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Medium duty truck quality circle to reduce defect per unit in overall cab in white

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Abstract

This paper deals with the Defect reduction (DPU-Defect per unit) of MDT (Medium Duty Trucks) all over CIW (Cab-In-White) for increase in production rate and reduction in rework with subtraction of repeated concerns. Quality and performance of a Product is the one that weighs the OEM's name, Bharath Benz was never the less in this area as Benz is named for its unique magic in makes. Basically Two Trucks are produced in CIW (Cab in White) – Heavy Duty Truck (HDT) & Medium Duty Truck (MDT). 60% of the HDT are made by Robots were as the MDT is of 20%, here starts the Difference in Production rate and quality issues which automatically degrades the Fame of the company. Keeping each and every concern in mind the main aim of the project is sketched in a way to increase the production to maximum and eliminate the defects to minimum. The Quality circle is implemented in the department and some of the results are picturized in this journal.

Key Words: Defect per unit, Increase in Production rate, Decrease in Defects

1. INTRODUCTION

The root cause of slow production in MDT is identified and worked on it to its maximum end for the betterment of the company and as well as personal. The Detailed description of the project is reported with our mechanical knowledge as well as with the guidance of company staffs. Basically Two Trucks are produced in CIW (Cab in White) – Heavy Duty Truck (HDT) & Medium Duty Truck (MDT) [1]. 60% of the HDT are made by Robots were as the MDT is of 20%, here starts the Difference in Production rate and quality issues which automatically degrades the Fame of the company [2]. Keeping each and every concern in mind the main aim of the project is sketched in a

way to increase the production to maximum and eliminate the defects to minimum.

2. SCOPE:

MDT quality circle plays a vital role in increasing the MDT production rate and parallely reduces the rework time and also optimizes the production result [3,4].

3. PROBLEMS:

MDT cabin's faces lot of concerns and defects due to maximum manual handling rather than robot handling. This leads to increase in production time, work pressure and more reworks, which automatically reduces the production rate when compared to HDT (Heavy

Duty Truck). More Rust issues, Offset problems, panel mismatch and no Proper seating of panel in the guide. Normally Production ratio of HDT to MDT trucks is 4:1 and rarely comes to 2:1 [5,6,7] based on orders, we have come up with some technical ideas to improve the production rate to 2:1 as normal & 1:1 on rare cases.

4. OBJECTIVE:

- To identify the Concerns of MDT that
- Product Quality can be maintained

5. PROJECT APPROACH:

- Brainstorm Problems
- Select a problem to resolve & kick off
- Analyze the current state & collection of Data
- Set Goals
- Identify the Top defects and its location

6. PROJECT TIME LINE

affects the production rate.

- Collocate the Offline concerns and workers problem
- To find apt solutions in order to curb the repeated concerns and regulate the production flow.
- To initiate Quality circle at low cost and Profitability Reduction in rework process
- Brainstorm the root cause and analysis
- Implement the corrective action
- Check the effectiveness of countermeasure implementation
- Standardize and stabilize

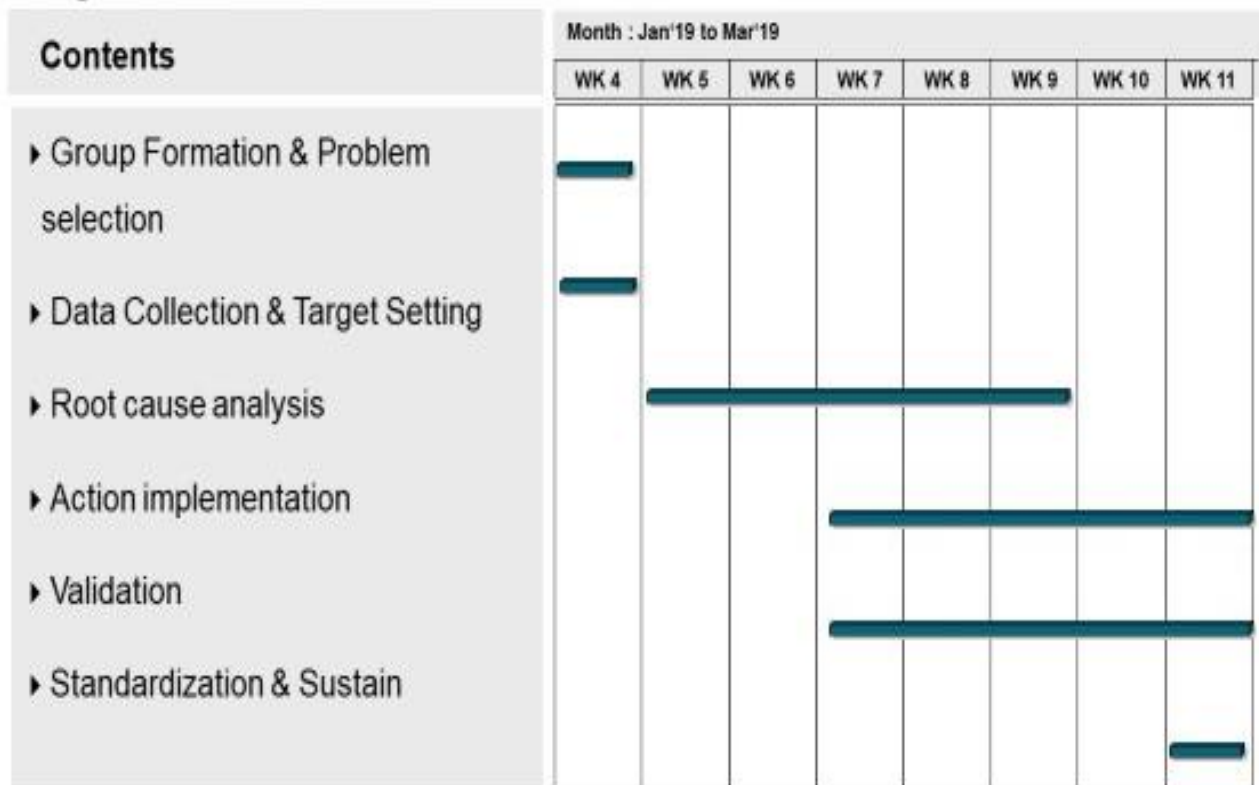


Fig.1 Gantt chart of the project

Fig.1. shows the Time line of the various activities happened inside the company. These are the important criteria where lead time can be reduced.

7. TARGET:

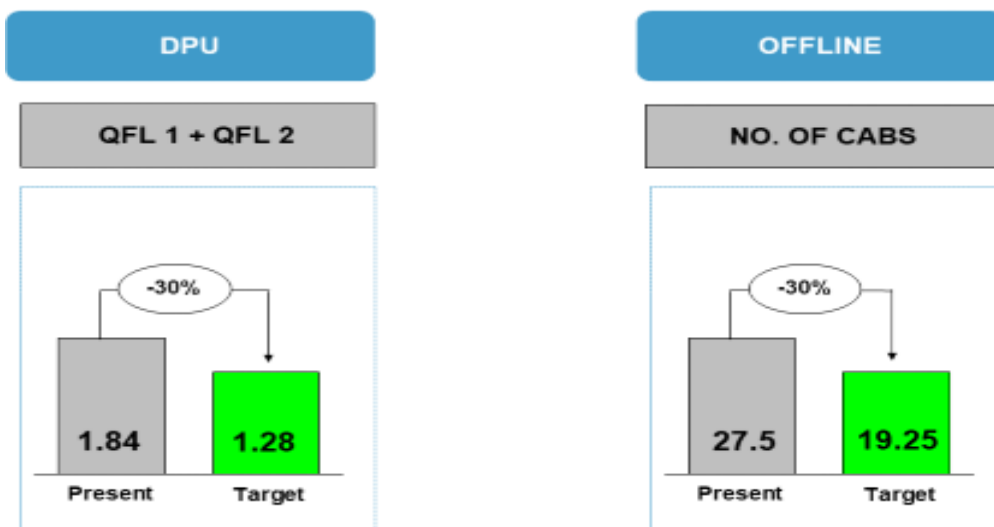


Fig 2. Percentage reduction in QFL 1, QFL 2 and No. of Cabs.

8. PROBLEM IDENTIFICATION:

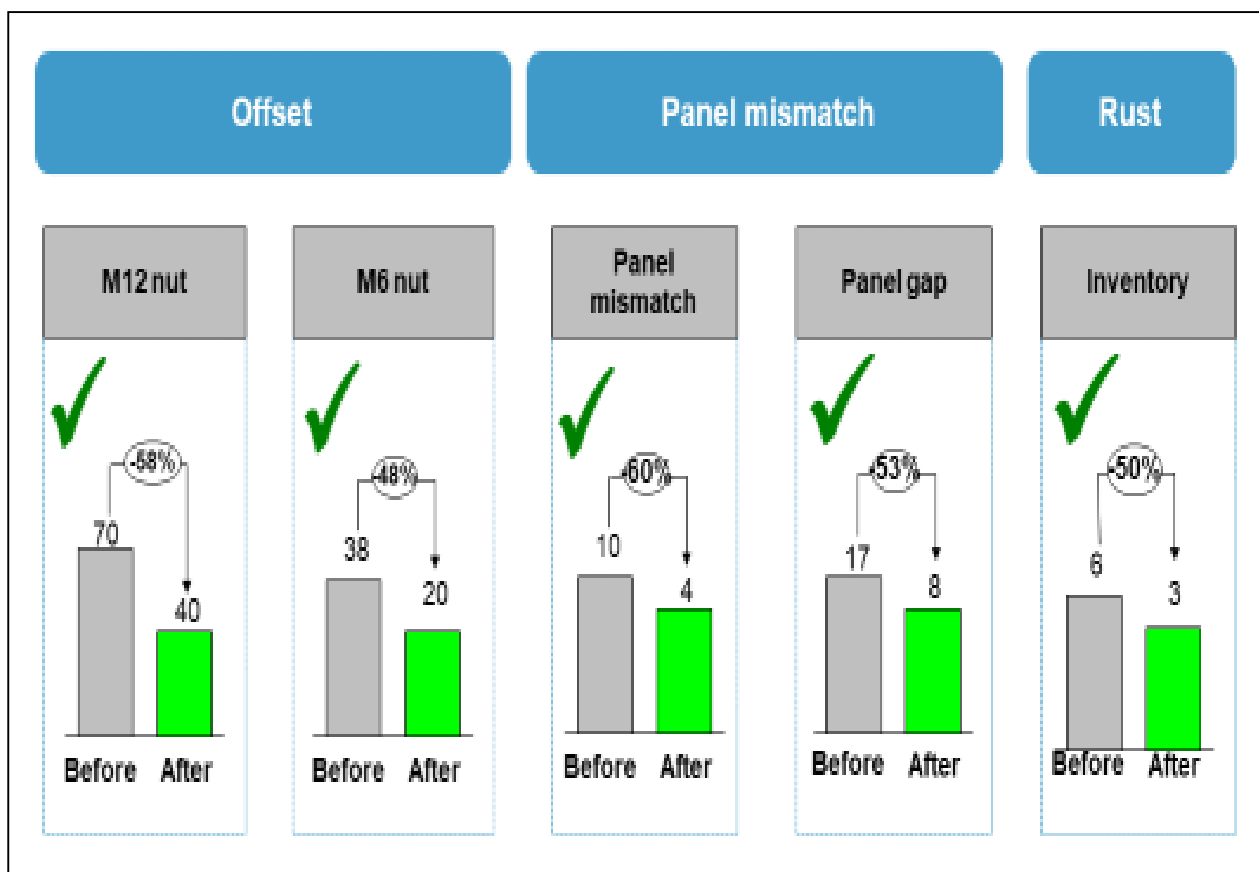


Fig.3. Problem identification and Rectification of three components M12 nut, Panel and Inventory Rust.

Fig.3., shows how the percentage of reduction in defect formation for the components like M12 nut, Panel and Rust formed in inventory area. In

all the components, nearly 50% of problems can be reduced.

9.RESULTS:



Fig.4.Effect of defect in Seat Mounting gap in L61095

Here MDT, DYC and SLC rear floor to seat mounting gap issue in L61095 has been addressed. Fig.4. first image shows the gap between both the

parts. In second image, gap has been arrested by adding the shim to avoid the gap.

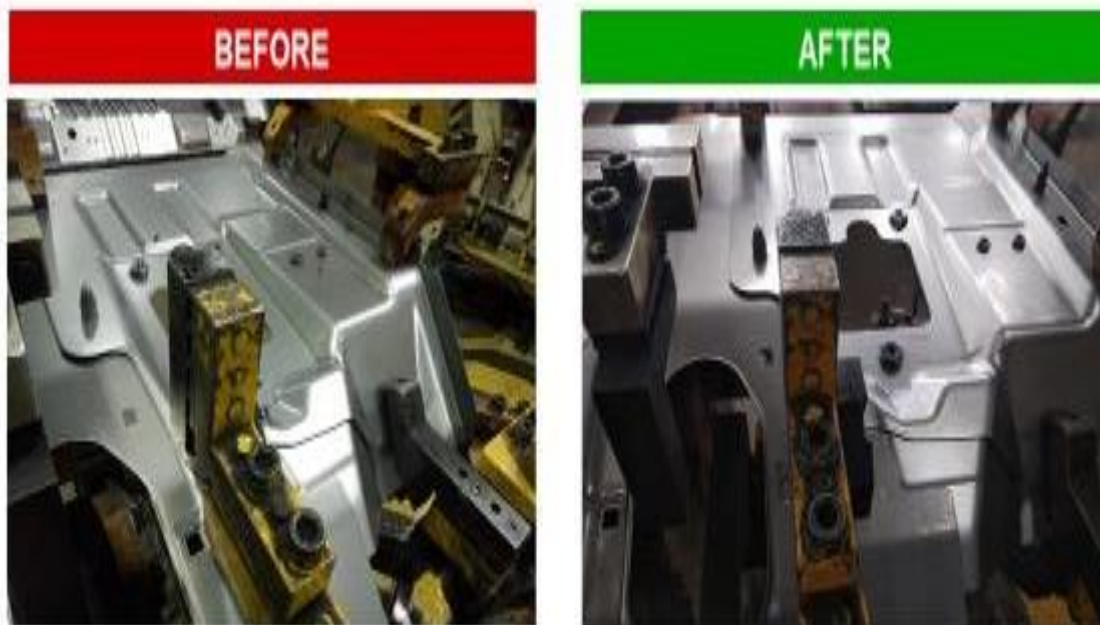


Fig.5. Effect of defect in brake pedal gap in L61080

Fig.5.In before image, there is a gap between both the parts. In after image, the gap has been arrested by adding the shim

to avoid the gap and Teflon has been provided to arrest the gap.

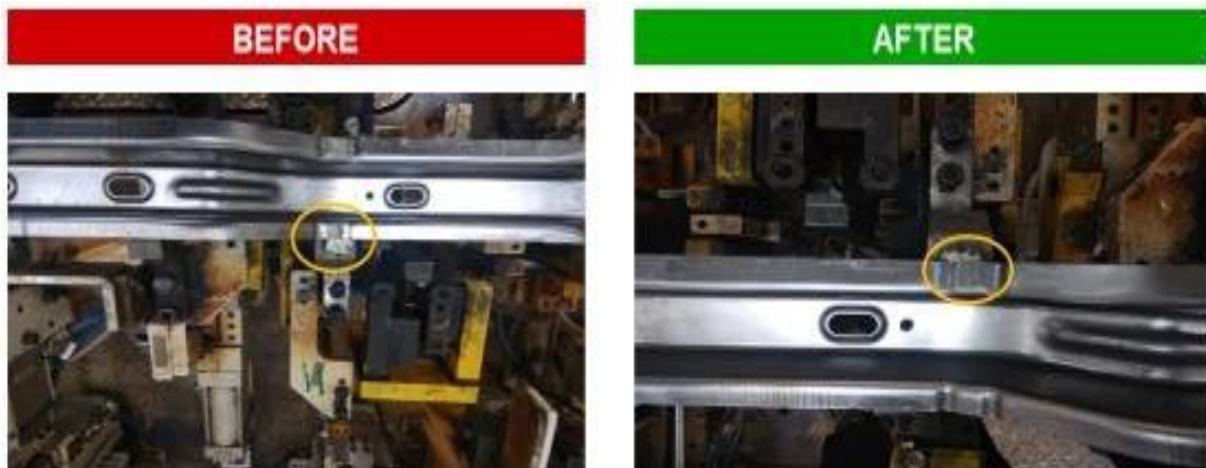


Fig 6.Effect of sensor mounting in different slots

Fig.6. shows MDT SLC part mismatch between middle cross member to long member. In before image, it is found that earlier part is getting mismatch between middle cross member to long

member and sensor also not sensing. But in after image, sensor mounting has been modified from slot hole to fixed hole. So sensor is rigid now.



Fig.7.Effect of rust formation in inventory

Fig.7.explains MDT DYC & SLC Rust issue in front floor panel in L61095.In before image, there is a rust issue and we could not able to check

because of part is inverse. In after image, prevention of rust by avoiding the excess inventory.

10. Conclusion

The Implementation of Quality circle leads to the increase of production rate and quality of MDT (medium duty truck). This Project is concluded with addition of shims, sensors, X & Y axis movement of parts, Part guide installation, rubber sleeve for rust prevention, etc. This project gives mutual benefits to the company.

Reference

- 1.Terry Wallace, "Innovation and hybridization: Managing the introduction of lean production into Volvo do Brazil", International Journal of Operations & Production Management, 2013.
- 2.L. David Weller, "Unlocking the culture for quality schools: reengineering", International Journal of Educational Management, 2013.
- 3.E.V.Gijo,Johny Scaria, Jiju Antony, "Application of six sigma methodology to reduce defects of a grinding process, Quality and

- reliability Engineering International, 2011.
4. Hanumara Harshavardhan, Surapaneni Phaneendra, "Chowdary Failure Analysis for Cabin Front Cross Member Crack Formation in MDT Vehicles due to Abuse Conditions" Journal of Cleaner Production, 2017.
 5. Dong-Yeon Lee, Valerie M. Thomas, "Parametric modeling approach for economic and environmental life cycle assessment of medium-duty truck electrification" Journal of Cleaner Production, 2017.
 6. Assessment and Reliability of Transport Emission Models and Inventory Systems (ARTEMIS), 2006. Drive Cycles.
 7. Jianguang Fanga Yunkai Gao Guangyong Sunb Chengmin Xua Qing Li, "Multiobjective robust design optimization of fatigue life for a truck cab", Reliability Engineering & System Safety, 2015.