

Study of Clutch Cable Architecture and Its Influence in Efficiency of Mechanical Cable Release System

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Abstract : In competitive market like India, there is a high demand on the equal contribution on performance and its durability aspect of any system. In General vehicle has multiple sub-systems such as powertrain, BIW, Brakes, Actuators, Suspension and Seats etc., To withstand the market challenges, the contribution of each sub-system is very vital. The malfunction of any one sub system will directly have an impact on the performance of the major system which lead to dis-satisfaction to the end user. The Powertrain system consists of several sub-systems in which clutch is one of the prime sub-systems in MT vehicles which assist for smoother gear shifts with proper clutch dis-engagement and engagement. In general, most of the vehicles will have a mechanical or semi or full hydraulic clutch release system, whereas in small Commercial Vehicles (SCV) the majorly used clutch release system is mechanical cable release system due to its lesser cost and functional requirements. The major bottle neck in the cable type clutch release system is increase in pedal effort due to hysteresis increase and Gear shifting hard due to efficiency loss / cable slackness over the mileage accumulation of the vehicle. This study is to mainly focus on how the efficiency and hysteresis change over the mileage of the vehicle occurs because of the design architecture of outer and inner cable. The study involves several cable design validation results from vehicle level and rig level through the defined cable routing and test procedures. Results are compared to evaluate the suitable cable design architecture based on better efficiency and lower hysteresis parameters at initial and end of the validation.

Keywords : clutch, clutch cable, efficiency, architecture, cable routing

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