

## Hydraulic Pumps and Motors with Flow Diverting and Flow Limiting Capabilities

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**Categories:**

- Electrical Engineering
- Mechanical Engineering

**Keywords:**

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- Hydraulics
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- Motors
- Pump

Traditional hydraulic pump/motor units have good efficiency at high displacement, but drop off significantly at lower displacement. In addition, these units often require expensive controllers. Standard units use valve plates and other more traditional units, such as Artemis pumps, use solenoid valve latching techniques. However, techniques such as these cause a lot of lubricating gaps and leakage, reducing the efficiency of the unit. A new, more effective unit is necessary to tackle such issues regarding hydraulic motor efficiency.

Researchers at Purdue University have developed a mechanical device that directly monitors the valves of a hydraulic pump/motor unit to achieve both flow diverting and limiting variable displacement control. This device functions better at lower displacements than traditional units through state of the art operating strategies. Overall, this device increases efficiency by reducing lubricating gaps and leakage, only pressurizing the piston chamber when doing work, and reducing the need for complex controls. This technology can even be used with non-standard hydraulic fluids, such as water, and is applicable to a variety of piston devices such as radial pistons, inline pistons, and wobble plate pistons.

**Advantages:**

- Efficiency
- Applicable for variety of devices and fluids
- Reduces lubricating gaps

**Potential Applications:**

- Hydraulic fluid power

**People:**

- Lumkes, John Henry (Project leader)
- Helmus, Tyler Scott

**Intellectual Property:**

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