

To: NFPA Education Committee
National Fluid Power Association
3333 N. Mayfair Road, Suite 211
Milwaukee, WI 53222-3219

Date: 10/2/09

RE: Status Report on funded Hydraulic Pump Efficiency Student Research Project

The funds (\$5,000) granted to Montana State University's teaching Fluid Power Laboratory for equipment to allow students to study fluid power pump efficiencies, and conduct pump efficiency research, were received in December of 2008.

Items purchased from these funds to date include an Interface T4 Torque Transducer (\$3,560); and shaft couplers, a tank, hoses, and fittings to complete the basic assembly (\$806). On Sept. 22, 2009, the lab was approved for additional funds to supplement the NFPA grant for the purchase of the torque readout monitor. These items are added to the test bench, pressure transducers, flow meter, and data logger already in the lab which will comprise the pump test bench shown in fig. 1.

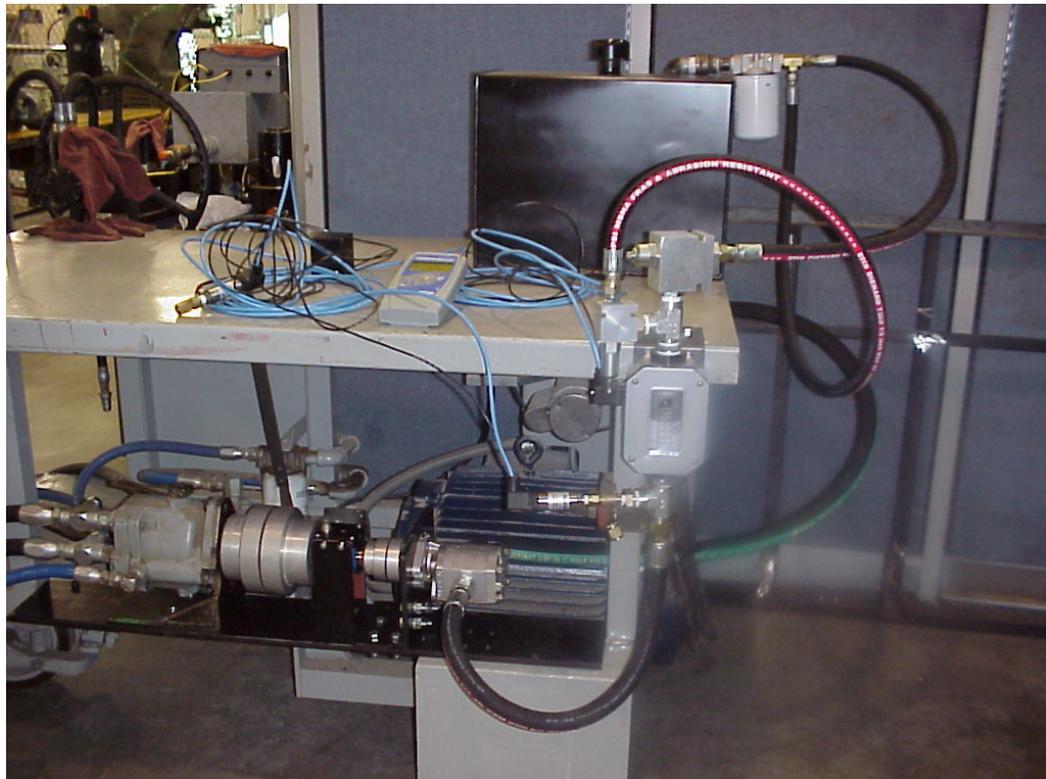


Figure 1, Pump efficiency test bench.

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Apart from receiving the torque readout instrumentation and calibrating it with the transducer, the pump test apparatus is ready for use.

We are proceeding on schedule with the activities described in the NFPA funding proposal. Three senior students in the Mechanical Engineering Department accepted as their senior capstone design, a project to design/redesign a pump to achieve significantly higher efficiencies at low (< 1000 rpm) speeds. These students will continue their research and have a design by late November 2009, then build and test the prototype by May 2009. They are working with several other students in the Fluid Power class (ME 435 / MET 430) on the project. Two other students have selected a class design project involving characterization of pump volumetric efficiency based on clearances, in which they will compare analytical pump leakage calculations with tests done on the new test bench by December 2009. The remainder of the fluid power class will use the test bench to develop pump curves for various pumps and evaluate their efficiencies. These labs will be conducted in October and November 2009.

As the above indicates, we have only begun the activities outlined in the proposal, and would very much like to follow this report with another in the spring of 2010, so that we could describe the use of the equipment and the students' design and research progress in detail, as well as provide photos of the equipment in use.

I believe the students in the senior capstone design and the class, ME 435 /MET 430 Fluid Power Technology, will benefit tremendously from the equipment that you have helped us to purchase and set up. I am very grateful for the funding assistance, which has been of great benefit to our students.

Any questions that you may have regarding the lab are always welcome.

Regards,

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