

## ABSTRAK

The motorcycle is widely used by the community one is the VESPA. On a motorbike vespa many rotating parts, such as the crankshaft is resting on the pads. The bearings have a very important role in maintaining the performance of the machine. Defective bearings will have an impact on his descent engine performance. To reduce impacts more severe bearing fault, then the bearing fault detection becomes important done. Vibration analysis is one way that is often used to detect bearing fault. This analysis is relatively easy to use, more effective and can be done at the time of the machine in case of work without having to stop the machine and unload machine parts. This research aims to apply the envelope analysis to detect disability early bearing on the crankshaft vespa engine.

This research method using spectrum domain analysis and envelope to detect fault in the path of the ball bearings. Research by way of comparing both methods aim to know which method is superior to detect ball bearing fault. The bearing are single row Danmotor brands with different conditions, namely bearings normal, flawed 0.25 mm, 0.50 mm and disability. the third condition Of the bearing will be tested using different variations of velocity i.e. 1500 RPM and 2000 RPM. Vibration detection using the Sensor will be on the accelerometer connected with Data Acquisition Modules run with Matlab software.

The results show that the time domain can indicate the frequency of bearing fault, but the frequency of bearing fault is difficult to find if the bearing has suffered severe damage resulting in a longer impulse duration. spectrum domain cannot show bearing defect frequency at shaft speed 1500 Rpm or at shaft speed 2000 Rpm. While the envelope method is able to show the frequency of bearing defects followed by 3x harmonics on both bearing defects and both shaft speeds. The envelope method is superior to the frequency domain because low frequencies that have a high amplitude value are eliminated, so they are able to detect bearing defects more specifically even when bearing defects are still early.

Keywords: envelope Method, frequency domain, defects in the pathway, bearing