

# Eight Keys to Successful Hydraulic Press Maintenance

By Peter Campbell



## Strategy for Optimal Operation

Hydraulic presses are durable. With CNC equipment often becoming outdated within a decade, there are still many hydraulic forging presses in service today that are 30, 40, 50 or more years old. The main operating components of motors, pumps and valves are of heavy-service industrial design. These components are durable, but also easily replaced if needed. Sturdy and well-built, the combination of these components makes for a dependable press. Consequently, when maintained properly, hydraulic forging presses have a long and productive life.

As press rebuilders, our team has seen reoccurring problems over the years that provide us with insight into the most common causes of hydraulic press failures. If you value the remarkable flexibility and efficiency of your hydraulic press, and you're ready to implement a winning strategy for long-term excellence in your forging operation, check out these eight keys to successful hydraulic press maintenance:

Hydraulic technology is vital to the forging industry, as it is used for both open die and closed die forging. Like a hammer and screw press, the hydraulic press has a variable shut height giving the open die forger great flexibility on billet or ingot size. For both open and closed die work, having full tonnage at

any point in the stroke provides great advantages over other types of metal forging equipment. Moreover, the hydraulic press delivers precise control over the forging process with the ability to change key parameters with every stroke.



Figure 1: Hydraulic hose protrusion requires replacement



Figure 2: A few of the items found in the bottom of the oil tank



Figure 3: Damaged pull back piston

## #1 - Invest in Your Press

Preventative maintenance is the key to the longevity of your hydraulic press. Depending on the design, size and work environment, a PM program will vary from press to press. It's true. Regular preventative maintenance takes commitment. But when you create and follow a PM program, you can successfully anticipate the needs of your investment. A PM program gives you and your team time to plan your repairs. Without a PM program your investment is vulnerable to breakage, unscheduled down time, unplanned expenses, and lost business. And that's not all. These losses can also damage the morale of your team. When you invest in your press, you actively invest in the culture and future of your company. The fact is, there's a lot on the line when it comes to the care and operation of your press. Your team will benefit from the most efficient and most cost-effective way to keep track of the health of your press. With a PM program in place, your team will have the tools they need to catch early warning signs of press problems.

## #2 - Support Your Operators

With maintenance departments running lean and losing seasoned veterans, critical tribal knowledge is disappearing from plant operations every day. You can recover and build a solid knowledge base among younger press operators by keeping good records of PM inspections, repairs, and adjustments. Clearly and consistently recording of problems and troubleshooting history is key to equipping the next generation of forging producers with important information. Your maintenance notes should include details of repairs and troubleshooting work done to your press that were successful and unsuccessful. Best practices are learned from past successes and previous trials that ended in failure. Valuable knowledge is gained from both experiences.

Operators' knowledge and experience is enhanced with additional training. Empowering your press operators with daily inspection tasks is also key to helping them detect problems early on. With this knowledge, they become keenly aware of their press in terms of regular noises and vibrations. The look and feel of the press in operation can tell an observant operator a lot about what

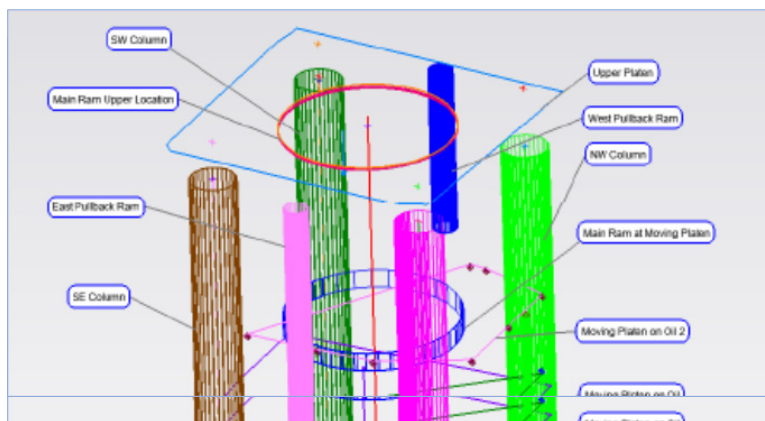


Figure 4: Laser alignment check is an important part of a good PM program



Figure 5: Cracked cylinder



Figure 6: Fabricating a new cross head at Campbell

is going on with the parts. Knowledgeable operators can often pick up changes in the press and catch problems before other technicians who are less familiar with the press. To be sure, seasoned operators and die setters have a reliable understanding of the design of the press and the dangers of improper use, such as overloading or faulty lubrication.

### #3 - Keep the Oil Clean

Dirty oil is one of the key causes of damage and accelerated wear. From rapid wear on components such as pumps, valves, manifolds, rams, and packings, to blockage reducing efficiency or flat-out failure, dirty oil is dangerous for the press. The oil should be checked during PM inspections for contaminants as well as particles, possibly brass, cast iron or steel shavings or particles from parts that might have been starved of lubricants. Contaminants enter the system when openings to the oil tank are not properly closed or are missing. Contaminants can also come from water spray or blowing slag off the die area. To keep your oil clean, include periodic oil filtering and testing in your PM schedule.

### #4 - Check the Oil Temperature

Oil temperature is important for proper function of the press. Many OEM's say 120°F is the ideal temperature for the oil. If the oil is running hotter, it may break down and lose its effectiveness. If heat is a problem, an air or water cooler may be added to the system.

### #5 - Check for Oil Leaks

Oil can also jeopardize the safety of the operator as a leak can cause a major slip hazard on the floor around the press or up on top. It is crucial for both safety and operation to check for oil leaks. In addition, with hot steel moving in and out of the press, it's not uncommon for puddles of hydraulic fluid to ignite. When it comes to operations, the press will run better, and parts will last longer with the correct amount of hydraulic fluid in it. Leaks should be addressed, loose fittings tightened, and oil cleaned up.

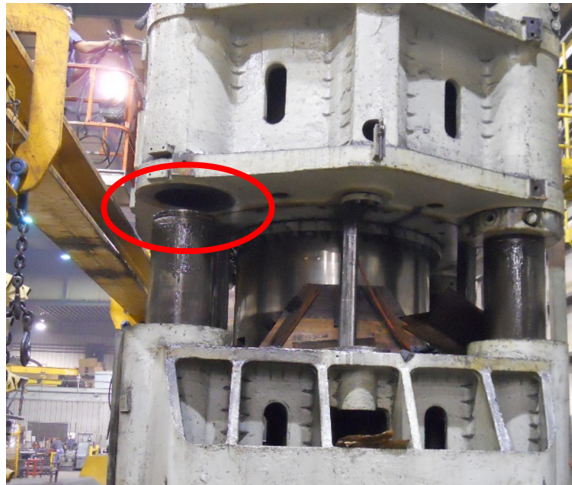


Figure 6 & 7: Broken tie bar due to off-center loading

### #6 - Maintain Proper Lubrication

Long lasting operation of the rod guide bushings on the moving platen or gib surfaces depends on proper lubrication. Not enough lube and bushings and the guide rods have premature wear. Too much lubrication may lead to contamination and dirt getting in causing accelerated wear. The same goes for the main ram or rams, a good, light film of oil should be running down the sides of the main ram.

### #7 - Check Running Clearances on Guide Bushings

Excess clearances allow for excess movement and accelerated wear. Excess clearance between the ram(s) and cylinder gland bushing and packings will allow for excess oil to leak out and possible loss of pressure. Uneven wear on the circumference of the ram causes excess wear on the ram and guide bushings. Excess clearance between the tie bar nuts and frame allows movement of the crown and/or bed of the press and/or columns causing wear between the mating surfaces. Also concentrated loading on fewer tie bars causes them to stretch, crack, or fail.

### #8 - Keep a Clean Press

It's much easier to locate leaks with a clean press. Indeed, it's much easier to locate cracks or scoring and signs of wear with a clean press. It's much easier to find, hire and keep an operator with a clean press. A clean press makes for a more productive and inspiring work environment.



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