Centerline Mud Pump - Owners Manual

Centerline Hydraulic Drive Mud pump adjustments, procedures, warranty & disclaimers:

1) **Hydraulic oil** - Use only new, clean, premium quality anti-wear (AW) hydraulic oil with HVI (high viscosity index) rating. Use of any other oil will void warranty.
2) **Pressure relief valves** - Be sure you have a hydraulic pressure relief valve properly sized for full system flow rate on each of your supply lines set to relieve at or below 5000 psi. If your hydraulic pump is equipped with a compensator, it should be set at least 500 psi, preferably 1000 psi above the relief valve setting. This is contrary to most hydraulic system design recommendations, but is necessary to prevent undesired compensator reactions to pressure fluctuations. **Warning – Do not operate pump without the above pressure relief valves installed and in good working order.**
3) **Shifter slide lubrication** – The shifter slides should be lubricated once a week with one pump of grease in each grease fitting. These grease fittings are found on the firewall next to the I.D. tag.
4) **Liner replacement** – Remove the (front-top) discharge valve from the top valve pot above the pump head flange. Remove the pump head flange and the compression ring behind the flange (this should slide out by hand). Use a liner puller to remove the liner - **take care not to cause damage to the aluminum face on the pump body.** Thoroughly clean out the pump body. Take a new liner and slide a new liner packing from the rear end up against the liner shoulder. Apply a light film of grease to liner exterior, liner packing, liner shoulder, and inside pump body throughout liner area. Slide new liner into clean pump body until liner packing seats against the internal pump body shoulder. Examine compression ring to assure that the back does not have indentions where the set-bolts connect deeper than 1/8", replace if necessary. Install compression ring making sure that the top 'window' is centered directly under the discharge valve so that the valve can be re-installed without the valve guide legs interfering with the compression ring window. **Completely** back-off liner set-bolt jam nuts and **remove** the liner set-bolts from the pump flange. Remove set-bolt packing, **thoroughly** clean set-bolt threads (chase threads with die if necessary) and install new set-bolt packing on bolts. Thoroughly clean set-bolt hole threads through flange and apply anti-seize compound in threads (chase holes with a tap if necessary). Install a new flange O-ring and reinstall flange. Tighten pump flange bolts progressively and evenly. Apply anti-seize compound on the set-bolts and install bolts in flange. Initially run the set-bolts in until the slack has been removed from each of the three set-bolts and then tighten them progressively 1/8 turn at a time until the bolts are snug.
5) **Liner Set-bolt adjustment procedure:** These are the three 5/8" square headed bolts on the face of each pump head flange. These bolts are preset at the factory but will need readjustment any time the pump head flange has been removed and replaced. With the set-bolt jam nuts and set-bolt gaskets completely backed out from flange and loose (as detailed in 4 above), use a torque wrench with a 3/4", 12-point socket, or a 5/8" square-drive socket on the set-bolts and progressively go around the three set-bolts and tighten until 30 ft./lbs torque is reached. Repeat the procedure until 35 ft./lbs is reached, then until 40 ft./lbs is reached, then until 45 ft./lbs is reached, and finally until 50 ft./lbs is reached. This is all the tightness required. **Notice**: The success of this technique depends on having thoroughly cleaned and lubricated the set-bolt threads and set-bolt-hole threads. **Caution: Over tightening these bolts will result in liner collapse. It requires very little torque to collapse the liners so be cautious!** Once adjusted, there should be no

further need for adjustment unless the pump head flange is removed.

6) **Piston rod power-end jam nut** - When loosening or tightening the fluid end piston rod jam nut, always use the wrench on the hydraulic cylinder rod flat **on the end where the rods connect** (not the opposite end). Never tighten or loosen fluid end piston rod by using the wrench on the flat on the rearmost hydraulic cylinder rod as this may cause serious damage to the hydraulic cylinder. The jam nut should be set and tightened at the inside end of the fluid end rod thread - adjusted so that the end of the jam nut is even with the edge of the recess at the back of the thread.
7) **Piston rod piston nut** - Fluid rod piston nuts should be torqued to 400 ft./pounds torque when installed. No adjustment should be necessary thereafter.
8) **Hydraulic connections** - The supply oil must go in the lower connection on mono pumps. This is directly beneath the center of the pump center sections. The oil returns from the higher connection that is off center of each cylinder. On duplexes, the oil must go into the hydraulic splitter located under/between the pump bodies. Use of hydraulic quick-connects should be avoided.
9) **Priming** - To prime the pump, remove the valve caps on the suction valve pots (the lower valve pots on the side of the pump body) on each cylinder and fill with water. Replace valve caps and tighten both nuts evenly to get even gasket compression. Submerge suction hose in pit and begin pumping at regular pumping rate. Priming must be done on each cylinder.

   Short cut method: When all fluid end expendables are in ***very*** good condition, the pump may not need to be re-primed when moved from one job to another if the pump was not drained between jobs and if there are ball valves installed on the two ¾" drain ports on the bottom of each cylinder. In these cases the suction may be attached and submerged in the suction pit and the pump started. While the pump is cycling at regular pump operating speed, the ball valves on the pump bottom should be "burped" - one at a time - by lightly placing a palm against the face of the ball valve and opening the valve. The palm of the hand will act like a check valve and will allow the pump cylinder to "burp" out air in the cylinder as the piston advances toward that drain, and seal against the palm as the pump withdraws from that drain until prime is picked up. When the cylinder begins discharging a solid smooth flow of drill fluid when stroking toward that ball valve, that valve can be shut and the process repeated on the other ball valves. Upon completion of this procedure, the discharge rate of the pump should be monitored to see if it is pumping smoothly and at the proper flow rate for the speed that it is operating at. If the discharge flow is uneven or the volume is not what it should be, one or more cylinders is not properly primed. **Note: Running pump dry/ not primed for an extended period of time will damage fluid end expendables.**
10) **Fluid rod packing adjustment** – For maximum packing and fluid rod life, packings should be adjusted to "drip" fluid when operating. When the packings are adjusted to where there is no leakage at all, it causes greatly reduced fluid rod life and packing life. Always adjust packing retainer nuts evenly and a little at a time. After each minor adjustment, allow the pump to operate for 30 seconds before judging whether to make further adjustment. This will allow the packings time to seat into the newly adjusted position.
11) **Hydraulic cylinder tie-stud/bolt adjustment** - Do not adjust the four hydraulic cylinder tie-studs/bolts. These studs/bolts are set at the factory and are adjustment sensitive. If you must remove these bolts or feel the may need adjustment, consult Centerline Manufacturing before proceeding to discuss alternate options.

    Tie-stud/bolt adjustment procedure:

    a. Remove nuts/bolts by loosening each bolt ¼ turn at a time around the pattern.

b. To re-install nuts/bolts, tighten bolts progressively – going around the four stud/bolts each bolt a little at a time until they are torqued to 400 ft/lbs.

12) **Shifting Linkage adjustment** – The shifting linkage adjustment is critical to proper operation of the pump. The linkage has been properly adjusted at the factory and this adjustment should only be necessary if the linkage has been disconnected, or if a new shifter has been installed.
Shifting linkage adjustment procedure:
   a. Remove the shifting disc from the end of the rear hydraulic cylinder rod.
   b. Apply hydraulic power to drive the rod out slowly until it dead heads at the end of the stroke. **Turn off hydraulic system and allow sufficient time for the hydraulic oil pressure to bleed off – *at least* 30 seconds**.
   c. Push the shifting slide fully to the opposite shifted position.
   d. Press the shifting disc flat against the end of the hydraulic rod with the bottom of the disc setting at the top of the shifting slide tab. **Measure and record** the distance from the outside end of the shifting slide tab to the closest face of the shifting disc.
   e. Apply hydraulic power slowly to move the hydraulic cylinder rod to the other end of the cylinder stroke until it dead heads there. **Turn off hydraulic system and allow sufficient time for pressure to bleed off as before**.
   f. Repeat steps c & d. Loosen jam nut against pilot valve and adjust linkage so that the measurement from the end of the shifting slide tab to the closest face of the shifting disc is the same on both ends. Tighten jam nut securely. Apply hydraulic power slowly to move rod to center of cylinder stroke. Turn off hydraulic system. Replace shifting disc on rod end and secure with the 5/8" fine thread bolt.

Safety warning - **Never operate Centerline pump drive with the cowling off; Never attempt to make adjustments to any part of the pump while in operation as this could result in serious injury, dismemberment and/or death.** Furthermore, the cowling is a necessary structural component of the drive box and operation of the pump without the cowling could cause structural damage to the drive box and/or failure of welds in the drive box.

Limited Warranty:

Centerline Manufacturing warrants new pumps and pump drives against defects in material and workmanship for a period of six months from the date of sale. Centerline Manufacturing will, solely at their discretion, repair or replace any covered items that are found to be defective in material or workmanship within that time period at no charge. All warranty claims to be examined and repairs performed at Centerline Manufacturing facilities or authorized warranty agent locations. Pumps/drives must be returned to Centerline Manufacturing or authorized warranty agent freight prepaid for warranty inspection and/or action**. This warranty does not cover any incidental or consequential damages - including but not limited to lost income that may be incurred by the owner, operator(s) or any other party as a result of the use or inability to use Centerline Manufacturing products.**

> Items covered: Machined castings, machined parts, fasteners, hydraulic cylinders, hydraulic valves, shifting mechanisms, shifting linkage, and frame components.

> Items not covered: Hydraulic hoses, hydraulic hose leaks, hydraulic fitting leaks, fluid end expendables - i.e. liners, liner packing, pistons, piston rubbers, piston rods, piston rod packing, fluid end check valves, check valve seats and springs, and o-rings.

Exclusions: This warranty void wherever it is determined that product has been abused, or operated in excess of product ratings. This warranty void wherever it is determined that product has been neglected i.e. lack of normal and reasonable maintenance. All determinations will be made only by Centerline Manufacturing authorized warranty

examiner(s) only.

Fitness for use - Centerline Manufacturing does not guarantee, or represent , any Centerline Manufacturing product(s) as being useful for any particular purpose.