

STUDY AND ANALYSIS OF THE FAITUGE FAILURE (OF BOLT ADAPTER) OF PROSTHETIC SACH FOOT

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ABSTRACT

In this paper, the study and analysis of failure mechanism of non-articular prosthetic foot (SACH) in the region (Bolt Adapter), the tests of mechanical properties and fatigue behavior were carried for material from which the bolt is manufactured, a region where the failure occurs and also analysis of the gait cycle and GRF of amputee subject and Compare it with normal subject and inserted of these properties to the program of engineering analysis (Ansys) to calculate the safety factor of fatigue and stress equivalent (Von-Mises) and lastly, the fatigue test to SACH foot is carried by Fatigue tester device to calculate the number of cycles to failure and to improving the fatigue properties to bolt the laser peeing was used to the material the bolt manufacture from it and testing the specimen after hardened and calculate the safety factor. The results showed that the safety factor after hardening by laser is increased by 42.8%.

In this paper, study the mechanism of failure in bolt of prosthetic and find the distribution of von- mises stress in foot and safety factor of fatigue and determine the number of cycles to failure at bolt and improving the fatigue properties of bolt material by laser peening and calculate the safety factor after hardened.

KEYWORDS: Analysis, Prosthetic, Foot, SACH, Fatigue, Bolt, Adapter