ABSTRACT

Shafts have been widely used in machining construction which serves to carry power from one location to another. But at the time when the shaft rotates with a certain speed so as to produce a vibration that can cause deflection of the shaft, then this condition is called a critical rotation. To be able to find the critical rotation point on the shaft, a shaft critical spin test was made. Critical rotation test equipment is made with the aim to find out how much deflection occurs on the shaft and at what speed the critical rotation occurs on the shaft. Before being used for testing, the critical shaft rotation test equipment must first be analyzed for its safety factor. The safety factor is a factor that is used to evaluate that the design of machine elements is guaranteed with minimum dimensions and as a safety in the system, if in a situation the system receives a burden outside of the calculation, which aims to prevent the design from failing in that situation. The way to find the safety factor of this test tool is to use actual calculations and simulations on the Solidworks software. Safety factor data that has been obtained from actual calculations and simulated on the Solidworks software will then be compared. The way to find the safety factor of this test tool is to use actual calculations and simulations on the Solidworks software. To find the value of the safety factor, it's necessary to know in advance the actual stress that occurs in each component. Safety factor data that has been obtained from actual calculations and simulated on the Solidworks software amounting to 4 - 2000 will then be compared. For the result of the two data there is a difference of 1% - 8% and for the value of the safety factor in two data above the use of the standard value of the safety factor in ASME B.106. 1M Transmission Shaft Design and ASME-Elliptic. So that there is no need for component replacement and the shaft critical rotation test equipment is ready for use.

Keywords*: Shaft, critical rotation, shaft critical rotation test, safety factor, Solidworks*