Paper ID: NITETMECH37

DESIGN AND DEVELOPMENT OF KINEMATIC LINKAGE BASED VARIABLE DISPLACEMENT PUMP

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IJIERT-NITET-16

ABSTRACT

Variable displacement hydraulic pump with high efficiency at all operating conditions from zero to maximum output is beneficial to multiple applications .There is number of architectures currently available for variable displacement pump .But variable displacement pump is 5 to 6 times costly with compared to fixed discharge pump. Thus objective of this project is defined to develop a variable displacement pump by varying the stroke of radial piston pump. This achievement is based on simple four bar linkage with one control link. Control link is joined at one end of connecting link and rotation of output yoke controlled by unidirectional clutch. By controlling the position of control link can vary the output without changing the input.
When control link at 120˚, zero max mechanics is at zero speed condition. When control link is at 0˚, zero max mechanism at maximum speed condition. Thus from this mechanism get variable flow rate as per requirement between 0-120 degree control link position. Result of this project shown in various position of control link related flow rate and related volumetric efficiency which shows that when speed increases flow rate is going to increase at all position of control link and volumetric efficiency is slightly decreases still resultant volumetric efficiency is more beneficial. From this project tried to improve power, energy loss with cost reduction.

KEY WORDS: Variable displacement, hydraulic pump, control link, mechanism.