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DESIGN AND PARAMETRIC MODELING OF ACCUMULATOR USING ANSYS

Ramu Garugubilli
Assistant Professor, Department Of Mechanical Engineering Avanthi Institute Of Engineering And Technology Bhogapuram (M), Vizianagaram (Dist).

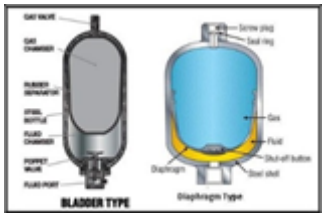
Marupalli Venkatesh
M.Tech Student, Department Of Mechanical Engineering Avanthi Institute Of Engineering And Technology Bhogapuram (M), Vizianagaram (Dist).

Abstract

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.

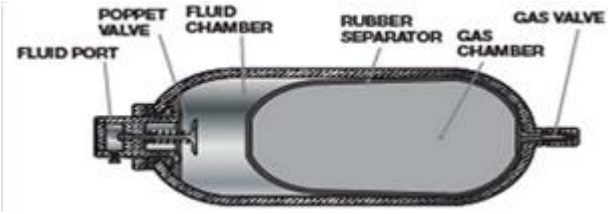
CHAPTER - 1 INTRODUCTION

Accumulator



1. General Overview:

Hydraulic fluid itself has a very high bulk modulus, miniscule changes in the volume of a closed hydraulic system result in large swings in pressure. Pump-motor noise can cause unsafe pressure fluctuations in this way if unaccounted.



Schematic Diagram Of Hydraulic Accumulator

Where is a capacitive factor, capacitance in the case of capacitors, compliance in the case of springs, and compressibility in the case of pressure vessels (Karnopp 52)? Furthermore, when written in this form, the capacitive factors of multiple elements can be easily combined analytically. When N elements meet at a junction of common effort. This can most easily observed in the case of capacitors arranged in a parallel circuit. Each capacitor stores the same amount of charge as it would if the other parallel branches were removed, because each capacitor sees the same effort (voltage) as the next. Therefore, the total capacitance of the circuit is equal to the sum of capacitance.

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