A PROJECT REPORT ON

Design and Analysis of Accumulator

A project report submitted in partial fulfillment of the requirements for the award of the

Degree of

BACHELOR OF TECHNOLOGY

IN

MECHANICAL ENGINEERING

SUBMITTED BY

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TAMARAM, MAKAVARAPALEM, NARSIPATNAM-531113

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CERTIFICATE

This is to certify that the project work entitled "DESIGN AND ANALYSIS OF ACCUMULATOR" submitted by **P.RAVI KUMAR (18811A0325), K.THALUPULESWARA RAO (18811A0340), P.DIVAKAR (18811A0324), P.NAVEEN (18811A0322)** to Avanthi Institute of Engineering and Technology, Makavarapalam, Visakhapatnam in partial fulfillment for the award of the degree of Bachelor of Technology in Mechanical Engineering, is a bonafide record work carried out by them, under guidance and supervision during 2018- 2022.

The results embodied in this project work have not been submitted to any other university or institute for the award of any degree.

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20/6/22

PROJECT GUIDE

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ABSTRACT

Pressure transient can occur in piping system due to much different abnormal system conditions. In a hydraulic system, one such condition that can cause a pressure transient is the action of an external force on an actuator in the system. An example where this type of transient can occur is in mechanical shocks of hydraulically operated suspension system for a dump truck. A proven method to suppress this type of pressure transient is to incorporate an accumulator into the system near the actuator. This project outlined a numerical approach for analyzing the response of such an accumulator affected by external force acting on a hydraulic actuator.

A description is presented on how to perform fundamental analyses for accumulators used to maintain pressure control in closed-loop fluid systems. Since the accumulator is one of the most important component with the largest sound radiation surface area in rotary compressor, its noise contribution may be substantial. Noise generation and transfer mechanism of the accumulator are so complicated that it is difficult to identify the acoustic characteristics, because both structural and cavity modal are possible to be excited by many sources such as structural vibration, aero-acoustics, pressure pulsation etc., in addition coupling between them cannot be ignored either. In this paper, both of the noise generation and transfer mechanism are studied systematically, also standing wave and me mechanical vibration theory are applied to build the mathematical model.

Keywords: Accumulator, Hydraulic Systems, Pressure Control, Vibrations, Dampening, Energy Storage Device, ANSYS Software.