

# Consumer Kaizen: Increases in Quality Resulting from Consumer Rapport and Excellence of Product Ownership, Case of Cadillac Motor Car Division

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**Abstract:- An illustration of an additional form of constant improvement of a product or brand of products, resulting from the iron-clad loyalty generated by the intense experience of ownership and support of a marque. Unlike traditional forms of kaizen generated within an organization, or the results of consumer complaints or suggestions for improvement solicited by market research through quantitative data, increase in quality is derived by actual component reengineering by very specific, qualified consumers. Minor product drawbacks and weaknesses are alleviated through component correction and redesign, even to include commercial aftermarket component development. While this example focuses on the automotive industry, the basic concept may be applied to virtually any manufacturing or service industry where strong impact is made to the culture. This type of dedicated, firsthand product testing can be of great value in the planning and engineering of future products.**

**Keywords:-** ABS Plastic, Automotive Component Design, Brand Loyalty, Cadillac Lyriq, Celestiq, Cadillac Motor Division, General Motors, Kaizen, Quality Assurance, Stainless Steel 302 (S30200),

## I. INTRODUCTION

About the most outstanding advantage that a company can have in the marketplace is a powerful, even elite brand with an exceptionally strong following. Since the 20th Century, to describe something in grand terms, as something that was the best of its kind is to refer to it as the “Cadillac” of its type or class [1].

That term says a lot about this name. It conveys a certain experience that many aspire to, but few will accomplish. For decades, the top leaders of their fields sought to have this name on what they drove to get them to where they performed their respective tasks. And it was a very distinct experience. One that was very powerful, very personal, exceptionally comfortable and especially secure. So much so, that those who sought The Cadillac Experience tended to drive theirs longer than most other car owners. And when they did part, they sought that type of experience again in a newer model [2][3].

This experience was not affected by culture. Rather, culture was indeed not only affected by it, but in many ways defined by it. This is best illustrated by the introduction of the

2023 Lyriq model. So named as to the fact that the Cadillac is referenced in the lyrics of more songs written than any other car in history [4]. In addition, Cadillacs have been powerful support elements in literature, motion pictures and television series, at times becoming almost like another character within the story.

So, the Cadillac became a perceived ultimate in ownership and as a result became a cultural symbol of excellence. And this illustration is meant to exemplify the long-term positive effects of building and maintaining this type of intense relationship with the consumer. Cadillac has traditionally been at the forefront of technological development and advancement [5]. Yet it should be noted that the Division’s strongest sales and profitability have been during periods of the marque’s proven reliability, coupled with sheer luxury and comfort. Elements which have always gone together in the brand’s strongest times as a cultural icon and influencer [6].

The term “Kaizen” is a Japanese word meaning “change for the better”. However, in western culture it is more often used to refer to continuous improvement within an organization. A series of generally small changes which can have long-term positive effects, and may be applied within management systems, production lines, corporate communications, and of course product planning and design [7].

Yet kaizen, in its traditional form typically begins and ends within the production or service process of an organization.

For this illustration, we will attempt to show how this type of relationship with the consumer may even result in kaizen to the product *by* the consumer. Although this example is not typical, it does illustrate specific cases where the intensity of the experience may not only satisfy the customer, but also inspire them. A sort of Consumer or Post-Production Kaizen where improvements are physically created during product ownership. Not through the results of suggestions for future models or quality complaints or recalls [3], or even beta testing, but through strong dedication to the product based on the image it portrays, its reputation, and overall experience it provides. While most consumers would not be able to contribute to a product’s refinement and continuing improvement, select individuals, in this case with very basic engineering and

fabrication skills can assist a company in providing kaizen to the product. Indeed, an additional benefit of excellence.

**II. ILLUSTRATION**

One individual who began driving the marque at an early age reflected the Cadillac Experience in an article published in *The Self-Starter*, a publication of the Cadillac-LaSalle Club of Detroit, Michigan [8]. The piece illustrated the owner’s experience, or indeed impactful relationship with the car, including some completely unintentional incidents which tested certain aspects of its design to its absolute limits. Contributions of a long-term Cadillac owner. This customer has owned many models during their driving career but has kept the first for over 30 years. This led to a series of articles dealing not only with the superb experience of ownership, but also in technical assistance with common problems with specific automotive components.

The first dealt with how to repair a component with a high failure rate over time, Part Number 2000 5118 [9]. The component was the ABS (Acrylonitrile butadiene styrene) plastic frame, molded in woodgrain pattern which housed the electrical switches mounted in the armrest interior panels of each door. It was often a twofold problem. The frame itself was prone to breaking away from its mounting as well as its eventual inability to secure the chromed steel plate which houses the vehicle’s power switches and mirror controls. The steel switch plate was mounted within the plastic frame and secured by heat welds, or melted stalks of ABS. These deteriorated over time when exposed to heat, cold and vibration from operation of the vehicle. The frame was unavailable for replacement separately from the entire assembly, either as OEM or aftermarket component. Replacement was further complicated as the plate which held the switches varied in configuration by model type and model year, as did the woodgrain color and pattern of the ABS.

A solution was developed involving the use of fasteners to secure the frame to the mounting in the armrest. To address the problem of the plate mounting, a procedure was also developed of removing the perimeter of each stalk of the ABS heat welds, and then hollowing them out to be threaded with fasteners to mount the plate within the frame much more securely. As a result, this technique was implemented by many owners who encountered this same problem with their vehicles.

Although these solutions resolved the immediate problems, they did not tackle the challenge of the plastic frame itself being broken down over time by heat, cold, exposure to ultraviolet rays and above all, stress from usage. ABS material is known for its high tensile strength and flexibility in relation to its weight but has an exponential rate of becoming brittle when stressed to the point of cracking [10]. A permanent solution was designed, (Figure 1) a replacement frame manufactured from brushed aluminum alloy. Now many of these problems were resolved by simply using different materials. This alleviated the weakness of the ABS along with pre-threaded mountings which now could be secured within the replacement frame with machine fasteners. The problem

with the frame breaking away from its mounting was also solved as the aluminum is much more rigid, and the mounting tabs would now not break off as with the ABS frame. The finish aesthetically mated well with the brushed aluminum face insert of the switch plate itself and the car’s interior. But for those owners who preferred an original appearance, wood grain adhesive BOPP (Biaxially oriented polypropylene) in the same patterns as molded in the original ABS was available and could be applied.

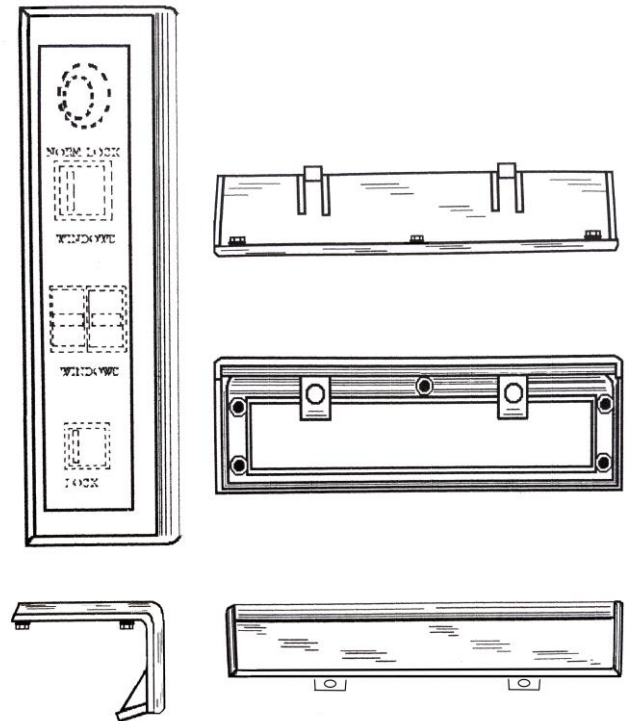


Fig 1: Illustration of Redesign of Component 2000 5118.

Other solutions to minor common problems were also developed. One dealt with a way of solving a familiar problem with the Cadillac (as well as other Divisions) crests or emblems (i.e., Component 20248001) on the vehicle body [11]. The colored plastic portion of the crest became opaque over time due to ultraviolet ray exposure. A solution to this problem was to gently grind down the plastic to where the elements of the crest were visible again, and then clarify the area with applications of clear nail polish. The nitrocellulose bonded with the plastic portion of the Cadillac crest, returning it to a transparent appearance again. The repair also aided in sealing out moisture to protect the emblem from further damage, especially to the colored portion’s adhesive backing.

For older models equipped with factory Citizen’s Band radios, (CB) a solution to repairing the power antenna assembly (i.e., Component 5044856) at a crucial weak point was also published [12]. As this was an option available for a relatively short period of time, replacement assemblies were extremely difficult to locate. The solution involved a procedure where the repair could be made without removal of the antenna assembly from the car.

The next solution took on even larger proportions, as the progression from technical assistance to component design, now gave way to that of aftermarket component manufacturer.

A longstanding problem, which had plagued owners for literally decades was the “emblem cover” (i.e., part 20005683 and 20005684) or Cadillac crest mounted on the trunk to cover the keyhole. The emblem rotated to one side to allow insertion of the key by means of a carbon steel pivot spring. This spring had a real tendency to break or rust out, leaving the assembly unserviceable. Again, due to the slight variances between year models, the emblems were difficult and expensive to obtain through dealerships. The spring itself had no part number and could only be obtained by the purchase of a complete new assembly. Yet even after the costly purchase and installation of a new emblem, the same problem remained with the high failure rate of the spring.

The problem had become, to a certain extent, legendary. And it was also not unique to Cadillac products. The basic design and spring were used for many years on other GM and even Chrysler products which shared the same trim supplier. This component was improved over time. A thicker wire spring and a more substantial rotation pin were added on later models, slightly increasing the rate of reliability yet not completely solving the problem. Even newer models eventually suffered the same fate, especially those in northern or coastal climates which were exposed to road salts.

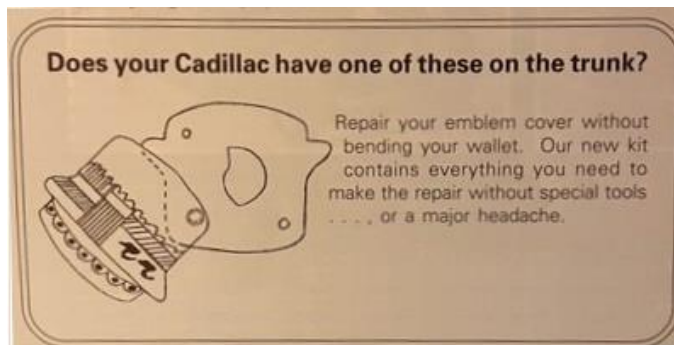


Fig 2: Original Magazine Advertisement for Emblem Cover Repair Kit, *The Self Starter* [13].

To meet this need, a new replacement spring kit was designed and made available for purchase [13]. (Figure 2) It contained a new spring manufactured from 302 series stainless steel (S30200) wire which would, for all intent and purpose, never rust out or break. To facilitate the re-installation after removal of the rivets from the trunk with an 11/64” drill bit, two methods were also provided. Hardware to replace the aluminum rivets originally installed on the car, as well as an alternative method of fasteners with expanding plastic washers for those owners without tools for installing rivets.

Cadillac Motor Division was also extremely helpful to the project by identifying which models and model years used the problematic emblem cover as a component. The Public Relations Department also provided a copy of *Cadillac: Standard of the World: The Complete History* by Maurice D. Hendry which featured photos of each model, making identification of which used this assembly much easier [5].

The kit was made available through advertisement in *The Self-Starter* and later, the internet. Based on sales, response and feedback, it was indeed a solution that had long been awaited.

### III. CONCLUSION

These simple solutions illustrate how progressively powerful one Experience one Company created became, and the results and indeed dividends to both the marque and the customer. From satisfied owner, to repeat customer, to enthusiast, to technical developer, to aftermarket component manufacturer and distributor. To illustrate the impact of the Cadillac Experience even more powerfully, this owner was also a common stockholder in General Motors Corporation before becoming Motors Liquidation Company yet has stayed in support of the Cadillac marque and the new Company after the restructure [14].

Now if this kind of experience and relationship can be replicated with present, as well as future models, the possibilities for growth in market share could be greatly accelerated. These examples came from year models where components were far more mechanical and electrical than electronic and digital as those of today. As the Division moves forward with its commitment towards vehicle electrification with the upcoming Lyriq and Celestiq models and autonomous driving [15] [16], more advanced contributions to the product by result of an equally intense rapport with appropriate skill could be developed.

Again, while only select consumers would truly be able to participate, refinements developed by qualified individuals could be recognized by their communications being keyword scanned through computer software. Those with appropriate backgrounds would know how to describe problems in correct terminology, identify component materials, reference part numbers and define drawbacks within assemblies and subassemblies. Modern and more technically skilled devotees to the marque could in turn assist in correcting far more complex problems, such as the creation of Apps or other software to correct glitches in vehicle information systems or even breeches of security. Other minor components could be refined and replicated today with the use of 3D printing. The first example of the console frame may be reproduced in its original basic form by a relatively simple and inexpensive printer using Fused Filament Fabrication technology, which platform supports a variety of materials including ABS plastic [17]. It is a testament to the Cadillac Experience that even after over 30 years of ownership, the improvements featured were all with minor components, as no chronic or insoluble problems arose with the powertrain or electrical systems within that time. So, the basic method or combination of factors by which this Experience may be created remains virtually unchanged. As kaizen is a continuous process, this type of hard feedback, derived from actual use could be of considerable value to engineering departments and product planners.

This same principle for improvement can also apply to any elite brand which has historically made significant impacts upon culture. For example, a fragrance manufacturer such as

Chanel having a following so strong which leads a devoted consumer with a background in packaging in coming up with an improved box, reducing breakage during transit, cost and waste, or designing the container in such a way to make the packaging itself collectible, as additional promotion for the brand.

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