Training notes from the woods
& the classroom

September 2008

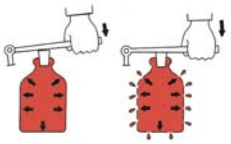
Hydraulics & Hydrostatic Service

This workshop focuses on servicing and field troubleshooting hydrostatic transmissions and hydraulic systems. Specific topics addressed include: unit and component description, function trouble shooting, control adjustments, repair procedures and understanding the Beta and Micron ratings of filters. The training is classroom based and features animated and working model training aids.

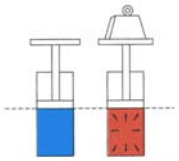
8 Principles of Hydraulics

1. Liquids have no shape of their own.

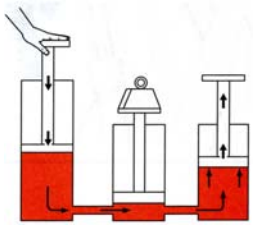
2. Liquids are practically incompressible.



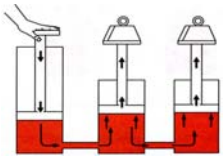
3. Liquids transmit applied pressure in all directions, and act with equal force at right angles to all surfaces.



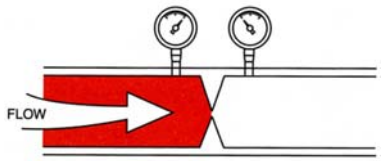
4. Liquids under pressure follow the path of least resistance.



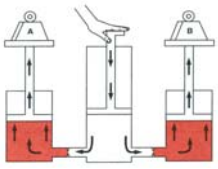
5. Resistance to flow



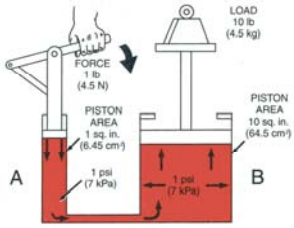
6. Flow across an orifice results in a pressure drop that is directly proportionate to the flow and inversely proportionate to the area of the orifice opening.



7. Hydraulic systems can provide great increases in work force.



8. Energy put into a hydraulic system in the form of flow under pressure will result in either work or heat.



Quick Tips/Reminders

- 85% of all hydraulic failures are due to contamination.
- New oil needs to be filtered before adding it to your system.
- Three main sources of contamination include: *ingressed* (contamination from surrounding environment), *built-in* (caused during manufacturing of machine) and *induced* (poor maintenance procedures).
- Filter media matters (paper vs. microglass) – the most efficient paper filter will only provide nominal filtration. Most manufactured paper
- filters are 50% efficient at the rated micron size. Microglass, on the other hand, can provide filtration efficiencies up to 99.9% efficiency.
- In a hydraulic system running 66 gallons of contaminated fluid (ISO 22/21/18) per minute, more than 4 tons of dirt are likely to pass through your components each year. In a hydraulic system running 66 gallons of well filtered fluid (ISO 16/14/11), you can reduce the amount of dirt passing through your components to approximately 25kg per year – resulting in significantly improved expected pump life.

Photo: Presenter Troy Ladwig uses a working model to discuss the operation and components of a closed looped hydraulic system. (Photo at right to be replaced with one I took at the workshop)

Presenters

Jason Aus
Account Manager
SunSource Hydraulic Service & Repair
952.240.4801
jaus@sunsrce.com

Troy Ladwig
Senior Account Manager
SunSource Hydraulic Service & Repair
800.427.3623 ext. 5613
tladwig@sunsrce.com

MLEP Contact Information

Dave Chura, Executive Director
Minnesota Logger Education Program
301 W 1st Street; Suite 510
Duluth, MN 55802
218-722-5442 · dchura@mlep.org · www.mlep.org