



Open access Journal

International Journal of Emerging Trends in Science and TechnologyIC Value: 76.89 (Index Copernicus) Impact Factor: 4.219 DOI: <https://dx.doi.org/10.18535/ijetst/v4i5.01>

Defect Analysis & Reduction in Rejection on “Governor Support”

Authors

Manoj Kadam¹, Deepak Pawar²¹B.E.(Final Year) Mech. Dept. BAMU Aurangabad²Asst. Prof. Dept. Of Mech. BAMU Aurangabad

ABSTRACT

Currently the assembly of engine are performed by manually. During assembly of governor support O-ring cut due to improper fitment. In this project we provide additional ring which acts as seal. This seal avoid the leakage of oil during testing of engine. Due to this reduces the time for replacement the O-ring. For replacing the O-ring which is required to disassemble the engine. In this report we have mention the function of a Governor, introduction to our project, necessity of project, causes of problem, possible solutions, company profile and different department in company

Keywords –Assembly, assemblytime, Cost, Productivity.

1. Introduction

The function of a Governor is to control the speed or RPM of the engine in a control manner. When load on engines changes, engine tends to accelerate or decelerate. During increase in load, RPM of the Engine decreases and it leads to slowing of engine. Now in this case Governor in order to maintain the speed, increases fuel supply to engine, so that speed can be attained to the desired value. But when load on engine decreases, then it tends speed up and in this case Governor reduces the supply of fuel to maintain the desired RPM. Governors can be used to limit the top speed for vehicles, and for some classes of vehicle such devices are a legal requirement. They can more generally be used to limit the rotational speed of the internal combustion engine or protect the engine from damage due to excessive rotational speed. Currently the assembly of engine are performed by manually. During assembly of governor support O-ring cut due to improper fitment. In this project we provide additional ring which acts as seal. This seal avoid the leakage of oil during testing of engine. Due to this reduces the time for replacement the O-ring. For replacing the O-ring which is required to

disassemble the engine. In this report we have mention the function of a Governor, introduction to our project, necessity of project, causes of problem, possible solutions, company profile and different department in company.

2. Study of Assembly

The assembly of engine are performed by manually. During assembly of governor support O-ring cut due to improper fitment. When O-ring cuts the oil leakages from crankcase during testing of engine. Following are the stages of assembly:

1. Engine Number Punching.
2. Subassembly of Lubricating Oil Pump.
3. Governor Gear fitment.
4. FIP casing, Relief Valve fitment.
5. Governor Support fitment.
6. LOP Adaptor fitment.
7. EFD Bolt, Stud fitment.
8. Engine Feet fitment.
9. Cam follower and suction bulb fitment.
10. Cylinder stud, lives and loading.
11. Crank Shaft fitment
12. Cam Shaft fitment.

13. Crankshaft end play measurement (linkage setting).
14. PTO cover fitment.
15. Piston S/A fitment.
16. Starter plate and back plate fitment.
17. Cylinder head fitment.
18. Back plate bolt and hand screw.
19. High pressure pipe and air screw fitment.
20. Feed pump and starter motor fitment.
21. EGR flange and name plate fitment.
22. Diesel filler fitment.
23. Oil filter fitment and unloading.
24. Testing

3. History

Earlier

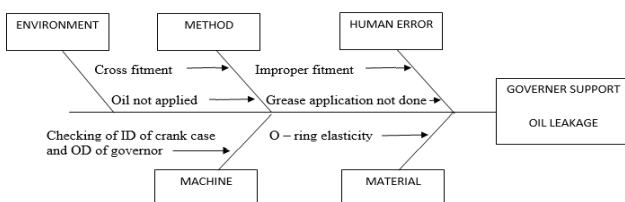
The assembly of engine are performed by manually. During assembly of governor support O-ring cut due to improper fitment. When O-ring cuts the oil leakages from crankcase during testing of engine.

4. KaizenIdea

4.1 Problem Status

- 1) More assembly time.
- 2) More time required to replacing the O-ring
- 3) Oil leakages from crankcase during testing.

4.2 Root causes:



The overall study of the problem and observations on the assembly line where the governor support is assembled, the basic and foremost issue observed is regarding the cross fitment of the governor. As there is mere small tolerance in which the governor has to be fitted and its almost not possible to grant a tolerance as it's the area where the tolerance has to be zero and a mere gap leads to a leak in the engine. Other than the proper fitment of the governor in the crank case, the inner part of the crankcase which cuts the o-ring at certain point has to be rubber with the sand paper so that the sharp ends of the crank case don't cut the ring.

Proper amount of greasing and applying oil on the ring can also reduce the friction of the crankcase and the o ring so that it may not cut the ring. Some alternations in the material of the o ring will definitely solve the issue as, if the elasticity of the material is bit increased then the point of cut on the ring may become more elastic and it will not cut. The above points are illustrated in the form of certain points given below:

1. Cross fitment of the governor support.
2. Oil not applied.
3. Improper fitment of the governor.
4. Application of grease on the edges of the crank case hole not done.
5. Checking of inner diameter of the crank case and the outer diameter of the governor.
6. Elasticity of the ring.
7. Variation in temperature in the environment which changes the properties of the material of the ring.

4.3 Kaizen

- 1) Change the wire diameter of O-ring.
- 2) Insertion of ring of appropriate thickness on innermost edge of the governor support.

4.4 Kaizen idea sheet:-

KAIZEN CONFERENCE	KAIZEN IDEA SHEET -ENGINEER LEVEL KAIZEN
Plant: Greaves Cotton Ltd.	Assembly: Defect analysis during testing of engine.
Kaizen Theme: To reduce the time for replacing the O-ring	Idea: Insertion of ring of appropriate thickness on the innermost edge of the governor support.
Problem present status: Oil leakage from crankcase during testing.	Pictorial Presentation
	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Before</p> <p>Without insertion of ring on innermost edge of the governor support.</p> </div> <div style="text-align: center;"> <p>After</p> <p>Insertion of ring on innermost edge of the governor support.</p> </div> </div>
Why-Why analysis?	Result:
Why? Oil leakage from crankcase during testing.	<p>Team member: Manoj Kadam</p>
Why? To reduce time which is required for replace the O-ring.	

5. Selection of material

We select the Buna -N rubber for ring which is select due to property of this rubber is resist the leakage of oil. It is also called as nitrile, acrylonitrile.

6. Results

- 1) Hence we have studied the function of governor support, how to find problem in companies, how to prepare kaizen sheet, why analysis, various types
- 2) It Reduces the time for replacing the O-ring.
- 3) It increases the productivity

Acknowledgement

With a profound feeling of immense gratitude and affection, I would like to thank my project guide Prof. **D. D. Pawar** & Company Guide **Mr. S. M. Takwale** for his continuous support, motivation, enthusiasm and guidance. His encouragement, supervision with constructive criticism and confidence enabled me to complete this project.

I also wish to extend my reverences to **Prof. G.S.Dhage**, Head of Mechanical Engineering Department for motivating me to put my best efforts in this project work.

I express my deep gratitude towards **Dr. R. S. Pawar**, Principal for constant motivation and providing necessary infrastructure.

I express my admirations for **Prof. K.T. Patil** (Project Coordinator) for his valuable advice and support throughout this venture.

References

1. The theoretical basis for the operation of governors was described by James Clerk Maxwell in 1868 in his seminal paper 'On Governors'.
2. Gibbs observed that the operation of the device in practice was beset with the disadvantages of sluggishness and a tendency to over-correct for the changes in speed it was supposed to control.
3. These sorts of theoretical investigations culminated in the 1876 publication of the Gibbs' famous work On the Equilibrium of Heterogeneous Substances and in the construction of the Gibbs' governor