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AUTOMATION OF HYDRAULIC TYRE WEAR TESTING MACHINE USING PROPORTIONAL CONTROL VALVE BY INTERFACING PROGRAMMING LOGIC CIRCUIT

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ABSTRACT

The Research work aims for automation of the hydraulic tyre wear testing machine by using proportional control relief valve through interfacing with programmable logic control called PLC. This research work is an earnest attempt to automate the existing hydraulic system of conventional loading of tyre for analysing its serviceability i.e. the ability of the tyre offers resistance to wear under various load conditions. This research work is suggestion to the MRF Ltd, R&D department. The existing hydraulic system is of conventional type of hydraulic loading system, the tyres are tested for its wear resistance by manual application of load by gradually increasing the system pressure of the conventional relief valve and the pump used in the system is fixed displacement vane pump.

This type of manual application of load on tyres consumes more time for testing and also results in non uniformity of applying load on the tyres. Hence, the emanation of thought for complete automation of the system has nurtured. The newer idea of automation of the system replaces the conventional relief valve with proportional control relief valve and fixed displacement vane pump with load sensing piston pump and the automatic method of application of increasing the system pressure i.e. the load on proportional control relief valve is carried out by interfacing the proportional control relief valve with PLC. This automation of the system eventually will eases the burden of manual application of load on the tyres, emphasis in uniformity of loading the tyres for conducting a better wear analysis test and also cut down the ideal time as well more numbers of tyres can be tested from same system by the introduction of load sensing pump.

KEYWORDS: Servo Valve, DC Power Supply and Control Amplifier