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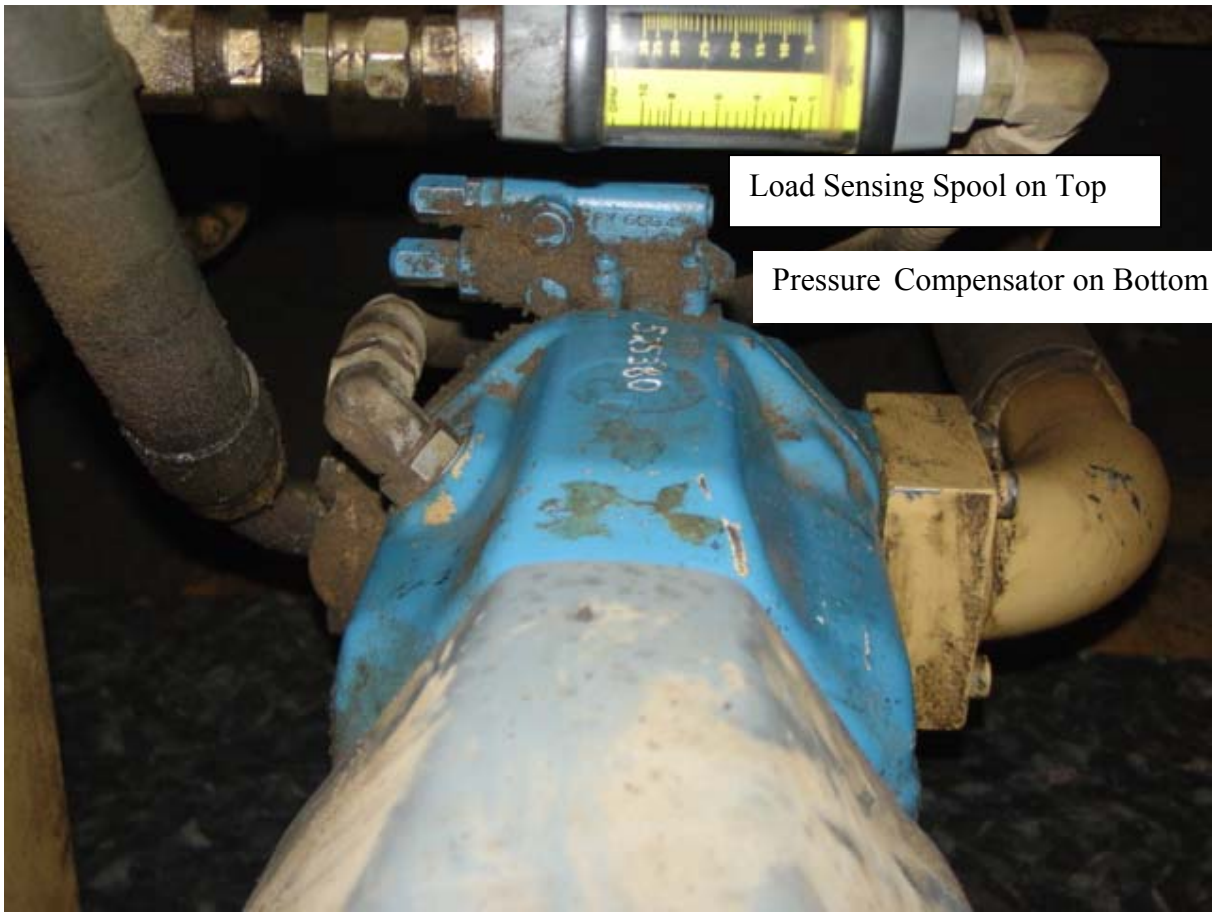
Consulting Report
Quad Feeder
Jan.25th, 2005
Alan Dellinger

Reason for Consult
I was asked to look at the Quad Feeder hydraulic unit on the scheduled down day while I was at the plant conducting Hydraulic Training on the Products Area. This system uses 3 pressure compensating pumps. All 3 pumps have load sensing but no pressure relief valves in the system. The Quad Feeder pumps make a lot of noise when the 2 cylinders extend.

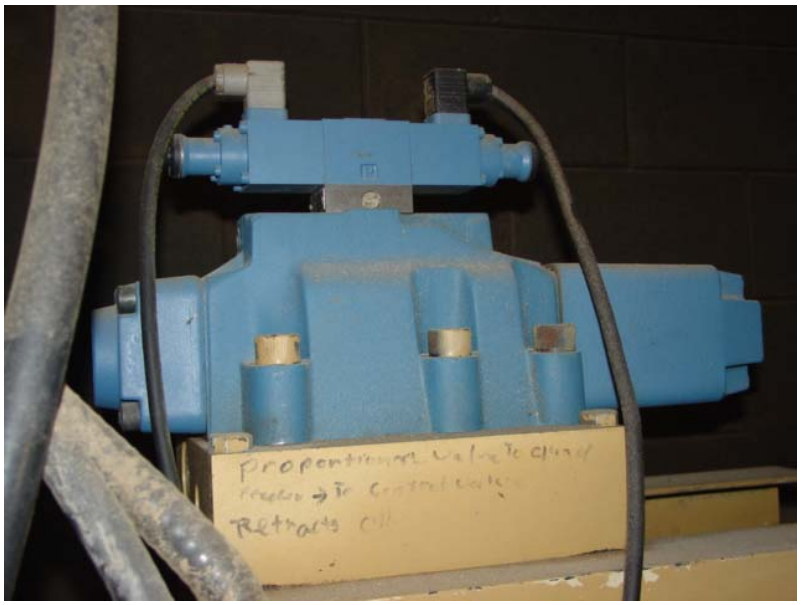
Observations
I monitored the Quad Feeder pumps as they operated. When the cylinders extended the pumps made a loud whining sound There was concern that the pumps were being over worked. I monitored the system pressure as they operated. The pressure never moved more than 300 PSI from the compensator setting. This means that the pumps were delivering enough volume to the system. Large pressure drops of more than 300 PSI indicates low volume. Volume is not a problem here.

These pumps have a load sensing spool. The Quad Feeder was designed to use the load sensing, but it is not being used .



When using load sensing, the pump will provide power matching of pump output to system load demand, maximizing efficiency and improving load metering of any proportional valve installed between the pump and the load.

Load sensing ensures that the pump always provides only the amount of flow needed by the load. At the same time the pump operating pressure adjusts to the



Quad Feeder Proportional Valve

actual load pressure plus a pressure differential required for the control action. When the system is not demanding power, the load sense control will operate in an energy saving mode.
The differential pressure is that between the inlet port and outlet port of the proportional valve.

Recommendations

The pumps are defiantly being over worked.
The load sensing needs to be set on these pumps. See page 33 in the Troubleshooting Strander and Woodyard Hydraulics Manual for the pressure settings of these pumps.
Also, a pressure relief valve needs to be installed down stream of the Quad Feeder pumps. If the compensator failed without a pressure relief in the system, a motor may kick out or a line could rupture. Relief valves also absorb shock.

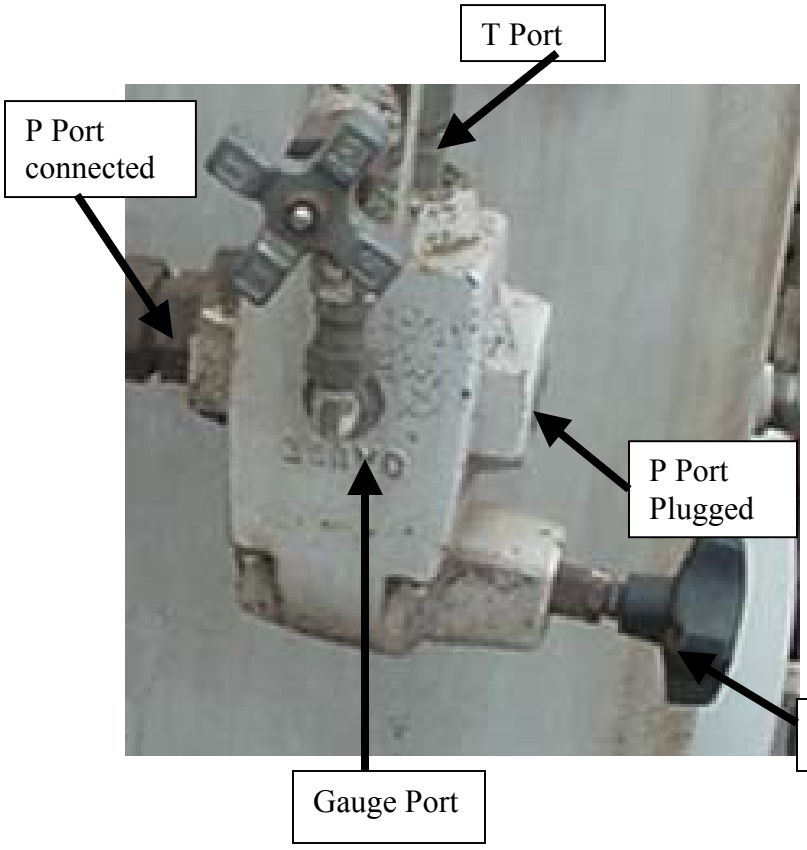
A second relief valve needs to be installed down stream of the Slasher Deck pumps.

The relief valves tank lines can be connected to the reservoir here.

I also recommend to use the vickers high flow relief valve, 3000 PSI max pressure.

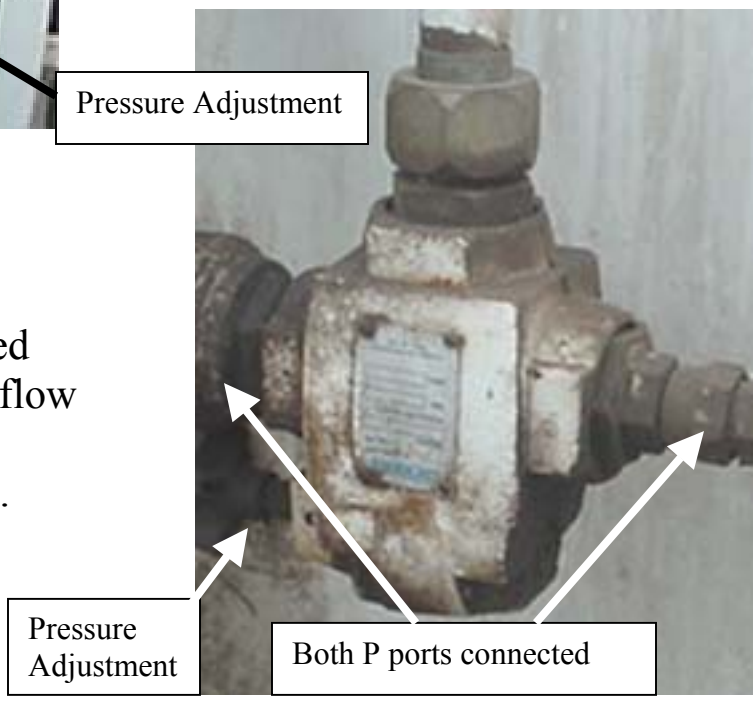
Model Code: C S – (H) 10 – F (V) - _ - 3*

See out Maintenance Hydraulic Troubleshooting Manual for the proper procedures for setting relief valves with pressure compensating pumps.



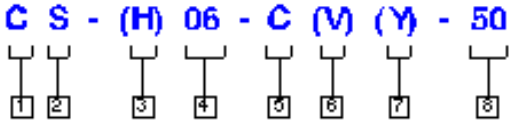
This valve can be mounted in pressure line tee, with one P Port plugged. But always run T port back to tank.
See photo at left.

Also, this valve can be mounted directly in line with the pump flow by connecting both P ports.
Always connect T port to tank.
See photo at right.



Relief Valve Sizing Chart

Model Code



1 Valve Type

C – Relief valve

2 Connections

S – SAE straight thread
T – NPTF thread* (not available in 03 size valve)

*Not recommended

3 High-flow Designation

H – High-flow valve (available in CS models only)
Blank – Omit if not required

4 Valve Size

03 – .8750-14 UNF-2B straight thread (0.625 tubing)
06 – 1.0625-12 UN-2B straight thread (0.750 tubing) or 3/4" pipe
10 – 1.6250-12 UN-2B straight thread (1.250 tubing) or 1 1/4" pipe

5 Pressure Range

B – 8,5 to 70 bar (125 to 1000 psi)
C – 35 to 140 bar (500 to 2000 psi)
F – 100 to 210 bar (1500 to 3000 psi)

6 High Vent Spring

V – Optional high vent spring installed (required in high-flow models)
Blank – Omit if not required

7 Sequence Valve Designation

V – Configured as sequence valve (not available in 03 size valve)
Blank – Omit for relief valve

8 Design Number

5* – For 03 and 06 size valves
3* – For 10 size valve

Subject to change. Installation dimensions same for designs 30 through 39 and for designs 50 through 59.

General Information

The series C*-03/06/10 valve can be ordered as either a pressure relief valve or a sequence valve.

Inlet and outlet pressure connections can be used interchangeably when the valve is mounted in the pressure line. The valve may also be teed off the pressure line with one of the inlet pressure connections plugged.

Minimum venting pressure (see curves on page 18) designates the pressure at which the valve operates (regardless of adjustment) when the vent connection is open to tank. This action is sometimes required during a part of a cycle. Use only when indicated by circuit.

Sincerely,
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