EXPERIMENTAL STUDY OF VIBRATION RESPONSES DUE TO BELT DEFECT ON V-BELT TRANSMISSION SYSTEM

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ABSTRACT

Condition monitoring method by means of measurement and observation of vibration levels and vibration characteristics of machinery is widely used in industry. This is because vibration is a good indicator of machinery condition and is an early indicator of machinery problems.

This final project is an experiment intended to study effects of belt defects, using two speed ratios, to characteristics of vibration responses of a v-belt transmission system. Types of defected belt used in this final project are lumped, crack (on the belt surface) and intensity variation of defected belt.

The purposes of experiments are to gain graphic of vibration responses characteristic from the v-belt transmission system correlated with this kind of defects. A v-belt transmission test bed from previous experiment is used in this final project.

Some of the results obtained from the experiment are: compared to normal condition, the lumped v-belt and the cracked one, has increased vibration amplitude level at driven pulley speed harmonics. Effects of lump are similar to effects of crack. The harmonics of BPF are occurs, on horizontal vibration spectrum of transmission with speed build up. For speed build up cases, multiplying of lump defects are increasing the vibration level. Noticed that, for transmission with speed reduction, vibration responses is dominated by 91 Hz spectrum, which is drop off the vibration level during multiplying the number of belt lumps. Multiplying the number of cracks, are intended to decrease vibration level.

Keywords: v-belt, condition monitoring, vibration, belt defects