

## **HYDRAULIC OPERATED STATOR STAMPING MACHINE**

Mr.Aumsai R.Waghmare

Student:BE (Department of Mechanical Engineering) Shri Chhatrapati Shivaji Maharaj College of Engineering  
Ahmednagar, India waumsai84@gmail.com

Mr.Shubham S. Shete

Student:BE( Department of Mechanical Engineering) Shri Chhatrapati Shivaji Maharaj College of Engineering  
Ahmednagar, India shubhamshete27297@gmail.com

**Abstract— Stator stamping hydraulic machine is different from the conventional stamping machine, in which the system is quicker and gives highest productivity. Stator have the number of slot on outside perimeter. And number of teeth on inside perimeter. Winding is fitted in the teeth. And the winding which fill inside the stator called as field winding, where the winding field inside the rotor called as armature winding. These stamping has to come in exact and accurate position. If they are not in accurate position then the winding can't fill inside the stator as well as rotor also. The slot are use to make the exact position of those stamping. Hydraulic operated stator stamping machine is use to make the stator stamping combination with exact and accurate position. This machine use hydraulic system to make it possible. Hydraulic system use in this machine is conventional hydraulic system. This hydraulic system use number of cylinder to complete the operation. The stator stamping combination is generated in single working stroke. The stator is produced by punching and stamped with stamp punching mode .This system gives accurately placed winding position by holding stator in properly design clamps. The system working done with the help of hydraulic actuators and high pressure hydraulic oil. The stamping starts by placing number of stator over a mandrel. The hydraulic operated stator stamping machine gives more stator stamping in single stroke of operation. Conventional method uses hydraulic presses and manual invention, which results in more noise and time consuming operation, and it reduces production rate because in single stroke of operation it cannot completed the whole stator stamping combination .So for this hydraulic operated special purpose stator stamping machine is more beneficial and higher productive.**

### **I. INTRODUCTION**

Stator-

The stator is the stationary part of a rotary system, found in electric generators, electric motors, sirens, or biological rotors. The main use of a stator is to keep the field aligned.

Rotor-

The rotor is a moving component of an electromagnetic system in the electric motor, electric generator, or alternator. Its rotation is due to the interaction between the windings and magnetic fields which produces a torque around the rotor's axis.

Rotor and stator both are may be made up from number of stamping. Number of stamping comes together and from

stator and rotor. These stamping is made up from the metal sheet by stamping method. They have down the product by stamping process. These stamping has to come in exact and accurate position. If they are not in accurate position then the winding can't fill inside the stator as well as rotor also. The slot are use to make the exact position of those stamping.

#### **1.1 Problem statement**

The conventional method which has been used from last few years are not sufficient to mass production also they are time consuming. To work with conventional method worker has skill to operate machine. Conventional method also use the hydraulic system in terms of hydraulic press. But number of slot are affected on number of iteration. That means number of slot are four then system has to compete the operation in four iterations.

That's the reason that production rate is too low. Some time delivery date cannot be matched. Due to number of iteration more power and man force is required. Which will reduces the profit of company and increase in annual cost. Efficiency of conventional method is too low.

That's the reason that this method have to modified for better future of advance manufacturing process and the profitable company.

#### **1.2 Methodology**

Methodology used in this system is noting but conventional hydraulic system. System uses number of hydraulic cylinder. This cylinder work as actuator for the operation. This hydraulic actuators use to holding, lifting and positioning the workpice .For the automation solenoid operated control valve's are used in system. Cylinder motion that's means extract and retract is use for operation. Working medium is hydraulic fluid, mechanical linkages are reduces. No wear and tear due to no friction.

If the load is suddenly increases it will not affect on system. If we consider mechanical or electrical or any other system they will affected by change in load. Those system will fail if they will not get stop. Is we consider pneumatic system it will not provide the high pressure and force. Also it is fast cannot withstand with suddenly increases in load. But pneumatic system is faster than hydraulic system

### **2.LITERATURE REVIEW**

Hydraulics control systems are widely used and a well-known control systems. A number of studies on the performance of hydraulic control systems and its components have been made in recent past. Some of the relevant and significant studies related with the present work are discussed here.

(R Keith Mobley)Today, hydraulic power is used to operate many different tools and mechanisms. In a garage, a

mechanic raises the end of an automobile with a hydraulic jack. Dentists and barbers use hydraulic power to lift and position their chairs. Hydraulic doorstops keep heavy doors from slamming. Hydraulic brakes have been standard equipment on automobiles since the 1930s. Most automobiles are equipped with automatic transmissions that are hydraulically operated. Power steering is another application of hydraulic power. Construction workers depend upon hydraulic power for their equipment. For example, the blade of a bulldozer is normally operated by hydraulic power.

A wide range of industrial applications require substances, objects, or components to be moved from one location to another. A further typical requirement is the application of force to locate, hold, shape, or compress a component or material. These tasks can be achieved using a prime mover, with rotary motion being provided, for example by an electric motor and linear motion by screw jacks, rack and pinions, and solenoids. Liquids and gases can also be used to convey energy from one location to another and as a result produce rotary and linear motions and apply forces. Fluid based systems using a liquid as the transmission media are known as hydraulic, and those using a gas are known as pneumatic. The gases used in pneumatic systems tend to be low density and compressible, in comparison with the relatively high density and incompressible liquids used in hydraulic systems. As a result, pneumatic systems can be characterized as having a “softer” action in comparison with hydraulic systems, while hydraulic systems can generally be operated at much higher pressures, producing higher forces.

### 3.ACTUAL MACHINE DESIGN

#### 3.1 Construction

It consist of three cylinder attached on the moving metal plate of 500×500×60mm dimension. This plate can be move in z direction along four rod of 30mm ×1100mm long. At the top of the four rod anther metal plate is attached, which one is fixed. Having a circular hole of 330mm diameter. Distance between these two metal plate is 1100mm. This all structure is mount on the basement. Another end of basement is fitted with the reservoir, pump, motor and valve assembly. Also it has control panel which is used to control the whole machine.

#### 3.2 Actual Machine Setup

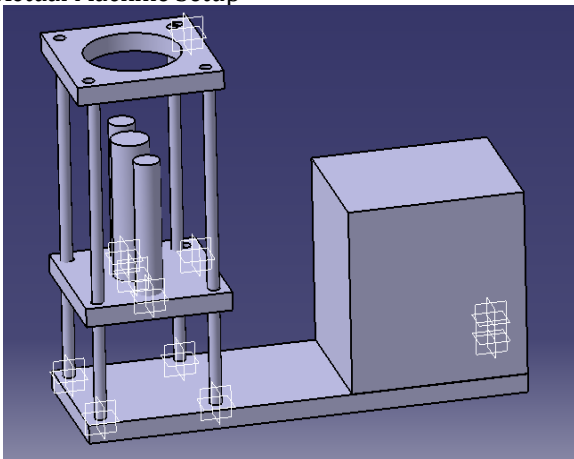


Fig : Actual Machine Setup

### 3.3 Component Use In System

Table 3.3 Component Use In System

Sr.no	Component	Quantity
1	Reservoir	1
2	Filters	1
3	Hydraulic Pump	1
4	The pressure relief valves	1
5	Directional control valves(4/3)	2
6	Directional control valves(4/2)	1
7	Pilot operated Check valve	1
8	Limit Switches	6
9	Flow control Valve	1
10	Actuator (Clamping)	1
11	Actuator (Travel)	2
12	Pressure Switch	1

### 3.4 Working

Working is similar to conventional hydraulic system. Electric motor start running at a particular rpm and motor is connected to pump. Pump start pumping of hydraulic fluid from reservoir to system through the filter. Pressure relief valve is also attached to the system. This is use to avoid failure of system and unwanted accident of system. Fluid is traveling through the pipe. Towards the direction control valve, solenoid operated 4/3 dcv will be use. That valve transfer the fluid to the cylinder for operation. Internally two cylinder which are at the side of middle cylinder will extract and due to this moving plate will move upward direction. Then material is load inside the Mandrill which is connected to the rod of middle cylinder. After loading material in the system then the middle cylinder will retract for clapping. After claiming v strip is insert inside the slot of stamping . Then two side cylinder will get retract. Due to retraction it side cylinders plate will move downward. At the time of retraction v strip converted into flat strip due to use of bearings. These bearing apply force on the strip at the time of retraction stroke and hence the whole operation will completed in single stroke of system.

### CONCLUSION

As the completion of this machine we conclude that, The hydraulic operated stator stamping machine is different from conventional stamping machine by its construction and principle of action. The constructional setup is very simple as it requires less space and working done within shortest time interval Thus, the method gives higher productivity and production rate increases. Stator and rotor stamping is most important part in motor winding process .It requires precise and accurate machining. Winding positioning is done very accurately with the help of this machine. Also to operate this machine skilled worker is not necessary. Easy to handle, operate and maintain. The important function of this machine is , if the

dimension of stator changes with change in design of motor it not affect on the machine , machine is able to complete operation with change in design. No need of modification in machine. Due to use of this machine profit of company increase.

#### **REFERENCE**

1. P.k.chandrashekara,R.B.Mali , Hydraulics and pneumatics , Lecturer Sinhgad Technical Educatioun Society , Sou. Venutai Chavan polytechnic , pune,Maharashtra,India.
- 2.R.Keith Mobley, Hydraulics Fundamentals,The Plant Performance Group
3. INTERNET:  
[www.wikipedia.com](http://www.wikipedia.com)  
[www.engineering.com](http://www.engineering.com)  
[www.hydraulicspneumatics.com](http://www.hydraulicspneumatics.com)  
[nptel.ac.in](http://nptel.ac.in)