International Journal of Recent Engineering Research and Development (IJRERD)
ISSN: 2455-8761
www.ijrerd.com || Volume 02 – Issue 11 || November 2017 || PP. 64-66

Setting Time Reduction in Drilling Machine

Manoj Kumar.A[1], Praveen.D[2], Muthaiyan Ravi Kumar[3]

[1*] *UG Student, Bannari Amman Institute of Technology, Sathyamangalam, Erode, India*
[2] *UG Student, Bannari Amman Institute of Technology, Sathyamangalam, Erode, India*
[3] *Professor, Bannari Amman Institute of Technology, Sathyamangalam, Erode, India*

Abstract: The competition in the current business world is marked by intense agitation and severe contention. This agitated situation has made organizations to revitalize themselves by marching in different routes to keep them competitive in the market as well to accomplish their objectives positively. Now a day's most of the organizations have taken the established route – Lean to crush the competition. This condition has improved the lean management strategies like, improving the value stream, reduce the changeover times, creating flow in manufacturing, leveling the production based on demand; reducing capital investment etc. This concept has provided the organizations a major source of competitive advantage. The utilization of the source is mainly due to the capability of the organization to change and manage the change. In this study we have reduced the setting time for the drilling machine in engine block production in engine manufacturing company .As before the setup have been implemented the setup for the machine takes nearly 4 hrs to 5hrs. by this setup this is reduced to 2to 5 minutes .

Keywords: engine block, setuptime reduction, changeover time

1. Introduction

To increase the productivity it is necessary to reduced production time, but the total time for production contains setup time and production time. So the setup time is nothing but elapsed time in between last piece of the old series to the first good piece of new series. Setup time is non-value activity. NVA are those activities which does not convert input into theoutput for example transportation, setup time, defects etc. andfor these type of activities customer does not will to pay. So it is very straight that if we minimize this non-value adding activities it will beneficial. For increase in production time in Single Minute Exchange of Dies we use the different quality tools. Also we can use the modern technologies. Though weinvest money in the Single Minute Exchange of Dies the payback period will be very short and bottom line for the company will go up[1].we have try to reduce the setting time for the machine LA8864 as setting before is 4 to 5 hours, as by this setup it can be reduced to 2 to 3 minutes. As by this, production also will get increased and the turnover of the company also get increased, approximately 3 to 5 engine get out of the production per day after this setup have been installed

Why SMED? 1. To survive in today's compete2.To reduced inventory3.Flexibility for scheduling of job4.To increase safety on workplace.

2. Literature Review

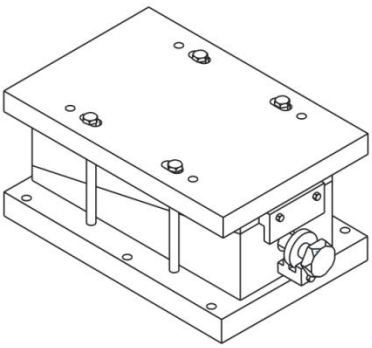
Rahul et al [3] discussed about the SMEDA case study in small scale industry. The study focused on one of the noteworthy accomplishment inkeeping the price of products low is the gradualshorting of the production cycle. They also explained about the basic procedure, important terms andalso focused on better teamwork, good order, planning and simple modifications. Sundar et al [4] discussed about the Lean Manufacturing ImplementationTechniques in industry. They found that due toSingle Minute Exchange of Dies was developed in 1950's inrapidly changingbusinessenvironmentthe organizations are forced to face challenges andcomplexities. To survive they need to enhanceproduct quality therefore the value adding processesshould be cut down to achieve the perfection inquality.

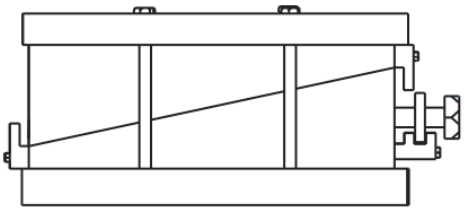
Andreia Simoes at al [5] explained that short changeover time have beenalways critical in manufacturing business setupduration, initiatives have been associated with shingo's SMED method. Although the companies initiated SMED some failed on implementation. Inpresentdays a tailored methodology is developed specifically for automotivesuppliers. The companies achieved 33% reduction onchangeover time

Related concept Hydraulic pumps are sources of power for many dynamic machines. Hydraulic pumps are capable of pushing large amounts of oil through hydraulic cylinders or hydraulic motors. In this fashion, the pump converts the mechanical energy of the drive (i.e. torque, speed) into hydrostatic energy (i.e. flow, pressure). You can use hydraulic machines - equipped with a pump - to do different types of work such as lift,

lower, open, close or rotate components.A hydraulic pump is the source of power of your hydraulic system making it the most critical component.Hydraulic pumps operate according to the displacement principle. This involves the existence of mechanically sealed chambers in the pump. Through these chambers, fluid is transported from the inlet (suction port) of the pump to the outlet (pressure port). The sealed chambers ensure that there is no direct connection between the two ports of the pump. As a result, these pumps are very suitable to operate at high system pressures and are ideal for hydraulics. Use single chamber vane pumps or piston pumps to operate a hydraulic pump with variable displacement.

Hydraulic pumps are manufactured depending on different functional and hydraulic system requirements, such as operating medium, required range of pressure, type of drive, etc. A large range of design principles and configurations exists behind hydraulic pumps. Consequently, not every pump can fully meet all sets of requirements to an optimum degree. Three different types of hydraulic pumps exist: gear pumps, piston pumps and vane pumps.



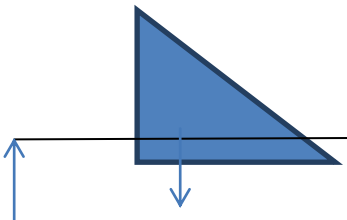


Front view

3. Methodology

The purpose of the setup is for drilling machine to drill the engine oil shell in the block and the reason for the setup is difference in engine type, for one type the drill should be made 1.8mm above the ordinary setup, for this alternative steps are given. The additional setup are two plates to stop the movement of setup, four bolts to clamp the parts, center spindle for lifting the upper part where lower part is fixed, steps are below

1. First step is to make the upper position of setup be left unchanged except four holes have been made to clamp the top plate and bottom plate of the setup
2. The center block of the setup is cut in two half to make the desired setup
3. The two blocks are holed for the setup
4. The additional plate is joined as per the design
5. The cut have been done as per the calculation
   a) the cutting angle and distance have to be calculated by using sin θ = opp/hyp as per the formula the known values are substituted sin θ =126/373
      θ = 19.7andcosθ=373/x
      x= 396
      difference(396-373)the distance in both the side should be 23
   b) Designing of bolt



As the load is applied like the simply supported beam
The load is uniformly distributed load
As it was UDL the maximum bending moment of the bolt can be calculated by using
B.M = WL/8
Where ,
W is the load applied
L is the length of the boltBy this we have selected bolt of size M20 of pitch 1.5 mm , by stress calculated from the bending moment of the bolt.

4. Conclusion

The design above we have drafted are to reduce the setting time in LA8864 machine , we can furter reduce the setting time by some other process as in case of this design the fabrication is done and test the process and note the time process

Reference

[1]. Maynards Industrial Engineering Handbook (2004) Tata Macgraw hills pg. no. 4.81-4.85.
[2]. R. Sundar, A. N. Balaji ―A Review on lean manufacturing and implementation techniques.‖
[3]. Mr. Rahul R. Joshi and Prof. G. R. Naik (2012)―Application of –SMEDAcasestudyMethodologyin small scale industry International Journal of Scientific Research Publication, Volume 2, Issue 8, August 2012
[4]. Andreia Simoes, Alexandra Tenera (2010),‖Improving setup time in press line –Application of the SMEDmethodology.‖ Management and control of production logistics university of Coimbra, Portugal September 8-10, 2010.
[5]. Mr. Rahul R. Joshi and Prof. G.R. Naik (2012) ―Reduction in Setup time by SMED a literature review‖International Journal of Modern Engineering Research (IJMER), Volume 2, Issue 1, Jan Feb 2012 pp-442-444.
[6]. R. Bharath, A.C. Lokesh ―L owner‘s component manualmanu facturing and through on that quick change over. (QCO) ‖ Volume 7, Issue 2 2008.

Authors Profile

Manoj Kumar. A currently pursuing BE Mechanical Engineering at Bannari amman Institute of Technology.

Praveen. D currently pursuing BE Mechanical Engineering at Bannari amman Institute of Technology.

Muthaiyan Ravi kumar received the B. E. degree in Mechanical Engineering from Coimbatore Institute of Technology in 1996 and M. Tech degree in Energy Engineering from Regional Engineering College in 2000 and Ph D degree in Mechanical Engineering from Anna University in 2012. Presently working as a professor, Mechanical Engineering Department, Bannari amman Institute of Technology.