

INCREASING STIFFNESS OF DIAPHRAGM-SPRING FINGERS AS A PART OF SYSTEM APPROACH IMPROVEMENT OF FRICTION CLUTCH FUNCTION

DARKO DANEV¹, MILAN KJOSEVSKI² & SIMEON SIMEONOV³

^{1,2}Ss. Cyril and Methodius University in Skopje, Faculty of Mechanical Engineering Skopje, Macedonia

³Goce Delcev University Stip, Faculty of Mechanical Engineering, Štip, Macedonia

ABSTRACT

In contemporary vehicles, friction clutches are exposed to increased engine performances, i.e. increased torque, particularly for vehicles equipped with diesel engines. Demands for low mass and low moments of inertia of the moving parts are more pronounced. Towards the aim of meeting those demands, there is a tendency for manufacturing of clutch covers by drawing from a thin tin sheet metal, thus decreasing their axial stiffness, and increasing the path of the release bearing. Such a situation in conditions of increasing vehicle speed endangers the fast and precise work and functionality of the friction clutch. Concomitantly, the effort and the work that the driver needs to make and do during its clutch release increase. These factors need to be within certain limits.

This paper provides an analysis of a possible response to this kind of challenges. The focus is pertinent to the analytical and experimental analysis of the capacity to decrease backlash in the process of release of the clutch with an inexpensive technological procedure for profiling the fingers of the diaphragm-spring as a way to increase their stiffness. The impact of the analyzed interventions on the dynamic durability of the diaphragm-spring is also assessed through an adequate experiment.

KEYWORDS: Friction Pad, Diaphragm-Spring, Stiffness of the Fingers, Process of Engagement