Electric Machine Sizing for ePump – A Case Study of Axial Piston Machines
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Abstract

As a result of the push towards zero emission technologies, electrification is finding its way into all types of equipment and systems, including fluid power systems. This trend to meet the needs of electric and hybrid vehicles will only increase in the coming years as electrification in the heavy equipment industry continues to grow. The push for electrification does not mean the eventual replacement of hydraulics with electric motors will occur. Instead, the industry will work toward ways to integrate electric technologies in the most effective ways possible and to make maximum use of the power density and efficiency provided by hydraulics technology.

Therefore, it is important to design electrified fluid power systems in an efficient, cost-effective, and compact manner. Electrifying fluid power systems rely on designing an electrified flow source or electric machine driven hydraulic machine (ePump). However, the design process of such ePumps is fairly convoluted with considerations of battery, inverter, electric machine, cooling architecture, hydraulic machine, system flow demands, etc. Moreover, for electrifying a state-of-the-art hydraulic system, there is no standard design practice or guidelines to make this transition efficient and cost-effective. The complexity of the design process hampers the rate of electrification of current fluid power systems.

The lecture discusses the different design specifications affecting the design of the ePump. The lecture will focus on providing general guidelines on selecting key design variables affecting the size, cost, efficiency, and operating capability of the ePump.

Join this webinar to learn more about these topics and gain insight into the ePump design methodology.

(*) The webcast link will be shared to Maha members, as well as to companies interested in joining the Maha center.

For more information on the webcast, and for receiving the webcast link, please contact avacca@purdue.edu, or shangl@purdue.edu, or Prithvi at pchandir@purdue.edu