

PRODUCTIVITY IMPROVEMENT OF OIL SEAL TRIMMING MACHINE

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Abstract— Every industry profit depends upon the production rate. We visited the **ABI INDUSTRY**, In that industry they manufacture Oil Seal, O-Rings and Engine Mountings. They produce O-Rings pieces and trim with oil seal trimming machine. We improve the overall productivity of that industry through the reduction of cycle time in the trimming process with the help of modifying the oil seal trimming machine. It can produce more products at the same production time. The old cartridge will be modified, and same time trimming machine speed increase, the production of O-Rings also increases. So, we introduce the Productivity improvement of oil seal trimming machine.

Key Words ;

Oil Seal, Rubber, Trimming , O- Ring

II. INTRODUCTION

Rubber product industry is the most emerging industry now a day in Indian as well as global market. In India it is the 4 th largest market, which shows that how much it contributes towards our economy. Rubber product industry includes the personal care products also like rubber product. So, our project mainly focuses on the market and study of rubber product in India, it consists various domestic companies.

Major players are Fenner, Tega India, Rubfila international Ltd, Gujarat reclaim & Rubber product Ltd, Merchem Ltd etc.

Rubber product market is gradually developing very fast and day by day many new varieties, liquids product, are added in it by various companies to exits in the market. Rubber industry is very sensitive as the price of rubber is constantly changing and economic decline or rise affects the rubber industry. The rubber produces wide range products like auto tyres, autotubes, automobile parts, footwear, belts, cables & wires, battery boxes etc. Block rubber, Preserved Latex, crepes and sheets are some forms in which rubber is produced and used.

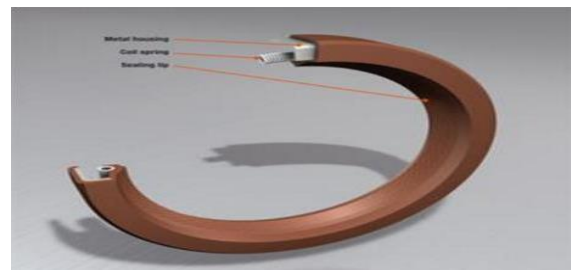


Fig 1.OIL SEAL

III .METHODOLOGY

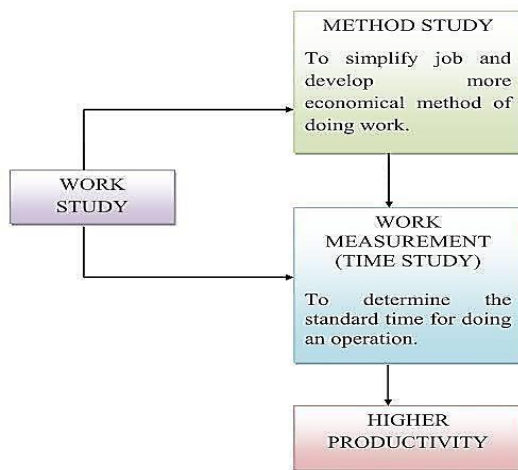
India is progressing at higher rate and hence industrial development is on its high that's why efficient working equipment required. Oil seal trimming machine is required so the industry context of view of the project work. Hence the future of this project work seems promising.

The work can be modified further more on following basis:

1. Carriage and cutting Speed increase
2. Production rate can be increase
3. pneumatic system pressure bar increase

WORK STUDY (OIL SEAL)

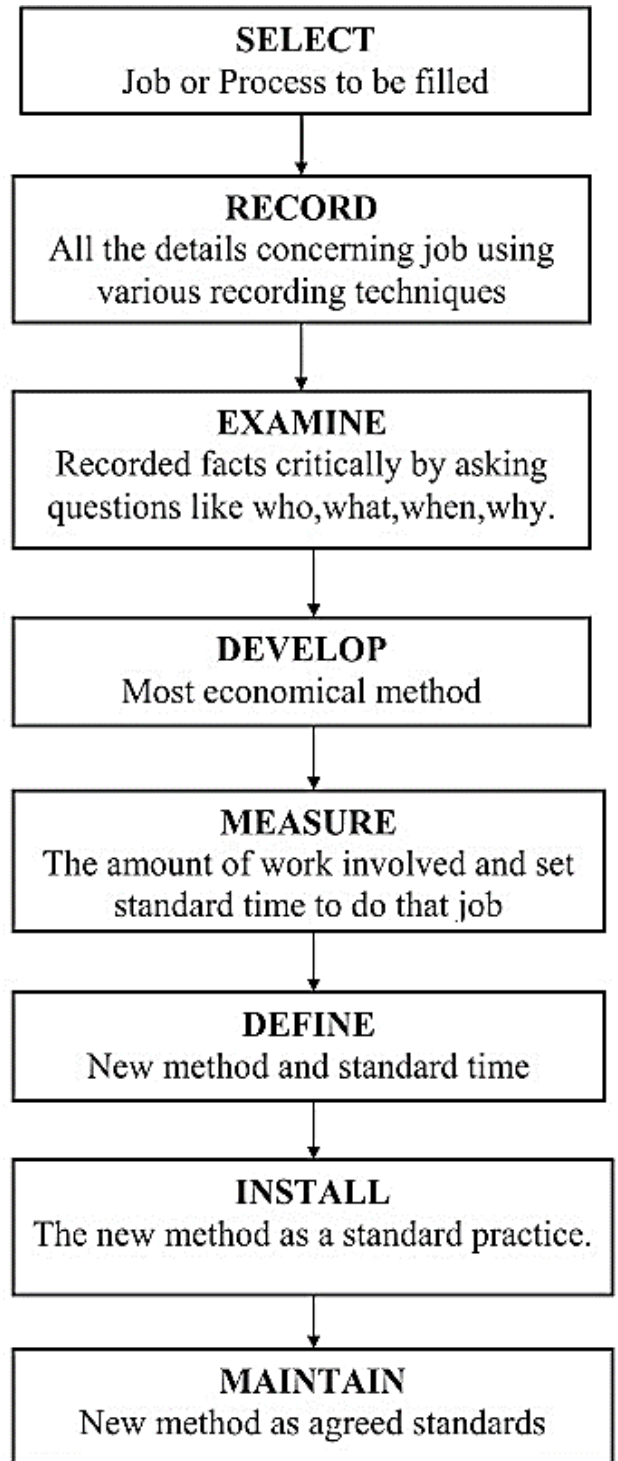
Work Study is the study of human work in all Aspects in order to increase the effectiveness with which the work is done.



WORK STUDY FORMULA

$$\text{WORK STUDY} = \text{METHODY STUDY} + \text{WORK MEASUREMENT}$$

WORK STUDY FLOW CHART



TIME STUDY

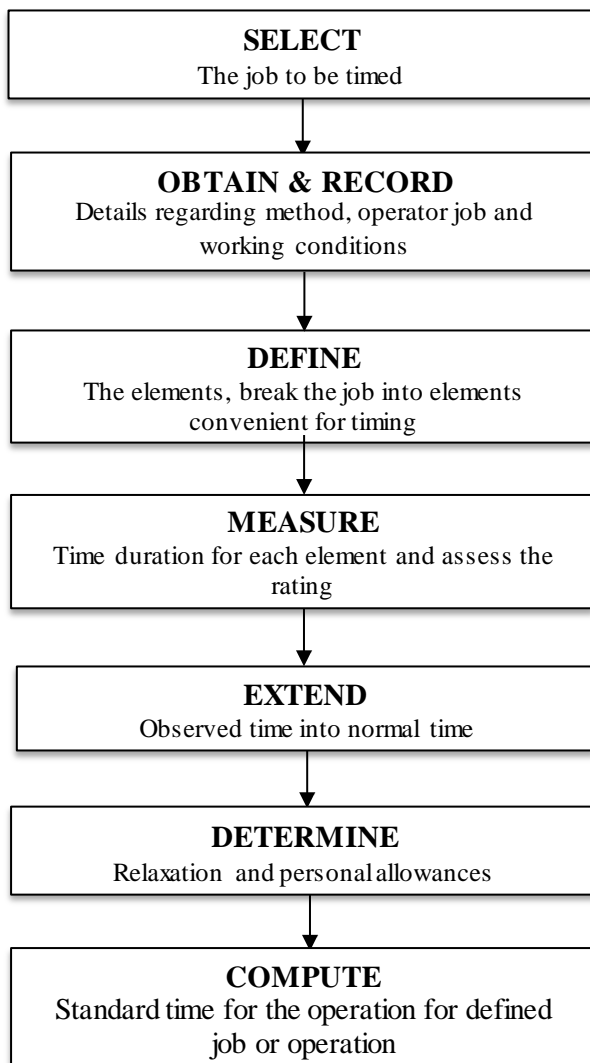
Time study is defined as a work measurement technique for recording the times and rates of working for the elements of a specified job carried out under specified conditions and for analyzing the data so as to obtain the time necessary for carrying out the job at a defined level of performance.

NORMAL TIME = OBSERVED TIME *

RATING FACTOR

STANDARD TIME = NORMAL TIME *

ALLOWANCES



OIL SEAL TRIMMING MACHINE

This oil seal trimming machine is mainly used burr edge trimming (cutting) and lip angle precision cutting of various rubber oil-seal, dust wipers, rubber-cup, fasteners, and all the round soft rubber products

CALCULATION

1. Cartridge Length Existing
 Length = 50cm
 Increased = 20cm

The Cartridge Length is increased to 70cm

(This allows more jobs to be hold)

Number of job can be held in existing cartridge= 50 pieces

Number of job can be held in modify cartridge= 70 pieces

2. Cutting Speed

Cutting Speed

(Vc formula)= 22/7 *D*S/1000



D – Diameter (mm)

S – Spindle speed (rpm)

D- 57mm

S- 2800 rpm

$V_c = 3.14 * 57 * 2800 / 1000$

$V_c = 501 \text{ m/min}$

CUTTING SPEED (V_c) = 501 m/min

3. Pneumatic system pressure increase

Normal pressure Bar = 6 Bar

ID = 2 Bar

OD = 2Bar

FEED = 2 Bar

Increase pressure Bar = 6 + 3 Bar
= 9 Bar

ID = 3Bar

OD = 3Bar

FEED = 3Bar

Normal bar Production 1 hr = 1080 pieces

One Day 24 hrs = 24* 1080
(One Machine)

(One Machine) =25,920 pieces.

Increase bar production 1 hr = 1140 pieces

One Day 24 hrs = 24* 1140
(One Machine)

(One Machine) =27,360 pieces.

Productivity Improvement Pieces

=27360- 25920

Productivity Improvement Pieces

= 1710 Pieces.

IV RESULT

The overall production of O-Rings will be improved through the reduction of cycle time with help of modifying oil seal trimming machine. By increasing the length of the cartridge the get many benefits that is usually one operator handles two oil seal trimming machine. Now the modification allows the operator to handle three machines. The modification increases the machine timing and decreases the refill cycles .it gives more time for the operator to handle one more oil seal trimming machine.it also requires less man power, it results 25,000 pieces into 30,000 pieces per shift.

V CONCLUSION

1. Using modified oil seal trimming machine, the productivity can be increased much beyond the stated results. Several techniques being explored to find the best method for cavity production.
2. After completing the major project on productivity improvement of oil seal trimming machine
3. The overall production of O-Rings will be improved through the reduction of cycle time with help of modifying oil seal trimming machine. By increasing the length of the cartridge the get many benefits that is usually one operator handles two oil seal trimming machine. Now the modification allows the operator to handle three machines. The modification increases the machine timing and decreases the refill cycles .it gives more time for the operator to handle one more oil seal trimming machine.it also requires less man power, it results 25,000 pieces into 30,000 pieces per shift.

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