

## PokaYoka for Filter Pin Detection in Nozel Holder Body

<sup>1</sup>Arati S.Pingle , <sup>2</sup>Prof . Dr. S. A. Patil (Ugale)

KarmaveerKakasahebWagh Institution of Engineering  
Education and Research Nashik,India.

**Abstract-** Every manufacturing industry in the world is focused to produce high quality ,defect free product. The success of any industry depends on quality of their product .During actual manufacturing of any product different operations are carried out by operators .The whole production depends on operator mentality and its interest in work which ultimately causes silly mistake or errors by operator. Rejection of manufactured product cannot be ignored now a days in manufacturing industry due to worldwide competition. To avoid mistake in assembly line, pokayoka mechanism plays an important role in manufacturing industry.In this project pokayoka mechanism is applied to find missing part in product. A raspberry pi model is used as controller . It is a single board computer which follows the pokayoka algorithm written in python.

**Index Terms:** Poka-yoka, Raspberry pi .

### I. INTRODUCTION

Poka Yoke is a total quality management concept. It is developed by a Matsushita manufacturing engineer named Shingo to prevent human errors from occurring in the production line[1].Poka means “ mistake or errors” and Yoke means “avoid” .The main approach of pokayoka is to achieve zero defect products[2]. To produce defect free product pokayoka is best approach in assembly line . It will improve the product quality which will directly improve the industry status[3].The pokayoka mechanism consist of control method and warning method.This is used to mistake proof an entire system[4].

In this project pokayoka mechanism is used for finding missing part in that product. It consist of prevention-based Poka-Yokes which consist of control method and warning method[5]. The purpose of project is to find the missing filter pin in manufactured nozel holder body. If filter pin is missing in nozel holder body it will cause clogging of nozzle spray hole. Which causes more flow of

fuel in cars. This will be result in wastage of time ,money which affects total production[6-12].



Fig.1.Location of filter pin

### II.SYSTEM BLOCK DIAGRAM

Araspberry pi model is used to control all operation in the system. A python programming is used in the given system

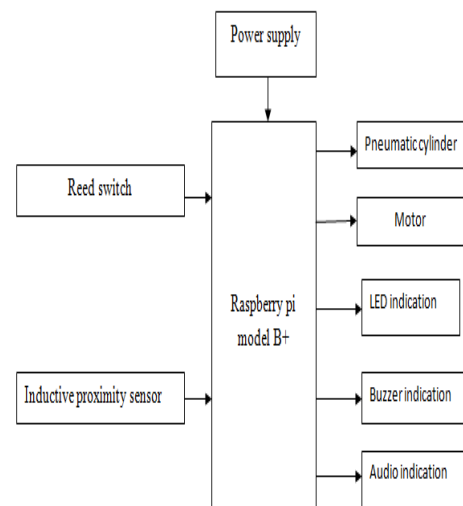


Fig.2.System block diagram

Reed switches are placed in the pneumatic cylinder which will sense the magnet position inside the pneumatic cylinder. Depending on magnet position the cylinder will move in up and down position which will hold the job. The inductive proximity sensor is used which sense the metal .This system will check at a time four jobs .If filter pin is missing in any of four job at that conditionLED will

glow , buzzer will be ON and audio indication will be given to the operator. At that condition when fault or error occur system directly stop.

### III.ALGORITHM

1. Start
2. Pallet present and pin lifter up
3. All part clamp
4. All pin up
5. All part check
6. If no fault occurs then pallet will be out
7. If fault occurs then LED will glow and then buzzer will be ON
8. Machine stop
9. Operator will select the manual mode, then open the door and take faulty job out ,Door close
10. Reset
11. Then Auto mode selected by operator

### IV.FLOWCHART

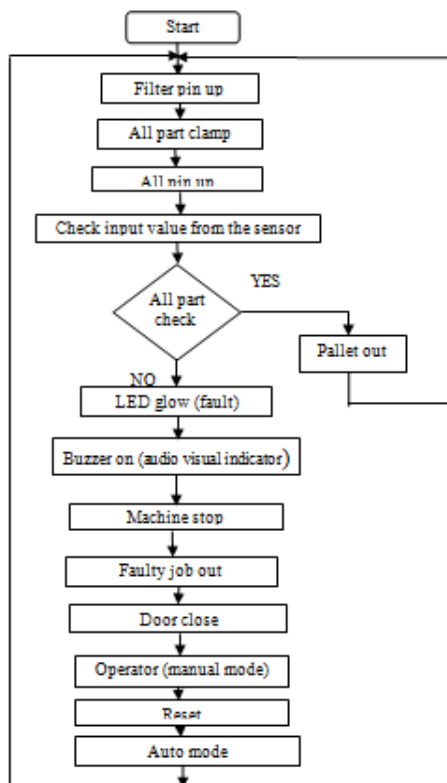


Fig.3.System flow chart

### V.SIMULATION RESULT

In fig.4.we can see that the pneumatic cylinder on which reed switches are placed.It will sense the magnet. Depending on sensor command clamping operation will be performed ,which hold the job .



Fig .4.pneumatic cylinder

In fig.5.we can see that the simulation window.Which containsprogram written in python .

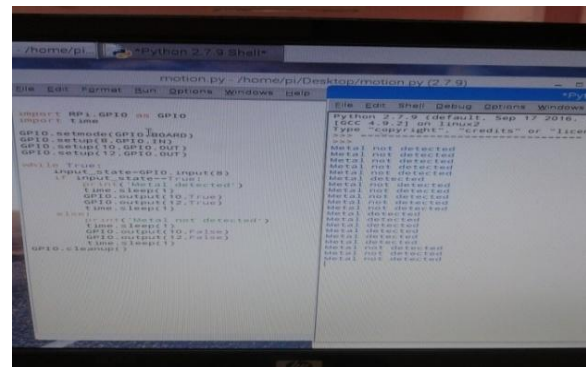


Fig.5.Raspberry pi programming simulation window

In fig.6.we can see the hardware simulation. By using raspberry pi model all operation are perform .proximity sensor is connected to GPIO port. When metal is detected it gives indication to the oprator by glowing LED and making the buzzerON .

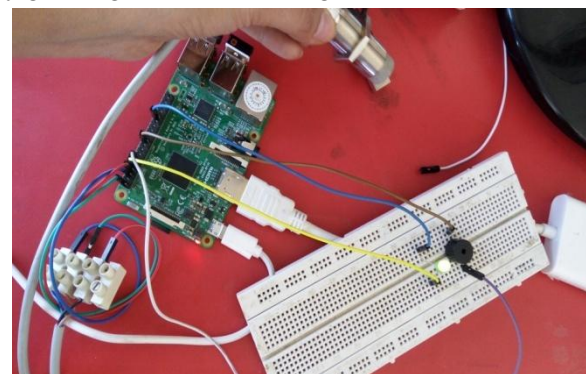


Fig.6.hardware simulation

## VI.CONCLUSION

This is very powerful concept because it is so simple and effective. Repair and rework is betotally avoided using this method .This approach Enhanced Productivity, also highest level of quality can beachieved. It also reduced Quality Cost , also enhanced customer satisfaction.

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