

ABSTRACT

Zero accident motto is one of the main targets in the workplace. In the assembly department of PT. Astra Daihatsu, the STOP 6 dangerous potential caused by vehicle accident, namely, crossing forklift supply tire and wheel disk with towing axle and forklift supply axle in the wheel disk supply process from the warehouse to the setting velg post. The solution is by designing a lifter wheel disk machine using a pneumatic. The design aims to optimize the wheel disk lifter machine and be safe for use in wheel disk moving process.

The improvement focused on the method and environment factor that used a forklift in the wheeldisk pallet supply process because the setting velg post has a height of 50 cm from the assembly production area. Wheeldisk lifter machine design used the Autodesk Inventor 2018 software. The equipment was tested with the static analysis loading simulation using von mises stress, 1st principal stress, 3rd principal stress, displacement, and safety factor. The pneumatic lifted the wheel disk from the wheel disk setting table to the press tire machine. The pneumatic based on the received load, which was 45,64 kg, and performed buckling analysis on the rod piston to determined pneumatic used within the safe limitations due to the received load.

The planning results obtained for the lifter wheel disk machine design is using the pneumatic type SMC MBB40-350Z-W with a Ø40 mm diameter of cylinder and a 300mm of lifting distance. The pneumatic use is on a safe limitation which is 14.502,28 N, owing the fact that the buckling stress on the rod piston is greater than the received load which is 447,72 N and the simulation result of static analysis (working stress) which is 7,764 MPa, is smaller than the yield strenght of aluminium 6061 (permissible stress) which is 48 MPa.

Keyword: Lifter Wheeldisk, Pneumatic, Rod Piston.

INTISARI

Motto *zero accident* menjadi salah satu target yang harus dicapai oleh suatu perusahaan. Pada *assembly department* PT Astra Daihatsu Motor terdapat potensi bahaya STOP 6 akibat tertabrak kendaraan yaitu *crossing forklift supply tire* dan *wheeldisk* dengan *towing axle* dan *forklift supply axle* pada proses *supply wheeldisk* dari *warehouse* menuju pos *setting velg*. Solusi penanggulangannya berupa perancangan mesin *lifter wheeldisk* dengan menggunakan *pneumatic*. Perancangan dilakukan bertujuan untuk merancang mesin *lifter wheeldisk* yang optimal dan aman pada proses pindah *wheeldisk*.

Improvement terfokuskan pada faktor *methode* dan *environment* yang menggunakan *forklift* pada proses *supply* palet *wheeldisk* karena pos *setting velg* memiliki ketinggian 50 cm dari area produksi *assembly*. Perancangan mesin *lifter wheeldisk* dilakukan menggunakan *software* Autodesk Inventor 2018. Alat tersebut diuji dengan simulasi pembebanan *analysis static* berupa *von mises stress*, *1st principal stress*, *3rd principal stress*, *displacement*, dan *safety factor*. *Pneumatic* berfungsi untuk mengangkat *wheeldisk* dari meja *setting velg* menuju mesin *press tire*. Pemilihan *pneumatic* berdasarkan beban yang diterima yaitu 45,64 kg dan dilakukan analisa *buckling* pada *rod piston* untuk menentukan penggunaan *pneumatic* dalam batas aman akibat beban yang diterima.

Hasil perancangan yang diperoleh untuk perancangan mesin *lifter wheeldisk* yaitu menggunakan tipe *pneumatic* SMC MBB40-350Z-W dengan diameter silinder Ø40 mm dan jarak angkat 300 mm. Penggunaan *pneumatic* tersebut dalam batas aman karena nilai gaya *buckling* pada *rod piston* yaitu 14.502,28 N jauh lebih besar dari beban yang diterima yaitu 447,72 N dan hasil simulasi pembebanan *analysis static (working stress)* yaitu 7,674 MPa jauh lebih kecil dari *yield strenght* aluminium 6061 (*permissible stress*) yaitu 48 MPa.