Mud Puppy 118 Pump

Installation and Operation Manual

"RECYCLES THE MUD AND DUMPS THE CRUD"

MUD PUPPY

MUDPUPPYINC.COM

Table Of Contents

FOREWORD

This manual contains instructions for the installation, operation, and maintenance of the Mud Puppy 118 pump. As pump service conditions and specifications vary considerably in pump installation, this manual cannot cover every situation, but it is intended that the information included will serve as a guide. Should questions arise, or start-up problems occur, it is suggested to contact Mud Puppy Pump Distributor or Sales Representative in your area.

There are many principles of proper pump installation and applications as well as special considerations for the Mud Puppy 118 design that, if followed, will further enhance its performance.

This document will deal with both general and specific recommendations for improved Mud Puppy 118 performance in both oilfield and industrial applications.

GENERAL INSTRUCTIONS

1. Operate the pump only in the performance range for which it was designed.
2. The pump driver must drive the pump CLOCKWISE when viewed from the coupling end. Reversing the rotation will damage the pump.
3. Do not operate the pump with the suction or discharge valves closed.
4. When operating in drilling mud, packing leakage from clogging the drip area and hardening around the slinger and front seal. See Section E for mechanical seal installation.

CAUTION!
EXERCISE SAFETY IN ALL PERFORMANCES: DO NOT IGNORE ANY WARNINGS; USE ONLY APPROVED METHODS, MATERIALS AND TOOLS. DO NOT PERMIT ANY FUNCTION OF QUESTIONABLE SAFETY; ACCIDENTS ARE CAUSED BY UNSAFE ACTS AND UNSAFE CONDITIONS.

WARNING!
FAILURE TO OBSERVE THE WARNINGS AND NOTES OF CAUTION IN THIS PUBLICATION CAN RESULT IN PROPERTY DAMAGE, SERIOUS BODILY INJURY, OR DEATH.

ATTENTION!
THESE TERMS ARE USED TO DRAW ATTENTION TO ACTION THAT WILL CAUSE DAMAGE TO THE PUMP, COMPONENTS OR ATTACHMENTS.

WARNING!
FAILURE TO SHUT DOWN POWER AND RELIEVE PRESSURE FROM THE PUMP BEFORE SERVICING CAN RESULT IN SERIOUS PERSONAL INJURY AND PROPERTY DAMAGE.

BEFORE SERVICING PUMPS

1. SHUT DOWN OR DISENGAGE THE PUMP POWER SOURCE.
2. SHUT DOWN ALL PUMP ACCESSORY EQUIPMENT.
3. RELIEVE OR "BLEED OFF" ALL PRESSURE FROM THE LINES PRIOR TO REMOVING PIPING.

INSTALLATION

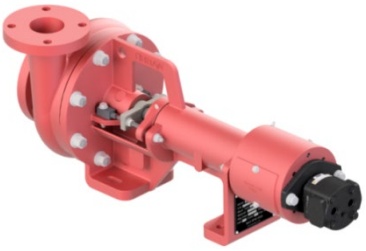
INTERCHANGEABILITY

The Mud Puppy 118 horizontal centrifugal pumps outside envelope dimensions are the same as older 1¼ inch pumps of the same nominal size so the models can be interchanged without changing existing piping, couplings, or bases.

PUMP ASSEMBLY AND MOUNTING

To install the Mud Puppy 118 pump, place the pump on the machine lining up the pump with the mounting holes. Mount using (4) 5/8" X 2 ¾" bolts, (8) 5/8" flat washers (4) 5/8" lock washers and (4) 5/8" nuts.

If the pump is equipped with a motor adapter, mount the motor to the pump using (2) 3/8" X 2½" bolts, (4) 3/8" flat washers and (2) ½" lock washers as shown below.



Pump Equipped with Motor

Pump Equipped with Stub Shaft

LOCATION

The pump should be located near the liquid source so that the suction line may be short and direct. The pump should be located below the level of the liquid to eliminate the necessity of priming.

FOUNDATION

The foundation should be sufficiently rigid and substantial to absorb any vibration and support the base plate at all points. A concrete foundation, poured on a solid footing of adequate thickness to support the pumping unit, provides the most satisfactory foundation. The base plate should be installed in a level position.

NOTE:
A DETAILED DESCRIPTION OF PROPER PROCEDURES FOR GROUTING BASE PLATES MAY BE FOUND IN THE HYDRAULIC INSTITUTE STANDARDS, 13TH EDITION, PAGES 116&117.

The rugged design of the frame and fluid end makes the Mud Puppy 118 more tolerant of improper foundations than many other pumps. When fabricated bases or fabricated skid bases are utilized, the foundation should be sufficiently rigid and level to absorb any vibration and support the base at all points.

COUPLING ALIGNMENT

Good service life of the pump and driver depends upon good alignment through the flexible coupling. If the motor was mounted at the factory, the pump and motor were in alignment when shipped. The alignment between the pump and driver should be inspected after installation to ensure that transportation or other handling has not caused misalignment of the unit.

To check the alignment using a straight edge, lay the straight edge in line with the shaft on the OD's of the coupling halves. There should be no gaps under the straight edge. Check two locations, 90 degrees apart. Angular misalignment can be checked by measuring the gap between coupling half faces. There should be no more than a *1/64* inch in the gap between coupling halves.

CAUTION!
MISALIGNMENT BETWEEN THE MOTOR AND MUD PUPPY 118 PUMP COULD CAUSE FAILURE OF THE COUPLING, PUMP, MOTOR, BEARING OR EITHER SHAFT. ALIGNMENT MUST NOT BE ATTEMPTED UNTIL THE BASE IS IN POSITION AND THE MOUNTING AND FLANGE BOLTS HAVE BEEN TIGHTENED.

The recommended procedure for coupling alignment is with the use of a dial indicator, as illustrated in Figures 1 and 2. The dial indicator is attached to one coupling half with the indicator button resting on the 0.0. of the other coupling half to measure offset misalignment. To measure angular misalignment, the indicator is positioned so that the buttons rest on the face, near the 0.0., of the other coupling half. Rotate the shaft and dial indicator one revolution while the other shaft remains stationary and note the T.I.R. Unless otherwise specified by the coupling manufacturer, offset misalignment should be limited to 0.005 inches T.I.R. Adjust the alignment by loosening the pump or driver mounting bolts and retighten or shim as required.

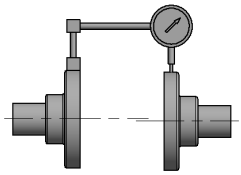


Figure 1
Measuring Offset Misalignment
Using a Dial Gauge

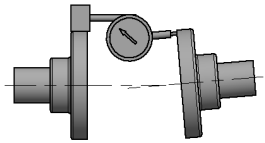


Figure 2
Measuring Angular Misalignment
Using a Dial Gauge

In areas where a dial indicator arrangement is not available, an adequate job of alignment can be done with a straightedge. This method is especially useful if the coupling used contains a rubber drive element.

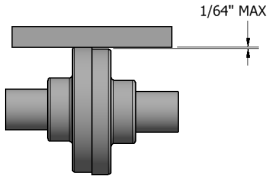


Figure 1A
Measuring Offset Misalignment
Using a Straightedge

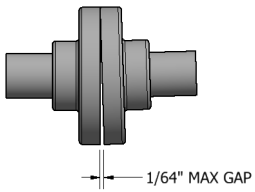


Figure 2A
Measuring Angular Misalignment
Using a Straightedge

To check offset misalignment, lay the straightedge in line with the shafts on the O.O.'s of the coupling halves. There should be no gaps under the straightedge. Check two locations 90 degrees apart. Angular misalignment can be checked by measuring the gap between coupling half faces. There should be no more than a *1/64* inch gap under the straightedge or a *1/64* inch variation in the gap between the coupling halves. See Figures 1A and 2A.

NOTE:
FURTHER REFERENCE ON COUPLING ALIGNMENT CAN BE FOUND IN HYDRAULIC INSTITUTE STANDARDS, 13TH EDITION, PAGES 177 & 120.

PIPING

Piping must not be connected to the pump until the grout has hardened and the foundation and pump hold down bolts have been tightened.

Piping should be anchored independently of the pump and as near to it as possible. Pipe companion flanges should line up naturally with pump flanges.

CAUTION!
DO NOT DRAW THE PIPE TO THE PUMP WITH FLANGE BOLTS.

PUMP SUCTION

Properly selected and installed suction piping is extremely important to eliminate vibration and cavitation in the pump. Vibration can cause packing problems, mechanical seal damage, or undue bearing loads.

The suction line should be equal to or larger than the pump suction.

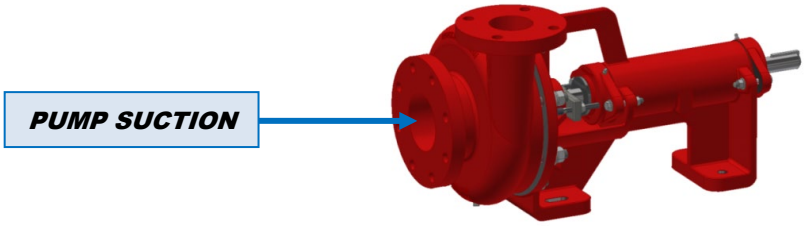
CAUTION!
THE CAPACITY OF A CENTRIFUGAL PUMP SHOULD NEVER BE ADJUSTED BY THROTTLING THE SUCTION LINE.

A positive shut-off valve of a type to cause minimal turbulence should be installed in the suction line to permit the closing of the line for removal of the pump for inspection and maintenance.

The suction line should be designed to eliminate any air pockets. The piping should gradually slope downwards to the supply source to eliminate air pockets.

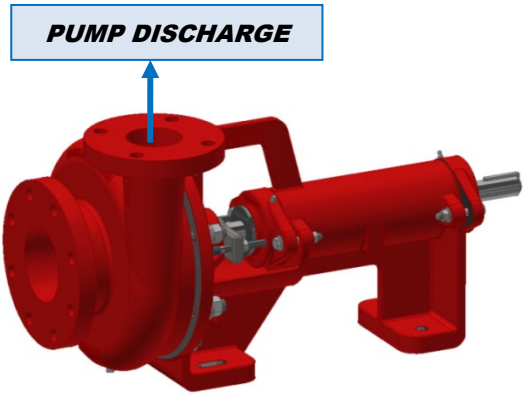
The suction line should have a straight section into the pump of a length equivalent to at least two times its diameter; i.e. a 4 inch suction line should have a minimum 8 inch straight run.

For temporary hook-up when flexible hose is used, a non-collapsing hose is essential since the suction line pressure is often below atmospheric pressure. A collapsed suction line will result in below average or complete loss of flow.



PUMP DISCHARGE

A positive shut-off valve should be located in the discharge piping to permit the closing of the line for removal of the pump for inspection and maintenance. All piping should be independently supported and accurately aligned.



CAUTION!
THE PUMP MUST NOT SUPPORT THE WEIGHT OF THE PIPE OR COMPENSATE FOR MISALIGNMENT.

If operating conditions are not known with sufficient accuracy, it will be necessary to provide a throttle valve in the discharge line to ensure that the pump operates at the design point.

If the pump is connected to a pressurized system, it is important to install a check valve between the pump discharge and the throttling valve. The check valve will prevent back flow through the pump. Back flow may cause the impeller to become loose on the shaft.

CAUTION!
A LOOSE IMPELLER WILL LIKELY RESULT IN MECHANICAL DAMAGE AND FLUID LEAKAGE BENEATH THE SHAFT SLEEVE.

PREPARATION FOR OPERATION

MECHANICAL SEALS

When mechanical seals are furnished they are installed and adjusted at the factory. Item 21, TT021 carbide mechanical seal, normally used in drilling mud environments, do not require external flush.

To properly prepare special or industrial mechanical seals for operation, various cooling and flushing flows may have to be connected. Liquid from an outside source may be required. If outside flushing is required, connect the necessary cooling or flushing lines to the seal and be sure they are operating before starting the pump. See seal drawings and instructions if special seals are used.

WARNING!
NEVER OPERATE A PUMP "DRY" WITH MECHANICAL SEALS. MECHANICAL SEAL FAILURE WILL OCCUR!

CAUTION!
CHECK PUMP ROTATION BEFORE RUNNING.

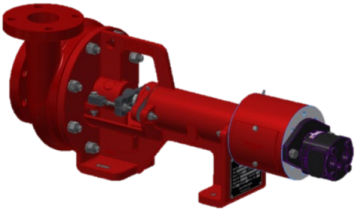
PUMP ROTATION

Most pumps manufactured have clockwise rotation when viewed from the coupling end. The correct rotation can be found by an arrow on the casing.

It is very important that the pump rotation is determined before starting the pump.

The best way to check rotation is to disconnect the coupling, but it can be checked without disconnecting the coupling. One person should be at the pump watching the shaft while a second person starts and then immediately stops the pump so the shaft barely turns over.

Once the pump is completely installed check for any water leaks, check the hydraulic fluid pressure.



Clockwise Pump Rotation

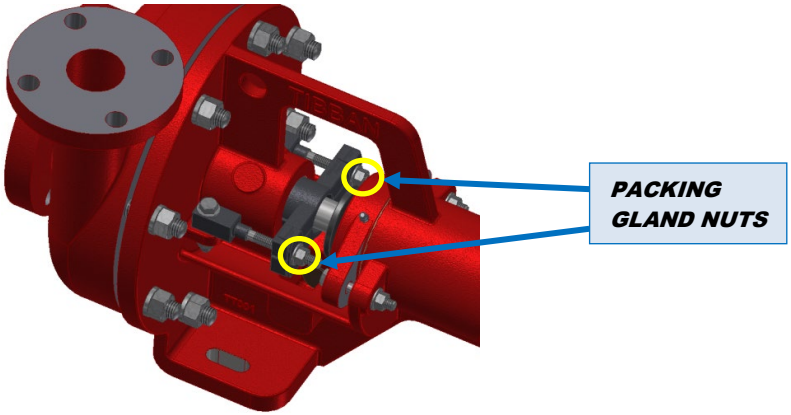
PRIMING THE PUMP

Be sure the pump has fluid in the pump housing before running. If the pump is operated without fluid, the mechanical seal or packing can be destroyed. Vent air from the suction line and fill it with liquid. Start the pump with the discharge valve cracked open. After discharge pressure stabilizes, gradually open the discharge valve to the required position. If flow is lost, close the discharge valve and wait a few seconds for the discharge pressure to build. Continued flow difficulty indicates improper pump selection or installation.

WARNING!
RUNNING THE PUMP WITH IMPROPER PRIMING MAY DESTROY THE SEALING FACES OF THE MECHANICAL SEAL DUE TO OVERHEATING OR MECHANICAL DAMAGE FROM PULSATION BETWEEN STATIONARY AND ROTATING COMPONENTS. DO NOT RUN THE PUMP WITH THE SUCTION VALVE CLOSED AT ANY TIME! THERMAL SHOCK CAN CRACK THE STATIONARY SEAT IF THE TEMPERATURE IS RAISED FROM ROOM TEMPERATURE TO 250° F IN LESS THAN 30 SECONDS. RUN THE PUMP WITH THE DISCHARGE VALVES CLOSED ONLY FOR SHORT PERIODS OF TIME. THE ENERGY GOING INTO THE PUMP HEATS THE FLUID IN THE CASING. IF THE PUMP NEEDS TO OPERATE SHUT IN SOME OF THE TIME, BE SURE TO INSTALL A SMALL LINE (1/4 OR 1/2 INCH) BACK TO THE SUCTION TANK BETWEEN THE DISCHARGE VALVE AND THE PUMP FOR COOLING!

PACKED PUMPS

Loosen the packing on startup. The gland bolt nut should be only finger tight. New packing will expand faster with heat than older packing. Therefore, new packing must be adjusted more slowly than old packing. Too tight and it will not leak. With no cooling it will burn and be no good for sealing.



NOTE:
PACKING MUST HAVE COOLING; THEREFORE IT MUST LEAK.

When adjusting the packing always adjust only ¼ turn on each nut at a time; waiting for the packing to heat before adjusting tighter.

CAUTION!
THE PACKING MUST LEAK 10-12 DROPS PER MINUTE TO REMAIN COOL.

Check the following items before starting the pump:

1. Pump rotates freely by hand.
2. Pump rotates in proper direction.
3. Coupling aligned.
4. Oiler full and oil level correct (oil lube pumps).
5. Suction valve fully open.
6. Pump and suction line full of fluid.
7. Discharge valve is slightly open, not fully open. Fully open the discharge valve after the pump is running.

OPERATION

MAXIMUM OPERATING CONDITIONS

NOTE:
THESE MAXIMUM OPERATING CONDITIONS APPLY TO PUMPS THAT ARE EXPOSED TO ROOM TEMPERATURES WITHOUT EXTERNAL INSULATION.

1. Cast Iron: Maximum working pressure is 175 PSI at 150°F OR 150 PSI at 250°F. Interpolate for pressure between 150° and 250°F maximum.
2. Steel: Maximum working pressure and test pressure in accordance with ANSI 8 16.5-1973, Tables 2.1 through 2.23 and Table 3.
3. For H-30 and HARD alloy, contact a Mud Puppy Pump Distributor.
4. Cooling water through the lantern ring is required when fluid being pumped is between 150° and 250°F. In addition, it may be necessary to run water over the exposed shaft to prevent excessive heat buildup at the bearings.
5. Maximum hydraulic performance is in accordance with published performance curves.

PUMP RECORDS

Information to be included in these records should be:

1. Pump size and serial number.
2. Pump model number, impeller diameter, material of construction.
3. Mechanical seal manufacturer, type, code and drawing number.
4. Motor horsepower and speed of operation.
5. Service conditions.
6. Frequency of operation.
7. Record of maintenance, including parts usage and general pump conditions.
8. Nomenclature and part number of replacement items.

NOTE:
MAINTAIN DATA CARDS OR PUMP RECORDS WHENEVER POSSIBLE. THIS WILL PROVIDE READY ACCESS TO INFORMATION FOR ORDERING SPARE PARTS AND FOR EVALUATING PUMP AND MECHANICAL SEAL PERFORMANCE.

LUBRICATION OF BEARINGS

The pump is shipped with sufficient lubrication packing in the bearing to assure trouble-free operation for start-up under normal life. If the pump is disassembled, it is advisable to pack the bearings with grease properly before re-assembly. Pack the bearing through approximately ½ of its circumference.

The bearings normally may run at temperatures up to 180°F, without injury. A temperature of 180°F is hotter than the hand can stand to touch, for a second or two; however at this temperature it will not burn off the paint. The temperature may be determined by use of a laser thermometer at bearing cap.

If the bearings run hot, immediate service is necessary. This abnormal condition indicates that:

1. The bearings may not be properly installed.
2. Pump and motor are out of alignment. (See Section D Coupling Alignment)
3. Excessive grease has been forced into the bearing housing.
4. Insufficient grease is present in the housing.
5. Improper grade or contaminated lubricant is present in the bearing housing.

To correct this condition perform the following in the order listed:

1. Check the motor and pump for misalignment.
2. Check for proper amount of grease.
3. Return the pump to service.
4. In addition, a competent lubrication engineer should be consulted to recommend the proper lubricant for the particular operating condition.

Pumps are supplied from the factory grease lubricated unless oil lubrication is requested. Oil lubrication should be used whenever the pump speed exceeds 2400 RPM. The bearing caps have been drilled and tapped for grease fittings. Mud Puppy Corp.. Inc. recommended bearing grease is Chevron Dura-Lith® EP 2 or compatible grease. Greases available in tubes are the best. Five shots with a standard hand operated grease gun of the above grease or equivalents in each bearing monthly is sufficient for 24 hour per day operation.

LUBRICATION OF INBOARD LIP SEALS

The standard Mud Puppy 118 Pump is equipped with labyrinth seals that do not require lubrication.

WARNING!
FAILURE TO REMOVE THE GREASE RELIEF PORT PRIOR TO ADDING GREASE CAN FORCE OLD GREASE PAST THE LIP SEALS AND INTO THE BEARINGS, GREATLY SHORTENING THEIR LIFE. BEARING FAILURES IS MORE OFTEN CAUSED BY LACK OF LUBRICATION MORE OFTEN THAN NORMAL BEARING WEAR.

PACKING

Space is provided for two rings of graphite packing at the impeller side of the Lantern Ring. Packing should be of a grade suited to the operating conditions of the pump; square braded packing is regularly furnished. Excessive tightening of packing gland nuts causes shaft wear. It is unnecessary and should be avoided. Slight leakage approximately 10-12 drops per minute is desirable to act as a packing lubricant. A grease fitting has been installed in the ¼" tapped Lantern Ring connection.

CAUTION!
MOST EARLY PACKING FAILURES ARE CAUSED BY OVER TIGHTENING OR POOR INSTALLATION.

PACKING APPEARANCE

If the packing being removed is hard and brittle, likely it was run dry at some point during its life. This is often done in the first hour of service. The packing has more ability to grow with heat during its early life. Even if the packing is adjusted correctly before starting the pump, in the first few minutes, the spacing will grow with the heat and become overly tight. It will then run hot and burn the packing.

PACKING CAUTION!
ONCE PACKING IS BURNED, IT WILL NEVER SEAL PROPERLY AGAIN.

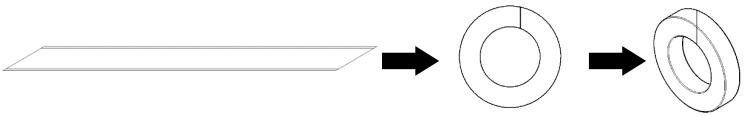
CORRECT INSTALLATION OF PACKING

Make sure the box is clean of old packing and the plastic grease ring. Bend a wire and pull it down the shaft to be sure it is smooth for good packing life. Feel for grooves cut from old packing.

The order to install is as listed. (See picture):

1. Graphite Rope Packing (against wear plate)
2. Graphite Rope Packing
3. Graphite Rope Packing
4. Grease Ring (with the groove in it)
5. Graphite Rope Packing
6. Graphite Rope Packing (until the packing is complete)

NOTE:
EACH BIECE HAS A SPLIT IN IT. SEPARATE THE SPLIT IN THE GRAPHITE ROPE PACKING BY TWISTING. FLATTEN THE GRAPHITE ROPE PACKING WITH A HAMMER FOR EASIER INSTALLATION OF ROPE.

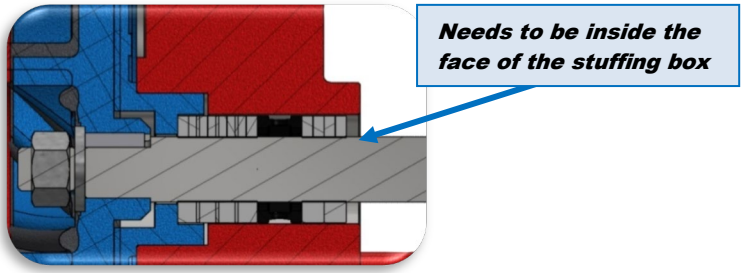


a. Wrap one piece around the shaft and push it into the stuffing box.

b. Use the packing gland to push the piece by hand as far in as possible, (Rotate the split 90° from the last, each time a piece is installed)

c. Continue with the other pieces in the order listed until the packing is complete, (repeating steps A and B above, as needed)

d. When the packing is completely installed, it should be flush (or inside the face of the stuffing box) and not sticking out.



GREASE

The stuffing box may be lubricated with grease as often as necessary to prevent the packing from overheating. It should be lubricated at least once a day. It is best to install a spring loaded grease cup to automatically lubricate the packing. As the grease cup is filled, a spring is compressed and a stem rises. As the grease is used, the spring forces new grease to the packing, and the stem lowers. When the stem is low the cup needs refilling. Grease should be pumped into the box while turning the shaft until it comes out around the packing gland and shaft (approximately 20 shots).

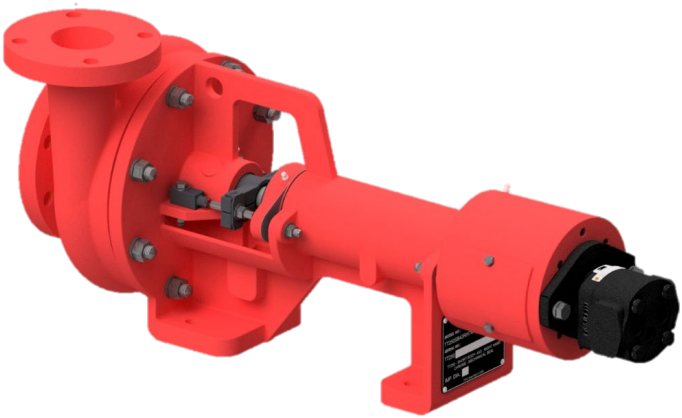
If the packing leakage is excessive, a thick water pump grease should be used rather than the general purpose grease. In most cases, general purpose grease is acceptable.

WATER

It is best to inject water into the grease ring from an external source when pumping drilling mud. This will keep most of the solids out of the packing. PACKING AND SHAFT LIFE WILL BE INCREASED UP TO 500%. Also, water leakage from the packing will not be as objectionable as mud.

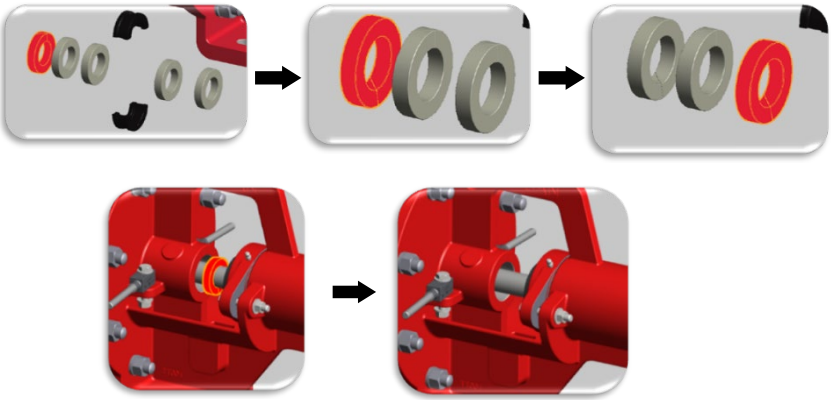
If water cannot be used, the next best addition to the packing is grease from an automatic spring-loaded grease cup. There is a visual inspection when the cup no longer has grease. The stored grease normally lasts a week or more if the packing is adjusted correctly.

RE-PACKING THE PUMP (ROPE PACKING SEAL OPTION)

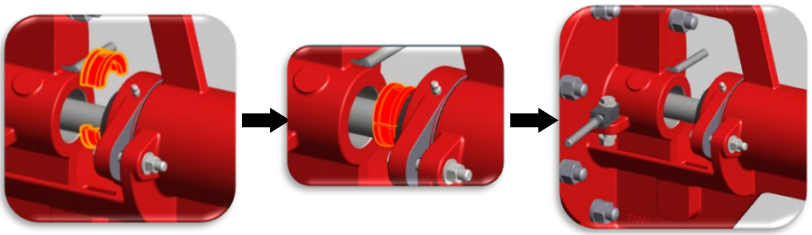


1. Make sure the box is cleaned of all old packing and the plastic grease ring. Bend a wire and pull it down the shaft to ensure it is smooth for good packing life. Feel for grooves in the shaft. Replace the shaft if there are excessive grooves.

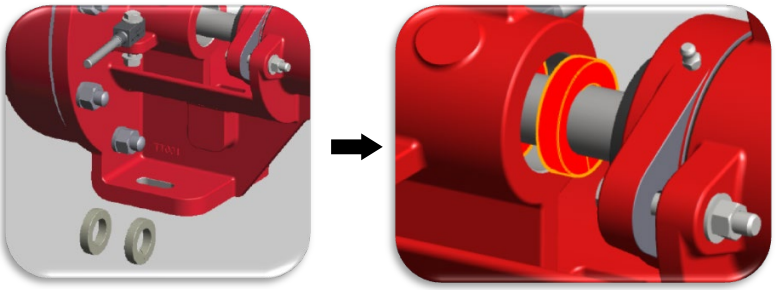
2. Grease all five (5) shaft packing rings. Insert three (3) packing rings alternating the splits in the rings from top to bottom starting with the split on the first ring on the bottom.



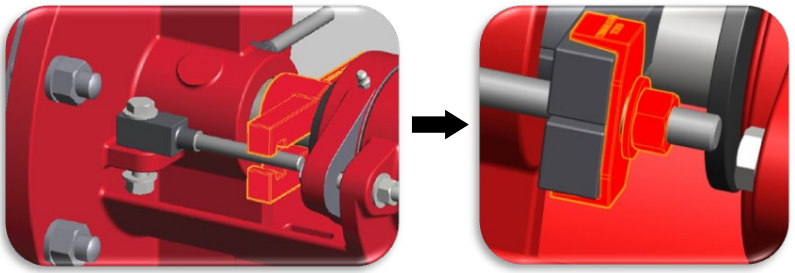
3. Install the Grease Ring so that the two halves encompass the pump shaft. Slide the Grease Ring halves into the pump pedestal packing box until they meet the third Rope Packing Ring.



4. Insert the final two Rope Packing Rings. The objective is to have the last split down so that the leakage will drip down.



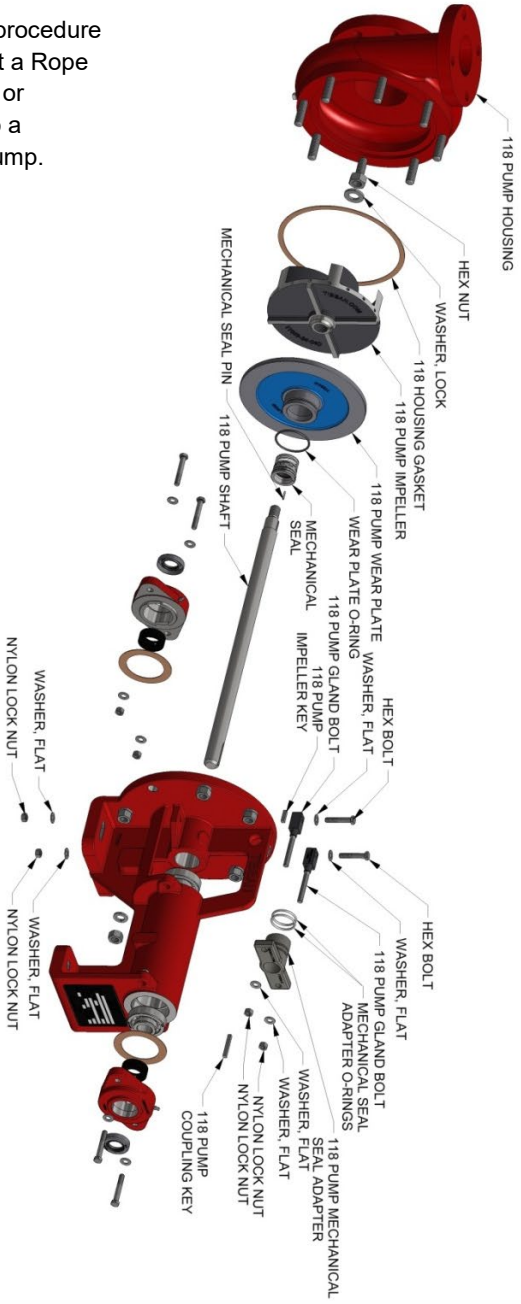
5. With the packing gland in position, swing the gland bolts into place. Initially tighten the gland hard to compress the packing. Then back off the gland bolts and retighten only finger tight.



CAUTION!
TIGHTEN THE GLAND AGAINST THE PACKING FINGER TIGHT ONLY. IF PACKING IS OVER-TIGHTENED IT MAY BE BURNED WHEN THE PUMP IS STARTED.

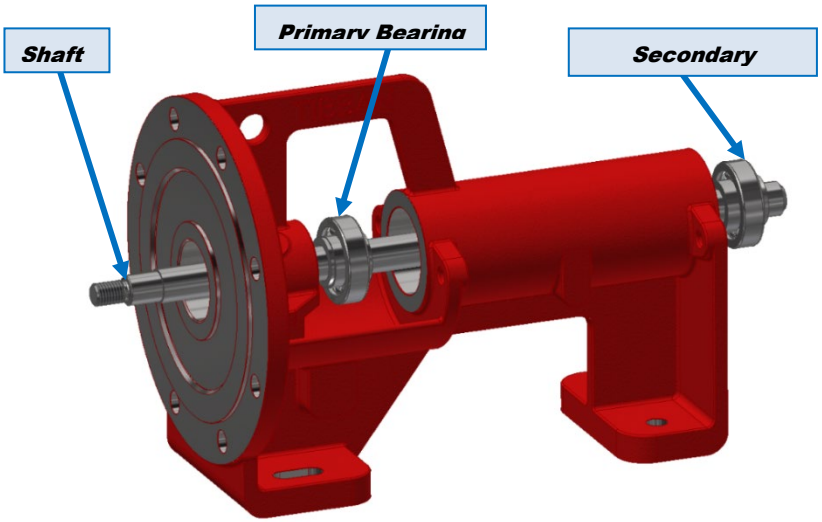
MECHANICAL SEAL CONVERSION FIELD INSTALLATION

This describes the procedure and parts to convert a Rope Packing Pump with or without a motor into a Mechanical Seal Pump.

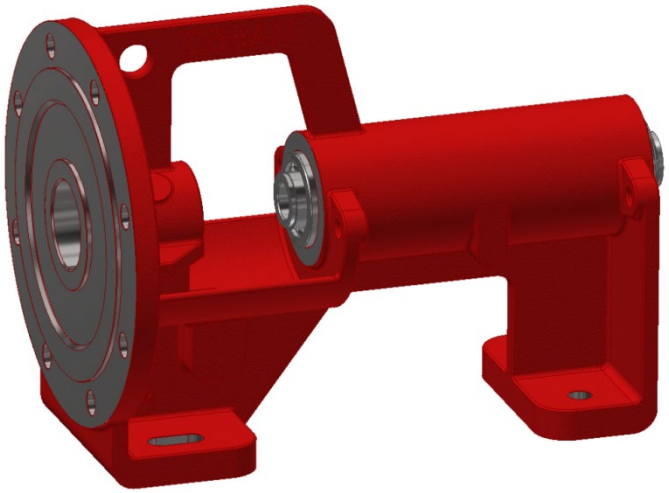


1. The Primary Bearing and Secondary Bearing need to be packed with grease. Fully pack both bearings with grease before they are installed in the Pump Pedestal.

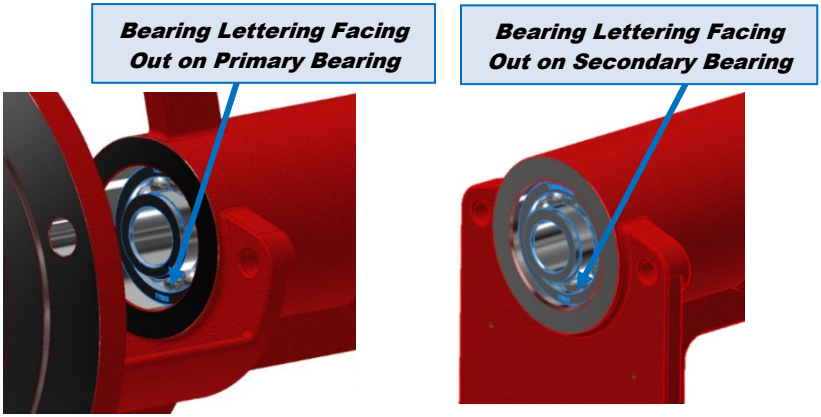
2. Install the Primary and Secondary Bearings by seating them into the Pump Pedestal. Make sure the lettering faces out on each bearing. Slide the Shaft into the Pedestal through bearings to align them in the pedestal.



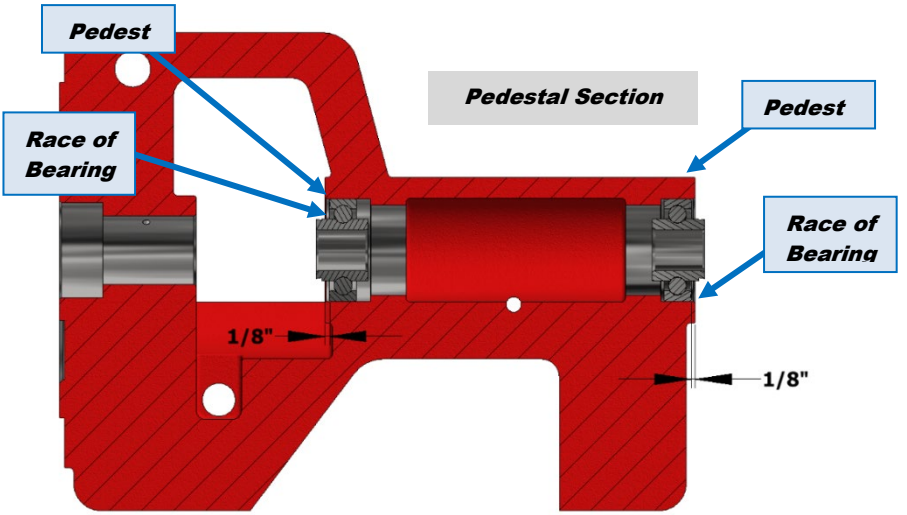
3. Now remove the shaft. The shaft at this point was only used to align the bearings.



4. Ensure that the lettering on the bearing is facing out on the Primary Bearing and Secondary Bearing.

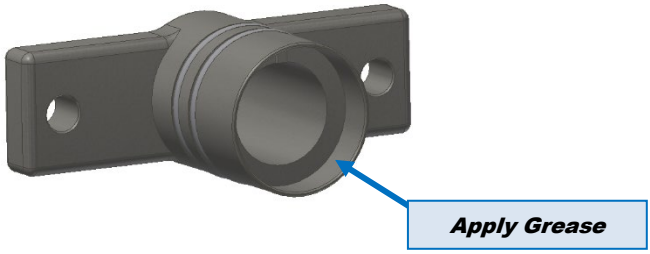


5. The depth of the bearings need to be set. The race of the bearing must be 1/8 inch below the surface of the pedestal. A large socket OR the 118 Pump Bearing Installation Tool can be used to set the depth. Fit the Tool or Socket over each bearing. Lightly and uniformly tap the bearing into the seat in the pedestal. First, seat the Primary Bearing to the correct depth, then set the depth of the Secondary Bearing.

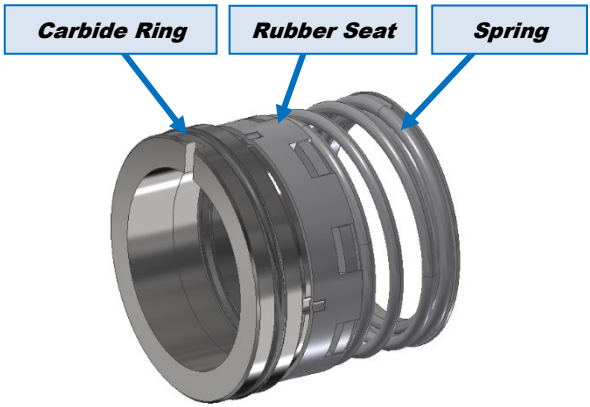


6. Now install Mechanical Seal Adapter O-Rings onto 118 Pump Mechanical Seal Adapter. Be sure to apply O-Ring grease before sliding O-Rings onto Mechanical Seal Adapter.

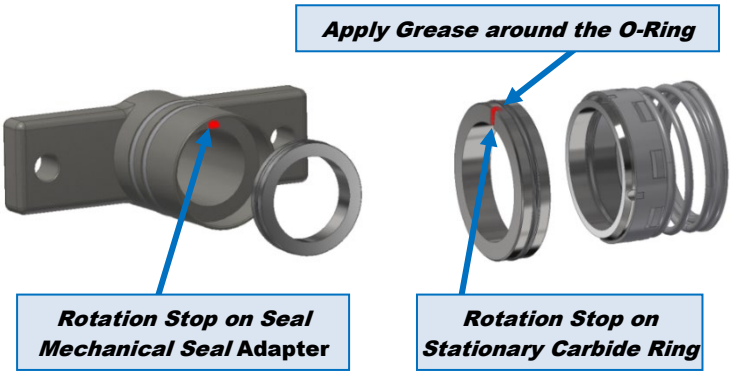
7. Apply grease around the inside of the Mechanical Seal Adapter for the stationary carbide ring.



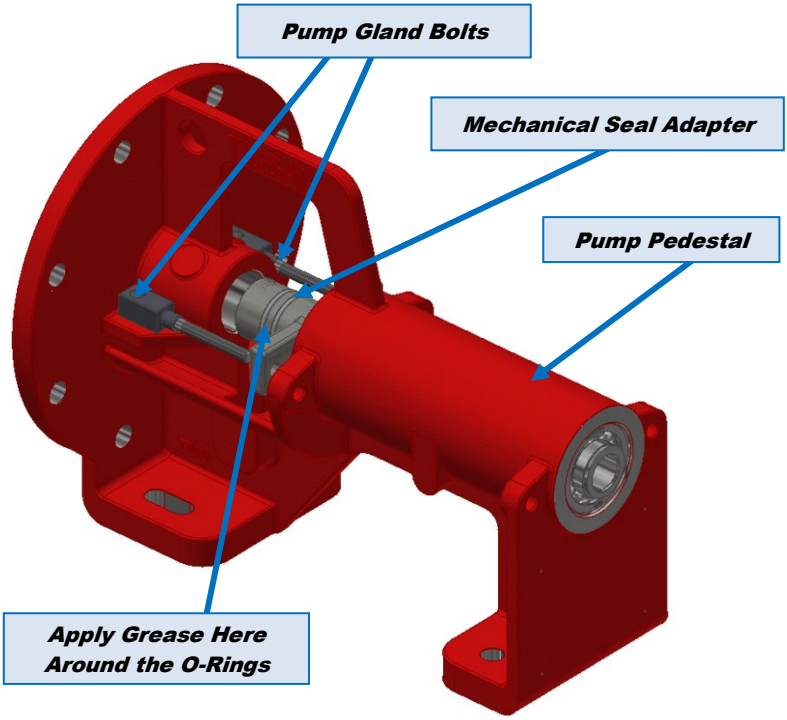
8. There are 3 pieces to the Mechanical Seal, the Carbide Ring (stationary side), the Rubber Seat and the Spring (rotating side).



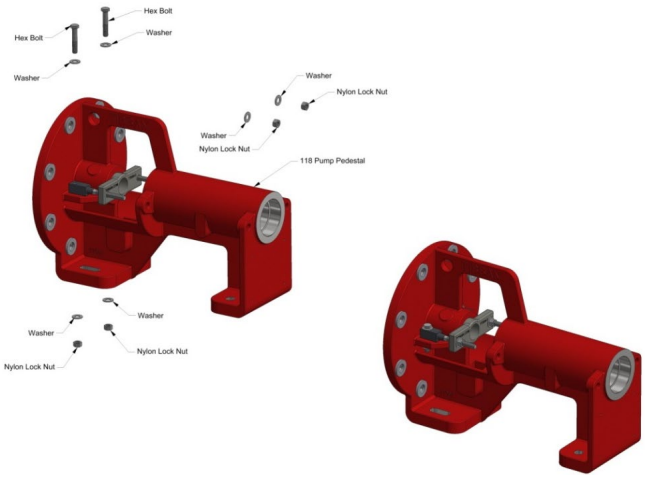
9. Install stationary carbide from the Mechanical Seal Assembly. Make sure the rotation stop in the seal holder lines up with the rotation stop in the stationary carbide. Make sure that the O-Ring is on the stationary carbide. And add grease around the O-Ring.



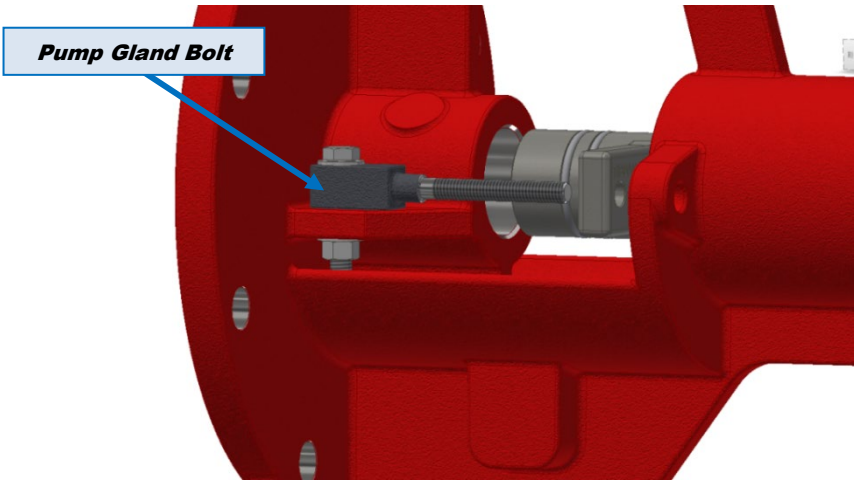
10. Hold the 118 Pump Mechanical Seal Adapter in-line to the shaft and drop 118 Pump Gland Bolts onto 118 Pump.



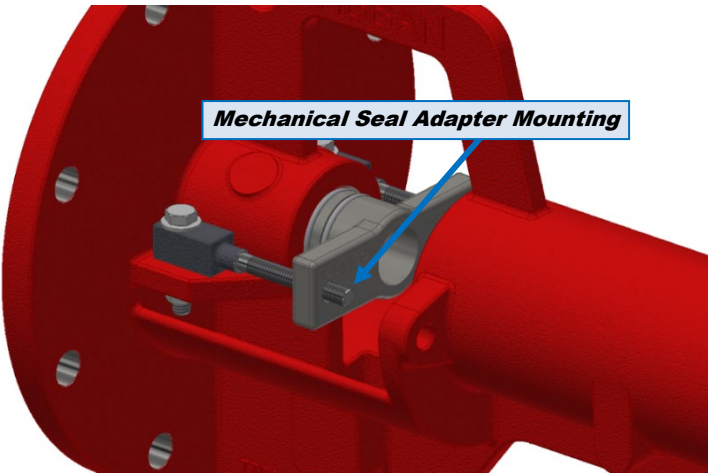
11. Install the Mechanical Seal Adapter with Nuts, Washers and Bolts.



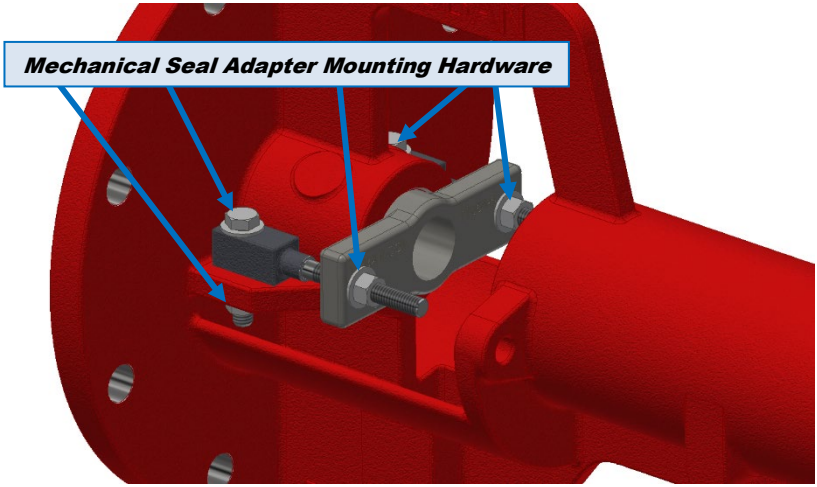
12. Loosely tighten both Pump Gland Bolts on each side of the pedestal.



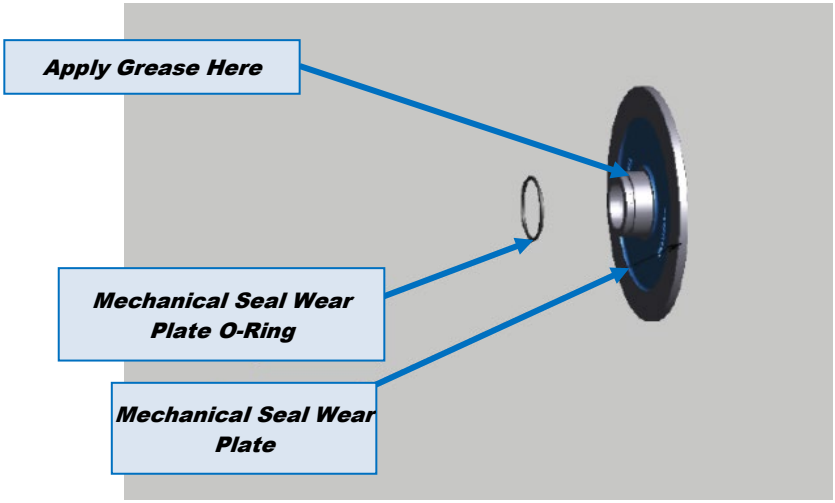
13. Feed the Pump Gland Bolt threads through the Mechanical Seal Adapter mounting holes.



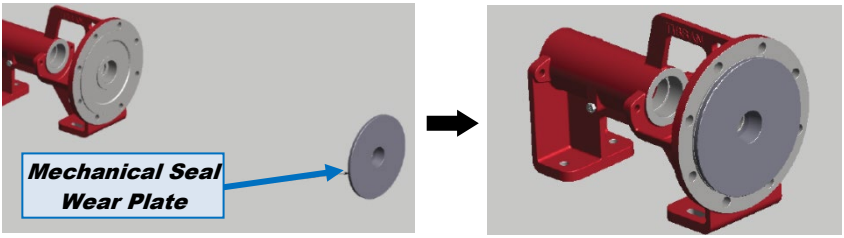
14. Carefully slide the Mechanical Seal Adapter into the Pump Pedestal until it bottoms out on the Pedestal. Fully tighten the Mechanical Seal Adapter hardware to the Pedestal and the Mechanical Seal Adapter.



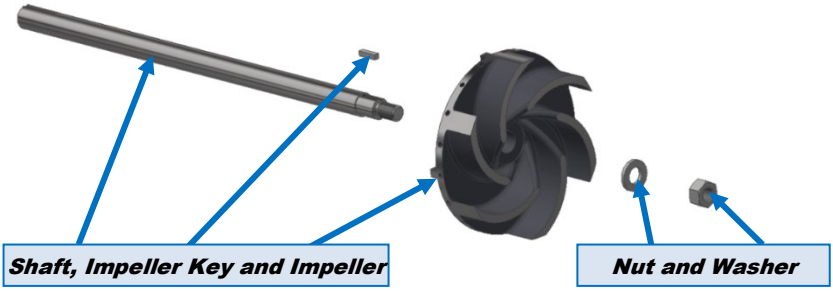
15. Install the Mechanical Seal Wear Plate O-Ring onto the Mechanical Seal Wear Plate. Apply grease around the O-ring gland on the Mechanical Seal Wear Plate.



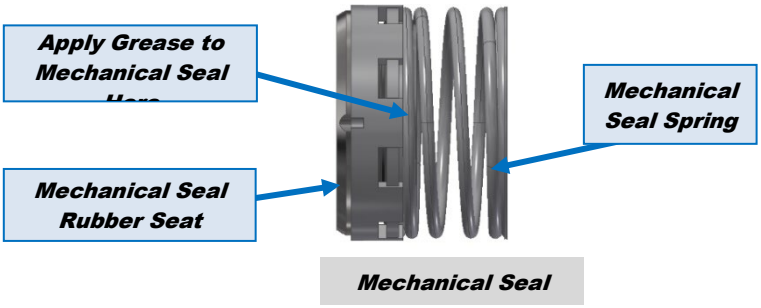
16. Now install the Mechanical Seal Wear Plate onto the Pump Pedestal. Seat the O-Ring of the Wear Plate into the seat of the Pump Pedestal.



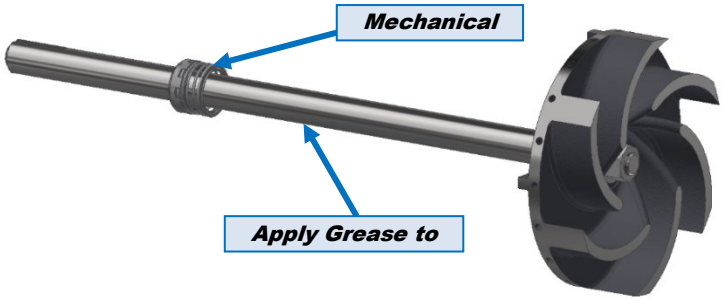
17. Install the 118 Impeller Key onto the 118 Pump Shaft and slide the 118 Impeller onto the 118 Pump Shaft and fully tighten the Washer and Nut onto the 118 Pump Shaft. Make sure that the Impeller Keyway lines up with the Impeller Key on the Pump Shaft when installing.



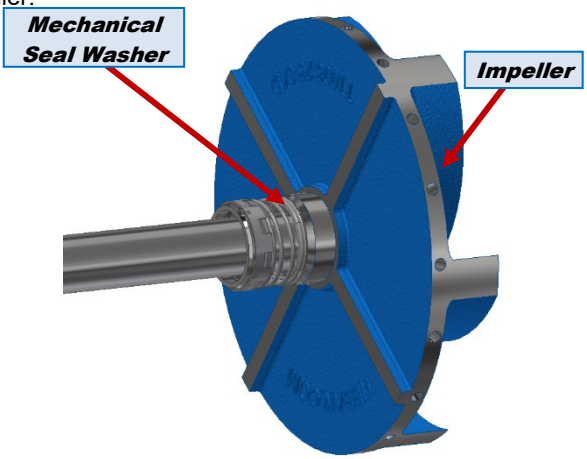
18. Focusing attention to the Mechanical Seal, mate the Rubber Seat to the Mechanical Seal Spring section of the Mechanical Seal as shown. To ensure that these two pieces stay together apply some grease around the Rubber Seat.



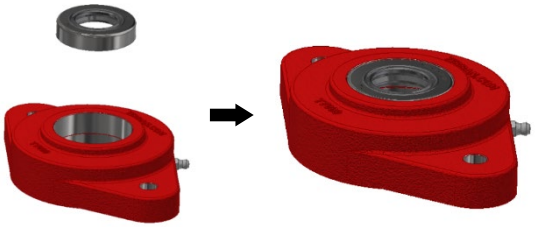
19. Slide the Mechanical Seal onto the Shaft/Impeller assembly with the spring facing toward the impeller. Apply grease to the shaft as well. Now slide the Seal onto the Pump Shaft from the threaded side of the shaft.



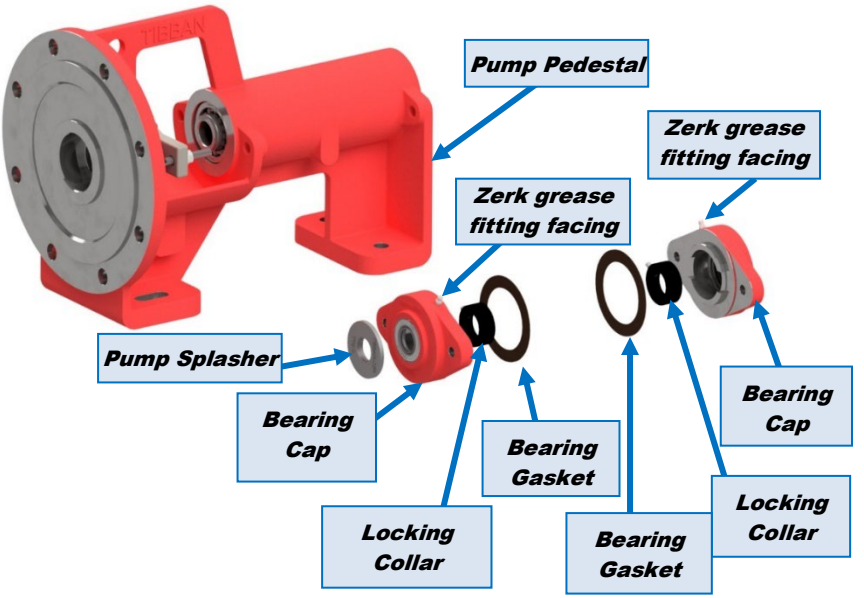
20. Slide the Mechanical Seal including the Mechanical Seal Washer until it meets the Impeller.



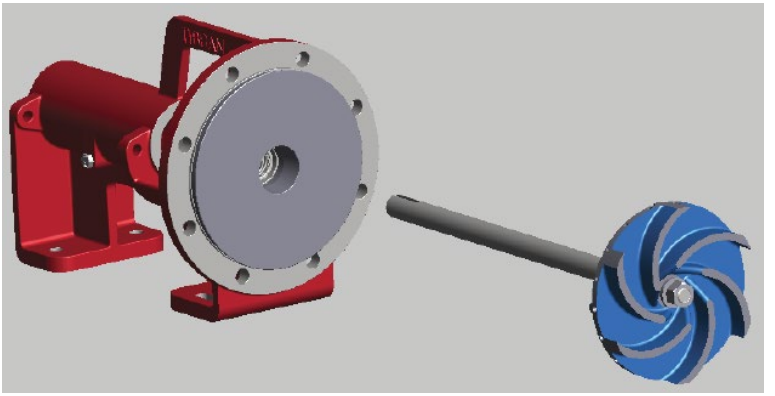
21. Now prepare the Bearing Caps for installation. Install the bearing seal into the Bearing Cap.



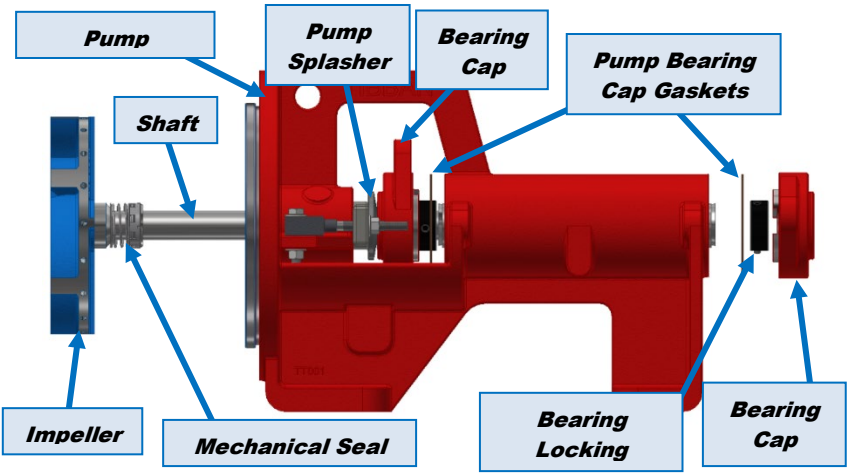
22. Now put the Bearing Cap and Pump Splasher in line with the Pump Shaft. Make sure the Zerk grease fitting is facing up on the Bearing Caps.



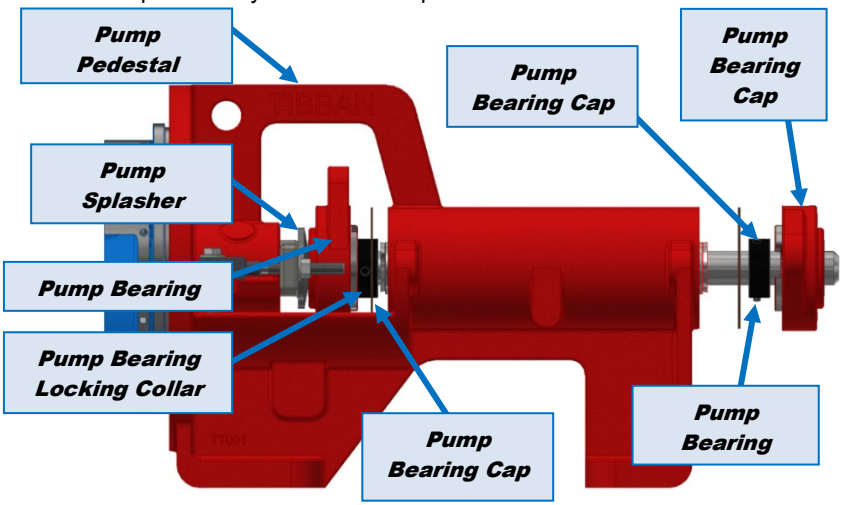
23. Slide the Pump Shaft/Impeller Sub Assembly through the Pump Pedestal.



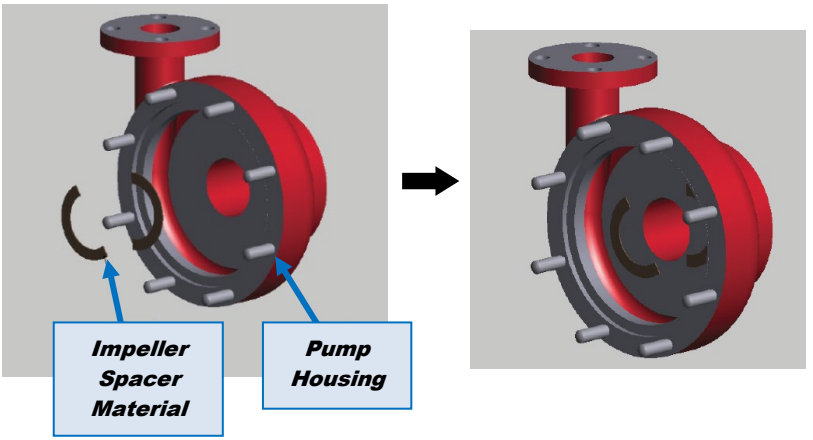
24. It is important to note that the Pump Shaft must slide through the 118 Pump Splasher, the Bearing Caps, Collars and Seals and Bearing Cap Gaskets. Make sure that the Bearings are thoroughly greased.



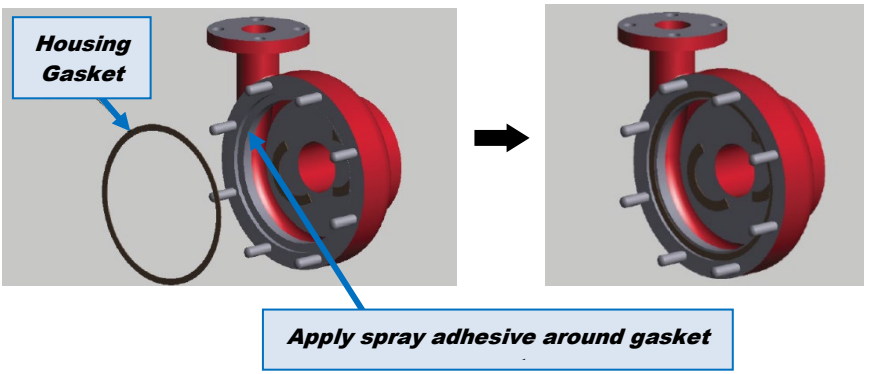
25. Slide the Pump Shaft through the Pump Splasher, the Pump Bearing Caps, the Pump Bearing Locking Collars and the Bearing Cap Gaskets. Test the Mechanical Seal by pushing the Impeller against the Wearplate. The Spring of the Mechanical Seal should have enough tension to push the Impeller away from the Wearplate.



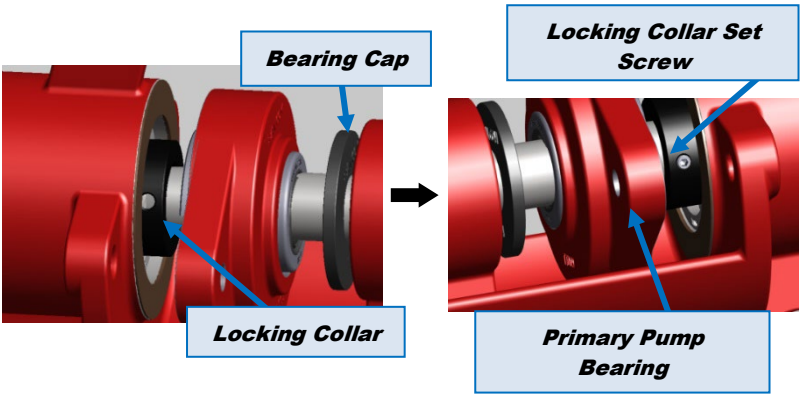
26. The attention now needs to be focused on the Pump Housing. Lay two pieces of gasket material approximately 1/32" thick inside the Pump Housing. Apply spray adhesive to the Pump Housing so that the gasket material will stick to the Pump Housing. The gasket material is used to space the Impeller away from the Pump Housing by 1/32".



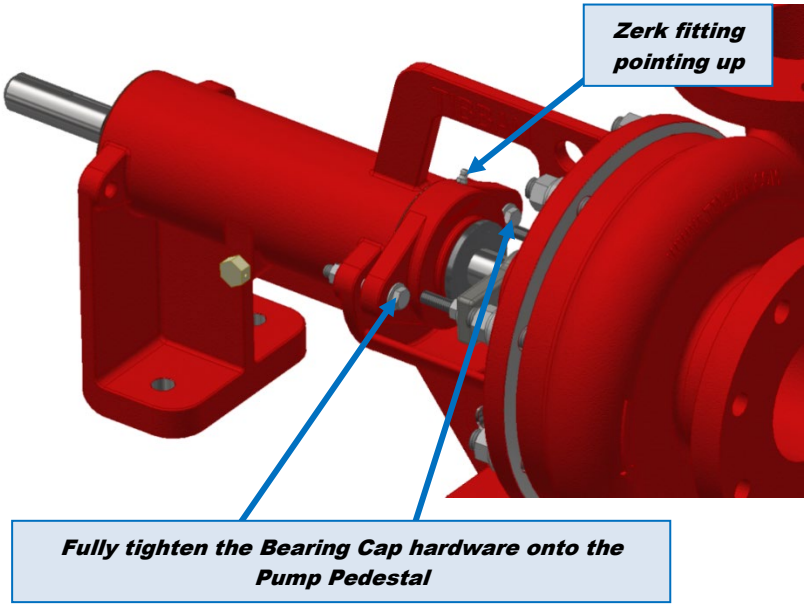
27. Now seat the Housing Gasket into the Pump Housing and spray adhesive so that the gasket material will stick to the Pump Housing.



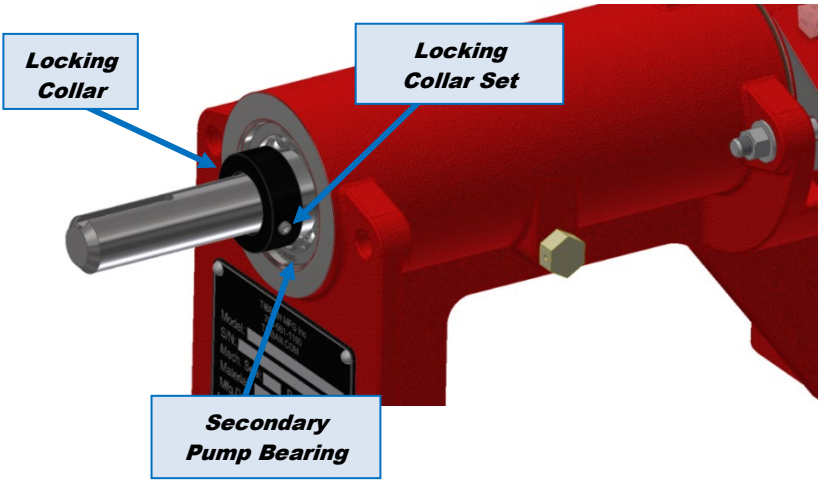
28. Now it is time to lock the Primary and Secondary Bearings into place. Press the Locking collar against the wide inner ring of the Primary Bearing then rotate the collar against the bearing so that the set screw faces the bottom of the pump and the drift pin hole is facing the top of the pump. Then fully tighten the Locking Collar Set Screw to the Pump Shaft to lock the Primary Pump Bearing to the Pump Shaft.



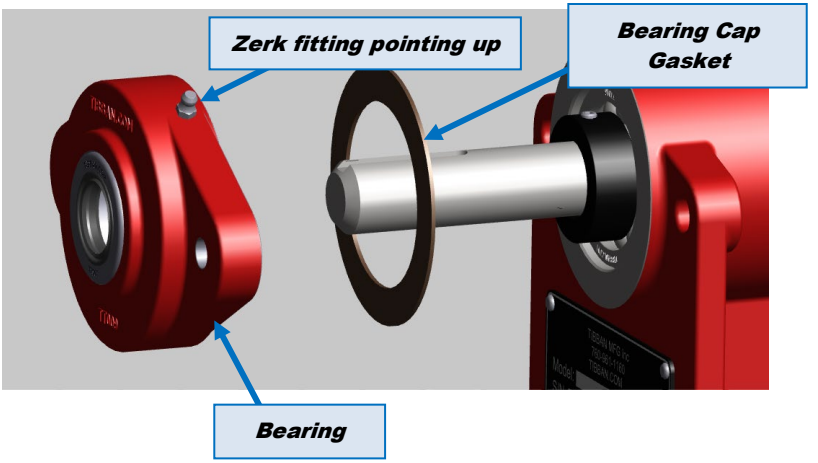
29. Install the mounting hardware for the bearing cap and fully tighten onto the pump pedestal. Double check that the Zerk fitting on the bearing cap is pointing up.



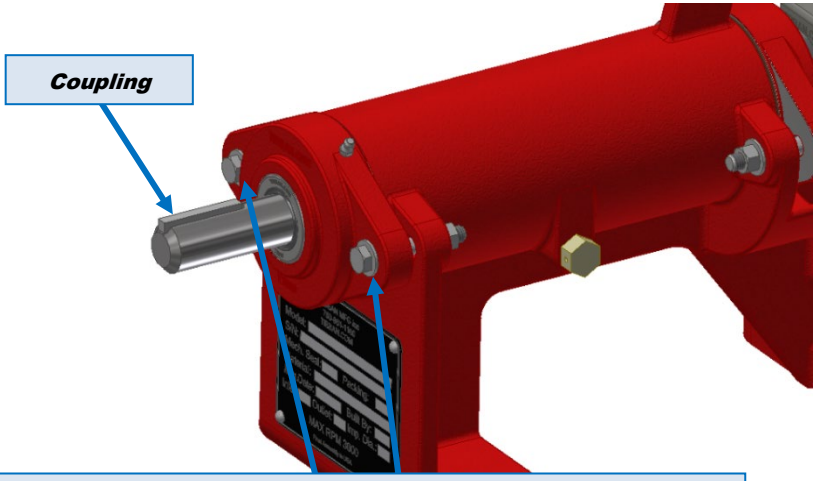
30. Focusing on the back of the pump, press the Locking Collar against the wide inner ring of the Secondary Bearing then rotate the collar against the bearing so that the set screw faces the bottom of the pump and the drift pin hole is facing the top of the pump. Then fully tighten the Locking Collar Set Screw to the Pump Shaft to lock the Secondary Pump Bearing to the Pump Shaft.



31. Slide the Bearing Cap and Bearing Cap Gasket onto the rear of the Pump. Make sure that the Bearing is thoroughly greased and the Zerk fitting is pointing up.



32. Install the mounting hardware for the bearing cap and fully tighten onto the pump pedestal. Next, install the Coupling Key onto the shaft.

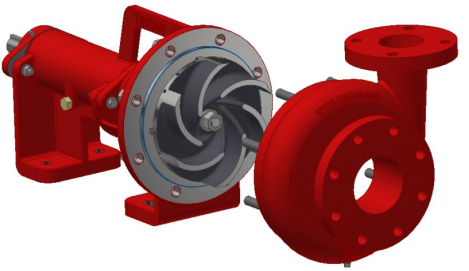


Fully tighten the Bearing Cap hardware onto the Pump Pedestal NOTE: Evenly tighten bolts so Bearing Cap is not at an angle.

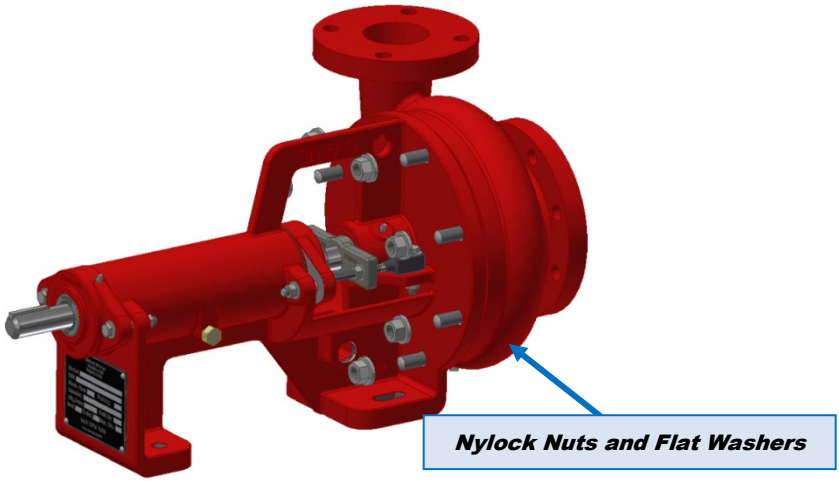
NOTE:
MAKE SURE THAT THE BOLTS ARE EVENLY TIGHTENED SO THAT THE BEARING CAP IS EVENLY FLUSH AGAINST THE PEDESTAL.

NOTE:
IF THE PUMP IS EQUIPPED WITH A MOTOR ADAPTER THEN INSTALL IT AT THIS TIME.

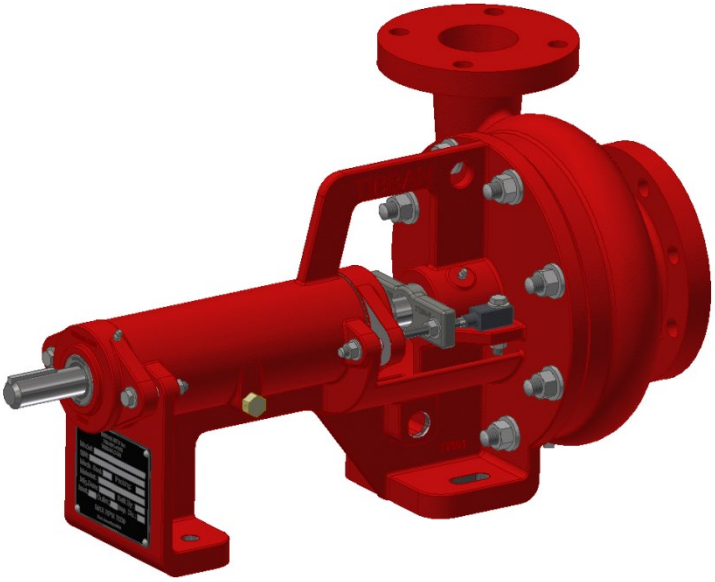
33. Now install the Pump Housing onto the Pump Pedestal.



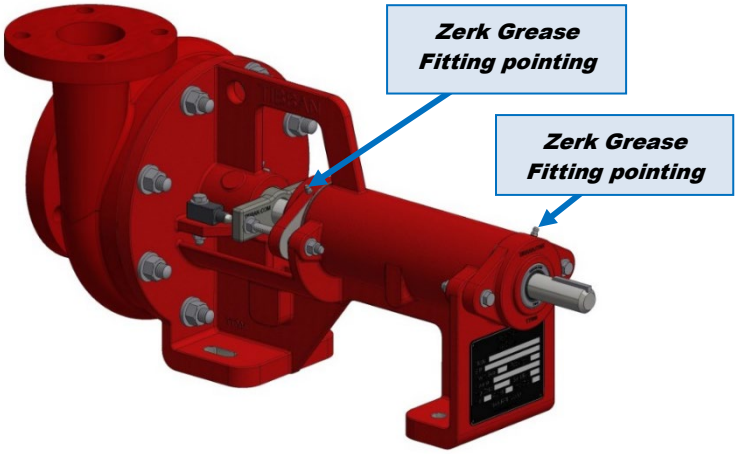
34. Install the Flat Washer and fully tighten the Nylock Nuts to secure the Pump Housing to the Pump Pedestal.



35. The spring from the Mechanical Seal is now pushing the Impeller against the spacer gaskets in the Housing.



36. The pump now is fully assembled and one last check to make sure Zerk Fitting is pointing up on the Primary and Secondary Bearing Cap.



PUMP INSPECTION

IMPELLER

Replace if impeller shows excessive erosion (especially on the pump-out vanes on the back of the impeller), corrosion, extreme wear, or vane breakage.

SHAFT

Check for run-out to see that the shaft has not been bent. If run-out exceeds 0.002 inch, replace the shaft. Bearing seats and oil seal area must be smooth and free of scratches or grooves. Shaft threads must be in good condition. Replace shaft, if necessary.

MECHANICAL SEAL

Seal faces, gaskets, and shaft sealing members, must be in perfect condition or excessive leakage may result. Replace worn or damaged parts.

PACKING BOX FOR ROPE PACKING

The packing box will need to be greased on a daily basis. We recommend Chevron SRI-2 or equivalent. We recommend that the same type of grease is used for both the packing box and the bearings because mixing different types of grease will sometimes cause incompatibility issues. Grease the packing until the grease comes out at the shaft or at the packing.

BEARINGS

Replace bearings if worn, loose, or rough and noisy when rotated. New bearings should not be unwrapped until ready for use. Replacement bearings must be of the proper size and type as supplied with the original equipment.

When greasing these bearings, Chevron SRI-2 or equivalent is recommended. When using a standard sized grease gun five (5) shots of grease every 2-3 months should be sufficient for a 24 hour operation. If running less than 24 hours reduce for less use.

SEALS

It is recommended that all O-ring and gasket seals be removed during disassembly and replaced. In those cases where new seals are not available, the old ones can be reused if they are not torn or otherwise damaged.

GENERAL

All parts should be clean before assembly. This is especially important for retaining rings and O-ring grooves, threads, gasket surfaces, bearings, and bearing surfaces. Any burrs should be removed with crocus cloth.

EXCESSIVE PACKING LEAKAGE AND RAPID PACKING WEAR

GENERAL

Most early packing failures are caused by over-tightening or poor installation.

PACKING APPEARANCE

If the packing removed is hard and brittle, it has been run dry some time in its life. This is often done in the first hour of service. The packing has more ability to grow with heat during its early life. Even if the packing is adjusted correctly before starting the pump, in the first few minutes of operation the packing will grow with heat and become over tightened. It will then run drop-tight and the packing will burn. ONCE THE PACKING IS BURNED IT WILL NEVER SEAL PROPERLY AGAIN. Let new packing leak more in the first few hours and then adjust it to 10-12 drops per minute.

INSTALLING WATER FLUSH SYSTEM TO BE ACCEPTABLE BY OIL COMPANIES

GENERAL

Many oil operators will not allow water to be put on the packing because of excess water getting into the mud, a result of poorly designed and maintained systems. Two major problems cause this complaint:

a. Too much line pressure

b. Not turning water off when pump is not in use.

CONTROLLING WHEN TO USE WATER ON PACKING

LARGE VOLUMES of water get into the mud when the pump is NOT OPERATING. When the pump is running, the shaft deflects. And when stopped, the shaft straightens up and a gap occurs down one side of the shaft between the packing and the shaft. This allows a stream of water to enter the mud. The water can be manually turned off when the pump is shut down but a better way is to install a solenoid valve in the water supply line that turns the water on and off as the motor is turned on and off.

Only a small amount of water (a few drops per minute) which gets into the mud while the pump is running should not be objectionable to the oil companies.

BEARING FAILURES AND HOW TO IMPROVE BEARING LIFE

GENERAL

Except for cavitation problems, bearing failure is the greatest cause of increased pump operating cost. If the pump continues to run when bearing failures occur, there is an excellent chance the entire pump will be destroyed. Therefore it is very important to change the bearings when failure starts. If a complete failure happens then other fluid end parts will be damaged. Bearing failure is more often caused by lubrication failure than by normal bearing wear.

MISALIGNMENT BETWEEN PUMP AND DRIVER

A major cause of bearing failures is misalignment. Alignment between the pump and motor should always be checked after shipment and periodically re-checked.

DETECTION OF BEARING FAILURE WHEN PUMP IS RUNNNING

The first indication of lubricant and bearing failure is a rapid rise in operating temperature. The temperature should be measured on the frame once a week to get a feel for how hot the bearings normally run. A sudden high increase in temperature normally means the bearings are beginning to fail and need changing.

A hand cannot be kept on the pump very for very long on unsatisfactory temperatures. If a hand is kept on the housing for 5 seconds the temperature is about 180°F, which is suitable for most pumps. If a hand cannot be kept on the housing for five seconds or if the bearing housing is too hot to the touch, there is most likely lubricant and/or bearing failure.

NOTE:
EXCEPT FOR CAVITATION ISSUES, THE BIGGEST CAUSE OF FAILURE IS INCREASED PUMP OPERATION.

CAUTION!
IF THE PUMP IS CONTINUED TO BE USED WHEN BEARING FAILURE OCCURS THERE IS A VERY GOOD CHANCE THE WHOLE PUMP MAY BE DESTROYED, THEREFORE IT IS VERY IMPORTANT TO CHANGE THE BEARINGS WHEN FAILURE STARTS. IF COMPLETE FAILURE OCCURS THEN OTHER PARTS AND FLUIDS WILL BE DAMAGED.

IDENTIFICATION OF BEARING FAILURE

ABNORMALLY HIGH TEMPERATURES

Normal operational temperature is less than 180°F. If a hand is held on the bearing housing for 5 seconds or longer the bearing temperature is running in a normal range (suitable for most pumps). If the bearing housing is too hot to put a hand on it, the pump probably has lubricant or bearing failure.

GREASE APPEARANCE

Indications of lubrication failure are:

1. Grease is stiff or cracked.
2. Changes in color (usually darker, or jet black)
3. Grease has an odor of burned petroleum

NOTE:
IN THE CASE OF LITHIUM BASED GREASE, BURNED GREASE HAS AN APPEARANCE OF GLOSSY BRITTLE VARNISH WHICH WILL SHATTER WHEN PUNCTURED WITH A SHARP OBJECT.

Grease is a mixture of oil and usually soap, when a pump sits for a long period of time the grease separate and run out of the bearing. It will appear there is still grease in the bearing but it will not have any lubricant properties. It is necessary to re-grease the bearings after sitting for long periods of time before running. In the case of sealed bearings they will need to be replaced after sitting for a prolonged period of time.

NOISE

Lack of lubrication is usually accompanied by a whistling noise coupled with a rise in temperature. If not corrected the bearing temperature will continue to rise and the intense heating will reduce the bearing hardness.

BEARING DISCOLORATION

A brownish or bluish discoloration indicates that the bearing operating temperature was excessively high, to the extent that the bearing lost its physical properties and was no longer operable.

RETAINER FAILURE

The bearing part that first indicates distress in lubrication failure is usually the retainer, where the greatest amount of rubbing takes place increasing the probability of early failure. Always be sure to use good clean lubricant from a tube and not from an open bucket.

DIRTY LUBRICATION

Contaminates found in lubricants often act as an abrasive compound, which will lap or polish ball and race surfaces, increasing the probability of failure. Always be sure to use clean lubricant from a tube and NOT from an open bucket.

TOO MUCH LUBRICANT

A very common error in the maintenance of machinery is the tendency to over lubricate. If the bearing reservoir is kept consistently full of grease, the friction heat developed within the lubricant cannot get out and will cause its rapid deterioration.

WRONG KIND OF LUBRICANT

After experimentation of many different lubrications, we recommend Chevron SRI Grease 2 or its equivalent in as far as availability allows, the same lubricant should be used or its equivalent.

CAUTION!
MANY TYPES OF GREASE ARE INCOMPATIBLE AND ALTHOUGH COMPLETELY ADEQUATE WHEN USED INDIVIDUALLY, MAY PROVE UNSATISFACTORY WHEN MIXED.

MISCELLANEOUS INFORMATION

OPERATING LIMITS OF RIG CENTRIFUGAL PUMPS

As with any type of equipment, centrifugal pumps have operating limits. Observing these limits will extend the life of the pumps.

SUCTION LINE VELOCITY

Suction line velocity should not exceed 8.5 feet per second for reasonable pump life. This means the maximum flow for a 6 inch suction is 900 GPM and an 8 inch suction is 1600 GPM. If a flow more than 1600 GPM is desired then a 10 inch or larger suction line should be installed.

NET POSITIVE SUCTION HEAD (NPSH)

The system must have enough NPSH for the pump requirements or the pump will cavitate, greatly reducing its life.

It appears that most installations do not have enough NPSH to run a 6x5 pump at flows above 1400GPM even with an 8 inch suction. (This does not mean that no one has enough NPSH). The result of inadequate NPSH is cavitation and early pump failure.

CAPACITY REQUIREMENTS OF EQUIPMENT IN RIG APPLICATIONS

The chart below lists the normal design requirements when the equipment is new with no wear.

EQUIPMENT VOLUME	DESIGN
4" CONE	60 GPM
4H (5") CONE	80 GPM
6" CONE	125 GPM
8" CONE	250 GPM
10" CONE	500 GPM
6" MUD HOPPER	550 GPM
¾" NOZZLE	80 GPM
1" NOZZLE	150 GPM
1 ½" NOZZLE	300 GPM
2" NOZZLE GPM	550 to 660
MECHANICAL BRAKES	40 to 50 GPM
ELECTRIC BRAKES GPM	50 to 200

TROUBLESHOOTING

EXCESSIVE WATER LEAKING AND RAPID PACKING FAILURE:

It is normal to have some water leaking through the packing. Excessive leaking would be more than 12 drops per minute. If there is excessive leaking at the packing, the pump will need to be repacked. Excessive leaking is generally caused by groove in the shaft. The shaft can be checked for grooves by removing the packing and sliding a wire with a short section of the tip bent 90° across the shaft to detect damage on the shaft. If there are deep grooves in the shaft then the shaft will need to be replaced.

PACKING BURNED

If the packing is burned and hard when removed the packing was over tightened and the lack of leakage and/or lack of proper greasing caused the packing to burn. This will cause the packing to become hard and no longer soft and pliable which could cause damage to the shaft. To prevent this from happening, loosen the packing glands by ¼ turn, after packing to prevent burning the packing.

LONG TERM PUMP AND MOTOR STORAGE

1. Pump packages should be stored indoors, in a clean, dry and protected environment.
2. The storage area is to be free of any vibration and from extreme temperatures.
3. Motor and pump shafts are to be rotated manually every two months. A record of the rotation should be made.
4. Grease in the packing and the bearings will need to be purged at the time of removal from storage, making sure that an ample supply of fresh grease is in each grease cavity. In the case of sealed bearings, they will need to be replaced after prolonged storage.
5. If the pumps are to be stored outside, the pump suction and discharge openings should be sealed to prevent any water from entering the pump housing causing rust during the wet end during storage.

CUSTOMER SERVICE

- **www.mudpuppyinc.com**
- **Phone: 442-242-7507**
- **Also contact at 530-662-5055**

MUD PUPPY 118 PUMP AND WET END KIT ORDER SHEET

118 Pump — *Sample Number: TT118SS43RH7M*

TT118

Housing	
21	2X1-1/2" Housing
32	3X2" Housing
43	4X3" Housing

Material	
4	Cast Iron
7	Chrome Hardened

Shaft Configuration	
SS	Stub Shaft
MA	Motor Adapter

Rotation	
RH	Right Hand
LH	Left Hand

Seal	
M	Mechanical Seal
R	Rope Packing

118 Wet End — *Sample Number: TT118WE43RH7M*

TT118WE

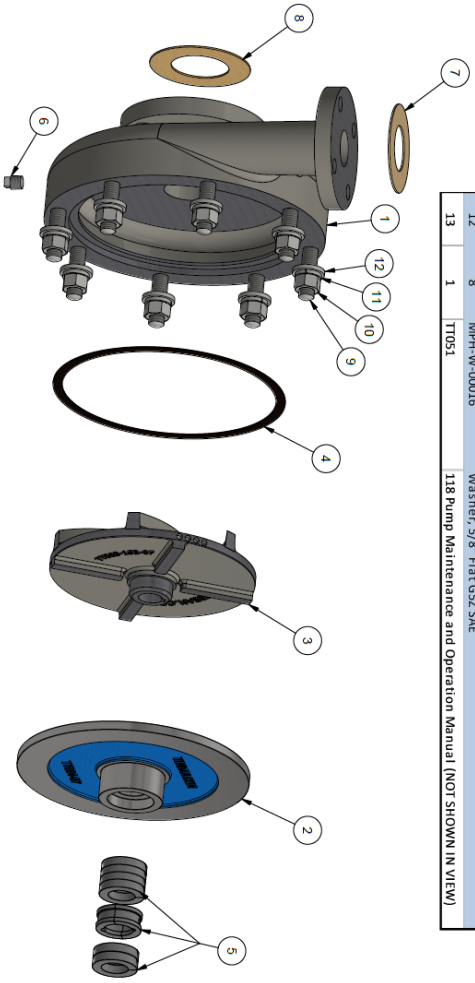
Housing	
21	2X1-1/2" Housing
32	3X2" Housing
43	4X3" Housing

Material	
4	Cast Iron
7	Chrome Hardened

Rotation	
RH	Right Hand
LH	Left Hand

Seal	
M	Mechanical Seal
R	Rope Packing

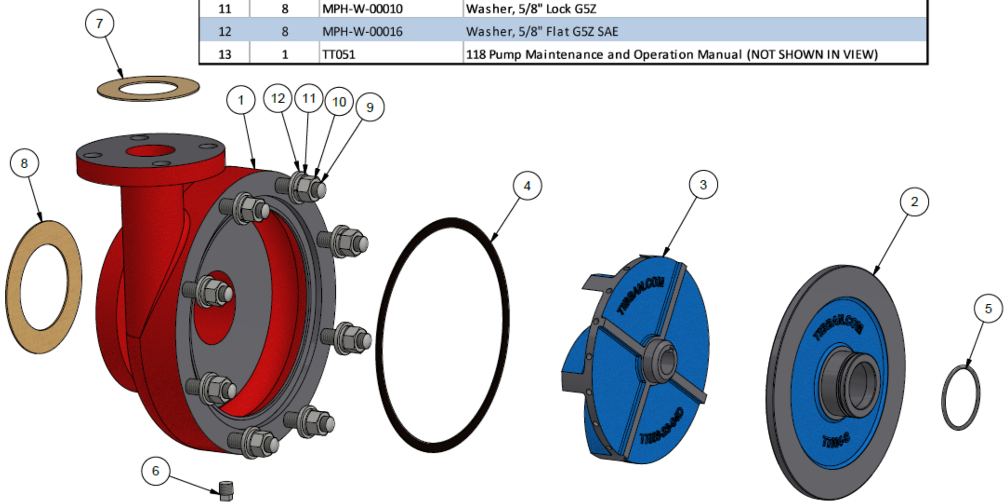
118 PUMP WET END KIT 2X1-1/2 CHROME PACKED SEAL



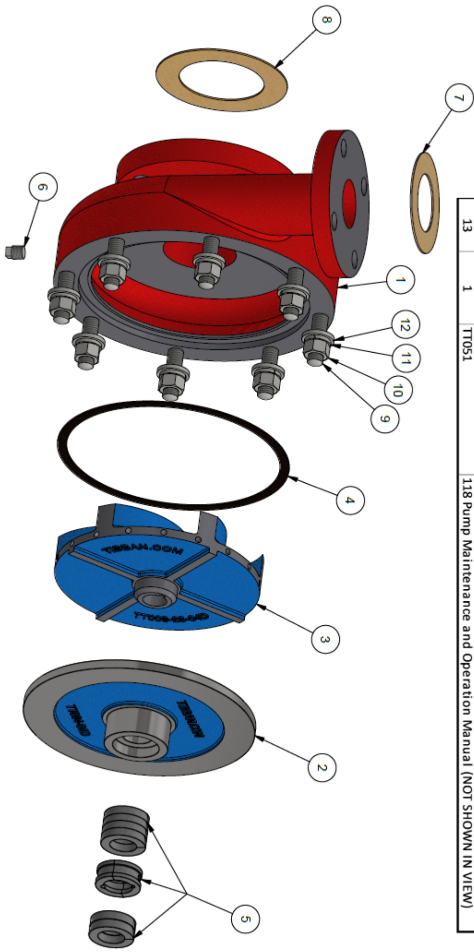
TT118WE21RH7R 118 PUMP WET END KIT 2X1-1/2 CHROME PACKED SEAL			
Item	Qty	Part Number	Desecription
1	1	TT002-12-07	Housing, 118 Pump, 2X3, RH, Chrome
2	1	TT004-07	Wear Plate, 118 Pump Rope Packing Chrome
3	1	TT003-12-07	Impeller, 118 Pump 2X3X8.5 RH Chrome
4	1	TT013	Gasket, 118 Housing
5	1	TT018	Kit, Rope Packing, Kevlar, 118 Pump
6	1	MPH-U-00003	Plug, Drain 1/4-28
7	1	TT047	Gasket, 2" Ring Bolt Flange
8	1	TT048	Gasket, 3" Ring Bolt Flange
9	8	MPH-D-00001	Stud, 5/8-11 X 2 3/4" 118 Pump Housing
10	8	MPH-N-00005	Hex Nut, 5/8-11, Grade 5
11	8	MPH-W-00010	Washer, 5/8" Lock GSZ
12	8	MPH-W-00016	Washer, 5/8" Flat GSZ SAE
13	1	TT051	118 Pump Maintenance and Operation Manual (NOT SHOWN IN VIEW)

118 PUMP WET END KIT 3X2 DUCTILE IRON MECHANICAL SEAL

TT118WE32RH4M 118 PUMP WET END KIT 3X2 DUCTILE IRON MECHANICAL SEAL			
Item	**Qty**	**Part Number**	**Description**
1	1	TT002-23-04D	Housing, 118 Pump, 2X3, RH, Ductile Iron
2	1	TT004-S	Wear Plate, 118 Pump, Mechanical Seal Ductile Iron
3	1	TT003-23-04D	Impeller 118 Pump 2X3X8.5 RH Ductile Iron
4	1	TT013	Gasket, 118 Housing
5	1	MPH-R-00002	O-Ring, Wear Plate 118 Mechanical Seal
6	1	MPH-U-00003	Plug, Drain 1/4-28
7	1	TT047	Gasket, 2" Ring Bolt Flange
8	1	TT048	Gasket, 3" Ring Bolt Flange
9	8	MPH-D-00001	Stud, 5/8-11 X 2 3/4" (118 Pump Housing
10	8	MPH-N-00005	Hex Nut, 5/8-11, Grade 5
11	8	MPH-W-00010	Washer, 5/8" Lock G5Z
12	8	MPH-W-00016	Washer, 5/8" Flat G5Z SAE
13	1	TT051	118 Pump Maintenance and Operation Manual (NOT SHOWN IN VIEW)



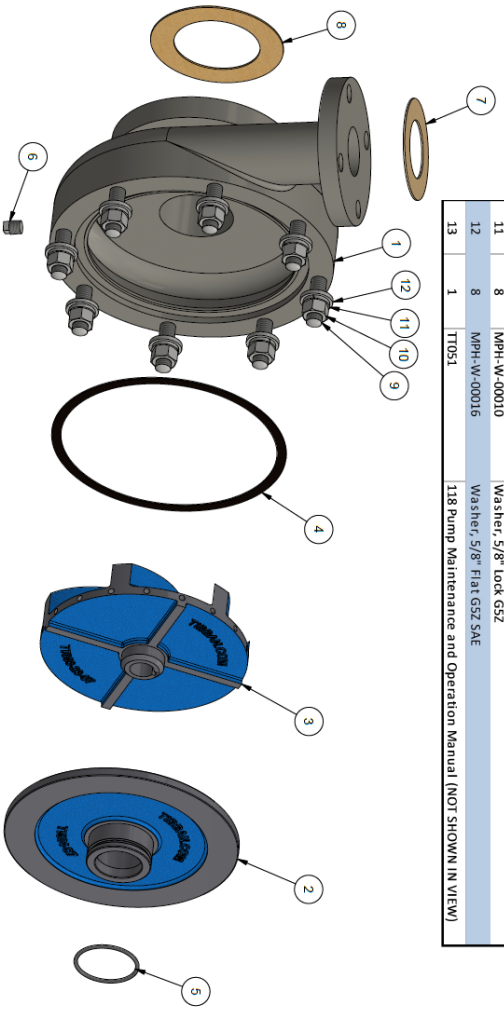
118 PUMP WET END KIT 3X2 DUCTILE IRON PACKED SEAL



TT118WE32RH4R 118 PUMP WET END KIT 3X2 DUCTILE IRON PACKED SEAL

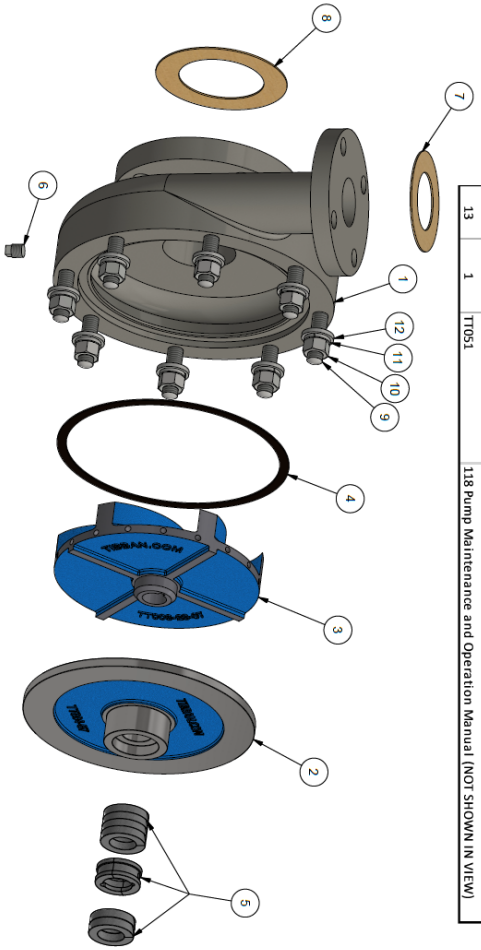
Item	Qty	Part Number	Description
1	1	TT002-23-04D	Housing, 118 Pump, 2X3, RH, Ductile Iron
2	1	TT004-04D	Wear Plate, 118 Pump Rope Packing Ductile Iron
3	1	TT003-23-04D	Impeller, 118 Pump 2X3X8.5 RH Ductile Iron
4	1	TT013	Gasket, 118 Housing
5	1	TT018	Kit, Rope Packing, Kevlar, 118 Pump
6	1	MPH-U-00003	Plug, Drain 1/4-28
7	1	TT047	Gasket, 2" Ring Bolt Flange
8	1	TT048	Gasket, 3" Ring Bolt Flange
9	8	MPH-D-00001	Stud, 5/8-11 X 2 3/4" (118 Pump Housing
10	8	MPH-N-00005	Hex Nut, 5/8-11, Grade 5
11	8	MPH-W-00010	Washer, 5/8" Lock G5Z
12	8	MPH-W-00016	Washer, 5/8" Flat G5Z SAE
13	1	TT051	118 Pump Maintenance and Operation Manual (NOT SHOWN IN VIEW)

118 PUMP WET END KIT 3X2 CHROME MECHANICAL SEAL



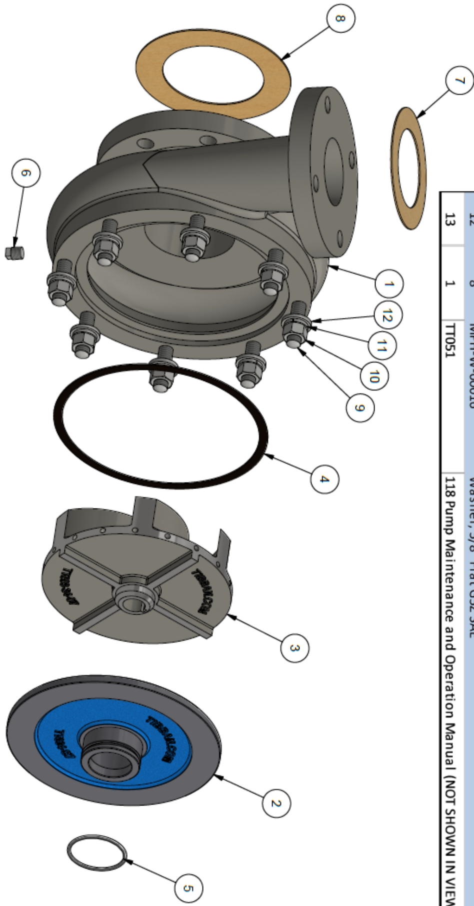
TT118WE32RH7M 118 PUMP WET END KIT 3X2 CHROME MECHANICAL SEAL			
Item	Qty	Part Number	Desecription
1	1	TT002-23-07	Housing, 118 Pump, 2X3, RH, Chrome
2	1	TT004-57	Wear Plate, 118 Pump, Mechanical Seal Chrome
3	1	TT003-23-07	Impeller 118 Pump 2X3X8.5 Chrome
4	1	TT013	Gasket, 118 Housing
5	1	MPH-R-00002	O-Ring, Wear Plate 118 Mechanical Seal
6	1	MPH-U-00003	Plug, Drain 1/4-28
7	1	TT047	Gasket, 2" Ring Bolt Flange
8	1	TT048	Gasket, 3" Ring Bolt Flange
9	8	MPH-D-00001	Stud, 5/8-11 X 2 3/4" (118 Pump Housing
10	8	MPH-N-00005	Hex Nut, 5/8-11, Grade 5
11	8	MPH-W-00010	Washer, 5/8" Lock GSZ
12	8	MPH-W-00016	Washer, 5/8" Flat GSZ SAE
13	1	TT051	118 Pump Maintenance and Operation Manual (NOT SHOWN IN VIEW)

118 PUMP WET END KIT 3X2 CHROME PACKED SEAL



TT118WE32RH7R 118 PUMP WET END KIT 3X2 CHROME PACKED SEAL			
Item	**Qty**	**Part Number**	**Desecription**
1	1	TT002-23-07	Housing, 118 Pump, 2X3, RH, Chrome
2	1	TT004-07	Wear Plate, 118 Pump Rope PackingChrome
3	1	TT003-23-07	Impeller, 118 Pump 2X3X8.5 RH Chrome
4	1	TT013	Gasket, 118 Housing
5	1	TT018	Kit, Rope Packing, Kevlar, 118 Pump
6	1	MPH-U-00003	Plug, Drain 1/4-28
7	1	TT047	Gasket, 2" Ring Bolt Flange
8	1	TT048	Gasket, 3" Ring Bolt Flange
9	8	MPH-D-00001	Stud, 5/8-11 X 2 3/4" (118 Pump Housing
10	8	MPH-N-00005	Hex Nut, 5/8-11, Grade 5
11	8	MPH-W-00010	Washer, 5/8" Lock GSZ
12	8	MPH-W-00016	Washer, 5/8" Flat GSZ SAE
13	1	TT051	118 Pump Maintenance and Operation Manual (NOT SHOWN IN VIEW)

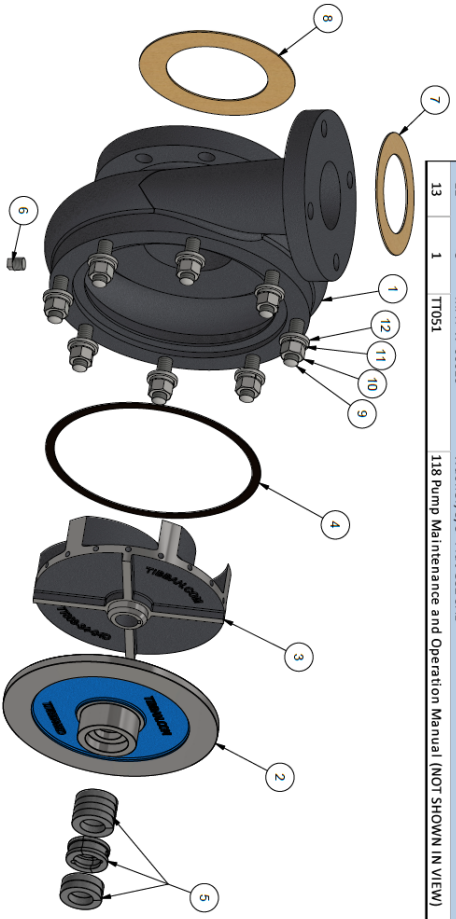
118 PUMP WET END KIT 4X3 DUCTILE IRON MECHANICAL SEAL



TT118WE43RH4M 118 PUMP WET END KIT 4X3 DUCTILE IRON MECHANICAL SEAL

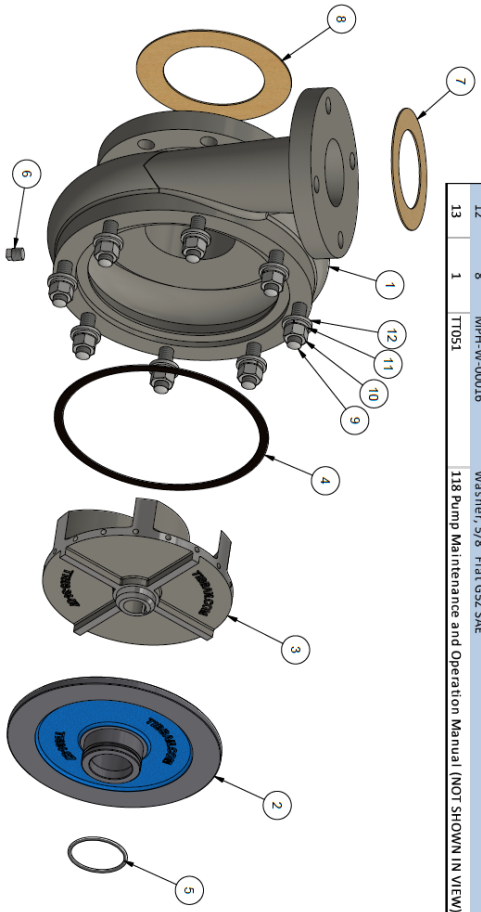
Item	Qty	Part Number	Description
1	1	TT002-34-04D	Housing, 118 Pump, 3X4, RH, Ductile Iron
2	1	TT004-S	Wear Plate, 118 Pump, Mechanical Seal Ductile Iron
3	1	TT003-34-04D	Impeller 118 Pump 3X4X8.5 RH Ductile Iron
4	1	TT013	Gasket, 118 Housing
5	1	MPH-R-00002	O-Ring, Wear Plate 118 Mechanical Seal
6	1	MPH-U-00003	Plug, Drain 1/4-28
7	1	TT048	Gasket, 3" Ring Bolt Flange
8	1	TT049	Gasket, 4" Ring Bolt Flange
9	8	MPH-D-00001	Stud, 5/8-11 X 2 3/4" 118 Pump Housing
10	8	MPH-N-00005	Hex Nut, 5/8-11, Grade 5
11	8	MPH-W-00010	Washer, 5/8" Lock G5Z
12	8	MPH-W-00016	Washer, 5/8" Flat G5Z SAE
13	1	TT051	118 Pump Maintenance and Operation Manual (NOT SHOWN IN VIEW)

118 PUMP WET END KIT 4X3 DUCTILE IRON PACKED SEAL



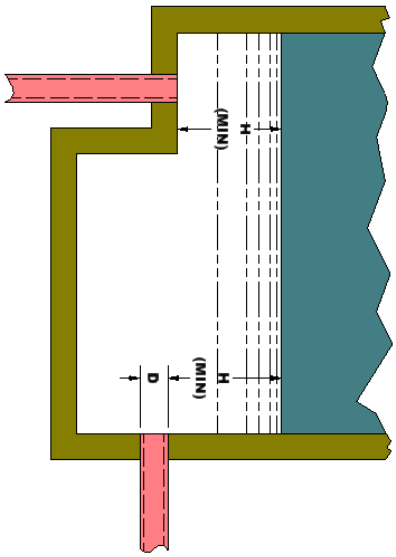
TT118WE43RH4R 118 PUMP WET END KIT 4X3 DUCTILE IRON PACKED SEAL			
Item	**Qty**	**Part Number**	**Desecription**
1	1	TT002-34-04D	Housing, 118 Pump, 3X4, RH, Ductile Iron
2	1	TT004-04D	Wear Plate, 118 Pump, Rope Packing Ductile Iron
3	1	TT003-34-04D	Impeller 118 3X4X8.5 RH Ductile Iron
4	1	TT013	Gasket, 118 Housing
5	1	TT018	Kit, Rope Packing, Kevlar, 118 Pump
6	1	MPH-U-00003	Plug, Drain 1/4-28
7	1	TT048	Gasket, 3" Ring Bolt Flange
8	1	TT049	Gasket, 4" Ring Bolt Flange
9	8	MPH-D-00001	Stud, 5/8-11 X 2 3/4" (118 Pump Housing
10	8	MPH-N-00005	Hex Nut, 5/8-11, Grade 5
11	8	MPH-W-00010	Washer, 5/8" Lock GSZ
12	8	MPH-W-00016	Washer, 5/8" Flat GSZ SAE
13	1	TT051	118 Pump Maintenance and Operation Manual (NOT SHOWN IN VIEW)

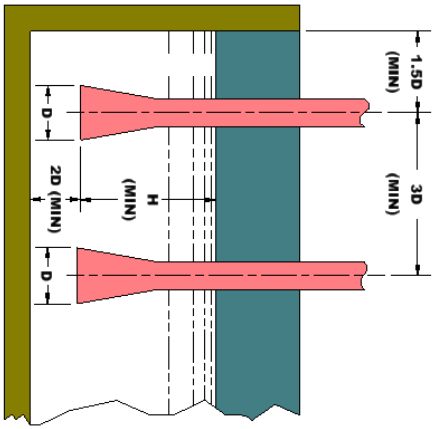
118 PUMP WET END KIT 4X3 CHROME MECHANICAL SEAL



TT118WE43RH7M 118 PUMP WET END KIT 4X3 CHROME MECHANICAL SEAL			
Item	**Qty**	**Part Number**	**Desecription**
1	1	TT002-34-07	Housing, 118 Pump, 3X4, RH, Chrome
2	1	TT004-57	Wear Plate, 118 Pump, Mechanical Seal Chrome
3	1	TT003-34-07	Impeller 118 Pump 3X4X8.5 RH Chrome
4	1	TT013	Gasket, 118 Housing
5	1	MPH-R-00002	O-Ring, Wear Plate 118 Mechanical Seal
6	1	MPH-U-00003	Plug, Drain 1/4-28
7	1	TT048	Gasket, 3" Ring Bolt Flange
8	1	TT049	Gasket, 4" Ring Bolt Flange
9	8	MPH-D-00001	Stud, 5/8-11 X 2 3/4" (118 Pump Housing)
10	8	MPH-N-00005	Hex Nut, 5/8-11, Grade 5
11	8	MPH-W-00010	Washer, 5/8" Lock GSZ
12	8	MPH-W-00016	Washer, 5/8" Flat GSZ SAE
13	1	TT051	118 Pump Maintenance and Operation Manual (NOT SHOWN IN VIEW)

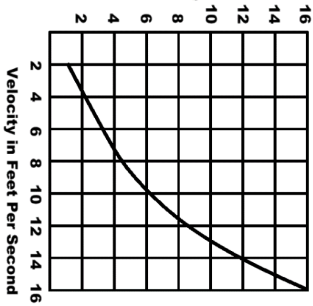
PIPING RECOMMENDATIONS



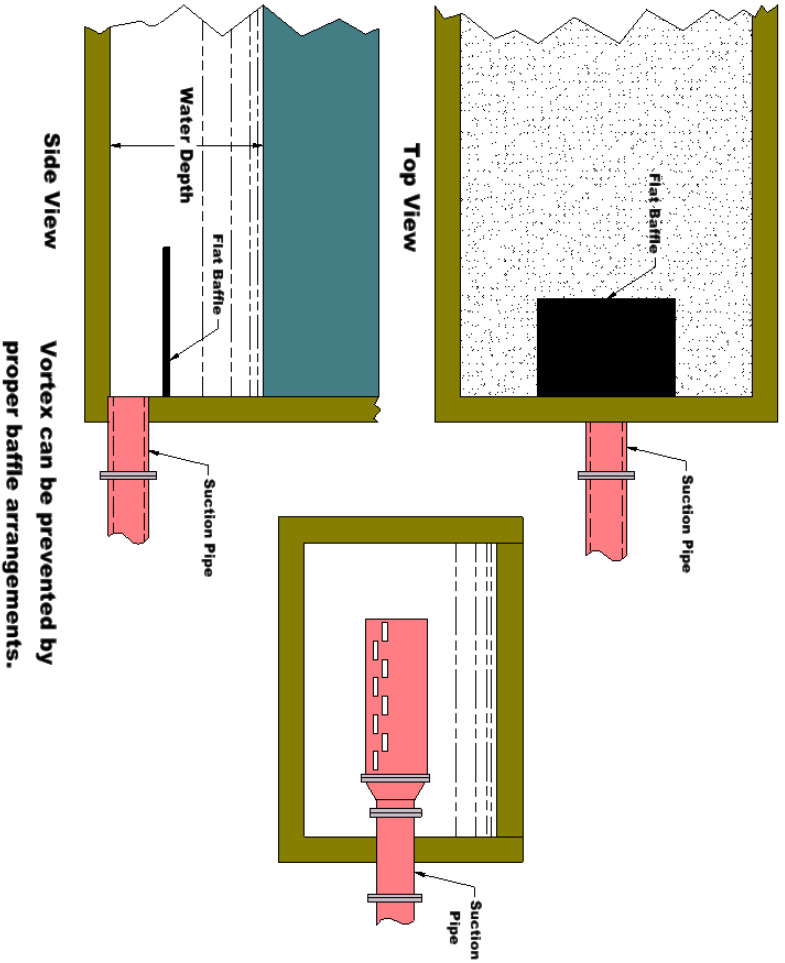


This can be used as a guide for minimum submergence and piping design.

$$\text{Velocity, feet per sencond} = \frac{\text{GPM X .4}}{D^2 \text{ (inches)}}$$

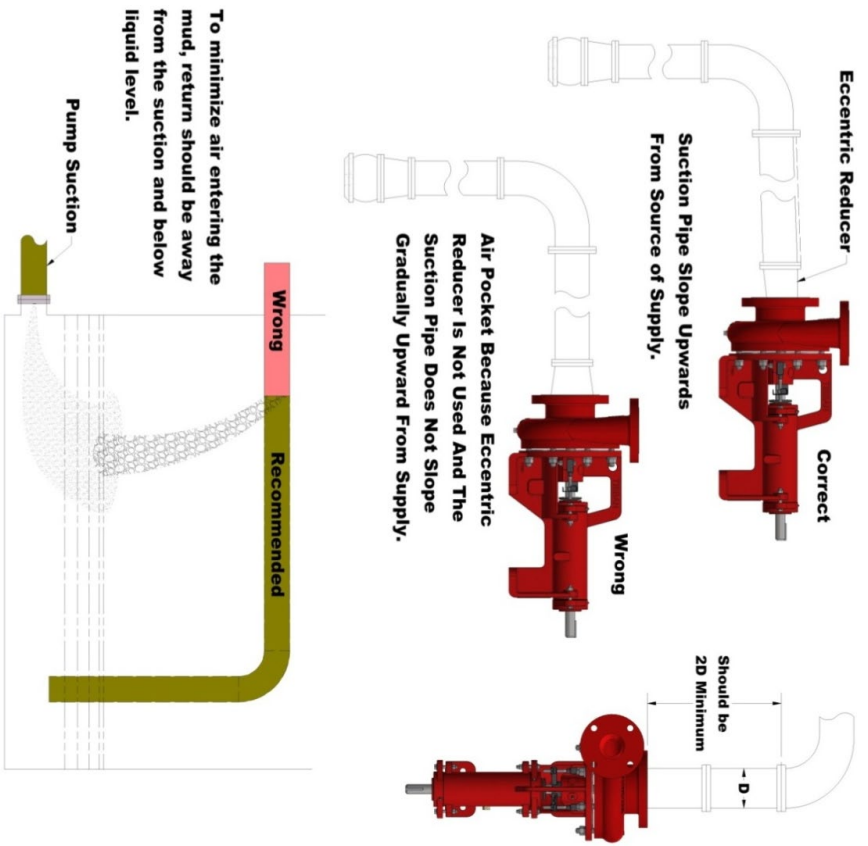


PIPING RECOMMENDATIONS (CONTINUED)

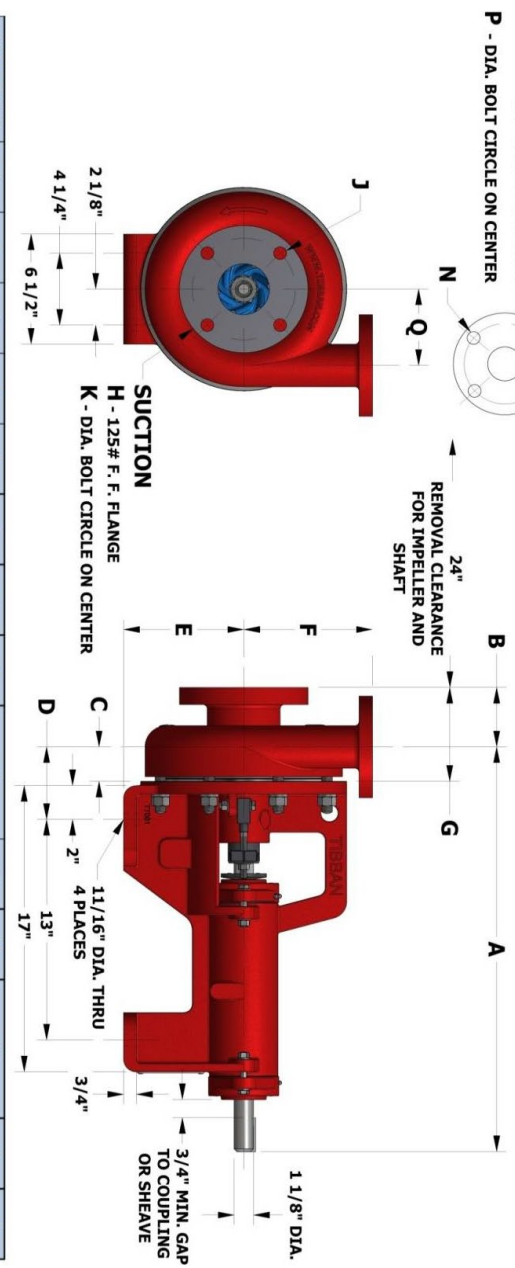


Vortex can be prevented by proper baffle arrangements.

PIPING RECOMMENDATIONS (CONTINUED)

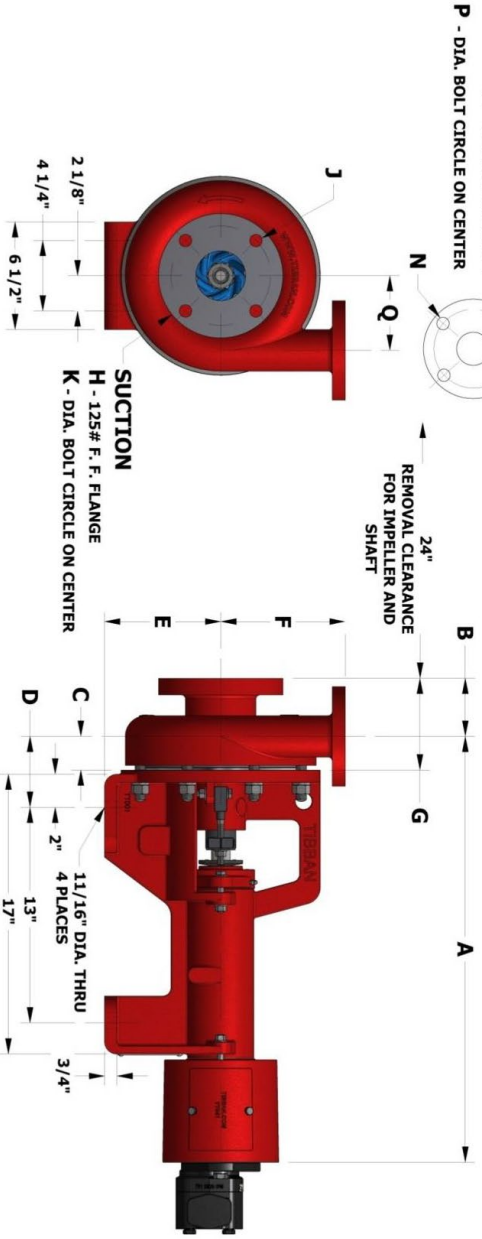


118 PUMP DIMENSIONS STUB SHAFT



118 PUMP SIZE	A	B	C	D	E	F	G	H	J	K	M	N	P	Q
1 1/2" X 2"	23 5/8"	3"	1 5/8"	3 7/8"	7 3/16"	7 1/2"	4 5/8"	2"	3/4" DIA - 4 PLACES	3 7/8"	1 1/2"	5/8" DIA - 4 PLACES	3 7/8"	4 3/4"
2" X 3"	23 5/8"	3 1/2"	1 3/4"	4"	7 3/16"	7 1/2"	5 1/4"	3"	3/4" DIA - 4 PLACES	4 3/4"	2"	3/4" DIA - 4 PLACES	4 3/4"	4 1/2"
3" X 4"	24 1/32"	4 1/8"	2 1/8"	4 3/8"	7 3/16"	8"	6 1/4"	4"	3/4" DIA - 8 PLACES	6"	3"	3/4" DIA - 4 PLACES	6"	5"

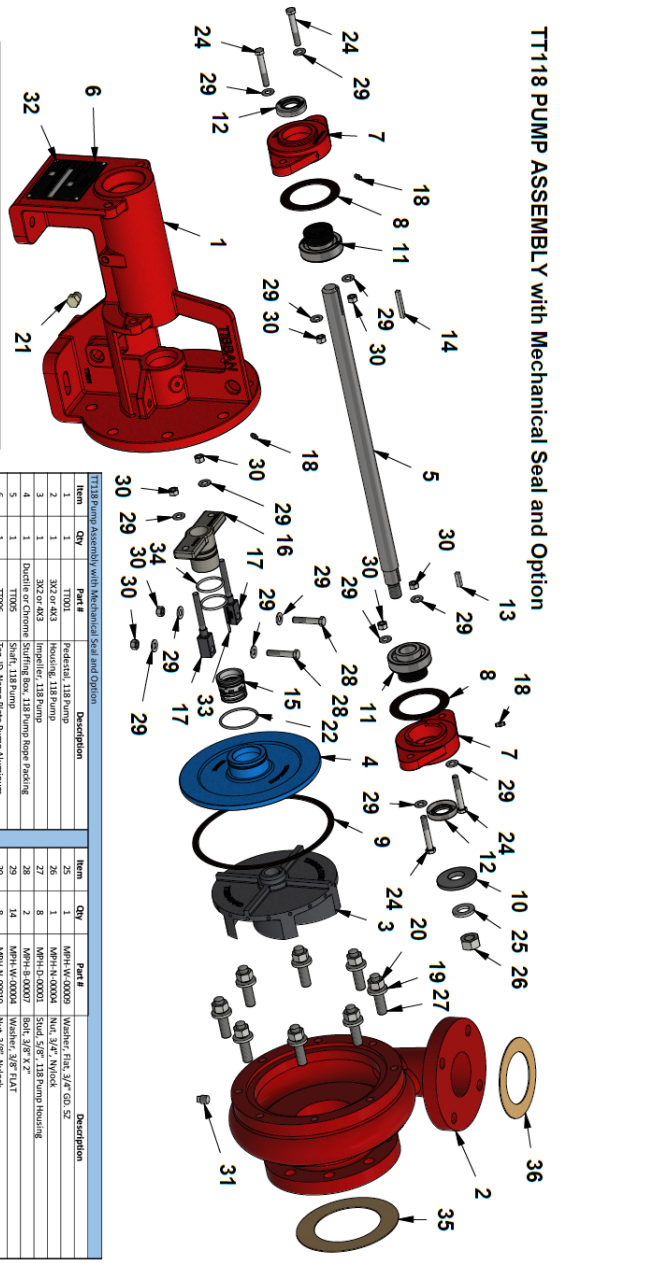
118 PUMP DIMENSIONS MOTOR ADAPTER



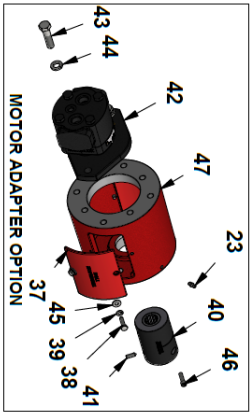
118 PUMP SIZE	A	B	C	D	E	F	G	H	J	K	M	N	P	Q
1 1/2" X 2"	25 11/16"	3"	1 5/8"	3 7/8"	7 3/16"	7 1/2"	4 5/8"	2"	3/4" DIA - 4 PLACES	3 7/8"	1 1/2"	5/8" DIA - 4 PLACES	3 7/8"	4 3/4"
2" X 3"	25 11/16"	3 1/2"	1 3/4"	4"	7 3/16"	7 1/2"	5 1/4"	3"	3/4" DIA - 4 PLACES	4 3/4"	2"	3/4" DIA - 4 PLACES	4 3/4"	4 1/2"
3" X 4"	25 27/32"	4 1/8"	2 1/8"	4 3/8"	7 3/16"	8"	6 1/4"	4"	3/4" DIA - 8 PLACES	6"	3"	3/4" DIA - 4 PLACES	6"	5"

118 PUMP ASSEMBLY WITH MECHANICAL SEAL AND OPTION

TT118 PUMP ASSEMBLY with Mechanical Seal and Option



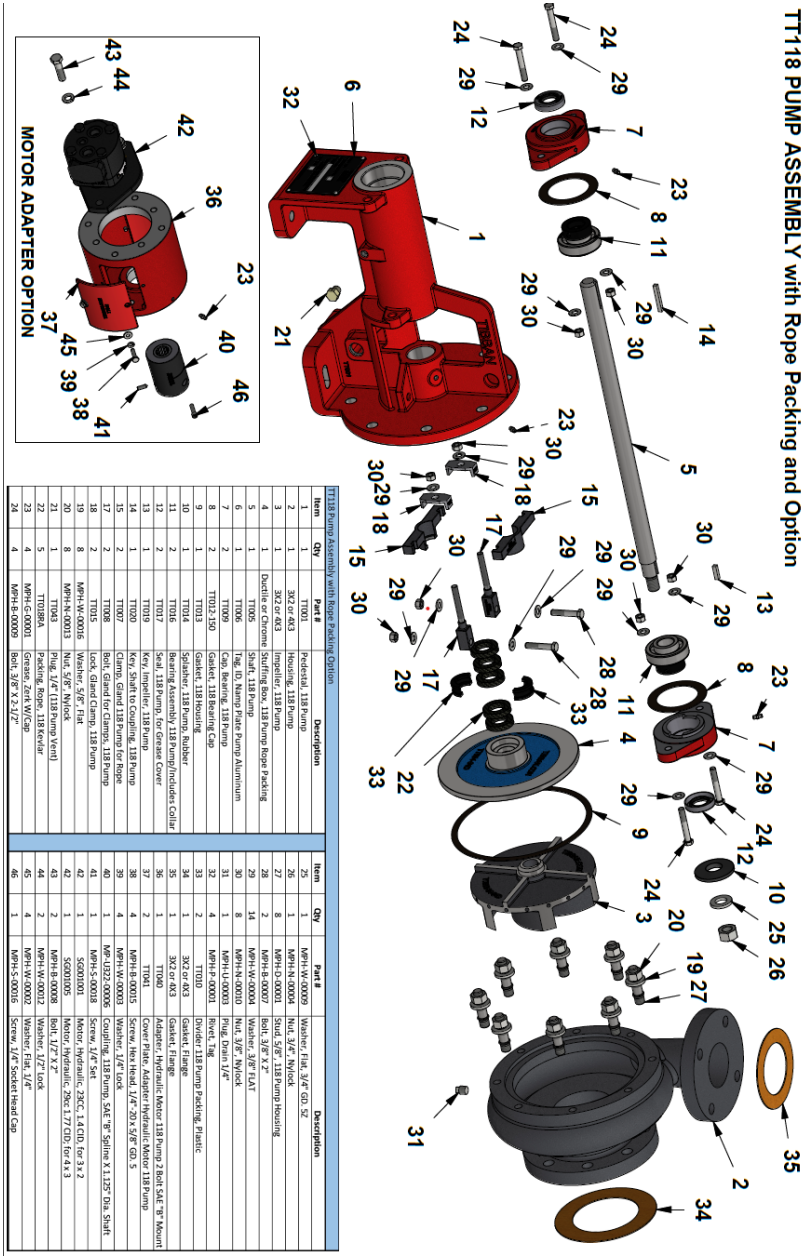
MOTOR ADAPTER OPTION



TT118 Pump Assembly with Mechanical Seal and Option

Item	Qty	Part #	Description
1	1	TT001	Pedestal, 118 Pump
3	1	302 or 403	Housing, 118 Pump
4	1	302 or 403	Impeller, 118 Pump
5	1	Ductile or Chrome	Stuffing Box, 118 Pump Rope Packing
6	1	TT005	Tag, ID, Motor Plate Pump Aluminum
7	2	TT009	Cap, Bearing, 118 Pump
8	2	TT013-150	Gasket, 118 Housing
9	1	TT013	Gasket, 118 Housing Cap
10	1	TT014	Splasher, 118 Pump, Rubber
11	2	TT016	Bearing Assembly 118 Pump/Includes Collar
12	2	TT017	Seal, 118 Pump, for Grease Cover
13	1	TT019	Key, Impeller, 118 Pump
14	1	TT020	Key, Shaft to Coupling, 118 Pump
15	1	TT021	Seal, Mechanical, 118
16	1	TT054	Sleeve, Mechanical Seal, 118 Pump
17	2	TT008	Bolt, Gland for Clamps, 118 Pump
18	1	TT039	Plug, 1/8" (Drain)
19	8	MPH-W-00016	Washer, 5/8", Flat
20	8	MPH-N-00013	Nut, 5/8", Nylock
21	1	TT043	Plug, 1/4" (118 Pump Vent)
22	1	MPH-R-00002	O-Ring, Wear Plate, 118 Mechanical Seal
23	3	MPH-G-00001	Grease, Zerk W/Cap
24	4	MPH-B-00009	Bolt, 3/8" X 2-1/2"
25	1	MPH-W-00009	Washer, Flat, 3/4" GD. 5Z
26	1	MPH-N-00004	Nut, 3/4", Nylock
27	2	MPH-D-00001	Stud, 5/8" X 3"
28	2	MPH-W-00002	Washer, 5/8" FLAT
29	14	MPH-N-00010	Nut, 3/8", Nylock
30	8	MPH-U-00003	Plug, Drain 1/4"
31	1	MPH-P-00001	Rivet, Tag
32	4	MPH-P-00002	Pin
33	2	MPH-R-00001	O-Ring, Mechanical Seal Holder, 118 Pump
34	2	302 or 403	Gasket, Flange
35	1	302 or 403	Gasket, Flange
36	1	TT041	Cover Plate, Adapter Hydraulic Motor 118 Pump
37	2	MPH-B-00015	Screw, Hex Head, 1/4"-20 x 5/8" GD. 5
38	4	MPH-W-00003	Washer, 1/4" Lock
39	4	MP-U322-00006	Coupling, 118 Pump, SAE "B" Spline X 1.125" Dia. Shaft
40	1	MPH-S-00018	Screw, 1/4" Set
41	1	SG001001	Motor, Hydraulic, 23CC, 1.4 CID, for 3 x 2
42	1	SG001005	Motor, Hydraulic, 29cc 1.77 CID, for 4 x 3
43	2	MPH-B-00008	Bolt, 1/2" x 2"
44	2	MPH-W-00012	Washer, 1/2" Lock
45	4	MPH-W-00002	Washer, Flat, 1/4"
46	1	MPH-S-00016	Screw, 1/4" Socket Head Cap
47	1	TT040	Adapter, Hydraulic Motor 118 Pump 2 Bolt SAE "B" Mount

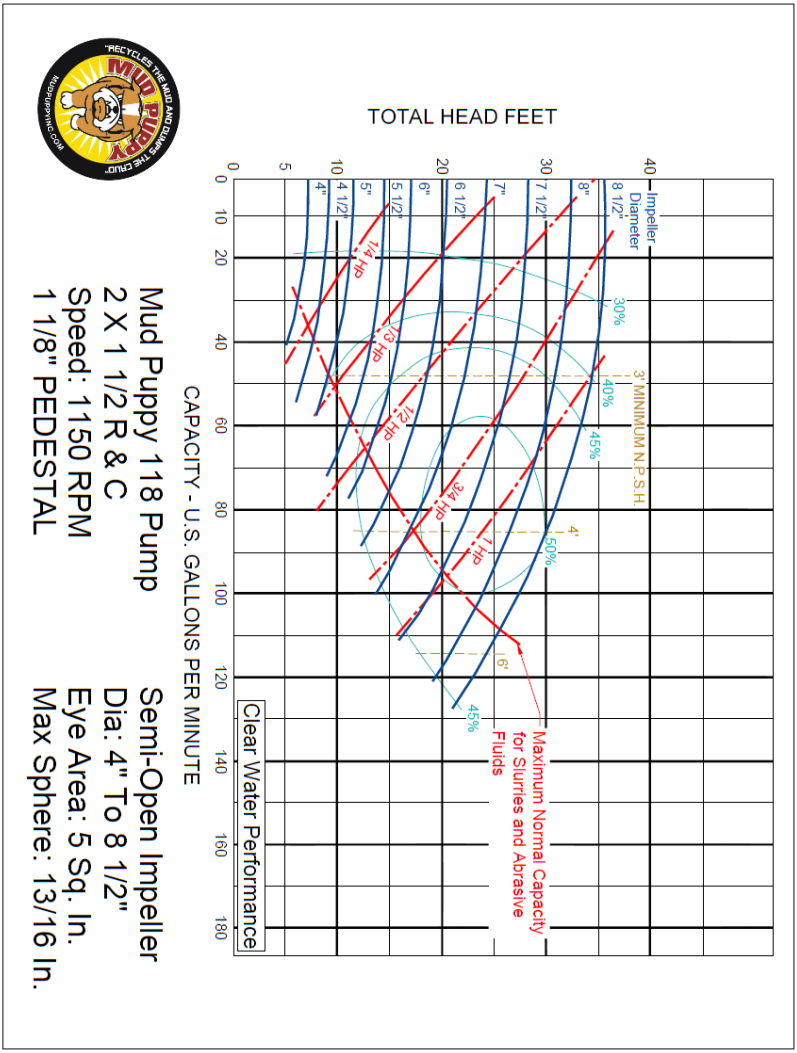
118 PUMP ASSEMBLY WITH ROPE PACKING AND OPTION



TT118 Pump Assembly with Rope Packing Option			
Item	Qty	Part #	Description
1	1	TT001	Pedestal, 118 Pump
2	1	3X2 or 4X3	Housing, 118 Pump
3	1	3X2 or 4X3	Impeller, 118 Pump
4	1	TT005	Ductile or Chrome, Stuffing Box, 118 Pump Rope Packing
5	1	TT005	Shaft, 118 Pump
6	1	TT006	Tag, ID, Namp Plate Pump Aluminum
7	2	TT009	Cap, Bearing, 118 Pump
8	2	TT012-150	Gasket, 118 Bearing Cap
9	1	TT013	Gasket, 118 Housing
10	1	TT014	Splasher, 118 Pump, Rubber
11	2	TT016	Bearing Assembly 118 Pump(Includes Collar
12	2	TT017	Seal, 118 Pump, for Grease Cover
13	1	TT019	Key, Impeller, 118 Pump
14	1	TT020	Key, Shaft to Coupling, 118 Pump
15	2	TT037	Stamp, Gland 118 Pump for Rope
18	2	TT015	Bolt, Gland Clamp, 118 Pump
19	8	MPH-W-00016	Washer, 5/8", Flat
20	8	MPH-N-00013	Nut, 5/8", Nylock
21	1	TT043	Plug, 1/4" (118 Pump Vent)
22	5	TT018PA	Packing, Rope, 118 Kevlar
23	4	MPH-G-00001	Grease, Zerk W/Cap
24	4	MPH-B-00009	Bolt, 3/8" X 2-1/2"

Item	Qty	Part #	Description
25	1	MPH-W-00009	Washer, Flat, 3/4" GD. 5Z
26	1	MPH-N-00004	Nut, 3/4", Nylock
27	8	MPH-D-00001	Stud, 5/8", 118 Pump Housing
28	2	MPH-B-00007	Bolt, 3/8" X 2"
29	14	MPH-W-00004	Washer, 3/8" FLAT
30	8	MPH-N-00010	Nut, 3/8", Nylock
31	1	MPH-U-00003	Plug, Drain 1/4"
32	4	MPH-P-00001	Rivet, Tag
33	2	TT010	Divider 118 Pump Packing, Plastic
34	1	3X2 or 4X3	Gasket, Flange
35	1	3X2 or 4X3	Gasket, Flange
36	1	TT040	Adapter, Hydraulic Motor 118 Pump 2 Bolt SAE "B" Mount
37	2	TT041	Cover Plate, Adapter Hydraulic Motor 118 Pump
38	4	MPH-B-00015	Screw, Hex Head, 1/4"-20 x 5/8" GD. 5
39	4	MPH-W-00003	Washer, 1/4 Lock
40	1	MPH-C-00006	Coupling, 118 Pump, SAE "B" Spline X 1.125" Dia. Shaft
41	1	MPH-S-00038	Spacer, 1/4" Thick
42	1	SG003001	Motor, Hydraulic, 23CC, 1.4 CID, for 3 x 2
42	1	SG003005	Motor, Hydraulic, 29cc, 1.77 CID, for 4 x 3
43	2	MPH-B-00008	Bolt, 1/2" X 2"
44	2	MPH-W-00012	Washer, 1/2" Lock
45	4	MPH-W-00002	Washer, Flat, 1/4"
46	1	MPH-S-00016	Screw, 1/4" Socket Head Cap

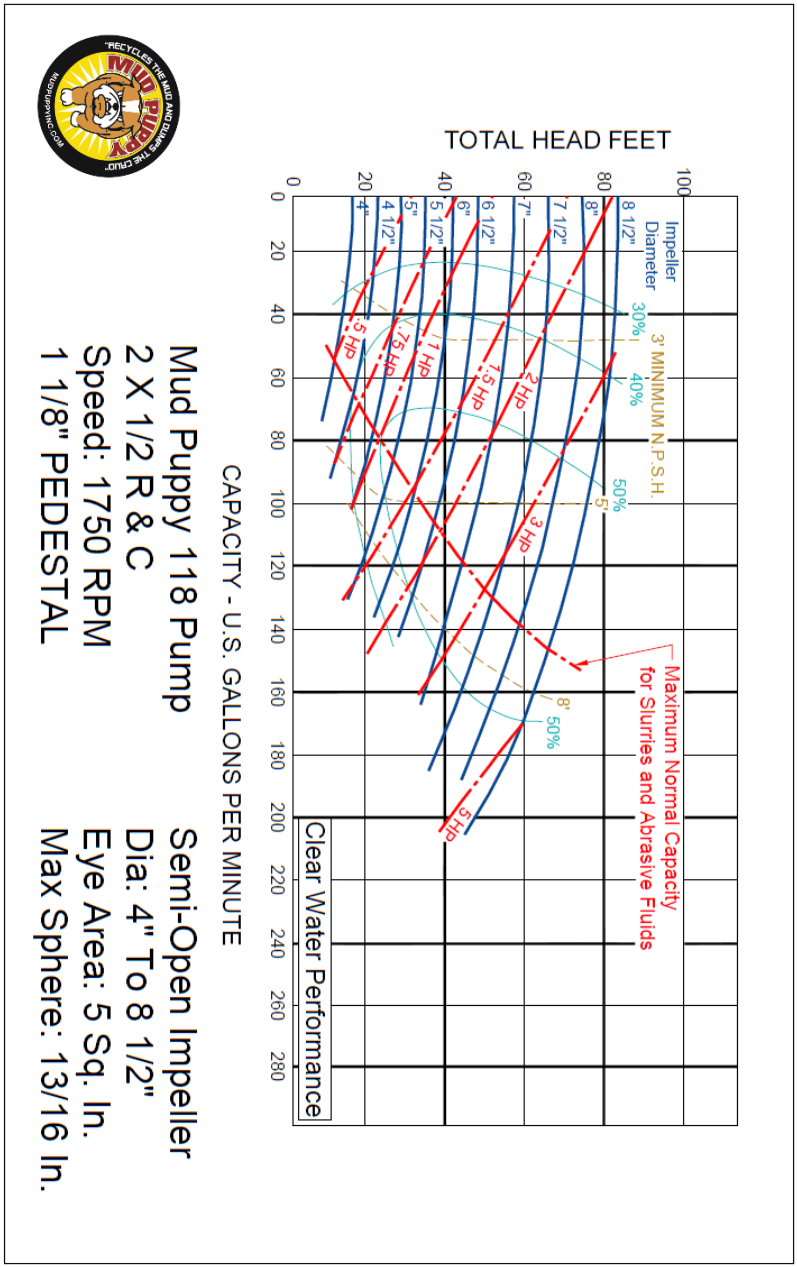
MUD PUPPY118 2X1-1/2 PUMP CURVE 1150 RPM



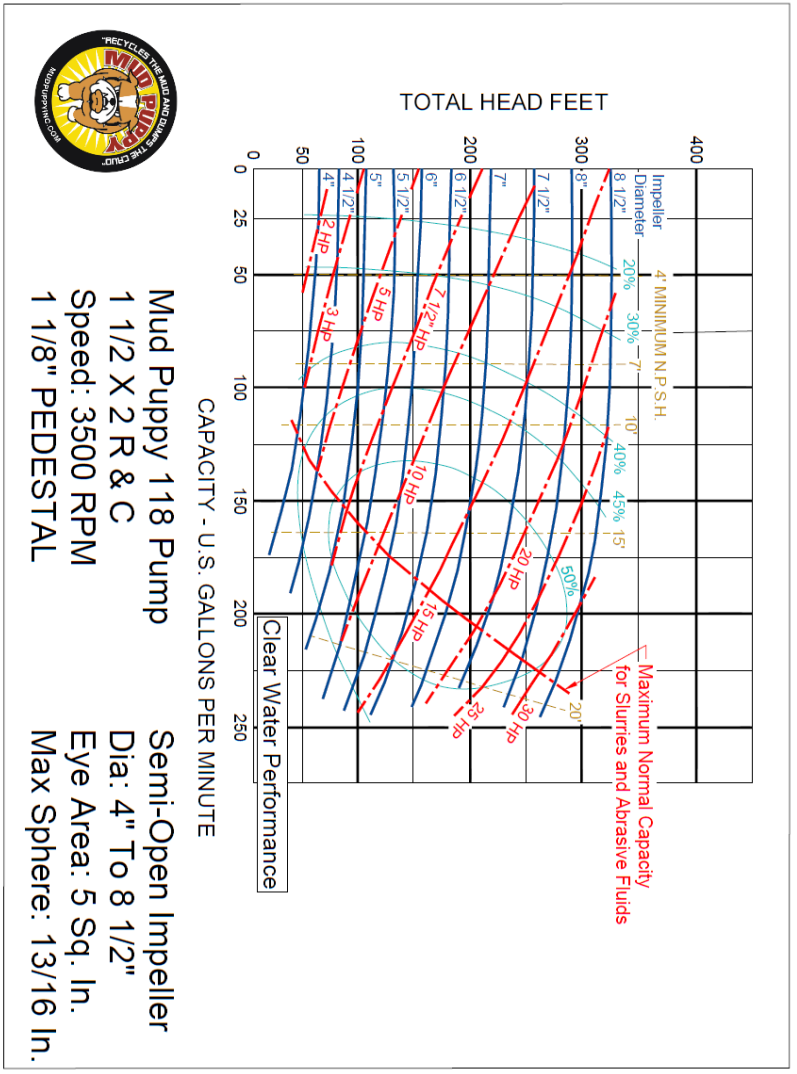
Mud Puppy 118 Pump
2 X 1 1/2 R & C
Speed: 1150 RPM
1 1/8" PEDESTAL

Semi-Open Impeller
Dia: 4" To 8 1/2"
Eye Area: 5 Sq. In.
Max Sphere: 13/16 In.

MUD PUPPY118 2X1-1/2 PUMP CURVE 1750 RPM



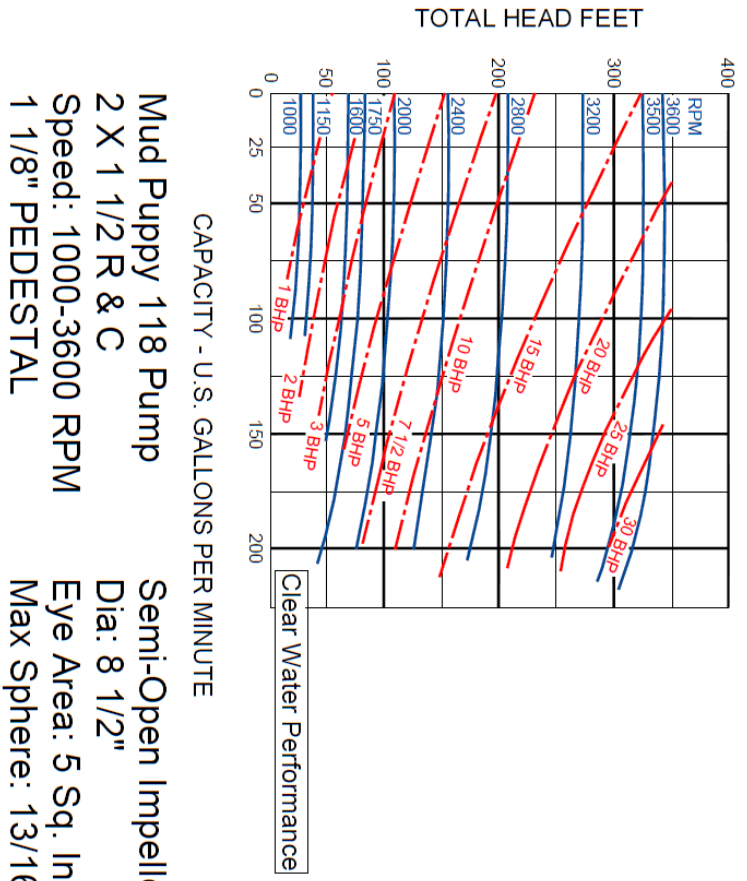
MUD PUPPY118 2X1-1/2 PUMP CURVE 3500 RPM



Mud Puppy 118 Pump
1 1/2 X 2 R & C
Speed: 3500 RPM
1 1/8" PEDESTAL

Semi-Open Impeller
Dia: 4" To 8 1/2"
Eye Area: 5 Sq. In.
Max Sphere: 13/16 In.

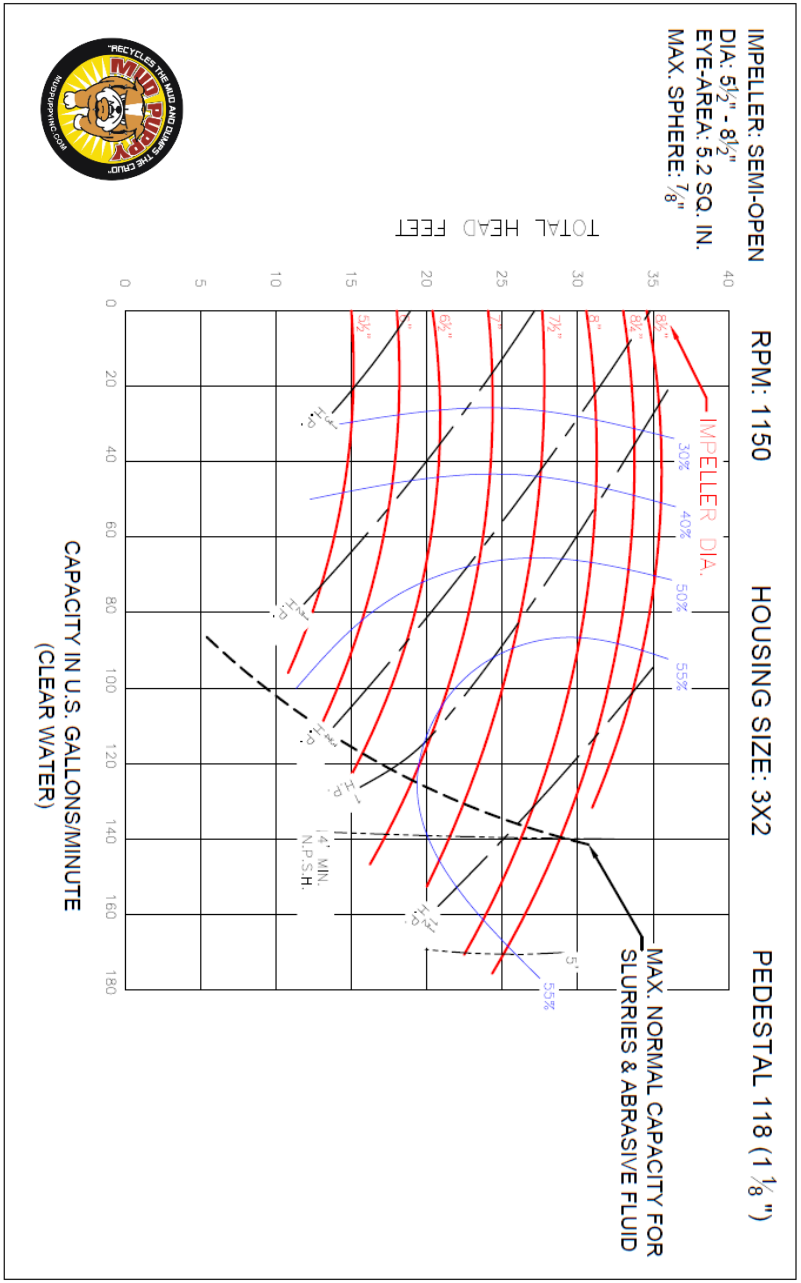
MUD PUPPY118 2X1-1/2 PUMP CURVE 1000 - 3600 RPM



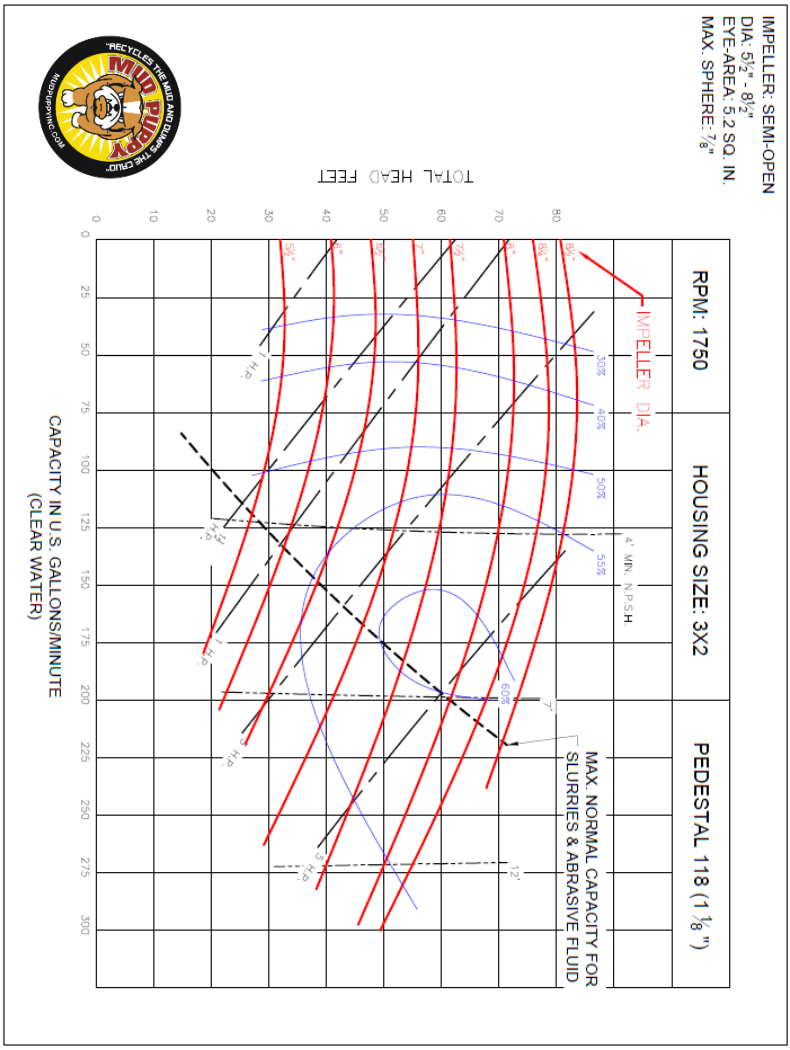
Mud Puppy 118 Pump
2 X 1 1/2 R & C
Speed: 1000-3600 RPM
1 1/8" PEDESTAL

Semi-Open Impeller
Dia: 8 1/2"
Eye Area: 5 Sq. In.
Max Sphere: 13/16 In.

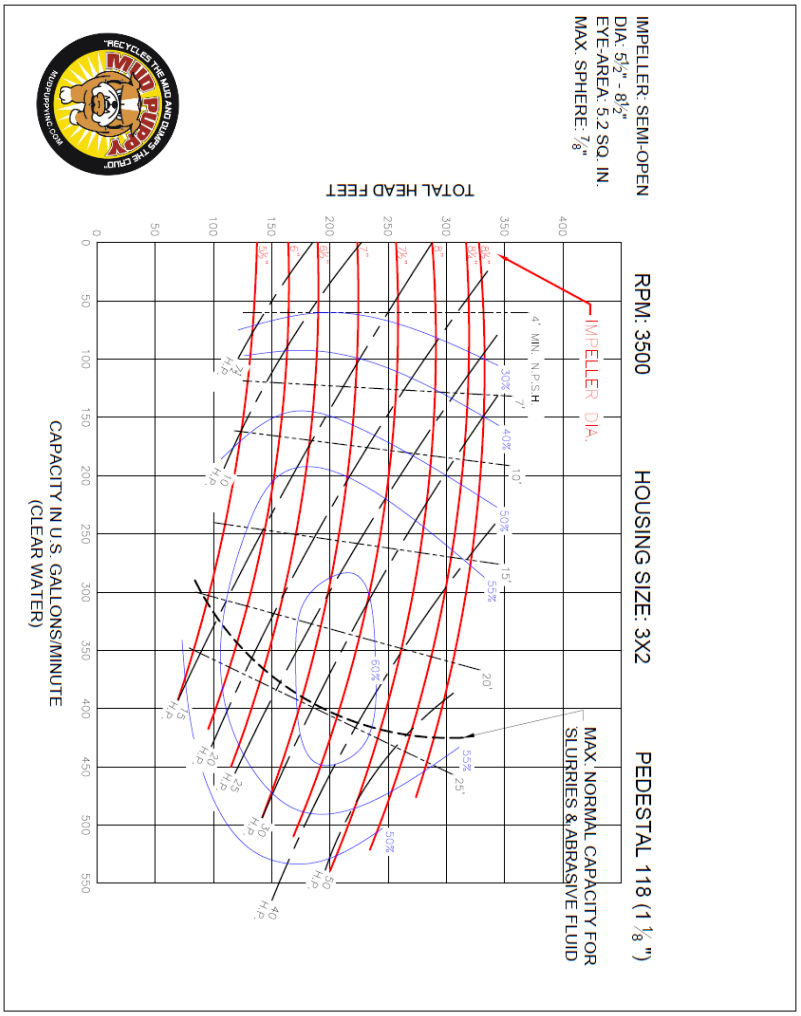
MUD PUPPY118 3X2 PUMP CURVE 1150 RPM



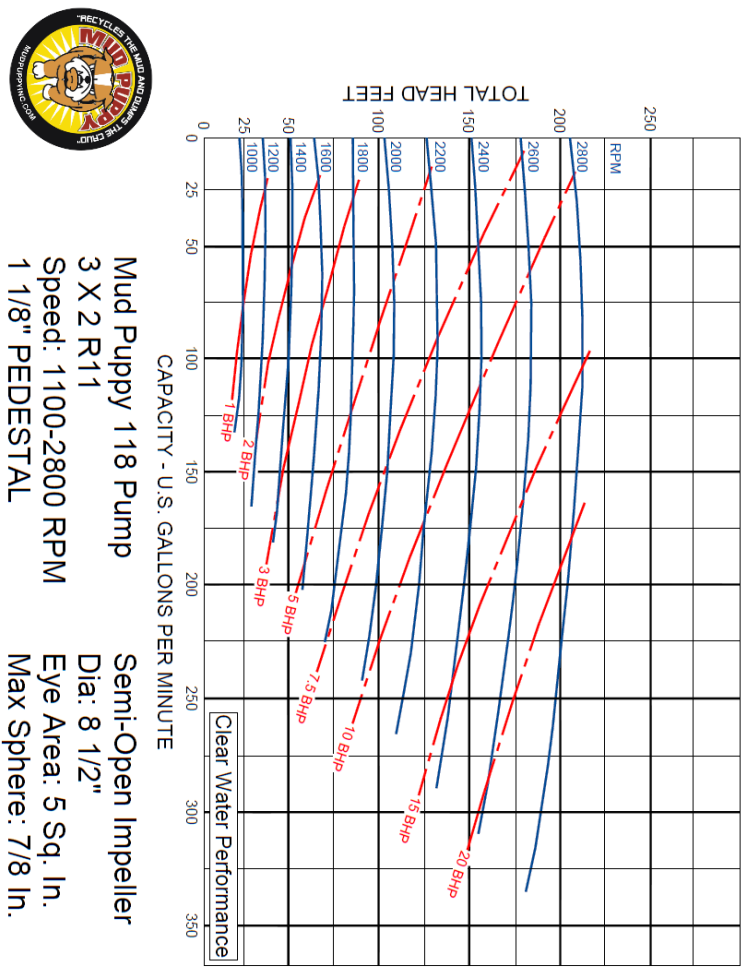
MUD PUPPY118 3X2 PUMP CURVE 1750 RPM



MUD PUPPY118 3X2 PUMP CURVE 3500 RPM



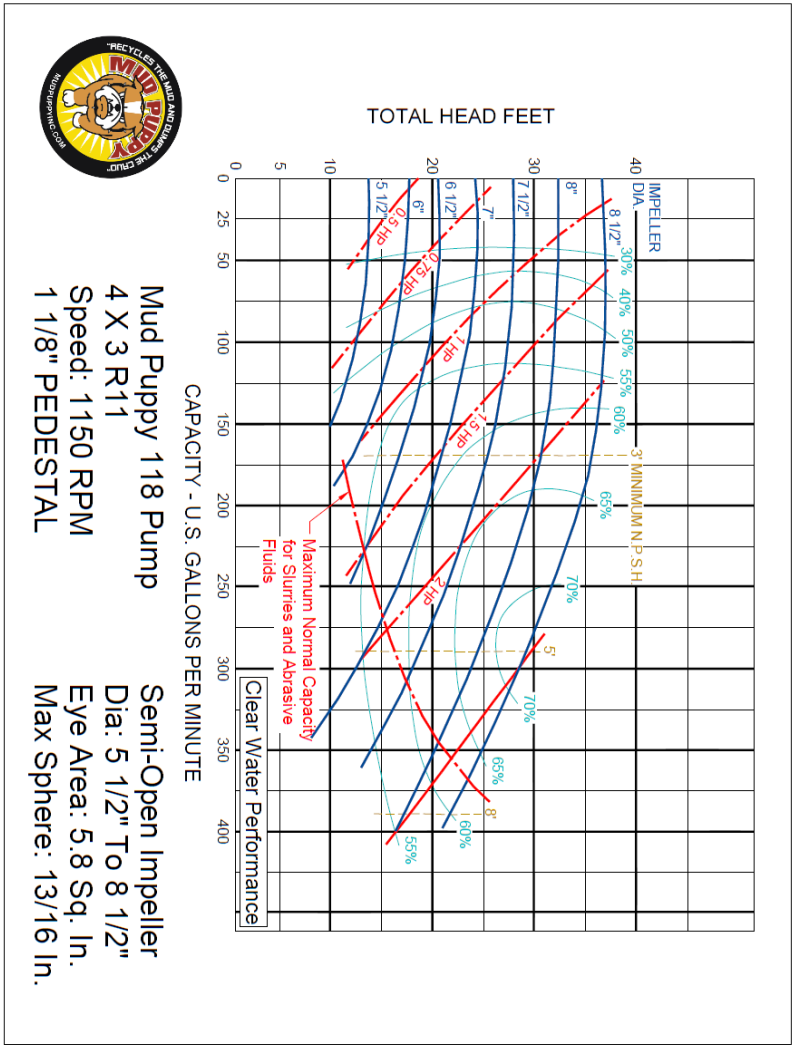
MUD PUPPY118 3X2 PUMP CURVE 1100 - 2800 RPM



Mud Puppy 118 Pump
3 X 2 R11
Speed: 1100-2800 RPM
1 1/8" PEDESTAL

Semi-Open Impeller
Dia: 8 1/2"
Eye Area: 5 Sq. In.
Max Sphere: 7/8 In.

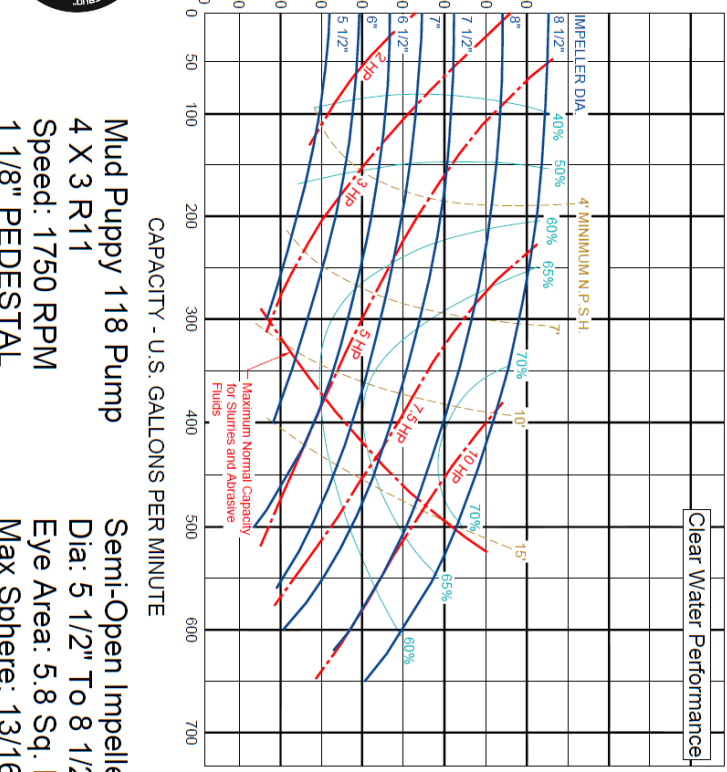
MUD PUPPY118 4X3 PUMP CURVE 1150 RPM



Mud Puppy 118 Pump
4 X 3 R11
Speed: 1150 RPM
1 1/8" PEDESTAL

Semi-Open Impeller
Dia: 5 1/2" To 8 1/2"
Eye Area: 5.8 Sq. In.
Max Sphere: 13/16 In.

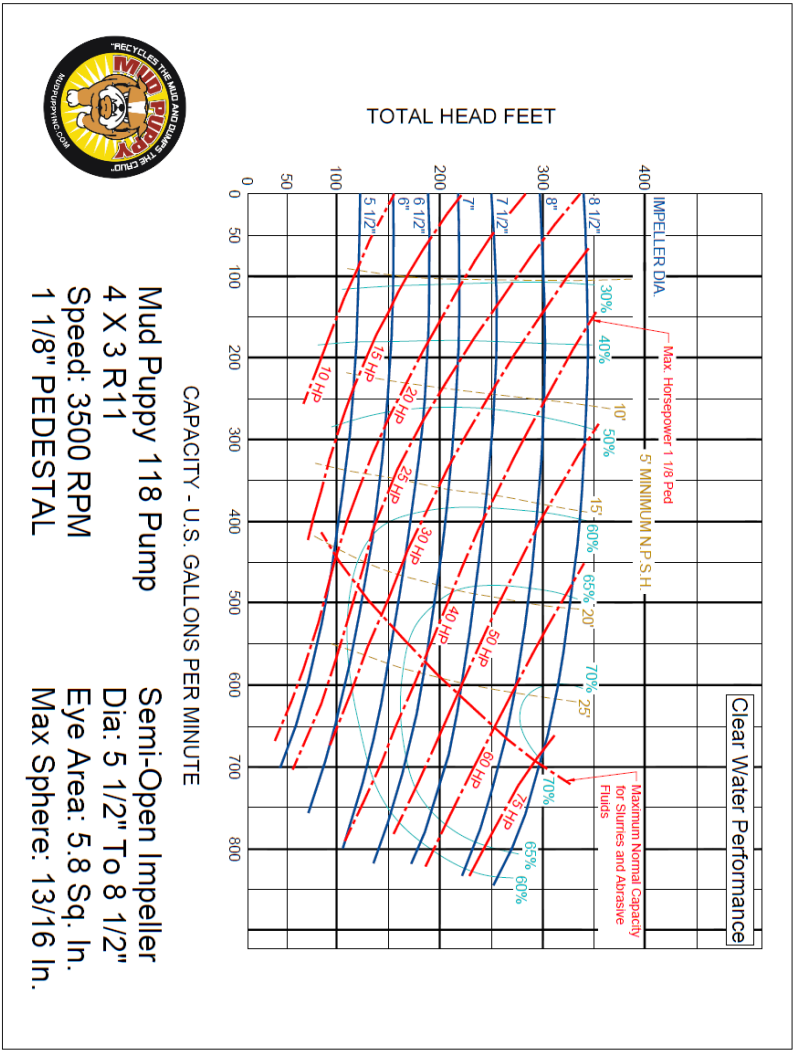
MUD PUPPY118 4X3 PUMP CURVE 1750 RPM



Mud Puppy 118 Pump
4 X 3 R11
Speed: 1750 RPM
1 1/8" PEDESTAL

Semi-Open Impeller
Dia: 5 1/2" To 8 1/2"
Eye Area: 5.8 Sq. In.
Max Sphere: 13/16 In.

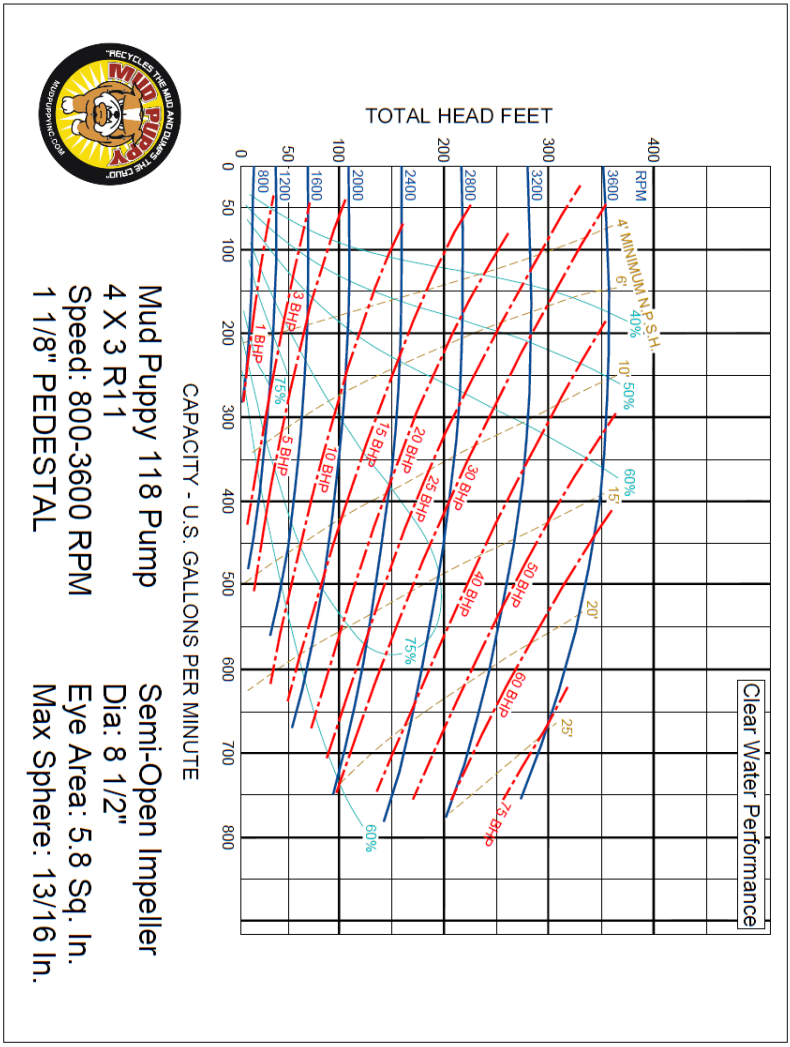
MUD PUPPY118 4X3 PUMP CURVE 3500 RPM



Mud Puppy 118 Pump
4 X 3 R11
Speed: 3500 RPM
1 1/8" PEDESTAL

Semi-Open Impeller
Dia: 5 1/2" To 8 1/2"
Eye Area: 5.8 Sq. In.
Max Sphere: 13/16 In.

MUD PUPPY118 4X3 PUMP CURVE 800 - 3600 RPM



Mud Puppy Corporation

530-662-5055

38642 W. Kentucky Ave.
Woodland, CA 95695

orders@mudpuppyinc.com
www.mudpuppyinc.com

Mail: PO Box 8522
Woodland, CA 95776