EXPERIMENTAL STUDY : VARIOUS WHEEL CHARACTERISTIC TO GET MAXIMUM BALANCE PERFORMANCE IN BALANCING PROCESS

Name : Harie Satiyadi Jaya
Student Identity Number : 2108 201 001
Faculty : Mechanical Engineering FTI - ITS
Supervisor : Prof. Dr.Ing.Ir. Suhardjono, MSc.

ABSTRACT

Wheel Vehicle unbalance will be happened when the center of mass is not co-axial with the rotary axis. That vehicle wheel hinged balance, hence arising centrifugal force must be compensation with the same attachment force but opposite direction, that’s call balancing process. The most common balancing method used at industry is phase angle method, four run method and modal balancing. Currently, balancing machine used one turn only for different wheel, for example C206 standard commercial balancing machine, produced by CEMB USA, where speed of revolution utilized is < 100 rpm for balancing process with various of wheel size. Weakness from that's balancing process is have no in precise to identify where unbalance mass position and what exactly revolution wheel balancing should be done, is under natural frequency, near natural frequency or above natural frequency.

To solve that’s problem above, in this thesis will be developed new balancing wheel machine prototype. Step in this balancing process is determines position of optimal angle correction weight first, with various revolution of wheel, under and above the natural frequency. Goal this research expected increase accuration of balancing process causing is got maximum balance performance.

Result from this research is percentage of vibration amplitude reduction from unbalance to balance condition, that is 87,9% for velg ring 12" with 10,75 kg weight at 450 rpm; 77,8% for velg ring 13" with 11,75 kg weight at 460 rpm; 66,7% for velg ring 14" with 17,7 kg weight at 385 rpm, 80,4% for velg ring 15" with 16,05 kg weight at 450 rpm and 87% for velg ring 15" new condition with 16,5 kg weight at 450 rpm.

Keyword : balance performance, mass unbalance, wheel vehicle balancing , phase angle method