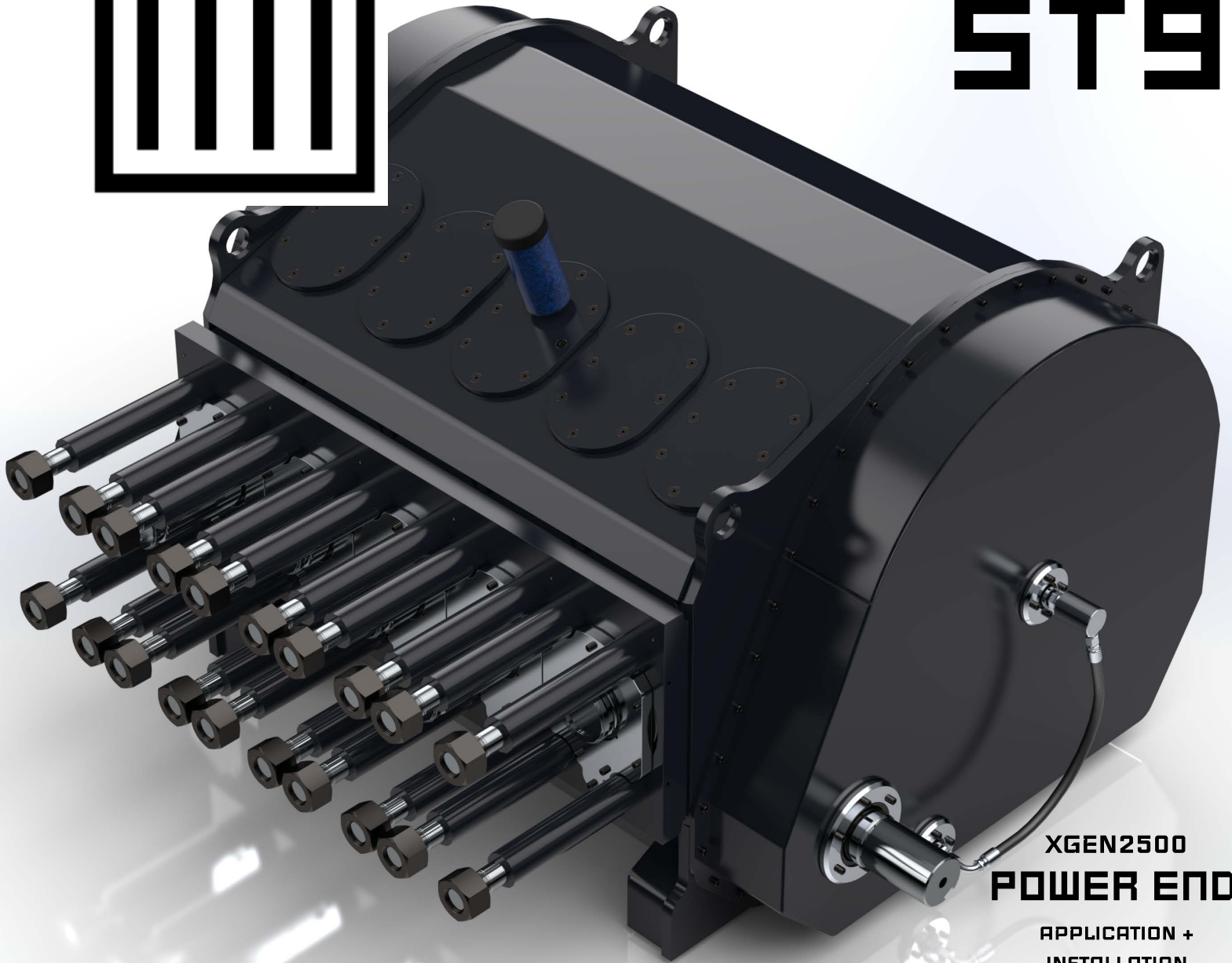


ST9



**XGEN2500
POWER END**

**APPLICATION +
INSTALLATION**

SECTION 1 DANGER NOTICES

DANGER

Please read and follow all safety guidelines laid out hereafter. Pressure pumps necessitate a high level of caution and expertise to operate safely.

TO AVOID PERSONAL INJURY, DEATH AND/OR EQUIPMENT DAMAGE, PLEASE READ THIS ENTIRE DANGER NOTICE SECTION AND THE REMAINING MANUAL SECTIONS PRIOR TO OPERATING OR MOVING THE PUMP SYSTEM.

Contact a ST9 G+O service representative if you are unable to comply with any of the danger notices or procedures described in these documents. Use the pump performance data to

learn the upper performance limits of this system. The system should not be operated beyond its stated capacity, nor should modifications be made before consulting directly with ST9 G+O.

COVERS AND GUARDS

DANGER

Moving parts are covered or otherwise guarded to keep personnel from potential harm. All covers and guards should be secured prior to operation.

Covers and guards do not only protect personnel, but also protect the system from contamination intrusion.

EQUIPMENT MOVING AND LIFTING

DANGER

The use of proper lifting equipment utilized by qualified and competent operators is necessary to safely moving and lifting heavy equipment like this power end system. All lifting equipment should be properly rated and inspected to be in good condition before application.

Many individual components have lifting eyes or lugs, which must not be used to lift completed assemblies, as they are designed to bear the weight of the individual component only.

PUMP SERVICING

DANGER

Do not attempt to service, on the pump while the unit is operating. Shut off the pump drive engine and relieve the fluid pressure in the suction and discharge systems before any work is performed on the pump systems.

Arrest the crankshaft and make sure the pump cannot turn before service. Make sure all power systems connected to the pump are locked out and tagged out. During operation, watch for any leaks from the system. High pressure fluids from inside the pump can kill, so take care while in operation. The chemicals used in proppant can also pose risk to operators so take care in their presence.

SECTION 2 SPECIFICATIONS

The power end design is a fabricated steel frame made from high-strength steel plate. Unique internal geometry innovations provide for superior durability and performance.

NOTICE

The direction of rotation must be such that if the crankshaft is viewed from the side of the input shaft, it is rotating counterclockwise.

The crossheads and crosshead-guides are full-cylindrical design for optimal lubrication and minimal wear. The connecting rods are automotive derivatives. The connecting rods are accessible through the rear of the power end, and the crossheads through the front of the power end. The crankshaft is forged steel with six cylindrical roller-bearings. The main bearings consist of five floating and one fixed bearing.

The crankshaft and crossheads are on the same centerline. The fluid end is affixed to the power end by the twenty stay-rods.

The power end is fully sealed to contain the lubricant oil, collecting the oil and draining out the bottom skin through two NPTF weld-let connections. This is a dry sump power end. An external oil sump and lube pressure and filter system is required.

GEAR REDUCTION COMPONENTS

The internal gear reduction is achieved by two helical bull gears attached to either end of the crankshaft, and one pinion shaft with helical pinion gears on each end. The overall ratio of the reduction gear unit is 6.353:1

POWER END AND GEAR REDUCTION COMPONENTS LUBE SYSTEM

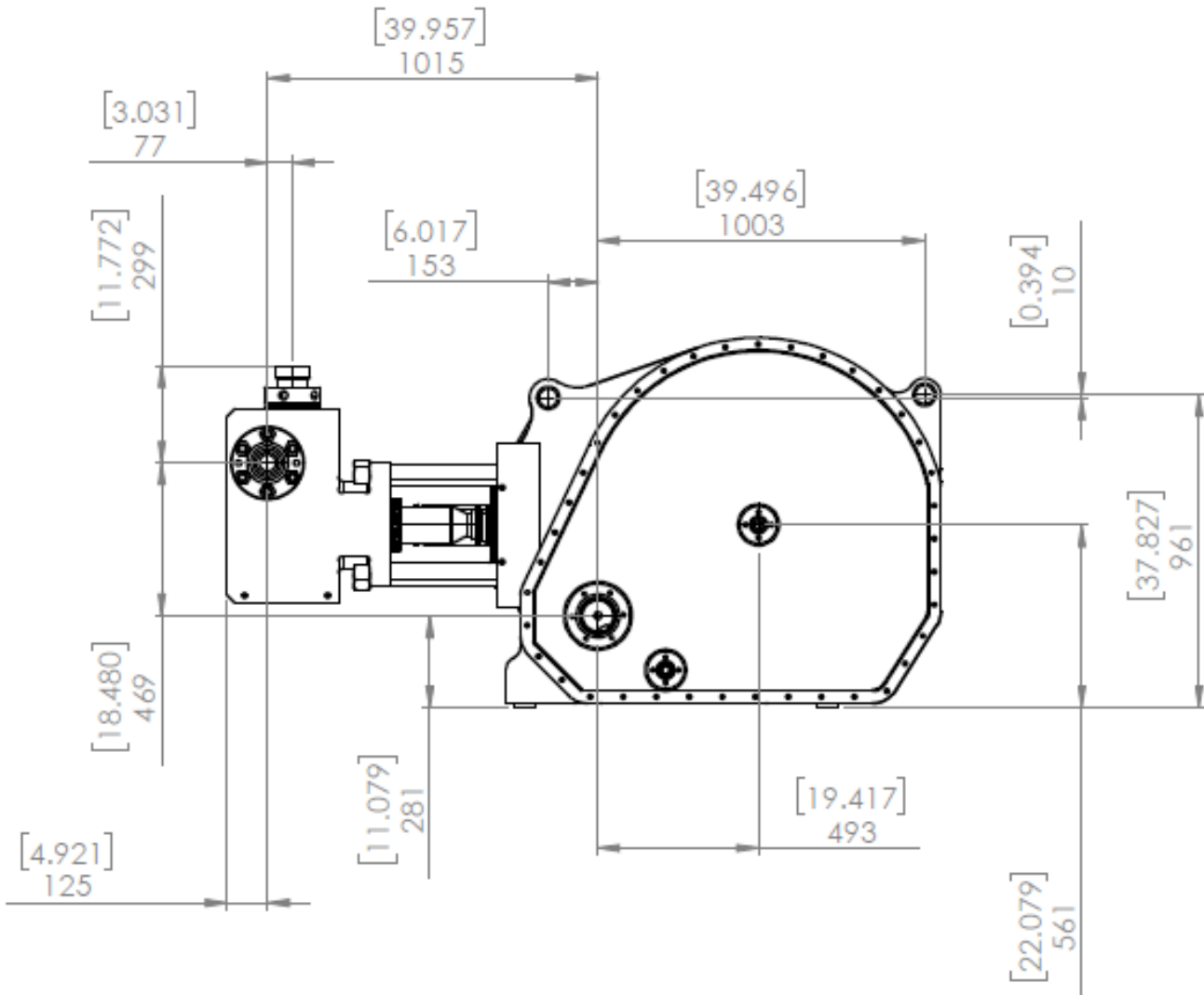
Both the internal gear reduction components and the power share a lubricant oil inlet. The power end inlet is located on back near the bottom of the power end. The rear main oil bar is charged thusly, and a total of seven hoses are fed off this bar. The five crossheads are oiled through these hoses which span from the rear to an overhead position. The pinion bearings and crankshaft bearing are fed by the remaining hoses, and the remainder of the reciprocating assembly is lubricated on this path as well. Oil is removed from the power end through two primary drain connections in the bottom of the frame. Oil passages at the forward part of the frame members allow the crosshead cylinders to drain to the power end sump. Oil is also drained from the gear covers through drain holes in the outside frame plates. These drains are all combined together and empty into the main drains in the bottom of the power end frame. From here, it exits to an external oil sump. The two bull gears are oiled by oil jets located inside the gear covers.

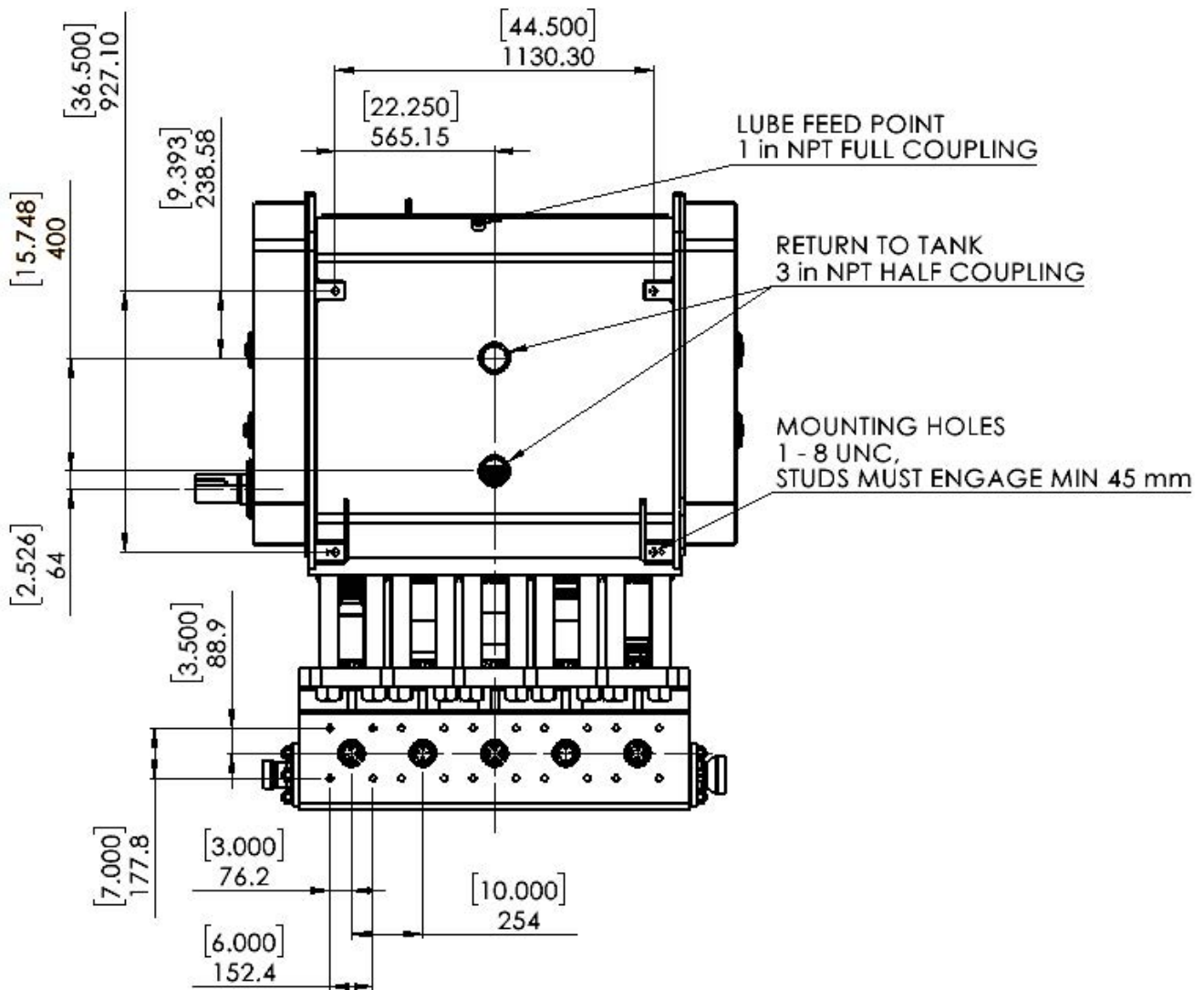
NOTICE

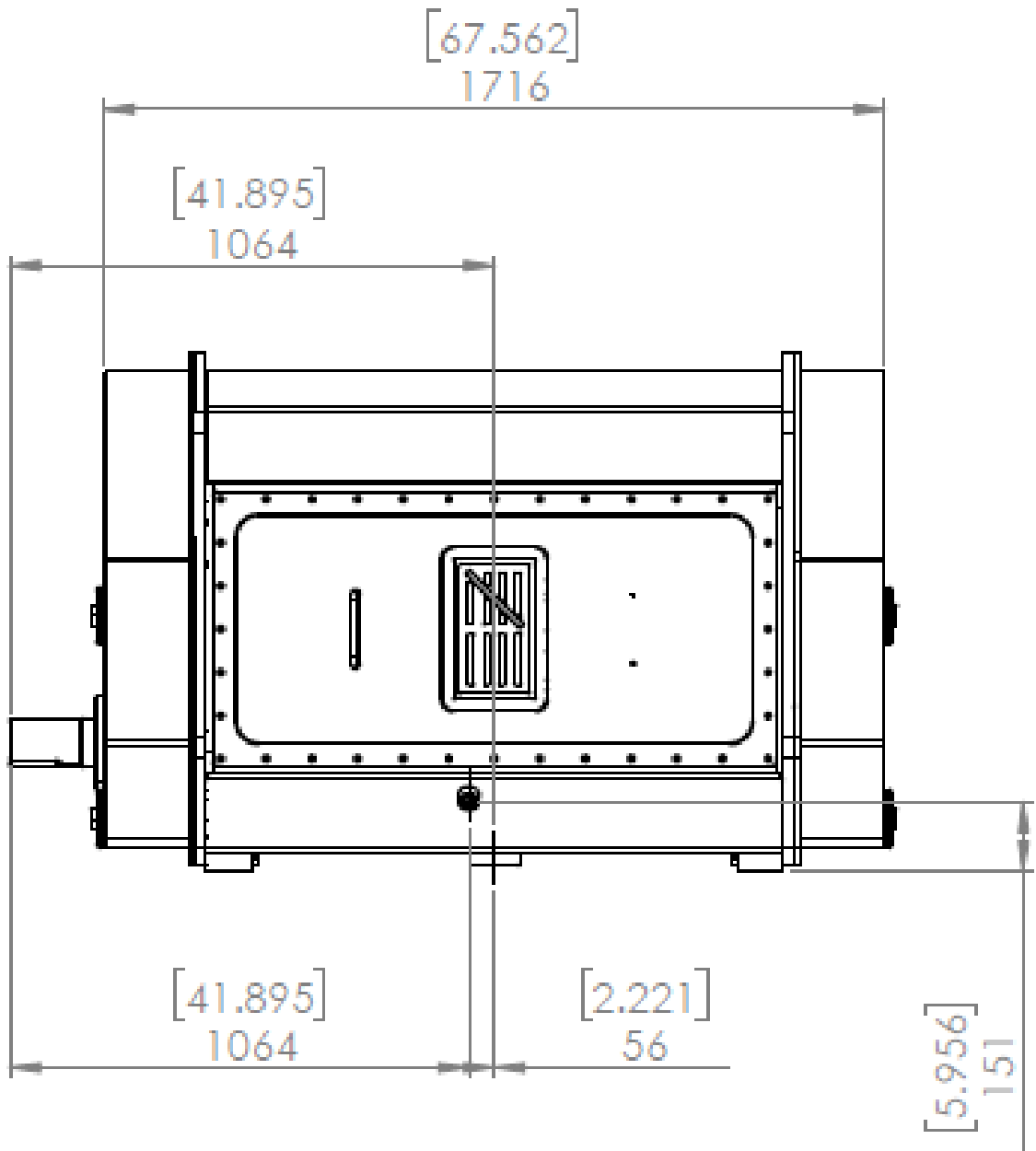
It is extremely important to maintain some downward slope in the entire drain system back to the lube reservoir.

Superior materials and innovative internal geometry advances aside, the fluid end is a conventional quintuplex valve-over-valve arrangement. Plungers can be removed through the front suction caps, and packing can be removed and replaced through removal of the rear gland packing nut.

XGEN 2500 w/ XGen 4.5" Fluid End
PERFORMANCE RATING
Power Rating: 2500HP
Plunger Stroke: 8"
Power End Weight (lbs): 11,325
Fluid End Weight (lbs): 5,423
TOTAL Pump System Weight (lbs): 16,748







SECTION 3 INSTALLATION

DANGER

Read all safety rules and precautions before attempting to operate the power end.

This section deals with preparation of the power end following shipping or storage of the power end and guidelines for the user supplied lubrication system.

PREPARATION AFTER SHIPPING AND STORAGE

All pumps are shipped dry and therefore must be flushed with light weight oil before operating, regardless of duration or method of storage. Power ends are not prepared for storage and are intended to go into operation as soon as possible.

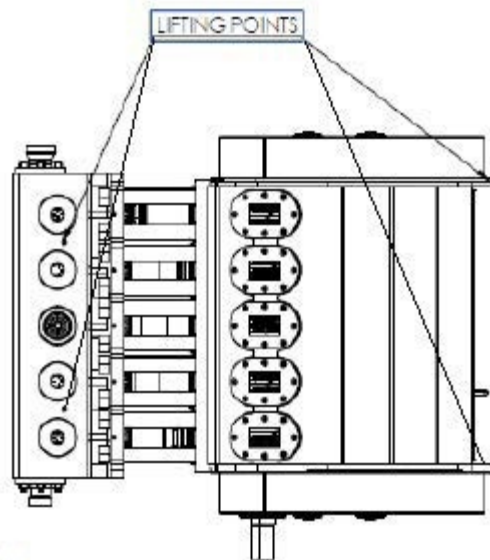
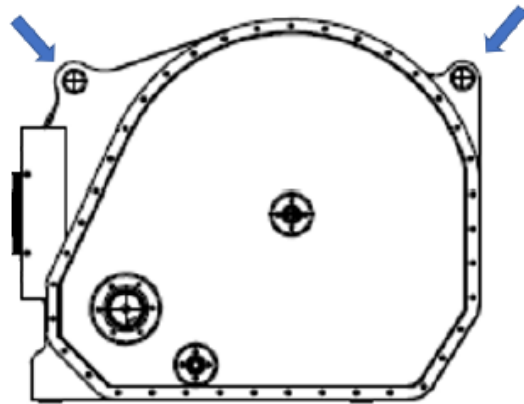
If the power end must be stored for an extended duration:

1. Clean and flush the power end with rust preventative. Make sure the rust preventative will not clog the lube lines in the power end.
2. Remove the breather from the power end and plug the hole.
3. Apply rust preventative to all exposed metal on the power end.
4. Plug all lube inlets and outlets on the exterior of the power end.

POWER END MOVING INSTRUCTIONS

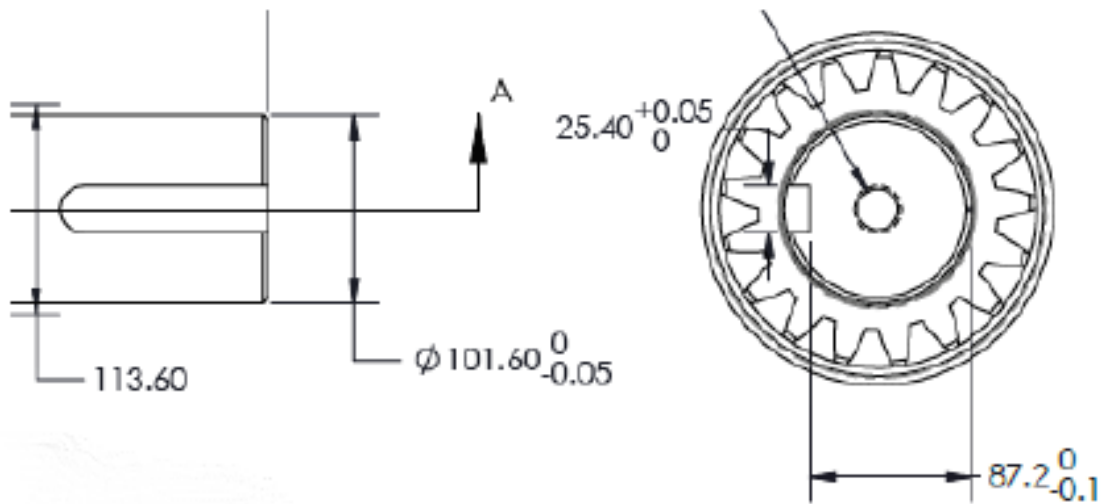
DANGER

Take care when moving your ST9 power end system. The system has different lifting points depending on whether a completed pump system with a fluid end or just a power end is being lifted. Please refer to the diagrams below.



POWER END MOUNTING INSTRUCTIONS Follow this procedure to shim the feet of the power end. This will require the use of (4) Grade 8, 1 hex head screws with lock washers to secure the power end frame.

1. Set the power end on the mounting location.
2. Either a bolt or stud and nut combination of Grade 8 with lock washers must be used. Thread size is 1" 8-UNC B7.
3. Install a bolt on the two rear corners of the power end, snug not tight.
4. Measure the gaps at the bottom of the power end. Allow for no greater than 0.1mm difference in mounting feet height.
5. Shim the high foot of the power end if necessary.
6. Install the remaining two bolts.
7. Torque the bolts to 475 ft/lbs.
8. Couple the pinion input shaft and couple with driveshaft.
9. Drive shaft angle should be no greater than 5 degrees.
10. Drive shaft key and coupling is sized



POWER END LUBRICATION SYSTEM

Proper lubrication system furnishing is critical to the functioning of the power end. This system is designed for a minimum sump capacity of 75 gallons. All other components should be chosen and applied with care given the critical nature of the system.

Lube Pump

A positive displacement pump is required to supply the power end. Gear type pumps have demonstrated reliable performance for similar applications and are recommended. Use the largest suction port available for the selected pump size to maximize performance.

Lube System Requirements

- Use a positive displacement lube pump. Gear types are suggested.
- Use the largest suction port that will fit the given pump.
- Flow velocity should not exceed 2ft/second.
- Use a strainer three times larger than necessary for the flow.
- ASTM Grade 220 Oil is recommended for the majority of applications.
- Oil cleanliness requirements are ISO 15/13/10.
- Target oil pressure is 125 psi. Max 180 psi, low alarm 40 psi. Low pressure warning devices are highly recommended.
- Maximum oil temperature should not exceed 175F.
- Target oil flow from the pump is 40 GPM.
- Vacuum pulled at the lube pump inlet should not exceed 4 psi.