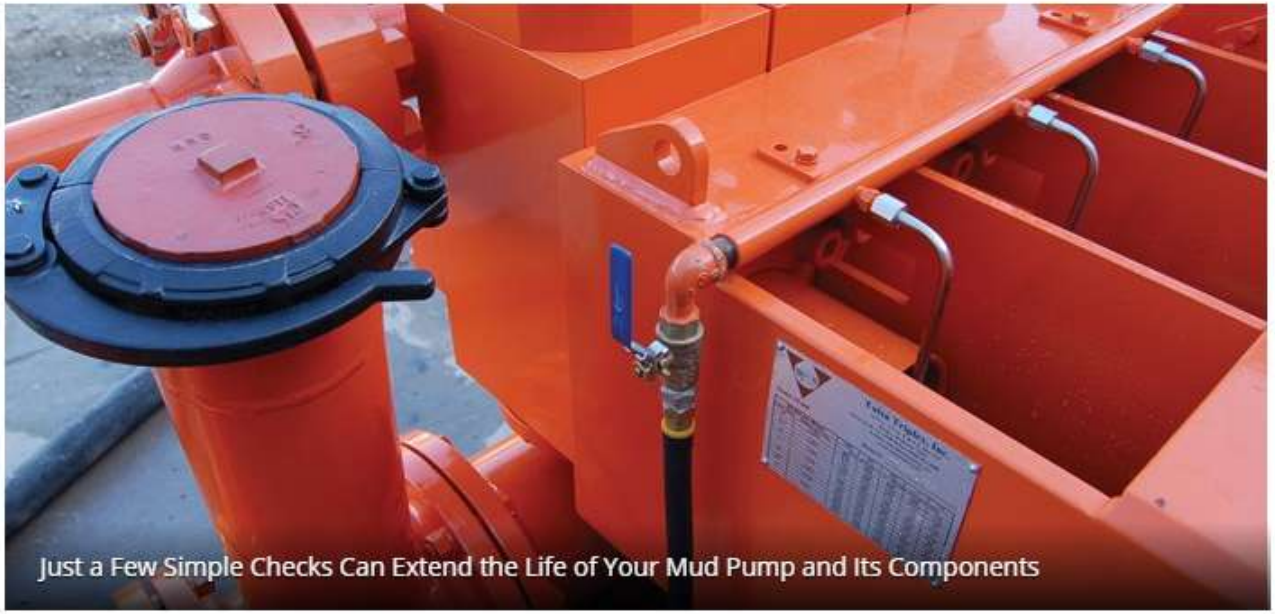

Mud Pump Maintenance

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BY MIKE KEZDI ON MARCH 10, 2015 DIRECTIONAL DRILLING, FEATURES, HORIZONTAL DIRECTIONAL DRILLING, PUMPS

Many things go into getting the most life out of your mud pump and its components — all important to extend the usage of this vital piece of equipment on an HDD jobsite. Some of the most important key points are covered below.

Pump Service

The most important thing you can do is service your pump, per the manufacturer's requirements. We get plenty of pumps in the shop for service work that look like they have been abused for years without having basic maintenance, such as regular oil changes. You wouldn't dream of treating your personal vehicle like that, so why would you treat your pump like that.

Check the oil daily and change the oil regularly. If you find water or drilling mud contamination in the oil, change the oil as soon as possible. Failure to do so will most likely leave you a substantial bill to rebuild the gear end, which could have been avoided if proper maintenance procedures would have been followed. Water in the oil does not allow the oil to perform correctly, which will burn up your gear end. Drilling mud in your gear end will act as a lapping compound and will wear out all of the bearing surfaces in your pump. Either way it will be costly. The main reasons for having water or drilling mud in the gear end of your pump is because your pony rod packing is failing and/or you have let your liners and pistons get severely worn. Indication of this is fluid that should be contained inside the fluid end of your pump is now moving past

your piston and spraying into the cradle of the pump, which forces its way past the pony rod packing. Pony rod packing is meant to keep the oil in the gear end and the liner wash fluid out of the gear end. Even with brand new packing, you can have water or drilling fluid enter the gear end if it is sprayed with sufficient force, because a piston or liner is worn out.

Monitor your oil and keep your pistons, liners and pony rod packing in good condition. If a liner starts to leak, identify the problem and change it as soon as possible.

Liner Wash Fluid

There is also usually a valve on the inlet of the spray bar. This valve should be closed enough so that liner wash fluid does not spray all over the top of the pump and other components.

Liner wash fluid can be comprised of different fluids, but we recommend just using clean water. In extremely cold conditions, you can use RV antifreeze. The liner wash or rod wash system is usually a closed loop type of system, consisting of a tank, a small pump and a spray bar. The pump will move fluid from the tank through the spray bar, and onto the inside of the liner to cool the liner, preventing scorching. The fluid will then collect in the bottom of the cradle of the pump and drain back down into the collection tank below the cradle and repeat the cycle. It is important to have clean fluid no matter what fluid you use. If your liners are leaking and the tank is full of drilling fluid, you will not cool the liners properly — which will just make the situation worse. There is also usually a valve on the inlet of the spray bar. This valve should be closed enough so that liner wash fluid does not spray all over the top of the pump and other components. Ensure that the water is spraying inside the liner and that any overspray is not traveling out of the pump onto the ground or onto the pony rod packing where it could be pulled into the gear end. If the fluid is spraying out of the cradle area and falling onto the ground, it won't be long before your liner wash tank is empty. It only takes a minute without the cooling fluid being sprayed before the liners become scorched. You will then need to replace the pistons and liners, which is an avoidable costly repair. Make a point to check the liner wash fluid level several times a day.

Drilling Fluid Cleanse

Drilling fluid — whether pumping drilling mud, straight water or some combination of fluid — needs to be clean. Clean meaning free of solids. If you are recycling your fluid, make sure you are using a quality mud recycling system and check the solids content often throughout the day to make sure the system is doing its job. A quality mud system being run correctly should be able to keep your solids content down to one quarter of 1 percent or lower. When filling your mud recycling system, be sure to screen the fluid coming into the tanks. If it is a mud recycling system, simply make sure the fluid is going over the scalping shaker with screens in the shaker. If using some other type of tank, use an inline filter or some other method of filtering. Pumping out of creeks, rivers, lakes and ponds can introduce plenty of solids into your tanks if you are not filtering this fluid. When obtaining water out of a fire hydrant, there can be a lot of sand in the line, so don't assume it's clean and ensure it's filtered before use.

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Cavitation Prevention

Cavitation is a whole other detailed discussion, but all triplex pumps have a minimum amount of suction pressure that is required to run properly. Make sure this suction pressure is maintained at all times or your pump may cavitate. If you run a pump that is cavitating, it will shorten the life of all fluid end expendables and, in severe cases, can lead to gear end and fluid end destruction. If the pump is experiencing cavitation issues, the problem must be identified and corrected immediately.

The long and the short of it is to use clean drilling fluid and you will extend the life of your pumps expendables and downhole tooling, and keep up with your maintenance on the gear end of your pump. Avoid pump cavitation at all times. Taking a few minutes a day to inspect and maintain your pump can save you downtime and costly repair bills.

Trevor Young is president of Tulsa Rig Iron Inc., based in Kiefer, Okla.

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