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Mechatronic design and modeling of fluid power system in cold rolling mills

Ali Jafari
Qazvin Islamic Azad University, Iran

This paper presents a theoretical and practical investigation of a cold rolling mill. The hydraulic power system of the lines has a servo-proportional circuit. For the investigation, first, every single governed equation of four key hydraulics components included a variable displacement pump, a relief valve, a servo proportional valve and a double acting cylinder (D.A.C) are elicit. Using the actual parameters of the hydraulic system, these equations are solved by Matlab/Simulink, the results in terms of the movements of servo-proportional valve spool and relief valve pressure differences are graphically illustrated. For evaluating the modeling, the real tests are conducted in the line. A practical result represents graphically in term of movements of servo-proportional valve spool and the pressure differences which is measured by a transducer and a pressure gage, respectively. At last these mathematical and actual results are compared. This comparison shows an acceptable approximation between the two graphs. The results of this paper increase the hope for doing new optimum design without needs to actually test in the future.

Biography

Ali Jafari is a PhD researcher from Qazvin University. He teaches in the same university as a lecturer on full time basis.

ebrahimi_sara62@yahoo.com