

# Problem: Piston Pump Failures on a High Cycle Punch Press



An OEM built a high cycle punch press for a special application that an automotive facility required. The hydraulic application required 2,200 PSI and 15 GPM from the hydraulic system. The press would punch several holes in a "U" shaped fabrication at a fast cycle with the cylinder stroke being less than 2".

The OEM used a pressure compensated pump with a directly operated safety relief set about 200 PSI above the pump compensator adjustment. The directly operated directional valve had a closed center position, and the cylinder lines were made of hoses.

They had a problem getting any life from the pressure compensated pump. They would fail anywhere from 4 to 8 weeks with one lasting 12 weeks. The system had good filtration with a 3 micron pressure filter and a 5 micron return filter either having elements with a Beta ratio equal to or exceeding 100. A fluid sample was taken and analyzed. The ISO code report was better than the manufacturer's recommendations.

The system had good filtration, properly set pressure controls and functioned well except for the pump failures.



Any idea what could be the problem?



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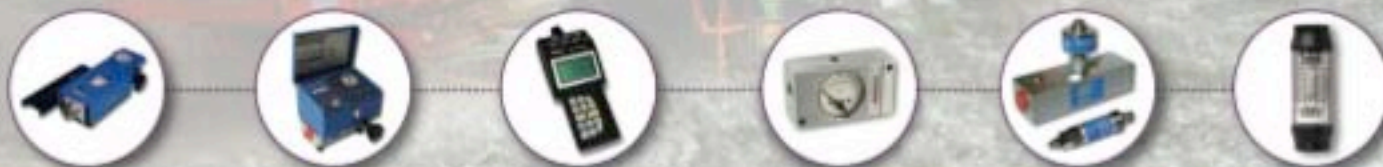
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## Previous Solution: Hydraulic Storage System Retrieval Car Crash



The retrieval car hunting problem was caused by a low spot worn into the rails. Every time the car was told to move, the steel on steel wheels and rail would slip and spin during acceleration of the car. This constant spinning wore a low spot on the rail. When the encoder tried to position the car to allow extraction of a cab, it would stop at a point where the worn spot started, and the car wanted to move slightly and rest in the bottom of the worn groove.

The fix was to move both rails 1 to 2 inches forward so the groove was away from the stopping points. The acceleration ramp was also increased so the wheels started slowly and ramped up without spinning the wheels.

But why did the car jump the end barrier of the rails instead of stopping when commanded? The Sun brake valve should have prevented this. Sun brake valves are designed somewhat differently than the normal industry standard valves. To increase the pressure setting of the Sun valve, you must turn the adjustment knob counterclockwise and to lower the setting, clockwise. This is opposite of most valves, and the technician (yours truly) didn't know this. With a low setting, there wasn't any braking force on the drive motor, creating a run-away condition.

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