

Calibrations and Effect of Different Operating Conditions on the Performance of a Fluid Power Control System with Servo Solenoid Valve

Authors : Tahany W. Sadak, Fouly, A. Anwer, M. Rizk

Abstract : The current investigation presents a study on the hydraulic performance of an electro-hydraulic servo solenoid valve controlled linear piston used in hydraulic systems. Advanced methods have been used to measure and record laboratory experiments, to ensure accurate analysis and evaluation. Experiments have been conducted under different values of temperature (28, 40 and 50 °C), supply pressure (10, 20, 30, 40 and 50 bar), system stiffness (32 N/mm), and load (0.0 & 5560 N). It is concluded that increasing temperature of hydraulic oil increases the quantity of flow rate, so it achieves an increase of the quantity of flow by 5.75 % up to 48.8 % depending on operating conditions. The values of pressure decay at low temperature are less than the values at high temperature. The frequency increases with the increase of the temperature. When we connect the springs to the system, it decreases system frequency. These results are very useful in the process of packing and manufacturing of fluid products, where the properties are not affected by 50 °C, so energy and time are saved.

Keywords : electro-hydraulic servo valve, fluid power control system, system stiffness, static and dynamic performance

Conference Title : ICACCA 2018 : International Conference on Automatic Control Components and Applications

Conference Location : Paris, France

Conference Dates : September 20-21, 2018