

## Energy Storage and Reutilization for a Single-Rod Electro-Hydrostatic Actuator

### Technology Details

This technology features a novel Energy Storage and Reutilization (ESR) system which has been designed, prototyped, and tested for an existing single rod Electro-hydrostatic Actuator (EHA). A particular algorithm has been developed to combine the ESR system with the EHA. Simulations and experiments have been conducted to verify the efficacy and the applicability of the ESR system. Our experimental evaluations suggest that the designed ESR system can decrease the input power of the main source by at least 44.2% in minimum and 70.2% in maximum. Thereby, enhancing the energetic efficiency. This proves the proposed ESR system is highly viable especially for heavy-duty hydraulic arms during load handling. In addition, its easy implementation and simple configuration makes it usable in any EHA applications for both energy storage and energy reutilization.

### Technology Benefits

Energy can be saved when external loading shows (is recognized) as a potential to help the actuation. The saved energy can then be used effectively once needed, thereby reducing (if not eliminating) the otherwise wasted energy.

### Applications

Any mobile hydraulic machine that uses hydraulic actuators for performing tasks. Excavators, feller bunchers, harvesters. Very relevant to hydrostatic actuation systems that already present efficiency.

### Development Stage

Fully functional prototype has been developed and tested on a laboratory backhoe machine.

#### Patent Status:

US National Phase (App No. 18/412851; filed 15 January 2024).

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