

Rejection Control of Front and Rear Bumper using Lean Manufacturing

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Abstract - A study of reduction control of front and rear bumpers and it's major problems. Our project study depends on the reduction of bumpers due to few problems such as scratches, paint chip off, and minor damages. Analyzing of some other damages during material handling and parts assembling.

Various problems in bumpers are reduction of bumpers due to paint chip off in various parts of the bumpers has to be controlled. Reduction of bumpers due to scratches in various parts of the bumpers has to be controlled during material handling. Reduction of bumpers due to minor damages which causes part bend and shape changes have to be controlled during the time of material handling and assembling. Overlapping of paint to be controlled at various parts of the bumpers.

Keywords: *Paint Chip Off, Scratches, Minor damages, Slight deformation of shape.*

I. ABOUT THE COMPANY

Hyundai Motor Company (HMC)

The Hyundai Motor Company is a South Korean multinational automated manufacture headquartered in Seoul, South Korea. The company was founded in 1967 and, along with its subsidiary, Kia Motors (acquired in 1998), together comprise the Hyundai Motor Group, which is the world's fifth largest automaker based on annual vehicle sales in 2013.

In 2008, Hyundai Motor (Without Kia) was the ranked as the eighth largest automaker. As of 2013, the company sold over 4.73 million Vehicles Worldwide in that year and together with kia total sales were 7.56 million.

Hyundai operates the world's largest integrated automobile manufacturing facility in Ulsan, South Korea, which has an annual production capacity of 1.6 million units. The company employs about 75,000 people worldwide. Hyundai vehicles are sold in 193 countries through some 6,000 dealerships and showrooms

II. INTRODUCTION:

The bumpers are mainly affected during material handling and assembling. These corners are undergoing major problems called PAINT CHIFF OFF. But these kinds of PAINT CHIP OFF are very small defects which will not lead to total reduction of bumper and it can be easily solved by touching of the similar color of paint at the final inspection. Even though PAINT CHIFF OFF are one of the main problems in the bumpers. The SCRATCHES

are other major problems in the bumpers which will lead to total rejection of bumper. The scratches are a little etc part of paint chip off or a kind of continuous or stretching of a long chip off is known as scratches. The next major defects which cause rejection of bumpers are minor damages Such as deformation of shapes in a little area of bumpers. Because these kinds of defects are the one which cannot be solved with the same part of the bumpers so the bumpers have to be removed and replaced by another bumper in this case.

Bumper defects can be reduced by identifying source of defect and rectifying it. The process or suggestion included in rectifying is given below.

III. PROBLEM IDENTIFICATION

Problem Description

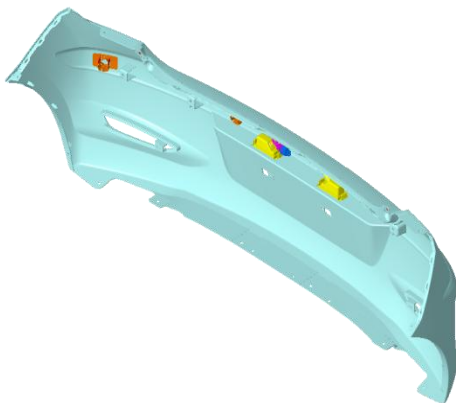
After the analysis in the line of assembly and material handling here are the few problems which act as major role on reduction of front and rear bumper.

- Paint Chip Off
- Scratches
- Minor damages
- Slight deformation of shape

IV. PART DETAILS

Bumpers are the big and one of the main parts of a car. Bumpers of Hyundai manufacturing cars are a product of Vendor Company named as HANIL AUTOMOTIVE. Bumpers from Hanil are an already painted part in the company. Hanil is a continuous vendor among the other vendors in Hyundai which supplies products for FIVE years.

These bumpers act as a stylish image of a car model. There are many different types of bumpers are manufactured, which differs according to the model of a car.

**Fig1:Front Bumper****Fig 2:Rear Bumper**

The above shown figure is the image of front and rear bumpers.

The marked parts of the bumpers are the one which is the largely affected and undergoing the all kinds of damages. During the process of material handling and assembling of the bumpers

V. POSSIBLE CAUSES OF BUMPERS:

**Fig 3: Material Handling**

Due to the continuous process in the screw bit the Magnet losses its magnetic strength and there is a possibility of the fall down of the screw and causes some time consumption and concentration of the worker is distraction on the falling screw so there is a possibility of making scratches in the bumpers and some other parts which is handled in the assembly lines. This material handling takes

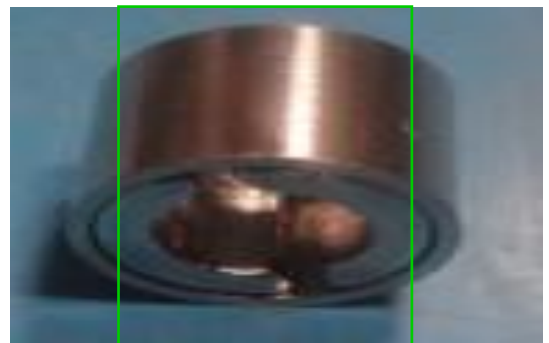
place the vital role in the economic status of the company by increasing the work load in the check line and decreasing the production of the car which is again sent to the paint department for making the touch up in the scratches.

**Fig 4: Buffering Brush**

The buffing is the process of removing the unwanted particles like dust which is present on the surface of the paint. It consists of the backup pad which where the cleaning cloth is attached to it. The normal size of the backup pad we are using in the line is 60mm by this only the small area of the part is covered and the time is increased to finish the process.

**Fig 5: Packing of Bumpers**

As the above pictures describes that the bumpers are arranged horizontally in the trolley without any safety protection. So there are chances to scratches are made in the bumper during the time of transportation from the vendors.



VI. CORRECTION FACTOR:



Fig 6: Material Handling

Like above mentioned in the possible causes due to the continuous action of the screw bit the magnetic strength of the screw bit is decreased so the only way to make correction in the material handling is we should increase the magnetic strength of the screw bit which has the capable of holding the screw in proper manner. By using the more magnetized screw bit the screw could not fall down easily and the worker takes only less time to make the process.



Fig 7: Buffing Brush



In the buffing process of polishing the parts and the removing the unwanted foreign particles which makes the parts as a dusted surface. Then the time taken to complete a single part is more because of the size of the backup pad is very small. So the size of the backup pad is increased to reduce the time consumption and avoid the foreign particles. This counter measures is provided to manage the time.



Fig 8: Packing of Bumpers

Due to the scratches in the bumpers during the time of transportation the foam pad is fixed in the trolley which is used to avoid the damages in bumpers. Foam pad is a soft material and less in cost hence it is economically advisable to use. Thus it can control the rejections in effective cost.

VII. A CASE STUDY:

In our project we can find the problems in the bumper paint chuff off and scratches. The problems we cannot fully solve just we can find out the problems and gave the suggestion to the Hanil automotive company.

VIII. REVIEW AND DISCUSSION:

While us analyzing the assembly line we can find out the paint chuff off and scratches of the bumpers. The bumpers are comes from the container and it can take it to the trolley. Each trolley 12 bumpers can be tokened to the assembly line. In that line the front and rear bumpers can be fixed. After fixing the bumpers then other parts of the car can be assembled and finally the car came to the analyzing section. In that section the full body of the car were checking if there is any problems then it can be go to inspection area. If the small paint chuff off of the bumpers we can applied the paint as the color of the car. If the bumper may be in scratches then it can go to the inspection area and rechecking the part of the bumper. These are all we analyzing the line and we gave some suggestion to the company that are some of the problem occurs in travelling and also it can transfer to the trolley. Hence these are the problems we discussed in the above process.

IX. CONCLUSION :

After knowing the various problems and damages on the rejection of bumpers we finally suggest some of the alternate method and some safety arrangements on the bumpers which may reduce the rate of rejection of bumpers. These methods suggest on rejection control of front and rear bumpers may not affect the economic status and time consumption of work.

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