

ABSTRAK

Priagung Adil Wicaksono, 25419026

PERANCANGAN WALL MOUNTED JIB CRANE DENGAN KAPASITAS ANGKAT 1.5 TON

Skripsi. Jurusan Teknik Mesin. Fakultas Teknologi Industri. Universitas Gunadarma, 2023.

Kata kunci : Perancangan, *Wall Mounted Jib Crane 1.5 Ton*, *Static Simulation*, *Solidworks*.

(xvii + 79 + Lampiran)

Lift aircraft are aircraft or equipment manufactured to lift, lower, position and hold components or loads. One example of a lifting aircraft is a jib crane. A jib crane is a type of aircraft with a working system similar to a small tower crane, which is a combination of a lifting crane and a hydraulic crane. Jib cranes are divided into two types, namely pillar jib cranes and wall-mounted jib cranes. Therefore, the idea arose to create a design for a wall mount jib crane using Solidworks 2020 software. This type of wall mount jib crane has a track feature installed on a construction pole or wall with a load capacity of 0.5-1.5 tonnes. The dimensions of WF iron are 3,800 mm x 113 mm x 243 mm using AISI 1045 material. The aim of this paper is to discuss the design of a wall mounted jib crane with a lifting capacity of 1.5 tons by calculating the main components of the wall mounted jib crane such as beams, bolts, motors, gearbox, drum and steel rope. The author carried out an analysis using the finite element analysis (FEA) method to determine the von Mises value, safety factor and displacement using Solidworks 2020 software. The Wall Mounted Jib Crane has a power source produced by an electric motor with a power specification of 12.26 kW with a speed of 3,000 rpm and a gearbox with ratio 1:20. This Wall Mounted Jib Crane has a rope tension force value of 4371.55 N and a drum diameter value of 200 mm, a length of 580 mm, then a drum flange diameter of 300 mm and a drum capacity of 245.03 m. In Wall Mounted Jib Crane bolts to connect the support structure to the building construction, there are bolts used, namely grade 8.8 bolts measuring M16x1.5 with a minimum bolt diameter required of 3.32 mm. Simulation results using Solidworks 2020 software with a load of 14,700 N. From the load, the maximum von Mises stress value on the beam is 64.4 MPa while the minimum value is 6.4 MPa. The maximum displacement value in the beam is 8.7 mm while the minimum value is 0.9 mm. The safety factor value for the beam is 8.2 ul.

Daftar Pustaka : 2006 - 2023

Dosen Pembimbing : Dr. Iwan Setyawan, ST., MT.