

R.S. No. 77, Thirubuvanal Main Road, Tel : +91 413 2640201
Thirubuvanal, +91 413 2640202
Puducherry - 605 107. URL : www.rane.co.in
CIN : L65993TN2004PLC052856

Rane (Madras) Limited



Ref: RML/HR/2021-22

27.11.2021

The Head of the Department
Sri Venkateshwaraa College of Engineering & technology,
Puducherry.

Dear Sir / Madam,

Sub: Project Confirmation – Reg.

Ref.: Your permission request letter dated 22.11.2021:

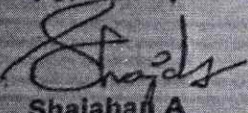
Hereby, we confirm below listed Final year B. Tech (Mechanical Engineering) student of your institution to undergo the Industrial Project work in our organization from November 2021 to February 2022.

- | | |
|-------------------------|------------------|
| 1. Mr. E. Ajay | Reg.No. 18TB1102 |
| 2. Ms. V. Bhuvaneshwari | Reg.No. 18TC1106 |
| 3. Mr. C. Dinesh | Reg.No. 18TD1313 |
| 4. Mr. V. Bharathan | Reg No. 18TB1112 |

The student is strictly advised to follow the rules and regulations of the company and the data collected from the company shall be kept confidential.

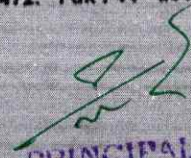
Thanking you,

For Rane (Madras) Limited,


Shajahan A
Deputy Manager-HR

Registered Office : "Malthri" 132, Cathedral Road, Chennai - 600 086. Tel : 28112472. Fax : 44 - 28112449




PRINCIPAL
SRI VENKATESHWARAA COLLEGE OF
ENGINEERING & TECHNOLOGY
ARITUR, PUDUCHERRY - 605 102.

BONAFIDE CERTIFICATE

This is to certify that the project work entitled "IMPROVEMENT ON THE RACKBUSH TO ELIMINATE RATTLE NOISE IN THE STEERING GEAR (In Small Passenger and Off road Vehicles)" is a bonafide record of the work done by

1. Bhuvaneshwari V (18TC1106) *Bhuvaneshwari V*
2. Ajay E (18TB1102) *Ajay E*
3. Dinesh C (18TD1313) *Dinesh C*
4. Bharathan V (18TB1112) *Bharathan V*

in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology in **Mechanical Engineering** of the **SRI VENKATESHWARAA COLLEGE OF ENGINEERING AND TECHNOLOGY, ARIYUR, PUDUCHERRY** during the year 2021 - 2022.

University Examination held on 25/7/22

G. Palani
25/7/22
Project Guide

B. M. S.
25/7/22
Head of the Department

B. M. S.
Internal Examiner

[Signature]
External Examiner



[Signature]
PRINCIPAL,
SRI VENKATESHWARAA
ENGINEERING & TEC.
ARIYUR, PUDUCHERRY - 605 102.

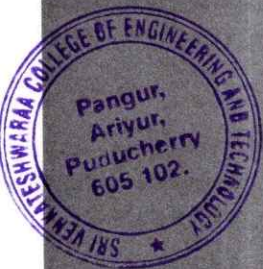
DECLARATION

We affirm that the project work titled "IMPROVEMENT ON THE RACKBUSH TO ELIMINATE RATTLE NOISE IN THE STEERING GEAR (In Small Passenger and Off-road Vehicles)" being submitted in partial fulfillment for the award of Bachelor of Technology is the original work carried out by us. It has not formed the part of any other project work submitted for award of my degree.

1. Bhuvaneshwari V (18TC1106) *Bhuvaneshwari V*
2. Ajay E (18TB1102) *Ajay E*
3. Dinesh C (18TC1110) *C. Dinesh*
4. Bharathan V (18TB1112) *V. Bharathan*

SIGNATURE

certify that the declaration made above by the candidate is true.



A handwritten signature in green ink, appearing to be "G. Palanivel".

PRINCIPAL,
SRI VENKATESHWARA COLLEGE OF
ENGINEERING & TECHNOLOGY
ARIYUR, PUDUCHERRY - 605 102.

Signature of guidance

Mr.G.PALANIVEL , M.E.,

Assistant Professor,

Department of Mechanical Engineering,

Puducherry.

ABSTRACT

Automobiles are used all around the world. Electric vehicles are becoming more popular in recent years due to their environmental benefits. The steering system is used to regulate the vehicle's directional characteristics and stability. Because the driver controls the steering system directly, it is critical to consider human comfort while developing the steering system. In this study, a rack and pinion type steering gear box is constructed for Manual Steering Systems, Electronic Power Steering, Power Steering, Electric Vehicles, and Vehicles with Petrol or Diesel Engines.

In order to isolate the steering rack in the steering rack housing, the rack bush is a crucial component in the steering system. The project's goal is to reduce rattle noise in steering systems with rack lengths of less than 300 millimeters by upgrading the rack bush which is found as a problem in the industry since it is an industrial project work. These shorter steering racks are found in several off-road and passenger cars. We are using the problem-solving technique in this project. We initially discovered the issue as a result of the Customer's complaint. We next proceeded further by analyzing, designing and fabricating of the new modified rack bush and tested them. Thus, we finally with the comparison of the previous old rack bush, the new rack bush eliminated the rattle noise and provides the good performance with the minimum teeth contact.

Thus we conclude this project with the new rack bush with the noise free, wear resistant and with the good in performance

KEYWORDS:

Manual Steering Systems, Electric vehicles, rack bush, rattle noise.



A handwritten signature in green ink, appearing to be "S. Venkateshwarra".

PRINCIPAL
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Rane (Madras) Limited

Rane

Expanding Horizons

Date: 18.07.2022

TO WHOMSOEVER IT MAY CONCERN

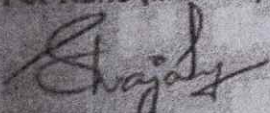
This is to certify that the students of final year B. Tech (Mechanical Engineering) of Sri Venkateshwaraa College of Engineering & technology, Puducherry, have successfully completed their Industrial Project Work in our organization from November 2021 to February 2022.

- | | |
|-------------------------|------------------|
| 1. Mr. E. Ajay | Reg.No. 18TB1102 |
| 2. Ms. V. Bhuvaneshwari | Reg.No. 18TC1106 |
| 3. Mr. C. Dinesh | Reg.No. 18TD1313 |
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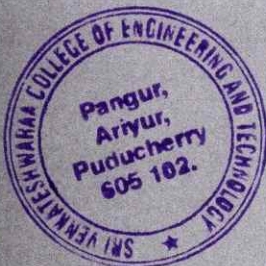
During the tenure with us, their character and conduct were found to be good.

We wish them all the best for their future endeavor.

For Rane (Madras) Limited,


Shajahan A

Deputy Manager -HR




PRINCIPAL,
SRI VENKATESHWARAA COLLEGE OF
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ARIYUR, PUDUCHERRY - 605 102.