

A
Project Report on

STRUCTURAL ANALYSIS OF LEAF SPRINGS SUBJECTED TO VARYING LOADS

A Project report submitted for the partial fulfilment of the requirements for award of
Degree of

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Submitted by

NANDAVARAPU CHANDRA SEKHAR	19815A0355
VARADA SRINIVAS	19815A0380
GAMPA BHASKAR BABU	19815A03A1
PILLALA MALLU NAIDU	19815A0388

Under the guidance of
Sri. B. RAMAKRISHNA M.Tech
Asst. Professor



DEPARTMENT OF MECHANICAL ENGINEERING
AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY
(PERMANENTLY AFFILIATED TO JNTU-KAKINADA, ACCREDITED BY NBA &
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(Affiliated to Jawaharlal Nehru technological university Kakinada, A.P)
TAMARAM, MAKAVARAPALEM-531113

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DEPARTMENT OF MECHANICAL ENGINEERING

AVANTHI INSTITUTE OF ENGINEERING & TECHNOLOGY



CERTIFICATE

This is to certify that the project entitled “**STRUCTURAL ANALYSIS OF LEAF SPRINGS SUBJECTED TO VARYING LOADS**” is the record of the work carried out by NANDAVARAPU CHANDRA SEKHAR(19815A0355), VARADA SRINIVAS(19815A0380), GAMPA BHASKAR BABU(19815A03A1), PILLALA MALLU NAIDU(19815A0388) students of final year B. Tech in the department of Mechanical engineering. This work is done for the partial fulfilment for the award of BACHELOR OF TECHNOLOGY during the year 2021-2022.


Project Guide

B.RAMAKRISHNA M.Tech

Assistant professor


Head of Department

V.HARI KIRAN M.Tech,(Ph.d)

Head of Department.

External Examiner

ABSTRACT

Springs, shock absorbers, and linkages make up a good and efficient suspension system. They link a vehicle's body structure to its wheels and allow relative motion between them. They are in charge of a vehicle's safety handling and braking. A leaf spring suspension, on the other hand, is constructed up of a set of relatively long steel strips attached to a frame at both ends and suspending the axle in the middle. A leaf spring is a thin, arc-shaped piece of spring steel with a rectangular cross-section. Because the axle is suspended by the spring, leaf spring suspensions are significantly easier to use and do not require the complicated suspension geometry of coil-spring suspensions. Leaf springs are also significantly more durable than coil springs. They can withstand far greater loads with less deflection than coils. Leaf spring trucks are also easy to raise and lower. Leaf springs essentially mean that each spring is coupled to the chassis at set points, leaving just a little area for suspension geometry adjustment and modification. In addition, these springs flex much less than coil springs, resulting in a loss of wheel-to-ground contact in extreme conditions. The design and static structural analysis of a truck leaf spring is carried out using a simulation tool ANSYS for different materials such as Structural steel, EN 45 steel, Al 6061 alloy, AISI 1030 alloy, high carbon steel and carbon epoxy composites where the high amount of stress induced areas are identified in the stack of layer strips. The results such as deformations, stresses and fatigue characteristics for different materials are investigated to choose best suitable leaf spring to be employed in an automotive load carrying truck.