# OPERATION & PARTS MANUAL

## Lubrication Pump

## EH2325

**Pump S/N: F61600F**

**Publication No. 050175A**

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# Introduction

This manual contains important safety, operation, maintenance, and parts information for your Akkerman EH2325 Lubrication Pump. You must read and understand this manual and any additional equipment manuals before you operate and maintain this equipment. Keep this manual with your EH2325 Lubrication Pump at all times. Additional copies of this manual may be purchased from the Akkerman Aftermarket Support Department, or downloaded from the Akkerman web site at www.akkerman.com.

The contractor is responsible for the overall safety program on the job site. Use this manual as a part of the safety program.

The use of second rate parts could affect the efficient performance of the EH2325 Lubrication Pump. ALWAYS use genuine Akkerman parts.

Understand safety signal words, DANGER, WARNING, CAUTION, SAFETY INSTRUCTIONS, and NOTICE. When you see these words in this manual or on safety decals mounted on your equipment, follow the safety message to avoid personal injury and/or property damage.

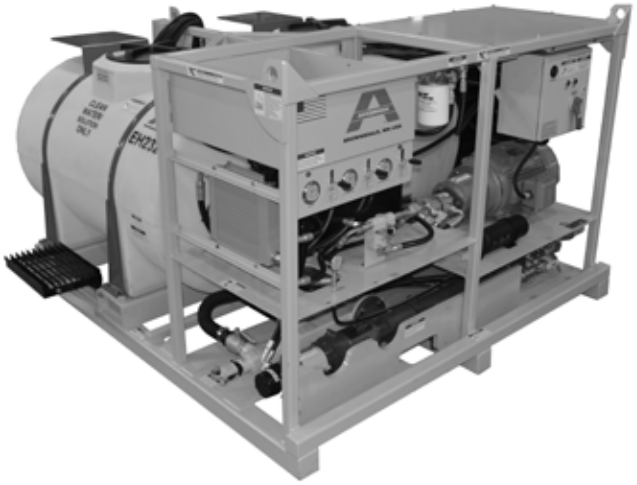
**⚠DANGER** Indicates an extremely hazardous situation which, if not avoided, WILL result in death or serious injury.

**⚠WARNING** Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.

**⚠CAUTION** Indicates a potentially hazardous situation, which, if not avoided, MAY result in minor or moderate injury. It may also be used to alert against unsafe practices.

**SAFETY INSTRUCTIONS** Usually consists of individual messages stating procedures or actions that must be followed for the safe operation of a product.

**NOTICE** Identifies potential property damage and important installation, operator, or maintenance information.



**Akkerman EH2325 Lubrication Pump**

The electro-hydraulic EH2325 Lubrication Pump lubricates the outside of the pipe to reduce friction between the pipe and ground and decrease thrust loads on pipe jacking and microtunneling operations. The control valve provides an efficient and effective means of bentonite injection. The in-tank hydraulic mixers prevent settlement. The Moyno® pump provides continuous, non-pulsating output at high volume.

If you find any errors with this manual or have any suggestions for improvement, please let us know. Email your comments via the Akkerman web site (Contact Us web page), or mail your suggestions to: Akkerman Inc, ATTN: Technical Publications, 58256 266th Street, Brownsdale, MN 55918.

Akkerman Inc. reserves the right to improve its product without notice or obligation.

# NOTES

# Contents

# Safety

## BE ALERT FOR SAFETY INFORMATION

When you see this safety alert symbol on your equipment or in this manual, be alert to the possibility of personal injury or property damage.

Read all safety information.

Keep safety decals clean and in good condition. Replace missing or damaged safety decals.

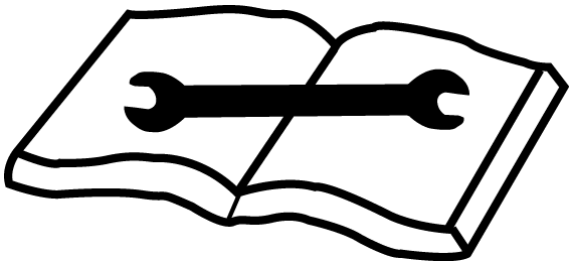
**ATTENTION!**
**BECOME ALERT!**
**YOUR SAFETY IS INVOLVED!**

## READ OPERATOR'S MANUAL

**⚠WARNING** Unsafe operation or maintenance can cause severe injury or death.

Read and understand the Operator's Manual before operating or servicing this equipment.

Any unauthorized modifications will void the warranty.



## WEAR PROTECTIVE CLOTHING

Wear OSHA approved protective clothing, such as hard hat, gloves, safety goggles, earmuffs or ear plugs, face shield, and steel-toed boots, when operating and servicing this equipment.

Wear reasonably close fitting clothing and remove jewelry before working on or near this equipment. This will help prevent the danger of catching them in moving parts or controls.

## HYDRAULIC OIL/FLUIDS UNDER PRESSURE

**⚠WARNING** Escaping oil or other fluids under pressure can penetrate your skin causing serious injury.

Release all pressure before performing maintenance or repairs. Never weld near pressurized fluid lines.

DO NOT use your hands to check for leaks. When searching for leaks, use a piece of wood or cardboard.

Contact medical help immediately if any oil or fluid is injected into your skin. A serious infection or reaction can emerge without proper medical treatment.

## BEWARE OF SUSPENDED LOADS

**⚠WARNING** Suspended loads may fall and cause severe personal injury or death.

If a hydraulic hose, chain, or cable from the boom of a crane or excavator breaks, the boom and/or load can fall instantly.

Do not enter area under or around a load.

## AVOID CONTACT WITH MIXER SHAFT & PROPELLER

**⚠WARNING** Contacting shaft or propeller may cause serious injury.

Keep ALL parts of body and foreign objects from coming in contact with mixer shaft or propeller during operation.

## LOCKOUT TAGOUT POWER BEFORE SERVICING

**⚠DANGER** Failure to lockout tagout power before servicing will cause severe personal injury or death.

LOCKOUT TAGOUT power before attempting to make repairs or adjustments to this equipment, unless otherwise indicated. Proper lockout tagout will prevent accidents and save lives. Performing the lockout tagout will also prevent the equipment from moving or operating unexpectedly.

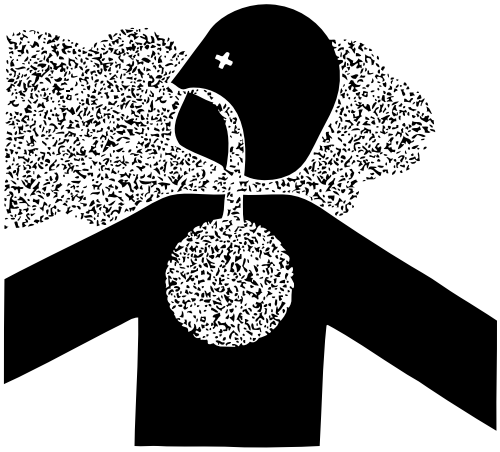
Refer to Lockout Tagout Procedure Guideline in this section for more information.

## EXPOSURE TO DANGEROUS CHEMICALS

**⚠WARNING** Exposure to chemicals may cause serious injury or death.

BEFORE mixing chemicals or other agents in the jetting and/or lubrication tanks, be sure the area is well ventilated and other personnel removed from the area.

Use proper personal protective equipment per the chemical manufacturer's instructions.



## INSPECT ELECTRICAL CONNECTIONS

**⚠WARNING** Regularly inspect electrical connections to be sure they are secure. Failure to do so could cause an explosion if moisture enters a unsecured electrical connection.

## AVOID PINCH POINTS

**⚠WARNING** Moving parts or the mishandling of parts can cause severe personal injury.

Keep hands away from moving parts.

Watch your fingers, hands, and legs while equipment is in operation.

Handle parts carefully to avoid crushing and pinch point hazards.

## KEEP PERSONNEL AWAY FROM MOVING PARTS

**⚠WARNING** Crushing hazard.
Keep personnel away from inside of jacking frame. Failure to do so could result in serious personal injury or death.

## FIRE PREVENTION

**⚠CAUTION** Fires can cause injury or property damage.

Keep equipment clean. Remove all debris from equipment.

Have a fire extinguisher available at all times. Keep the fire extinguisher fully charged.

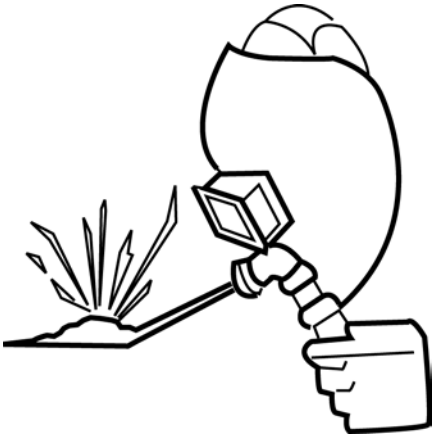
## BE CAREFUL OF OIL COOLER FINS

**⚠WARNING** Oil cooler fins are SHARP and may cause injury if touched.

Oil cooling system may be HOT and cause severe burns if contacted.

Always use gloves when near the oil cooler. Perform service on oil cooler only when cool.

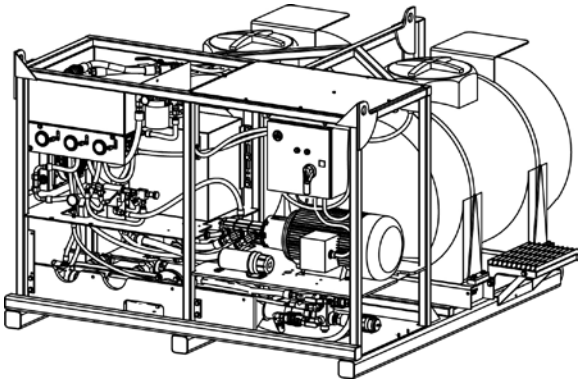
## UNAUTHORIZED WELDING



**⚠WARNING** Unauthorized welding can cause structural failure resulting in possible injury or death.

Do not weld on any structural member. Unauthorized welding or repair will void the warranty.

## REGULARLY CLEAN AND INSPECT EQUIPMENT



Remove any grease, oil, or debris buildup to avoid potential injury or equipment damage.

Inspect equipment for damage. If damaged, repair or replace immediately.

## PRACTICE SAFE MAINTENANCE

**⚠WARNING** Unexpected movement may cause serious personal injury.

Shutdown engine before performing any maintenance, adjustments, or removing obstructions.

Only trained and qualified personnel should perform any maintenance or repairs.

Keep the area around the equipment clean and dry when performing maintenance.

Do not service the machine while it is in operation.

Replace worn or damaged parts. Remove grease, oil, or debris buildup.

## SLIPPERY WHEN WET

**⚠WARNING** Slips and falls can cause serious personal injury.

Ensure firm footing in wet or slippery conditions.

Replace skid-resistant material if it is damaged or missing to prevent slips and falls.

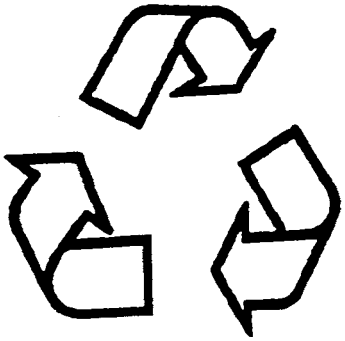
Remove any buildup of grease, oil, or debris.

## KEEP JOB SITE CLEAN AND ORGANIZED

**⚠WARNING** Tripping can cause serious personal injury.

Be sure to keep job site clean and organized.

## RECYCLE WASTE



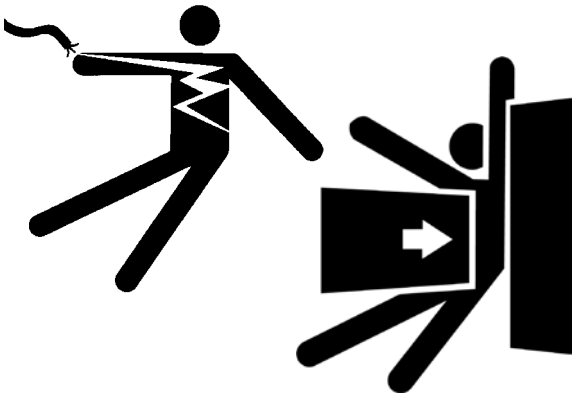
Follow local, state, federal, and international regulations when recycling or disposing of waste. Waste includes fluids/oil, fuel, filters, coolant, and batteries.

Use leakproof containers when draining fluids/oil. Do not pour waste on the ground, down a drain, or into any water source.

# NOTES

# LOCKOUT TAGOUT PROCEDURE GUIDELINE

***LOCKOUT TAGOUT power before attempting to make repairs, service or adjustments. Proper lockout tagout will prevent accidents and save lives.*** OSHA requires equipment placed in lockout tagout when the unexpected machine start up or release of stored energy could injure workers during cleaning, adjustments, repairing and servicing.

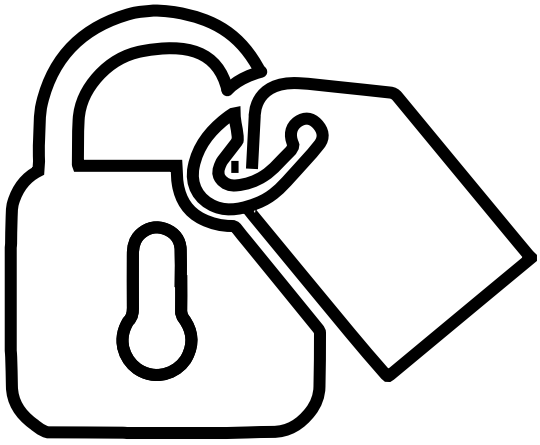


**⚠DANGER** Failure to lockout tagout power before adjustments, repairs or servicing WILL cause severe personal injury or death.

LOCKOUT TAGOUT power before adjustments, repairs or servicing. Electrical repairs must be performed only by a certified electrician.

**The contractor is fully responsible for the safety of all personnel on the job site. Use the following as a guideline for a lockout tagout procedure. The contractor must determine the best lockout tagout practices for his/her employees on the job site.**

1. Follow all Federal, State and Local safety regulations and procedures.
2. Be sure OSHA prescribed safety personal protective equipment is being worn by all personnel.
3. Be sure the area is safe for operation. Keep work site clean and organized.
4. Set all controls to the OFF or neutral position.
5. Push IN all E-Stop buttons (if equipped).



6. There are two lockout tagout options for the EH2325 Lubrication Pump:
   - Lockout Tagout the Power Source - refer to step 7 for details.
   - Lockout Tagout the EH2325 Control Panel Box - refer to step 8 for details.

7. ***Lockout Tagout the Power Source Option***

   Lockout Tagout power source or generator. Refer to the power source or generator manufacturer for proper lockout tagout procedure.

*(Continued on next page)*

8. **Lockout Tagout the EH2325 Control Panel Option**

• Be sure the main power disconnect switch (A) on the control panel box is in the OFF position.

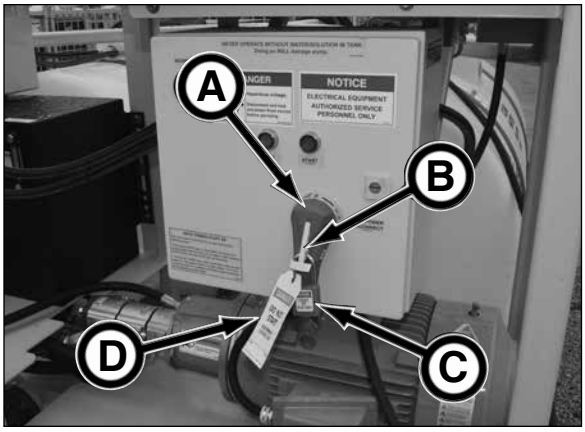
• Flip safety latch (B) out on main power switch and install shackle of OSHA approved lock (C) with tag (D) through latch.

• Secure lock by pushing shackle into body of the lock until the shackle is locked into the locking mechanism. Turn key to lock shackle in place.

• Remove key from lock.

• Test to be sure shackle is fully secured into lock.

• Sign “Equipment Locked Out” tag or equivalent.



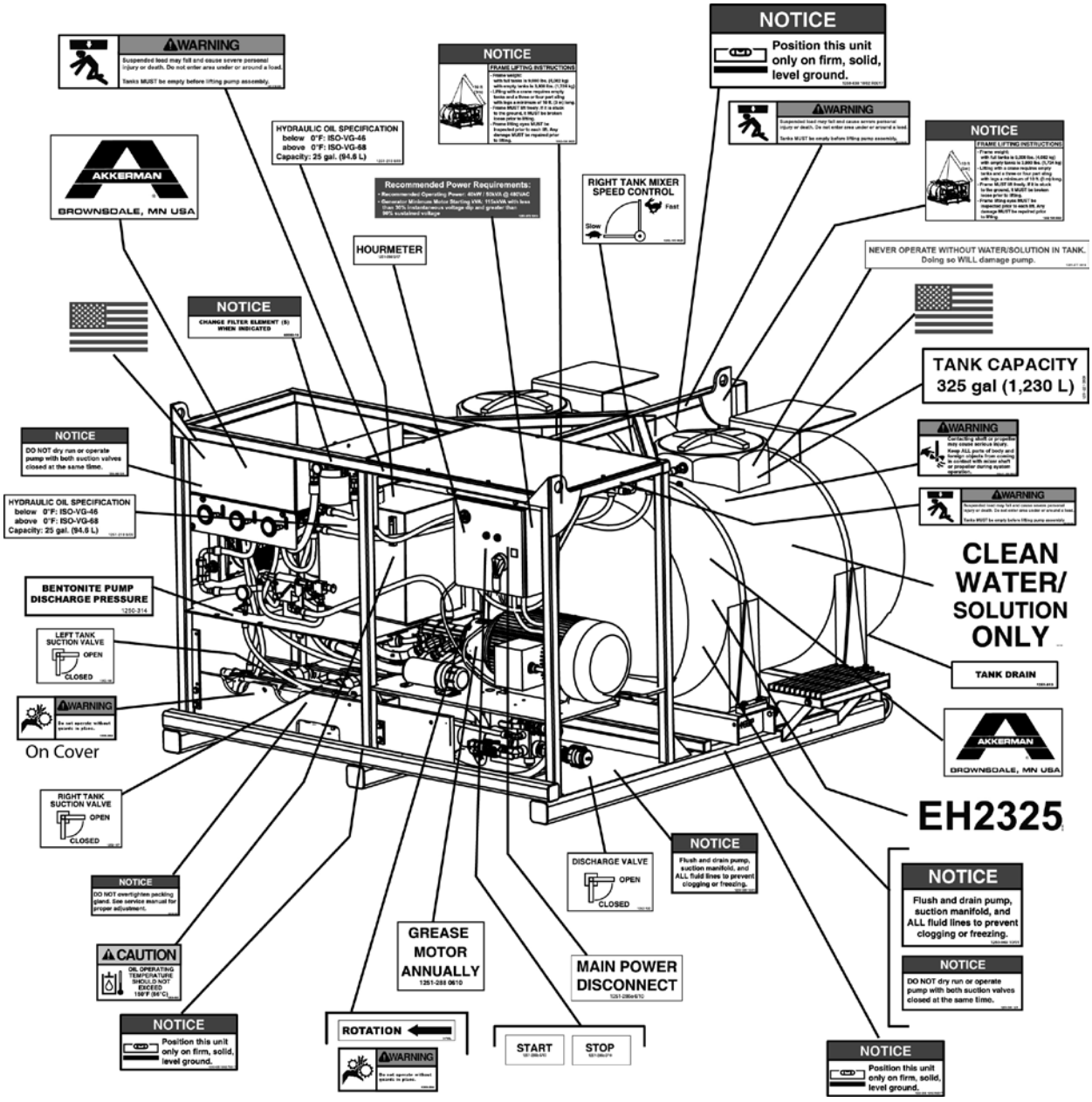
# NOTES

# Decals

Keep all decals clean and readable. Use soft cloth, water, and a mild soap to clean the decals if they are too dirty to read. DO NOT clean decals with solvent. Solvent can damage them. Replace safety decals immediately if they are damaged, missing, or hard to read.

Serious injury or property damage can occur if safety instructions are not followed. Contact your Akkerman Aftermarket Support representative for free replacement safety decals.

If a part is replaced that has a decal on it, apply a new decal to the replacement part. Before applying a new decal, be sure the surface is clean and dry.




**EH2325 Right View Shown**

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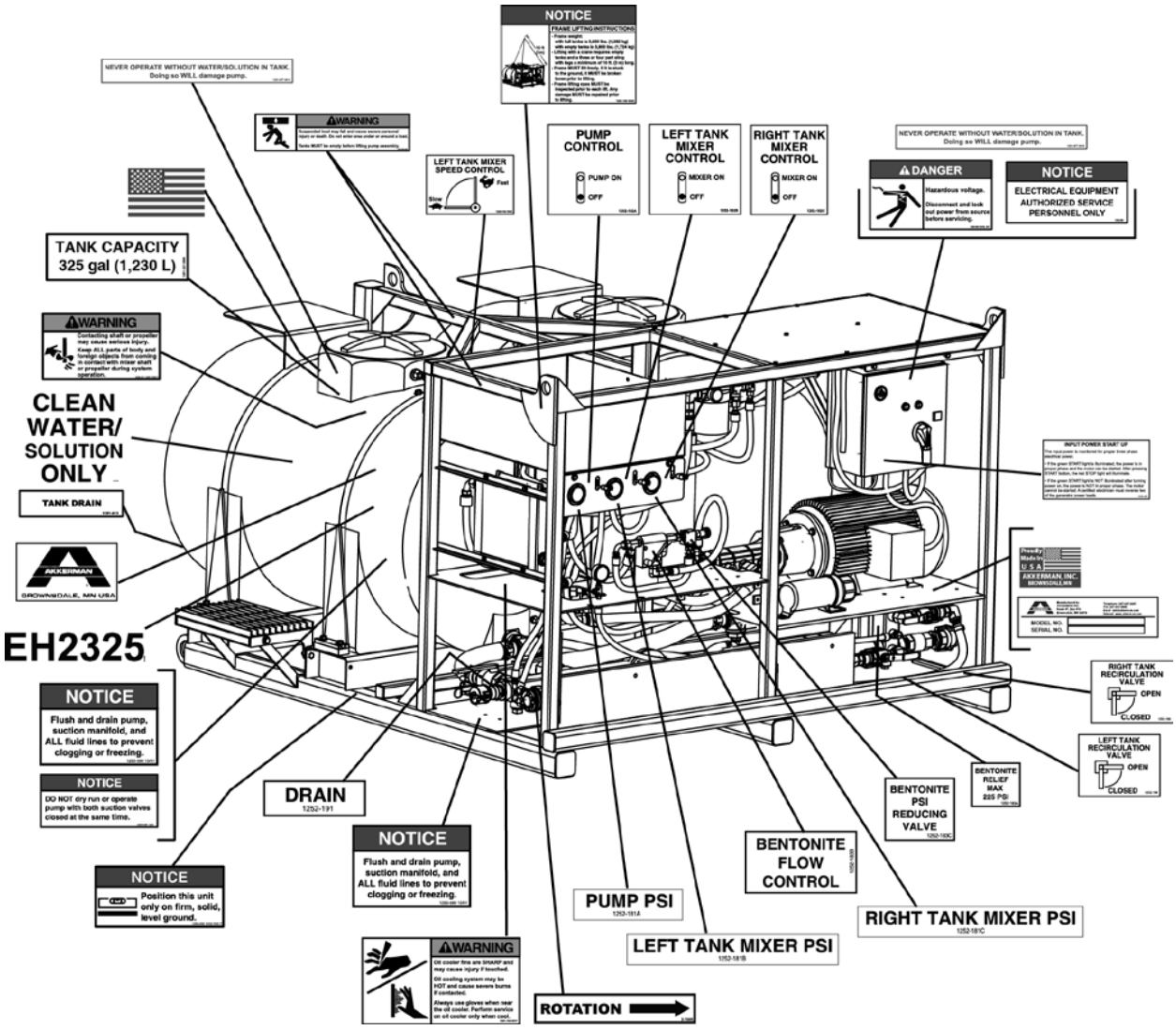
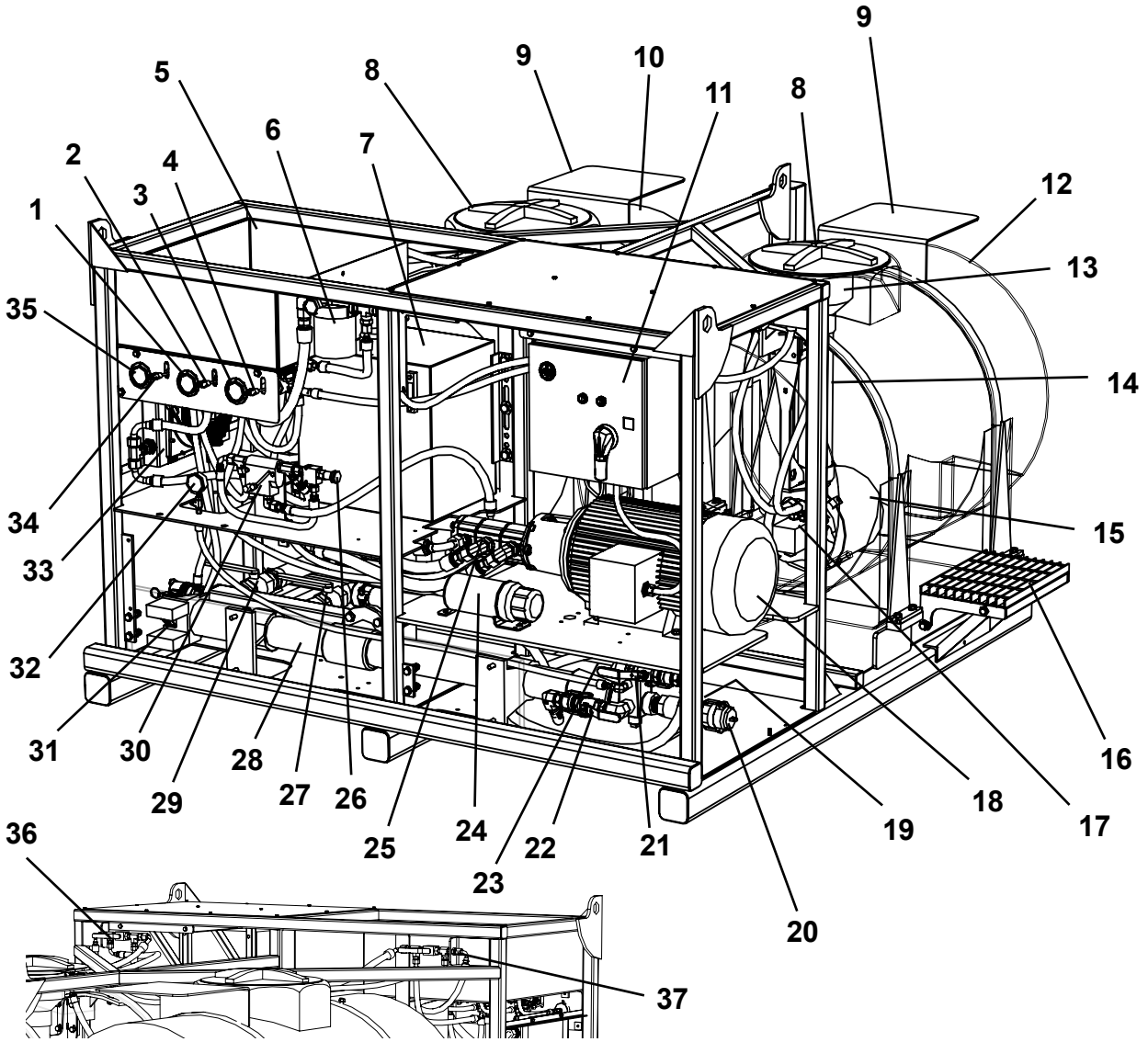
## Decals (Continued)




**EH2325 Left View Shown**

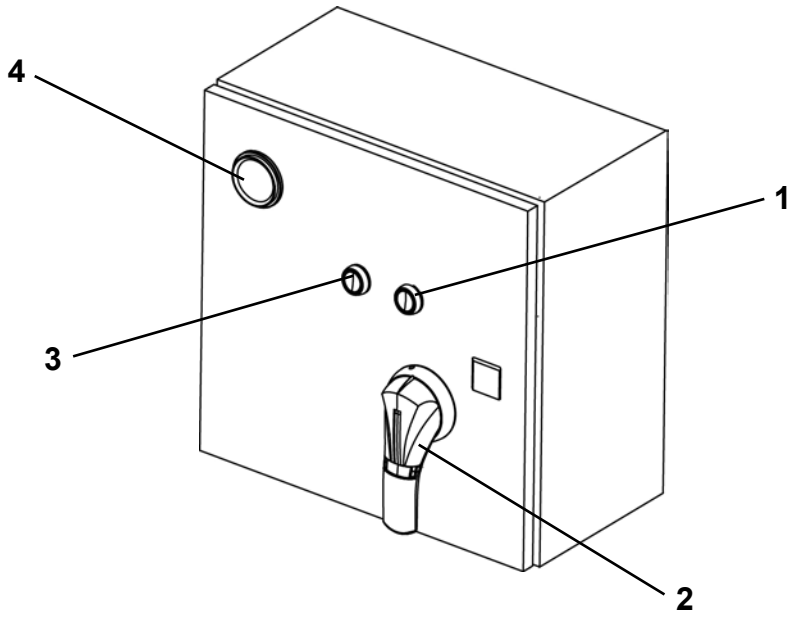
# Terminology

## EH2325 LUBRICATION PUMP




1. Left Tank Mixer PSI
2. Left Tank Mixer Control
3. Right Tank Mixer PSI
4. Right Tank Mixer Control
5. Storage Basket
6. Hydraulic Return Filter
7. Hydraulic Tank (25 gal.)
8. Tank Lid
9. Shelf
10. Left Tank (325 gal.)
11. Control Panel
12. Right Tank (325 gal.)
13. Removable Reducer Coupling
14. Mix Tube
15. Agitator Chamber
16. Step
17. Mixer Motor With Propeller
18. Electric Motor 30 HP
19. Discharge Shutoff Valve
20. Discharge Outlet
21. Right Tank Recirculation Valve
22. Left Tank Recirculation Valve
23. Bentonite Relief Valve
24. Manual Storage Tube
25. Triple Pump
26. Bentonite PSI Reducing Valve
27. Tank Suction Valve - Right Tank
28. Moyno Pump
29. Tank Suction Valve - Left Tank
30. Bentonite Flow Control
31. Hydraulic Pump Drive Motor
32. Bentonite Pump Discharge PSI
33. Oil Cooler
34. Pump Control
35. Pump PSI
36. Mixer Speed Control - Right
37. Mixer Speed Control - Left Tank

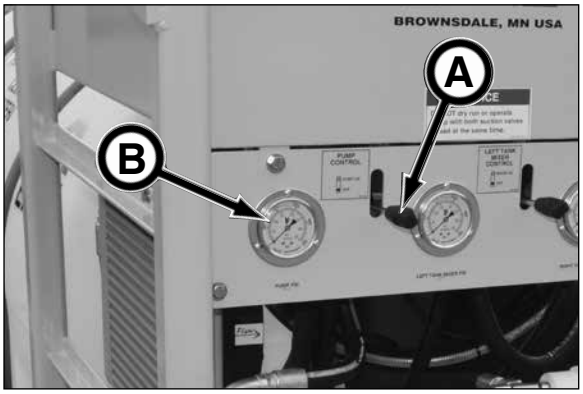
# CONTROL PANEL - EH2325




1. Stop Switch
2. Main Power Disconnect Switch
3. Start Switch
4. Hourmeter

# Controls & Instruments

## PUMP CONTROL




**IMPORTANT: NEVER** dry run or operate pump with both suction valves closed at the same time. Doing so WILL cause pump damage.

The Pump Control (A) is used to turn the Moyno pump on and off.

| | |
|---|---|
| Pump ON | - Up Position |
| Pump OFF | - Down Position |

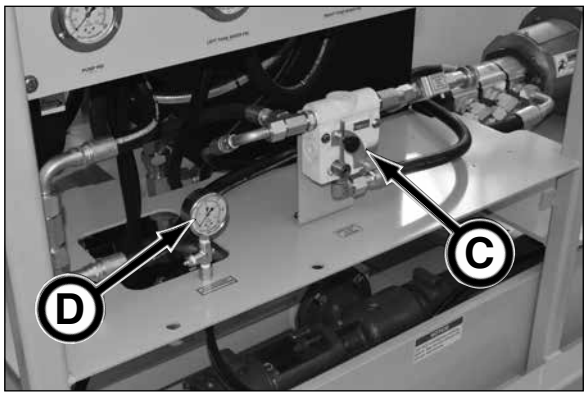
Before starting pump:

1. Pump control lever must be OFF.
2. Mixer controls must be OFF.
3. At least one of the suction valves must be open.
4. There must be enough water/solution in each tank to cover inlet.

The Pump PSI gauge (B) indicates the hydraulic pressure to pump the fluid. Typically the gauge will register 500 - 2,000 psi, depending on the application.

Maximum pressure is 2,000 psi (13,790 kPa).

## BENTONITE FLOW CONTROL

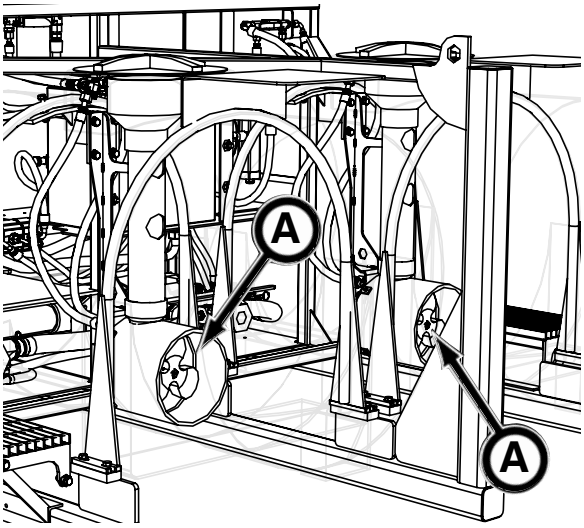



The Bentonite Flow Control (C) is used to regulate the fluid for lubricating the pipe line (bentonite injection) and for tank recirculation. The control is adjusted between 0 - 10 (0 to 100%), with 10 being the maximum output.

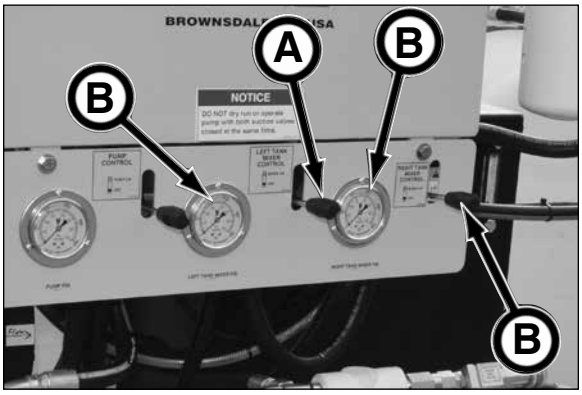
The Bentonite Pump Discharge Pressure is shown on gauge (D).

- 25 gpm max at 0 psi
- 18 gpm at 225 psi

# IN-TANK MIXER CONTROLS




The in-tank mixers (A) aggressively mixes liquid based polymers and bentonite to prevent fluid settlement. The mixers are controlled with the Tank Mixer controls (B) (Left and Right tanks) and regulated with the Mixer Speed controls (C).




The Tank Mixer Controls (B) are used to turn the right and left tank mixers on and off.

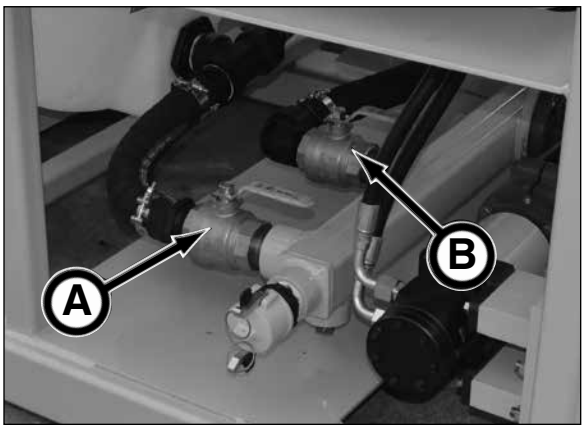
| | |
|---|---|
| Mixer ON | - Up Position |
| Mixer OFF | - Down Position |

The Tank Mixer PSI gauge (B) indicates the hydraulic pressure to operate the mixer.

Maximum pressure is 2,000 psi (13,790 kPa).


The Tank Mixer Speed Controls (C) are used to regulate the speed of the mixerS.

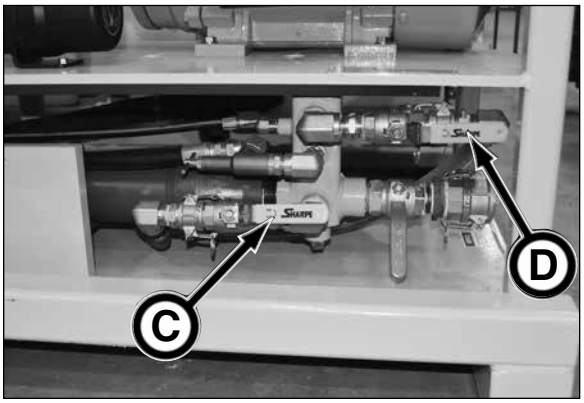
## TANK SUCTION VALVES




The tank suction valves (A - left tank, B - right tank) are used to open and close the tank supply outlets.

**NOTICE** At least one of the tank shutoff valves MUST be open before starting the pump. Failure to do so WILL cause damage to pump and cause the hydraulic oil to heat up.

## RECIRCULATION VALVES

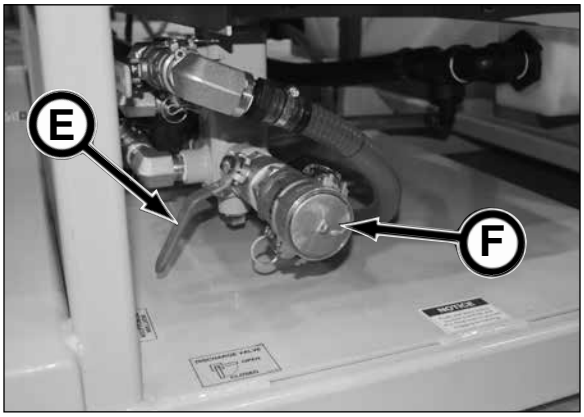



The EH2325 Bentonite Pump is equipped with recirculation valves so the solution can be transferred from a full tank to an empty tank.

Open the suction valve on the full tank and open the recirculation valve on the empty tank. Then close the discharge shutoff valve. Start the pump and set the flow to the desired speed.

Left Tank Recirculation Valve (C)
Right Tank Recirculation Valve (D)

## DISCHARGE OUTLET SHUTOFF VALVE




The Discharge Outlet Shutoff Valve (E) will open and close the discharge outlet.

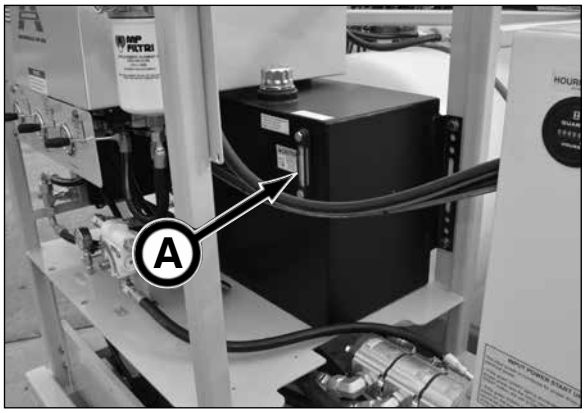
Use the shutoff valve to close the discharge outlet when recirculating solution.

Remove/install plug (F) as needed per operation.

**NOTICE** If outlet shutoff valve is left open or outlet is unplugged, the fluid may slowly leak from tanks through pump and out the discharge outlet.

## HYDRAULIC TANK

The hydraulic tank provides hydraulic oil for the Moyno pump and mixer motors. The tank includes a temperature and sight gauge (A).




Fill oil until fluid reaches high mark on sight gauge.

Recommended hydraulic oil:

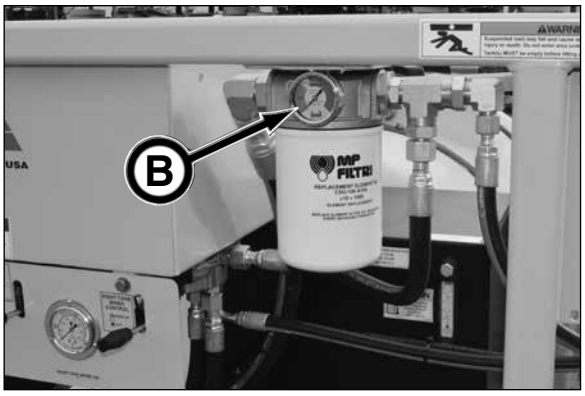
| Ambient Temp. | Hydraulic Oil |
|---|---|
| below 70°F (21°C) | ISO 46 |
| above 70°F (21°C) | ISO 68 |

**NOTICE** Do not mix oil manufacturers or grades.

Hydraulic oil tank capacity is 25 gal. (94.6 L).

## HYDRAULIC RETURN FILTER INDICATOR

To prevent over or under servicing of the hydraulic return filter, a filter indicator (B) has been installed on the return filter housing.



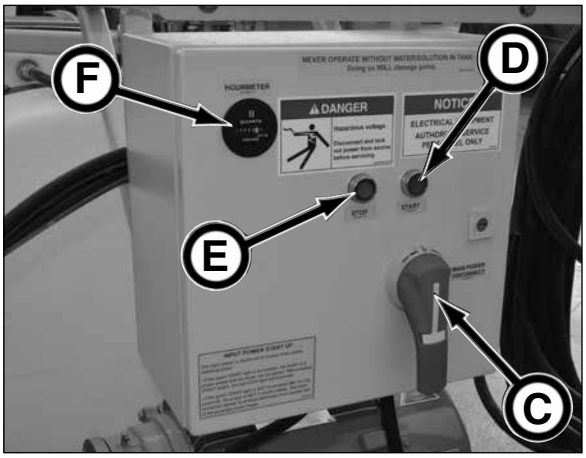

The green OK zone indicates that the filter is functioning properly.

The yellow zone indicates that the filter will soon require replacement.

When the needle on the gauge is in the red CHANGE zone, replace filter as soon as possible to prevent component damage (for more information, refer to Check Hydraulic Return Filter in section 9, Periodic Maintenance.

## CONTROL PANEL

The control panel consists of the start button, stop button, hourmeter and the main power disconnect switch.




Flip the main power disconnect switch (C) to the ON and OFF position.

Start and stop the electric motor by depressing the Start button (D) and the Stop button (E).

The input power is monitored for proper three phase electrical power:

- After turning power on, if the green START light is illuminated, the power is in proper phase and the motor can be started. After pressing START button, the red STOP light will illuminate.
- If the green START light is NOT illuminated after turning power on, the power is NOT in proper phase. The motor cannot be started. A certified electrician must reverse two of the generator power leads.

The hourmeter (F) registers in full and 1/100ths hours.

# Pre-Start Inspection

**⚠WARNING** Do not operate this equipment until you read, study, and understand this manual and any other equipment manuals that may be used. A daily inspection of the equipment must be performed to prevent severe personal injury or death and equipment damage.

**The contractor is fully responsible for the safety of all personnel on the job site.** Check with the contractor that all site preparation requirements are in place. Be sure to comply with all MSHA and OSHA regulations, such as: an active safety program is in practice, a confined space permit (if needed) is issued, personal protective equipment is being worn; flammable, combustible, and hazardous materials are properly stored; and a lockout/tagout procedure is in place (for more information, refer to section 1, Safety, Lockout Tagout Procedure Guideline).

Use the following checklist ✓ as a guide for your daily pre-start inspection.

| | |
|---|---|
| | 1. Follow the MSHA (Mining Safety & Health Administration) and OSHA (Occupational Safety & Health Administration) regulations. |
| | 2. Contractor is responsible for all personnel to wear proper protective equipment on the job site. Replace equipment if defective. |
| | 3. Combustible, toxic and oxygen deficiency detectors MUST be in place, tested, and in proper working condition. |
| | 4. A qualified electrician must check that all electrical connections are properly secured and grounded prior to operation. |
| | 5. BEFORE connecting EH2325 to 480V power source, be sure the Main Power Disconnect switch is in the OFF position. |
| | 6. Once power is properly connected, flip main power disconnect switch ON and check for proper motor rotation. If not, lock out/tag out power and switch phase connections and retest. |
| | 7. Water/solution must be in tanks prior to start up. |
| | 8. Be sure Pump and Mixer Controls are in the OFF position. |
| | 9. Be sure pump shaft control shutoff valves are in Bypass position. |
| | 10. The tank suction valves MUST be open prior to starting the pump. |
| | 11. All pump connections must be secure to prevent cavitation. |
| | 12. USE ONLY CLEAN WATER SOURCE. |
| | 13. Check controls and switches for proper operation. Repair or replace if damaged or worn. |
| | 14. Remove combustible or flammable materials from equipment. Store materials properly. |
| | 15. Check hydraulic oil level. Add as needed. |
| | 16. Check controls and switches for proper operation. Repair or replace if damaged or worn. |
| | 17. Inspect equipment for damage. Repair or replace as needed. |
| | 18. Thoroughly clean equipment of mud and dirt. |
| | 19. Be sure all covers and guards are in place and securely fastened before operation. |
| | 20. Check for loose or missing hardware. Replace damaged or missing hardware. |
| | 21. Check for worn, loose, or damaged wire connections. Repair or replace wiring connections. |
| | 22. Tighten loose clamps or fittings. |
| | 23. Check for fluid leaks. Repair leak or replace components. |
| | 24. If operating in freezing weather, be sure to constantly mix water/solution to prevent freezing. |
| | 25. If EH2325 will be shut off for a considerable length of time and the temperature is at or below freezing, flush and drain pump, suction manifold, ALL fluid lines and tanks. Treat with RV anti-freeze. |
| | 26. Keep job site clean and organized. |

# NOTES

# Operation

## OPERATING GUIDELINES

**⚠WARNING** Do not operate this equipment until you read, study, and understand this manual and any additional equipment manuals before you operate this equipment Failure to do so, could result in severe personal injury or death.

1. Before operating, read and understand the Safety, Pre-Start Inspection, and Operation sections.
2. Do not operate this equipment while under the influence of alcohol, drugs, or medication.
3. Follow all Federal, State, and Local safety regulations and procedures.
4. Be sure OSHA prescribed safety protective equipment is being worn by all personnel.
5. Be sure the area is safe for operation. Keep work site clean and orderly.
6. Have a fully charged fire extinguisher on the job site at all times.
7. Before operating, inspect equipment and conduct repairs as needed.
8. Test the electrical motor for proper rotation prior to operating the lubrication pump.
9. Test air monitoring and ventilation detectors for proper operation. Never enter a tunnel or shaft without combustible gas detectors and oxygen deficient detectors.
10. Never walk or work under any part of the excavator or crane and suspended loads.
11. Do not make any modifications to any Akkerman products. Doing so could cause structural failure and will void the warranty.
12. Check shields and guards. They must be in place and undamaged prior to operation.
13. The tank suction valves MUST be open and the tanks filled with water/solution prior to startup. Failure to do so WILL cause damage to pump.
14. Check all fluid levels before operating. Add as necessary.
15. Remove combustible or flammable materials from equipment.
16. Test all controls and switches to make sure they operate properly.
17. Place all controls in the OFF position before start up.
18. Eye, ear and respiratory protection MUST be worn by operator while filling tanks with chemicals such as wetting agents, polymer, etc.
19. Never dry run or operate pump with tank suction valves closed.
20. In cold weather operation, constantly circulate water/solution to prevent freezing.
21. At daily shutdown or if pump will not be operated for a prolonged period of time in freezing weather, flush and drain pump and ALL fluid lines to prevent clogging or freezing.
22. Keep ALL parts of the body and foreign objects from coming in contact with mixer shaft or propeller during pump operation.
23. If repairs, adjustments or removing obstructions from mixing tanks are necessary, before making repairs etc., be sure to lockout tagout power source to prevent accidental starting of equipment (for more information, refer to section 1, Safety, Lockout Tagout Procedure Guideline).
24. If this manual is lost, contact your Akkerman Aftermarket Support Representative for a new manual or download this manual from the Akkerman web site at www.akkerman.com.

# LUBRICATION GUIDELINES


The lubrication type or mixture is based on soil conditions, consistency, clay, sand, cobble, rock, etc. Your polymer supplier can help you with the proper lubrication mixture based on your Geotech report for the project. The amount of bentonite is typically provided with the engineering project data requirements.

As a guideline, typical usage of lubricant as a ***minimum*** can be calculated with the following formula:

- 0.04 x [Overcut - Pipe OD] = Gallons of Bentonite per foot of advancement

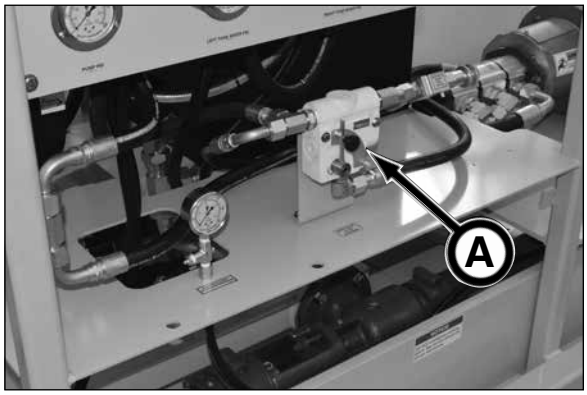
***Example Using the Formula:***
*For a 72" OD Pipe With a 73.5" OD Overcut*

*$0.04 \times [73.5^2 - 72^2]$ = Gallons of Bentonite*
*[5402 - 5184]*
*0.04 x [218]*
*218 x 0.04 = 8.72 gallons (minimum) of bentonite per foot of advancement*

Keep in mind the geology of the project will affect the volume of lubricant required as noted:

- Nonconductive Geology (Clay / rock) will generally use the minimum volume calculation.

- Conductive Geology (sand / gravel [voids]) will require an additional amount of lubricant than the minimum volume calculation.




Use the Bentonite Flow Control (A) to adjust the lubricant flow for lubricating the pipe line (bentonite injection) and for tank recirculation.

# SETTING UP LUBRICATION PUMP

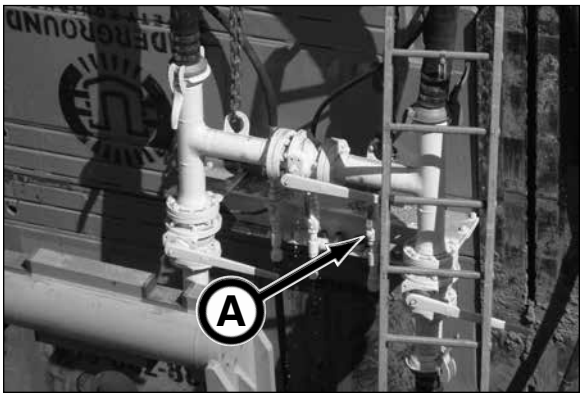
1. Position the Lubrication Pump on firm, level ground near desired area of use.


**⚠WARNING** Do not position the pump near the edge of shaft where the ground may be unstable and cause a slide or cave-in. Doing so could cause severe injury or death.

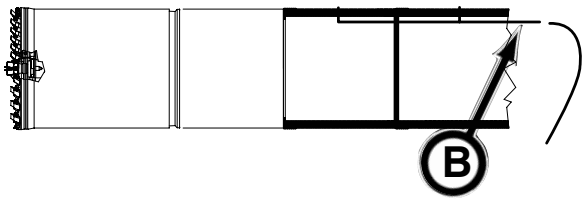
2. Connect a 2 in. hose to the discharge outlet hose connection or a reducer adapter to hose. *Recommended that reducer is no smaller than 1 in hose connection.*

3. ***Microtunneling:***
   - Connect outlet hose to:
     a. wall valve bentonite connection (A) or
     b. ABIS system and then connect hose from ABIS to wall valve bentonite connection (A).

   - Connect hose to bentonite outlet connection on wall valve and then to pipe bentonite pump line/hose connection (B).




4. ***TBM:***
   - Connect outlet hose to:
     a. pipe bentonite pump line/hose connection (B) or
     b. ABIS system and then connect hose from ABIS to pipe bentonite pump line/hose connection (B).




5. Once the outlet hose is properly connected, proceed to Setting Up The Electric Motor on the next page.

# SETTING UP THE ELECTRIC MOTOR

**⚠DANGER** Hazardous voltage.

Failure to lockout tagout power before connecting power leads or performing service, WILL cause severe personal injury or death.

LOCKOUT TAGOUT main power supply BEFORE connecting power leads or performing service (refer to Section 1, Safety, Lockout Tagout Procedure Guideline). Electrical connections and repairs must be performed only by a certified electrician.


1. Turn OFF power source and perform lockout/tagout procedure (refer to Section 1, Safety, Lockout Tagout Procedure Guideline).

2. Test to ensure no voltage is present.

3. Be sure main power disconnect switch (A) is in the OFF position.

4. Connect the EH2325 power cables to a 480 VAC, 60 cycle, 3 phase power source.

***Recommended Power Requirements:***

- Recommended Operating Pwr: 40kW / 50 kVA @ 480VAC
- Generator Minimum Motor Starting KVA: 115 skVA with less than 30% instantaneous voltage dip and greater than 90% sustained voltage.

5. The input power is monitored for proper three phase electrical power. Flip the main power disconnect switch (A) to the ON position.

   • After turning power on, if the green START light is illuminated, the power is in proper phase and the motor can be started. After pressing START button, the red STOP light will illuminate.

   • If the green START light is NOT illuminated after turning power on, the power is NOT in proper phase. The motor cannot be started. A certified electrician must reverse two of the generator power leads.

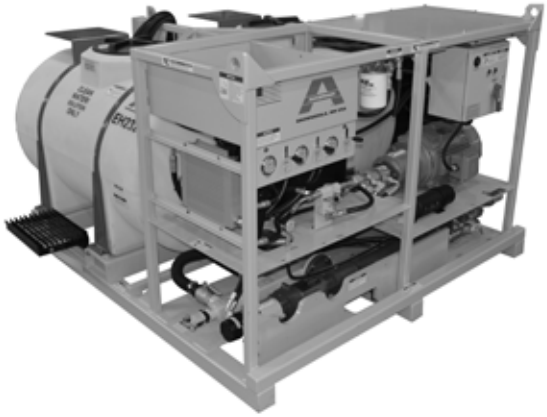
6. Double check motor for proper rotation. Momentarily start and then stop the 30HP electric motor and check for proper rotation. If the rotation is incorrect, have a certified electrician switch the two generator power leads. Then recheck motor for proper rotation.

7. Proceed to Start Up Procedure in this section.

## STARTING THE ELECTRIC MOTOR

1. Set up the electric motor for operation. Refer to Setting Up The Electric Motor in this section.

2. Proceed to Start Up Procedure in this section. DO NOT start the electric motor without following the start up procedure. Doing so may cause pump damage. NEVER dry run pumps.

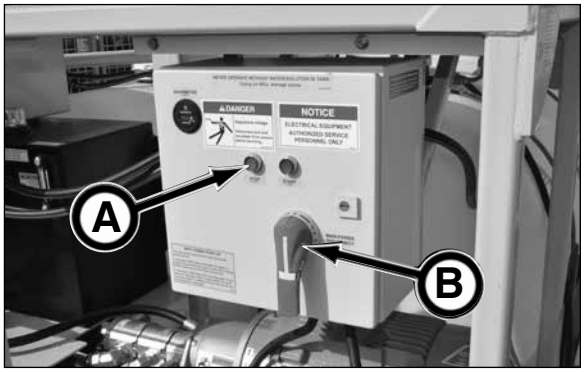


## SHUTTING DOWN THE ELECTRIC MOTOR

1. Depress Stop button (A).

2. Move main power disconnect switch (B) to the OFF position.

3. Perform lockout tagout procedure (refer to Section 1, Safety, Lockout Tagout Procedure Guideline) to main power source to prevent any accidental starting of the EH2325 Bentonite & Lubrication Pump.



# START UP PROCEDURE

**⚠DANGER** Hazardous voltage.

Failure to lockout tagout power before connecting power leads or performing service, WILL cause severe personal injury or death.

LOCKOUT TAGOUT main power supply BEFORE connecting power leads or performing service (refer to Section 1, Safety, Lockout Tagout Procedure Guideline). Electrical connections and repairs must be performed only by a certified electrician.


1. Set up the electrical motor for operation. Refer to Setting Up Electrical Motor in this section.

2. Be sure main power disconnect switch (A) is in the OFF position.

3. Check hydraulic oil tank level. Add oil if necessary.

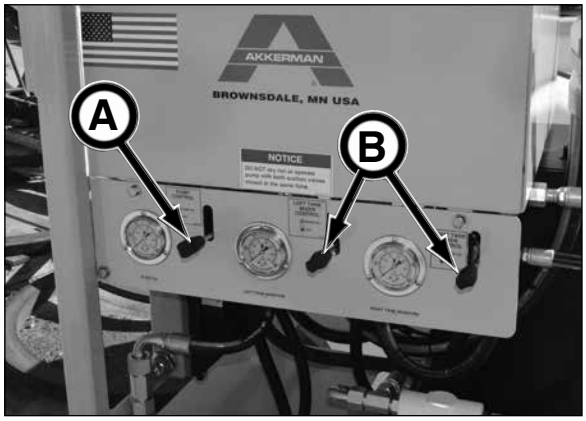

4. Add CLEAN water in tanks before starting the electric drive motor. Replace tank lid securely to prevent foreign objects from entering tank.

**NOTICE** NEVER dry run pumps. Doing so will result in pump damage.

*(Continued on next page)*

5. Be sure at least one of the tank suction valves is open.

6. Place Pump Control (A) and both Tank /Mixer Controls (B) in the OFF position.



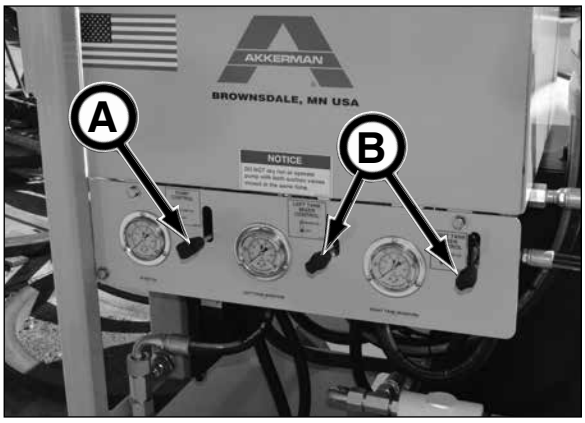

9. Move main power disconnect switch to the ON position.


10. Depress Start button.

11. Check for leaks.

# DAILY SHUTDOWN

1. Place Pump Control (A) and both Tank /Mixer Controls (B) in the OFF position.

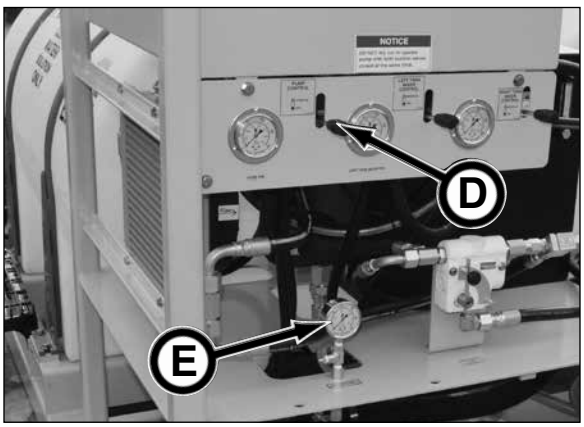



2. Place both Mixer Speed controls (C) in the Slow position.


3. Close both tank suction valves.

4. **BRIEFLY** turn Pump (D) ON until pressure decreases on discharge pressure gauge (E) to empty discharge line to prevent the lubricant from settling in the lines overnight. Be sure to shut pump OFF.

   **IMPORTANT: Do not dry run pump. Doing so WILL damage the pump.**




*(Continued on next page)*

5. Close the discharge outlet shutoff valve.


6. Depress Stop button.


7. Move main power disconnect switch to the OFF position.

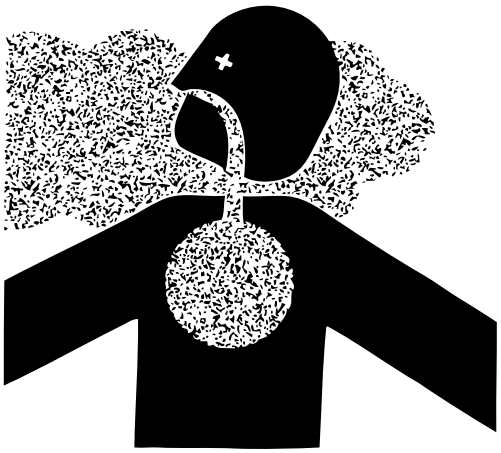

8. Perform Lockout Tagout procedure to main power source to prevent any accidental starting of the EH2325 Lubrication Pump (refer to Section 1, Safety, Lockout Tagout Procedure Guideline).

9. If the potential of freezing weather exists, refer to Cold Weather Protection in this section.

# MIXING TANKS

**⚠WARNING** Contacting shaft or propeller may cause serious injury.

Keep ALL parts of body and foreign objects from coming in contact with mixer shaft or propeller during operation.



**⚠WARNING** Exposure to chemicals may cause serious injury or death.

BEFORE mixing chemicals or other agents in the jetting and/or lubrication tanks, be sure the area is well ventilated and other personnel removed from the area.

Use proper personal protective equipment per the chemical manufacturer's instructions.

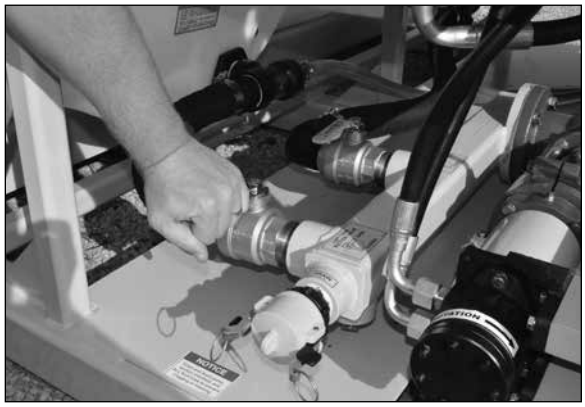
1. Fill water tank with clean water as needed per instructions on lubricant packaging.


**NOTICE** Before mixing polymers and bentonite, the water should be stabilized to the following pH and hardness levels:

| | |
|---|---|
| pH | 8.5 - 9.5 |
| Water Hardness | do not exceed 200 ppm (depending on lubricant) |

Note:

a. Pure water is neutral with a pH level of 7.
b. Soda ash helps lower water hardness as well as raise the pH simultaneously.

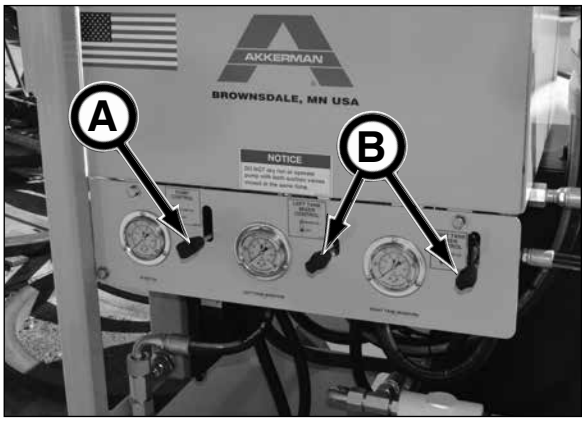


2. Close tank suction valve(s) for mixing in the tank.

   **IMPORTANT:** If mixing while pumping lubricant to prevent settlement, open tank suction valve(s). NEVER dry run pump. Doing so WILL cause pump damage.

*(Continued on next page)*

3. Place Pump Control (A) and Mixer Controls (B) in the OFF position. Mixer Speed Controls should be in the SLOW position.



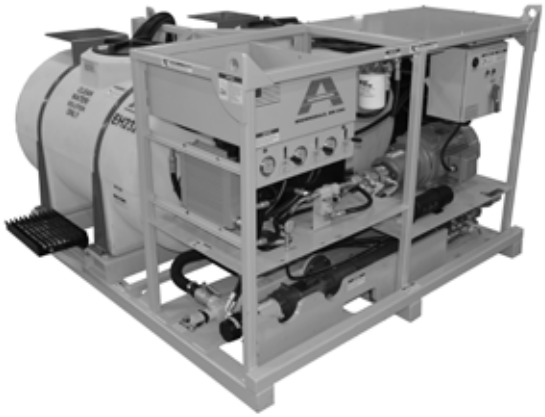

4. Start electric motor.


5. Flip the desired Tank Mixer control to the ON position.

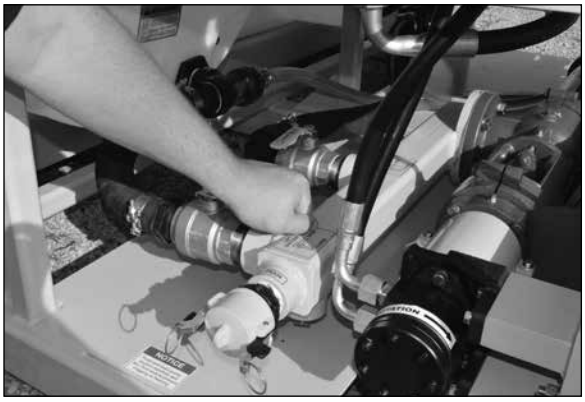

6. Adjust Mixer Speed control as needed.


7. Remove cover on tank to gain access to hopper (C).
8. Gradually pour lubricant into hopper in tank, following instructions on packaging (for example, depending on material, add material through the hopper at a rate not to exceed 3 - 5 minutes per 50 pounds).
9. Replace tank cover to prevent foreign objects from entering the tank.
10. Allow time for proper mixing of solution. Follow instructions on packaging.
11. The tank solution is now available for use.
12. If needed, repeat steps 1 through 11 for other tank.

# USING RECIRCULATION VALVES TO TRANSFER FLUID



If the need arises to transfer fluid from one tank to the other tank, recirculation valves are equipped on the EH2325 Lubrication Pump.



**NOTICE** This example is shown transferring fluid from the left tank to the right tank.

1. Open suction valve on the full tank. Be sure suction valve on empty tank is closed.

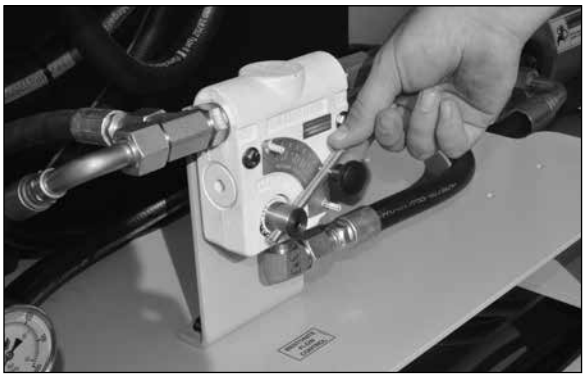
2. Close the recirculation valve on the full tank.

3. Open the recirculation valve on the empty tank.

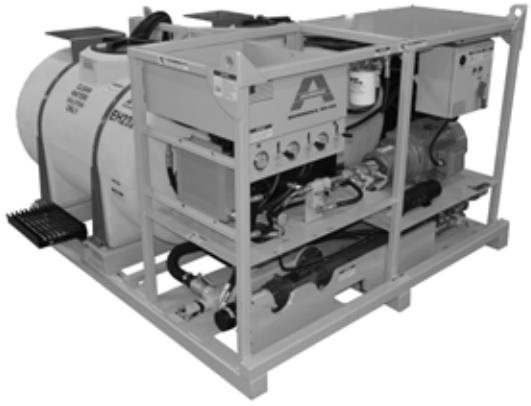
*(Continued on next page)*

4. Close the discharge shutoff valve.

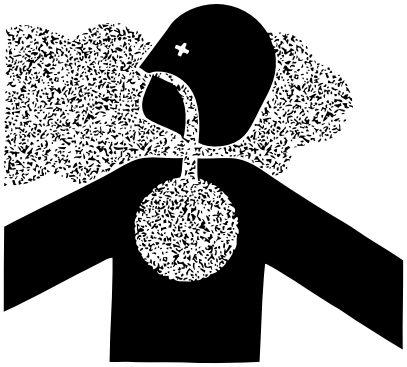

5. Start the EH2325 pump and set the flow control to the desired speed.

6. Once complete, close recirculation valve and resume normal operation as needed.



# CLEANING TANKS



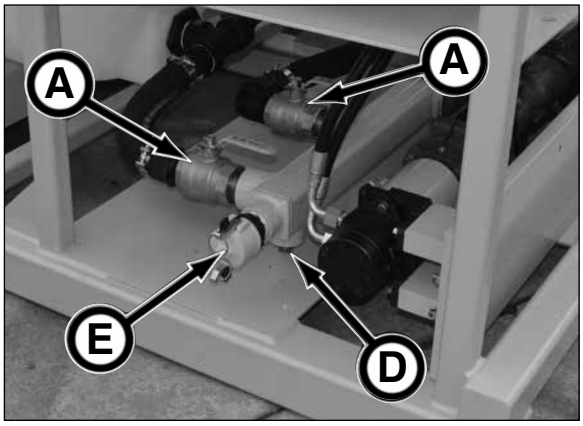
**⚠WARNING** Exposure to chemicals may cause serious injury or death.

BEFORE mixing chemicals or other agents in the water tank, be sure the area is well ventilated and other personnel removed from the area.

Use proper personal protective equipment (PPE) per the chemical manufacturer's instructions.


**⚠WARNING** Do not allow anyone to enter tank. Tank fumes or becoming accidentally trapped may cause severe injury or death.

1. Fill tanks with clean water.

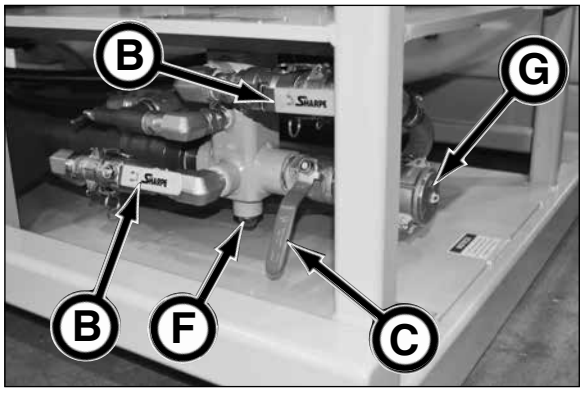



2. Open tank suction valves (A), recirculation valves (B), and discharge shutoff valve (C).

3. Remove suction manifold drain plug (D), drain cap (E), recirculating manifold plug (F) and discharge outlet plug (G).

4. Operate pump to flush the tank and pump lines until the water is clear and free of sediment. Failure to do so will result in clogging of the fluid in the tank, hoses and/or components.

   **IMPORTANT:** While pumping fluids, monitor water level in tank. NEVER dry run pump otherwise pump damage WILL result.

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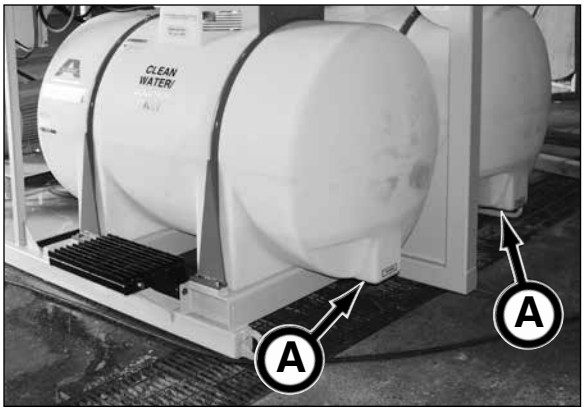
**NOTICE** If needed, the hopper can be removed from mix tube assembly for ease of cleaning tank. Be sure to replace hopper on mix tube assembly after cleaning.




**NOTICE** To help drain tank, CAREFULLY tip EH2325 towards tank drains (A).

5. Continue using clean water to flush the tanks and fluid system components until the water is clear and free of sediment. Failure to do so will result in clogging of the fluid in the tank, hoses and/or components.

6. Flip Pump Control to the OFF position, depress Stop button and move the main power disconnect switch to the OFF position.

7. Once tanks are clean and water emptied:

   • Close tank suction valves, recirculation valves, and discharge shutoff valve.

   • Reinstall suction manifold drain plug, drain cap, recirculating manifold plug and discharge outlet plug.

8. Put enough water in each tank to cover outlet to prevent accidental dry running of pump.

**NOTICE** NEVER operate pump without suction valve(s) open and tank(s) filled with water.

**IMPORTANT:** If operating in freezing weather, the tank must be drained and a RV anti-freeze solution must be added to the tank to prevent component damage. Refer to Cold Weather Protection in this section.

9. Replace tank covers.

# NOTES

# COLD WEATHER OPERATION

Freezing temperatures during the tunneling process, creates the necessity to prepare the site and equipment for the cold weather. Failure to do so will cause damage to components and supporting equipment. Refer to Cold Weather Protection in this section for more information.

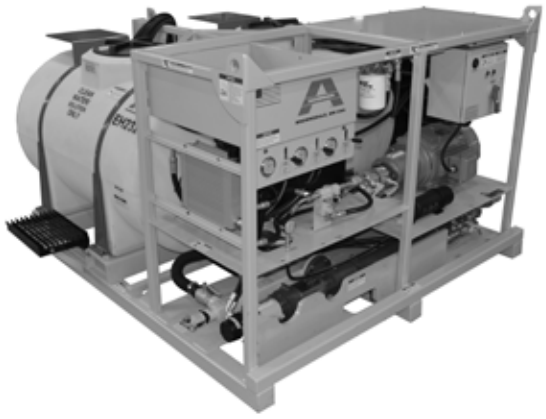
There are various methods of keeping equipment from freezing:

- When working with water, it needs to be constantly circulated to prevent freezing. Otherwise the equipment must be drained and treated with a RV anti-freeze solution to prevent freezing.
- If the EH2325 Lubrication Pump will be shut off for a considerable length of time and the temperature is at or below freezing, the fluid must be drained and treated with RV anti-freeze.
- Water tanks must be drained and treated with RV anti-freeze.
- Drain hoses to prevent freezing and keep low areas properly drained to prevent freezing damage.
- For all equipment, use proper lubricant based on ambient temperature to prevent damage.
- Use compressed air to purge a system of water. Be sure the discharge valve is open before doing so.
- Install heaters for hydraulic systems.


If systems were shut down for freezing weather, be sure to start systems slowly and let them run for at least five minutes to allow for warm up and in the case of a pump, to displace any surface ice that may have accumulated in the fluid before going back to full operation mode.

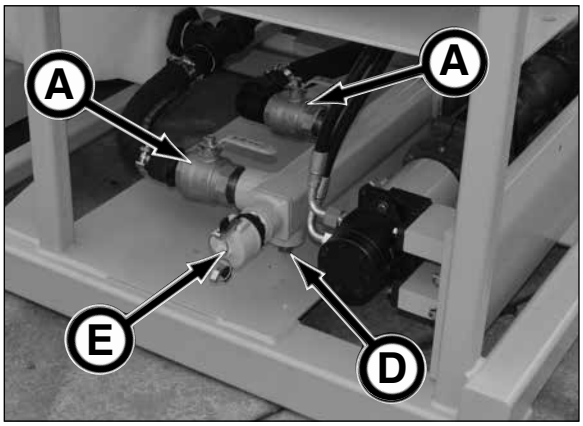
Remember it is also critical to keep the work site safe and employees comfortable during the freezing weather. Good training, supervision, proper clothing and limiting personal exposure to the weather is essential for keeping personnel and equipment safe on the job site.

# COLD WEATHER PROTECTION



To prevent component damage in freezing weather, the tank and pump system MUST be cleaned, drained and treated with a RV Anti-Freeze solution. Failure to do so will cause damage to pump components.


1. Fill tanks with clean water.

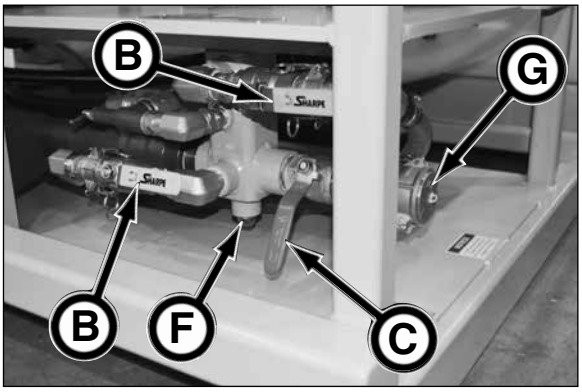



2. Open tank suction valves (A), recirculation valves (B), and discharge shutoff valve (C).

3. Remove suction manifold drain plug (D), drain cap (E), recirculating manifold plug (F) and discharge outlet plug (G).

4. Operate pump to flush the tank and pump lines until the water is clear and free of sediment. Failure to do so will result in clogging of the fluid in the tank, hoses and/or components.

   **IMPORTANT:** While pumping fluids, monitor water level in tank. NEVER dry run pump otherwise pump damage WILL result.

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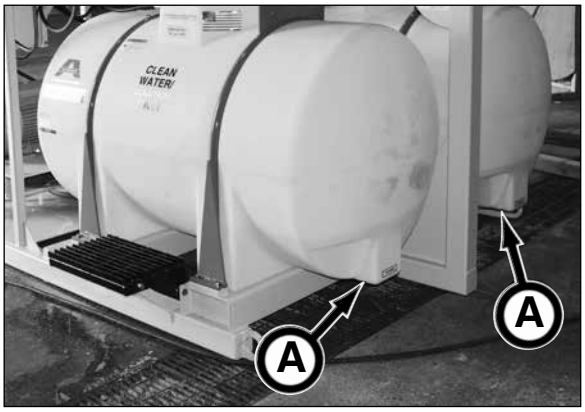



**NOTICE** To help drain tank, CAREFULLY tip EH2325 towards tank drains (A).

5. Continue using clean water to flush the tanks and fluid system components until the water is clear and free of sediment. Failure to do so will result in clogging of the fluid in the tank, hoses and/or components.

6. Flip Pump Control to the OFF position,

7. Once tanks are clean and water emptied:

   • Close discharge shutoff valve.

   • Reinstall suction manifold drain plug, drain cap, recirculating manifold plug and discharge outlet plug.

8. Add approximately 4 - 5 gallons (15 - 19 L) of clean water in each tank.

9. Add 4 - 5 gallons (15 - 19 L) of RV anti-freeze in each tank. Be sure there is a 50/50 mixture of liquid to RV anti-freeze in the tanks.

**NOTICE** Be sure to follow the proper solution instructions on the RV anti-freeze container.

10. Replace tank covers.

11. Flip Pump Control to the ON position. Cycle pump for at least two minutes to ensure the water/RV anti-freeze mixture is pumped through complete system.

**NOTICE** NEVER dry run pump. Doing so will damage pump.

12. With the 50/50 mixture of water to RV anti-freeze in the tanks and pumped through the pumping system, close tank suction valves and recirculation valves.


13. Flip Pump Control to the OFF position and depress Stop button and move the main power disconnect switch to the OFF position.

14. Perform Lockout Tagout procedure to main power source to prevent any accidental starting of the EH2325 Lubrication Pump (refer to Section 1, Safety, Lockout Tagout Procedure Guideline).

# NOTES

# Transporting

## TRANSPORTING GUIDELINES

1. Know the local, state, and federal transportation regulations.

2. Obtain required permits for transporting.

3. Remove any obstacles from the trailer floor.

4. Clean debris from equipment.

5. Load and unload on level ground.

6. Securely fasten the EH2325 Lubrication Pump to trailer floor.

7. BEFORE lifting equipment with a hoist or other lifting device, the equipment lifting eyes and sling must be inspected for damage before lifting.

8. Observe the lifting instructions on the equipment.

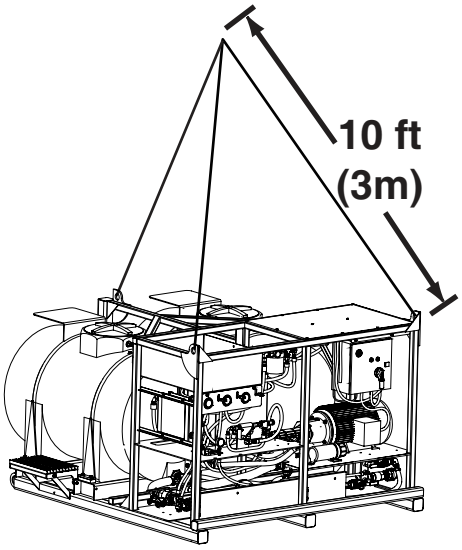
## LIFTING INSTRUCTIONS

- Frame weight:
  with full tank: 9,000 lbs (4,082 kg)
  with empty tank: 3,800 lbs (1,724 kg)

- Lifting with a crane requires a three or four part sling with legs a minimum of 10 ft (3 m) long.

- Frame MUST lift freely. If it is stuck to the ground, it MUST be broken loose prior to lifting.

- Frame lifting eyes MUST be inspected prior to each lift. Any damage MUST be repaired prior to lifting.

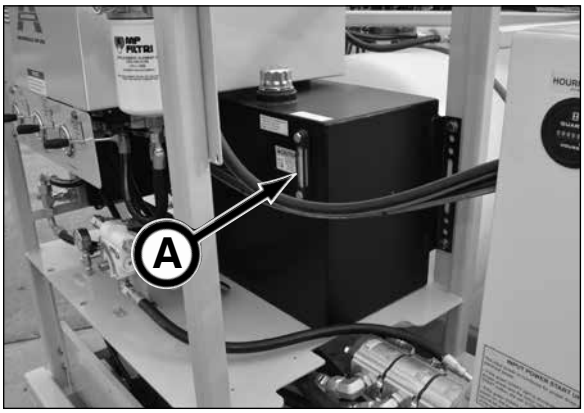


# NOTES

# Lubricants

**NOTICE** Use of inferior lubricants will affect the efficient performance of your EH2325 Lubrication Pump. Always use high quality lubricants as specified in this section. Refer to the Periodic Maintenance section for proper lubrication quantity, maintenance intervals, and procedures.

## HYDRAULIC TANK OIL




The hydraulic tank (A) is factory filled with ISO-VG-68, a premium AW (All-Weather) hydraulic oil.

Use ISO-VG-68 or equivalent when adding or changing lubricant.

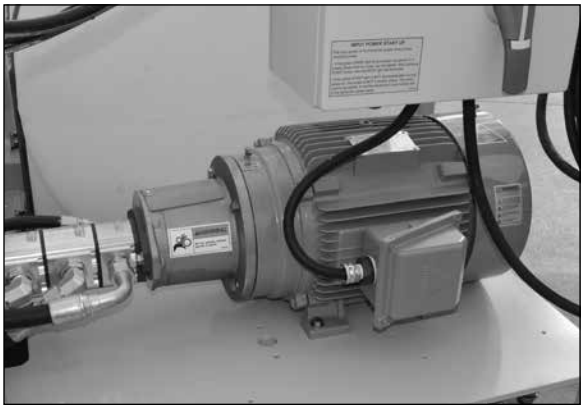
Recommended: hydraulic oil:

| *Ambient Temp.* | *Hydraulic Oil* |
|---|---|
| below 70°F (21°C) | ISO 46 |
| above 70°F (21°C) | ISO 68 |

**NOTICE** Do not mix oil manufacturers or grades.

Hydraulic oil tank capacity is 25 gal. (94.6 L).

## ELECTRIC MOTOR BEARING GREASE



The electric motor lubrication grease fittings are lubricated with Mobil Polyrex® EM grease.

The Polyrex EM grease is a specially formulated grease for electric-motor bearings.

Use Mobil Polyrex® EM grease or equivalent (refer to Grease Type below) when lubricating the lubrication fittings.

When adding lubricant, keep dirt out of the lubrication area. Wipe the fitting completely clean and use clean greasing equipment.

**GREASE TYPE (unless nameplate states otherwise:**
***Nameplate Ambient Temperature between -22°F (-30°C) to 150°F (65°C) inclusive:***
Recommended grease for standard service conditions is Mobil Polyrex® EM. Equivalent and compatible greases include: Texaco Polystar RB, Rykon Premium #2, Pennzoil Pen 2 Lube, Chevron SRI & Mobil SHC 100.

***Nameplate Ambient Temperature below -22°F (-30°C):*** Special low temperature grease is recommended such as Aeroshell 7 or Beacon 325 for ball bearings and Mobil SHC 100 for roller bearings.

# STORING LUBRICANTS

Your equipment can operate at maximum performance only if clean lubricants are used. Use clean containers to handle all lubricants.

Lubricants should be stored in an area protected from dust, moisture, and other contaminates.

All lubricants must be stored at least 100 ft (30.5 m) from the portal, entrance to the tunnel, launch shaft or reception shaft.

# Periodic Maintenance

**⚠WARNING** Review the Safety section in this manual before performing maintenance. Failure to do so, could cause severe injury or death.

The requirements for maintenance are shown on the maintenance charts in this section. Intervals of maintenance are based on normal operating conditions. If operating under more difficult conditions, use a shorter time interval between maintenance.

## LOCKOUT TAGOUT POWER BEFORE SERVICING

**⚠WARNING** Severe personal injury or death can result from unexpected machine movement.

LOCKOUT TAGOUT power before attempting to make repairs or adjustments to this equipment, unless otherwise indicated. Proper lockout tagout will prevent accidents and save lives. Performing the lockout tagout will also prevent the equipment from moving or operating unexpectedly.

Refer to Lockout Tagout Procedure Guideline in Section 1, Safety for more information.

## HYDRAULIC OIL/FLUIDS UNDER PRESSURE

**⚠WARNING** Escaping oil or other fluids under pressure can penetrate your skin causing serious injury.

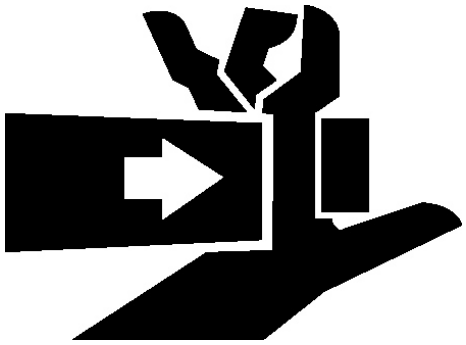
Release all pressure before performing maintenance or repairs. Never weld near pressurized fluid lines.

DO NOT use your hands to check for leaks. When searching for leaks, use a piece of wood or cardboard.

Contact medical help immediately if any oil or fluid is injected into your skin. A serious infection or reaction can emerge without proper medical treatment.

## AVOID PINCH POINTS

**⚠WARNING** Moving parts or the mishandling of parts can cause severe personal injury.



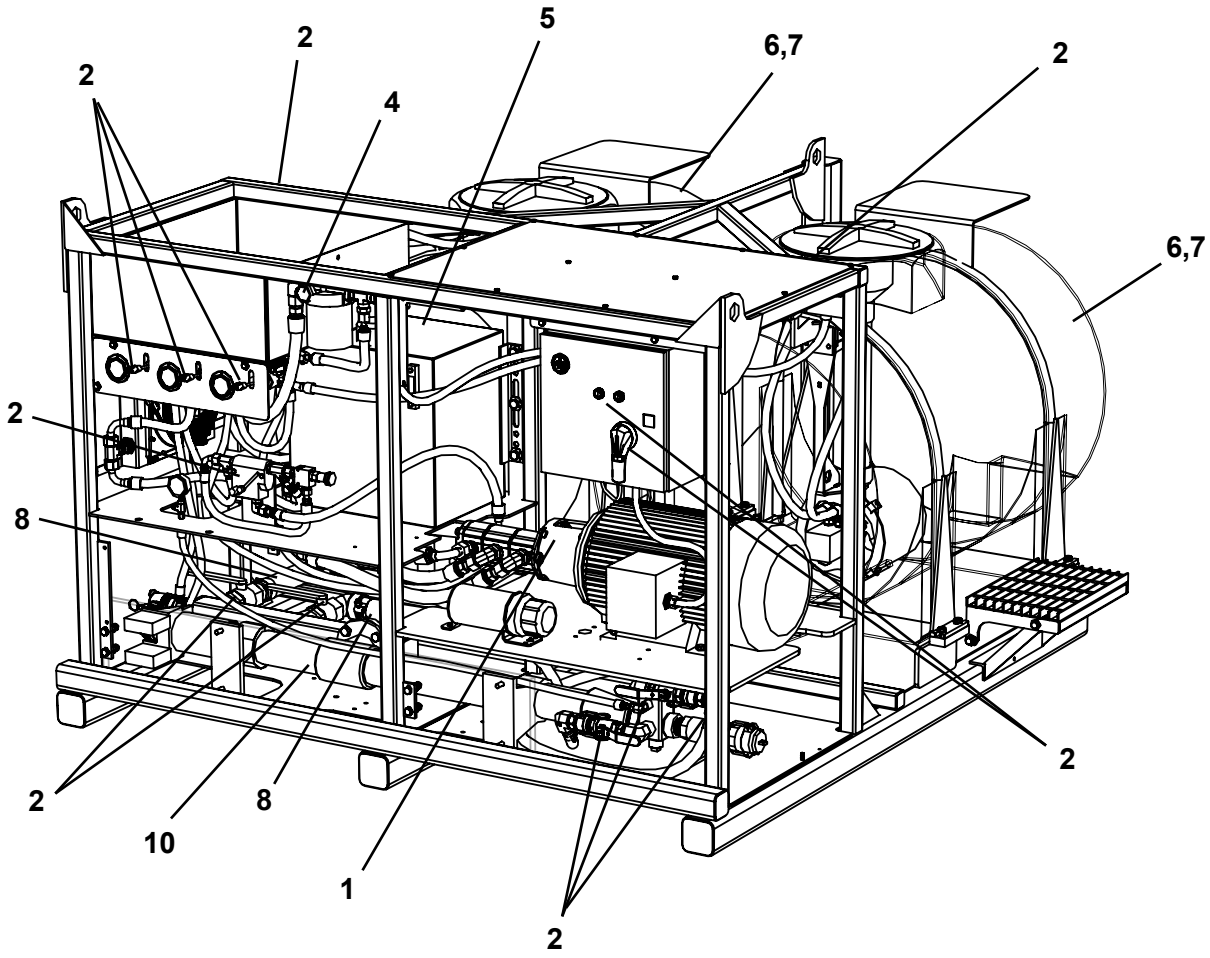
Keep hands away from moving parts.

Watch your fingers, hands and legs while equipment is in operation.

Handle parts carefully to avoid crushing and pinch point hazards.

# MAINTENANCE CHARTS

**NOTICE** Use the item number in the chart to refer to the detailed maintenance procedures later in this section.

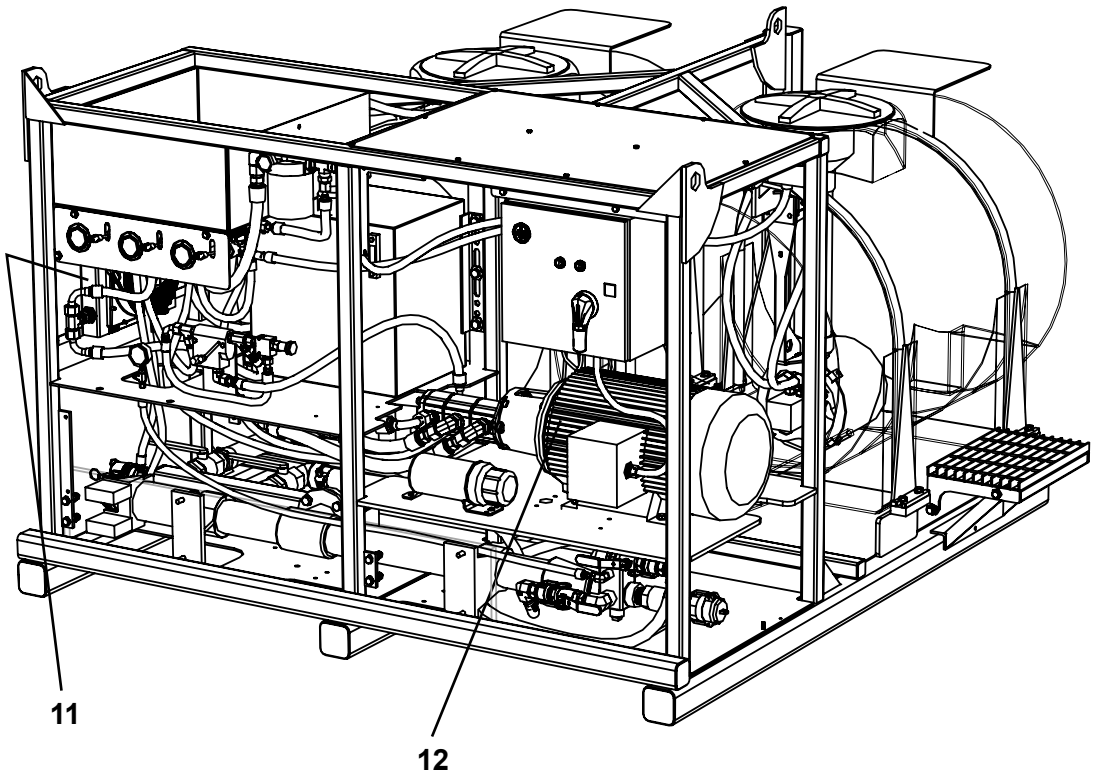



## *DAILY OR EVERY 10 HOURS OF OPERATION

| ITEM | COMPONENT | SERVICE | REQUIREMENT | MATERIAL |
|---|---|---|---|---|
| 1. | Covers & Guards | Inspect | Replace if damaged. | |
| 2. | Valves, Levers & Controls | Inspect | Inspect for proper operation. | |
| ^3. | Wiring & Cables | Inspect | If damaged, replace with new. | |
| 4. | Hydraulic Return Filter | Check Indicator | Replace filter as needed per indicator. | Return Filter |
| 5. | Hydraulic Tank | Check Fluid Level | Add hydraulic fluid as needed. | See Section 8 |
| 6. | Water/Solution Tank | Inspect | Repair or replace if damaged. | |
| 7. | Water/Solution Tank | Flush | Flush in freezing weather or is idle for more than a day. | |
| 8. | Hoses & Tube | Check | Replace if damaged. | |
| ^9. | Decals | Inspect | If damaged, replace with new. | |
| 10. | Pump | Inspect | Refer to Moyno Pump Instructions. | |

^ Not Shown

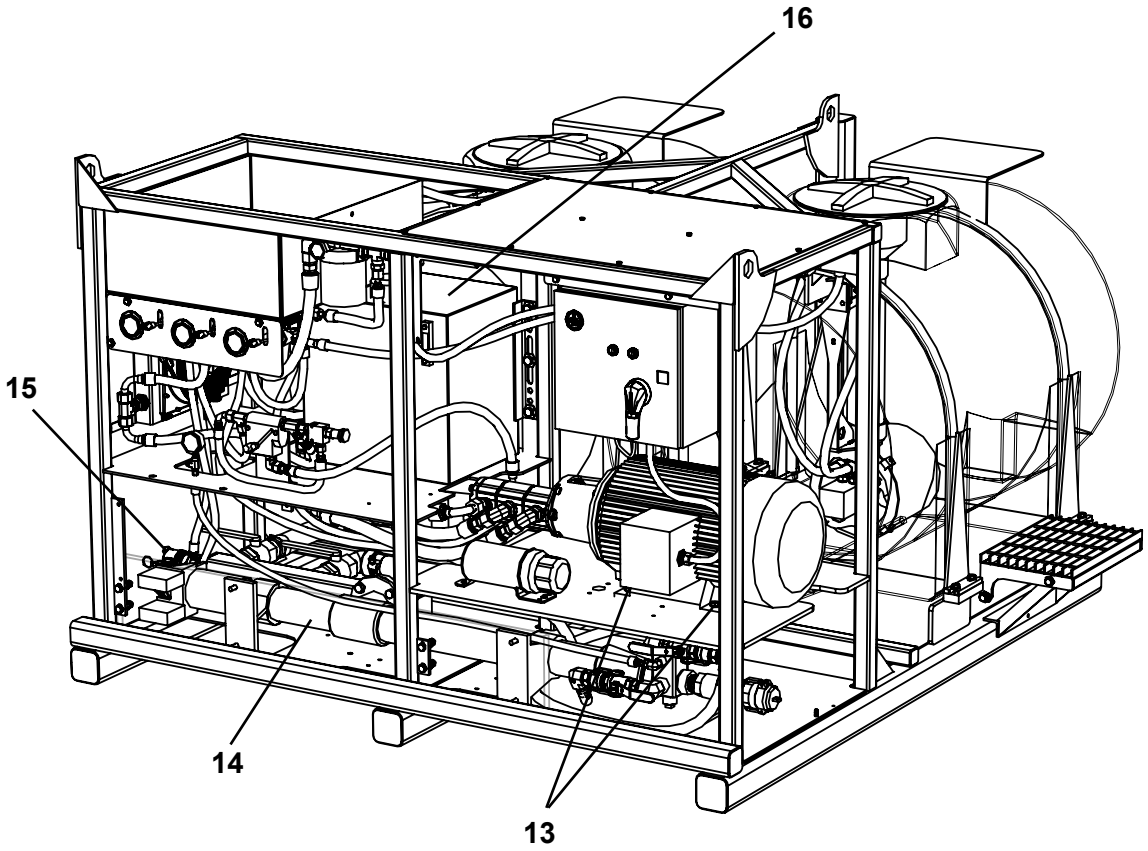
**NOTICE** Use the item number in the chart to refer to the detailed maintenance procedures later in this section.




## *WEEKLY OR EVERY 50 HOURS OF OPERATION

| ITEM | COMPONENT | SERVICE | REQUIREMENT | MATERIAL |
|---|---|---|---|---|
| 11.<br>12. | Oil Cooler Fins<br>Motor Cooling Fins | Check & Clean<br>Clean | If damaged, repair or replace. | |

**NOTICE** Use the item number in the chart to refer to the detailed maintenance procedures later in this section.



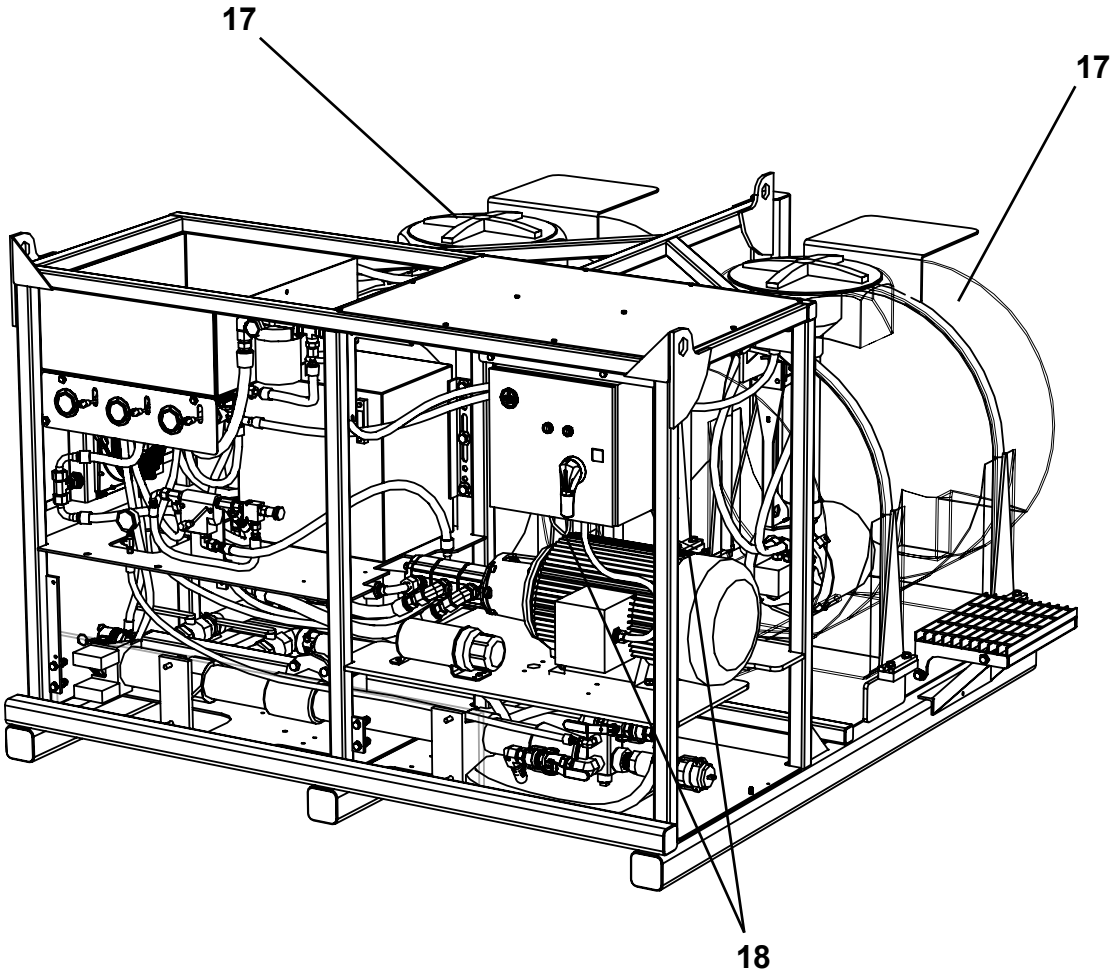

## *MONTHLY OR EVERY 250 HOURS OF OPERATION

| ITEM | COMPONENT | SERVICE | REQUIREMENT | MATERIAL |
|---|---|---|---|---|
| 13. | Motor Mounting Bolts | Inspect | If damaged, replace with new. | |
| 14. | Pump Mounting Bolts | Inspect | If damaged, replace with new. | |
| 15. | Pump Motor Mt. Bolts | Inspect | If damaged, replace with new. | |

## *EVERY 500 HOURS OF OPERATION

| ITEM | COMPONENT | SERVICE | REQUIREMENT | MATERIAL |
|---|---|---|---|---|
| 16. | Hydraulic Tank | Drain & Fill | 25 gal. (94.6 L) | See Section 8 |

**NOTICE** Use the item number in the chart to refer to the detailed maintenance procedures later in this section.




## AFTER EACH DRIVE

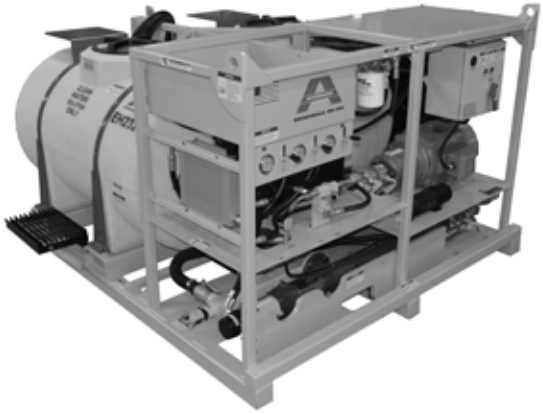
| ITEM | COMPONENT | SERVICE | REQUIREMENT | MATERIAL |
|---|---|---|---|---|
| 17. | Water/Solution Tank | Flush | Flush tank and prepare for storage. | |

## ANNUALLY

| ITEM | COMPONENT | SERVICE | REQUIREMENT | MATERIAL |
|---|---|---|---|---|
| 18. | Electric Motor Brgs. | Lubricate (2 Places) | 2 Shots | Mobil Polyrex EM |

# DAILY OR EVERY 10 HOURS OF OPERATION

**NOTICE** Refer to your engine operation manual for additional maintenance information.



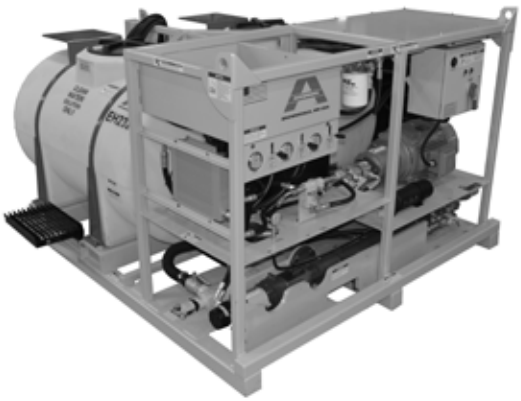
### 1. INSPECT COVERS & GUARDS

Inspect all guards and covers to be sure they are properly mounted in place, and undamaged. Repair or replace as needed. NEVER operate without covers or guards in place.


### 2. INSPECT VALVES AND LEVERS

Inspect valves and levers for proper operation.

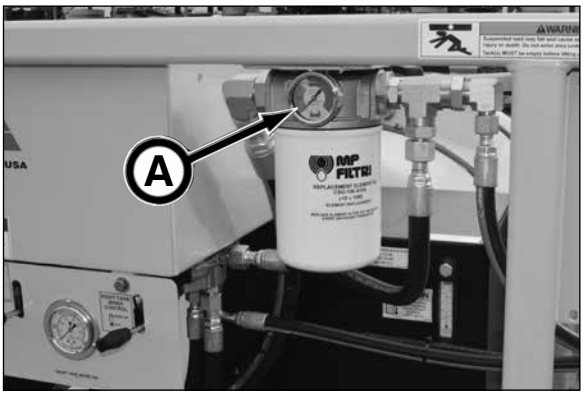
Repair or replace as needed.



### 3. INSPECT WIRING & CABLES

Inspect wiring and cable for cracking, fraying or other damage. Replace as needed.

**4. CHECK HYDRAULIC RETURN FILTER INDICATOR**




To prevent over or under servicing of the hydraulic return filter, a filter indicator (A) has been installed on the return filter housing.

The green OK zone indicates that the filter is functioning properly.

The yellow zone indicates that the filter will soon require replacement.

When the needle on the gauge is in the red CHANGE zone, replace filter as soon as possible using the following procedure:

1. Clean and dry area around return filter.

2. Remove filter. Dispose of oil and filter properly.

**NOTICE** Remove filter gasket if stuck in filter housing.

3. Fill new filter with clean hydraulic oil (refer to Section 8, Lubricants for oil specification).

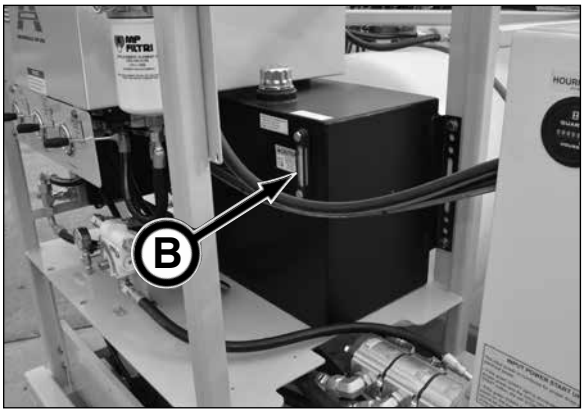
4. Lubricate new filter gasket with a light coating of clean hydraulic oil.

5. Install new filter. Hand tighten only.

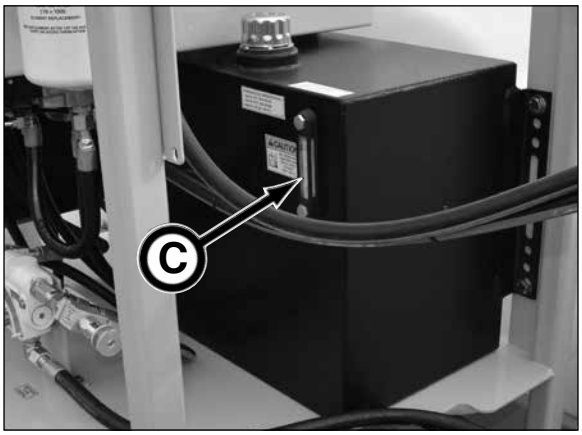
6. Start motor until the hydraulic system is warm. Then check for leaks.

7. Shut down motor.

8. Check hydraulic tank oil level on gauge (B). Add hydraulic oil, if necessary.




**5. CHECK HYDRAULIC TANK OIL LEVEL**




Check hydraulic tank oil level gauge (C). Add hydraulic oil, if necessary.

The hydraulic tank is filled with ISO-VG-68 Premium Hydraulic Oil. Refer to Hydraulic Tank in the Fuels & Lubricants section for more information.

Hydraulic oil tank capacity is 25 gal. (94.6 L).


### 6. INSPECT WATER/SOLUTION TANKS

Inspect water/solution tanks for damage. Repair or replace as needed.

### 7. FLUSH WATER/SOLUTION TANKS

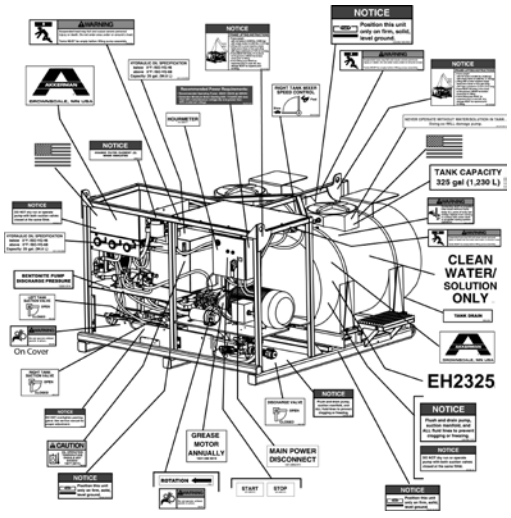
The water/solution tanks must be flushed with clean water if:


- the solution will be sitting idle more than an overnight period. Check the directions on the polymer or bentonite bag/container for additional instructions.

- the solution will be sitting idle overnight in freezing weather. The tanks will also require draining and adding a RV anti-freeze solution. (refer to Cold Weather Protection in section 6, Operation.

### 8. INSPECT OUTLET TUBES & HOSES

Inspect outlet tubes and hoses and all hydraulic hoses for cracks, wear or damage. Replace as needed.




### 9. INSPECT DECALS

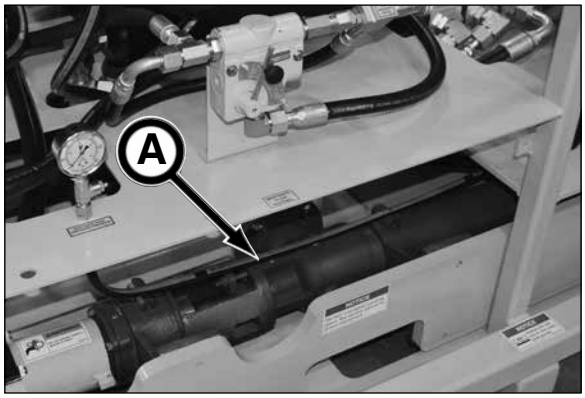
Visually inspect all decals so they are clean and readable. Replace decals if they are damaged, missing, or hard to read.

## 10. PUMP MAINTENANCE

The Moyno® pump (A) is designed for minimal maintenance with routine lubrication and adjustment of the packing gland and the infrequent lubrication of the bearings (refer to instructions below).

**IMPORTANT:**

1. **NEVER** dry run or operate the pump with both suction valves closed at the same time. Doing so WILL cause pump damage.
2. When performing maintenance to the packing gland, **NEVER** overtighten packing gland, otherwise pump damage will result.



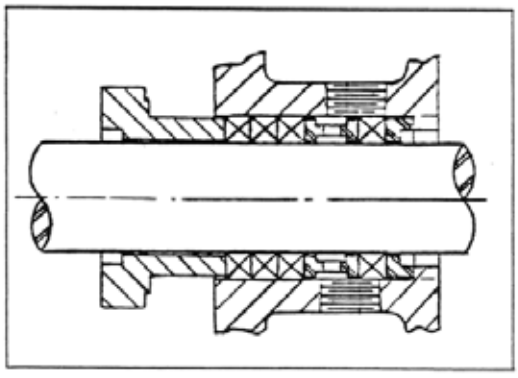

### MAINTENANCE

The Moyno pump has been designed for a minimum of maintenance, the extent of which is routine lubrication and adjustment of packing and infrequent lubrication of the bearings. The pump is one of the easiest to work on in that the main elements are very accessible and require few tools to disassemble.

**Packing**

The Moyno pump is normally furnished with die formed packing. The packing may be either grease lubricated through a grease fitting in the stuffing box or have plumbing connected to the housing to allow a water flush. (See Water Flush of Packing)

Packing gland adjusting nuts should be evenly adjusted so they are little more than finger tight. Over-tightening of the packing gland may result in premature packing failure and possible damage to the shaft and gland. When the packing is new, frequent minor adjustments are recommended for the first few hours of operation in order to compress and seat the packing. Greasing the packing often but with limited quantities of grease is the best practice. This can be done through a grease fitting which leads to a lantern ring in the mid-section of the packing. Do not use a one-piece spiral wrap of packing.

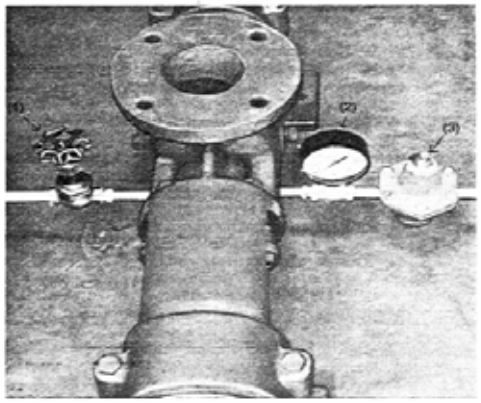


Cross section of stuffing box

**Water Flush of Packing**

When the material being pumped is abrasive in nature, it may be advantageous to flush the packing to prevent leakage under packing and excessive shaft wear.

Clean water can be injected through a 1/8" NPT tapped hole that normally houses the grease fitting for lubricating the packing. The water can be permitted to leak axially along the shaft In either direction or can be removed from the second tapped hole In the stuffing box. In both cases, the discharge from the stuffing box should be throttled slightly to maintain 10-15 PSI higher pressure in the stuffing box than is present In the suction housing.



Typical water Flush to packing

This is a basic arrangement, other variations can be used.
(1) Throttling Valve (2) Pressure Guage (3) Pressure Regulating Valve

**Bearings**

The Moyno pump is equipped with ball bearings in the drive end size L2 through L10. The bearings are lubricated at the factory and do not need additional lubrication for at least 1500 hours of normal operation.

When relubricating the bearings, the bearing-shaft assembly should be removed (See Disassembly Instructions) and cleaned of old grease. Add only enough grease to fill the area between the bearings 1/3 full. Add a few drops of oil to bearing seals before reassembling. It is normal for bearings to run warm to the touch for the first few hours of operation.

Any type of Ep Lithium soap base grease is satisfactory for bearing lubrication. The use of Sodium or Calcium base grease is not recommended.

The following is a partial listing of approved bearing lubricants:

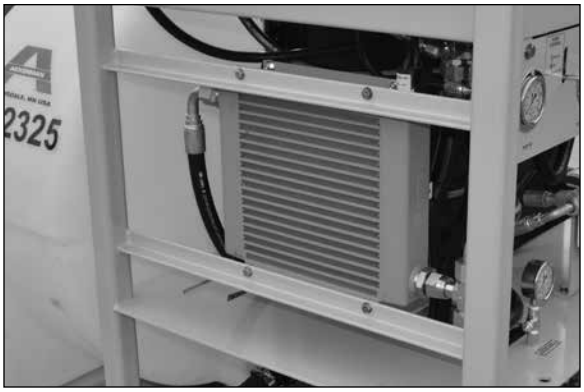
| | |
|---|---|
| Dow Corning | DC 33 |
| Keystone Lubricating Co. | Keystone #89 |
| Texaco | Regal AFB2 |
| Shell Oil Co. | Cyprina #3 |
| Humble Oil & Refining Co. | Beacon 325 |
| American Oil Co. | Supermil Grease #A72832 |
| Mobil | EP1 |
| Shell Oil Co. | Alvania #2 |

The complete Operation - Assembly Instructions for "L6" Drive End can be found at the following link:
https://www.moyno.com/dmdocuments/L6_drive_end.pdf

# WEEKLY OR EVERY 50 HOURS OF OPERATION

### 11. INSPECT & CLEAN OIL COOLER FINS

**⚠WARNING** Oil cooler fins are SHARP and may cause injury if touched.
Oil cooling system may be HOT and cause severe burns if contacted.
Always use gloves when near the oil cooler.
Perform service on oil cooler only when cool.



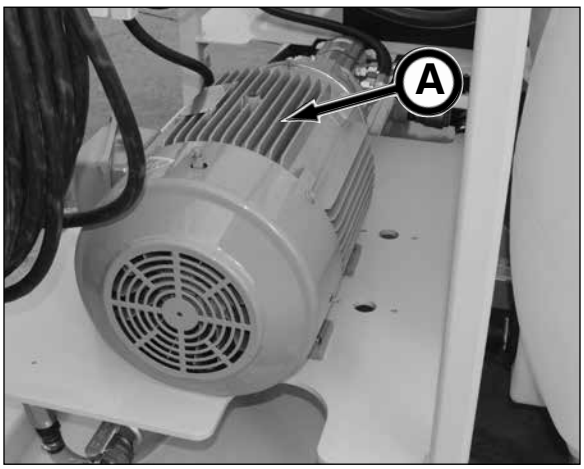

1. Inspect the oil cooler fins for dirt and bent or damaged fins.

**⚠CAUTION** When using compressed air, always wear eye protection to prevent injury to eyes.

2. Use compressed air (maximum 28 psi) to blow off dirt, dust and debris from oil cooler fins. If there is a large amount of debris on the fins, use a mild soap to thoroughly clean fins and then rinse with water.

3. Carefully straighten any bent fins.

4. Inspect oil cooler tubes for cracks, kinks, dents and fractured seams. Repair or replace oil cooler as necessary.




### 12. CLEAN MOTOR COOLING FINS

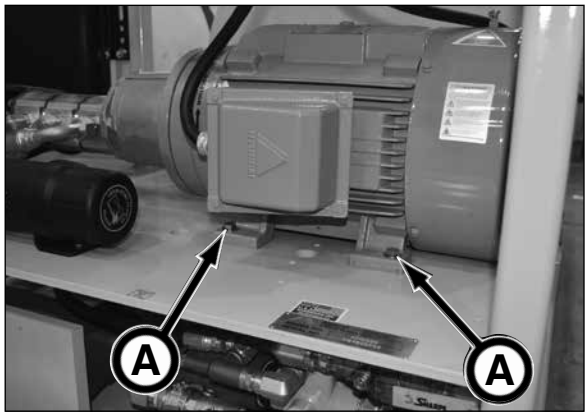
Remove and clean dirt and debris from motor cooling fins (A).

# MONTHLY OR EVERY 250 HOURS OF OPERATION

### 13. INSPECT MOTOR MOUNTS

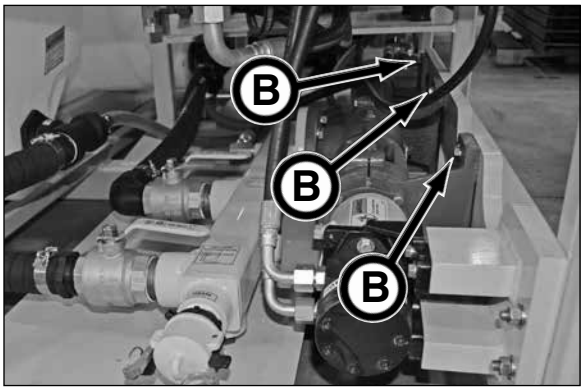
Visually inspect all electric motor mounting bolts (A) for loose hardware or damaged parts.

Tighten all loose hardware and replace defective parts.



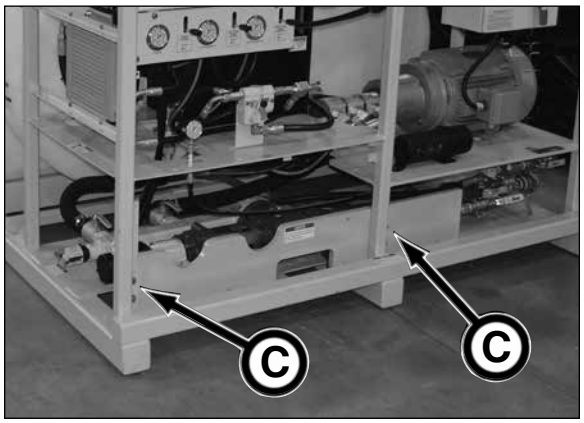

### 14. INSPECT PUMP MOUNTING BOLTS

Visually inspect pump mounting bolts (B) for loose hardware or damaged parts.




Visually inspect pump mounting plate bolts (C) for loose hardware or damaged parts.

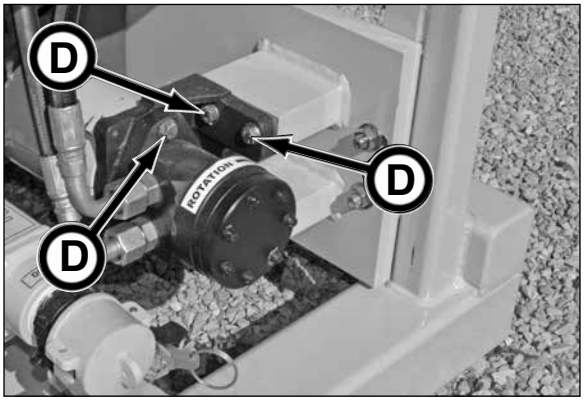
Tighten all loose hardware and replace defective parts.




### 15. INSPECT PUMP MOTOR MOUNTS

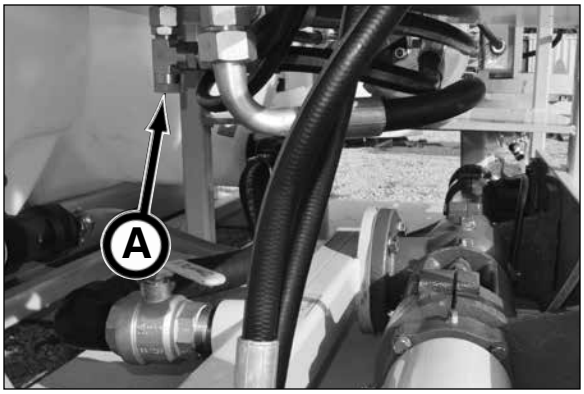
Visually inspect pump motor mounting bolts (D) for loose hardware or damaged parts.

Tighten all loose hardware and replace defective parts.



# EVERY 500 HOURS OF OPERATION

**NOTICE** Refer to your engine operation manual for additional maintenance information.




**16. DRAIN & FILL HYDRAULIC TANK**

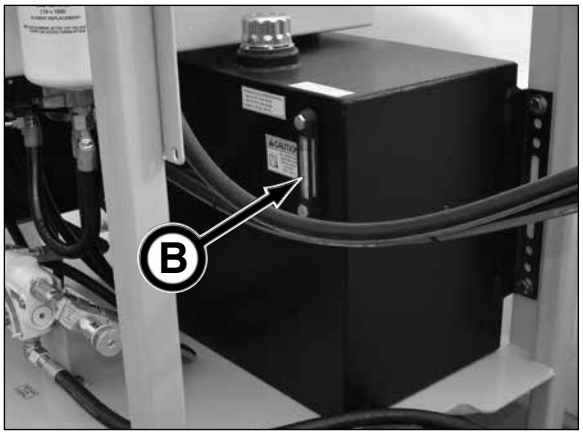
1. Remove drain plug (A) and drain oil into a catch pan.

2. Replace drain plug.


3. Remove fill cap.

4. Fill tank with approximately 25 gal. (94.6 L) of ISO-VG-68, a premium AW (All-Weather) hydraulic oil or refer to Hydraulic Tank Oil in the Lubricants section for more information.

5. Replace fill cap.




6. Check oil level with oil level gauge (B).

# AFTER EACH DRIVE

### 17. FLUSH & CLEAN WATER/SOLUTION TANKS


After each drive, the EH2325 Lubrication Pump tanks must be flushed and cleaned, and then add RV anti-freeze to the fluid system so the pump will be ready for the next drive.

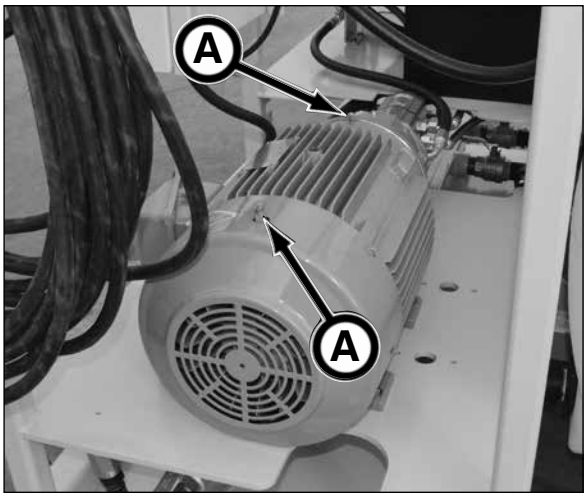
1. Flush and clean water system by using clean water to flush the tank and water system components until the water is clear and free of sediment. Failure to do so will result in clogging of the fluid in the tank, hoses and/or components. Refer to Cleaning Tanks in section 6, Operation for more information.

2. Once tank and water system is clean, completely drain system and add RV anti-freeze to the water system. Refer to Cold Weather Protection in section 6, Operation for more information.

3. Repeat steps 1 and 2 for other tank water system.

# ANNUALLY

### 18. LUBRICATE MOTOR BEARINGS




**NOTICE** For additional electric motor maintenance information, contact your Akkerman Aftermarket Support representative.

Lubricate the electric motor bearings (A) with two shots of Mobil Polyrex® EM grease or equivalent (refer to Grease Type below). There are two lubrication fittings on the electric motor.

When adding lubricant, keep dirt out of the lubrication area. Wipe the fitting completely clean and use clean greasing equipment.

**GREASE TYPE (unless nameplate states otherwise:**
***Nameplate Ambient Temperature between -22°F (-30°C) to 150°F (65°C) inclusive:***
Recommended grease for standard service conditions is Mobil Polyrex® EM. Equivalent and compatible greases include: Texaco Polystar RB, Rykon Premium #2, Pennzoil Pen 2 Lube, Chevron SRI & Mobil SHC 100.

***Nameplate Ambient Temperature below -22°F (-30°C):*** Special low temperature grease is recommended such as Aeroshell 7 or Beacon 325 for ball bearings and Mobil SHC 100 for roller bearings.

# Storage

## PREPARING FOR STORAGE

1. Repair worn or damaged parts.
2. Wash all equipment and tanks thoroughly.
3. Drain tanks. Flush and drain pump and all fluid lines including to prevent clogging or freezing during storage.
4. Lubricate all grease points.
5. Repaint equipment where necessary.
6. Drain hydraulic oil, flush oil reservoir, change hydraulic filter, and refill hydraulic tank. Check for leaks.
7. Wipe up lube spills. Dispose of rags and trash properly.
8. If possible, store equipment under cover and out of the weather in a ventilated area.
9. Clean and drain lubrication hoses. Store indoors to minimize UV damage.

# REMOVING FROM STORAGE

1. Clean equipment thoroughly.
2. Check to make sure all decals are clean and readable.
3. Check condition of wires and cables. Repair or replace as necessary.
4. Check for leaks. Repair or replace as necessary.
5. Check oil level in hydraulic tank. Add oil if necessary (refer to section 8, Lubricants for oil specifications). Also, check condition of the oil; be sure there is no water in the oil.
6. Check hydraulic return filter indicator. Replace filter as needed per indicator.
7. Check condition of all hoses and connections. Tighten, repair or replace with new as needed.
8. Before operating, cycle hydraulic functions several times to purge air from hydraulic system.
9. Fill lubrication tanks with clean water.
10. Review this Operator's Manual and all other tunneling equipment manuals.

# Troubleshooting

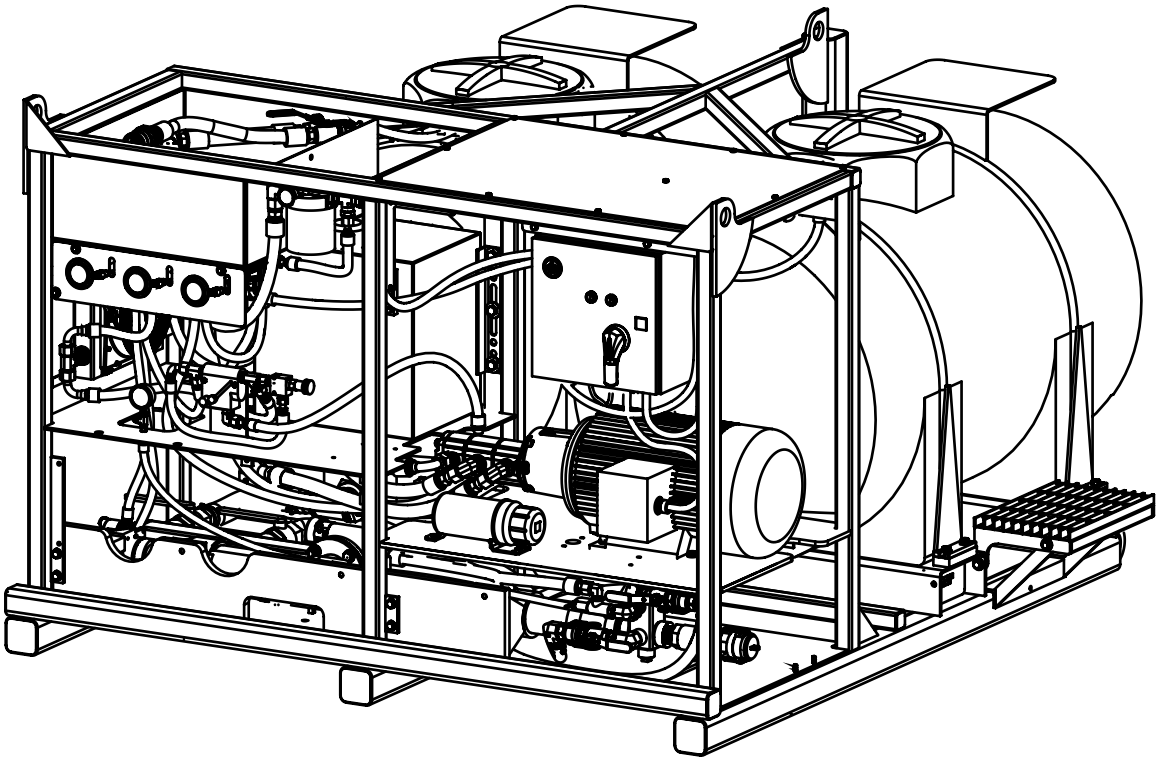
| Problem | Cause | Solution |
|---|---|---|
| Motor does not start. | Power source not hooked up. | Hook up power source. |
| | Main power disconnect switch OFF. | Flip switch to ON position. |
| | Wrong phase. | Rewire connection. |
| | If motor still does not start, contact your Akkerman Aftermarket Support Representative. | |
| Pump cannot reach maximum pressure. | Relief valve is not set properly. | Adjust relief to 225 psi max. |
| | Worn packing or packing break-in. | See Moyno packing gland adjustment instructions. |
| | If max. pressure still cannot be reached, contact your Akkerman Aftermarket Support Representative. | |
| Lubrication pump is pulsating. | Air in water supply. | Add more water/solution in tank and check pump inlet connections. |
| | Outlet cam lock is not engaged. | Be sure cam lock is fully engaged. |
| | Hydraulic oil level is low. | Fill hydraulic oil tank as needed. |
| | If pump continues to pulsate, contact your Akkerman Aftermarket Support Representative. | |
| No water discharge out of pump. | No water in tank. | Fill tank. |
| | Suction hose not connected to pump. | Connect suction hose. |
| | Pump Control is in OFF position. | Move Pump Control to ON position. |
| | Suction valve on tank(s) closed. | Open tank suction valve(s). |
| | Mixer Speed Control is in Slow or Off position. | Move Mixer Speed Control to higher speed. |
| | Wall valve bentonite connection ball valve is turned to OFF position. | Turn wall valve to ON position. |
| | Outlet hose damaged. | Replace hose. |
| | Pump does not spin freely. | Carefully use a pipe or strap wrench to loosen stator. |
| | Rotor & stator adhesion. | Lubricate rotor and stator per Moyno instructions. |
| | If no water still does not discharge out of pump, contact your Akkerman Aftermarket Support Representative. | |

*(Continued on next page)*

| Problem | Cause | Solution |
|---|---|---|
| Hydraulics are running hot. | Dirty oil cooler. | Clean oil cooler. |
| | Incorrect relief valve setting. | Adjust valve to 225 psi max. |
| | Pump is worn. | Replace pump. |
| | If the hydraulics continue to run hot, contact your Akkerman Aftermarket Support Representative. | |
| Mixer not functioning. | Mixer Control is in OFF position. | Move Mixer Control to ON position. |
| | Hydraulic oil level is low. | Fill hydraulic oil tank as needed. |
| | If mixer is still not functioning contact your Akkerman Aftermarket Support Representative. | |

# Specifications

## EH2325 LUBRICATION PUMP



**Dimensions:**

Height ..... 61.5 in. (1,562 mm)
Width
with steps in ..... 88.25 in. (2,242 mm)
with steps out ..... 109 in. (2,769 mm)
Length ..... 104 in. (2,642 mm)
Weight* (empty tanks)..... 3,800 lbs. (1,724 kg)
(full tanks) ..... 9,000 lbs. (4,082 kg)
* approximate

**Power Unit:**

Electric Motor @ 1,800 rpm .. 30 HP (22.5 kW)

**Recommended Power Requirements:**

- Recommended Operating Pwr: 40kW / 50 kVA @ 480VAC
- Generator Minimum Motor Starting KVA: 115 skVA with less than 30% instantaneous voltage dip and greater than 90% sustained voltage.

**Drive System** ..... Direct Drive

**Mixer (Agitator)** ..... Hydraulic-Driven, In-tank

**Fluid Pumps**

Pump 1 Flow (Max.)..... 12 gpm (45 L/min)
Pump 2 Flow (Max.)..... 12 gpm (45 L/min)
Pump 3 Flow (Max.)..... 12 gpm (45 L/min)
Pressure Rating (Max.) .... 2,000 psi (13,790 kPa)

**Progressive Cavity Pump**

Pressure (Max.)..... 225 psi (1,551 kPa)
Flow (Max.) ..... 25 gpm (95 L/min)

**Fluid Capacities**

Water Tank .....Two, 325 gal (1,230 L)
Hydraulic Reservoir ..... 25 gal. (94.6 L)

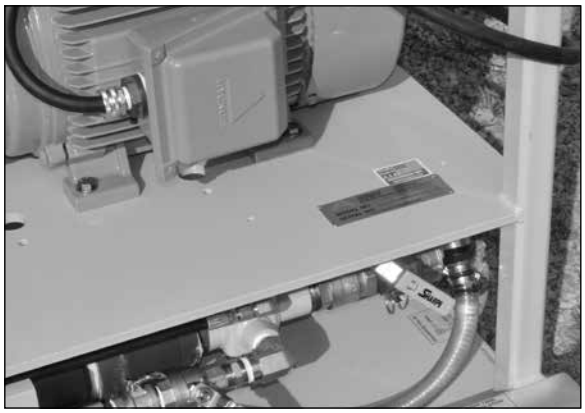
# TORQUE CHART

Use these torque values as a guideline when tightening hardware unless otherwise specified in this manual.

| Lubricated Coarse UNC Threads Grade 8 Fasteners | | | Lubricated Fine UNF Threads Grade 8 Fasteners | | |
|---|---|---|---|---|---|
| **Bolt Size** | **Torque ft. lbs.** | **(N·m)** | **Bolt Size** | **Torque ft. lbs.** | **(N·m)** |
| 1/4 - 20 | 10 | (14) | 1/4 - 28 | 11 | (15) |
| 5/16 - 18 | 20 | (27) | 5/16 - 24 | 22 | (30) |
| 3/8 - 16 | 35 | (47) | 3/8 - 24 | 39 | (53) |
| 7/16 - 14 | 56 | (76) | 7/16 - 20 | 62 | (84) |
| 1/2 - 13 | 85 | (115) | 1/2 - 20 | 96 | (130) |
| 9/16 - 12 | 123 | (167) | 9/16 - 18 | 137 | (186) |
| 5/8 - 11 | 170 | (231) | 5/8 - 18 | 192 | (260) |
| 3/4 - 10 | 301 | (408) | 3/4 - 16 | 336 | (456) |
| 7/8 - 9 | 450 | (610) | 7/8 - 14 | 500 | (678) |
| 1 - 8 | 680 | (922) | 1 - 12 | 740 | (1003) |
| 1-1/8 - 7 | 960 | (1302) | 1-1/8 - 12 | 1030 | (1397) |
| 1-1/4 - 7 | 1360 | (1844) | 1-1/4 - 12 | 1500 | (2034) |
| 1-1/2 - 6 | 2360 | (3200) | 1-1/2 - 12 | 2660 | (3607) |

# Identification Numbers

Model and serial numbers are required when ordering parts or requesting service information. Record your model and serial numbers below.



**EH2325 LUBRICATION PUMP**

Model Number EH2325

Serial Number _____

# NOTES

# Safety Data Sheets

The Federal Occupational, Safety, and Health Administration (OSHA) Standard 29 CFR 1910.1200, require that specific safety data sheets (SDS) be available to employees before operating this equipment. This may include information on substances contained in this equipment such as hydraulic fluid and gear lubricant.

Akkerman Inc. will provide, at no cost, SDS which apply to its product line. Simply contact your Akkerman Aftermarket Support representative for a copy.

To ensure a prompt response to your SDS request, include your return address (including zip or postal code) and the equipment's model numbers and serial numbers with your request.

# NOTES

# Warranty

Akkerman warrants that all equipment manufactured by it be free from defects due to workmanship or material when normally used and serviced for a period of 90 days from the date of shipment by Akkerman. Normal wear and tear to the equipment, including, but not limited to, wear on the cutter face tooling, hydraulic filters, augers, casings, slurry line and seals is not covered by this warranty. Akkerman does not warrant that the equipment meets the requirements of any particular safety code or rule governing equipment classification. If the Customer has questions about local safety codes, rules or ordinances, authorities local to the project should be consulted.

In order to be considered as a potential warranty claim, the component in question must be returned to Akkerman (freight prepaid) for factory inspection and analysis, and determination of warranty applicability. No warranty is provided for electronics or electrical components of any kind. The validity of all warranty claims are subject to the discretion and determination of the Akkerman Aftermarket Support Department. All such determinations are final.

# NOTES

# Parts
## Contents

# INTRODUCTION

This parts manual contains assembly illustrations of the Akkerman EH2325 Series Lubrication Pump. The illustrations in this manual are intended to show typical construction of various parts. In some instances, the details of parts illustrated may not exactly represent their actual appearance, but will help to identify parts performing the same functions.

LOCATING PARTS

This parts manual is organized to help you locate parts information quickly. An Alphabetical Index, Section 17, is provided to determine the page number of the assembly a part is used. If the part number is known, the Numerical Index, Section 18, can also be utilized to find the page number of the assembly.

USE GENUINE AKKERMAN PARTS

The use of second-rate parts could affect the efficient performance of the Lubrication Pump. ALWAYS use genuine Akkerman parts.

PARTS ORDERING

To order fast, accurate, and reliable parts service, call (800) 533-0386, (507) 567-2261, or fax (507) 567-2720, and provide the following information.

1. Model Number
2. Serial Number
3. Part Number, Description, and Quantity
4. Shipping Preference

MEASUREMENTS

The unit of measure in this manual is in inches unless indicated otherwise.

HARDWARE SPECIFICATION

All Akkerman products are assembled with SAE Grade 8 bolts, nuts, and washers. ALWAYS use matched fastener hardware when replacing or repairing the unit.

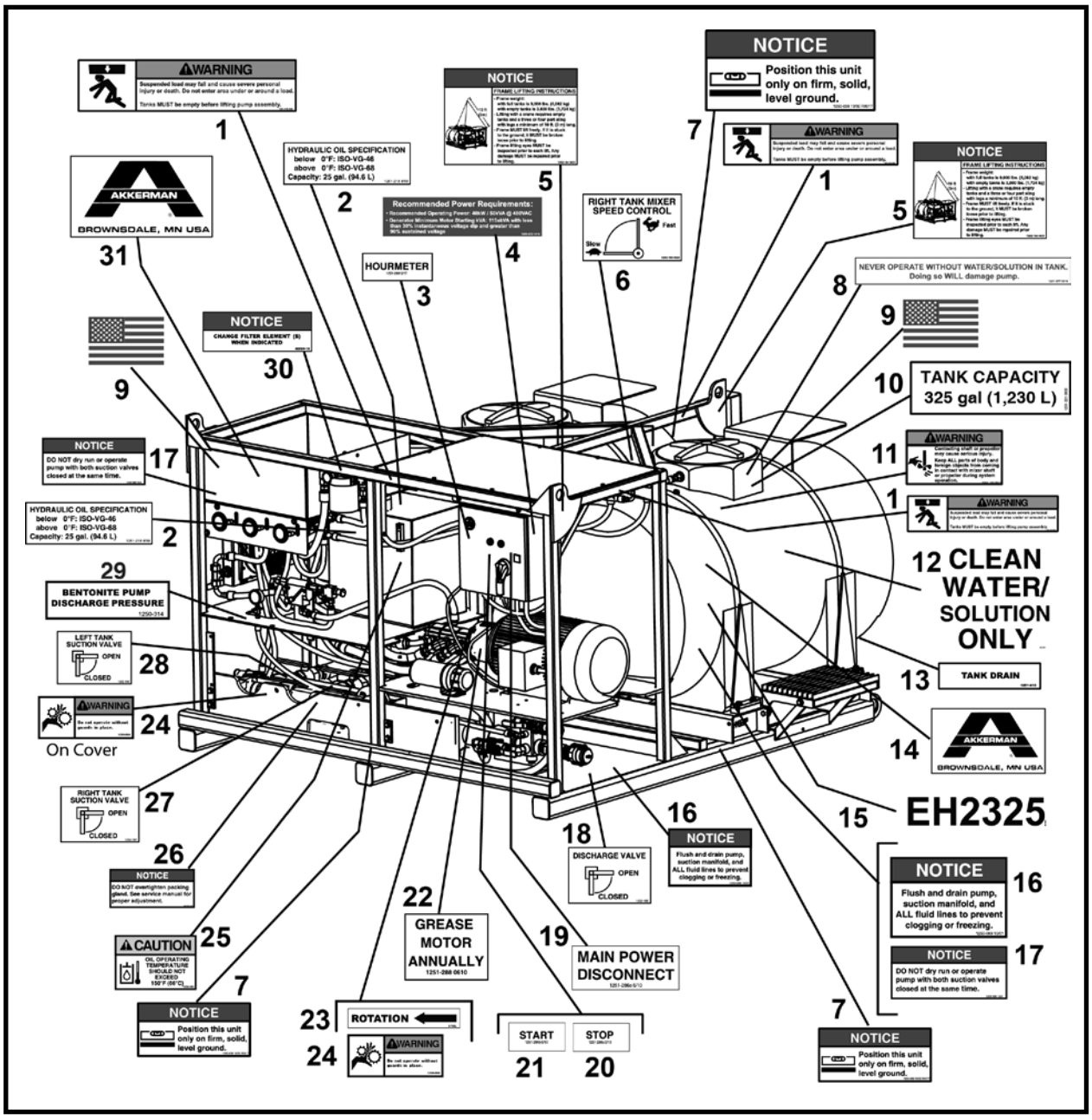
If you find any errors with this manual or have any suggestions for improvement, please let us know. Mail your suggestions to:
Akkerman Inc, ATTN: Technical Publications, 58256 266th Street, Brownsdale, MN 55918.

Akkerman Inc. reserves the right to improve its product without notice or obligation.

# NOTES

# EH2325 LUBRICATION PUMP DECALS - RIGHT VIEW, 1255-115

**EH2325 (SN: F61600F)**




| ITEM | QTY | PART NO. | DESCRIPTION |
|---|---|---|---|
| 0 | 1 | 1255-115 | KIT, Decal EH2325 |
| 1 | 3 | 1251-018 | DECAL, Warning Suspended Loads |
| 2 | 2 | 1251-218 | DECAL, Hydraulic Oil Specification |
| 3 | 1 | 1251-286F | DECAL, Hourmeter |
| 4 | 1 | 1251-972 | DECAL, Recommended Power Requirements |
| 5 | 2 | 1252-184 | DECAL, Notice Lifting Instructions |
| 6 | 1 | 1252-193 | DECAL, Right Tank Mixer Speed Control |
| 7 | 3 | 1250-638 | DECAL, Notice Position Level Ground |
| 8 | 1 | 1251-677 | DECAL, Never Operate Without Water/Solution |
| 9 | 2 | 1250-558 | DECAL, USA Flag Small |
| 10 | 1 | 1251-221 | DECAL, Tank Capacity 325 gal. |
| 11 | 1 | 1250-311 | DECAL, Warning Keep Away From Propeller |

*(Continued on next page)*

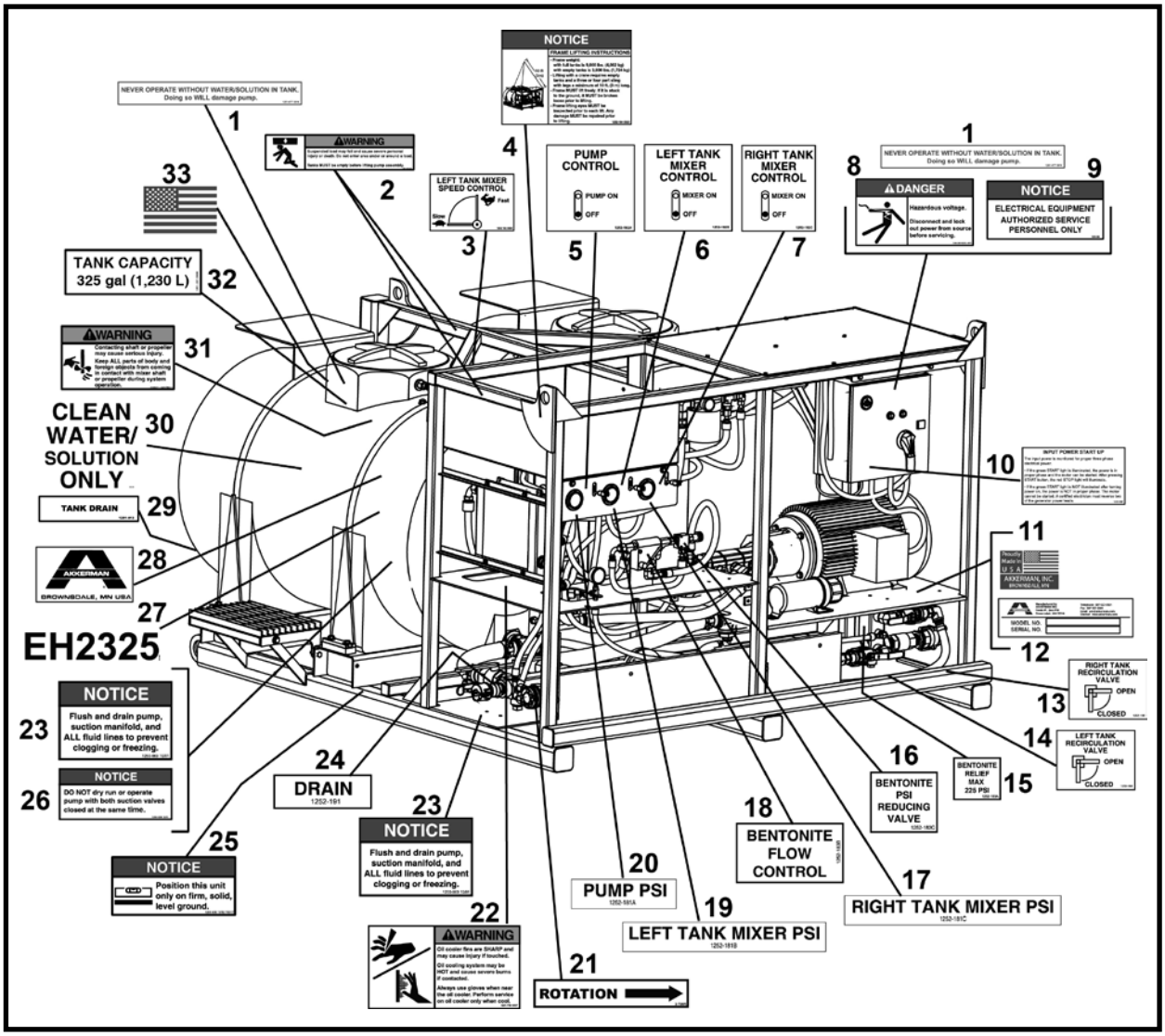
# EH2325 LUBRICATION PUMP DECALS - RIGHT VIEW, 1255-115

**EH2325 (SN: F61600F)**

| ITEM | QTY | PART NO. | DESCRIPTION |
|---|---|---|---|
| 12 | 1 | 1251-678 | DECAL, Clean Water/Solution Only |
| 13 | 1 | 1251-813 | DECAL, Tank Drain |
| 14 | 1 | 1251-246 | DECAL, Akkerman, Large |
| 15 | 1 | 1252-180 | DECAL, Model EH2325 |
| 16 | 2 | 1250-069 | DECAL, Notice Flush Drain Manifold |
| 17 | 2 | 1250-089 | DECAL, Notice Do Not Dry Run |
| 18 | 1 | 1252-190 | DECAL, Discharge Valve |
| 19 | 1 | 1251-286E | DECAL, Main Power Disconnect |
| 20 | 1 | 1251-286C | DECAL, Stop |
| 21 | 1 | 1251-286B | DECAL, Start |
| 22 | 1 | 1251-288 | DECAL, Grease Motor Annually |
| 23 | 1 | 3-700L | DECAL, Rotation Left |
| 24 | 2 | 1250-004 | DECAL, Warning Keep Guards In Place |
| 25 | 1 | 1250-483 | DECAL, Caution Oil Temp |
| 26 | 1 | 1250-090 | DECAL, Notice Do Not Overtighten Gland |
| 27 | 1 | 1252-187 | DECAL, Right Tank Suction Valve |
| 28 | 1 | 1252-186 | DECAL, Left Tank Suction Valve |
| 29 | 1 | 1250-314 | DECAL, Bentonite Pump Discharge PSI |
| 30 | 1 | 40000-16 | DECAL, Notice Change Filter |
| 31 | 1 | 1251-245 | DECAL, Akkerman X-Large |

# EH2325 LUBRICATION PUMP DECALS - LEFT VIEW, 1255-115

**EH2325 (SN: F61600F)**




| ITEM | QTY | PART NO. | DESCRIPTION |
|---|---|---|---|
| 1 | 2 | 1251-677 | DECAL, Never Operate Without Water/Solution |
| 2 | 2 | 1251-018 | DECAL, Warning Suspended Loads |
| 3 | 1 | 1252-192 | DECAL, Left Tank Mixer Speed Control |
| 4 | 1 | 1252-184 | DECAL, Notice Lifting Instructions |
| 5 | 1 | 1252-182A | DECAL, Pump Control |
| 6 | 1 | 1252-182B | DECAL, Left Tank Mixer Control |
| 7 | 1 | 1252-182C | DECAL, Right Tank Mixer Control |
| 8 | 1 | 1250-385 | DECAL, Danger Hazardous Voltage |
| 9 | 1 | 1250-383 | DECAL, Notice Electrical Equipment |
| 10 | 1 | 1252-062 | DECAL, Input Pwr Start Up |
| 11 | 1 | 1250-544 | DECAL, Made in USA |
| 12 | 1 | - | PLATE, Serial Number |
| 13 | 1 | 1252-189 | DECAL, Right Tank Recirc Valve |
| 14 | 1 | 1252-188 | DECAL, Left Tank Recirc Valve |
| 15 | 1 | 1252-183A | DECAL, Bentonite Relief PSI |
| 16 | 1 | 1252-183C | DECAL, Bentonite PSI Reducing Valve |
| 17 | 1 | 1252-181C | DECAL, Right Tank Mixer PSI |

*(Continued on next page)*

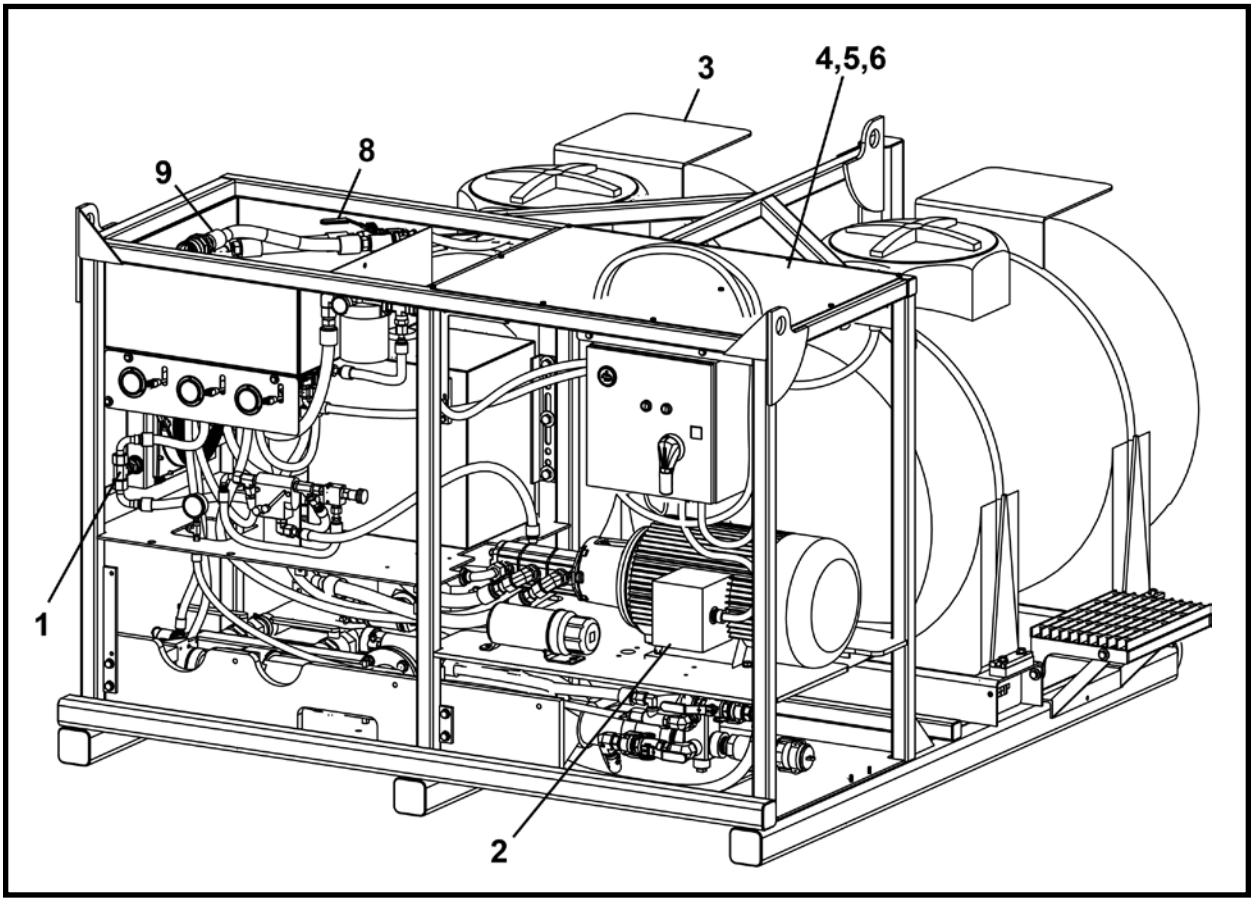
# EH2325 LUBRICATION PUMP DECALS - LEFT VIEW, 1255-115

**EH2325 (SN: F61600F)**

| ITEM | QTY | PART NO. | DESCRIPTION |
|---|---|---|---|
| 18 | 1 | 1252-183B | DECAL, Bentonite Flow Control |
| 19 | 1 | 1252-181B | DECAL, Left Tank Mixer PSI |
| 20 | 1 | 1252-181A | DECAL, Pump PSI |
| 21 | 1 | 3-700R | DECAL, Rotation Right |
| 22 | 1 | 1251-749 | DECAL, Warning Oil Cooler Fins Sharp |
| 23 | 2 | 1250-069 | DECAL, Notice Flush Drain Manifold |
| 24 | 1 | 1252-191 | DECAL, Drain |
| 25 | 1 | 1250-638 | DECAL, Notice Position Level Ground |
| 26 | 1 | 1250-089 | DECAL, Notice Do Not Dry Run |
| 27 | 1 | 1252-180 | DECAL, Model EH2325 |
| 28 | 1 | 1251-246 | DECAL, Akkerman, Large |
| 29 | 1 | 1251-813 | DECAL, Tank Drain |
| 30 | 1 | 1251-678 | DECAL, Clean Water/Solution Only |
| 31 | 1 | 1250-311 | DECAL, Warning Keep Away From Propeller |
| 32 | 1 | 1251-221 | DECAL, Tank Capacity 325 gal. |
| 33 | 1 | 1250-558 | DECAL, USA Flag Small |

# EH2325 LUBRICATION PUMP ASSEMBLY, F61600F

**EH2325 (SN F61088F)**



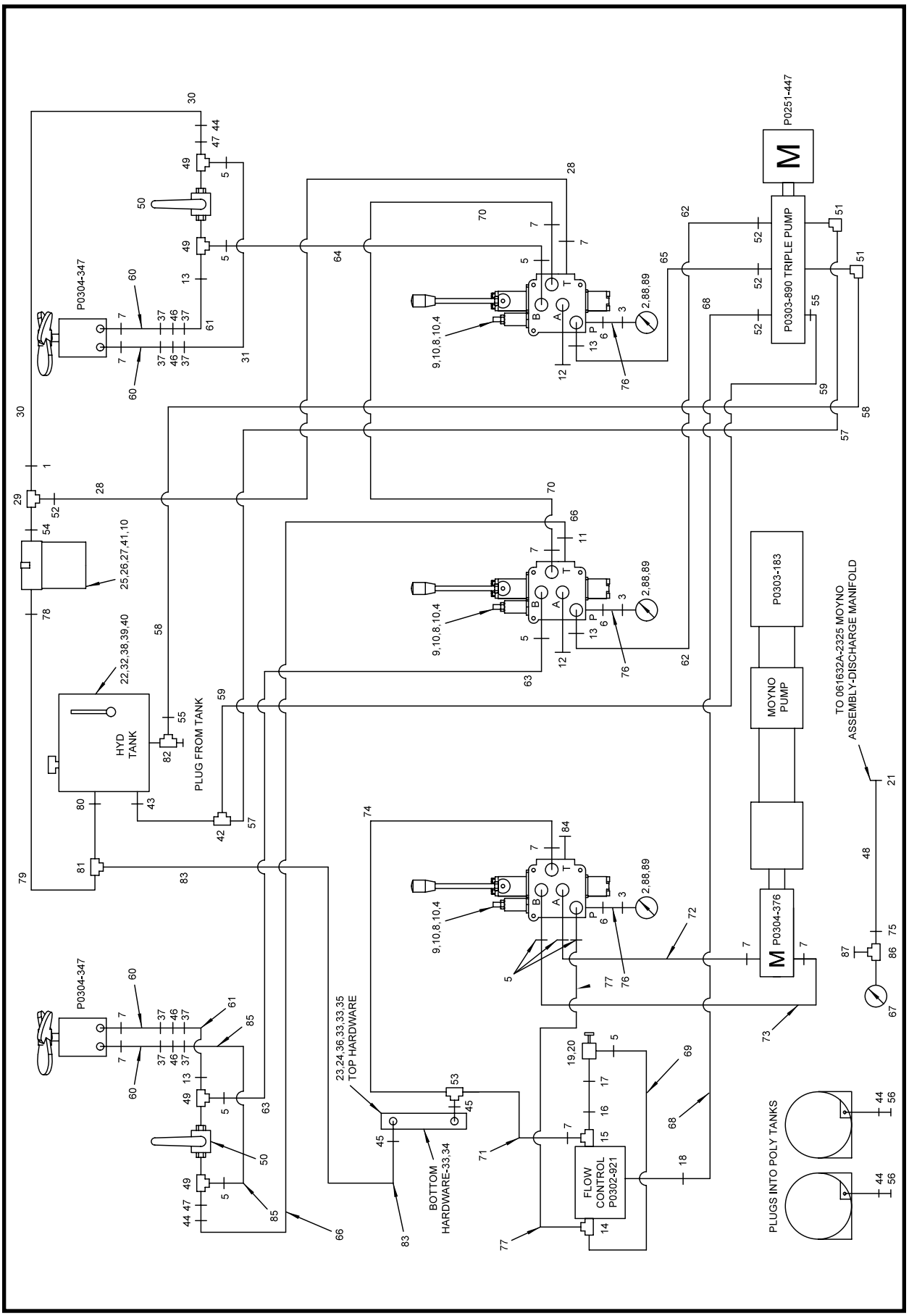

| ITEM | QTY | PART NO. | DESCRIPTION |
|---|---|---|---|
| 0 | 1 | F61600F | EH2325 LUBE PUMP ASSEMBLY |
| 1* | 1 | 061635A | ASSEMBLY, Hydraulic |
| 2* | 1 | A62194A | ASSEMBLY, Electrical |
| 3* | 1 | 061633A | ASSEMBLY, Bentonite Moyno |
| 4 | 1 | 061626P | PLATE, Panel - Top |
| 5 | 12 | P0001-04-002 | BOLT, Hex 1/4 UNC x .5 |
| 6 | 12 | P0040-004 | WASHER, Hardened Flat 1/4 |
| 7* ^ | 1 | 1255-115 | KIT, Decal EH2325 |
| 8* | 1 | 061795A | ASSEMBLY, Bentonite Valve 1 x 10’ |
| 9* | 1 | 061815A | ASSEMBLY, Camlock Reducer |

* Refer to this section for parts information.
^ Not Shown

# NOTES

# HYDRAULIC ASSEMBLY, 061635A

## EH2325 (SN F61600F)



# HYDRAULIC ASSEMBLY, 061635A

## EH2325 (SN F61600F)

| ITEM | QTY | PART NO. | DESCRIPTION |
|---|---|---|---|
| 0 | 1 | 061635A | HYDRAULIC ASSEMBLY |
| 1 | 1 | P0300-373 | FITTING, 08MFOR-12MB90 |
| 2 | 3 | P0301-142 | GAUGE, 5000 psi |
| 3 | 3 | P0300-594 | FITTING, 4FB-4MFFOR |
| 4 | 3 | P0302-803 | VALVE |
| 5 | 10 | P0300-305 | FITTING, 08MFOR-08MB |
| 6 | 3 | P0300-717 | FITTING, 6MFFOR-8MB90 |
| 7 | 11 | P0300-385 | FITTING, 10MFFOR-10MB |
| 8 | 6 | P0001-04-009 | BOLT, Hex 1/4 UNC x 2.25 |
| 9 | 6 | P0003-04-000 | NUT, Hex 1/4 UNC |
| 10 | 14 | P0040-004 | WASHER, Hardened Flat 1/4 |
| 11 | 1 | P0300-302 | FITTING, 08MFOR-10MB90 |
| 12 | 2 | P0300-193 | PLUG, 08MB-PLUG |
| 13 | 4 | P0300-892 | FITTING, 10MFFOR-8MB |
| 14 | 1 | P0300-423 | FITTING, 10MFOR-10MB-10MFOR |
| 15 | 1 | P0300-667 | FITTING, 10MB-10FB-10FB |
| 16 | 1 | P0300-788 | FITTING, 10MB-08FB |
| 17 | 1 | P0300-542 | FITTING, 08MB-08MB |
| 18 | 1 | P0300-383 | FITTING, 10MFOR-10MB90 |
| 19 | 1 | P0302-254 | VALVE, Pressure Control Relief |
| 20 | 1 | P0302-254A | BODY |
| 21 | 1 | P0300-120 | FITTING, 06MJ-08MP |
| 22 | 1 | P0125-139 | TANK, 25 Gallon (Includes items 4a & 4b) |
| 4a | 1 | P0125-139A | CAP, Breather |
| 4b | 1 | P0125-139B | GAUGE, Sight |
| 23 | 1 | P0093-039 | OIL COOLER |
| 24 | 1 | P0093-040A | SWITCH, Temp W/Soft Start |
| 25 | 1 | P0309-144B | ASSEMBLY, Filter Head |
| 26 | 1 | P0309-145A | ELEMENT, Filter 10 Micron |
| 27 | 1 | P0301-105 | GAUGE, Filter Indicator |
| 28 | 1 | A09881A-019 | HOSE ASSEMBLY, 5/8 x 19 |
| 29 | 1 | P0300-536 | FITTING, 12MB-12FB-12FB |
| 30 | 1 | A09853A-078 | HOSE ASSEMBLY, 1/2 x 73 |
| 31 | 1 | A09873A-034 | HOSE ASSEMBLY, 1/2 x 34 |
| 32 | 100 QT | P0126-038 | OIL, Hydraulic Duragard AW-68 |
| 33 | 6 | P0040-005 | WASHER, Hardened Flat 5/16 |
| 34 | 2 | PM6A-16-1.00 | BOLT, Hex M6 x 1.00 x 16 10.9 |
| 35 | 2 | P0003-05-000 | NUT, Hex 5/16 UNC |
| 36 | 2 | P0001-05-004 | BOLT, Hex 5/16 UNC x 1 |
| 37 | 8 | P0040-016 | WASHER, Hardened Flat 1 |
| 38 | 6 | P0001-10-007 | BOLT, Hex 5/8 UNC x 1.75 |
| 39 | 12 | P0040-010 | WASHER, Hardened Flat 5/8 |
| 40 | 6 | P0013-10-000 | NUT, Lock 5/8 UNC |
| 41 | 2 | P0001-04-003 | BOLT, Hex 1/4 UNC x .75 |
| 42 | 1 | P0300-551 | FITTING, 20MFFOR-20FFORX-20MFFOR |
| 43 | 1 | P0300-620 | FITTING, 20MFOR-20MB90 |
| 44 | 4 | P0300-325 | FITTING, 08MJ-08MJBKHD |
| 45 | 2 | P0300-886 | FITTING, 12MFFOR-16MBSPP |
| 46 | 4 | P0300-903 | FITTING, 10MFFOR-10MFFOR-BKHD90 |
| 47 | 2 | P0300-332 | ORING, 08OR |
| 48 | 1 | A09864A-064 | HOSE ASSEMBLY, 1/4 x 64 |
| 49 | 4 | P0300-688 | FITTING, 08MB-08FB-08FB |
| 50 | 2 | P0302-801 | VALVE, Ball 08ORD-7250 PSI |

*(Continued on next page)*

## HYDRAULIC ASSEMBLY, 061635A

### EH2325 (SN F61600F)

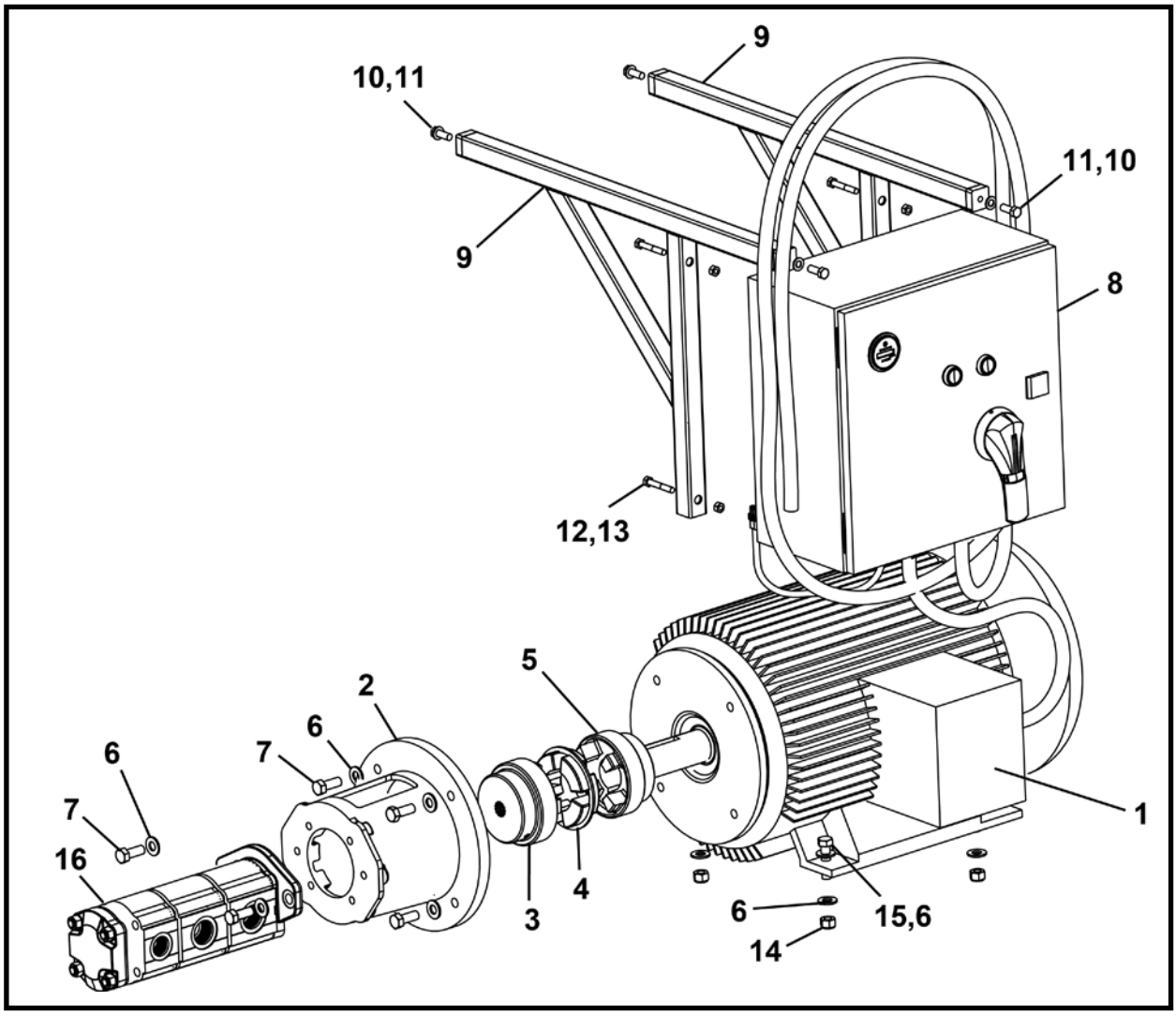
| ITEM | QTY | PART NO. | DESCRIPTION |
|---|---|---|---|
| 51 | 2 | P0300-371 | FITTING, 16MFOR-16MB90 |
| 52 | 4 | P0300-580 | FITTING, 10MFS-12MORB |
| 53 | 1 | P0300-890 | FITTING, 12MFFOR-12MFFOR-12FFORX |
| 54 | 1 | P0300-658 | FITTING, 20MB-12FB |
| 55 | 2 | P0300-319 | FITTING, 16MFFOR-16MB |
| 56 | 2 | P0300-562 | CAP, #8 JIC |
| 57 | 1 | A09875A-035 | HOSE ASSEMBLY, 1 x 35 |
| 58 | 1 | A10374A-026 | HOSE ASSEMBLY, 1 x 26 |
| 59 | 1 | A09870A-028 | HOSE ASSEMBLY, 1 x 28 |
| 60 | 4 | A09877A-039 | HOSE ASSEMBLY, 5/8 x 39 |
| 61 | 2 | A09877A-024 | HOSE ASSEMBLY, 5/8 x 24 |
| 62 | 1 | A09877A-064 | HOSE ASSEMBLY, 5/8 x 64 |
| 63 | 1 | A10324A-032 | HOSE ASSEMBLY, 1/2 x 32 |
| 64 | 1 | A10324A-071 | HOSE ASSEMBLY, 1/2 x 71 |
| 65 | 1 | A09877A-063 | HOSE ASSEMBLY, 5/8 x 63 |
| 66 | 1 | A10324A-042 | HOSE ASSEMBLY, 1/2 x 42 |
| 67 | 1 | P0301-110 | GAUGE, 600 psi |
| 68 | 1 | A09877A-040 | HOSE ASSEMBLY, 5/8 x 40 |
| 69 | 1 | A10359A-030 | HOSE ASSEMBLY, 1/2 x 30 |
| 70 | 1 | A09881A-022 | HOSE ASSEMBLY, 5/8 x 22 |
| 71 | 1 | A09876A-032 | HOSE ASSEMBLY, 5/8 x 32 |
| 72 | 1 | A10359A-034 | HOSE ASSEMBLY, 1/2 x 34 |
| 73 | 1 | A10359A-036 | HOSE ASSEMBLY, 1/2 x 36 |
| 74 | 1 | A09876A-016 | HOSE ASSEMBLY, 5/8 x 16 |
| 75 | 1 | P0300-969 | FITTING, 04FP-04MJBKHD |
| 76 | 3 | A10059A-018 | HOSE ASSEMBLY, 1/4 x 18 |
| 77 | 1 | A09832A-026 | HOSE ASSEMBLY, 1/2 x 26 |
| 78 | 1 | P0300-450 | FITTING, 16MFOR-20MB90 |
| 79 | 1 | A10342A-043 | HOSE ASSEMBLY, 1 x 43 |
| 80 | 1 | P0300-374 | FITTING, 16MFOR-20MB |
| 81 | 1 | P0300-328 | FITTING, 16MFOR-16FFORX-16MFOR |
| 82 | 1 | P0300-537 | FITTING, 16MB-16FB-16FB |
| 83 | 1 | A09988A-030 | HOSE ASSEMBLY, 3/4 x 30 |
| 84 | 1 | P0300-060 | PLUG, 10MB |
| 85 | 1 | A09873A-073 | HOSE ASSEMBLY, 1/2 x 73 |
| 86 | 1 | P0300-275 | FITTING, 04MP-04FP-04FP |
| 87 | 1 | P0063-016 | FITTING, Grease 1/4-NPT Straight |
| 88 | 9 | P0017-06-750 | SCREW, Round Machine 6/32 x 3/4 |
| 89 | 9 | P0003-03-000 | NUT, Hex 6-32 |

QT - Quart

* Refer to this section for parts information.

# ELECTRICAL ASSEMBLY, A62194A

**EH2325 (SN F61600F)**

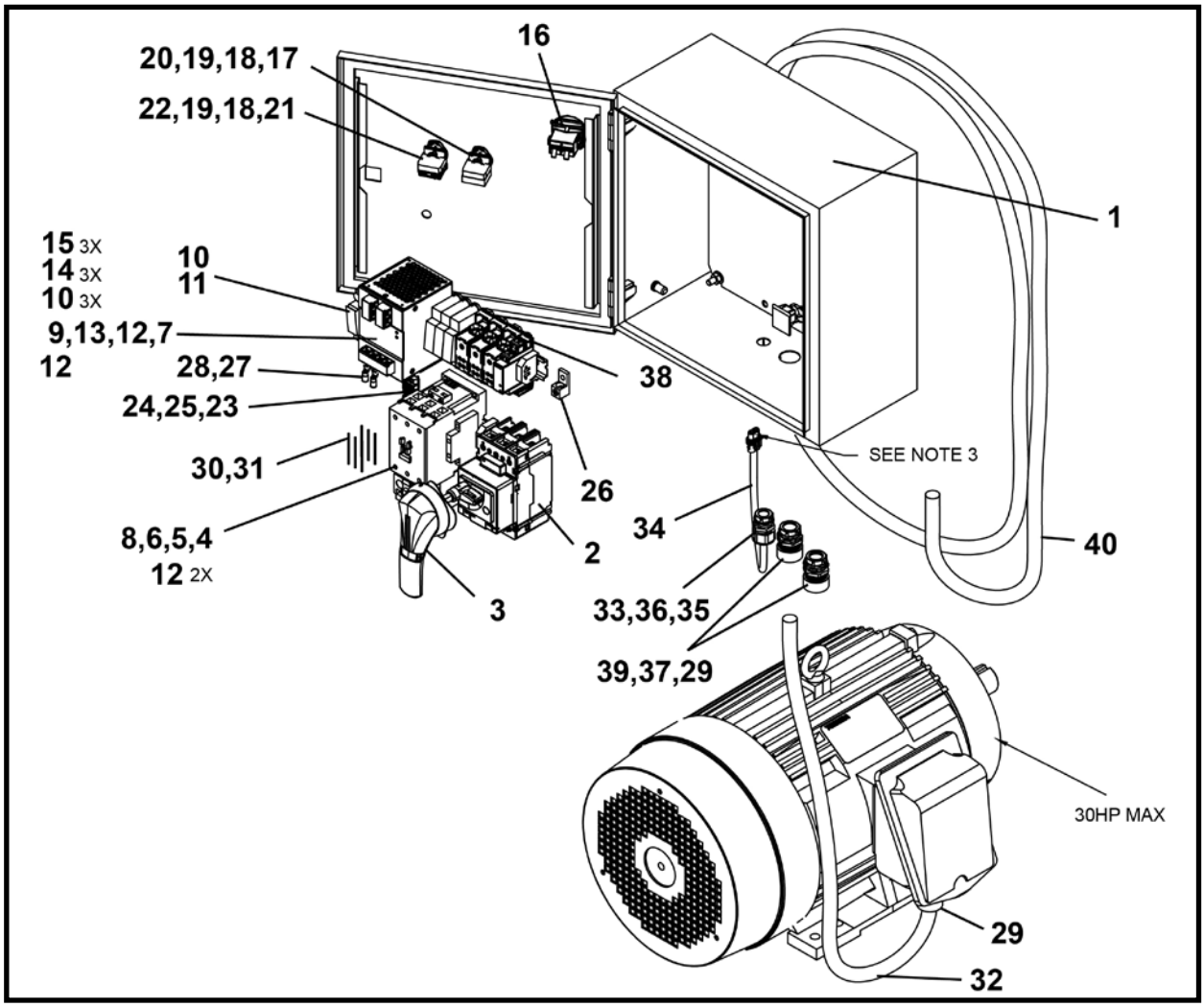



| ITEM | QTY | PART NO. | DESCRIPTION |
|---|---|---|---|
| 0 | 1 | A62194A | ELECTRICAL ASSEMBLY |
| 1 | 1 | P0251-447 | MOTOR, Electric 30 HP |
| 2 | 1 | P0305-252 | MOUNT, Pump Drive |
| 3 | 1 | P0305-225 | SPLINE |
| 4 | 1 | P0305-112D | INSERT |
| 5 | 1 | P0305-201 | COUPLER |
| 6 | 14 | P0040-008 | WASHER, Hardened Flat 1/2 |
| 7 | 6 | P0001-08-005 | SCREW, Hex Cap 1/2 UNC x 1.25 |
| 8* | 1 | A49113A | ASSEMBLY, Electrical |
| 9 | 2 | A62193A | MOUNT, Electrical Box |
| 10 | 4 | P0040-006 | WASHER, Hardened Flat 3/8 |
| 11 | 4 | P0001-06-004 | BOLT, Hex 3/8 UNC x 1 |
| 12 | 4 | P0013-05-000 | NUT, Nyloc 5/16 UNC |
| 13 | 4 | P0001-05-008 | BOLT, Hex 5/16 UNC x 2 |
| 14 | 4 | P0013-08A-000 | NUT, Nyloc 1/2 UNC |
| 15 | 4 | P0001-08-008 | BOLT, Hex 1/2 UNC x 2 |
| 16 | 1 | P0303-890 | PUMP |

* Refer to this section for parts information.

# ELECTRICAL ASSEMBLY, A49113A

**EH2325 (SN F61600F)**

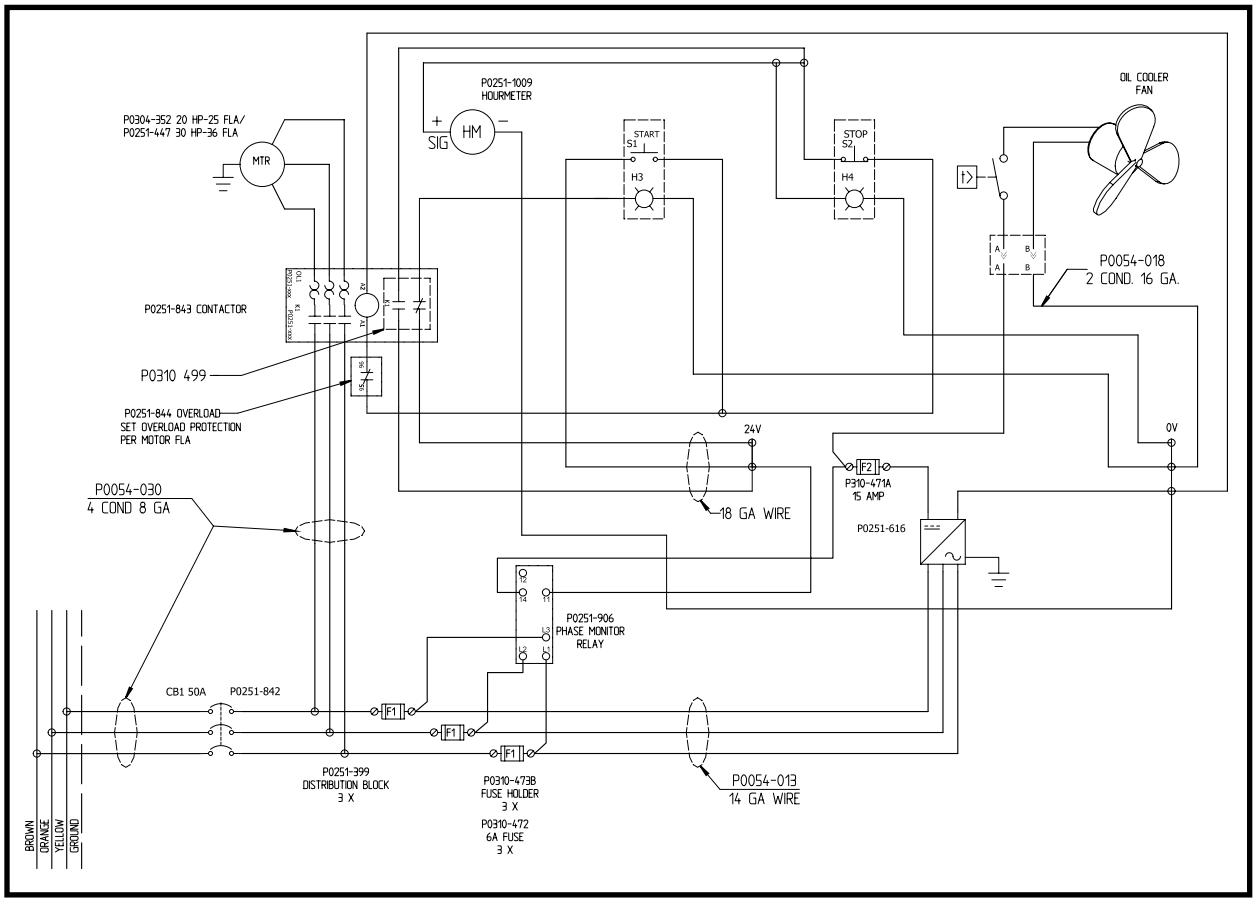



| ITEM | QTY | PART NO. | DESCRIPTION |
|---|---|---|---|
| 0 | 1 | A49113A | ELECTRICAL ASSEMBLY |
| 1 | 1 | P0251-845 | ENCLOSURE |
| 2 | 1 | P0251-842 | BREAKER, Circuit |
| 3 | 1 | P0251-482 | BREAKER, Handle & Shaft |
| 4 | 1 | P0251-843 | CONTACTOR, Non-Reversible |
| 5 | 1 | P0251-844 | RELAY, Overload |
| 6 | 1 | P0310-499 | CONTACT, Auxiliary N O |
| 7 | 1 | P0251-616 | POWER SUPPLY, 24V, 10 Amp |
| 8 | 1 | P0310-503-005 | RAIL, Din 5.0 |
| 9 | 5 | P0020-83-022 | SCREW, Truss Head 8-32 x .375 |
| 10 | 4 | P0310-473B | HOLDER, Fuse Din Rail |
| 11 | 1 | P0310-471A | FUSE, 600 VAC 15A |
| 12 | 4 | P0310-571 | FUSE HOLDER END STOP |
| 13 | 1 | P0310-503-012 | RAIL, Din 12.0” |
| 14 | 3 | P0251-399 | BLOCK, Distribution |
| 15 | 3 | P0310-472 | FUSE, 6 Amp |
| 16 | 1 | P0251-1009 | METER, Hour |
| 17 | 1 | P0310-412F | PUSHBUTTON, Illuminated |
| 18 | 2 | P0310-419F | LATCH, Mounting |
| 19 | 2 | P0251-563 | LIGHT, White LED Pilot |
| 20 | 1 | P0056-122F | BLOCK, Contact N C |

*(Continued on next page)*

# ELECTRICAL ASSEMBLY, A49113A

## EH2325 (SN F61600F)

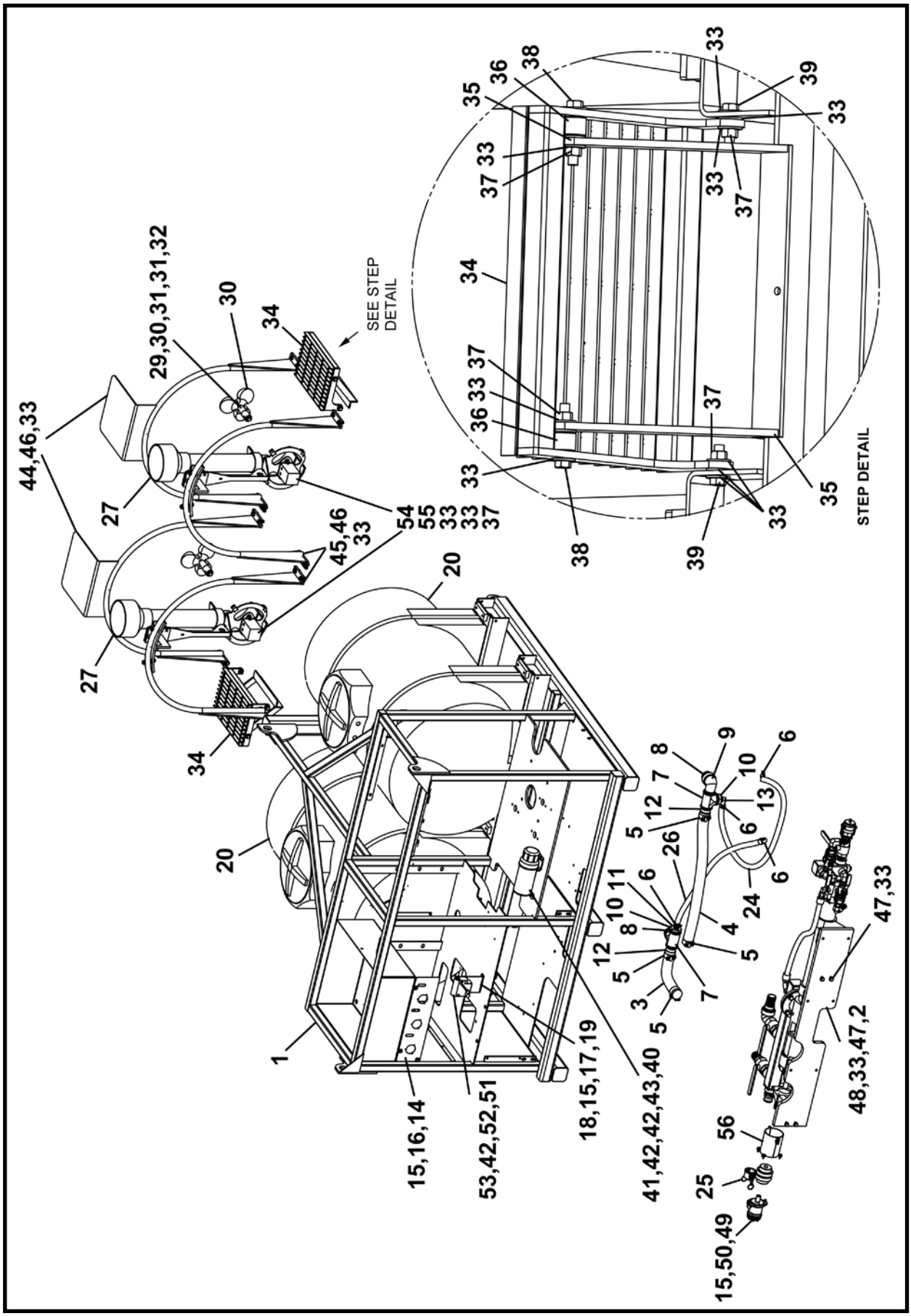



| ITEM | QTY | PART NO. | DESCRIPTION |
|---|---|---|---|
| 21 | 1 | P0310-411F | PUSHBUTTON, Illuminated |
| 22 | 1 | P0056-121F | CONTACT, N O |
| 23 | 1 | P0310-432 | STRIP, 15 Position Barrier |
| 24 | 2 | P0017-06-323 | SCREW, Round Head Machine 6-32 x .5 |
| 25 | 1 | P0310-433 | STRIP, Jumper 15 Position |
| 26 | 1 | P0055-157 | LUGS |
| 27 | 2 | P0055-174 | FORK, # 6 Stud 16-14 Wire |
| 28 | 28 | P0055-245 | FORK, Locking #6 Red |
| 29 | 3 | P0311-075 | RELIEF, Strain 3/4 |
| 30 | 48 LI | P0054-013 | WIRE, 14 GA |
| 31 | 140 LI | P0054-596B | WIRE, 18 GA Blue/White Stripe |
| 32 | 1 | P0054-030-120 | CORD, Power #8 8 GA x 120 |
| 33 | 1 | P0311-032 | BUSHING, Insulating 1/2 |
| 34 | 75 LI | P0054-018 | CABLE, 16 GA |
| 35 | 1 | P0311-121 | RELIEF, Strain |
| 36 | 1 | P0311-018 | NUT, Lock 1/2 |
| 37 | 2 | P0311-019 | NUT, Lock 3/4 |
| 38 | 1 | P0251-906 | MONITOR, Phase 500 VAC |
| 39 | 2 | P0311-033 | BUSHING Insulating 3/4 |
| 40 | 1 | P0054-030-1200 | CORD, Power #8 8 GA x 1200 |

LI - Linear Inch

# BENTONITE MOYNO ASSEMBLY, 061633A

**EH2325 (SN F61600F)**



# BENTONITE MOYNO ASSEMBLY, 061633A

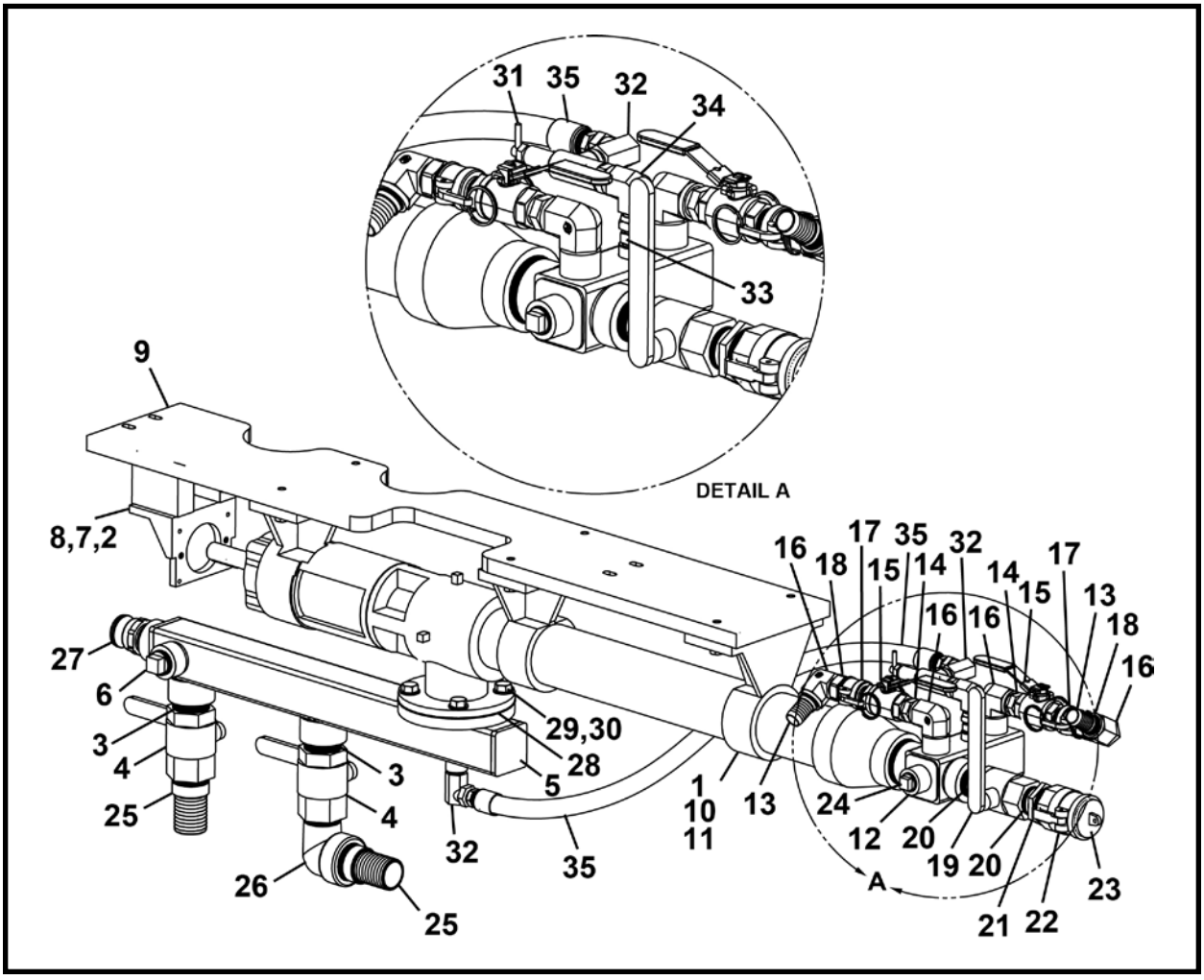
## EH2325 (SN F61600F)

| ITEM | QTY | PART NO. | DESCRIPTION |
|---|---|---|---|
| 0 | 1 | 061633A | BENTONITE MOYNO ASSEMBLY |
| 1 | 1 | A61141A | FRAME |
| 2* | 1 | 061632A | ASSEMBLY, Moyno Pump |
| 3 | 1 | P0201-159-016 | HOSE, Suction 2 x 16 |
| 4 | 1 | P0201-159-038 | HOSE, Suction 2 x 38 |
| 5 | 4 | P0201-183 | CLAMP, T-Bolt 2-5/32 To 2-15/32 |
| 6 | 4 | P0201-205 | CLAMP, T 1-3/4 Hose |
| 7 | 2 | P0258-112 | TEE, Socket 2 |
| 8 | 2 | P0258-115 | NIPPLE, 2 x 2 |
| 9 | 1 | P0258-114 | ELBOW, Street 2 90° |
| 10 | 2 | P0258-110 | BUSHING, Reducing 2 x 1 |
| 11 | 1 | P0258-109 | ADAPTER, 1 Barbed x MNPT |
| 12 | 2 | P0258-113 | ELBOW, 1 Barbed x 1 MNPT 90° |
| 13 | 1 | P0258-039 | HOSE BARB, 2 MNPT |
| 14 | 1 | 061628P | COVER, Valve |
| 15 | 7 | P0040-006 | WASHER, Hardened Flat 3/8 |
| 16 | 3 | P0001-06-002 | BOLT, Hex 3/8 UNC x .5 |
| 17 | 2 | P0001-06-004 | BOLT, Hex 3/8 UNC x 1 |
| 18 | 2 | P0003-06-000 | NUT, Hex 3/8 UNC |
| 19 | 1 | 061627P | MOUNT, Flow Control |
| 20 | 2 | A48401P | TANK, 325 Gallon |
| 21 | 1 | P0305-132A | COUPLER, 1 Bore x 1/4 Keyway |
| 22 | 1 | P0305-132B | COUPLER, 1-1/8 Bore x 1/4 Keyway |
| 23 | 1 | P0305-182 | INSERT |
| 24 | 1 | P0201-238-062 | HOSE, Water Suction 1 x 62 |
| 25 | 1 | P0258-108 | CAP, Nylon Cam & Groove Hose |
| 26 | 1 | P0201-238-050 | HOSE, Water Suction Hose 1 x 50 |
| 27* | 2 | 061655A | FRAME, Agitator |
| 28 | 2 | P0258-075 | PLUG, 1 NPT Poly Threaded |
| 29 | 2 | A48479P | SHAFT, Agitator Ext |
| 30 | 2 | A48411P | PROPELLER 10 |
| 31 | 8 | P0032-002 | SCREW, Socket Set 5/16 x .375 |
| 32 | 2 | P0047-003-1.75 | KEY, Square 1/4 x 1.75 |
| 33 | 56 | P0040-008 | WASHER, Hardened Flat 1/2 |
| 34 | 2 | A45054A | STEP |
| 35 | 2 | A45057A | BRACE, Step |
| 36 | 4 | A45170P | BUSHING, |
| 37 | 12 | P0013-08A-000 | NUT, Nylock 1/2 UNC |
| 38 | 4 | P0001-08-012 | BOLT, Hex 1/2 UNC x 3 |
| 39 | 4 | P0001-08-007 | BOLT, Hex 1/2 UNC x 1.75 |
| 40 | 1 | P0095-133 | CANISTER, Manual |
| 41 | 2 | P0013-04-000 | NUT, Nyloc 1/4 |
| 42 | 2 | P0040-004 | WASHER, Hardened Flat 1/4 |
| 43 | 2 | P0020-14-205 | SCREW, Truss Head Machine 1 |
| 44 | 2 | A48824A | STRAP, Tank W/Bag Shelf |
| 45 | 2 | A48823A | STRAP, Tank |
| 46 | 16 | P0001-08-005 | SCREW, Hex Cap 1/2 UNC x 1.25 |
| 47 | 4 | P0001-08-009 | BOLT, 1/2 UNC x 2.25 |
| 48 | 4 | P0003-08-000 | NUT, Hex 1/2 UNC |
| 49 | 1 | P0304-376 | MOTOR |
| 50 | 2 | P0001-06-005 | BOLT, Hex 3/8 UNC x 1.25 |
| 51 | 1 | P0302-921 | CONTROL, Flow |
| 52 | 2 | P0001-04-010 | BOLT, Hex 1/4 UNC x 2.5 |
| 53 | 2 | P0003-04-000 | NUT, Hex 1/4 UNC |
| 54 | 2 | P0304-347 | MOTOR (Includes item 54a) |
| 54a | 1 | P0304-347B | KIT, Seal |
| 55 | 4 | P0031-08-007 | SCREW, Socket Head Cap 1/2 UNC x 1.75 |
| 56* | 1 | 061809A | GUARD, Lube Pump |

* Refer to this section for parts information.

# MOYNO PUMP ASSEMBLY, 061632A

**EH2325 (SN F61600F)**




| ITEM | QTY | PART NO. | DESCRIPTION |
|---|---|---|---|
| 0 | 1 | 061632A | MOYNO PUMP ASSEMBLY |
| 2 | 1 | P0304-142 | BRACKET |
| 3 | 2 | P0402-008 | NIPPLE, Close 2 |
| 4 | 2 | P0302-208 | VALVE, Ball 2 NPT |
| 5 | 1 | 061629A | MANIFOLD, Suction |
| 6 | 1 | P0416-006 | PLUG, Square 1-1/4 |
| 7 | 4 | P0001-06-005 | BOLT, Hex 3/8 UNC x 1-1/4 |
| 8 | 4 | P0040-006 | WASHER, Hardened Flat 3/8 |
| 9 | 1 | 061624A | BASE, Pump |
| 10 | 6 | P0001-08-007 | BOLT, Hex 1/2 UNC x 1.75 |
| 11 | 6 | P0040-008 | WASHER, Hardened Flat 1/2 |
| 12 | 1 | 061620A | MANIFOLD, Discharge |
| 13 | 2 | P0258-109 | ADAPTER, 1 Barbed x MNPT |
| 14 | 2 | P0300-013 | FITTING, 16MP-16MP |
| 15 | 2 | P0302-864 | VALVE, Ball 1 1000 psi |
| 16 | 4 | P0300-057 | FITTING, 16MP-16FP90 |
| 17 | 2 | P0100-023 | CAM LOCK, 1 BRASS |
| 18 | 2 | P0100-024 | PLUG, FPT 1 |
| 19 | 1 | P0302-207 | VALVE, Ball 1-1/2 NPT |
| 20 | 2 | P0402-007 | NIPPLE, Close 1-1/2 |
| 21 | 1 | P0413-012A | BUSHING, Reducer 2 x 1-1/2 |

*(Continued on next page)*

## MOYNO PUMP ASSEMBLY, 061632A

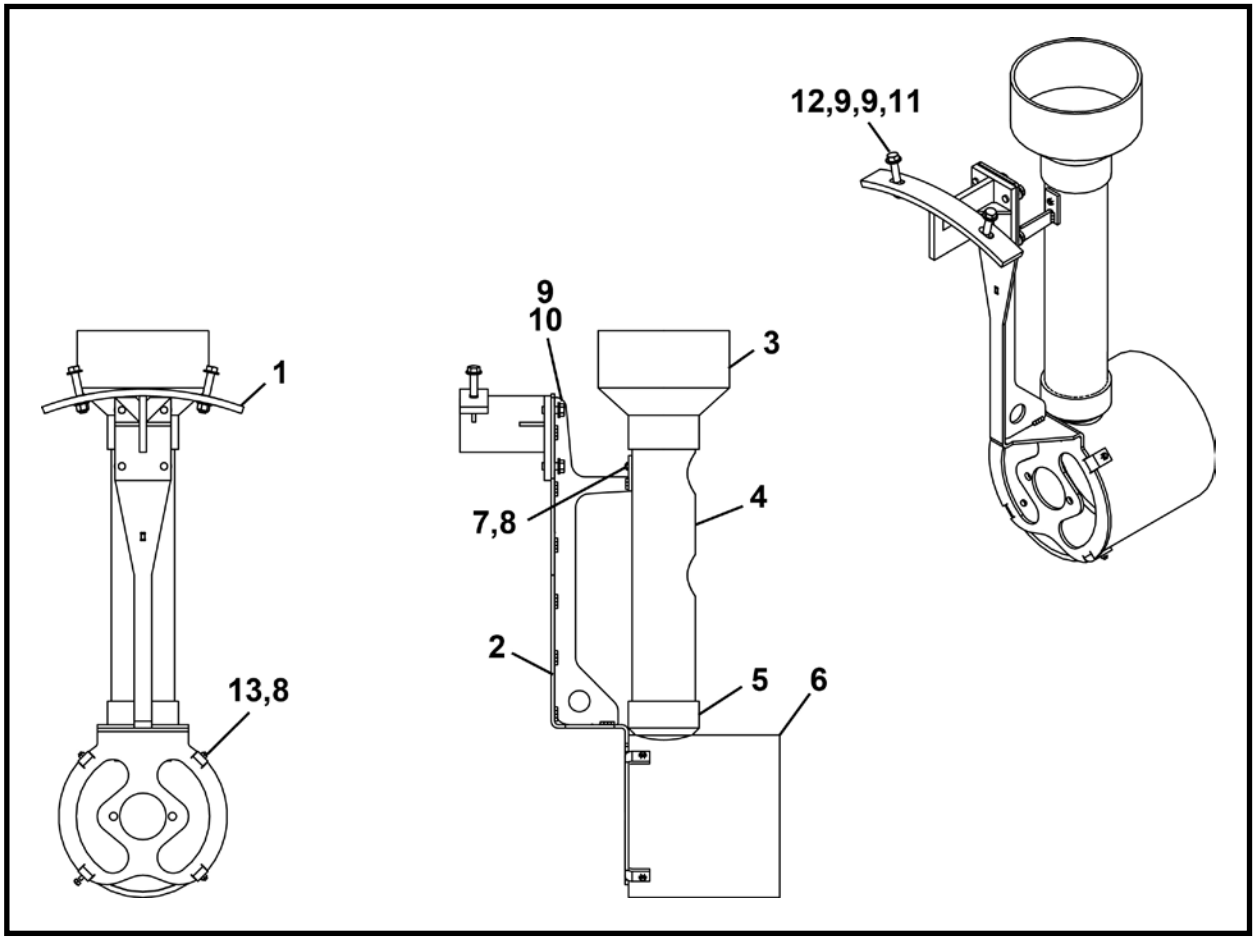
### EH2325 (SN FA61600F)

| ITEM | QTY | PART NO. | DESCRIPTION |
|---|---|---|---|
| 22 | 1 | P0100-021 | SOCKET, FPT 2 |
| 23 | 1 | P0100-027 | PLUG Dust |
| 24 | 1 | P0258-075 | PLUG, 1 NPT |
| 25 | 2 | P0258-039 | HOSE BARB, 2 Male NPT |
| 26 | 1 | P0258-114 | ELBOW, Street 2 90° |
| 27 | 1 | P0258-090 | ADAPTER, 1-1/2 x 1-1/2 |
| 28 | 1 | P0426-030B | GASKET, Flange 3 |
| 29 | 4 | P0001-10-006 | BOLT, Hex 5/8 UNC a 1.5 |
| 30 | 4 | P0040-010 | WASHER, Hardened Flat 5/8 |
| 31 | 1 | P0302-349 | VALVE, Pressure Relief |
| 32 | 1 | P0300-064 | FITTING, 12MJ-12MP90 |
| 33 | 2 | P0300-063 | FITTING, 12MJ-12MP |
| 34 | 1 | P0300-100 | FITTING, 12FP-12FPX90 |
| 35 | 1 | A09874A-042 | HOSE ASSEMBLY, 3/4 x 42 |

* Refer to this section for parts information.

# AGITATOR FRAME ASSEMBLY, 061655A

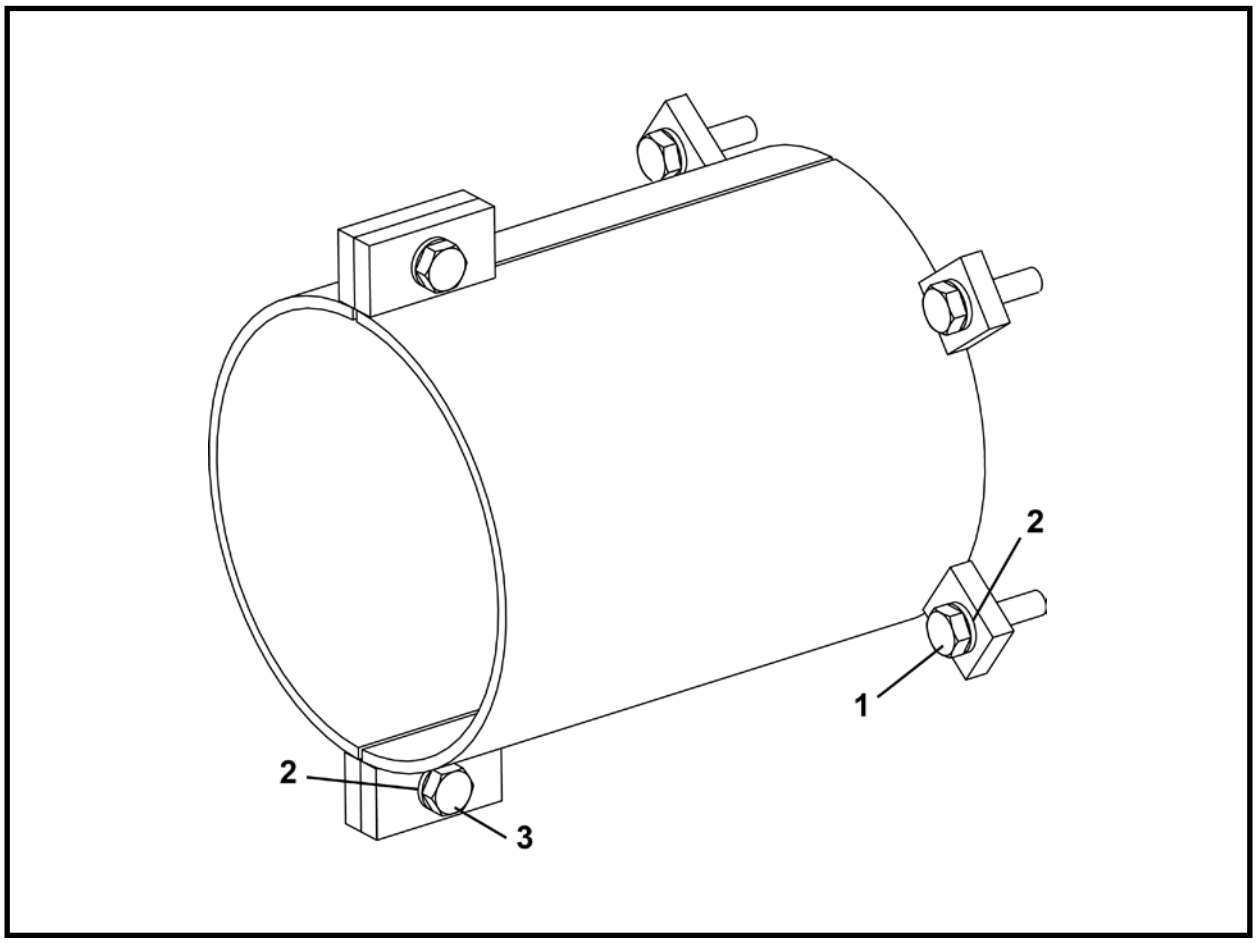
**EH2325 (SN FA61600F)**




| ITEM | QTY | PART NO. | DESCRIPTION |
|---|---|---|---|
| 0 | 1 | 061655A | AGITATOR FRAME ASSEMBLY |
| 1 | 1 | A48424A | MOUNT, Agitator |
| 2 | 1 | A08330A | FRAME, Agitator |
| 3 | 1 | P0258-066 | COUPLING, Reducing 8 x 4 |
| 4 | 1 | A48477P | TUBE, PVC Bentonite Mix |
| 5 | 1 | P0258-067 | COUPLING, Reducing 4 x 3 |
| 6 | 1 | A48478P | TUBE, PVC Agitator Mix |
| 7 | 1 | P0001-04-003 | BOLT, Hex 1/4 UNC x .75 |
| 8 | 5 | P0013-04-000 | NUT, Nyloc 1/4 |
| 9 | 8 | P0040-008 | WASHER, Hardened Flat 1/2 |
| 10 | 4 | P0001-08-005 | SCREW, Hex Cap 1/2 UNC x 1.25 |
| 11 | 2 | P0001-08-012 | BOLT, Hex 1/2 UNC x 3 |
| 12 | 2 | P0013-08A-000 | NUT, Nyloc 1/2 |
| 13 | 4 | P0020-14-205 | SCREW, Truss Head Machine 1 |

# LUBE PUMP GUARD, 061809A

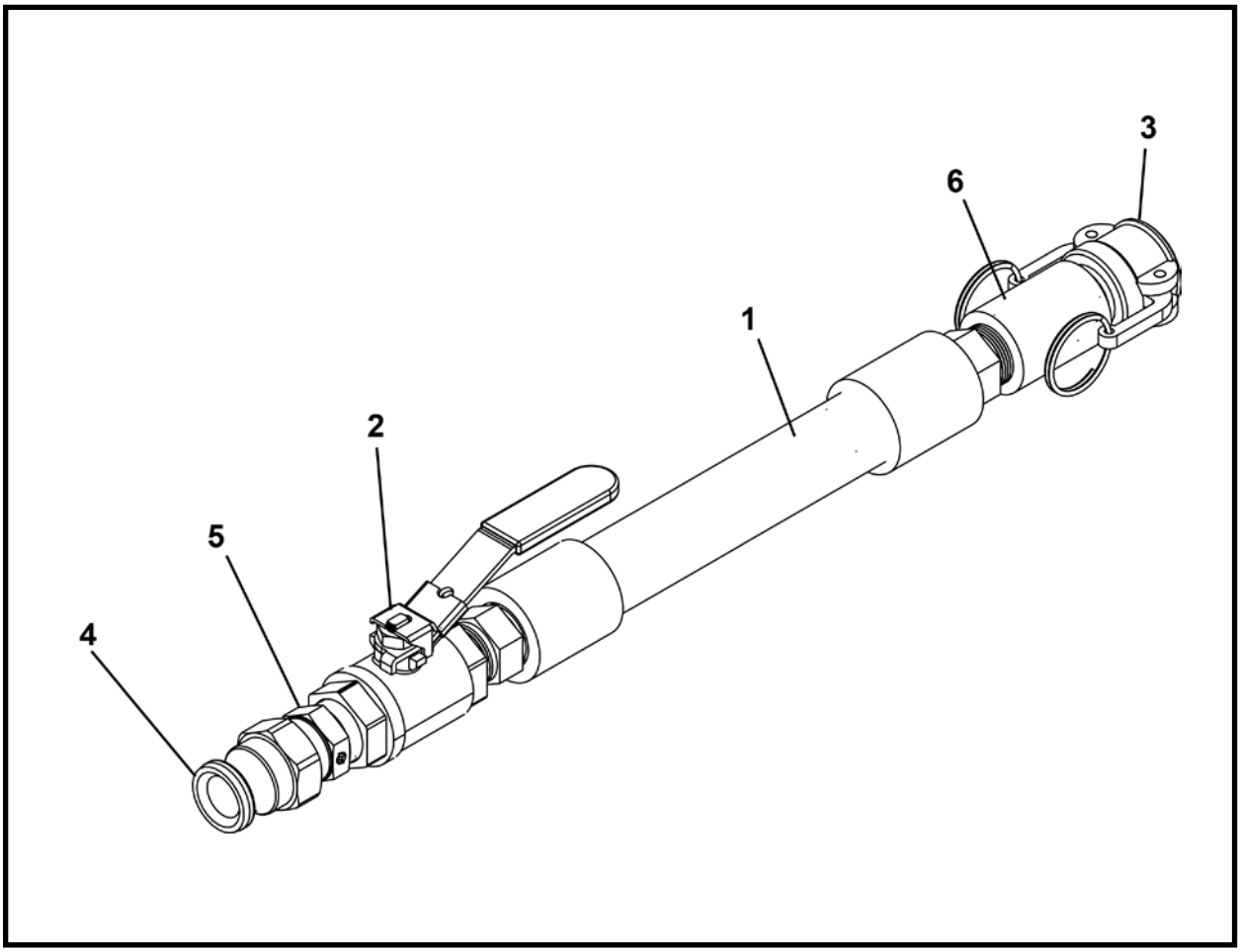
**EH2325 (SN FA61600F)**




| ITEM | QTY | PART NO. | DESCRIPTION |
|---|---|---|---|
| 0 | 1 | 061809A | LUBE PUMP GUARD |
| 1 | 4 | P0001-04-004 | BOLT, Hex 1/4 UNC x 1 |
| 2 | 6 | P0040-004 | WASHER, Flat Narrow 1/4 UNC |
| 3 | 2 | P0001-04-003 | BOLT, Hex 1/4 UNC x .75 |

# BENTONITE VALVE ASSEMBLY, 061795A

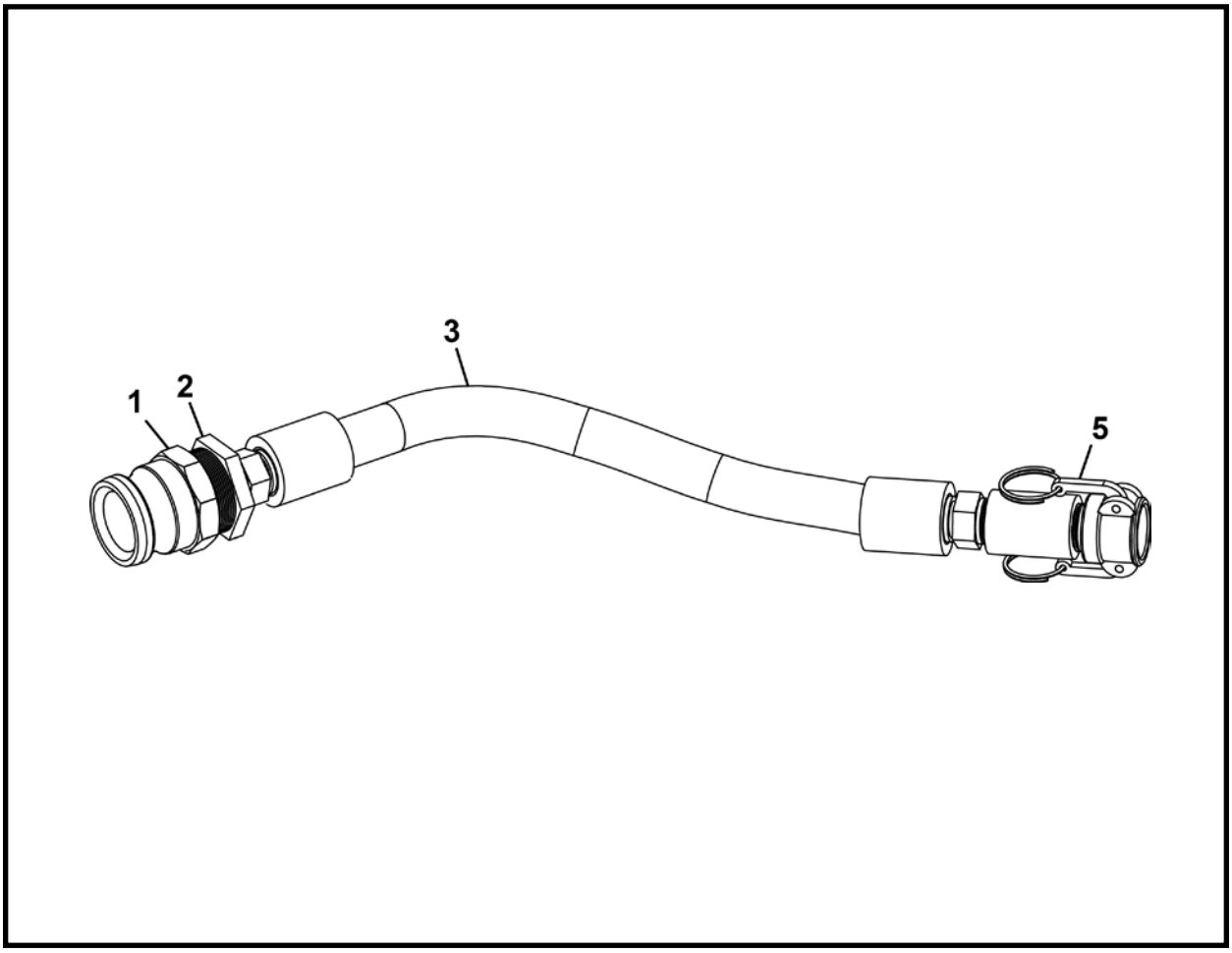
**EH2325 (SN FA61600F)**




| ITEM | QTY | PART NO. | DESCRIPTION |
|---|---|---|---|
| 0 | 1 | 061795A | BENTONITE VALVE ASSEMBLY 1” x 10’ |
| 1 | 1 | A09986A-124 | HOSE ASSEMBLY, 1 X 124 |
| 2 | 1 | P0302-864 | VALVE, Ball 1000 psi |
| 3 | 1 | P0100-023 | CAM LOCK 1 |
| 4 | 1 | P0100-024 | PLUG, FPT 1 |
| 5 | 1 | P0300-013 | FITTING, 16MP-16MP |
| 6 | 1 | P0400-005 | COUPLING, Pipe 1 |

# CAMLOCK REDUCER ASSEMBLY, 061815A

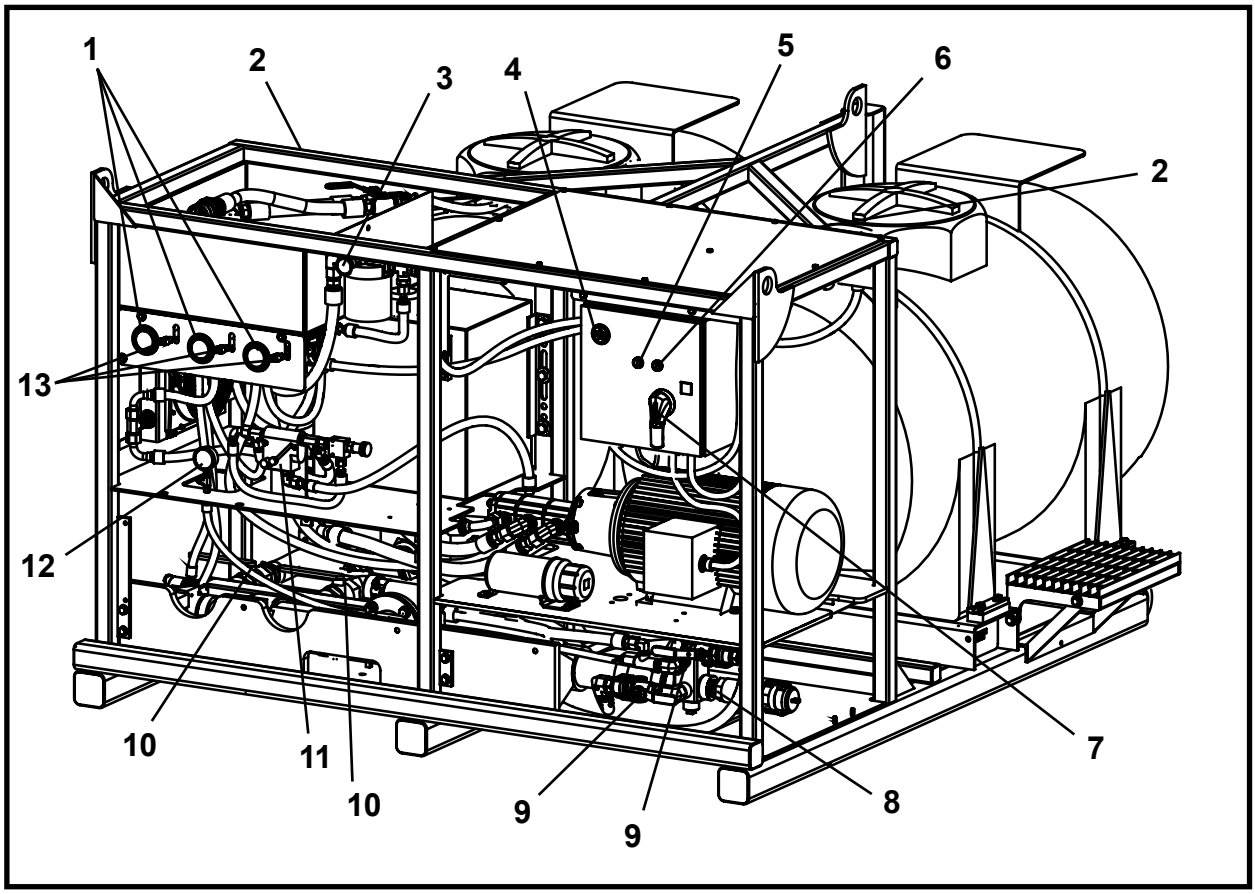
**EH2325 (SN FA61600F)**




| ITEM | QTY | PART NO. | DESCRIPTION |
|---|---|---|---|
| 0 | 1 | 061815A | CAM LOCK REDUCER ASSEMBLY |
| 1 | 1 | P0100-022 | PLUG, FPT 2 |
| 2 | 1 | P0413-010 | BUSHING, Hex 2 x 1 |
| 3 | 1 | A10340A-025 | HOSE ASSEMBLY, 1 x 25 |
| 4 | 1 | P0400-005 | COUPLING, Pipe 1 |
| 5 | 1 | P0100-023 | CAM LOCK 1 |

# OPERATOR CONTROLS

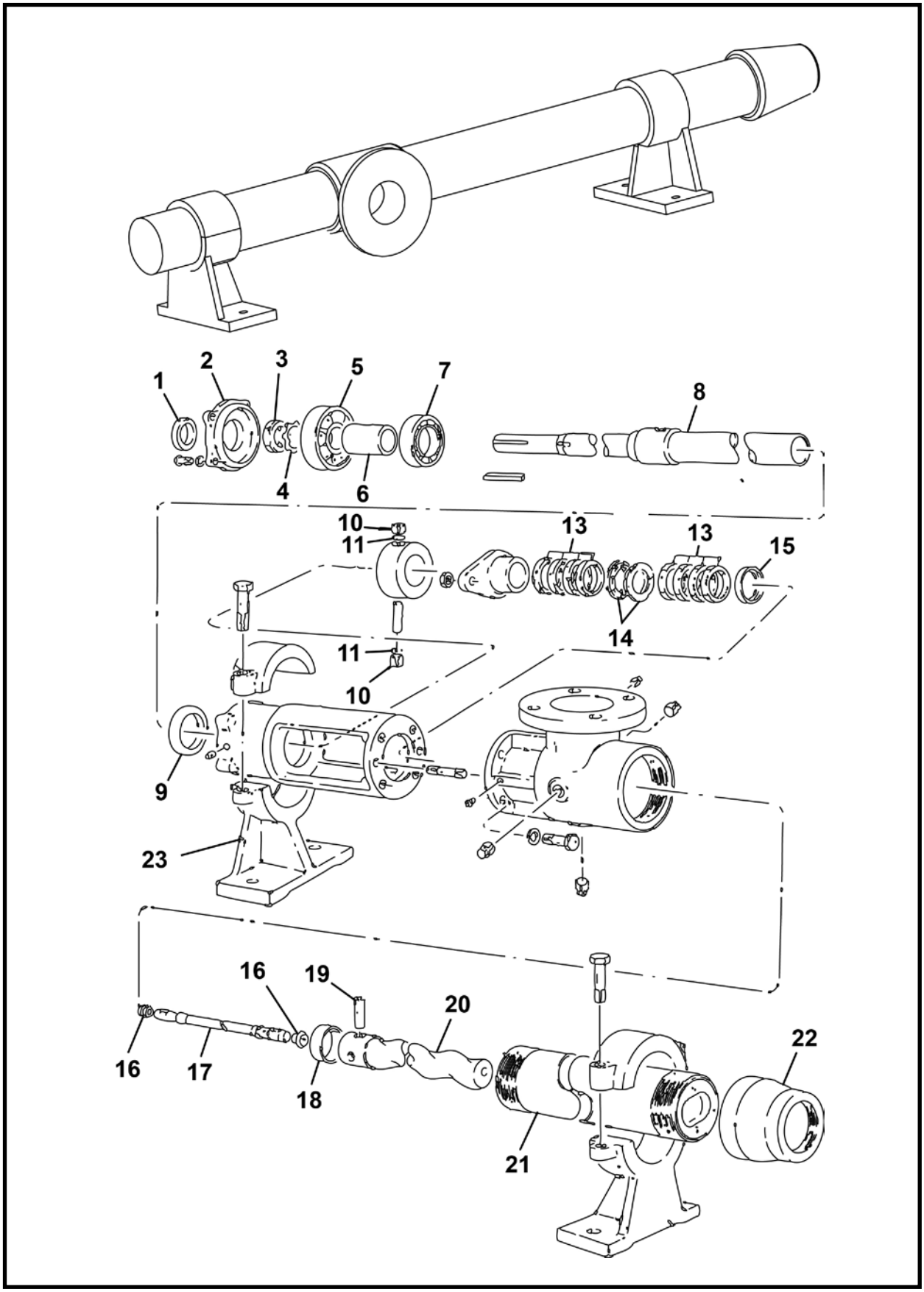
## EH2325 (SN FA61600F)




| ITEM | QTY | PART NO. | DESCRIPTION |
|---|---|---|---|
| 1 | 3 | P0301-142 | GAUGE, 5000 PSI |
| 2 | 2 | P0302-801 | VALVE, Mixer Control |
| 3 | 1 | P0301-105 | GAUGE, Filter Indicator |
| 4 | 1 | P0251-1009 | HOURMETER |
| 5 | 1 | P0310-412F | PUSHBUTTON, Illuminated |
| 6 | 1 | P0310-411F | PUSHBUTTON, Illuminated |
| 7 | 1 | P0251-482 | SWITCH, Disconnect |
| 8 | 1 | P0302-207 | VALVE, Ball 1-1/2 |
| 9 | 2 | P0302-864 | VALVE, Ball 1 |
| 10 | 2 | P0302-208 | VALVE, Ball 2 |
| 11 | 1 | P0302-921 | CONTROL, Flow |
| 12 | 1 | P0301-110 | GAUGE, 600 psi |
| 13 | 3 | P0302-803 | VALVE |

# NOTES

# MOYNO PUMP, P0303-183



# MOYNO PUMP, P0303-183

| ITEM | QTY | PART NO. | DESCRIPTION |
|---|---|---|---|
| 0 | 1 | P0303-183 | PUMP |
| 1* | 1 | P0303-183I | SEAL |
| 2 | 1 | P0303-183G | PLATE, Bearing Cover |
| 3* | 1 | - | NUT, Bearing Lock |
| 4* | 1 | - | WASHER, Bearing Lock |
| 5* | 1 | - | BEARING, Ball |
| 6* | 1 | - | BEARING, Spacer |
| 7* | 1 | - | BEARING, Ball |
| 8 | 1 | P0303-196 | SHAFT, Drive |
| 9* | 1 | P0303-183H | SEAL, Grease |
| 10** | 2 | P0303-183D | SCREW, Pin Retaining |
| 11** | 2 | P0303-183E | WASHER, Pin Retaining |
| 12** | 1 | P0303-183C | PIN, Shaft |
| 13 | 2 | P0303-202 | SET, Packing |
| 14 | 2 | P0303-183B | RING, Half |
| 15 | 1 | P0303-203 | WASHER, Packing |
| 16** | 2 | P0303-183K | WASHER, Connecting |
| 17** | 1 | - | ROD, Connecting |
| 18 | 1 | P0303-200 | PIN, Retainer |
| 19** | 1 | P0303-201 | PIN, Rotor |
| 20 | 1 | P0303-205 | ROTOR |
| 21 | 1 | P0303-204 | STATOR |
| 22 | 1 | P0303-225 | REDUCER |
| 23 | 1 | P0303-183J | SUPPORT, Pump, W/Cap |

NOTE:
* Bearing Kit, P0303-221 includes items 1, 3, 4, 5, 6, 7, and 9
**Pump Kit, P0303-195 includes items 10, 11, 12, 16, 17, and 19

# NOTES

# Alphabetical Index

## G (continued)



## H



## I



## I (continued)



## J



## K



## L



## M

## M (continued)



## N



## O



## O (continued)



## P



## R

## S



## T



## T (continued)



## U



## V



## W

# Numerical Index

# NOTES