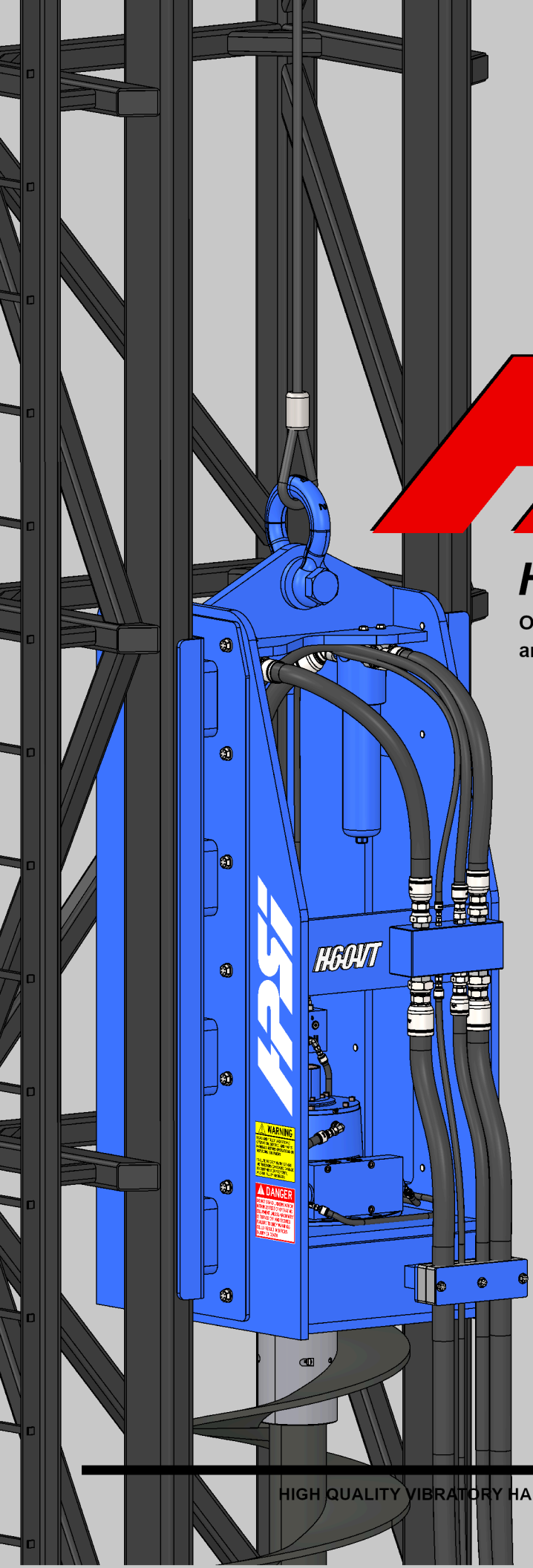

H60VT AUGER

Operators, Maintenance and Parts Manual

GeoQuip Power Systems, LLC

HIGH QUALITY VIBRATORY HAMMERS, HYDRAULIC AUGERS, AND HYDRAULIC POWER UNITS V.2025

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SECTION 1: GENERAL INFORMATION

1.1 Warranty

GeoQuip Power Systems, LLC hereby warrants that the product is free from defects in material and workmanship attributable to GeoQuip Power Systems, LLC under normal use and service for a period of ninety (90) days from the date of delivery of such machine.

THE EXCLUSIVE REMEDY OF THE BUYER UNDER THIS WARRANTY is the repair or replacement, without charge, of any defective part or parts of this machine as long as the buyer notifies GeoQuip Power Systems, LLC by registered mail of such defect within seventy-five (75) days from the date of delivery of this machine.

Any part or parts claimed to be defective must be shipped to the GeoQuip Power Systems, LLC factory at 1203 Ozark, N. Kansas City, Missouri 64116, transportation prepaid. The GeoQuip Power Systems, LLC acceptance of any part so shipped shall not be deemed an admission that the part is defective, and if GeoQuip Power Systems, LLC finds that any part returned is not defective, such part shall be re-shipped to the Buyer at Buyer's expense.

THE BUYER'S SOLE AND EXCLUSIVE REMEDY AGAINST GeoQuip Power Systems, LLC UNDER THIS WARRANTY shall be for the REPAIR OR REPLACEMENT of defective parts as provided above. THE BUYER AGREES THAT NO OTHER REMEDY, INCLUDING, BUT NOT LIMITED TO, INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR LOST PROFITS, LOST SALES, INJURY TO PERSONS OR PROPERTY OR OTHER INCIDENTAL OR CONSEQUENTIAL LOSS SHALL BE AVAILABLE TO THE BUYER.

THE SOLE PURPOSE OF THE STIPULATED EXCLUSIVE REMEDY shall be to provide the Buyer with free repair or replacement of defective parts in the manner provided herein. This EXCLUSIVE REMEDY shall not be deemed to fail of its essential purpose so long as GeoQuip Power Systems, LLC is willing and able to repair or replace defective parts in the prescribed manner. THE BUYER SHALL NOT BE REQUIRED TO DELIVER A DEFECTIVE PART TO GeoQuip Power Systems, LLC IF:

(1) The part was destroyed as a result of its defect in any party covered in the warranty.

AND

(2) GeoQuip Power Systems LLC is reasonably satisfied that the part was defective at the time of sale.

If both conditions are met, GeoQuip Power Systems, LLC shall replace the part in the same manner provided herein as if the Buyer had delivered it to GeoQuip Power Systems, LLC at its factory.

THIS WARRANTY SHALL NOT APPLY to any machinery which has suffered abuse, misuse, neglect or accident or to any machinery which has been altered so as to affect its ability or reliability, (except where such alteration has been accomplished with the prior written consent of GeoQuip Power Systems, LLC) or which has been repaired in any way by the Buyer without the prior written consent of GeoQuip Power Systems, LLC or which has been negligently installed by the Buyer.

WARNING: THIS PRODUCT IS NOT TO BE USED IN ANY FASHION DIFFERENT FROM THAT WHICH BUYER HAS ADVISED SELLER SHALL BE ITS INTENDED USE. NO WARRANTY CONVEYED HEREIN SHALL APPLY TO USE OTHER THAN THAT WHICH BUYER HAS INDICATED TO SELLER AT THE TIME OF PURCHASE.

SELLER DOES NOT WARRANT PRODUCTS MANUFACTURED BY OTHER MANUFACTURERS WHICH MAY BE USED IN THE ASSEMBLY OF THE TOTAL PRODUCT SOLD BY SELLER, BUYER'S SOLE REMEDY AS TO PRODUCTS MANUFACTURED BY OTHERS SHALL BE PURSUED WITH SUCH OTHER COMPONENT PRODUCT MANUFACTURERS.

THE BUYER EXPRESSLY UNDERSTANDS THAT GeoQuip Power Systems, LLC HAS MADE NO EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, IMPLIED OR EXPRESSED WARRANTIES FOR MERCHANTABILITY OR FITNESS, OTHER THAN THE EXPRESSED WARRANTY SET FORTH ABOVE. THE SELLER, HEREBY, DISCLAIMS ALL OTHER EXPRESSED WARRANTIES, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND ALL OTHER IMPLIED WARRANTIES.

Any oral statements made by any person about the machine described in the Agreement DO NOT CONSTITUTE WARRANTIES and are not part of this Agreement. The entire Agreement between the parties hereto is embodied in this writing. This writing constitutes the final expression of the parties' Agreement, and it is a COMPLETE AND EXCLUSIVE STATEMENT of the terms of that Agreement. All oral or written agreements between the parties made prior to the execution of this Agreement are hereby merged herein. This Agreement SHALL NOT BE MODIFIED OR ALTERED in any way other than by writing, signed by the parties to the Agreement, their successors or authorized agents, and this Agreement SHALL NOT BE VARIED, SUPPLEMENTED, QUALIFIED, EXPLAINED, OR INTERPRETED BY ANY PRIOR COURSE OR DEALING BETWEEN THE PARTIES OR BY ANY USAGE OF TRADE.

GeoQuip Power Systems, LLC

1203 Ozark St.

North Kansas City, Missouri 64116

1.2 About this Manual

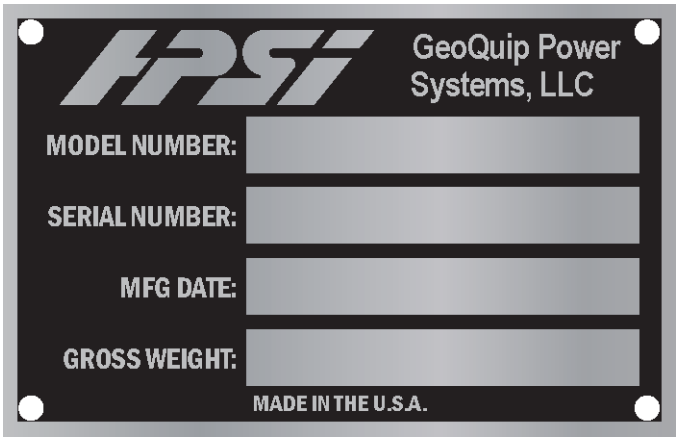
The intent of this Manual is to inform the user how to navigate, use, and properly maintain an HPSI H60VT Auger. Please keep this document stored in or within reasonable access while maintaining or running this equipment. Due to the dangerous nature of this product, HPSI always strongly recommends any work on their product be done by an HPSI technician. Always follow all necessary safety precautions while maintaining dangerous equipment.

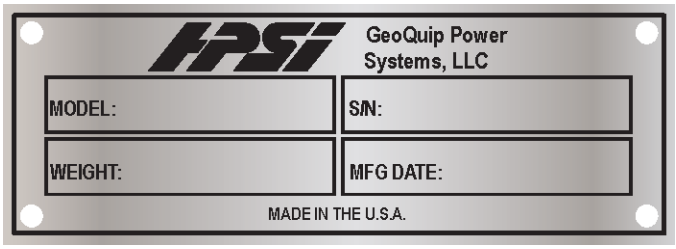
Due to our desire to provide our customers with the longest lasting, most reliable products possible, we are always making improvements. This manual may feature information that is different from your equipment. Please do not hesitate to call HPSI, we have experts who can help direct you with problems that may come up.

For updated or replacement copies of manuals and specification sheets contact HPSI. Digital copies of this manual can be found at Hydraulicpowersystems.com.

1.3 Ordering from HPSI

We understand down time on a job site costs money. That's why Hydraulic Power Systems has built its name on the reliability of our product. In the occasion that something does go wrong, our service/parts support is unmatched in the industry. Identify the serial number of your unit and give us a call. We stock most of our parts in-house and have them immediately available.





1.4 Contact Us

Phone Numbers:

Main Line: 816-221-4774
Email: Parts@4HPSI.com

Address:

Geoquip Power Systems, LLC
d/b/a Hydraulic Power Systems
1203 Ozark St.
North Kansas City, MO, 64116

SECTION 2:
SAFETY

2.1 Important Safety Information

Most accidents involving product operation, maintenance, and repair are caused by a failure to observe basic safety rules and precautions. An accident can often be avoided by recognizing potentially hazardous situations before the situation occurs. A person must always be alert to potential hazards. This person should also have the necessary training, skills, and tools to perform these functions properly.

WARNING

IMPROPER OPERATION AND/OR MAINTENANCE OF THIS PRODUCT CAN BE EXTREMELY DANGEROUS AND COULD RESULT IN SERIOUS INJURY OR DEATH.

DO NOT OPERATE, PERFORM MAINTENANCE, OR MAKE ANY REPAIRS ON THIS PRODUCT UNTIL YOU HAVE READ AND UNDERSTOOD THE OPERATION, MAINTENANCE AND REPAIR INFORMATION IN THIS MANUAL.

SAFETY PRECAUTIONS AND WARNINGS ARE ALSO PROVIDED ON THE PRODUCT. IF THESE HAZARD WARNINGS ARE NOT FOLLOWED, SERIOUS BODILY INJURY OR DEATH COULD OCCUR TO YOU OR OTHER PERSONS.

GeoQuip Power Systems, LLC cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this publication and on the product are therefore not all inclusive. If a tool, procedure, work method or operation technique not specifically recommended by **GeoQuip Power Systems, LLC** is used, you must first determine that it is not dangerous for you and others in the vicinity. Concern for the safety of the product should also be taken into consideration. You should ensure that the unit will not be damaged or made unsafe by the particular operation, maintenance, or repair procedures you choose.

The information, specifications, and illustrations in this document are the latest available at the time of publication. The specifications, pressures, measurements, adjustments, illustrations, and other items can change at any time.

These changes can affect the service given to the product. Obtain the complete and most current information before starting any job. **GeoQuip Power Systems, LLC** factory authorized representative, have the most current information available. For the name of the nearest FACTORY AUTHORIZED REPRESENTATIVE contact **GeoQuip Power Systems, LLC**. at (816) 221-4774.

2.2 Standard Safety Procedures

WARNING

NEVER START ENGINE WITH THE GOVERNOR LINKAGE DISCONNECTED. INSTALL GUARDS OVER ALL EXPOSED ROTATING PARTS.

ALWAYS STOP ENGINE BEFORE ADJUSTING OR REPAIRING HYDRAULIC POWER UNIT.

DO NOT WEAR LOOSE CLOTHING WHEN WORKING NEAR ENGINE OR AUGER.

ALWAYS WEAR PROTECTIVE GLASSES, CLOTHING, HEADGEAR, RESPIRATOR, ETC. WHEN CONDITIONS REQUIRE THEM.

NEVER INSPECT ENGINE COOLING SYSTEM WHILE UNIT IS RUNNING.

IF EQUIPPED WITH JACKET WATER COOLING SYSTEM, REMOVE COOLANT FILLER CAP SLOWLY TO RELIEVE PRESSURE THAT MAY HAVE BUILT UP DURING OPERATION. NEVER REMOVE CAP WHILE ENGINE IS HOT OR OPERATING. STEAM FROM COOLING SYSTEM COULD CAUSE SERIOUS INJURY.

BE PREPARED IF A FIRE STARTS.

KEEP A FIRST AID KIT NEAR BY WHEN OPERATING EQUIPMENT. EXTINGUISH ALL OPEN FLAMES INCLUDING CIGARETTES OR OTHER BURNING SUBSTANCES WHILE REFUELING UNIT AND WHEN SERVICING BATTERIES.

WARNING

PROTECTIVE CLOTHING AND EQUIPMENT SHOULD BE WORN AT ALL TIMES.

WEAR PROTECTIVE CLOTHING AND EQUIPMENT APPROPRIATE FOR THE JOB. AVOID LOOSE FITTING CLOTHING.

PROLONGED EXPOSURE TO EXCESSIVE NOISE CAN CAUSE HEARING LOSS. WEAR SUITABLE HEARING PROTEC-TION SUCH AS EAR PLUGS.

OPERATING EQUIPMENT SAFELY REQUIRES THE FULL ATTENTION OF THE OPERATOR. AVOID DISTRACTIONS.

DO NOT OPERATE THE UNIT WHEN YOU ARE TIRED, ILL OR UNDER THE INFLUENCE OF ALCOHOL, DRUGS OR MEDI-CATION.

NEVER LET A MINOR OR INEXPERIENCED PERSON OPERATE THE UNIT.

WARNING

SERIOUS ACCIDENTS CAN OCCUR IF THE OPERATOR IS NOT ALERT TO THE PRESENCE OF CHILDREN. CHILDREN ARE OFTEN ATTRACTED TO MACHINERY AND WORK ACTIVITY. NEVER ASSUME THAT CHILDREN WILL REMAIN WHERE YOU LAST SAW THEM. BE ALERT AND TURN THE EQUIPMENT OFF IF CHILDREN ENTER THE WORK AREA. KEEP CHILDREN OUT OF THE WORK AREA AND UNDER SUPERVISION OF ANOTHER RESPONSIBLE ADULT.

INSPECT THE AREA BEFORE OPERATION. REMOVE OBJECTS WHICH CAN BE THROWN OR BE-COME ENTANGLED.

KEEP ALL PARTS OF YOUR BODY AWAY FROM THE EQUIPMENT WHEN OPERATING THE UNIT.

WARNING

UNDERGROUND HAZARDS

IT IS THE RESPONSIBILITY OF THE OPERATOR TO KNOW WHERE BURIED POWER, GAS, TELEPHONE, AND OTHER UTILI-TIES ARE IN THE WORK AREA. THIS MAY LEAD TO SHOCK OR AN EXPLOSION. HAVE THE WORK AREA MARKED FOR BURIED LINES AND DO NOT DIG IN MARKED AREAS SET BY YOUR LOCAL MUNICIPALS. STRIKING A HARD OBJECT UNDERGROUND CAN RESULT IN FAILURES.

WARNING

PRACTICE SAFE MAINTENANCE

DO NOT ADJUST OR REPAIR UNIT WHILE IN OPERATION.

BE SURE TO RELEASE HYDRAULIC PRESSURE FROM LINES BEFORE DOING ANY MAINTENANCE.

USE PROPER TOOLS AND EQUIPMENT WHEN CONDUCTING MAINTENANCE, REFER TO THIS MANUAL FOR ADDITIONAL INFORMATION.

WORK IN A CLEAN DRY AREA.

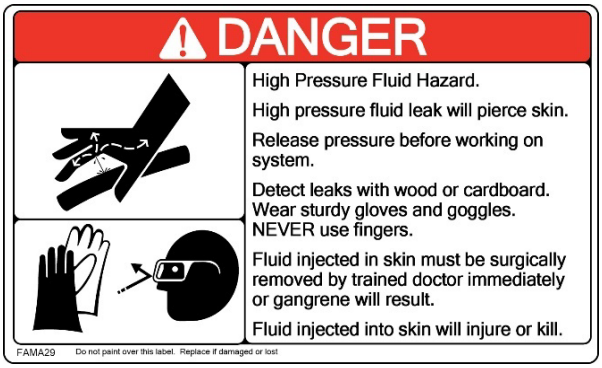
INSPECT ALL PARTS. BE SURE PARTS ARE IN GOOD WORKING CONDITION AND INSTALLED PROPERLY.

REMOVE BUILD UP OF GREASE, OIL OR ANY DEBRIS.

REMOVE ALL TOOLS AND UNUSED PARTS FROM EQUIPMENT BEFORE BEGINNING OPERATION.

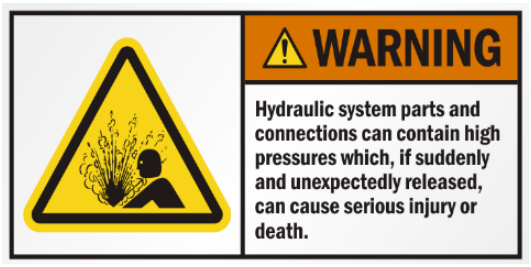

CAUTION
FALLING MATERIAL
SmartSign.com • 800-952-1457 • S2-0098


811
SAFETY IS IN YOUR HANDS.
EVERY DIG. EVERY TIME.


DANGER
High Pressure Fluid Hazard.
High pressure fluid leak will pierce skin.
Release pressure before working on system.
Detect leaks with wood or cardboard. Wear sturdy gloves and goggles. NEVER use fingers.
Fluid injected in skin must be surgically removed by trained doctor immediately or gangrene will result.
Fluid injected into skin will injure or kill.
FAMA29
Do not paint over this label. Replace if damaged or lost

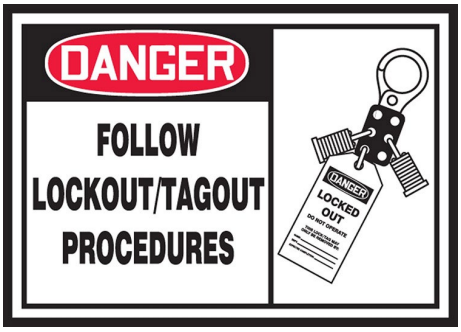

SAFETY INSTRUCTIONS
ELECTROCUTION HAZARD
TO AVOID DEATH OR SERIOUS INJURY, KEEP ALL PARTS OF THE CRANE, THE RIGGING AND MATERIALS BEING LIFTED AT LEAST 20 FEET AWAY FROM ALL ELECTRICAL POWER LINES AND EQUIPMENT
FOLLOW INSTRUCTION IN OPERATOR AND SAFETY MANUALS


DANGER
DO NOT WALK UNDER SUSPENDED LOADS

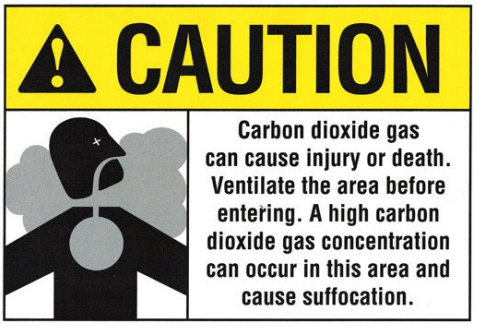

WARNING
Hydraulic system parts and connections can contain high pressures which, if suddenly and unexpectedly released, can cause serious injury or death.


DANGER
Rotating parts inside.
Keep hands clear.
Lockout/tagout before servicing.
DURAMARK
D00074M


WARNING
PPE REQUIRED

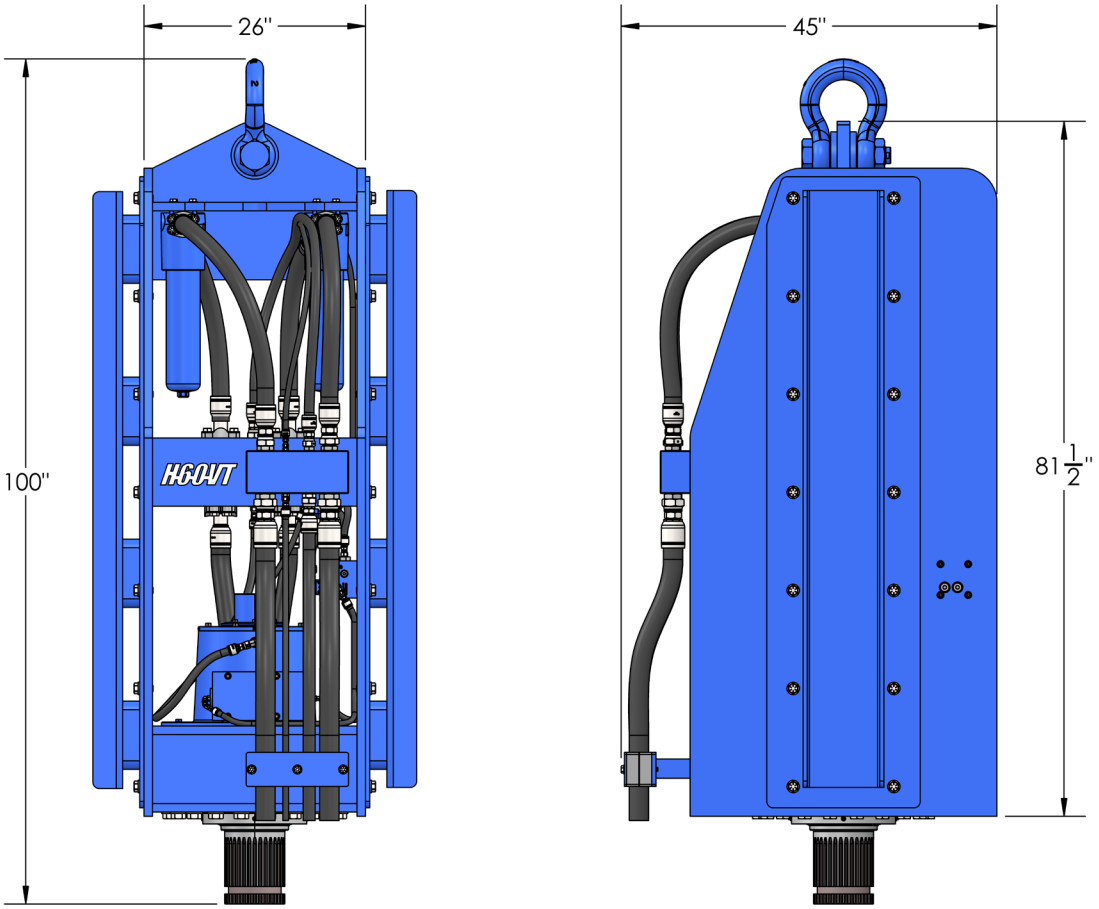

DANGER
FOLLOW LOCKOUT/TAGOUT PROCEDURES
DANGER
LOCKED OUT
DO NOT OPERATE


WARNING
FIRE EXTINGUISHER IS NOT PROVIDED


CAUTION
Carbon dioxide gas can cause injury or death. Ventilate the area before entering. A high carbon dioxide gas concentration can occur in this area and cause suffocation.

SECTION 3: INTRODUCTION

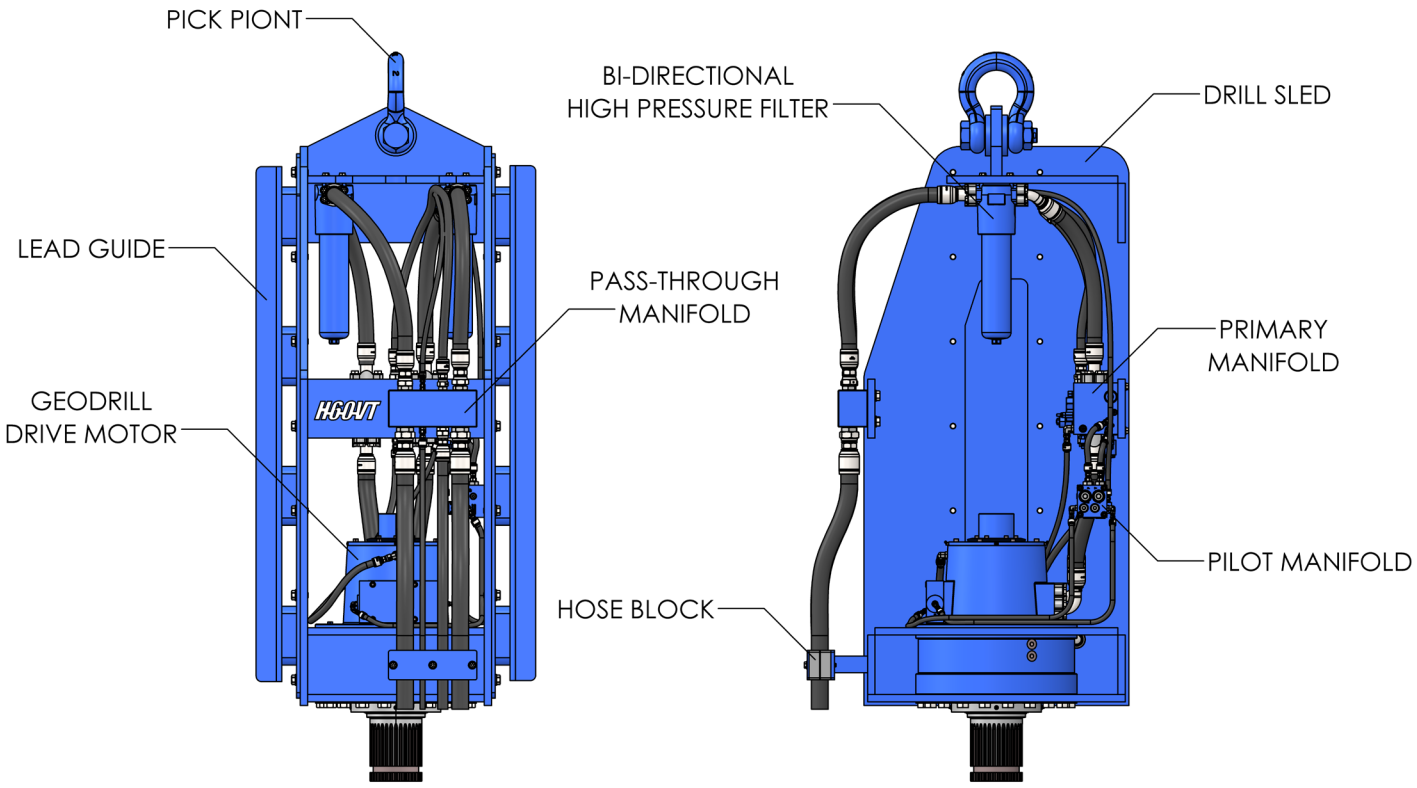
3.1 H60VT Specifications



SPECIFICATIONS	
Low Speed Maintained Output Torque	60,000 ft-lbs
High Speed Maintained Output Torque	30,000 ft-lbs
Maintained Rotation Speed- High Torque	25 rpm
Maintained Rotation Speed- Low Torque	50 rpm
Operating Pressure	5,000 psi
Operating Flow	100 gpm
Transport Weight (Includes 32in Guides, Stand, and Hose Bundle)	7,000 lbs
Approximate Suspended Weight	5,500 lbs
Shipping Dimensions (L x W x H)	92 x 92 x 100 in
Guides available for 26, 32, 42, 48in leads.	
Specifications are subject to change based on equipment options or design updates.	

3.2 General Overview

The HPSI Model H60VT Auger is designed to create strong and stable foundations for buildings, bridges, and other structures by drilling deep holes into the ground and installing piles or piers for support. The H60VT is well-suited for a range of soil conditions and foundation types, offering reliable torque and control for efficient drilling. It's a versatile tool for contractors needing dependable performance on deep foundation projects.



NOTE: For detailed information on attachments or accessories, refer to the ***HPSI Clamps and Accessories Manual.*** For additional details on the power unit, consult the appropriate ***Power Unit Manual.*** If you need further assistance, contact HPSI for support.

SECTION 4: MAINTENANCE

4.1 Daily Maintenance

1. Perform a complete visual inspection of the unit. Check for any signs of damage, wear, or abnormalities that could affect operation.
2. Inspect pop-off valves for any signs of leaks or damage. Replace any faulty components to prevent system failures.
3. Visually inspect all hoses for any signs of wear or damage. Replace hoses that show excessive wear or are cracked to prevent down time or injury.
4. Examine hose fittings for any looseness or damage. Tighten or replace any fittings that are not secure to prevent hydraulic leaks.
5. Inspect seals for any signs of leaks or damage. Replace any worn-out seals to avoid fluid loss and maintain system pressure.
6. Check the cotter pins on pick points to ensure they are properly secured and intact. Replace any missing or damaged cotter pins.
7. Inspect safety decals for visibility and condition. Replace any missing or damaged decals to ensure proper safety communication.
8. Check the condition of the hose block. Ensure it is securely mounted and free from damage or wear.
9. Inspect all bolts for tightness and integrity. Replace any missing or damaged bolts to avoid structural issues.
10. Note any additional damage or discrepancies noticed during the inspection and address as necessary.

NOTE: Daily maintenance helps prevent safety hazards, reduce downtime, and extend the life of any tool. Catching small issues early keeps the equipment running reliably and avoids costly repairs.

NOTE: Do not weld or cut on this equipment.

4.2 General Maintenance

1. **Operate Regularly:**

   Run the auger at least once per month to maintain proper lubrication of the motor and other critical components.

2. **Filter Element Replacement:**

   Replace the auger's drive motor filter elements—located in the top of the auger housing—every 250 hours of operation using factory part number FIL-01022 only. If the hydraulic system experiences contamination, replace the filters sooner.

NOTE: Do not use paper-type elements as they will collapse and can cause significant and costly damage.

3. **Fastener Check:**

   Inspect and replace all missing or damaged bolts, nuts, or fasteners immediately. Do not operate the auger until all components are secure.

4. **Hose Inspection:**

   Replace any damaged hoses on the auger or hose bundle at the first sign of wear or potential failure to prevent system failure or safety hazards.

4.2.1 Maintenance Intervals

ITEM	AS NEEDED	250 HOURS OR 1 YEAR	500 HOURS OR 2 YEARS
Auger Filter	X	X	
Fasteners	X		
Hoses	X		X

4.3 Torque Specifications

SIZE	TYPE	REQUIRED TORQUE
3/8" - 16	Socket-Head Grade 8	44 ft/lbs
1/2" - 13	Hex-Head Grade 8	107 ft/lbs
1/2" - 13	Socket-Head Grade 8	107 ft/lbs
5/8" - 11	Hex-Head Grade 8	212 ft/lbs
3/4" - 10	Hex-Head Grade 8	376 ft/lbs
3/4" - 10	Nut Grade 8	188 ft/lbs
3/4" - 10	Socket-Head Grade 8	376 ft/lbs
1" - 8	Hex-Head Grade 8	909 ft/lbs
1" - 8	Socket-Head Grade 8	909 ft/lbs
1" - 8	Lock Nut Grade 8	455 ft/lbs

4.4 Fluid Specifications

To ensure proper operation and long service life of the auger system, the hydraulic fluid must meet the following requirements:

Viscosity Requirements

- Recommended operating viscosity: **25 – 50 cSt**
- Minimum allowable intermittent viscosity: **15 cSt**
- Maximum viscosity at startup: **1000 cSt**
- Viscosity index: **Minimum 100**

NOTE: Operating temperature greatly affects fluid viscosity and lubrication performance. Always select oil based on actual operating temperatures. Using higher-viscosity hydraulic fluids may reduce wear and extend service intervals while improving running smoothness.

Water Content

- Water content must be **below 500 ppm (0.05%)**

Cleanliness Requirements

- Fluid must meet or exceed **ISO 4406 cleanliness level 18/16/13** *(equivalent to NAS 1638 Class 7)*

NOTE: Dirty hydraulic fluid can damage the auger's motor and other parts, leading to breakdowns and expensive repairs. Always use clean, properly filtered fluid and change filters as needed. Check fluid regularly to avoid problems.

4.5 Direct Drive

4.5.1 Maximum Case Pressure

The internal pressure of the motor directly affects the life of its seals. To reduce wear and prevent premature failure, it is recommended to keep case pressure as low as possible.

While running:

- Recommended average case pressure: **29 psi**
- Maximum permissible case pressure (intermittent): **145 psi**

While not running:

- Maximum permissible constant case pressure: **145 psi**

4.5.2 Minimum Operating Pressure

A minimum pressure must be maintained in the working lines to ensure the motor stays properly engaged during operation. This pressure keeps the motor pistons in constant contact with the cam ring. If the pressure drops too low, particularly at higher flow rates, the pistons can momentarily disconnect from the cam ring. This results in clattering or knocking noises as they re-engage.

Maintaining sufficient pressure prevents this and ensures smooth, consistent motor performance.

4.5.3 Flushing the Hydraulic System

Before connecting the motor to the hydraulic system, the motor's circuit must be flushed to remove contaminants and prevent damage.

Flushing Procedure:

- Always flush using clean hydraulic fluid and a filter installed in place.
- Circulate the fluid through the motor's circuit under normal pressure for at least one hour.
- After flushing, replace all filters before putting the system into service.

NOTE: The flushing procedure must also be completed after any major service or system modification.

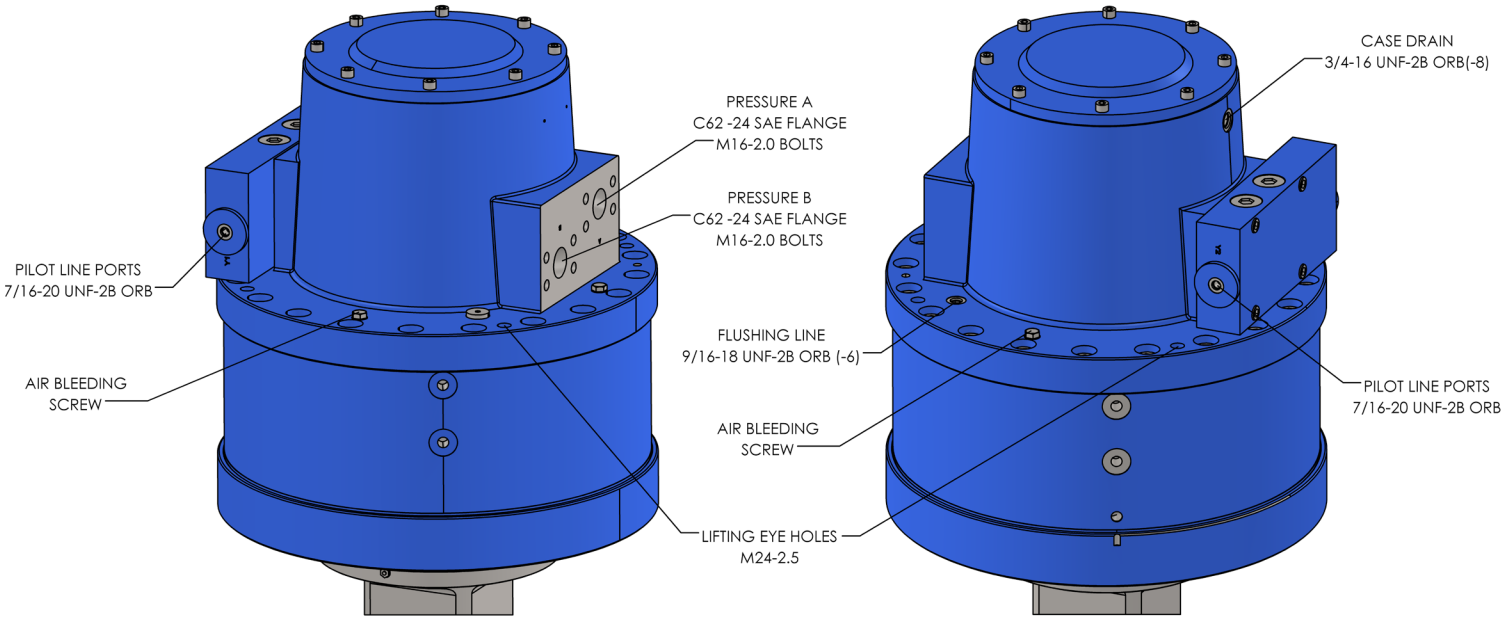
4.5.4 Air Bleeding Procedure

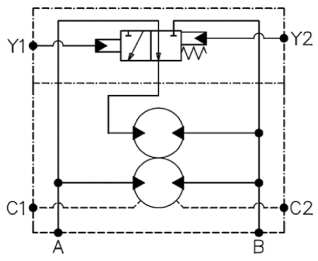
The air bleeding procedure ensures the motor housing is completely filled with hydraulic fluid by removing trapped air. Follow the steps below:

1. Locate the topmost air bleeding screw (E).
2. Verify that the motor's drain line (C2) is properly connected.
3. Apply low-pressure hydraulic fluid to the motor continuously during the procedure.
4. Loosen the air bleeding screw approximately half a turn.
5. Orient the motor so the air bleeding screw is at the highest point, allowing trapped air to escape.
6. Observe the flow from the screw. When only hydraulic fluid (no air bubbles) emerges, the housing is fully filled.
7. Tighten the air bleeding screw to a torque of **29 ± 2 ft-lbs**.

NOTE: Proper air bleeding is critical. Running the motor with air in the housing can cause damage or reduce performance.

4.5.5 Hydraulic Connections





Port:	Type:	Size:	Pmax: [7]
A / B	WORKING LINES		450 bar
	ISO 6162-2 type 1	1 1/2" flange (SAE 6000psi), M16 screws	
C1	FLUSHING LINE		10 bar
	ISO 11926-1	9/16"-18 UNF-2B ORB (size 6)	
C2	CASE DRAIN LINE		10 bar
	ISO 11926-1	3/4"-16 UNF-2B ORB (size 8)	
Y1/Y2	2-SPEED		350 bar
	ISO 11926-1	7/16"-20 UNF-2B ORB (size 4)	
-	-		-
	-	-	

[7] *Max. potential pressure in port. See performance for allowed operating pressure.*

4.5.6 Break-in Period

To ensure optimal performance and durability, all new and reconditioned motors must undergo a break-in period during their initial operation. This phase allows internal components to properly seat and stabilize through controlled wear.

Guidelines for Break-In:

- **Minimum Duration:** Operate the motor under controlled conditions for at least 8 hours.
- Power Limitation: Reduce the motor's power output by limiting the working pressure, rotational speed, or both.
- **Pressure Spikes:** Ensure that any pressure spikes lasting longer than 2 seconds remain below 75% of the motor's maximum rated pressure.
- **Purpose:** During break-in, internal components wear against each other slightly. This process helps the motor reach a stable wear pattern, ensuring consistent performance throughout its service life.

4.5.7 Use and Servicing

Proper use and regular maintenance of the motor help ensure optimal performance and longevity. Follow these guidelines for safe and efficient operation.

- **Regular Inspections**: Check the tightening torque of screw connections and ensure hydraulic connections remain secure.
- **Avoid High-Pressure Cleaning**: Do not use pressure washers directly on the shaft or housing, especially around the shaft seal area, as this may cause damage.
- **Prevent Full Submersion**: Do not operate the motor in conditions where it is completely submerged in water, mud, or other contaminants.

The internal temperature of the motor plays a critical role in its performance and lifespan. Observe the following operating limits:

- **Optimal Temperature**: To extend service life, avoid continuous operation above **70°C (158°F)**.
- **Maximum Intermittent Temperature**: The highest allowable short-term operating temperature is **85°C (185°F)**.
- **Minimum Operating Temperature**: The motor should not be used below **-35°C (-31°F)**.
- **Temperature Differential**: The difference between the motor's internal temperature and the hydraulic fluid should remain below **60°C (140°F)**.

To monitor temperature, measure the returning hydraulic fluid from the motor, taking into account both the drain line and the return lines (A or B).

- Apply grease to the attachment pin bosses and motor seal housing every 40 hours of use.
- Use a mineral oil-based lithium soap grease with a service temperature range of -40°C to 160°C (-40°F to 320°F).

4.5.8 Storing the Motor

Proper storage is essential to preserve motor condition and prevent damage during idle periods. Follow the guidelines below depending on the storage duration.

General Storage Procedure

- **Wash the Unit:** Clean the motor thoroughly using mild detergent and water to remove dirt, debris, and grime before storage.
- **Safety Measures:** Do not allow children to play near or around the storage area.
- **Protect Shafts and Ports:** Apply grease or a rust inhibitor to exposed shafts and hydraulic ports.
- **Lubricate Bearings:** Grease all bearing seals to prevent drying and corrosion.
- **Fastener Check:** Inspect and tighten all bolts, nuts, and screws.

Short-Term Storage (up to 9 months)

- **Seal Openings**: Cover all pressure openings and open threaded ports with appropriate protective caps.
- **Prevent Corrosion**: Protect unpainted surfaces from dirt, moisture, and oxidation.
- **Storage Environment**:
  - Store the motor in a **dry, clean area** with a stable temperature.
  - **Avoid proximity to corrosive chemicals** (e.g., acids, solvents, alkalis, and salts).
  - Keep away from **strong magnetic fields** and **excessive vibration**.

Long-Term Storage (over 9 months)

In addition to the short-term storage measures:

- **Paint Repairs**: Touch up any damaged or chipped paint to prevent rusting.
- **Anti-Corrosion Treatment**: Apply a suitable anti-corrosion coating to all unpainted surfaces.
- **Internal Protection**: Completely fill the motor with clean hydraulic fluid to protect internal components from corrosion and moisture damage.

NOTE: When stored under these conditions, the motor can remain in storage for up to **two years**. Storage beyond that period may still be possible but should be evaluated based on actual environmental conditions and verified before re-use.

SECTION 5: OPERATION

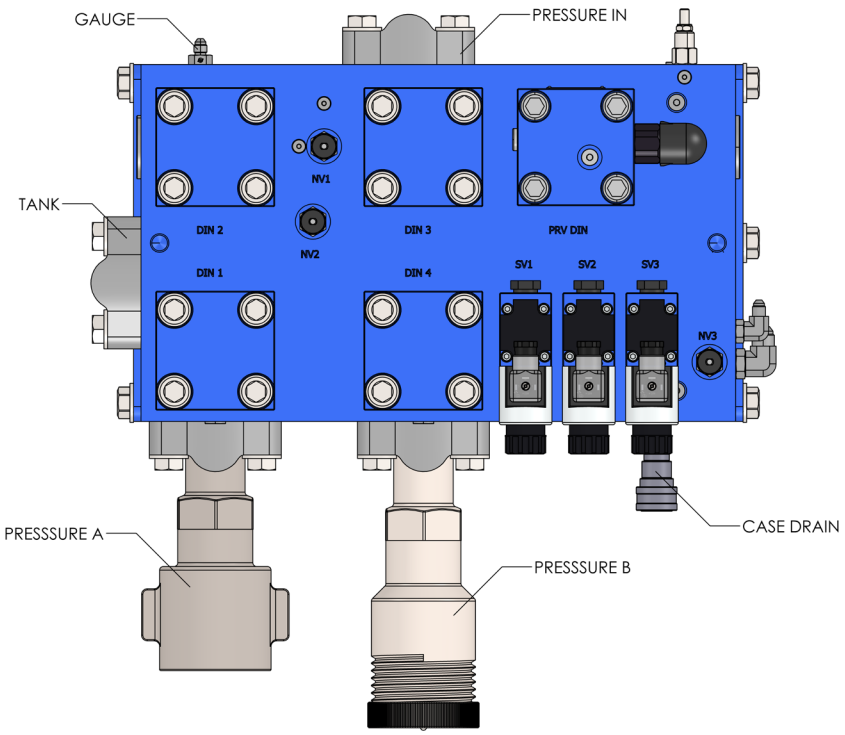
5.1 Auger Set-up

5.1.1 Connecting the Hydraulic Hoses to the Power Unit

To ensure safe and correct operation, follow the steps below when connecting hydraulic hoses between the Power Unit and the Auger:

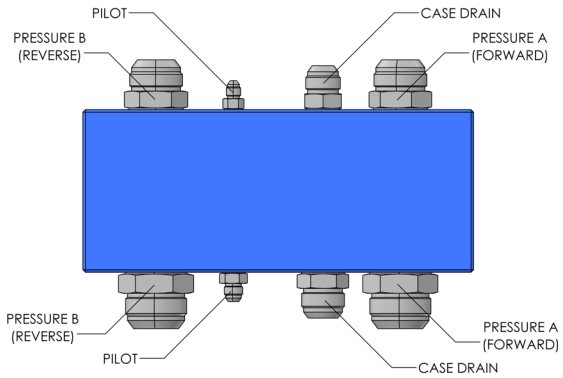
1. **Shut Down Power Pack**: Ensure the Power Pack is completely shut down before connecting any hydraulic hoses.
2. **Use Quick-Disconnect Couplers**: Connect the Auger and Power Pack using the designated quick-disconnect couplers.
3. **Relieve System Pressure**: Open the faucet valves (NV1, NV2, NV3) located on the top of the manifold by turning them counterclockwise to relieve any residual hydraulic pressure.
4. **Clean Couplers**: Wipe both ends of the quick-disconnect couplers with a lint-free cloth and suitable cleaning fluid before connecting.
5. **Secure by Hand Only**: Ensure all couplers are hand-tightened only. Do not use wrenches or hammers, as this may damage the internal components of the quick disconnects.
6. **Close Valves Before Starting**: After connections are made, close all three faucet valves (NV1, NV2, NV3) before starting the engine. Failure to do so can result in damage to the unit.

NOTE: Refer to **Section 5.1** of your **Power Unit Manual** for detailed instructions on starting and maintaining the Power Unit. This manual is specifically focused on the auger and does not cover the full operation or maintenance of the Power Unit.



5.1.2 Connecting the Hose Bundle to the Pass-Through Manifold

Trace the Hose Bundle lines back to the opposite side of the bundle and connect them as shown in the diagram below. If the drill operates in reverse, swap the lines accordingly to ensure proper flow direction, after shutting down the unknit and ensuring no pressure remains in the lines.



5.1.3 Pre-Start Procedure

Before operating the H60VT, perform the following checks to ensure safe and reliable operation:

1. **Lifting Shackle Installation**
   - Ensure the shackle is installed according to the manufacturer's specifications and instructions.
   - Follow all safety recommendations and warnings provided by the manufacturer.
2. **Fastener Inspection**
   - Inspect all nuts, bolts, and visible fasteners for signs of wear, looseness, or damage.
   - Replace any missing or damaged components as needed before operation.
3. **Hydraulic System Check**
   - Inspect all hydraulic hoses and fittings for visible leaks, cracks, or loose connections.
   - Repair or replace any compromised components prior to use.
4. **Air Bleeding**
   - Use the bleed screws located at the top of the H60VT drive to remove trapped air from the hydraulic system.
5. **Lubrication**
   - Apply grease to all zerk fittings on the Auger Direct Drive prior to initial use.
   - Continue to grease twice daily during operation for proper lubrication.
6. **Visual Component Inspection**
   - Visually inspect all bolts, pins, and fasteners on the following components:
     - Sheet metal enclosure
     - Radiator brackets
     - Oil coolers
     - Hydraulic manifold
     - Hydraulic reservoir
     - Any other accessible or mounted components
   - Ensure all are secure and in good condition.

5.2 Drilling Operations

5.2.1 Drilling

1. Start by positioning the auger or anchor on the ground where the hole is needed. Use the parent machine's auxiliary hydraulics to rotate the auger or anchor in a clockwise direction.
2. Lower the machine's arms to help the auger dig into the ground. Apply only enough down pressure to ensure it cuts in. If rotation slows or stalls, ease up on the pressure. Too much pressure will cause frequent stalling.
3. As the auger goes deeper, the machine's arms or boom may move in an arc. Be ready to reposition the machine as needed to keep the auger or anchor as vertical as possible.
4. After drilling down about 24" (610 mm), raise the auger to clear out any loose material.
5. When the hole is at the required depth, let the auger spin for a few seconds to clean out the bottom of the hole.
6. Stop the rotation, raise the auger out of the hole, and swing it aside. Spin off any loose dirt before moving on.
7. If the hole isn't clean enough, repeat steps 2 and 3 as needed.
8. After you're done drilling, or before unhooking the auger; stop everything, set the brakes, disengage the power, shut off the engine, and remove the key.

5.2.2 Operations to Avoid

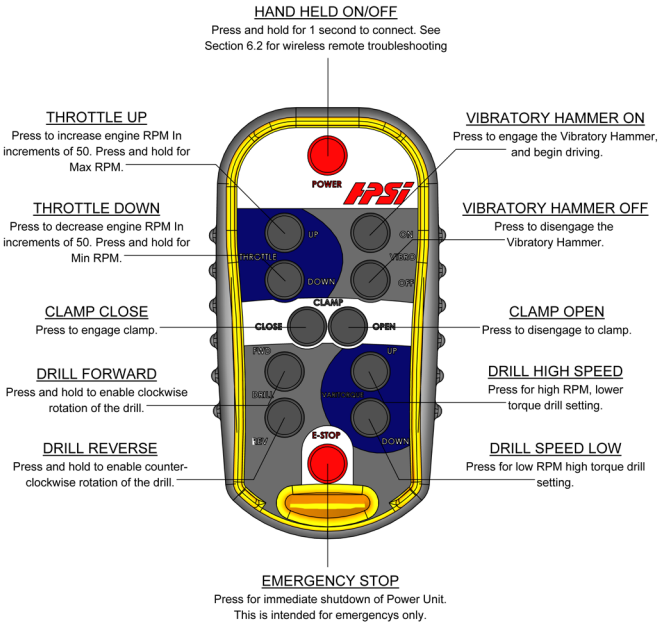
1. In some soils, or if too much down pressure is used, the auger can screw itself into the ground and get stuck. This can stall the drive. If that happens, reverse the auger rotation and slowly lift it out.
2. If the auger gets caught under rocks, roots, or other large obstacles, don't force it up. Use the reverse-and-lift method in Step 1 to free it.
3. Avoid putting side load on the auger. Drilling at an angle or forcing the auger sideways can damage both the drive and the auger flighting.
4. Make sure auger teeth and pilot bits are in good shape. Don't drill with damaged or worn teeth or holders.

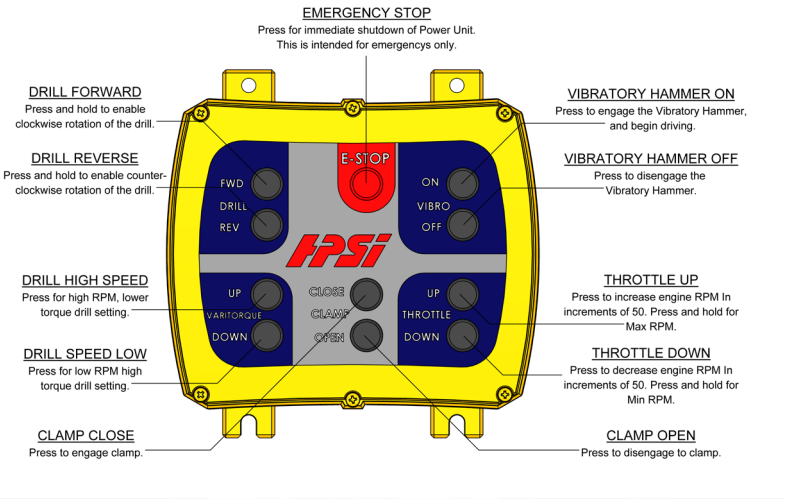
WARNING: Do not continually stall the Auger. Continued stalling may cause excessive heating of the hydraulic system and possible damage to the Auger Drive.

5.3 Wireless Remote

5.3.1 Controls

- To turn on the transmitter, press and hold the Power Button for at least one second until both LEDs light up, then release.
- The E-STOP button will turn off all other outputs.
- There are red and green LEDs both on the front of the transmitter and inside the receiver case. The green LED will blink two times per second when the transmitter and receiver are communicating. It will blink one time per second if there is no communication (i.e., no power to the receiver).
- The transmitter's red LED blinks one time per second if the battery is low and needs to be changed.





5.3.2 Sleep Timer

The transmitter is designed with a power saving feature which turns the transmitter off after 30 minutes if no buttons are pressed or if the receiver is off. This feature can be changed using the following procedure:

1) On the transmitter, press and hold POWER, THROTTLE DOWN, and VIBRO OFF buttons. The LEDs will blink once per second.
2) Press one of the following to adjust the sleep timer:

   THROTTLE UP = 15 min

   VIBRO ON = 30 min

   CLAMP CLOSE = 60 min

   CLAMP OPEN = Sleep disabled

SECTION 6: TROUBLESHOOTING

6.1 Auger

6.1.1 Loss of Operating Performance

This section addresses a drop in performance in the hydraulic auger system. It assumes any visible hydraulic leaks have already been located and repaired. Refer to the Parts Section for component drawings to assist with seal or part replacement.

The most effective way to troubleshoot the system is by isolating major components to narrow down the cause of the issue.

Procedure:

1. **Determine if the issue is in the auger drive or power unit.**
    - Disconnect the hydraulic hoses from the auger drive and install the proper hydraulic caps or plugs prior to testing.
    - With the engine running at normal operating speed, shift the auger control valve to forward or reverse.
2. Observe system pressure.
    - If pressure is below 4500 PSI, or the engine does not show signs of load, the issue is likely in the power unit.
    - If pressure is 4500–5000 PSI and the engine is under load, the issue is likely in the auger drive.
3. If the auger drive appears to be at fault, contact HPSI for service.
4. If the power unit appears to be at fault, determine whether the issue is related to pressure or flow:
    - If the auger is weak under load, try adjusting the relief valve located on the inlet side of the control valve.
    - If the adjustment has no effect, the relief valve may be dirty or the hydraulic pump may be worn.
    - If the auger performs well in soft conditions but struggles in harder material, the pump likely requires replacement.
    - If dirt is suspected in the relief valve, the blockage is typically between the poppet or ball and its seat.

6.2 Wireless Controller

6.2.1 Synchronizing Transmitter and Receiver

Each transmitter and receiver pair is synchronized at the factory. If a replacement transmitter is used, synchronization must be performed.

To synchronize:

1. Turn off both the transmitter and receiver.
2. On the transmitter, press and hold the POWER button for 10 seconds. The LEDs will begin blinking.
3. Turn on the receiver.
4. After a few seconds, the green LED on the transmitter will begin blinking rapidly.
5. Synchronization is complete.

6.2.2 Cloning Transmitters

If multiple transmitters are needed for the same receiver, they must be cloned to share the same ID code. Follow this procedure:

To clone a second transmitter:

1. Turn off both transmitters and the receiver.
2. On Transmitter A, press and hold the POWER button for 10 seconds until the LEDs blink, then release. Both red and green LEDs will blink together.
3. On Transmitter B, press and hold the POWER and CLAMP OPEN buttons at the same time until its LEDs start blinking.
4. Wait until the green LED begins blinking on both transmitters.
5. Turn off both transmitters.
6. Synchronize one transmitter to the receiver using the procedure in Section 6.2.1.

6.2.3 Uncloning Transmitters

To remove a cloned pairing and assign a new ID to a transmitter, use the following steps:

To unclone a transmitter:

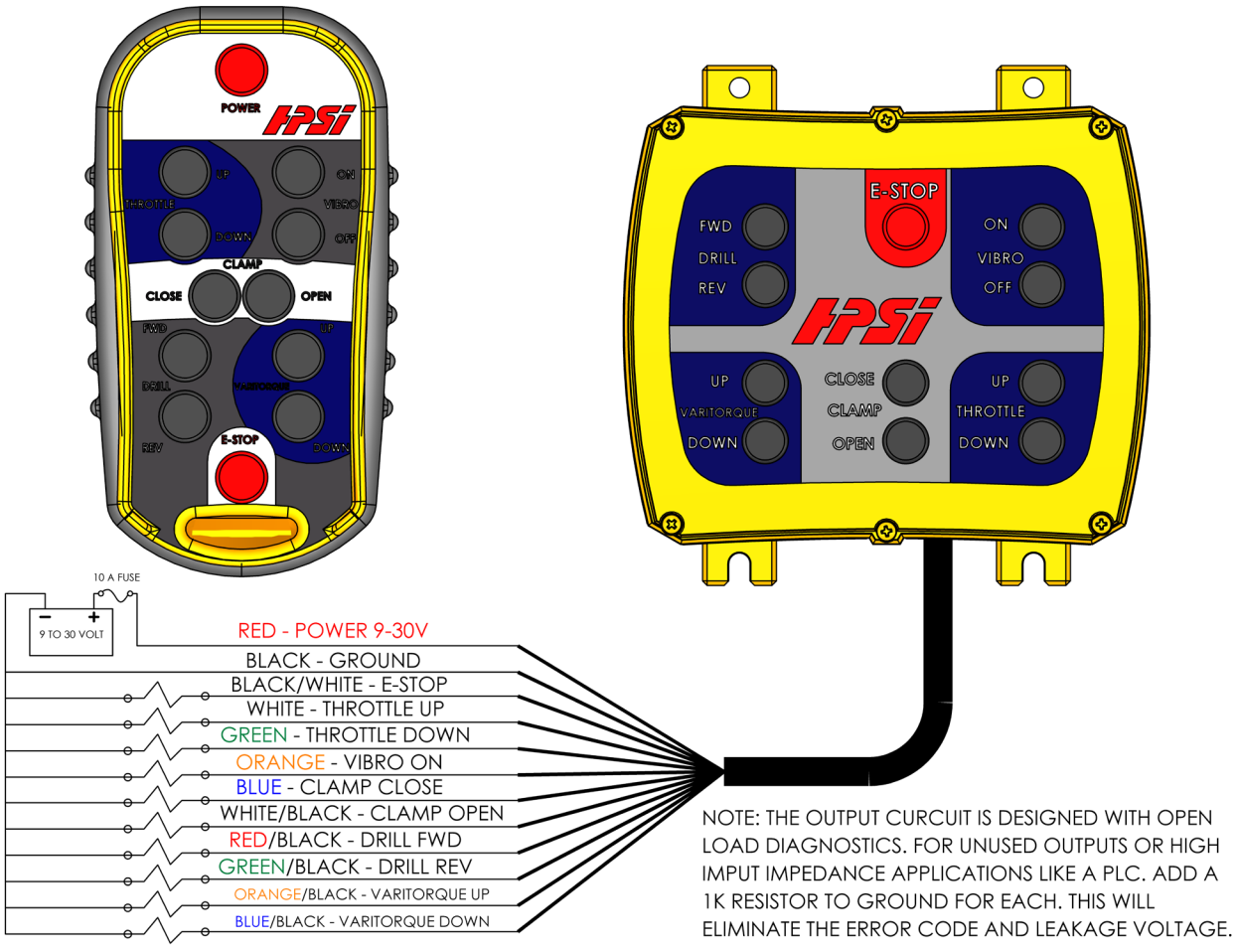
1. Turn off the receiver and all transmitters.
2. On the transmitter, press and hold the POWER, DRILL FWD, and VARITORQUE UP buttons at the same time until both LEDs start toggling. Release the buttons.
3. Press any button to generate a new ID.
4. Uncloning is complete.

Follow the synchronization procedure (Section 6.2.1) to pair the transmitter to a receiver.

NOTE: Refer to **Section 5.1** of your **Power Unit Manual** for information on troubleshooting the Power Unit. This manual is specifically focused on the auger and does not cover the full operation or maintenance of the Power Unit.

6.2.4 Error Codes

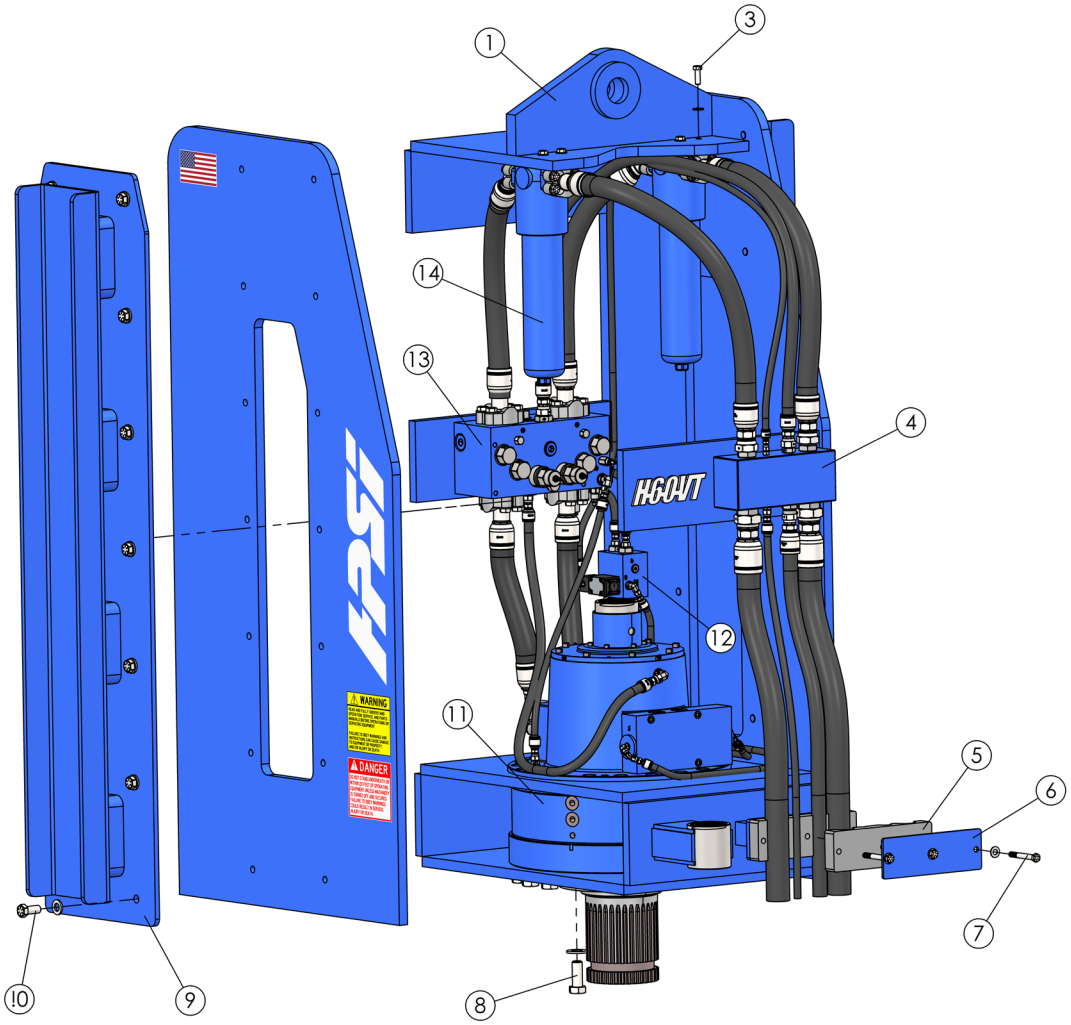
ERROR CODE	PROBABLE CAUSE	ERROR CODE	PROBABLE CAUSE
1	LOW BATTERY	8	VIBRO OFF OUTPUT ERROR
2	RF COMMUNICATION PROBLEM	9	CLAMP CLOSE OUTPUT ERROR
3	BUTTON ERROR	10	CLAMP OPEN OUTPUT ERROR
4	E-STOP ERROR	11	DRILL FWD OUTPUT ERROR
5	THROTTLE UP OUTPUT ERROR	12	DRILL REV OUTPUT ERROR
6	THROTTLE DOWN OUTPUT ERROR	13	VARITORQUE UP OUTPUT ERROR
7	VIBRO ON OUTPUT ERROR	14	VARITORQUE DOWN OUTPUT ERROR



NOTE: THE OUTPUT CURCUIT IS DESIGNED WITH OPEN LOAD DIAGNOSTICS. FOR UNUSED OUTPUTS OR HIGH IMPUT IMPEDANCE APPLICATIONS LIKE A PLC. ADD A 1K RESISTOR TO GROUND FOR EACH. THIS WILL ELIMINATE THE ERROR CODE AND LEAKAGE VOLTAGE.

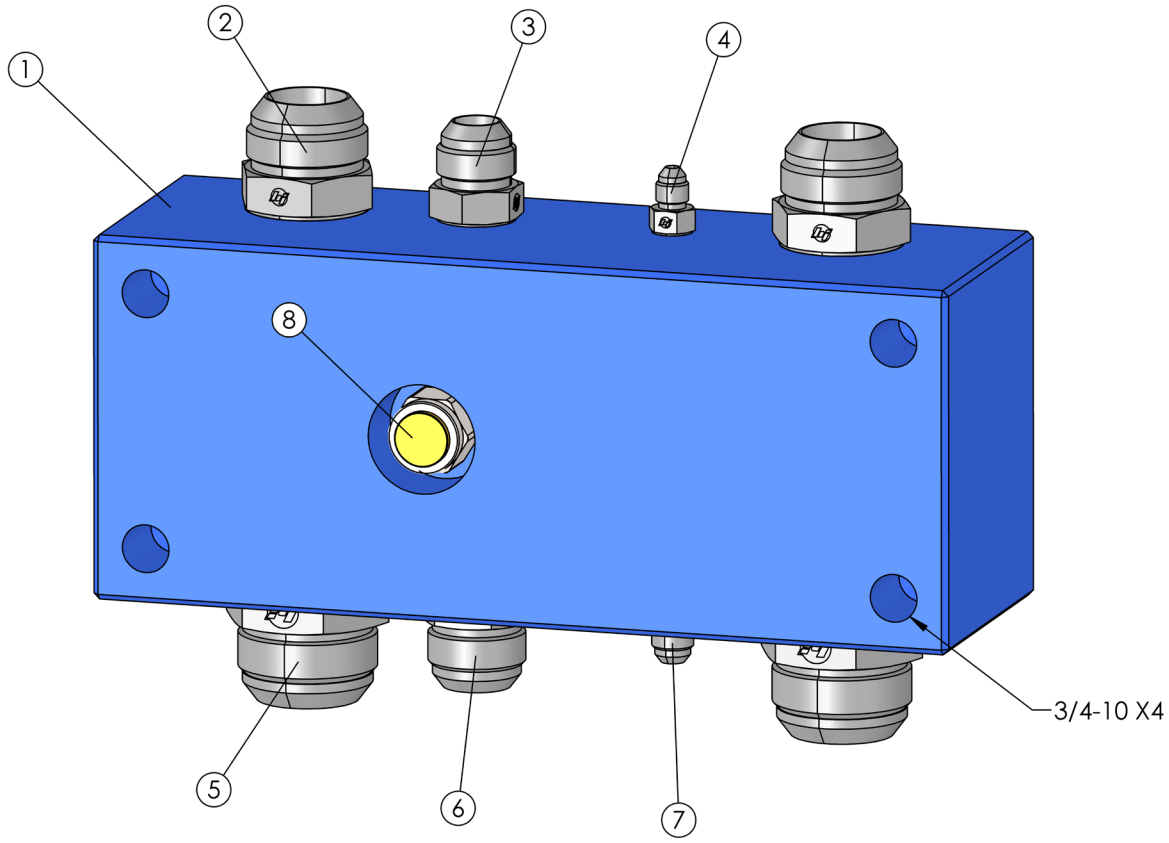
SECTION 7:
PARTS

7.1 Auger – Exploded View



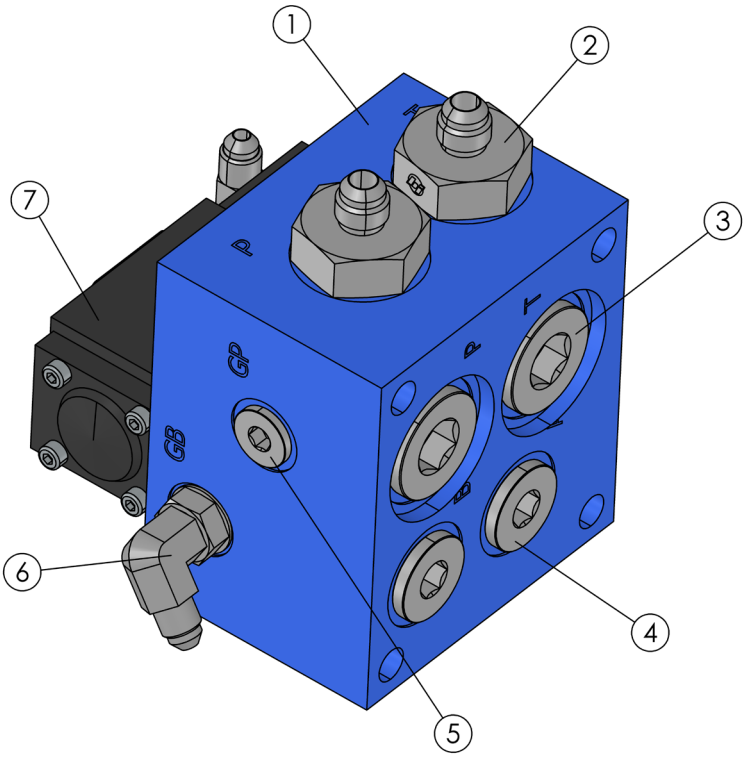
ITEM #	PART NUMBER	DESCRIPTION	QTY
1	AUG-02177	H60VT Drive Sled	1
2	BT-1/2H-1.5	Bolt 1/2-13 1 1/2 Hex Cap GR 8 (Flat Washers)	8
3	MAN-02182	H60/90 Passthrough Manifold	1
4	HOS-02183	H60/H90 Hose Block	1
5	HOS-02183-1	H60/90 Hose Block Plate	1
6	BT-1/2H-5	Bolt 1/2-13 5 Hex Cap GR 8 (Flat Washers, Lock Nut)	3
7	BT-1H-2.5	Bolt 1-8 2 1/2 Hex Cap GR 8 (Flat Washers)	20
8	AUG-02179	H60/90 32" Drill Guide (Different Sized Options Available)	2
9	BT-3/4H-1.75	Bolt 3/4-10 1 3/4 Hex Cap GR 8 (Flat Washers)	28
10	DRL-02159	Drill Direct Drive	1
11	MAN-02215A	H60/H90 Pilot Manifold Assembly	1
12	MAN-02214A	H60/H90 Drill Manifold Assembly	1
13	FIL-01530	H50, H60, and H90 Bi-directional Filter (ELEMENT FIL-01022)	2

7.2 Pass-Through Manifold – Bill of Materials



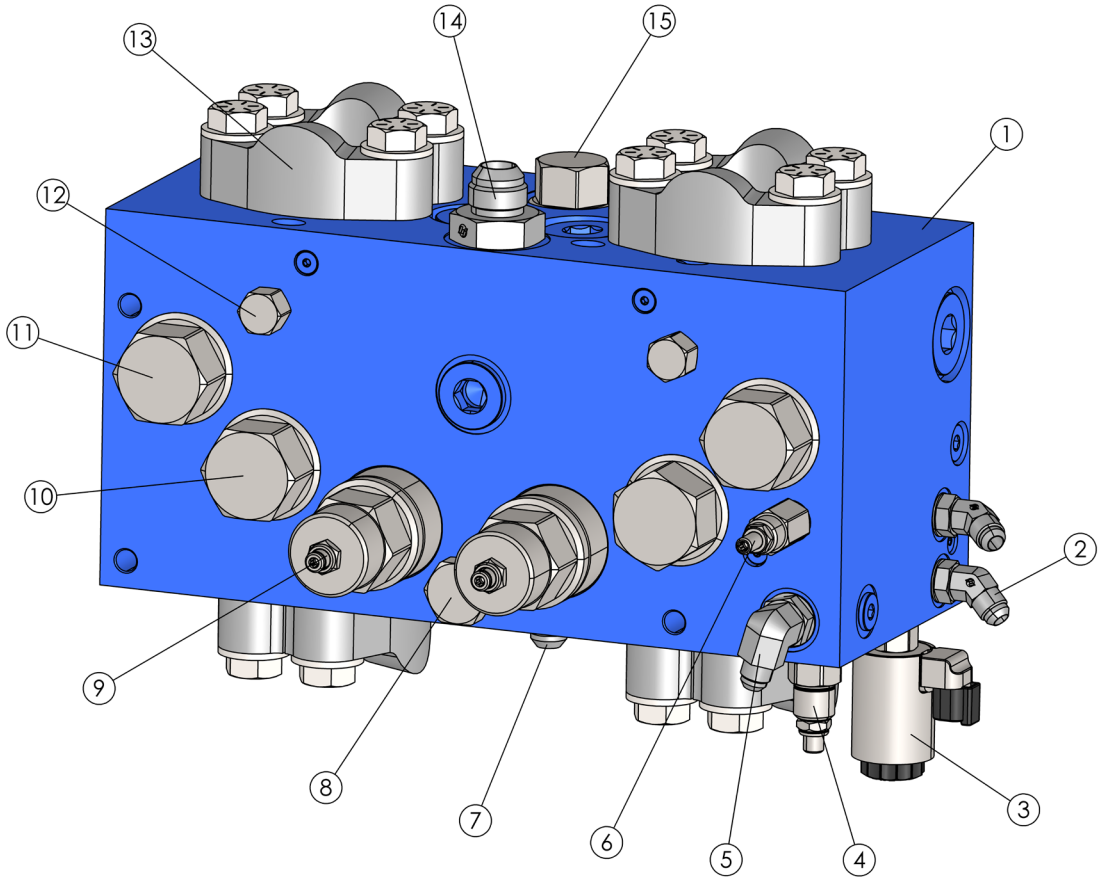
ITEM #	PART NUMBER	DESCRIPTION	QTY
1	MAN-02182	H60/H90vt Pass Through Manifold	1
2	S-2021-20-20S	-20mp X -20mj	2
3	S-2021-12-12S	-12mp X -12mj	1
4	S-2021-4-4S	-4mp X -4mj	1
5	S-2021-24-24S	-24mp X -24mj	2
6	S-2021-16-16S	-16mp X -16mj	1
7	S-2021-6-6S	-6mp X -6mj	1
8	VLV-33034	Case Drain Relief Valve	1

7.3 Pilot Manifold - Bill of Materials



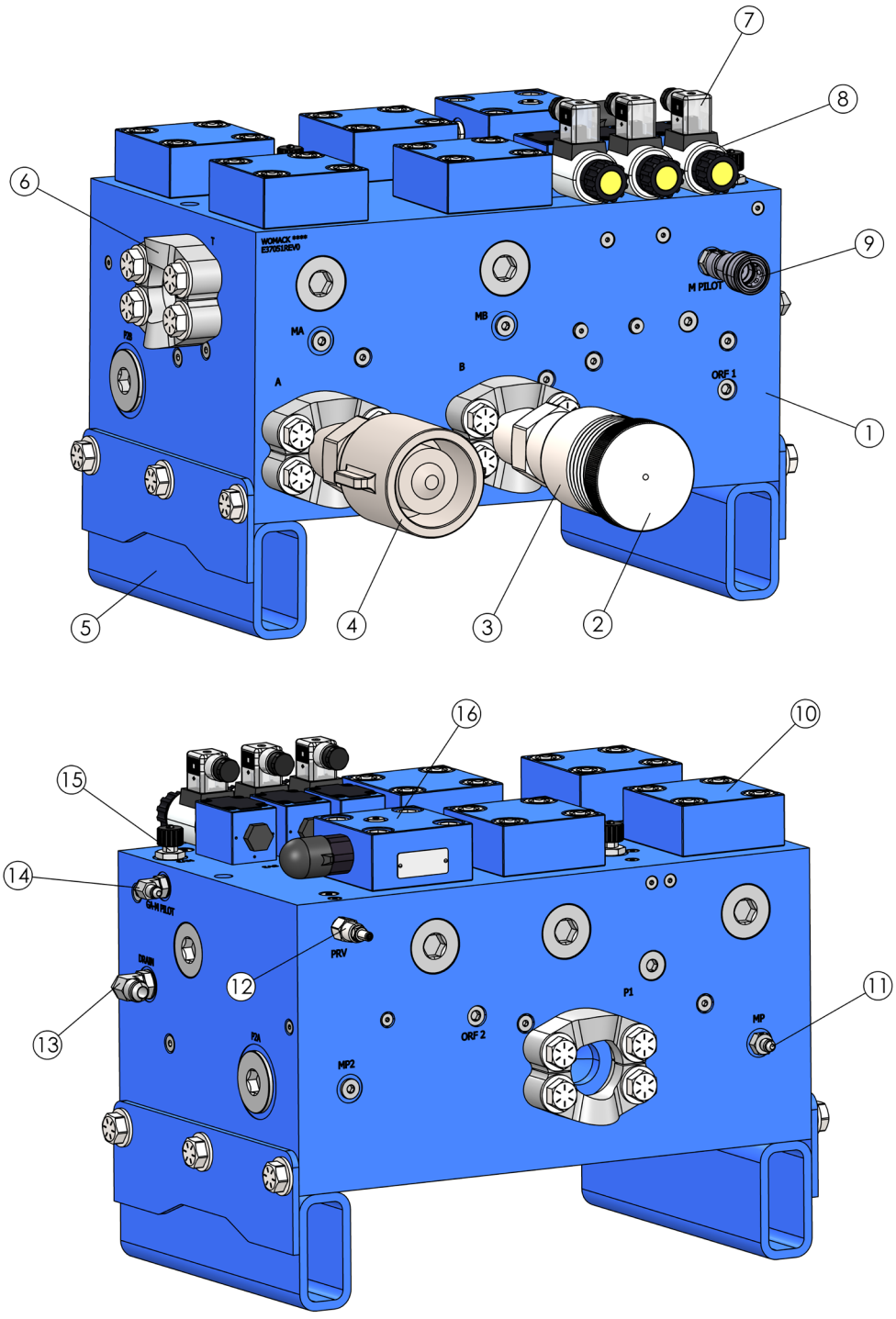
ITEM #	PART NUMBER	DESCRIPTION	QTY
1	MAN-02215	H60/H90 Pilot Manifold	1
2	S-202702-12-6S	-12MOR X -6MJ	2
3	S-FF2138-12S	-12 MOR Hollow Hex Plug	4
4	S-FF2138-10S	-08 MOR Hollow Hex Plug	2
5	S-FF2138-06S	-04 MOR Hollow Hex Plug	1
6	S-2062-6-4S	-04 MOR X -4MJ 90	2
7	VLV-02485	Drill Pilot Manifold Valve	1

7.4 Primary Drill Manifold – Bill of Materials



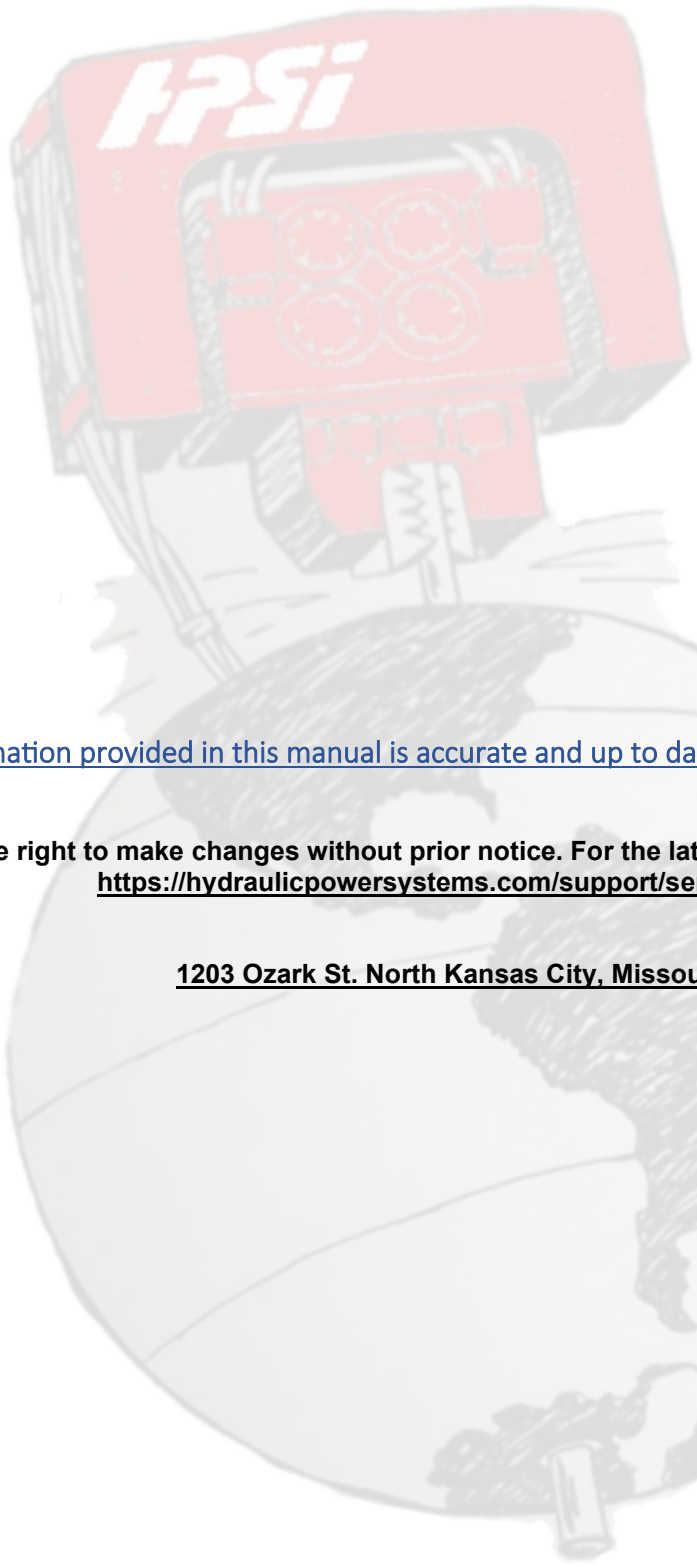
ITEM #	PART NUMBER	DESCRIPTION	QTY
1	MAN-02214	Primary Drill Manifold	1
2	S-2061-6-6S	-6MOR X -6MJ 45	2
3	VLV-02490	Solenoid-Operated Valve	1
4	VLV-02489	Flow Control Valve	1
5	S-2062-8-8S	-8MOR X -8MJ 90	1
6	VLV-02484	Relieving Valve 5gpm	1
7	S-202702-16-8S	-16MOR X -8MJ	1
8	VLV-02492	Check Valve 40gpm	1
9	VLV-02494	Counterbalance Valve	2
10	VLV-02487	Check Valve 160gpm	2
11	VLV-02486	Check Valve 160gpm	2
12	VLV-02491	Check Valve 10gpm	2
13	HOS-FF595-24	-24 Split Flange Kit, C62	4
14	S-202702-16-12S	-16MOR X -12MJ	1
15	VLV-02488	Check Valve 80gpm	1

7.5 Power Unit Drill Manifold – Exploded



7.5.1 Power Unit Drill Manifold – Bill of Materials

ITEM #	PART NUMBER	DESCRIPTION	QTY
1	MAN-02215	Primary Drill Manifold	1
2	QD-00170	1-1/2in Q.D. Dust Cap	1
3	QD-00187	1 1/2" QD Female	1
4	QD-00186	1 1/2" QD Male	1
5	MAN-02170B	Drill Manifold Stand	2
6	HOS-FF595-24	-24 Split Flange Kit, C62	4
7	ELE-02109	Lighted Din Connector	3
8	VLV-01437	Directional Valve 24 VDC	3
9	QD-00398	3/8" Female QD	1
10	VLV-02116	Sz 32 Manifold Logic Cover	4
11	S-202702-6-4S	-6MOR X -4MJ	1
12	VLV-02484	Reducing Valve	1
13	S-2062-8-8S	-8MOR X -8MJ 90	1
14	S-2062-6-4S	-6MOR X -4MJ 90	1
15	VLV-01172	Needle Valve	3
16	VLV-01439	Sz 32 Drill Relief Cover	1



All information provided in this manual is accurate and up to date as of the time of publication.

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