Automobile Cabin Water Leak Resolution

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Abstract

An automobile manufacturing company is concerned with the recurring number of claims for repairs on their vehicles. Customer satisfaction is down, because of water leaks inside their vehicles through the roof antenna hole. Vehicles must be fixed under a warranty claim, the company incurs in the cost of the fix. The issue was fixed permanently by replacing the clip and increasing the pressure that holds the antenna to the seal on the roof and eliminating any leaks.

Introduction

Background

An automobile manufacturing company must satisfy the needs of the consumer in order to gain consumer favor and market share. When the company has a good public image be it for fast cars or reliability its sales increase. Due to a growing number of warranty claims, the company is having to use up valuable resources such as money that can be invested in the company's growth and labor performed by employees that can be used for revenue generating activities. Also having warranty claims affects the products image in the publics eyes the general perception will be that the vehicle is unreliable and is a hassle to own.

Problem Statement

Several complaints from customers regarding water leaking through the roof of cars and dampening the headliner. Root cause analysis has determined that water leaks occur on account of the seal on the antenna failing.

Objective

Due to the amount of complaints regarding water damage, an investigation was made in order to find why there is water inside the vehicles. After following the water marks, it has been determined that water is leaking to the interior of the vehicle through the antenna roof seal. The task at hand is to develop a solution to reduce or eliminate the instances of issues that cause a vehicle to be claimed under a warranty fix. The solution must consider that the leak must be prevented, while at the same time minimizing the cost of implementation.

Methodology

A sample of the reported vehicles was be inspected to find the entry way through which water is leaking into the cabin.

Three solutions were proposed in order to correct the leak permanently. The first is the current fix which is replacing the antenna assembly.

The second is to use a sealant around the hole in the roof opening. Finally, replacing the holding clip on the antenna. Cost will be considered as the solution has to be cost effective.

Results

Replace antenna

This option is the one being implemented, but the cost for replacing the antenna is $327.

Add sealant around hole

When this solution was tested, it was found that it adds complexity in the form of additional costs, an extra step and it is likely to increase in assembly errors leading to more customer complaints. The cost for the sealant is $30.

Replace holding clip

The last solution tested was the replacement of the holding that creates pressure between the roof of the vehicle and the gasket. After changing the clip and creating a tighter seal, the seal was tested by using a pressure washer with a pressure of 30 psi. The cost for the new clip is $4.32. Figure 1, shows that the new seal can handle 50% more pressure than the one using the old clip, increasing from 20 psi to 30 psi. In Figure 2, a side by side comparison for the cost can be seen. Showing that the solution with the lowest cost is the clip replacement.

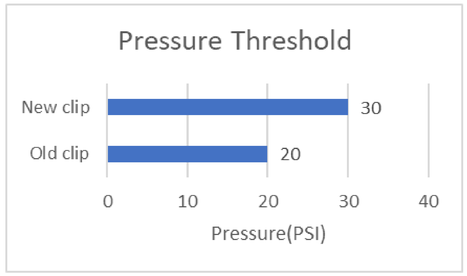

Figure 1
Pressure comparison

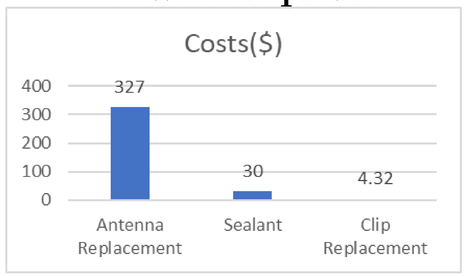

Figure 2
Cost comparison

Conclusion

The most cost-effective solution is the clip replacement. It is the least costly and it does not require taking the entire antenna assembly apart.

Bibliography

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