

ABSTRAK

Penelitian ini dilakukan pada motor-torak 4 *stroke* satu silinder dilakukan di Laboratorium Vibrasi Prodi Teknik Mesin Universitas Mercubuana, bertujuan untuk mempelajari karakteristik dinamik pada motor-torak 4 *stroke* satu silinder. Penelitian respon getaran diukur dengan menggunakan sensor *accelerometer khotec 107b* dan alat ukur *Vibration Analyzer Onno Sokki* dengan metode *bump test*. Respons getaran diukur pada 6 titik yaitu: pada posisi *piston* titik mati atas (TMA), pada posisi piston titik mati bawah (TMB), *timing chain*, *bearing*, *valve train*, dan tutup *valve train*. Rentang frekuensi yang digunakan sebesar 0 - 800 Hz. Pada posisi *piston* TMA didapat frekuensi 90 Hz - 798,2 Hz; pada posisi *piston* TMB didapat frekuensi 80,52 Hz - 799,7 Hz; pada *timing chain* memiliki frekuensi 29,71 Hz - 795 Hz; pada *bearing* memiliki frekuensi 84,43 Hz - 798,2 Hz; pada *valve train* memiliki frekuensi 84,43 Hz - 800,5 Hz; pada tutup *valve train* memiliki frekuensi 73,48 Hz - 798,9 Hz. Pada penelitian ini, terdapat frekuensi pribadi yang muncul lebih dari satu titik pengukuran. Hal ini menunjukkan adanya modus getar global. Dari ekperiment *bump test* ini diidentifikasi frekuensi pribadi global sebesar 119 Hz, 337 Hz, 488 Hz, 491 Hz, 533 Hz, dan 702 Hz sedangkan frekuensi pribadi yang lain berkaitan dengan modus getar lokal, karena hanya muncul pada satu titik pengukuran saja.

Kata kunci : karakteristik, motor torak 4 *stroke*, *piston*, *timing chain*, *bearing*, *valve*, *bump test*

STUDY OF BUMP TEST MEASUREMENT IN 4 STROKE ENGINE SINGLE CYLINDER

ABSTRACT

This research was carried out on 4 stroke engine single cylinder carried out at the Vibration Laboratory of the Mechanical Engineering Study Program at the University of Mercubuana, aims to study the dynamic characteristics of 4 stroke engine single cylinder. Vibration response research was measured using the Kohtect 107b Accelerometer sensor and the Onno Sokki Vibration Analyzer with the Bump test method. Vibration response is measured at 6 points, namely: at the position of the top dead center (TDC), at the position of the bottom dead center (BDC), timing chain, bearing, valve train, and valve train cover. The frequency range used is 0 - 800 Hz. At the position of the TDC piston the frequency is 90 Hz - 798.2 Hz; at the position of the piston BDC obtained frequencies 80.52 Hz - 799.7 Hz; the timing chain has a frequency of 29.71 Hz - 795 Hz; the bearing has a frequency of 84.43 Hz - 798.2 Hz; the valve train has a frequency of 84.43 Hz - 800.5 Hz; the valve train cover has a frequency of 73.48 Hz - 798.9 Hz. In this study, there were personal frequencies that appeared more than one measurement point. This shows the existence of a global vibrational mode. This experiment bump test identified global personal frequencies of 119 Hz, 337 Hz, 488 Hz, 491 Hz, 533 Hz, and 702 Hz while other personal frequencies were related to local vibrational mode, because it only appeared at one measurement point.

Keywords: characteristics, 4 stroke engine, piston, chain timing, bearing, valve, bump test