

ABSTRACT

In this research paper we present the work content & variability reduction of MCV model in main assembly line. At Present found that line has very less automation & most of the operations are done manually. That causes the work content & variability is more in each station of Main assembly line. Present line has a problem of line balancing and also the problem of tools & fixtures at various stations. The requirement of the vehicles depends on the demand of the customers. Usually, the marketing peoples convey the requirement of the vehicles to the production planning and control department.

Keywords: Productivity, MCV chassis assembly line, Time study, Method study.

I. INTRODUCTION

Work Study is a generic term for those techniques, particularly method study and work measurement, which are used in the examination of human work in all its contexts, and which lead systematically to the investigation of all the factors which affect the efficiency and economy of the situation being reviewed, in order to effect improvement'. This has to do with Productivity Improvement, but also improvement of Quality and Safety. Work Study is the systematic examination of the methods of carrying out activities such as to improve the effective use of resources and to set up standards of performance for the activities carried out.

Method-study concerned with "the way in which work is done (i.e., method)". It is used to simplify the way to accomplish a work and to improve the method of production. Method-study results in a more effective use of material, plant, equipment and manpower. It employs a systematic approach involving: Select-Record-Examine-Develop-Install-Maintain.

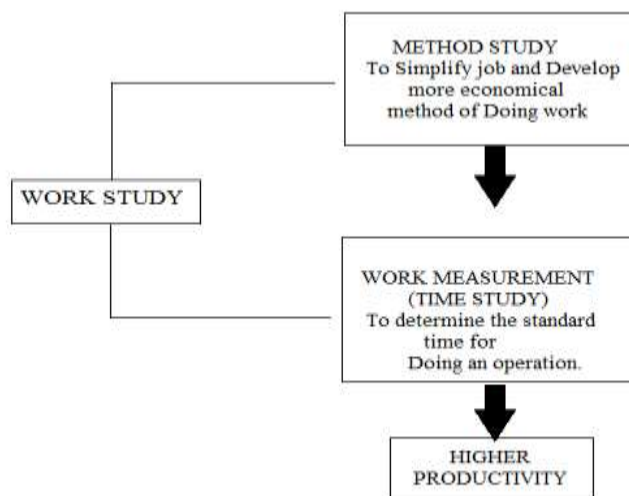


Figure 1: Components of Work Study

II. OBJECTIVES

1 Time Study

Time Study is a work Measurement technique which is involved to calculate the time of the operation in an assembly line with the help of an instrument (stopwatch).

Initially calculating the time of the fitments in units

2 Work study

A generic term for all those techniques which are used in the examination of human working all its context and which lead systematically to the investigation of all the factors which effect the efficiency and economy of the situation being reviewed in order to effect the improvement.

Basically it's a productivity raising technique by finding out the actual work content of a process and reduces it by proposing suitable improvements. It has two basic components viz: a. Method Study b. Work Measurement

3 Motion Study

Motion study is a technique of analyzing the body motions employed in doing a task in order to eliminate or reduce ineffective movements and facilitates effective movements.

- By using motion study and the principles of motion economy the task is redesigned to be more effective and less time consuming.
- Objective of motion study is job simplification so that it is less fatiguing and less time consuming.

III. METHODOLOGY

1. Procedure of time study

- Identifying the job to be timed and operations to be timed.
- Obtaining an improved procedure from method study department.
- Select worker for study
- Collecting the equipment and arrange machinery required to conduct time study and ensure accuracy in recording time
- Explaining to the worker the improved working procedure and use of tools and fixtures
- Breaking the job into operations and operations into elements and writing them in a proper format
- Conducting the observations and recording them on the time study form.
- Rating the performance of the worker.

2. Procedure/Steps involved in Work Study

The basic procedure of work study is as follows:

- Select the job or process to be suited.
- Record from direct observation everything that happens in order to obtain data for analysis.
- Examine the recorded facts critically and challenge everything that is done, considering in turn: the purpose of activity, the place where it is
- Performed, the sequence in which the elements are performed, the person who is doing it, the means by which it is done.
- Develop the most economic methods, taking into account all the circumstances.
- Measure the amount of work involved in the method used and calculates a "standard time" for doing it.
- Define the new method and the related time
- Install the new method and time as agreed standard practices.
- Maintain the new standard practice by proper control procedures



Fig 2 Steps involve in work study

3. Procedure for Motion Study

Motion Study can be performed in the following steps:

Step I: Break up the operation of the job:

The first step is to prepare a detailed list of all operations in the present method of manufacturing the job. All details such as material handling, machine work and hand work are included in the list. This may be done with the help of a process chart or diagrams of motion and film analysis or models etc.

Step II: Question each detail of the job:

Questions should be asked on himself by the motion study engineer about the way in which these operations are to be performed, and about the tools and equipment's needed. The procedure of this questioning is known as "Critical Examination".

Questions are asked on the following five points:

i. Purpose:

- What is the purpose of this operation?
- Does the operation fulfill the requirements?
- Whether the operation can be eliminated?

ii. Place:

- Where is the best place to do this operation?

iii. Sequence:

- What is the best time to do this operation?
- Whether it can be done at the same time as before or at any other better time?
- When will it be more suitable and economical?

iv. Person:

- Who will do this operation?
- Who can do it in a better way?

v. Means:

- How this operation can be performed i.e. which machines and tools are to be used?
- Can we make the work more easier to do and safer for both worker and equipment?

Step III: Develop a new method:

After considering the above questions a new better method is developed.

Before finalising the new method the following facts should also be thought over during the motion study:

i. Elimination:

Every operation of the job should be thought and whether it can be eliminated without any harm.

ii. Combine:

In this context it is to be observed that whether two or more can be combined to save operation time.

iii. Rearrangement:

If the rearrangement in the sequence of operations helps in simplification or in any other aspect that it should be done.

For example, in a factory the main sequence of operations was:

- a) Assembling.
- b) Storage.
- c) Inspection.
- d) Despatching.

In this sequence, inspection was carried out before despatching and the defective components were being sent back for correction.

It can be avoided if inspection is carried out before storage, then the sequence can be rearranged as follows:

- a) Assembling.
- b) Inspection.
- c) Storage.
- d) Despatching.

iv. Simplification:

If the operation is possible with any other easy, safe and economical method then that should be adopted.

The work can be simplified by:

- a) Using material handling equipment.
- b) Taking useful work by both hands.
- c) Using jigs and fixtures.
- d) Placing the materials, tools and equipment at proper working place.

Step IV: Installing the new method:

Install the new method as a standard practice.

For installing the new method, the following procedure is followed:

- i.** The new method must get the approval from the supervisors, workers and management.
- ii.** Then the workers must be trained to work according to the new method.
- iii.** Observe the installed method until it runs satisfactory.

Step V: Maintain the new method:

After implementation, care should be taken to maintain it to avoid unauthorized change in the method.

For maintaining the new method the following steps are advised:

- a) A job instruction sheet should be given to the worker.
- b) Scheduled checks should be done to compare what is actually being done against the job instruction sheet.
- c) Selection and training of persons must be done according to the job specifications for this new method.

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Recording Techniques – Charting:

Recording is the second step in the basic procedure for Method Study. Just after the selection of a particular work for study, the relevant information regarding various processes, inspection, and transportation with respect to an existing method or a new method must be recorded properly. Therefore, for efficient recording the charts have been developed.

The recording of the details will be done in charts to get more clear picture. Apart from that a record is also needed before and after comparison is to be made to assess the effectiveness of the study. Charting is the visual representation of recording of facts. It is a technique by which analysis for developing the method can be done quickly and easily.

For easy understanding care should be taken during the time of the preparation of the chart.

The following details should be given in the chart:

1. It should possess adequate description of all the activities involved in the method.
2. The current and proposed method should be shown.
3. The specific reference about the beginning and end of the activities should be given.
4. It should depict the time and scale followed.
5. It should explain the abbreviations and devices
6. It should possess the date of preparation of the chart.

IV. CONCLUSION

From the above discussion it can be concluded that the process can be improved based on method study, time study i.e. by work-study techniques work procedure and proper utilization of machine and material. It will improve the current process by reducing the transportations, and reducing the worker's fatigue. After implementing the suggested improvement ideas the firm is able to increase its productivity.

This paper is to present idea to improve productivity which can be used by automotive industry to reduce the cycle time of the bottle neck operations, by utilizing the concept of method study, time study i.e. by work-study techniques.

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