THE MAIN PRINCIPLES OF RETROSPECTIVE APPROACH IN AUTOMOTIVE DESIGN

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ABSTRACT

THE MAIN PRINCIPLES OF RETROSPECTIVE APPROACH IN AUTOMOTIVE DESIGN

In this thesis, the meaning of retrospective design is studied in automotive industry from the industrial design point of view. The main purpose of this study is to find out the main principles of the retrospective approach in automotive design. In order to do this, many examples from a variety of different design disciplines are used and examples from automotive industry are deeply analyzed. After giving general information about the meaning of the word “retro” and what it means in design for different design areas, it will be focused on the use of retrospective approach in automotive design with reviewing the current examples of the retro vehicles. In the next chapter, two current examples of the retro vehicle, Chrysler PT Cruiser and Volkswagen New Beetle, are going to be considered and they are compared to each other according to their retrospective designs. This will help us to understand how retrospective approach differs from one design to another in automotive industry although they are put in the same category in general. In addition to that, there wick be a case study of making a retrospective vehicle of an existed Turkish car from the past, Anadol Böcek (1975), to practice to show how a retrospective approach can be applied in automotive design. Finally, it will conclude the summary of the retrospective automotive design and what it contains in its deep meaning.

ÖZET

OTOMOBİL TASARIMINDA RETROSPEKTİF YAKLAŞIMLARIN TEMEL İLKELERİ

Bu tezde, retrospektif tasarımın otomotiv sanayisindeki anlamı Endüstri Ürünleri Tasarımı açısından incelenmiştir. Tezin ana amacı, otomotiv tasarımındaki retrospektif yaklaşımın genel ilkelerini belirlemektir. Bunun için birçok farklı tasarım alanından örnekler kullanılmış ve otomotiv tasarımdaki örnekler derinlemesine incelenmiştir. "Retro" kelimesinin anlamı konusunda genel bir bilgi ve birçok tasarım alanında ne tür bir anlam içerdiğini verildikten sonar, güncel retro araçlardan örneklerle otomotiv tasarımındaki retrospektif yaklaşımın üzerinde durulacaktır. Daha sonraki bölümde, retro araçlara iki örnek olan Chrysler PT Cruiser ve Volkswagen New Beetle incelenecek ve retrospektif yaklaşımlarına gore karşılaştırılacaktır. Bu bizim aynı katagoriye konsalar bile, retrospektif yaklaşımlarına göre herhengi bir aracın diğerinden ne kadar farklı olduğunu anlamamıza yardımcı olacaktır. Buna ek olarak, otomotiv tasarımında retrospektif yaklaşımın nasıl kullanacağını gösterebilemek için geçmişten bir Türk tasarımı olan Anadol Böcek retro olarak tekrar tasarlanacaktır. Son olarak, retrospektif otomotiv tasarımı içerdiği derin anlam özetlenecektir.

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CHAPTER 1

INTRODUCTION

1.1. Definition of the Problem

The whole history of literature contains a huge amount of readings that were written as a recreation of the existed texts. Any of these new readings represents a yield to the old one and is done to show the concern that the creator of the new passes beyond or is equal to the creator of the existed one. For instance, Vergilius guided Dante, who is the third biggest epic poem writer in history after Homeros and Vergilius, in the imaginary trip in the Divine Comedy. Vergilius took Dante and presented him to the all old poets originally Homeros. This imaginary trip that comprehends the Hell, Heaven and Purgatory is the Dante's trip to find the poetry and emphasizes the difficulty of being a poet. However, the most important thing for us in this reading is that Dante realized the link between Vergilius and Homeros and while he became a member of this poet group, he showed that how important is to look for all other existed test from past for creating a new reading. In other words, any artistic creation is based on another artistic item that existed before and this structure is called as "canon". (Şengel 2002)

As it can be understood from the history, none of the readings last long if it does not belong to a canon structure or none of the writers last long if he does not partake an existed canon. This means all new work of art can be only born from an origin of another existed one. This principle has been also applied to other creational disciplines such as, architecture, industrial design, fashion design, for a long time. To summarize, all new creations have to use the basic principles of existing ones even though it brings huge improvements and renewals.

Mostly canon principle had been used in all kinds of design in imperceptible way until another design trend came on the scene called "Retro". This was a rewording of canon with incorporating some other characteristics into its content and narrowing its definition to specific usage. Retro is the popular trend in today's world in every type of design and known as the all kinds of items that comes from the past.

The word “retro” is used commonly in daily chats but it should be used carefully. There are so many examples of the retro design in life and there should be some basic rules or features of the retro design while it is compared with other design styles. The main aim of this thesis is to provide a general framework for the word “retro design” and which areas it is used currently. It will then focus on principles and applications of retrospective styling in the context of automotive design.

1.2. Aims of the Study

The main objective of this study is to examine and figure out basic principles of the retro design in today’s automotive industry. To do this, it will benefit from comparison of retrospective vehicles in today’ market place and making a retro design for an existing vehicle in the past from Turkish automobile history.

In the second chapter, the meaning of the world retro is going to be mentioned and the answer of the question “What does retro design mean?” will be given with some examples from the different design areas that retro is used. Although retro design is used in every area of design, in this study it will focus on the main examples that retrospective design is mostly used such as fashion design, decoration and interior design, product design and, automotive design. Finally, this chapter will be concluded with automotive body design history summary to show what affects the design of the cars from the beginning of the first vehicle, what the retrospective designs in automotive industry and when and why it is started to be used in this industry with giving retro styled cars for the past one decade from now.

In the third chapter, to give a better explanation about the retrospective designs in automotive industry, two popular retro designed vehicles in the today’s market, Volkswagen New Beetle and Chrysler PT Cruiser, will be compared as the first case study. After their design stages are mentioned, it will continue with related concepts and new models of these vehicles to show what make them retro. Finally, by listing the main differences between them, it will show how different they are from each other although they are called as “retro” and how different retrospective approaches can be used in automotive design.

In the fourth chapter, a Turkish vehicle, which does not have many in its history unfortunately, is going to be redesigned according to gains from this thesis about the

retrospective automotive design. This unique vehicle is Anadol Böcek, which was very famous at its time with its futuristic design and funny look, all of which makes it a worthwhile subject for a retro design study. It is going to be demonstrated how a new Böcek is designed from this old Turkish beach buggy.

Finally, summary of all chapters will be provided drawing on conclusions from previous chapters and relating these to the future trends in retro design.

1.3. Method of the Study

Considering the aims and the problems that are defined before, the study is constructed in five chapters in order to reach a conclusion at the last one.

First of all, literature survey about retro designs is performed in order to collect enough information to analyze the background of the subject. Many examples of retro vehicles in today's market including concepts are studied and similarities and common points of them try to be determined.

There will be two case studies to define the retrospective approach in automotive design. The first one will be comparison of the two retro vehicles according to their styles. The vehicles are researched according to their ways of design and styles. It is supported by variety of pictures and visual documents for better understanding. The second case study is to design a retro vehicle from Turkish Automotive industry. There are some interviews with designers in Turkish Automotive industry to choose the right vehicle and decide what kind of design changes can be performed in this new vehicle. An existing vehicle is taken and it is redesigned with obeying the rules of retrospective styling. To do this, brainstorming is used to initiate the idea to set up the base of the design for the new vehicle. After sketches are done to give the general idea of the new vehicle, it is discussed with design engineers to give the final shape of the design.

CHAPTER 2

AN OVERVIEW OF THE RETRO STYLED DESIGN AND RETROSPECTIVE AUTOMOTIVE DESIGN

The prefix *retro-*, meaning "backward, back", comes from the Latin prefix *retro*, meaning "backward, behind". *Retrospect* adds *retro-* to the verb *specere*, "to look at". (WEB_1 2002)

2.1. Definition of the "Retro"

Defined by the dictionary as "directed backwards or behind", retro is a traditional prefix, usually attached to some more substantial or vibrant word. In contemporary culture, however, it has become a noun capitalized and standing alone, loosely defining and style that draws heavily from the past. Retro is a contemporary term to describe things from a past era. It is often used a positive sense, referring to quirky or attractive products that are no longer available.

Currently, there are two broad categories of Retro. First, what is "heavily influenced" by earlier styles but is new in design and manufacture is called "retro". These include everything from Old Navy graphics to Turner Classic Movie channel visuals and Johnny Rocket franchises. Chrysler's PT Cruiser epitomizes the phenomenon with its glossy hot rod exterior wrapped around a bland, under-powered, marginally-reliable platform of a standard compact. The smaller second category is comprised of actual designs from the periods which are being remanufactured to original specifications and sold at a premium. This includes a lot of 20^{th} century furniture, 1950s revival fabrics, Williams and Sonoma's latest benders and numerous niche market products. (WEB_1 2002)

Retro, in popular culture, can be seen as an uncritical enthusiasm of the past used as a weapon against contemporary cultural forms. Retro is uncritical because it sees itself as a return to a lost authenticity, to basic values which somehow have been corrupted by later evolutions.

However, the word “retro” started to be used commonly in design environments to express the new trend of the designing new with impression from past images that is proved to attract people’s affinities at their times. In order to define a design style as “retro”, this design should comprise some features.

The oxymoron “Modern Retro” usually focuses on design in the style of that from the 1950s and 1960s, particularly American varieties. The general term can be somewhat broader, however, covering anything from 1920s French Moderne to Depression-era American home furnishings to Scandinavian design from the 1970s.

2.2. Design Areas where Retro Styling is used

Retro styling is everywhere around us, especially in today’s world. It can easily be seen in every part of our lives that contain design. Past is often a good example to show what is valuable and what is not. The term “retro” is not a new terminology but it is started to use the description of a new trend in industry. Maybe it is not realized, but fashion design uses this practical way of designing for a long time. It will be better to give examples of some retro styled products from recent time in many different industries in order to understand the meaning of the retro styling deeply. It can not be limited as four or five categories but mainly four design areas has some good examples in order to figure out this hard-to-describe term such as, Fashion Design, Decoration and Interior Design, Product Design and the most important and current one, Automotive Design. Let us start with Fashion Design.

2.2.1. Retro Styling in Fashion Design

Retro styling is not a new term in Fashion design. Fashion design has used this type of styling technique for a long time. Trends in fashion design have to repeat themselves in some periods because of the some basic items and parameters that are obligatory and cannot be changed depending on time. A woman has to wear a dress, a skirt or trousers as what trousers, shirts mean for men. However, the cut and shape of the clothes, colors and patterns that are used on them, accessories that are combined with them, and the types of fabric and textures of what they are made from are always

changing according to the current trends that are shaped under the life conditions at that period of time. Thus, they are not long-lasting like time.

Retro design is also a rejection of the fifteen minutes shelf life of most trends. Fashion is obviously not an industry that likes to slow down. But even there, the ‘50s fascination has transcended the usual season-to-season dictates. Mid-century detailing first showed up in Marc Jacobs’ 2003 Spring collection. Jacobs brought in retro references both obliquely and directly and picked up bits from the cocktail-shaker days of the ‘50s and ‘60s; tiny bows and rolled collars, dot prints, cocktail dresses made from lace and satin, pencil skirts and cigarette pants. Pringle of Scotland and Balenciaga were other fashion firms that decided to use retro trends in their collections in that period of time. (Ozzard 2002)

Figure 2.1. A few examples from the runway of Marc Jacobs’ Spring 2003 collection

In fact, Marc Jacobs was not the first fashion designer who used retro trends in his designs but he is the guy who is very good at doing this in his collections. There were always so many flash backs in the fashion history to use retro icons from the beginning as already mentioned that the designers always inspired by the previous clothing, gathered them with the icons of that period. But there are some times when this inspiration becomes more visible such as 1990s, at the last decade of the century. The real reason that 1960s and 1950s made a comeback in 90s is that the designers are facing the end of a century and at the end of every century there seems to be a reluctance of people to go forward and summarize the whole century with reminiscent of the items in memories. Little dresses and skirts that have a length 40 to 50 cm from the waistline to hemline started to be seen in the streets. In fabrics, shocking pink, bright

red, turquoise and yellow were used all in the same pattern. The collections begun to show some 1950s influence in their lines, including post-war era when skirt lengths plummeted. Midcalf skirts with pinched-in waistlines, sweetheart necklines, apron dresses, beauty marks and hand-held handbags are the most well-known parts on the streets.

However the main big retro trend wave appeared in the first decade of the 21st century and the word "retro" became well-known in the fashion design and this was the starting point for the future collections.

Figure 2.2. Jacket, Bodice, Short Pants, Pants and Garters, Vivienne Westwood, 1997; Sweater and skirt, Rei Kawakubo, 1995

What is it about the postwar period that keeps pulling people back? Peace and prosperity may not have been the purview of that era alone but the '50s hold a special place in world's collective imagination. After the confusion caused by the World War 2 in the 1950s, society entered an era of mass consumption in the 1960s. The dynamics of mass production were everywhere evident in the world of fashion as a result of the war had propelled the industry. Thus, reasonably priced and good quality ready-to-wear clothing came into existence.

Haute couture, the accepted fashion authority up to this point, no longer seemed to offer designs that fitted the ordinary and practical lifestyle of people in the new, post World War 2 era. Parisian haute couture suffered much during war, but it was first Christian Dior who stimulated the haute couture revival with the collection called "New Look" in 1944. Cristobal Balenciaga was another great designer in the 1950s. Featuring creative silhouettes, a unique, extra space between the garment and the body, exquisite

colors; all these designs made Balenciaga become known as “The Master” of haute couture. In 1954, Gabrielle (Coco) Chanel made a strong come back. When women began to seek comfort as a respite from the nostalgic fashions of the 1950s, Chanel reintroduced the “Chanel suit”, which was a perfected version of her 1920s cardigan ensemble.

Figure 2.3. Chanel Dress, 1950s

In 1960s, baby boomer reached their teens, and the era of mass production was in full swing. In 1961, the Soviet Union launched the first manned space flight, and in 1963, President John F. Kennedy was assassinated. The May Uprisings in Paris occurred in 1968, and the first landing on the moon was achieved in 1969. In the middle of such explosive drama, the young generation sought its own distinct mode of expression, and the powerful new American culture was an obvious choice. The young found that displaying their physique was the most effective means of setting themselves apart from the older generation. In 1964, American designer Rudi Gernreich introduced the topless bathing suit, the “monokini”, which clearly represented a new concept of the body: a “body consciousness”. A dress exposing the legs up to the tights was tagged the “mini” and proved a simpler and more practical method to express the same concept. Bare legs in women’s fashion, which also appeared in the 1920s and will appear in a period of time in the future, developed through various conceptual stages in the 1960s. Andre Courreges mini dresses displayed against the powerful background of Parisian haute couture.

Figure 2.4. Dresses from Andre Courreges 1960s

Before the shock waves created by the mini-skirt had subsided, a women's pants style came into its own in the world of fashion. In the United States, jean clothing originally designed for manual labor became casual attire for both men and women in the 1930s. Then after World War 2, trousers found acceptable as women's casual wear, the taboo on pants for women in haute couture was finally broken.

Dresses also caused a stir. In his 1964 Space Age Collection, Pierre Cardin unveiled designs for future oriented dresses shaped in simple geometric patterns and made of inorganic materials. Moreover, in 1960, he broke into the filed of men's clothing, which up until then had been the closely guarded of tailors in a system that had remained largely unchanged since the French Revolution. Cardin anticipated the arrival of the "unisex" trend, a powerful shift in sensibility that fed into the hippie movement. By the late 1960s, men wore their hair long and donned brightly colored clothing with lace and frills.

Figure 2.5. Dresses from Piere Cardin, 1960s

New manmade materials opened up various possibilities for minimal fashion in the trendy futuristic and synthetic styles of the 1960s. Elsa Schiaparelli's attempts had been regarded as radical anomalies. In the world of haute couture, Paco Rabanne debuted sensationally in 1966 with a dress constructed almost entirely of plastic. It was Rabanne who first systematically moved beyond the idea that only fabric could be used to make garments, and he continued to adopt metal and non-woven materials for clothing. The reliability of mass-produced manmade fibers supported the development of the ready-to-wear industry. In 1935, the nylon was invented, the first manmade fiber, and in 1940, nylon stockings were first introduced, and then quickly became enormously popular. Polyester and Lycra was developed and started to be used in the market. (KCI 2004)

Figure 2.6. Some examples about women fashion from 1960s and 1970s

All these changes in the life and reflections on the fashion trends that completely appeared very different types and vision, and oscillations between the mass production and haute couture resulted that these two decades became a very popular source for the today's retro styled fashion designs.

The retro clothing is an ironic style that inserts its wearer into a complex network of cultural and historical references. It revitalizes and makes clear that the past is available to us only in a textural form and through the meditation of the present. Retro clothing is a Post-Modern genre, a highly visible way of acknowledging that its wearer's identity has been shaped by decades of representational activity, and that no cultural project can ever "start from zero".

Because of the exigencies of fashion merchandising and the craving for decorative excess, the only way for a fashion designer to look forward is by taking the past and realigning it so that it can serve the purposes of the future. That is why retro fashion has been not only the obsession of the last fifty years, but also the source of virtually everything new in the opinion of many.

Most current example in today's retro style is the western retro trend that was used widely in the world's fashion in the last summer. Western retro shirts, classical western boots, and fine dress shirts for men are highly demand. For women, a variety of options are available, from hats to footwear. Common materials include leather, wool, suede, and velvet, and many brands are taking advantage of this style with new lines of suitable apparel.

Figure 2.7. Western retro styled men and women shirts from street fashion

Another retro trend example that is faced nowadays is the shinny and sparkling sneakers and warm-up suits. In the beginning of the summer 2006, suddenly all shinny colored sport suits from the 1980s appeared in the street fashion as casual garments. The coats of these suits started to be combined with used-jeans and bright pink, yellow and green shirts. All big clothing brands immediately focused on this popular trend and prepared a few collections with this retro styling. The revival of the Converse shoes, with All-star series, happened at the same time with this new trend grown-up.

Figure 2.8. Retro styled warm-up suits, Adidas Summer-Fall, 2006.

Figure 2.9. Retro styled sneakers by Adidas, Nike and Converse

That fashion may seem to repeat certain styles are inevitable because the shape of the human body limits options. However, the reemergence of past styles must each time be considered a completely new expression of the present age, as it arises from an entirely new social context. This means we should get used to live with this trend and not be surprised when we come across with it once in an amount of time passed.

2.2.2. Retro Styling in Decoration and Decoration

Decoration is one of the areas that meet retro styling in the new millennium. It has occurred in two different ways. The first way is using the reproduction of the

original, classical vintage furniture and decoration elements according to a concept and the other one, on which this thesis is mainly focused, is using the new designed items that have retro styles and has some links with the original products or time period that they were designed. The reason why these reproductions of the original classics are willingly used in today's decoration is that the improvements in the manufacturing technologies let the classics, which was not quick assembled for mass production, and they were therefore expensive with the previous technology, be produced without big efforts and this makes them more affordable for variety of people. Retro styled products have completely different creation logics than reproductions although they are both called retrospective design. Retro styled furniture will be mention in the next section under another category as Product Design.

A kidney-shaped coffee table, kitchen banquettes and sleek chrome kitchen tables; lava lamps, starburst clocks, blonde Scandinavian-inspired furniture sets are the items, all fashionable in the '50s and '60s, are back and they are more popular than ever. The twenty-year period from the mid-50s to the mid-70s produced a huge variety of design ideas, from Danish modern furniture to inflatable, plastic chairs. Sparked by America's new affluence and optimism following World War 2, consumers yearned for anything modern and different from their parents' houses.

The age of space travel inspired sleek furniture shapes and styles. It can be imagined sitting in a house on the moon with popular one-piece plastic modular chairs and tables. Their brilliant white gave a sleek new technology look to kitchens, living rooms, and dining rooms.

Figure 2.10. Retro Styled interiors.

Durable, chrome dinette sets, bar stools, and kitchen tables are perhaps the most prized of retro furniture pieces. These sleek, Art Deco tables and chairs, which was popular in the ‘50s and ‘60s, evoke a gentler, simpler time, depicted on the “Happy Days” TV series. (Skolnik 2000)

The new “In” room of the 50s and 60s was a place where you can watch TV, play cards, and entertain guests. Every such room had built-in or freestanding custom bar with accompanying bar stools. Easy chairs and recliners were necessary for relaxing and upholstered ottomans to put your feet while watching TV accompanied most chairs.

Figure 2.11. Retro styled interiors and decoration patterns

Color was an important component of the design from ‘50s to ‘60s, and ‘70s. Post-war enthusiasm in the ‘50s ushered in splashes of bright red, often paired with black, as well as pink, lime green, and lavender. The 1960s saw a resurgence of vibrant, mod colors, such as hot pink, and lemon yellow. The 1970s introduced a palette of fall tones: harvest gold, avocado, and burnt orange. These bright colors were outset by white walls and light-colored carpeting. (Bingham,Weaving 2000)

Figure 2.12. Retro styled patterns

Retro accessories are also unique and interesting. Lava lamps, those symbols of 1960s pop culture, were a must for any household. Small appliances, from electric fondue pots to mini-fryers, rounded out any well-equipped kitchen, and plastic wall clocks adorned many living rooms' walls. Functional items also introduced an element of style, such as sleek, Bakelite rotary-dial telephones.

Figure 2.13. Retro accessories

All these extraordinary changes made the 50s and 60s attractive for current decoration trends. However the main point is to use retro styled furniture, in fact accessories or products, in today's media.

2.2.3. Retro Styling in Product Design

Product design consists of a very wide range of items, from furniture to packaging of goods. All these items are affected from the trends and shaped accordingly. The beginning of the 21st century showed us that the new trends in product design was again the simplicity and the slogan "Less is more" started to be heard more and more in the design speeches as it was in 1960s. Therefore, this is so obvious that there are some retro cues suddenly appeared in the new designs in this new world.

There was no starting event for this new trend or no favorite designer that has great studies on retrospective design. No designer highlights his or her design since it is carrying the retro cues from the past. This is not actually deserved by a designer who is responsible to create something totally new and make him or her to be just a developer instead of being an inventor. The result is a retro breeze turning around all designs around the consumers but not landing into one specific design.

Furniture design has used this old fashioned refreshment technique for a long time without putting it in front of people's face. Everyone has felt something special, familiar, and warm in those products but no one has been able to explain the reason clearly. The trends are being clear, pure and simple something reminiscent from the past. First Scandinavian and Victorian furniture made from huge amount of woods with heavy handmade ornamentation started to disappear and they were replaced by new minimalist furnishings with simple and pure taste of design. The new design was mainly focused on to use new, unexpected materials and new technologies in the products instead of the improvements on shapes. Reinterpretations started to become common in the design fairs with using the advantage of new technologies and some designers started to think how it would have been like to design a La Chaise chair with present technologies and social life.

Juli Chair is a good example for this new retro trend. Its designer, Werner Aisslinger who thinks that design at the beginning of the 21st century will overcome the stylish minimalism of the last decade, had some common points as shape, bright colors that are reminiscent from the 1950s and 1960s. It is so obvious that there are many reminiscent points with the armchair by Charles and Ray Eames from '50s. (Fiell 2005)

Figure 2.14. Juli Chair, 1998; Armchair, 1950s

Rossi di Albizzate introduced the Sha sofa and ottoman series designed by Bertoli Design in 2000. One year before, a quite new Dutch designer, Isabelle Leijn, unveiled a self production sofa, called Cocoon. These cute and soft shaped sofas and ottomans have another detail except being funky and crazy; they were reproduced in line with the Djinn chair and ottoman which is accepted as classics from Olivier Mourgue. The back side of the Cocoon sofa and the step of the Sha sofa were nearly the same as the original Olivier Mourgue design. (Fiell 1999)

Figure 2.15. Sha sofa and ottoman, 2000; Cocoon sofa, 1999; Djinn chair, 1965

Stefano Giovannoni, who has many designs for Alessi, designed another charming chair that is like coming out of the Alessi catalogues. His chair, named Bombo, and bar stools can also be described as retro products with their simple shapes and bright colors. Bombo is sitting there as the new generation of the Tulip chair family designed by Eero Saarinen for Knoll Associates in 1955. There were a bunch of similar designs as armchairs, chairs, tables, bar stools with the same design language in 1950s.

Figure 2.16. Tulip chair and armchair, 1955; Bombo chairs and stools, 1999

One of the most famous and well-know designers Philippe Starck also used this fashionable trend in his designs. His Ero's chair, 1999, and Victoria Ghost chair, which is the new generation of the La Marie polycarbonate chairs, are two examples for his retro styled designs. Ero's chair is very similar in shape and design with the chair from Laverne International's Invisible Group, in production between 1957 and the early 1970s. Its space aged design was coming from its transparent construction and material combination. Starck combined this design with some constructive cues from the Tulip chair from the same period of Laverne International one. (Fiell 2005)

Figure 2.17. Ero's chair, 1999; Laverne International chair, 1957

However, his other design, Victoria Ghost, is a retro study of the original Victorian furniture. It is a polycarbonate chair designed for the firm Kartel in last year. This chair was following the classic lines of the Louis Ghost chair. Both of these designs carry the classic lines of the old Victorian chairs. They were made from totally high tech new material with getting rid of the ornaments and simplifying the main lines that make them to be convenient for new manufacturing process.

Figure 2.18. Victoria Ghost, 2005; Victorian furniture, 1950s

The technologies and materials might be totally different but the shape and the spirit of the new product is the same or refreshed one of the original. Lighting currently is another design area that uses the retro styling. The basic and shapes are very popular in the lighting design since customers are not looking for the products with lots of ornamentation that does not let the light go through without changing. Life is so

complex so there is no need to make it more complex with the visual adding like the products that are seen at anytime and anywhere during the day.

The lighting designs of the German firm Büro für Form carry the mentioned simplicity and incomplexity in themselves. A product family Tria and Duo modular hanging lamps are the best products to understand the link between the space aged 1960s and today's world. They seem like a kitchen appliances that was design in 1960s with round corners and soft lines and could find easily a good place in the product catalogues of the firm Habitat. (Fiell 2005)

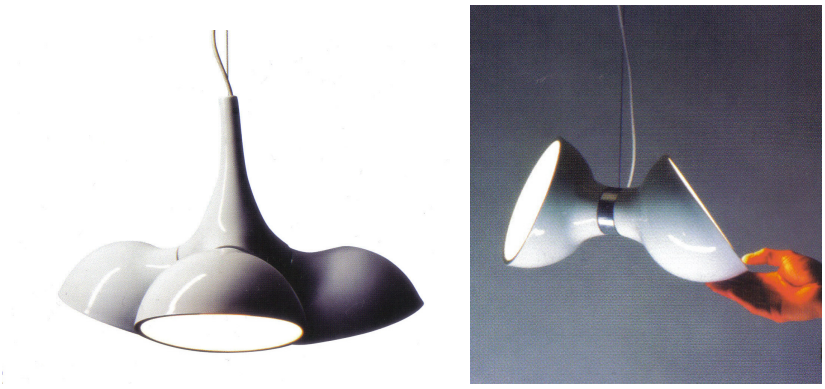

Figure 2.19. Tria and Duo modular hanging lamps, 2000

The retro styling is not limited in the furniture and lighting design, of course. In reality, the starting point was the retro radios and they became suddenly a very popular and well known in the design media. They were a competitor for the high-tech music systems and in fact, with the unbelievable features that they have it was so normal to vacillate between the oldie one and futuristic one. However, the main aim behind these new radios is just to create nostalgia with all new features that are provided in today's goods. Only the shape of the product reminds you the old days. Marco Pulga and Luca Artioli were the designers that first found this trend in their retro radios.

Figure 2.20. Radios designed by Marco Pulga and Luca Artioli

The design firms were not the only ones that accepted this new and nostalgic trend. The big electronic and home appliances firms found this new idea feasible to apply to their new products and use this retro trend as a sale strategy. The best and closest example for this was the nostalgic refrigerator series of Arçelik that started to be seen in the dealers in 2005. It offered both single and double door options with many different bright and lively colors.

Figure 2.21. Arçelik Retro refrigerator, 2004

2.2.4. Retro Styling in Automotive Design

Retro styling is fairly new term in Automotive Design history. However, it became very popular and it is commonly used in all type of vehicle design in this decade. Besides, it is using this new term unreservedly, unlike the other areas of design.

Automotive design has traditionally been catholic-drawing influences from a wide variety of sources. While the self referential nature of the motor industry has never been denied or concealed, drawing on the past has become an ever more explicit and acknowledged source of inspiration. Automotive designers are the most devoted consumers and promoters of the iconic images of the past, along with the mystique that accompanies them. Designers can conjure up elements of vehicles from past and present, from details as small as door-handles and plastic seat wrappers, to the fabled design philosophy of celebrated marques. Just as fashion, architecture, music, literature and design have all learnt to quote liberally from the past, so car design has generated

its own visual language, a semiotic wonderland of signs and signals that define each and every brand with an image and an expectation.

In the beginning of the car design, there was not many alternative from the past. Therefore the design should have been very similar with a horse carriage with some major changes; such as engine, steering, seating. The inspiration point was definite, a horse carriage or a bicycle. There were so many items that should have been improved before the design of the automobile body design. There were some problems about the durability of the vehicle since the driving conditions was not good enough. These early steam driven vehicles were heavy, crudely built and badly damaged the roads. Engines had not enough power to drive in high speeds and the chassis of the vehicles were too heavy. Since all of the vehicles were hand made, the cost of the vehicles are also not affordable by most of the people. The car needed to be improved.

Early models were built like carriages and had lots of ground clearance to accommodate poor and muddy roads. Engines were packed directly over the rear axle. Then engines moved forward, and engine compartments and hoods appeared. Consumers wanted more protection from the weather, and the enclosed body styled evolved.

Figure 2.22. A horse carriage

Mass production of automobiles begun just before 1900. The most well known manufacturer, a landmark with moving assembly line, was Henry Ford with his great success in automobile industry with Model T.

Figure 2.23. Ford Model T, 1908

With the advantage of the mass production the cost of the vehicle was down and innovation was ramped up. Throughout this era, development of automotive technology was rapid, due in part to hundreds of small manufacturers all competing to gain the world's attention. Two and four stroked engines were introduced; steering wheels took places of the tillers. For better ride comfort, leaf springs started to be used widely. Key developments included electric ignition and self-starter systems, independent suspension and four-wheel brakes were introduced in the market. Transmissions and throttle controls were widely adopted, allowing a variety of cruising speed, though vehicles generally still had discrete speed settings rather than the infinitely variable system familiar in cars of later eras.

After these engineering improvements, the number of customers started to increase sharply. As a result of this, the vehicles needed to attract the customer and the car body design became more important in automotive production.

The first automotive styling studio was established in the mid 1920's by Harley J. Earl, however the concept car did not appear till 1939. Until then, basic vehicle architecture and customer needs dictated how a car looks like.

In the vintage era lasted from the end of World War 1 (1919) through the Stock Market Crash of 1929, the automobile can be described as a one step further vehicle from a carriage. The front-engine car became dominant, with fully or partially closed bodies and standardized controls. The main and common characteristic of the vehicles were having sharp corners all round the vehicle and curvaceous fenders that did not wrap the stroked wheels. They could be described a more complex bicycle with better riding and has more functions.

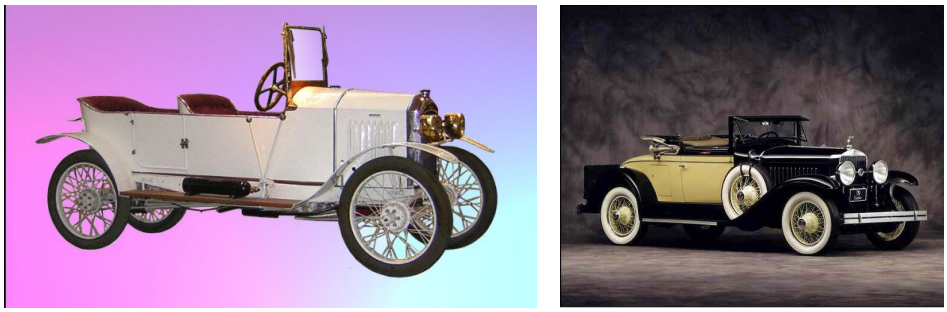

Figure 2.24. Peugeot Torpedo type 161, 1922; LaSalle, 1927.

Then in the late 1920s, smooth flowing lines started to appear in the body style, and the first styled U.S. car was the 1927 LaSalle, which borrowed from the sleek, soft lines of the European cars of that era. Smooth lines then begun to take hold in the 1930's.

After 1930, the pre-war part of the classic era, there were so many important improvements both in engineering and styling. The knowledge of aerodynamics resulted the vehicles consist of one piece body to decrease the drag resistance of the vehicle. As quality of the roads was improved and driving speeds increased the streamlining of the cars was changed in attempt to improve them visually and aerodynamically. The rounded forms and lighter panels also gave the bodywork more stability and strength. The running boards between the wheel arches disappeared and solid metal wheels became standard, while the spare wheel was stored inside the vehicle more often. Split screens were introduced to improve shape and aerodynamics and by the middle 1930's curved windscreen glass became available. The original Beetle started to be produced in this period financially sponsored by Hitler. (WEB_02 2002)

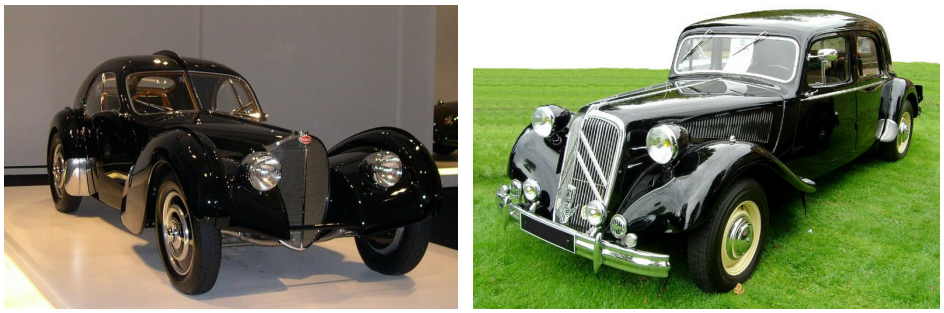

Figure 2.25. 1938 Bugatti Type 57SC "Atlantic"; 1935 Citroën Traction Avant

Figure 2.26. 1938 VW Beetle

Automakers soon learned that public acceptance of styling changes had to be cultivated and manipulated long before they hit the showrooms, so they started developing “dream cars” that were shown in the public to test out new ideas. The classic one, Buick Y-job, built in 1939, was essentially the first concept car.

Figure 2.27. Buick Y-job, 1939

By 1940s, engineer started shifting the passenger compartment ahead of the rear axle, which provided improved ride and handling, and stylist continued to pursue a rounded, massive look. But as fenders and other traditional vehicle contours disappeared into a smooth “slab side” look at the end of the decade. Designers started to look for new ways to decorate these vast expenses of flat sheet metal. The flared wheel arches had begun to disappear as the body work filled out the gap, the roof was getting progressively lower and the windscreen angle more raked. The lights were no longer separate but integrated into the bodywork and the classic three boxes silhouette was becoming increasingly apparent. Once again The Second World War between 1939 and 1945 interrupted the development of the car as companies concentrated more on equipping countries for war.

Automobile design finally emerged from World War 2 in 1949, engine power and vehicle speeds rose, design became more integrated and artful. As the 1950’s

arrived, big became synonymous with better, and automakers competed to get ever longer, lower and wider. This decade is also called the “Baroque” period of automotive design because stylist created tons of purely ornamental details, such as chrome trims, tailfins and huge grilles as they tried to develop new styling cues in absence of real fenders and bond contours. The concept car design had a sharp increase in that period and lots of ultra-futuristic cars were designed.

Figure 2.28. Ford Thunderbird, 1957; Chrysler Imperial, 1957

The average length of a car ownership decreased to two years by 1954 and this made older models look out-of-date quickly. The car sales were boosted, but by the end of 1950’s stylist had stacked themselves into a corner and had nowhere else to go. Buyers were tired of chrome ornaments. The inspiration point of the body design became the space shuttles, aircrafts, airplanes and rockets. Futuristic and aircraft-like concept vehicles started to be designed. This futurism was not only in the car design. It was in every design area such as, furniture, architecture, and home appliances. (Bellu 2002)

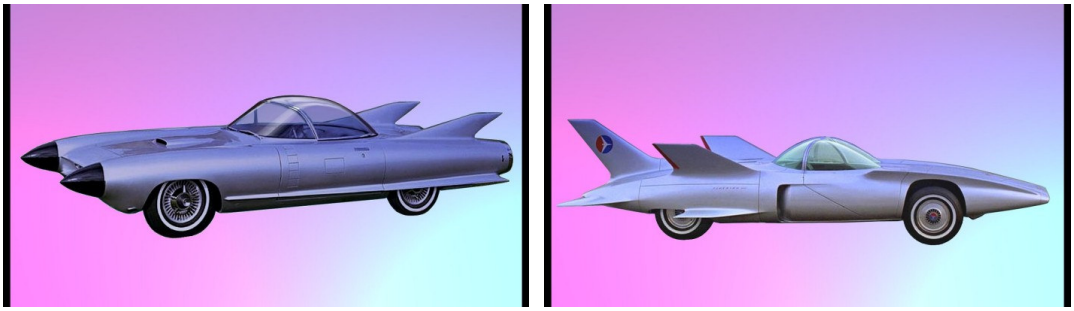

Figure 2.29. Cadillac Cyclon, 1959; GM Firebird 3, 1958

Unlike America, the automobile design in Europe was on another way. They tried to find some easy solutions for the transportation, and big engines and big car were not the solution for them. Efficient packaging leaded to ever smaller and more compact

rounded shapes eventually leading in 1959 to the introduction of Austin Mini. Mini was the starting point for one box and economic vehicles.

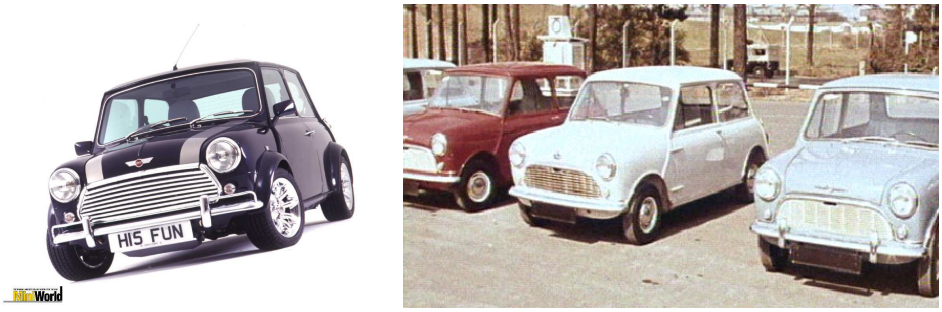

Figure 2.30. Austin Mini, 1960

After 1960, sport scars were becoming very popular and affordable with a large range of small high performance cars being born. This decade saw the last of the split windscreens and the introduction of curved side window glass. Concept cars were increasingly popular at the auto shows giving the public a taste of things that come on designer's mind and allowed by engineers.

Figure 2.31. Ford Mustang, 1964; Ferrari Coupe 250LM, 1964

However, styling trends towards crisper shapes during 1960s gave cars a more box appearance again. The curvaceous shapes turned to sharper corners and strict line in body styling. The continual study towards efficient packaging ensured that cars continue to get smaller and lighter. This period was also a golden age for sport cars enthusiasts. Many wild and exotic styling studies were shown at the international motor shows and a wide variety of different designs were available in the market.

Figure 2.32. Fiat X/19, 1973; Ferrari 512 BB, 1976

In this period, a popular vehicle 1974 VW Golf started to be produced. It would be another legend in automotive history with its new models and high selling volumes. It gave the small hatchbacks street credibility. The new body forms introduced in the market such as hatchbacks, off-road vehicles according to the customers needs.

Figure 2.33. VW Golf GTI, 1974; Jeep Cherokee, 1974

The 1980s, the small hatchbacks made their marks to the streets and GTI versions become very popular, often out performing well establish sports car. The two box package with large rear door was very practical and accepted by all levels of society. The new body forms continued to be introduced such as, SUV, 4X4's, crossovers. Practical and roomy designs were the most popular trend to get the middle level customer attention. The body design was soft and rounded aerodynamic look. The vehicle interior room kept same but the vehicle length was chopped.

Figure 2.34. Mercedes A class, 1996; Jeep Grand Cherokee, 1993

When we came the year 1990, the automobile designers were looking for a few inspiration points. Manufacturers had problems in their selling graphics. Customers were looking for something different, something more emotional. Then, the old friend came to help, the legendary designs from the past eras. The designers looked the future before and inspired from the events on that period. But this time, they had technology to redesign the oldies that had big emotional effect on customers. Who does not want to drive an old legend car without any functional problem? Then the retro trend era started.

No one noticed it at the time, but it probably started with the Prowler. That two seated, V shaped nosed, big tired with separate front fenders coupe brought us all right back to the street hot-rods of the 1940s. There were so many vehicles produced in 1940s and modified to be a hot-rod in today's streets. However, Prowler was built as a production hot-rod. (Popular Mechanics 1999)

Figure 2.35. Plymouth Prowler, 1997

The vehicle was built originally with Plymouth badging in 1997. However when vehicles were consolidated to Chrysler brand, Daimler Chrysler decided to continue this model due to its fanatics. The studies of this hot-rod styled retro car were started in 1990 and its final run was 2002 in auto shows. Its separate front bumpers, V shaped front end and grille and curvaceous front and rear fenders were the main retro styled portions of the vehicle. The retro cues could not be limited; in fact, the vehicle itself was totally retro styled.

The next step of this vehicle is another retro styled concept car; Chrysler Pronto. The 1997 Pronto Cruiser was a benchmark success in the automotive prophecy. Although it displaced minimum space outside, it somehow managed a lot of room inside. The body design was modern with a few retro cues such as the tall grille opening and split front bumpers similar to Prowler. The high roof allowed a more upright seating

position that was the main goals that PT Cruiser wanted to reach. The Pronto is the predecessor of the PT Cruiser.

Figure 2.36. Chrysler Pronto, 1997

If we continue with the Chrysler, it can be seen so many concept and serial production retro themed cars. The 1995 Chrysler Atlantic is another example inspired by legendary Bugatti Atlantique of the 1930's. Although its amorphous fenders flowing lines recall an earlier age of elegant international automotive design, the Atlantic featured truly modern all steel unitized construction with lots of over aged technologies. The interior design of Atlantic is not different than the exterior. Fully leather seating and classic gold trimmed watch-face gauges, Atlantic carried Chrysler's proud heritage of retro design. This vehicle achieved that classic heritage while setting a new standard in design creativity.

Figure 2.37. Chrysler Atlantic, 1995; Bugatti Atlantic, 1936

It is no doubt that the Chrysler is not the only car manufacturer to use this design trend. Ford started to use this styling technique first in 2005 Ford Mustang. Since Mustang's dramatic 1964 introduction, it has been the icon of American performance and style, capturing hearths worldwide. For 2005, Mustang combines an all new and fully modern architecture with the soul that makes Mustang a legend. Its signature long hood and short rear deck play on 40 years of history; C-scoops in the sides, three-element tail lamps and a galloping horse badge in the center of the grille are the main

key point of the retro design in exterior. The Mustang's shark-like nose with the forward-leaning grille gives it an attitude reminiscent of the 1967 model, while jeweled round headlamps in trapezoidal housing deliver striking new design flair. In its interior design, history and heritage are evident in the chrome-ringed air vents that are aligned vertically across the dash, precisely in line with the gauges. As in the 1967 model, the steering wheel has three spokes with a black center hub marked by the horse in tricolor bars logo. (Car Graphics 2004)

Figure 2.38. Ford Mustang, 1964; New Ford Mustang, 2005

However, Ford Mustang is not a totally retro. Although this vehicle can be described as a new chapter of an epic, it is a new generation of an alive vehicle and it is the next design of the continuous heritage.

Another retro car, Ford Thunderbird, is a real retro styling study of the Ford with great effort of the J Mays, who is the creator of the most popular retro styled vehicle Volkswagen New Beetle. He transferred as the Design Group Vice President of Ford Motor Company. Thunderbird, the revival of a Ford icon originally launched in 1955, has so many styling cues from that and other early T-birds. These retro cues construct the basics of the new T-bird such as the original egg-crate grille, single round headlights reminiscent of the 1955 to 1957 models and taillights similar to those on the 1961 and 1962 models. Rounding out the design is the famous porthole window on each side of the roof, and air scoop on the hood, vents along the sides, and turquoise insets in the Thunderbird logo on its nose. (Car Graphics 2005)

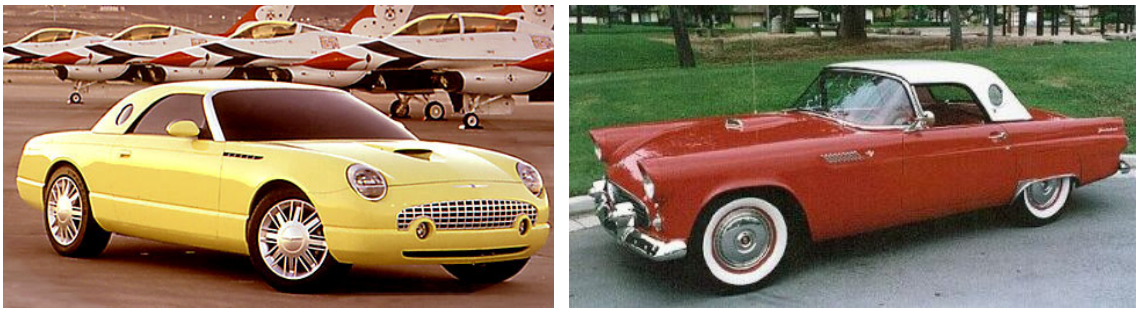

Figure 2.39. Ford Thunderbird, 2002; Ford Thunderbird, 1965

Lincoln, which is the j-venture company of Ford Motor Company, developed another car called Mark X again based on the same model, Ford Thunderbird. It might not have an oval side windows as updated Ford but it has a very similar shape with its original and rear area including rear lamps and in addition to that, headlamps. In fact, this car is also a retro of an old tradition in Lincoln history that all Ford Continental models have a brother version called Mark in Lincoln brand. (Car Graphics 2004)

Figure 2.40. Lincoln Mark X, 2004

Ford 49 is another concept car that is design as a retro of the original well-known car Ford 1949. The original vehicle was a great success in Ford Motor Company's history. The original '49 Ford served as a symbol of optimism for the future at its time with radically new "slab sides"; integrated body and fenders, independent front suspension and rear quarter windows that opened. Fifty years late, the Ford 49 custom coupe concept took Americans for an emotional drag race down memory lane with its classic shape and brilliant proportioning. The 49 concept's hyper smooth appearance is achieved by an all-glass upper body structure with concealing pillars and windshield wipers. The exterior finish is black with bright chrome wrapping around the greenhouse and modest chrome accents elsewhere, such as its badging and big chrome wheels. (Kaus 2003)

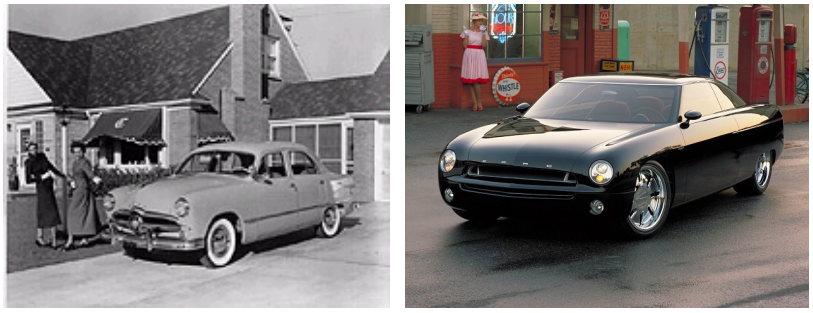

Figure 2.41. Ford Sedan, 1949; Ford 49, 2005.

Clean, simple and elegant design cues are conveyed in the rounded projector-beam front lighting. In the rear, sleek, narrow, wrap-around LED tail lamps make a distinctive statement. The 49's interior is also a modern interpretation of its original's simple design cues. A cantilevered, bench-style front seat is power-actuated. A floating center console runs the entire length of the interior, giving the impression of four-passenger bucket seating, while also serving to stiffen the vehicle's structure. This console houses the five-speed shift lever and ventilation system for both front and rear seat passengers. The whole interior has two tones: black and sienna.

The car's primary gauges are contained within a single round instrument binnacle that is similar to the production '49 and hot rods of the era. A two tone, leather wrapped steering wheel features cruise and radio controls on a metal ring, reminiscent of the "horn-ring" popular in 1950s. To sum up, this vehicle is more retro in inside than its exterior.

Ford Shelby Cobra is also another retro study of Ford Motor Company as a result of the big change due to their new Chief Designer; J. Mays. They redesigned a 40 years old legendary Shelby Cobra and created not only a concept vehicle but also an easy-to-produce vehicle. With its big frontal air inlet and headlamps, sharpened body contours two big stripes that start from the front to the end of the body, its exterior says it is ready to keep the legend continue from its reminiscent. It does not have any luxury items, including a music system, as it was in original. (Car Graphics 2004)

Figure 2.42. Shelby Cobra, 1967; 2004

After all this low production volume cars and concept cars, it should be mentioned as a very well-known icon of pop culture, recreation of a past legend, The New Mini from BMW. The styling of the car is deliberately reminiscent of the original. The New Mini brilliantly embodies the original Mini's same boldness in character, retaining the jutting, stubby hood, the distinctive bumper-to-bumper wheelbase and chopped-off hatch. In its exterior there are so many items that make the styling of the car retro such as replicated chrome grille, round headlights, and traditional two-tone white roof.

Figure 2.43. The Austin Mini, 1959; The New BMW Mini, 2001

In its interior, a blend of contemporary and retro-inspired styling cues creates a wonderful, well-balanced look. The sleek dash features a series of different-sized circular gauges, dials and vents, including a pod-like tachometer (located on the steering column) and a large central-dash-mounted speedometer that has the same design style as its original. 1960s-oriented toggle switches, which are located on the lower portion of the center console, are uniquely designed to revert to their original position after operation. Also located within the center console is a Harmann Kardon AM/FM/CD

system, offering premium audio throughout the cabin. This music system is important for Mini since this is the major difference between the new and the original one. The original Mini had no sound system in itself.

After many automotive firms started to use retro design styling in their new designs, Chevrolet also decided to create a new pickup as the combination of the old American muscle cars and hot rods; and the result was Chevrolet SSR that was introduced in 2003. This retro styled pick-up's dramatic exterior shape recall the full-fendered forms of the late 1940's and early 1950's but this innovative roadster is more than retro when it comes to incorporating leading-edge technology and creative design solution. SSR's flared front fenders and quarter panels are formed using a blend of modern technology and some traditional methods used to produce the original 1947-1953 Chevy pickup trucks. (Car Graphics 2003)

Figure 2.44. Chevrolet SSR, 2003; Chevy Pickup, 1947

One of the most distinguishing features of the SSR is its cleverly engineered power-retractable hardtop, which provides an open-air driving experience without sacrificing cargo space. Incorporating a 'top stack' design, SSR's hardtop is the first ever applied on a pickup. SSR's interior design is based on Chevrolet's twin cockpit approach, with a horizontal cross-car bar and body colored accents that pull exterior design cues to inside. The satin chrome aluminum look used in SSR's exterior continues in the interior door trim and instrument panel bezels. Retro styling continues inside the vehicle with cleanly styled instrument panel that contain three separate gauges and three climate control buttons; and ball like headed gear shifter.

Figure 2.45. Chevrolet SSR, 2003; Chevrolet HHR, 2005; Chevrolet Pickup 1947

The latest retro study of the Chevrolet is the HHR concept that was unveiled at the 2005 Los Angeles Auto Show. HHR is a four-door vehicle with a rear touch-pad liftgate. The HHR has a distinct design that fuses elements of the 1949 Chevy Suburban; the original utility vehicle with its high roof, and the SSR roadster with its retro and expressive exterior look. Like SSR, the HHR features deep-draw flared fenders which tuck in at the rockers for a solid, firmly-planted stance. A one-piece, stamped metal hood is reminiscent of the 1940 Suburban's heritage and is evidence of precise assembly quality. The single cavity headlamps integrated to the fenders and twin-tail lamp design in the rear emphases the modern design of this past oriented vehicle. Stamped door and window appearances with one-piece wraparound molding contribute to the clean, detailed design and major elements to show the retro styling of the vehicle.

Figure 2.46. Chevrolet HHR, 2006

HHR was designed to reach the same goal with Chrysler PT Cruiser; to create a small size SUV with reassuring high visibility, big storage space and cargo flexibility, in other words to create a multi functional vehicle. Therefore, the HHR's interior evokes a feeling of roominess and an upscale aura is created by details. The retro cues continues inside the vehicle as chrome instrument panel, round air blowers, chrome round door inner handles, and ball-like gear shifter.

These two successful muscled cars did not stop Chevrolet to continue this retro breeze. They were followed by a revival of an old American icon 1955 BelAir convertible. In its exterior the most important feature of the original BelAir, which is the higher rounded rear fender rather than front fender, is transferred to the new one with three cavities in the front fender behind the headlamps. In exterior, it has more similarities than its exterior. Classic dash board displays in horizontal, gear shift on the steering wheel and one piece front seats are carried over from classical American car that still keeps the American soul "can-do". (Car Graphics 2003)

Figure 2.47. Chevrolet BelAir, 1955, 2003

The VW New Beetle did not stop VW continuing to use retro styling in automotive design. VW Microbus, which was unveiled at the North American International Auto Show, 2001, is another successful study of the company since it achieved to steal the hearts of everyone with its unique and original VW Bus design.

Figure 2.48. VolksWagen Microbus Concept, 2001; VW Bus, 1965

The Microbus's exterior design tends more toward high-tech flexible transport of the future but the way to express this is to use the same synonyms with the original, utilitarian-though-huggable VW Bus of the past. Xenon headlamps housed in angular rectangles combine with the Microbus's high, blunt nose, large VW badge, two tone

paint, and stylized grille. The front end with these reminiscent items from its original makes the vehicle particularly cute and attractive for who has a past with this vehicle. Around back, the front end styling theme is repeated, where it looks more plausible and attractive. Although there is too many different features in Microbus such as sliding door, bold wheel arcs, and plastic bumpers, it can be easily understood the inspiration point of this vehicle from its silhouette. (WEB_3 2001)

Its interior is totally different from its original. Engineers wanted to create a more different environment in inside and therefore the retro styling cues inside the vehicle is not as many as the exterior has. However, all new technologies and high-tech equipments can be served to the customers with a bit influence from the past, especially the different sized and round gauges, circular air blowers and the gearshift attached to the instrument panel that operates by a new technology. The seating configuration is totally new for this model. The ultra-stylized interior is multi-configurable and looks like it might have been taken out of the business-class section of a passenger jet. Electronically activated dual sliding doors, second row seats that rotate 180 degrees in both directions, the screen that presents itself from the third-row bench seat, asymmetric and control by touch instrument panels are other interesting and modern features of this van.

Of course, the companies above are not the only ones that are styled with retro cues. The new model of the Mercedes SLK has so many common features with the original Mercedes 300SL, debuted in 1954. (Car Graphics 2003)

Figure 2.49. Mercedes SLR, 1950, 2003

Jaguar is another manufacturer that particularly suited to this retro revolution. The new Jaguar S-Type borrows many of the original S-Type's elements, including a centrally-positioned elliptical grille with vertical flutes, hood contours that merge gracefully with the headlights, larger outer headlamps and smaller inset driving lights,

rounded rear side windows, and a downward-slopping character line on each side of the car. (Car Graphics 2003)

Figure 2.50. Jaguar S-Type, 1954; Jaguar S-Type, 2000

Jaguar continued to use this retro approach in their new car designs in 2005 with an unbelievable Jaguar XK-E type racing car. This new sport vehicle has so many reminiscent and soft lines both in its exterior and interior design. Retro details are front and rear lamps and big oval front grille. (Car Graphics 2005)

Figure 2.51. Jaguar XK-E type, 1973; Jaguar XK, 2005

Although the new Nissan Z does not seem to be a retro vehicle, it becomes obvious when its hollowed-out headlight design, long dash-to-axle and long fender dimensions are reviewed. (Car Graphics 2005)

Figure 2.52. Nissan Z, 1970; the new Nissan Z, 2001

Another supporter of this new trend is Toyota with its new FJ Cruiser that carries lots of cues from the original FJ Cruiser, the 4X4's of 1960's and 1970's. Its front grille design, headlamps and front signals are reminiscent from the original Toyota 4X4. (Car Graphics 2005)

Figure 2.53. Toyota FJ Cruiser, 1970; the new FJ Cruiser, 2005

FJ Cruiser is not the only retro SUV in the automotive industry. The 2005 Jeep Liberty, redesigned by Thomas Freeman, is another exciting retro styled vehicle in recent Auto shows. It is easy to understand from seven slotted front grille, round headlamps and flared front and rear fenders.

Figure 2.54. Jeep Liberty, 1970; The new Jeep Liberty, 2003

After Mini's great sale success, Fiat decided to revive the old Fiat 500 model with a new and fresh design and new name, Fiat Trepiuno. All exterior design carries so many retro items from the original Fiat 500.

Figure 2.55. Fiat 500, 1957; Fiat Trepiuno, 2004

Another European Automotive manufacturer was decided to use retro trends in their new products and retro styled C-SportLounge was created and debuted by Citroen in 2005 International Auto Show in Frankfurt. With totally new and much admired design, and broken A pillars and body color strips in a glass roof, it pays homage to vehicles from Bertone from late 1980's such as the Bertone Citroen Zarbus, 1986.

Figure 2.56. Citroen Zarbus, 1986; Citroen C-SportLounge, 2005 (Product Insider 2005)

Suzuki is another automotive manufacturer that followed the retro theme way like Mini and Fiat. The Suzuki LC Concept that was unveiled in the 2005 Tokyo Motor Show is a K-car concept designed to target the segment that loves the Austin Mini's design, much alike the Daihatsu Mira Gino. This concept car is actually a reincarnation of the Suzuki's old 1960s model Suzulight mini car. It has a funky retro interior in beige and bright red theme. The driver's dash area looks seriously weird but cute.

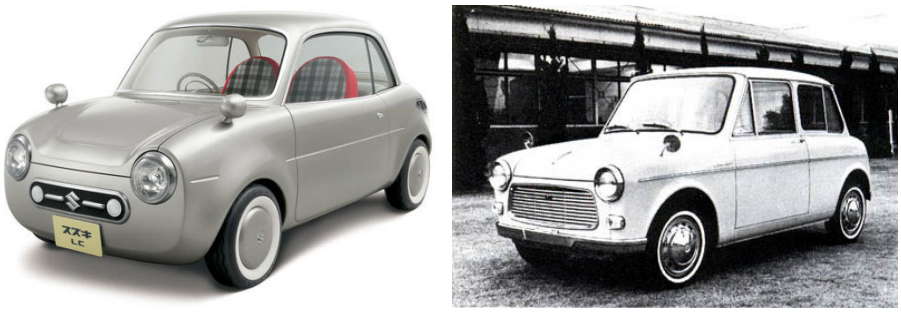

Figure 2.57. Suzuki LC Concept, 2005; Suzulight, 1960s

There is another important point that should be mentioned here. Creating a retro vehicle is completely different process than making a model update or a face lift operation which is commonly used in automotive industry. Most of the car manufacturers have to update their valid model in certain periods of time. This period varies from 8 to 10 years for a model update and 4 to 5 years for the face-lift operations, which contains minor updates on the current model. These changes are performed due to keeping the current product up-to-date according to the customer needs and legislation requirements. Volkswagen Golf is a good example for this process. This year Golf 5, which is the fifth generation of Golf series, was introduced in the market. Every model change contained some dramatic changes in the design of the vehicle but it was an on-going process. However, the New Beetle, again manufactured by Volkswagen, was revived from its original. This means that to be retro vehicle, the originator should be out of production a period of time ago. Of course, this is not the only point that a retro vehicle should have. It is also obvious that the old vehicle should be a legend in its time to be worth to do a retro study that requires huge amount of time, effort and money.

Figure 2.58. Golf Production series

CHAPTER 3

CASE STUDY ON THE EXISTING MARKET VEHICLES; VOLKSWAGEN NEW BEETLE AND CHRYSLER PT CRUISER

In order to comprehend the retro styling in automotive design, Volkswagen (VW) New Beetle (1998) and Chrysler PT Cruiser (2000) are the best examples in their areas. However, it should not be forgotten that there are some major differences between their design strategies. We can call both of them as "Retro" but they are created as a result of two different categories of "Retro".

3.1. Chrysler PT Cruiser (2000-…)

Figure 3.1. Some different shots of PT Cruiser

Chrysler PT Cruiser is one of the newest cars in the marketplace that epitomizes the meaning of retro design definitely. When it was first introduced in the market, its futuristic retro design created a big sensation and its classic hot rod appearance made it

not only a standard new vehicle but also a new vehicle that you always have a dream about.

3.1.1. General Information about PT Cruiser

Figure 3.2. Front view of PT Cruiser

Chrysler PT Cruiser is a SUV (Semi-Utility Vehicle) for five people and highly versatile and trend setting vehicle that includes so many retro design features that makes it a hot rod. It makes all people look at you when you are driving a PT Cruiser. Its funky, retro styling combines the full-fender look of American sedans of the 30s and 40s, with the hot rod esthetics of 50s and 60s. Then all filtered through a 21st century design studio.

Chrysler's engineers knew to be smart with components of the vehicle in order to create a stylish, high-quality, and fun-to-drive vehicle with affordable price. That's why PT Cruiser's power train layout and front suspensions, plus miscellaneous hardware and switchgear, are shared with some existing models. Otherwise, the platform and packaging are quite unique. PT Cruiser may look big, but it is quite compact vehicle. The vehicle is mainly, but not completely based on the Dodge Neon platform. The length is mere 168.8 inches, but the wheelbase measures 103.0 inches. The width of the Cruiser is almost identical with Neon and it is taller measuring 63 inches from the bottom of its 15 or 16 inch tires, to the top of its raised roofline. This compact design is important for another reason. PT Cruiser also would be sold in over

40 foreign markets, not only in U.S. but also in Europe where streets are often narrow and parking is at a premium. (WEB_4 2001)

One power plant is offered, a 2.4 L DOHC, for 150 hp and 162 lb-ft of torque. It's essentially the same iron block aluminum-head unit found in several other Daimler Chrysler products, and is backed by a standard five-speed manual transmission or an optional four-speed automatic.

Figure 3.3. PT Cruiser Engine

The engine features a pair of counter-rotating balancing shafts to cancel out the vibrations common to larger four-cylinder engines. The 2.4 L is smooth, sounds good, and certainly benefits from the other market cars. The shifter and shift linkage performance is fairly impressive. The gear ratios spot on to make the most engines' power band. This makes rowing up and down through the gears enjoyable.

MacPherson-strut suspension with a special beam-axle arrangement in the front and low mounted coil springs and tube shocks at the rear suspension provide an inclination from front to rear which is the main feature of a classic hot-rod. This low mounted rear suspension gives a wider interior freedom on the cargo space to PT Cruiser. Power front-disc/rear-drum brakes are standard, as is power-assisted rack-and-pinion steering. ABS (Anti-blockage system) is standard for all type of Cruiser.

The PT Cruiser Limited Edition is used 205/55R16 series tires which are 16 inches. These wheels provide a good handling and at speed, right amount of feedback from the steering wheel, yet it is also easy to park.

When PT Cruiser is looked inside, this exteriorly very small looked vehicle becomes a completely big saloon car. The low floor and tall profile make for easy entry and exit, and there is plenty of leg/head/shoulder/foot room for five people. Retro touches and fine detailing continue on the PT Cruiser's instrument panel and door panels. (McCullough 2005)

Figure 3.4. PT Cruiser interior

Body colored panels house the main gauges and passenger-side airbag. The symmetric instrument panel can be easily used for both LHD and RHD vehicles only changing some basic instruments to appropriate places. Dual seat-mounted side airbags are included with the optional leather/suede interior package, or are offered as a stand-alone option. Among additional safety features are childproof locks for the rear doors, universal anchor attachments for child seats, and a Sentry Key Theft Deterrent system with remote keyless entry. These childcare features offer the customer a family car with an appearance of a retro hot rod in their dreams.

Figure 3.5. Gauges on the dash panel of PT Cruiser

Speed, rpm, coolant temperature, and fuel level are displayed in easy-to-read gauges with attractive white (changing to black at night) faces; ancillary functions are managed via a series of warning lights. A panel with large, clearly marked twist controls for the heating and A/C systems is placed in the center of the dash houses, as

well as the sound system and ball-head switchgear. Two nicely styled components; a thickly contoured four-spoke steering wheel and a tubular, chrome shift lever topped by a cue ball like plastic knob; fall to the driver's hand. (Sawyer 2002)

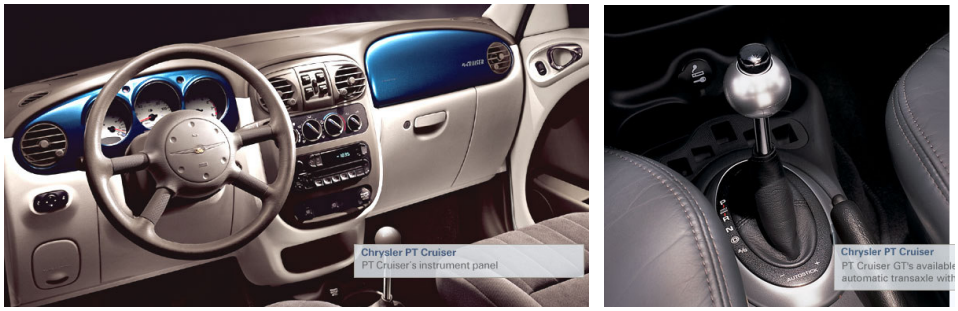

Figure 3.6. Four spoke steering wheel and cue ball like gear shifter

Visibility from either front seat is excellent in any direction, and the view through the windshield, over the shapely hood and curvaceous fenders. The center console keeps all manner of the storage areas, also provides rear-passenger-seat own ventilation ducts. The interior offers three separate powerpoints and a total of four cup holders.

All interior shapes are tasteful rounded, as well as outside of the vehicle, and the mostly soft-fell materials are high quality and pleasing to the touch. The most important interior components are seats and PT Cruiser shows how it was clearly designed with this all-important notion in mind. Seats offer an amazing array of configurations: the 65/35-split rear seats fold down, tumble forward, or can be removed entirely, and front passenger seat folds down as well.

Figure 3.7. Rear Cargo space of the PT Cruiser

A removable rear package shelf can be install in any of five different positions, one of which matches the seats when folded, creating a large, flat surface; another makes it a handly, elbow-high tabletop. And the large, top hinged tailgate opens high to provide easy access. The PT Cruiser provides a total of 26 different seating/shelf configurations, probably about 20 more that any owner is likely to need. With all seats up, the cargo area measures 19.0 cu ft; remove the rears and fold up the front right passenger seat to a maximum of 64.2 cu ft.

This Retro themed, incredible public appealed vehicle can be loaded up with pets and play toys, used for moving chores, taken skiing and surfing, or just cruised Main Street with your friends. (Neil 2000)With all these features PT Cruiser is achieved to stay in the below $20.000 valued economical vehicles. This makes the vehicle affordable for all type of customers.

This type of inexpensive cars usually suffer when it comes to tight structure, and most manufacturers become penny-pinch when it comes to expensive insulating and sound deadening materials. Neither of these problems affects the PT Cruiser. All experts and judging staffs were impressed by the absence of road and tire noise, squeak and rattles. Because the PT Cruiser' pointy face and truncated shape are aerodynamically clean, wind noise levels are quite low. These factors, when it is combined with other special features make the retro themed PT Cruiser quality of ride, and most popular vehicle in today's market.

3.1.2. Brief History of PT Cruiser Including the Design and Development Stages

In order to tell the story of PT Cruiser development, first the history of the company has to be reviewed with explaining the milestones that causes the creation of this retro styled vehicle.

Design is king at Chrysler. Chrysler concept vehicles draw huge crowds at international auto shows, and make admirers out of the competition. Many of those concepts go on the production vehicles changing very little from the dream cars we look at with amorous intentions on the stands or stage under spotlights.

Chrysler cars do not spark emotion, they often set trends—cab forward intrepid sedans, muscular Ram pickups and retro-cool PT Cruisers set the design standards for others to follow.

However, it hasn't always been that way. Beginning in 1985, Trevor Creed was one of the turnaround trios who would bring great design back to Chrysler with John Herlitz and Tom Gale. When Tom Gale became Vice President of Design, Chrysler began a process that eventually resulted in the company becoming the dominant force in American automobile design. At that time, the European-inspired Ford Taurus was the car that rocked the world. While Chrysler Chairman Lee Iacocca didn't like the Taurus, he liked the amount of publicity and admiration that the vehicle was generating for Ford. So many stories told that Ford Chairman Don Peterson had gone to the design Chief Jack Telnack and said "Jack, design the car that you would like to drive." That resulted as the Taurus and Sable. Iacocca came to Tom Gale with a similar order and Gale jumped at the opportunity, as a signal of a new era at Chrysler. (DeLorenzo, Lamm 2000)

According to Creed, just creating very futuristic concept cars was not enough while the production of them was not fast enough in Chrysler, therefore, the company should have gone even further. The result was the 1988 Portofino concept that not only wowed in auto shows, but also its radical design helped to develop so many essential cars such as, the Dodge Intrepid, Chrysler Concorde and Eagle Vision and the cab-forward revolution had begun.

Figure 3.8. Chrysler Portofino, 1988

Many other notable concepts followed the Portofino such as, 1989 Dodge Viper and Neon. These concepts not only made Chrysler's reputation as a design leader definite, but also the success of those concepts set the standards for all future Chrysler

products. Chrysler drew its product profile and it would never be a company looking for a brand versus product identity any more.

Creed's main problem was the difficulty to produce the same vehicle as it was designed as a concept. Therefore, all companies had to design their new vehicles regarding the production techniques restrictions and designing concept vehicles was nearly dead. However, there should be a way to overcome these obstacles in production while designing a completely notable new concept. Those days, Trevor Creed took the title of Senior Vice President Design Chrysler Group, after John Herlitz's retirements in 2000.

He has a mysterious and unbelievable eye for car design. Like a major record producer who knows a hit when he hears one, Creed not only knows when to push the envelope, but how far to push it. He aimed to create the hottest car designs, both in terms of the package and the style. He did not struggle for ordinary and banal, struggled to create something that is really different and really outstanding looking. As a result of this approach a series of vehicle were created. The first one is the Chrysler Prowler that was debuted first in 1997. This unusual two people hot rod was the first sign that shows what PT Cruiser would look like. Besides, Prowler is accepted as the first example of the retro styling in automotive design according to many car authorities.

Figure 3.9. Chrysler Prowler, 1997

Everyone in common thinks that Chrysler Prowler is the starting point of the decision to design PT Cruiser. In fact, the truth is that PT Cruiser grew out of a tiny concept car that few took seriously, called Expresso. It is ironic to fact that this concept was an idea conceived to replace another great American icon, the Checker cab.

Figure 3.10. Chrysler Expresso Concept, 1994

The Espresso was one of a trio show cars to demonstrate the flexibility of the Neon sedan and coupe architecture. Expresso design was cute but strange and expression to this show car wore. Viewed from the side, the windows had black shades over them like eyebrows, and the door handles were like two pupils at the rear corner of the windows, giving Expresso the appearance that it is looking at its own rear wheels. But according to the Daimler Chrysler Executive Vice President of Product Development and Design Tom Gale, it was a precursor to the tall-roof PT Cruiser.

The height of the car meant that seating could be upright, which is important in a small car, because it improves visibility by giving the driver a commanding view of the road. By sitting the driver taller in a smaller vehicle, designers also discovered that they could reduce the intimidation factor from larger vehicles not necessarily because of the size of those vehicles, but rather from higher seating position offered by that vehicle's design. The Expresso's taller design increases the interior storage capacity exponentially, that is very willing feature in today's vehicles. (DeLorenzo, Lamm 2000)

This tall car study should have continued and the Pronto, a five door "tall-car" concept was unveiled in 1997 North American International Auto Show. Pronto was designed with a number of objectives in mind, the first and foremost is to explore the idea of a small car that could offer the utility of a minivan. It was hoped that such a vehicle would have universal appeal, not only at U.S, but also in Europe where Chrysler was keen to expand its presence. Pronto also presented an opportunity to experiment with a low-cost plastic-body technology that would enable the company to build small vehicles at a competitive price in America.

Figure 3.11. Chrysler Pronto Concept, 1997

Pronto's design was modern with just a few retro cues, such as the tall grille opening flanked by almost free-standing bumpers that bore strong resemblance to the Prowler. The top featured a full-roof, fold-back canvas covering, while at the rear, a large all-glass lift gate was flanked by roof-to-bumper tail lamps.

The interior, which featured front buckets and a rear split fold-down bench, was roomy, practical, and flexible. The instruments were clustered in a single pod in the center of the dash. The Pronto Concept was made of a composite plastic material called ASA (Acrylonitrile/Styrene/Acrylate), which was essentially a recyclable material that could be inexpensively molded and glued together. In addition to eliminating the expensive welding operations, the plastic also featured a molded-in color, which meant no paint shop, and therefore the cost savings would be considerable. However, the downside of the plastic body was the fact that people like shiny cars and shiny paint jobs.

Despite the subtle Prowler cues, the overall shape of the vehicle, which was fairly crisp and modern, did little to attract the emotions. Its interior did not live up to the exterior in terms of the promise of utility and spaciousness. Chrysler had high hopes that the modern shape with just a hint of Prowler would pique the interest of potential customers to take a closer look at the Pronto. The main aim was to bring people in with its exterior, to attract them to come take a look for whatever reason, and hook them once they determine that the interior has all utility and spaciousness. The Prowler's package was a winner, but unfortunately the styling wasn't. Americans need to be fired up about this new trend as the Europeans were, and the work was progressing on the five-door PT Cruiser, the time came to try another concept car out on the public. This time, the show car would have two missions; first, to experiment with the hot rod styling theme in the European market, and the second, to confuse the competition, with making them think that the company was headed in a different direction.

The new concept car was unveiled in 1998 Geneva Motor Show. It was called the Pronto Cruizer, establishing a direct link to the original Pronto show car. It was also decided to make the Pronto Cruizer a three-door hatchback. As a three-door, the Pronto Cruizer could be viewed as Chrysler's answer to Volkswagen's New Beetle. It offered styling cues that were uniquely American with the kind of features that Europeans had come to expect cars in this class. Chrysler seemed to be serving up a cult car with styling heavility influenced by American pop culture.

Figure 3.12. Chrysler Pronto Cruizer, 1998

The Pronto Cruizer, unlike the plastic-body Pronto proposal, was intended from the start to be a steel unit-body vehicle. Painted a color called Aztek Gold, the Pronto Cruizer had an exaggerated look. The cab was at back, the fenders and grille seemed larger than life, and the running boards, which flow smoothly into the fenders, were a distinct 1940's styling cue. The roof sported a fold-back canvas sunroof. A steeply raked rear hatch and larger rear wheels made the car look like it was ready to pounce. The exterior design of the vehicle belonged to Bryan Nesbitt.

Complementing Nesbitt's exterior work was an interior that blended both Art Deco and techno touches. According to the Dave Smith, he was striving for a look that was unlike Japanese interiors, which focus on gadgetry. This car had to have a European feel; functional, not trendy. The instruments were clustered in a pod behind the retro-styled three-spoke steering wheel with light blue-colored faces. In a light touch, the shift ball and pedals were decorated with "happy faces". (DeLorenzo, Lamm 2000)

Figure 3.13. Pronto Cruizer interior

There was yet one more concept car in the works, called PT Cruizer, which would be shown to the public before the production PT Cruiser was unveiled. More conservative looking than the Pronto Cruizer, the PT Cruizer had five doors. The grille and fenders were more restrained and the touchdown point of the windshield was much farther forward. In addition, both the front windshield and rear hatch were less steeply raked, and yet the overall vehicle retrained some of the forward-trusting gesture of the Geneva show car. Best of all, there was no mistaking the hot rod influence in the car styling.

Figure 3.14. PT Cruizer, 1998; PT Cruiser, 2000

The main difference between the concept car PT Cruizer from the original production car PT Cruiser was not their names. The folded-back soft sunroof and the front and rear bumpers had the same color with the body. Therefore, it did not take too much time to see PT Cruiser in Auto shows. In 1999 North American International Auto Show, the original PT Cruiser was introduced and surprisingly this silver concept would be a production car and would go on sale in March 2000.

It was a long way from an idea that started out as the Plymouth Pronto and ended up the Chrysler PT Cruiser, a journey that also foreshadowed the demise of the Plymouth nameplate. The finished car, while using the Prowler-inspired grille and promising to sell for a Plymouth-like base price of around $16,000, used chromed door handles and the ornate Chrysler winged badge front and rear to convey a much more upscale aura.

3.1.3. Basic Design Features that Makes PT Cruiser a Retro Styled Vehicle

PT Cruiser added a new dimension to the Chrysler brand around the world by breaking the barriers of the conventional automotive design and function. Although Tom Gale, Vice President of the Chrysler Design Group told that the design philosophy "form follows function" was used in PT Cruiser design, it is easily seen that this time form has a big effect on the whole function of the vehicle. The main aim of designing this car is to offer customers a combination of innovative and functional vehicles that blends expressive design, relevant technology and premium features that attracts customers' emotions. Due to this, the PT cruiser exterior and interior design have so many retro design cues from 1930s and 1940s popular vehicles.

The design imperative "form follows function" establishes a new standard, combining emotional and reactional consumer needs with this vehicle. The unique proportions of the fenders, roofline and high beltline accented by three side windows create a distinctive side profile of PT Cruiser.

In order to see the basic retro design features of the PT Cruiser, the vehicle should be investigated as exterior and interior separately. The most important part of a retro vehicle is body design since the vehicle identity shows itself best by external characteristics. Therefore, let us start to investigate the PT Cruiser exterior design deeply.

3.1.3.1. Exterior Design

Figure 3.15. Exterior of PT Cruiser

One of the main goals met by PT Cruiser was to provide a vehicle that would keep the overall exterior length of a small car to address the global market needs while providing the space and function of a larger vehicle to satisfy customer requirements. Therefore, packaging became a very important item in this vehicle design, while the design has to keep its originality and uniqueness with its retrospective styling. This restrictions creates a negative effect on being out of limit in the exterior design, however Chrysler did it very well with its organic exterior in PT Cruiser.

PT Cruiser exterior has mainly four different proportions that have retro styling cues. They are front and rear fenders, hood and grille; headlamps and rear stop lamps, and the last one is tailgate and roof designs.

The main body of the vehicle is constructed on the wheels and fenders, giving the vehicle “wheels to the corner” image and proportion. This enhances the stability and encourages handling characteristics like the vehicles in 1930s and 1940s. The front fenders are wrapped tightly around the wheels and draw away from the hood, causing the wheels to appear larger, while the fenders appear lower and wider.

Figure 3.16. Front and rear fenders of PT Cruiser, 2000

The large and curvaceous fenders provide one of the key nostalgic elements of the vehicle, bringing back positive memories of the classic American automotive designs from 1930s and 1940s. These large fenders were very common in automotive exterior design in 1930s. The most well known ones are 1934 Chrysler Air Flow designed by Carl Breer and Chrysler Corporation engineers. The vehicle was called the "Car of the Future" in 1934. It took the automotive design at that time from the four-square shape that Ford had set with its Model T to a radical and completely unusual streamlined form. America was quite unprepared for its rounded shape. Before that time, the flat fenders of Model-T had given way to ones that looked like inverted tablespoons, and cars were nearer the ground.

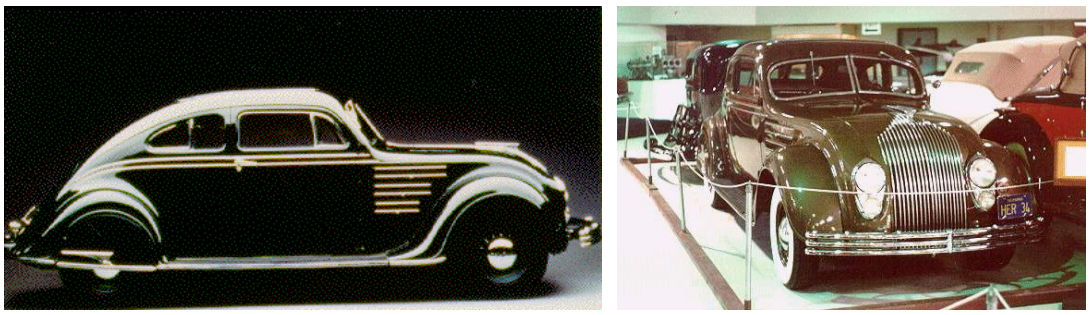

Figure 3.17. Chrysler Airflow, 1934

Even it were beautiful, the public would have had trouble accepting it. The car like Chrysler Airflow was a grand commercial failure at that time. The streamlining itself didn't even work. In the wind tunnel tests it was found the Airflow offered more drag that previous car had. However, it had a great assistance on the creation of the new vehicles, not only the ones from 1930s to 1960s but also the today's car like PT Cruiser.

Figure 3.18. Chevy, 1937; Desoto, 1937

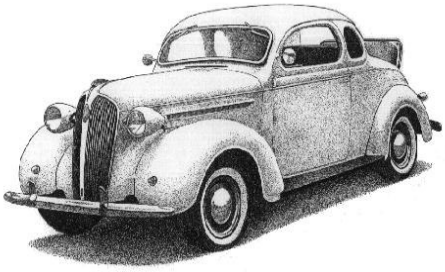


Figure 3.19. Plymouth Coupe, 1937; Pontiac, 1937


Figure 3.20. Chevrolet Coupe, 1939; Ford Coupe, 1939


Figure 3.21. Plymouth Coupe, 1939; Buick Century, 1940

Figure 3.22. Plymouth Sedan, 1940; Packard 110 Business Coupe, 1941

All of above vehicles have a common design styling in the front end rear fenders, hood and grill area and rear body sides. The large and curvy fenders that can be seen in today's PT Cruiser are the reflection of the past to the current high technology vehicles.

Figure 3.23. Front fender of the 1937 Chevy

The headlamps and rear lamps are other proportions of the vehicle that keeps some other retro cues. The organic shape of the front lamps became a common and very popular feature in near past, however the place where they used is the main retro cue of them in PT Cruiser. The headlamps situated on the fenders, as close to the front wheels as possible, making the vehicle appear smaller by reducing the front overhang. This headlamp design, reminds the past eras only because of their places, and pronounced grille gives the vehicle a face of reliance and strength.

Figure 3.24. Headlamps of the PT Cruiser, 2000

Like front fenders, grille carries some design cues from past era. The PT Cruiser hood and grille design is influenced from front fenders. The front fenders are narrow on its rear and becoming wider towards to the front and it makes the hood narrower in front. While high and robust hood keeps the big engine inside, high and large grille that covers all frontal area cools the 150 HP engine. This big grille is divided by a thinner but muscular front bumper that contains another retro feature from 1940s.

The front bumper is placed between the headlamps and fog lamps below the headlamps unlike the vehicles from ‘50s and ‘60s. The reason for this is today’s car safety and regulations. However, the shape of the front bumper is very similar with the past ones only with a material change. In fact, this is another reminiscent item with original vehicles.

PT Cruiser’s front end stuff provides sturdy, muscular and protective feeling. From the front, this pronounced grille and flush-mounted ellipse headlamps are carried forward from the Pronto Cruiser concept car, resulting in one of the most unique faces for any higher-volume production car. To sum up, it can be said that the front end of the PT Cruiser is the redesign of the front ends of the vehicles from 1930s and 1940s.

The roof rises toward the rear for both aesthetic and functional reasons. The inclination of the roofline gives the vehicle its “hot rod” posture, or attitude. The practical benefit result of this design is more head room for rear passengers and increased cargo space. This roof ends in the back with a fully retro tailgate with droplet-shape tail lamps on rear fenders. These uniquely shaped tail lamps capture the nostalgic spirit of the bullet-shaped tail lamps seen through the 1940s. Bullet-shaped tail lamps complete the reflection of unbridled American design, past and present.

Figure 3.25. Rear lamps pf the PT Cruiser

Unlike front bumper, the rear bumper keeps its original place on the vehicle; however it becomes a thicker and more muscular when it is compared with vehicles from that period.

Figure 3.26. Rear view of 1941 Mercedes

At the rear, the flared fenders with droplet-shaped stop lamps, curvy tailgate, and muscular rear bumpers give the PT Cruiser a confident, sure-footed stance from any angle.

Chrysler winged medallion situated both above the front grille and in the center of tail gate at rear of the vehicle to highlight the brand's heritage.

3.1.3.2. Interior Design

After all those retro themed exterior design of the PT Cruiser, there is a decrease on the number of retro themed element inside the vehicle. In fact, this is the way it should be, since main characteristics that describe a vehicle mostly gather in its exterior

design. In PT Cruiser it is the same but it is enough to talk about. In addition to this, the technology was changed from 1930s. There are so many developments inside of the vehicle, such as front side and rear airbags, high technology seat belts, adjustable and even foldable seats, air conditioning, music systems, navigation systems, computerized controls, etc. In order to keep all these high technology features, the interior design of the body does not have a big influence of past. However, it includes as its maximum.

PT Cruiser's perfectly designed exterior provides a roomy space inside of the vehicle. With this roomy interior, there is enough alternative for the seating. The seating can quickly and easily be transformed from one passenger to a five passenger vehicle in a matter of moments with foldable, removable rear seats. More than 26 different configurations of the seats are making the PT Cruiser truly "Personalized Transport" vehicle which is the meaning of "PT" in its name.

Inside the vehicle, the attention to detail is apparent. A circular theme, like exterior of the vehicle, allows the interior to be elegant in simplicity. Easy to read round analog gauges with chrome, instrument panel and dashboard match the vehicle's exterior color. This is another retro feature that PT Cruiser has. The symmetrical, browless instrument panel creates an immediate synergy with the PT Cruiser's exterior by incorporating color panels that coordinate with the exterior body color. The simplicity of the bright-ringed circular gauges integrated into the instrument panel reflects the heritage of precision craftsmanship. Chrysler PT Cruiser's steering wheel, with its small circular centre hub and spokes, give the vehicle a more open, air appearance. The two-toned spacious interior is enhanced by the Light Neutral and Dark Taupe colors. These four-spokes, round steering wheel and chrome cylinder, ball-like gear shift are other retro cues inside the vehicle.

Figure 3.27. PT Cruiser steering wheel on the left and 1941 Mercedes steering wheel on the right

Chromed door inner and outer handles are also other reminiscent elements used in the PT Cruiser.

Figure 3.28. Outer door handle on the left and inner handle on the right

3.1.4. Other PT Cruiser Vehicles and Concepts

After PT Cruiser had a great success in the market when it was debuted in 1998, the Chrysler authorities decided to create some other PT Cruisers to this legendary vehicle.

The first one, which was the starting point of the Cruiser concepts, is Pronto Cruiser. It is a transition model from Plymouth Prowler to PT Cruiser. After Plymouth Prowler was first shown at the Detroit Auto Show in January 1997, Exterior Designer Bryan Nesbitt translated the look into a two door coupe, giving it more of a chopped, street-rod flavor in the process. This resulted another styling study, the Pronto Cruiser. This new inspirational vehicle was debuted at the Geneva Auto Show in 1998 and received rave reviews.

Figure 3.29. Pronto Cruiser front

Figure 3.30. Pronto Cruiser rear

Pronto Cruiser is a combination of the PT Cruiser and Plymouth Prowler. It can be described as melted the two-door-plus-hatchback style of the PT Cruiser and sharper, fender-flared, rod-inspired flavor of the PT Cruiser. This three door Pronto Cruiser lived up to its 1940s inspired cruising looks with a 1.6 liter four cylinder engine. It may not be the king of the power to blur the lines of reality, but it's enough to take cruising down the strip. And that's just what Pronto Cruiser was meant to do.

Figure 3.31. Pronto Cruiser interior

Although it has so many similar exterior features with PT Cruiser, the interior of the vehicle is completely different. Its interior has designed mainly to be a hot rod not only a retro vehicle. (DeLorenzo, Lamm 2000)

The other two important concepts are GT Cruiser and Panel Cruiser. Both of these muscular vehicles made their world premier in 2000 North American International Auto Show.

GT Cruiser is a very similar concept vehicle but bigger than PT Cruiser in all dimensions. It is more American than PT and shows how this design can be individualized. Probably the best way to describe it is that PT Cruiser squared. GT Cruiser concept vehicle is Chrysler's own example of how the forthcoming PT Cruiser can be personalized.

Figure 3.32. GT Cruiser

GT Cruiser took the PT Cruiser to the next level by lowering it, adding power, and making some subtle modifications. Its contemporary, clear lines house a 200 hp, 225 lb-ft, turbo-charged in line four cylinder engine coupled with an American Club Racing five speed manual transmission. The lowered suspension incorporates ACR KONI/Mopar struts and upgraded sway bars. The vehicle rolls on 17 inches chrome wheels with 215/45 tires.

In its exterior design, lowering the vehicle by one inch and widening the track by two inches resulted in its aesthetic stance. Removing the winged badges from the hood

and tailgate and integrating them to the bumpers in the facial give the vehicle a clean front and rear appearance. In the true hot rod tradition, GT Cruiser's badges are incorporated in the grille and rear license plate brow while distinct flares can be seen on the fenders to accommodate its bigger wheels and tires. Dual chrome exhaust pipes underscore the sporty character.

In the interior, leather seats enhance the atmosphere in the vehicle, creating a performance feel during driving. In its interior, it has more common features with the original PT Cruiser.

The GT Cruiser is another example of the Chrysler brand's heritage approach to design-taking classic forms and revitalizing them with contemporary clean lines and the result is another way that PT Cruiser is personalized and to create a customized performance concept.

2000 Panel Cruiser is the panel version of the PT Cruiser. While the Panel Cruiser's exterior looks similar to the popular PT Cruiser, the main starting point of this design is GT Cruiser. Both of the vehicles share the same exterior features; only there is some minor changes due to usage differences of the vehicles.

Figure 3.33. Panel Cruiser front

Figure 3.34. Panel Cruiser rear and side view.

Whether it is a dog kennel, flats of flowers, a catered dinner for 100 guests or that antique armoire, the Chrysler Panel Cruiser concept can accommodate it within its modish exterior. The exterior design was set out like more cargovan-like vehicle based on the GT Cruiser, utilizing its abundant interior space while maintaining its clean, contemporary lines and youthful appearance. Coupled with cargo straps that are similar to those found in moving vans, the Panel Cruiser provides a multi-use cargo area. The replacement of the rear doors and windows with panels and the rear seats with wood floor creates a versatile rear cargo space that could be used as a light delivery truck or an individual lifestyle vehicle. Because the Panel Cruiser features 168.8 inches (4288.5 mm) of overall exterior length of a small car it can carry loads of cargo while still maneuvering in and out of tight city spaces. (DeLorenzo Lamm 2000)

The interior of the vehicle was designed to emphasize the volume available in the PT Cruiser. All 119.8 cubic feet (3.39 cubic meters) of the rear interior space feature a full wood floor with bright skid strips and wood bars along the side quarter panels.

The Panel Cruiser concept truck borrows design cues from classic American panel trucks and combines it with the power, handling and fun of a sports sedan.

The Chrysler PT Cruiser has come in many shapes and size, but none of the variations of that ingenious design evokes memories of the sedans in the late 1930s and early 1940s like and station wagons in 1950s and 1960s woody rear exterior; this is Chrysler California Cruiser concept.

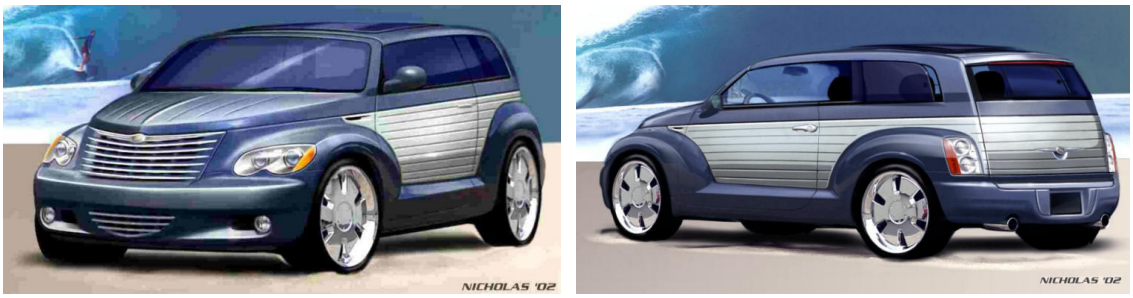

Figure 3.35. California Cruiser concept drawings

The California Cruiser made its public debut at the Paris Motor show in 2002. It is all new and built on the unique blend of style what is seen in all production models of the successful PT Cruiser, providing that the possibilities are endless. California Cruiser redefines both the exterior look and interior functionality of a Surf Wagon, with ample space and comfort for four people, every imaginable extreme sports toy, and even the ability to convert to a hotel room for two people. The main reason for this new design is changing consumer demands and expectations around the world. As a result of this refining consumer needs, an all-around versatile vehicle with two large doors, an innovative rear hatch and multi-functional interior was created and the vehicle itself amplifies what owners love about their PT Cruiser.

The exterior of the California Cruiser concept conveys a ‘Next Wave’ evolution in styling. Scalloped headlamps, a chrome-accented grille and an integrated bumper reflect the direction of Chrysler Crossfire and Pasifica while taking inspiration from the Chrysler’s heritage of award-winning style and design. Those vehicles have also great influence on the profile and rear design of the California Cruiser concept.

Figure 3.36. California Cruiser concept

With its chopped top profile and stance, California Cruiser concept is a pure American design statement. Crisp fender set lines and linear elements convey precision and a modern feel that respect classic vehicle heritage. The grille features a chrome Chrysler winged badge with chiseled satin chrome horizontal bars. There are dual projectors headlamps and new fog lamps to light the way as the 2.4 liter high output turbocharged engine transports driver and passenger down to highway.

With a push of a button, the California Cruiser's hard top transforms into an open-air cruiser. The full glass roof has a retractable sunroof in addition to a dropping door and quarter flip glass. One accent that takes attention is a contemporary satin silver body side appliqué that brings the oldies Woody theme into today's life. In addition, the California Cruiser has dual chrome exhaust tips, 19 inches billet aluminum machined wheels, and new, hi-tech clear tail lamps.

The California Cruiser concept's interior continues the ideas of precision and modern flavor found on the exterior design. Linear design elements throughout the interior create a panoramic and expensive ambiance.

Figure 3.37. California Cruiser Concept, interior

Silver insets on the door trim, quarter panels and hatchback trim replicate exterior trim panels again, in true Cruiser fashion, bringing the outside to inside while at the same time accentuating the interior's volume and contemporary design. An extended load floor with four individual seats that can be foldable flatly (including the driver seat) creates ultimate cargo volume, veracity and flexibility. All four headrests retract into the seat backs, allowing clearance for the seat to fold flat. There are also chromed winged badges in the seat backs for the clean brand recognition that this is a Chrysler.

The last concept, in fact it is a production vehicle now, is a very usual one; PT Cruiser Convertible debuted at the New York Auto Show in 2001. It was first in production in 2005. It is the convertible version of the PT Cruiser that has few modifications and updates.

Figure 3.38. PT Cruiser Convertible

The PT Cruiser Convertible does not have too many differences from the original PT Cruiser Sedan. The exterior and interior design are mainly same and the only difference is its chopped-top gangster-mobile appearance with the top up and outs the wind in the owners hair with the top down.

PT Cruiser Convertible is a two-door unlike PT Cruiser Sedan. The convertible looks shorter than the sedan, but it is not. It is probably the single door on each side creates this illusion. It is certainly lower by three inches. Closer examination reveals that the windshield is raked more radically and uses a different A-pillar design. With the top up, the convertible looks like a custom chopped-top hot rod. The main difference in the vehicle when it is compared with the competitors is the integrated sport bar right behind the front seats. Its slightly narrower and color-keyed design sits behind the

windows, inside the car, and provides minimization in the wind noise aerodynamically. A nice boot is provided that dressed up the appearance with the top down.

Figure 3.39. PT Cruiser Convertible, interior

The exterior design cues continue inside. Compared to the sedan, the convertible doesn't stand quite tall and offers only 84.3 cubic feet of interior volume. Head room and hip room are both reduced significantly, both in the front and the rear seat. The convertibles get the sport seats from the GT Cruiser across the board. The chair-like rear seats in the convertible have lots of leg room making them very comfortable, although it's tight around the hips and shoulders. The convertible's seats can be configured nine different ways, suggesting practically. The convertible does not offer the practicability of the sedan. With the rear seats upright, there is a 7.4 cubic feet left in the truck, eliminating one of the major compelling features of the PT Cruiser. When the rear seats are split 50/50 and fold and tumble to create a pass-through to the trunk, the cargo space increases to 13.3 cubic feet most. (Vasilash 2005)

The sport bar features integrated dome lights, an unusual touch in an open car. Rearward visibility is limited with its tiny rear windows. When the top and boot are lowered, the visibility is improved.

For a final word, the Chrysler PT Cruiser convertible appeals to people of all ages and lifestyles with its whimsical and retro design. Its practicability often closes the deal with a roomy, versatile that makes the price easy to justify. The convertible offers genuine open-air fun and is great for carrying four people.

3.2. Volkswagen New Beetle (1998-…)

Figure 3.40. New Beetle, 1998

Volkswagen New Beetle is another popular retro styled vehicle in current automotive market. It is the recreation of original Beetle (1947; when original Beetle was unveiled officially) devoted to the original design with current technology. While designing this emotional vehicle, an unwilling design principle "Form follows function" was used and a very difficult task was achieved by Volkswagen Company.

3.2.1. General Information about New Beetle

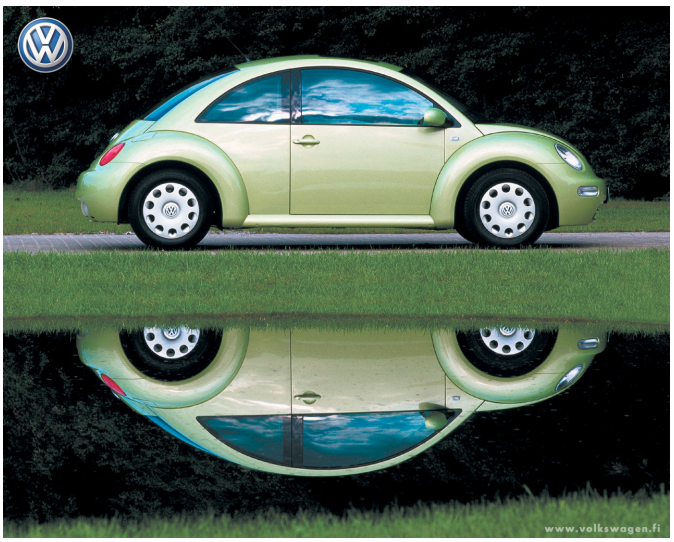

Figure 3.41. The New Beetle

Volkswagen officials took great pains to point out that this is the “New Beetle”, far more than just an update of the car that helped to define an American generation.

Despite its visual link, the car has absolutely no mechanical relationship to the original Beetle. As the advertisements say, the engine’s in the front, but its heart’s in the same place. Underneath this fresh styling, the front-drive New Beetle is a tight, confidence-inspiring German road machine; one extraordinary well equipped and engineered for its price range. Its body is extremely rigid, fully galvanized to resist rust, and effectively designed with energy-absorbing crush zones that lead its class in collision protection. The fenders and bumpers are made of a dent-resistant plastic. The headlights are halogen projector lamps. And the trunk lock is cleverly concealed behind a VW emblem on the rear hatch.

The New Beetle shares the same platform strategy as the ’99 Golf, Jetta, and other non-American VW models. This gives it an excellent foundation. As a result, it’s far roomier than the original. There is an uncanny similarity in the shape to the original Beetle. VW has captured the essence of the Bug. However, when the old and New Beetle is parked side by side, the differences become more ocular. The new shape is thoroughly modern. Gaps between doors, fenders and other body parts are some of the tightest in the market.

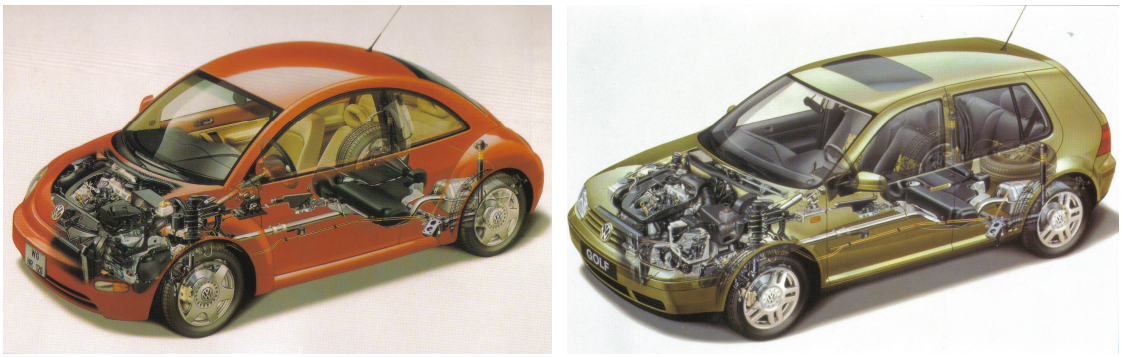

Figure 3.42. The transparent views of the New Beetle and Golf 4, which shares the same platform

Look beneath the skin and differences become even more apparent. The four-wheel independent suspension includes MacPherson struts up front and a torsion-beam axle with coil springs in the rear. In addition, anti-roll bars in both front and back limit body lean during cornering. The finely tuned suspension strikes an excellent balance between ride compliance and handling. The car feels solid, controlled and responsive,

whether on the highway or a curvy road. This rigid chassis also results in a smooth, controlled ride and little noise, vibration and harshness.

This drivability is complemented by linear, accurate steering characteristics of a power-assisted rack and pinion system. Meanwhile, stopping power is supplied by four-wheel disc brakes with optional antilock brake system. Finally, getting this entire dynamic characteristics to the road are 205/55HR16 tires, which provide good grip, quite running and sporty look to the vehicle with optional six-spoke aluminum wheels underscore its technical sophistication.

The New Beetle has four-cylinder engine that is placed in front of the vehicle. There are three engine choices. The most popular is a snappy, quickly accelerating 2.0-liter SOHC unit that musters 115 horsepower. Getting 0-100 kmph takes 9.7 seconds, which is about 20 seconds quicker than a 1960s Beetle. Unlike those venerable air-cooled 40-horse four-bangers of old, this water-cooled engine is impressively smooth and quiet. The second engine is 1.9-liter Turbo Direct Injection diesel, employing drive-by-wire technology. Either of the two current engines can be matched to a nice-shifting five-speed manual transmission or optional four-speed automatic that uses adaptive learning to adjust its shift pattern to fit an individual's driving style. (Sorge 1998)

Figure 3.43. VW New Beetle engine

The New Beetle's freshness and innovation doesn't stop at the body shape. Beetle's unique exterior styling is complemented by a unique interior design. Inside, the links to the original Bug are more understated, but the cockpit's fun and futuristic appeal remains high. The interior is simple and uncluttered treatment mixes strategic brightwork and textured plastic to create a high-tech environment that looks like it has been pulled right off the drawing board for a future-car project. Lots of different materials are used to give the Beetle a high-tech look. The upper dash uses coarse, hard

materials accented by smoother, softer surfaces elsewhere. Curved, dimpled door handles look ultra-modern. Upper door panels use a matte version of the car's exterior paint. The steering wheel features brushed aluminum spokes and carbon-fiber-looking handgrips. A small vase that is fixed to the dash and awaiting a daily bud to make the cool and space-age interior warmer keeps a small flower looking fresh or holds a plastic daisy. Below the center pod, there are three cup holders that work better as design elements than as functional conveniences, especially when rowing through the gears of the manual transmission. (McHugh 2001)

Figure 3.44. The New Beetle interior

Reminiscent of the old Beetle, a single instrument pod contains a large, easy-to-read speedometer, along with a tachometer plus fuel and engine temperature gauges. These gauges take on vibrant new life when the sun goes down. With the lights on, the gauge cluster glows with retro-looking bright indigo blue numbers and red needles. In the center of dash, beneath prominently stylized air vents are the controls for the six-speaker AM/FM/cassette audio system and climate control system. Sleek radio and heater controls are within easy to reach and the center-dash controls pierce the darkness with the red illumination surrounding a blue audio display colors straight out of a comic book, and all part of the Beetle fun.

Figure 3.45. The New Beetle interior features

The seats are Germanically produced, well contoured, and comfortable for long trips. Height adjusters, operated through a ratcheting pump handle mechanism, complement the telescopic steering column and provide enough adjustability to get virtually anyone situated comfortably behind the wheel. There is enough leg and head room for six-footers in the front seats. Beetle's sweeping roofline creates tremendous front-seat headroom, though it cramps people in back. The rear seat area offers good legroom, but tight headroom for taller passengers may make it a better location for children and small adults. In addition to dual front airbags, the Beetle once again goes beyond the expected for a car in its class to offer seat mounted side airbags, as well as seatbelts with pretensioners and force limiters.

Figure 3.46. Front and rear seats of the New Beetle

The outside mirrors are mounted well forward of the driver, which is actually a better position than that of many other cars which mount them too close to the driver. A huge dash area looms ahead of the driver, who cannot see the hood or anything else but road in front of the windshield. The only negative point on this area is the wide A pillars those effects to visibility of the driver. In the old Beetle the windshield was right in

front of the driver's face. Now the windshield is steeply raked and has been moved several feet forward.

Dual 12 volt power outlets and several cup holders make living with the New Beetle convenient. The liftgate can be opened by key or with a remote key knob. One touch power windows are useful but rear windows do not open; as a result rear seat passengers might feel a little claustrophobic on summer days. The trunk is small but rear seats can be folded down to carry more cargo with around 12 cubic feet cargo space.

Figure 3.47. The cargo area of the New Beetle

3.2.2. Brief History of PT Cruiser Including the Design and Development Stages

The creation of New Beetle is long, complicated, difficult and hard period for its designers. It might be said that it is more difficult then the original one. Although this thesis focuses on the New Beetle, it will give a brief summary of original to understand the roots of the basic theme of this sensational car.

The original Beetle's history started after 1930. At those days, there was an idea to create a people's car (Literally, the word "Volkswagen" means "people's car".) that everyone can afford with their average worker's monthly wage. Meanwhile, the year 1930, Ferdinand Porsche had just set up an automotive design company, which became known as the Porsche Büro. In 1931, a German motorcycle company, Zündapp, asked Porsche if he could design a suitable car for them. Porsche came up with a streamlined two door sedan, which had lines similar to the Beetle, named Type 12. It was not found feasible to produce this vehicle and this was the end of the Type 12.

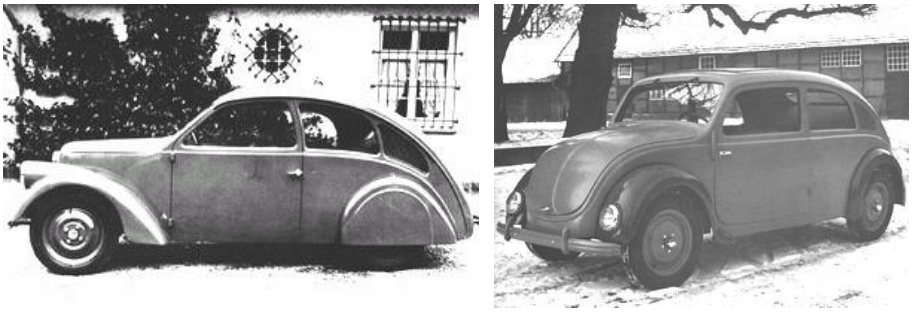

Figure 3.48. Porsche Type 12, 1931; Type 32; 1933

Porsche then designed a car for NSU in 1933 that was known as the Type 32. This car looked even more similar to the upcoming Kdf Wagen that Type 12. It had a very similar shape, and air-cooled four cylinder boxer engine mounted at the rear, linked to a swing-axle transmission. It also featured the Porsche-designed front and rear torsion bar suspension systems, which would go on to be used on the Beetle.

At the beginning of 1933, Ferdinand Porsche met with the new Chancellor of Germany, Adolf Hitler, to discuss the Auto-Union racing car that he was working on at that time. Hitler proposed a people's car that could carry five people, cruise up to 100 km/h, has climb ability of around 30 percent, and cost only 1000 Reich Marks; for the price of a motorcycle. This was an opportunity for Porsche to push his idea of a small car forward, as it helped Hitler to get a real people's car for the citizens of Germany, and everything went according to the plan.

Though he felt it was impossible to meet these requirements, Porsche made designs for a prototype vehicle. This became known as the Porsche Type 60, and he submitted it to Hitler's approval. The name was soon changed to the V1 (Experimental 1). Porsche was contracted to develop the People's car in June 1934. Hitler also proposed to have a convertible version produced and it was designated V2. Porsche was not able to make the deadline to finish the first two prototypes, as there was not enough time to physically design the cars and to built them. There were a few mechanical problems which appeared during the daily testing, but generally the car proved to be satisfactory.

Figure 3.49. Porsche Type 60 V1 and V2; 1935

Hitler then passed the control of the People's car project to the DAF. This financial support helped the People's car project and the V1 was updated and three new prototype cars were produced by Daimler Benz. This new design was the VW30 in early 1937 and looked more similar to the known Beetle. The cars were tested and all problems certainly were found and fixed.

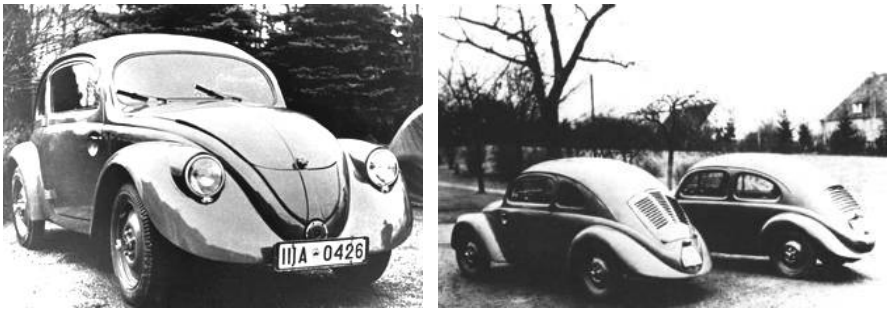

Figure 3.50. VW 30, 1937

In 1938, the Volkswagen Beetle in the final stages of development with the production of 30 prototypes. In February, Hitler ordered to locate an area in which to build a production factory. In 1939, several VW38s (pre-production) and VW39s (demonstration cars) were produced just to show that the factory did work, and to show that the final version of the car would look like. These cars were different from their predecessors in that they had front hinged doors (all VW designs before had suicide doors), split windows in the rear, larger hoods, and many other minor differences. This latest edition of the car would be the basis of the Beetle after the war was over.

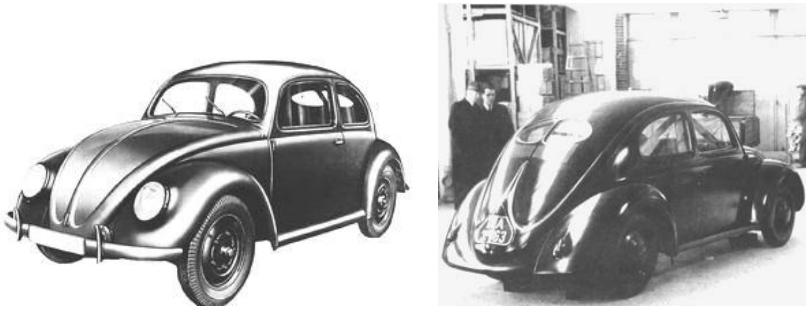

Figure 3.51. VW 38s, 1938

When the V38s were introduced, Hitler abruptly changed the name of the car to Kdf Wagen. Kdf stood for “Kraft durch Freude” which meant “Strength through Joy”. Despite the fact that the name was really rather silly, sounding odd even in original German, from May 26th the car was officially known as the Kdf-Wagen.

The Kdf-Wagens were then driven around the Germany and shown off to the public. After some time passed, the factory started to produce military vehicles since Germany invaded Poland in 1939, to start World War II. The factory was busy pumping out Type 82s; Kübelwagens. The Kübelwagen was a simple looking military vehicle that basically used the same parts as the Kdf-Wagen, but had a flat-sided body, and increased ground clearance. During the war, the company also produced an amphibious vehicle, which was known as the Type 128, and later as the Type 166; The Schwimmwagen. This vehicle was powered by a 25HP engine and had a retractable ducted propeller in the rear for water use. In the water, the Sschwimmwagen could achieve up to 5 mph, and surprisingly steered with its front tires. There were several military off-shoots of the Kdf-Wagen produced during the war such as Kommandeurwagen, Papler, and Hebmüller.

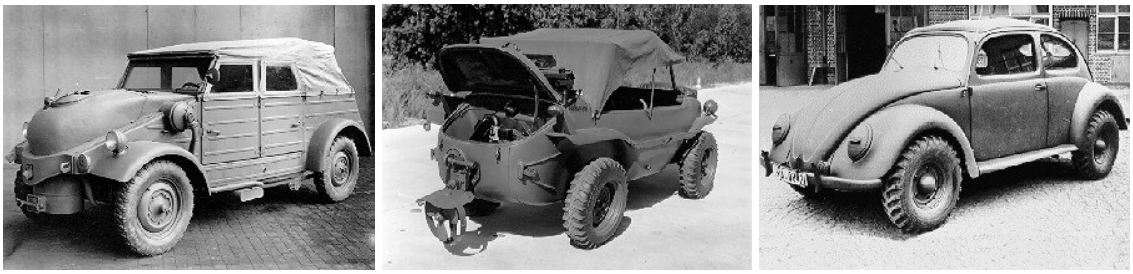

Figure 3.52. Kübelwagen; Schwimmwagen; Kommandeurwagen;1939

Production of military vehicles made the factory a prime target for allied forces during the war and it had been nearly destroyed. After the war was over, the British

Army took over the factory to produce light transportation. By the end of 1945, the factory had produced more than 2000 cars and most of them were produced from spare parts that were left in the factory. Sometime after 1945, the company was named "Volkswagen" by the British, and the factory was renamed as "Wolfsburg". The British thought to give control of the company to able hands and offer it to the Ford Motor Company. Henry ford refused the offer since he thought it would be waste of money. In 1949, Heinrich Nordhoff was appointed as the senior executive of Volkswagen. After 1949, production steadily increased. Nordhoff's experience and knowledge proved invaluable for the company.

Volkswagens were being exported to neighboring European countries such as Denmark, Sweden, Luxemburg, Belgium, and Switzerland. As early as 1950, Volkswagen began producing Beetles in South Africa as well. Volkswagen commissioned an old German coach building company, Karmann, to build their Beetle convertibles. Later in the mid-1950s, Beetle started to be exported to England and United States. However, Beetle was not sold and did not immediately gain popularity. The main reason for this is the low standards of the vehicles. This situation changed in the middle of the fifties, with exporting the first deluxe version of the Beetle in 1951. The reason is that these deluxe versions had chrome and more options as standard, such as radio, and more exterior color alternatives for the customers. The Volkswagen Beetle came across as a class-free and unconventional car which had no non-essential extras. With the Beetle, less was more, which appealed to individualists and those not able to afford the monsters Detroit had thrived on. (McCutcheon 1998)

Beetles built before 1953 looked almost identical to the Kdf wagen designed before VW2. Midway in 1953, Volkswagen changed the rear split windows of the Beetles, and added a-slightly larger oval window. This oval window increased the visibility out of the rear of the car up to 33%.

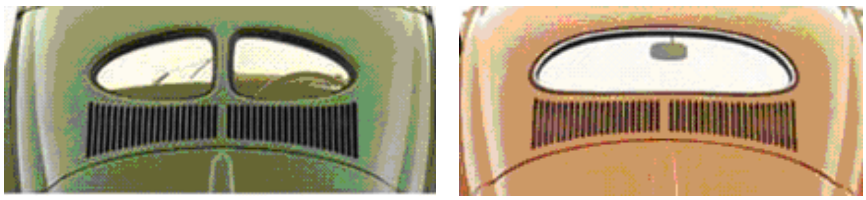

Figure 3.53. Rear split windows on the left, oval window on the right

Volkswagen production kept increasing through the late 1950s. In 1958, the larger rear window that today's Beetle's have was adopted. In each year, minor changes were made to the Beetle, and the other cars in Volkswagen lineup, but nothing very drastic. Different turn signals were added, slightly improved engines, and other small things were common in the year to year changes.

Figure 3.54. Larger rear window on the left

Unlike other American cars which the manufacturers changed every year in a competition for customer, the positive effect of owning a Beetle was that it looked the same every year. So if you bought a Beetle and kept it a few years most people wouldn't even know what year the car had been made. Parts were readily available, through the huge dealer network which had been formed. Service bills were cheap, and the Beetle was a very reliable car. Then as a result of the increasing sales, the Millionth Beetle rolled of the Wolfsburg production line in 1955.

This was an amazing achievement when it was considered the fact the company hadn't seriously advertised the car. When Volkswagen did, sales soared even further, with a very successful advertising campaign created by Doyle Dayne Bernbach (DDB). The advertising was honest, unpretentious and fun. DDB's technique made prospective customers feel they were being addressed sensibly and on their own level, rather that bragging that life would be more glamorous if they owned a Beetle. The Disney movie, Herbie, also helped promote the Beetle. The Herbie movies portrayed the Beetle as a "love bug". Volkswagen also became associated with youth and the counterculture. Baby boomers bought the car as a statement against materialism.

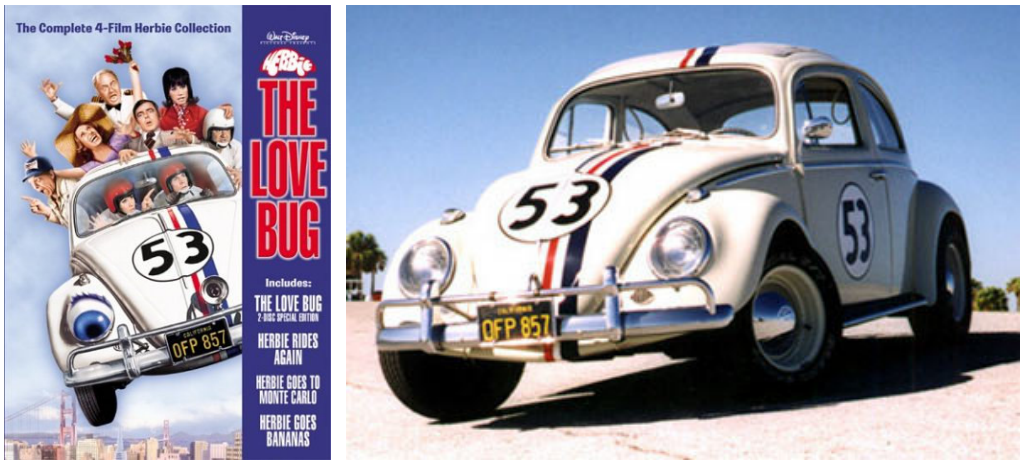

Figure 3.55. Herbie movie press and the Beetle that is used in the Herbie "The Love Bug" movie

Consequently, 1962 saw the 5 Millionth Volkswagen produced and annual production up to a million. By 1965, 10 million Volkswagen had been produced. In February 1972, Volkswagen took over the record for highest production of a vehicle from the Ford Model T, with the 15007034th Beetle.

After the Beetle's boom years in the late 1960s, its sales began to decline. There were lots of reasons for this decrease. The vehicle had severe shortcomings, especially in colder climates. The air-cooled engine couldn't put enough heat to keep the windows from frosting inside. The body rusted easily. The swing arm rear axle made for wicked handling. And the rear-engine design afforded little protection in head-on collisions. Faced with stiff competition from more modern designs- in particular economical Japanese autos in the United States, Volkswagen had lost, unfortunately.

In 1969, export Beetles had some major design changes such as CV joints in the rear of the car in an effort to improve high speed stability on American highways. The traditional swingaxle system worked well, but at high speeds tended to lose stability. In 1971, Volkswagen developed a new car called the Super Beetle. The Super Beetle had modern MacPherson struts in the front instead of the older transverse beam arrangement it had since the 1930s. The Super Beetles of 1971 had the same windshield as the standard Beetles did, but from 1972 to 1974, a wrap around curved windshield was implemented. These were the only Beetles to have anything in the way of a real dashboard. Super Beetles were smoother cruisers on the highway. Ever increasing US government regulations on safety and emissions controls pushed the Beetle to its limits. The Beetle could not be adopted to keep up with the other cars in the industry.

Volkswagen stopped production of the Beetle sedan in 1977, and stopped production of the cabriolet in 1979. In 1981, the 20 millionth Beetle was built in Mexico.

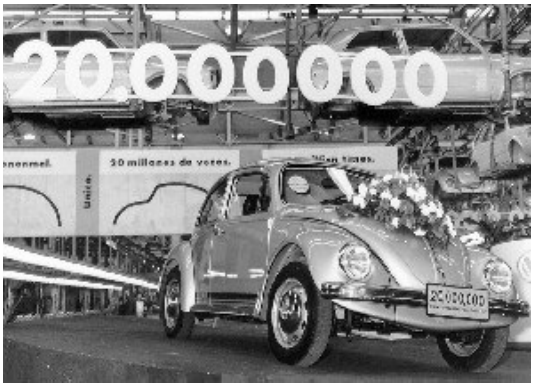

Figure 3.56. 20th of the Beetle rolling from the assembly line from Pueblo Plant

The Beetle was still thriving in Mexico and South America. Volkswagen of Brazil continued building Beetles until 1993. Volkswagen of Mexico hadn't stopped building Beetles till the New Beetle that is the next generation of the original one started to its production.

Figure 3.57. The last Beetle rolled from the assembly line from the VW Puebla Plant

The Beetle has the strongest following of any car. There are over a thousand enthusiast clubs world wide, and hundreds of Volkswagen car meetings are held each year. There are countless unofficial after-market parts manufacturers, stores, and service and restoration companies. It is without a doubt the most popular classic car ever produced.

The last Beetle to be exported from Mexico to Germany made the trip in 1985. Six years later, J. Mays and Freeman Thomas met in Volkswagen's newest North

American facility, a design studio about a 1000 miles north of where the original Beetle was still being produced. The pair was plotting the birth of a New Beetle.

Figure 3.58. Freeman Thomas and J Mays, the designers working on the New Beetle

It is very strange that when the Volkswagen Design team started with this new Concept 1 idea, it was initially a project to produce a zero emission vehicle. Volkswagen sales were falling down in the United States. The new cars such as Golf and Jetta, which had a great sales success in Europe, could not prevent this. So Volkswagen needed to do something which would make people remember they were still in the competition in U.S. To do this, they needed to give a product in shape to resemble something to Americans, but it should have been also designed with modern style. The result was Concept 1.

Figure 3.59. The caricature to show the design steps of the Concept 1

Concept 1 was designed under top secret conditions at the VWOA Design Center facility in Simi Valley, California, part of what Volkswagen AG refers to as its North American Region. The team was responsible for the project from start to finish.

In March 1992, work initially started at Simi Valley on a vehicle concept which relied on alternative power systems and the goal was zero emission. By September, Volkswagen had carried out extensive market research on the American automotive world and the result was that the instant reaction was the Beetle, when Volkswagen was mentioned. It was a legendary car which remained strong in the memories on American population. The Beetle was the synonym for Volkswagen brand right across North America. (DeLorenzo 1998)

Volkswagen realized it could act on the good feeling that the Beetle gave people, and in turn perhaps bring the Volkswagen name back into the limelight in the United States. The idea was changed to combine the zero emission study with a car which would revive the legendary Beetle. This was not a simple retrospective design, even though the first impression would shout out Beetle. The curved roofline which slopes steeply at the back of the car, and the rounded bonnet in contour with the semicircular wings both indicate a strong link with the original Beetle, but at the same time look new and refreshing.

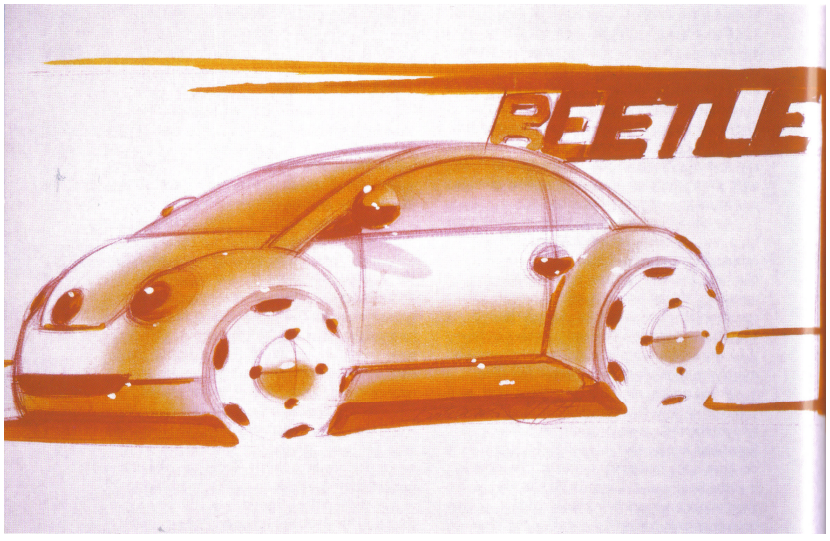

Figure 3.60. First sketches for the New Beetle

By March 1993, the design had gone from artwork to three dimensional 1:4 scaled models, and Hartmut Warkuss, the design director for the entire VW Group, had

met with VW Chief Executive Dr. Ferdinand Piech, who is the grandson of the Ferdinand Porsche to present the study. The outcome of the meeting was very positive. Having seen the Concept 1 design study and obviously realizing the potential high impact of it on the automotive world, Dr. Piech ordered for the study to be brought up to a full scale car, which would have to be ready to be debuted by VWOA at Detroit in January 1994.

However, the main story had happened before this meeting and the most excited part of the project had performed; styling. When it was decided to redesign the Beetle, J. Mays, who studied at the Art Center College of Design in Pasadena, California, shared this idea with another colleague Freeman Thomas. Thomas immediately grasped the Mays' concept. Both had a design attitude that the future could also combine the equity of the past with the design geometry of the future. The new Beetle wasn't going to be retro just for the sake of being nostalgic, but rather it would be a reinterpretation of the original one that would use, as a starting point, the classic elements and basic shapes that made it so popular to begin with.

The main design criteria should have been decided and Erwin Kamenda, the design engineer who knew the Volkswagen geometry and Auto Union geometry very well, helped them to pen the elements as the Beetle's bug-like eyes, the round, friendly curves of the fenders, the running board-like rocker panels of the Bug.

Mays and Thomas sat down and mapped out a plan. They had to set up a strategy how to sell the idea and fund the idea. They put together a project book with some rough sketches, ideas, and profiles and sent it to their boss at Volkswagen AG, Hartmut Warkuss. Warkuss liked the idea and urged Mays and Thomas to continue to pursue the idea on the sly. Mays and Thomas didn't want anyone to know this idea because they didn't want the idea to be killed. After Warkuss approval, the studies are picked up. (DeLorenzo 1998)

Mays and Thomas were creating designs that had separate fenders like the original Beetle, while the designer Craig Durfey took the approach of rounded integrated fenders that would give the look of the original but on a conventional car's body. All decided that the part of the iconistic elements was the side view, the arch of the roof, and the two arched fenders. They wanted the car to be distinctive from every single view.

The concept behind the New Beetle's design is quite simple. From a side view, it is made up of three cylinders; the front fenders and wheels, a large central cylinder that defines the roof and the rear fenders and wheels. The front and rear views are almost identical; two round eyes and a smile created by the hood in the front and the hatch at the rear.

Although Mays and Thomas thought the same way for this project, their different backgrounds caused to create two different designs. Mays worked at extreme geometric Bauhaus shapes, while Thomas worked at more emotional, whimsical types of shapes. From the beginning Mays want in a very strong Bauhaus direction, however Thomas took direction that was similar but warmer. At the end, the two models actually came to be almost identical to each other. Mays and Thomas would look at each other's ideas and incorporate them on their own models.

Figure 3.61. The ¼ scale models of the cars that J. Mays designed

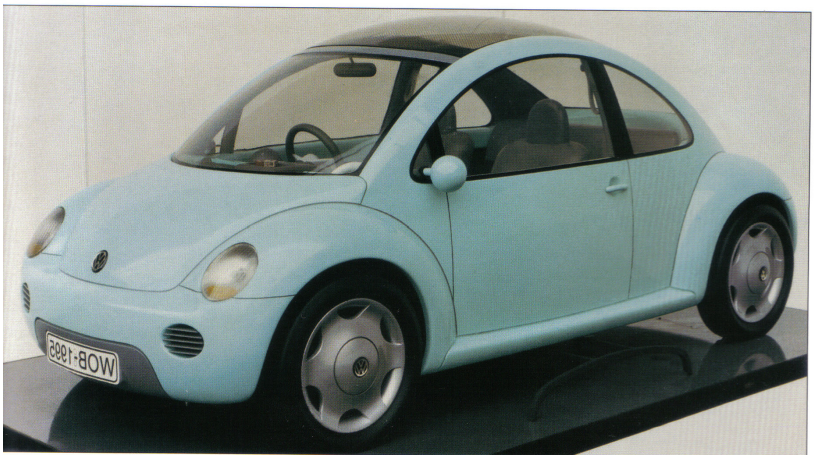

Figure 3.62. The ¼ scale models of the cars that Freeman Thomas designed

Mays' model had windows with the sharp-edged corners, while Thomas' model used corners with gentle radius. Mays' one had a flat front end, while Thomas' had a protruding nose to accommodate a bumper. Thomas developed the dual round intakes that mimicked the horn portals of the original as well as the way the A-pillar joins the front of the car.

The interiors of both cars were also very similar. Both carried over the circular themes from the exterior. There would be a single, round bezel behind the steering wheel to recall the old Beetle's basic instruments, which were a speedometer and a gas gauge. The interior would feature large body-colored panels and fascias, which copied the painted metal surfaces inside the original. Both designs had a grab handle on the dash and a bud vase.

And the rest was to photograph the models in the day light and prepare a presentation to Hartmut Warkuss. With a very nostalgic and emotional presentation, Warkuss approved the project and by September 1993, Ferdinand Piech had signed off on the project, called Concept 1. The Concept 1 was decided more like to be Mays' model. However, the project is not pure recreation of the original Beetle; it also included the use of hybrid and electric engine ideas. (DeLorenzo 1998)

By July 1993, the full scale clay mock-up of the Concept 1 was completed. It was much smaller car then the production model New Beetle, the dimensions of which we will look at later.

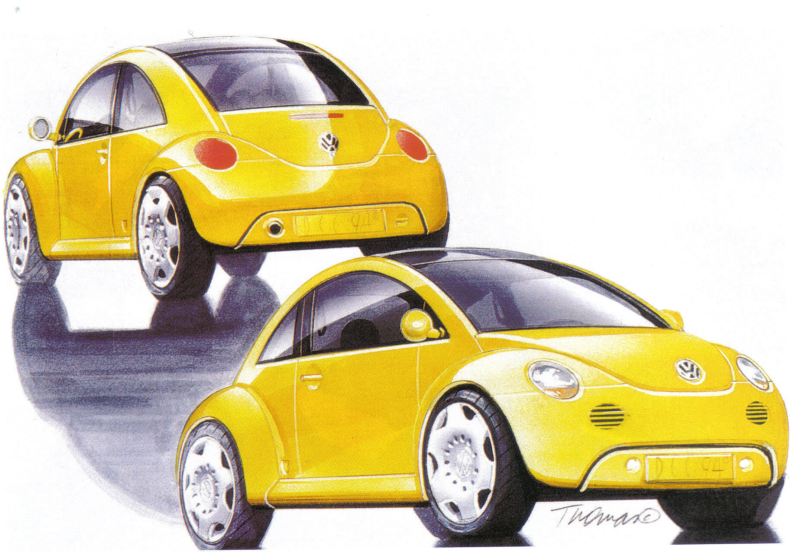

Figure 3.63. Some sketches of the Concept 1

Preparation work continued to get the yellow show car ready in time for the show. The design incorporated elements which harked back to the Beetle, but also many which were futuristic statements. The rounded forms have been brought as close as possible to two basic geometrical shapes; the circle and the sphere. Smooth surfaces remain the same, with no swage lines and ledges, deriving their subtle charm solely from their generous curves. The panel configuration is also logical and geometrically clear. There is a pleasing tension between the simplicity of the sleek surfaces and the few straight lines on the one hand, and the rounded shapes on the other. The lines on the side windows were the best example for this.

The difference was not only in the body design. The design of Concept 1 was to move away from the rear mounted air-cooled engine linked to a swing angle or independent suspension transmission. The new car had a front mounted engine and transmission. This was a large departure which made many feel that although the car might look like a Beetle, it would never be a real Beetle. The Beetle design had not really been changed since 1977 except for updates and improvements.

Concept 1 was ready to public at the Detroit Auto Show in 1994. Volkswagen admitted the response exceeded all expectations. The car created enormous interest. The attention to detail and quality was obvious however the main reason was obvious association with its predecessor. At the launch, VW Executives' main intention was to emphasize the typical qualities of Volkswagen; its honest, reliable, timeless and youthful design.

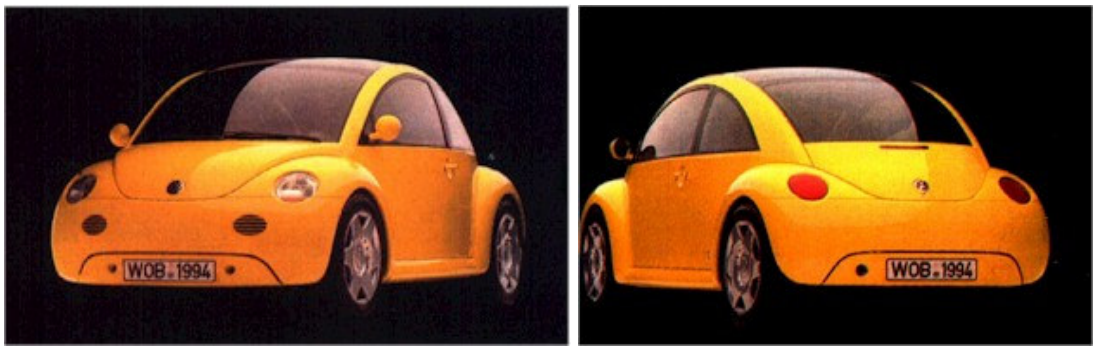

Figure 3.64. The yellow Concept 1 model

At this stage there was no statement made about the possibility of putting Concept 1 into production, mainly because VW hadn't made any plans to do so. However, the reaction from the public, press and VW dealers all across North America

was extremely positive. Everybody seemed to want VW to build this car. Volkswagen clearly had to start thinking very seriously about taking steps to put the vehicle into production. However, there was another big and important question for the VW. “Will it be possible to take this shape, which is well known, and make it work?”

The next step was to unveil a further study on the Concept 1 theme, the Concept 1 Cabriolet. The success at Detroit was continued at the Geneva Motor Show. The prototype was heralded as a glimpse into the future of Volkswagen, a car which was in class of its own, simple, unique and modern, looking forward optimistically but still showing its heritage. It didn’t take too much time that Dr Piech approved the project and Volkswagen confirmed that this design study car that created a public and media sensation upon its unveiling at the 1994 North American International Auto Show in Detroit, would be produced and on the market before the year 2000.

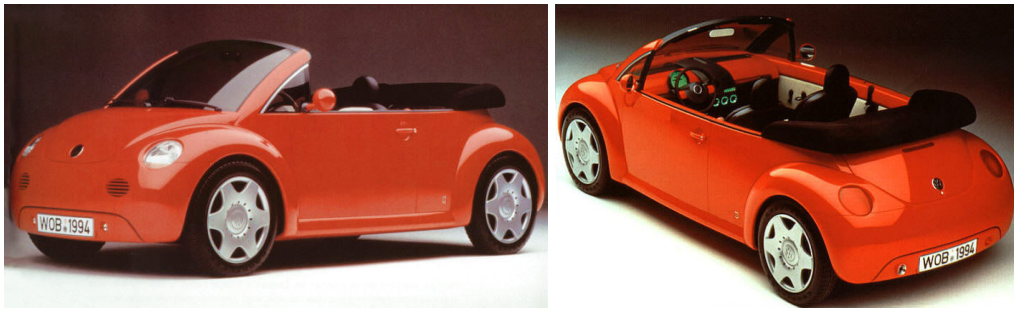

Figure 3.65. The Concept 1 Cabriolet version

The Volkswagen design team in the United States set out to design a car that brought the past and future together. In profile the car has a clean, simple shape. It was formed from three cylinders – two where the wheels are positioned, and one forming the passenger cabin. There are no aggressive lines. The car was designed with the motor up front, dual airbags, side impact beams and ABS brakes, and it seated four adults. All interior lighting on the instrument panel was electroluminescent, which goes a long way to help lessen eye strain. Driver information came from a single round gauge that encompassed the speedometer, engine temperature indicator, fuel gauge, and headlight switch. The Concept 1 also included an AM/FM stereo and compact disc player with six speakers. Furthermore, the seats and side panels featured impressively stylish woven black and white cloth inlays. (McCutcheon 1998)

Then the story moved away from Simi Valley to the design studios of Wolfsburg in Germany, where the task of turning the concept into a tangible production vehicle settled.

Figure 3.66. The production New Beetle sketches

Volkswagen knew that the economic production and marketable pricing would only be possible on the basis of what Volkswagen call a platform. Volkswagen Company wanted to bring the Beetle to be best in class in crash, handling, brakes, and acceleration. Then they realized that this would have cost the company what it takes to develop two cars to do it. At that point the styling department in California looked at it as if one of the existing platforms could support a car that continues the design philosophy of the old Beetle but rest on new systems. Since the size of the Concept 1 was near to the Polo platform, using this platform common seemed more feasible. This also made the car price more affordable which was another original Beetle's feature. However, the main sales market for this vehicle was America and this Polo platform was abandoned in United States since it was too small to meet the U.S. safety standards.

So the decision was changed to go on with an A platform vehicle, The Golf. (DeLorenzo 1998)

The larger Golf was already certified for the U.S. market, and by basing the Beetle on the A-platform, it could be built in the Puebla, Mexico, assembly plant that builds Golfs and Jettas (as well as the original Beetle for the Mexican market). Volkswagen could take advantage of the low-cost labor and the proximity to the United States to keep the sticker prices low and delivery to the New Beetle's larger market easy.

The change to the Golf platform meant the New Beetle would be much larger than Concept 1. The wheel base grew 17cm, overall length increased to 409 cm, nearly a foot longer than Concept 1. Width grew from 165 cm to 172 cm and the curb weight nearly doubled.

The decision to base the New Beetle on the Golf, while ultimately the Bug's salvation, almost killed the project. As much as the marketing people in the United States wanted the car, they couldn't do the engineering necessary to develop it. That had to be done in Germany. Engineers in Germany wanted to work on the new Golf (Golf Four). Few seemed interested in the New Beetle. So the development work was farmed out to Volcke and the American product planners. They insisted on changes to keep the sticker price low and ultimately those changes began to affect the development prototypes. While Concept 1 had been a marketer's dream, turning that vision to reality became an engineering nightmare.

While the development of the New Beetle became a big mess, Martin Winterkorn, the board member in the charge of technical development, convinced Dr. Piech to get rid of the external people and do it internally – not 100 percent internally- but on the key issues that give character to a car. Winterkorn assigned a small team, which was broken off from the Golf project, to finish the Beetle to Piech's liking. It was decided that if the Beetle was going to be based on the Golf platform, it would be exactly like the Golf, from engines to chassis dynamics to equipment availability. Dr. Piech said "The platforms are the same but each model wears a different hat."

This new team set about re-designing, starting with renditions and then moving onto computer designs. Then a platform was set up as a base for a full size clay model which was worked from an industrial plasticine mass to the required shape by hand using modeling tools. Once the design was finalized, further models, firstly without windows and later with them, were produced by casting a substance known as

Epowood, which is actually a form of plastic. Next the Epowood presentation model was measured with a data probe to form the basis for the first prototypes. The data was then programmed into computers and digitalized, to be used for the manufacture of bodywork tooling. Typically, this data also assists with further studies into details, such as crash simulations and other important tests.

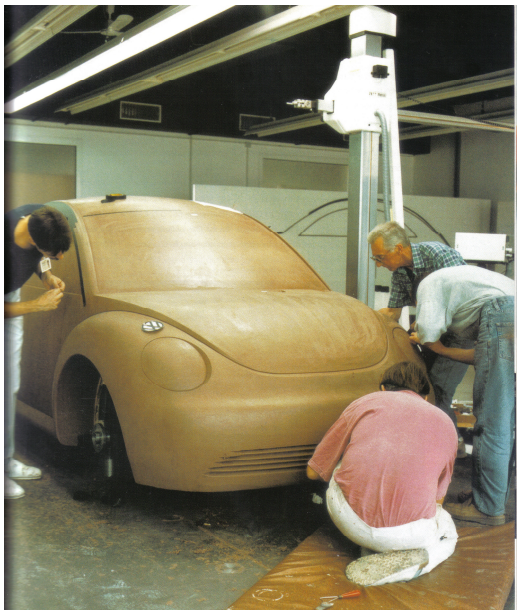

Figure 3.67. Clay modeling and data measuring

The next step was to move onto the interior of the car. The technical design team had to create the internal elements of the body, including load- bearing structures, reinforcements, pillars, sills and inner wings, along with components such as dashboard, doors, door inner panels and lid hinges. It was unbelievable that the body of a Volkswagen consists of around 300 stamped or pressed steel panels, all of which must pass stringent testing for quality and safety, along with being economically viable to produce. Interior design was equally important since this is the part of the car which the driver and passengers always see. In the same way that the exterior evolved, the interior started with Concept 1 idea, from which further artists renditions were drawn. Then a full scale wood and plasticine model of the interior was built. This particular model obviously needed aesthetic flair, but it also had to be completely functional. Therefore, while the dashboard was similar to that of the Concept 1, it has been highly modified. The steering wheel now has three spokes, unlike Concept 1 which had two. In addition, the door panels of the New Beetle were designed to incorporate netted door pockets, moulded arm rest and door pulls, and was added on them safety feature of a red warning light which illuminates when the door is open.

Figure 3.68. The interior of the Concept1 and the production New Beetle

The Color and Trim Department were the next team to work on the project. Working from a virtually infinite choice, they had to work out which colors this car would available in, taking into account current trends and attempting to offer a color which should meet every customer's need. Eight colors were chosen for the production vehicle. The interior materials, colors and finishes were all carefully chosen to be harmonious with not only the exterior finishes, but also each other. The first full scale exterior and interior models were presented to the Volkswagen Board of Management in November 1994 for approval.

A sheet metal concept car was built with the aim of unveiling the model in October 1995 at the Tokyo Motor Show. The press and public were excited to see that Volkswagen would be able to keep the attraction of Concept 1 during the transition from show car to production vehicle. Volkswagen dispelled that rumor decisively at Tokyo with a black prototype car. Volkswagen had to make comprehensive changes at the front end of the vehicle, mainly for safety reasons, but managed to keep it as close as possible to the lines of Concept 1. At this stage the car was known simply as concept and had a full tinted glass roof, which worked very well with the black paint work. The Japanese public gave the concept a truly amazing reception, with and astonishing 20000 advance orders placed at the show. Volkswagen was the winner.

Dr. Piech told the world it would produce the concept car before the millennium. He also announced that Volkswagen was to produce the vehicle at its North American production facility at the Puebla, Mexico. Furthermore, Puebla would produce the vehicle not only to serve the needs of the North American market, but also for all world-wide markets.

Five months after the production news, Volkswagen was back at the Geneva Motor Show and the car was officially named the 'New Beetle'. Volkswagen had modified the concept design and introduces the new car as the final stage of development apart from detail changes. An interesting feature of the Geneva New Beetle prototype was the drive train, which was a TDI engine linked to four wheel drive. The vehicle again met with a positive reception from all sides.

Figure 3.69. The New Beetle introduction at Geneva Autoshow

The interior of the Geneva New Beetle had a grey-yellow combination of fabric and leather, which gave an impression of lightness. Drag coefficient was also mentioned for the first time at Geneva, and despite the unmistakably unique shape, the drag coefficient was well below the critical level.

Now it was just a simple case of producing the car and the production started in Puebla plant in January 5, 1998.

3.2.3. Basic Design Features that Makes New Beetle a Retro Styled Vehicle

There are not many cars which catches the others attention in the way the New Beetle does in the market. In fact, it creates such a stir that it can be caught amount a millions of car. When you are driving through a built up area such as a town and you can easily see people pointing at you, waving at you, clapping their hands and shouting

at you. In this condition, either you are a famous celebrity, or you are driving a New Beetle. If you don't like a lot of attention, or suffer from paranoia, then the New Beetle is certainly not the car for you, at least for a few years. Of course there is one big reason of this sensation; of being on the receiving end of virtually undivided attention from most of the people around you, both pedestrians and other road users and that is the gorgeous retro design of the car.

It was mention in the design history of the New Beetle is that the New Beetle is designed according to the original Beetle and it can be summarized that it is the new car if the original Beetle is designed and produced in today's world. The design is mainly based on the "Function follows form" principle since the form of the car is much more important than the engineering. As a result, the New Legend was born.

To understand this overwhelming car, it is better to go over all retro elements and the best way is to start with the exterior features that have a big role on the design.

For this analysis, it is going to given some information about the retro features of the Concept 1 since it is the starting point of this new car and there are so many changes on the design due to production limitations, while Concept 1 is transformed to New Beetle.

3.2.3.1. Exterior Design

Figure 3.70. The New and Original Beetle for exterior comparison

When we turn around the New Beetle to underline the retro features, it is realized that it is really difficult to find out a starting point in the exterior. The whole exterior has similarity with the original. In the New Beetle design, it is not like to put one feature from the original and one other from different vehicle; it is completely a redesign of the original Beetle. Besides this, there was not a specific design problem that causes the redesign of the New Beetle in today's market. It is just a selling strategy and it is designed to be a modern Beetle.

Figure 3.71. The advertisement shot and press packs that emphasis the three circles idea

However, the best way to analyze the exterior is to start with the "three circles" on the profile of the vehicle. The curved roofline which slopes steeply at back of the car and the rounded bonnet in contour with semicircular wings both indicate a strong link with the original Beetle, but at the same time look new and refreshing. The first circle is the front fender contours and the second one is the rear fender, and the third one is the bigger roof line that starts from the center of the front circle to tangent of the rear circle that gives the hatchback appearance to the vehicle. The same principle was also used in the original Beetle with sharp cut in the windshield area.

The retro features started from front with front fenders and hood. In the New Beetle the meeting surfaces between the hood and the front fenders are smoother than the original one and this gives the car a modern face. There is no big depreciation between the hood and front fenders so the volume of the engine compartment increases and makes easy to locate all engine and sub-engine components in the front.

Figure 3.72. Concept 1 and original Beetle

Round front headlamps on the fenders and smiley hood is nearly the same with the original Beetle. Only the front bumper beam, which was made of steel with chrome coated, is integrated to the front bumper in the New Beetle due to today's vehicle safety regulations. This integration moves the front bumper a bit further and resulted with a change from the Concept 1 design.

In the original project, there were more retro features. For instance, the front bumper had the same profile with the hood and it seemed to continue through the hood and front fenders' curve. This profile was nearly the same in the original Beetle. As a result of this, there was no protrusive front bumper and this made the two horn grilles more visible. These new oval grilles in Concept 1 are redesigned of the aluminum grilles located on the front fenders of the original Beetle. One of these had the horn behind it, but the other was just blanked off for symmetry. However these did not make it into production to use these horn grilles as the engine air intakes with making them a

bit bigger since the New Beetle front wheel drive engine needs more air flow than the original one. Therefore, bigger and horizontal wide slots were added to the front bumper of the production New Beetle. In the first concept, the front featured a removable lower front panel or apron, which was designed to be changed as per the registration or license plate requirements of different markets. This apron also featured small high power mini fog lights.

Figure 3.73. The old Beetle, Concept 1 and New Beetle's front bumper and fenders

The front headlights incorporated the front turn signals in Concept 1 but they were separated in the production vehicle and turn signals moved down to a position on the sides of the front bumper. This was also another common feature with the original Beetle. In fact, this feature existed after a face-lift operation in the original Beetle history. Turn signals were moved from top of the front fenders to the sides of galvanized steel front bumper in Super Beetle. Since the shape of the plastic front bumper was directly taken from the original design, locating the front turn signals was so obvious and they should have been placed on sides of the bumper, not integrated to the headlamps like the Concept 1.

All four fenders were designed to be interchangeable from corner to corner. For example one front fender could be swapped for the opposite rear fender and vice-versa in Concept 1. This was a fantastic idea which would have halved the stock pile in the dealers, and also this made New Beetle more Beetle like. Unfortunately, it proved

impractical in series production. However, this would not make too much difference on the appearance of the vehicle from Concept 1 to the production New Beetle.

The rear bumper was smooth and followed the curve of the fender, assisting with the three circle profile of the vehicle. Again this would be lost in production but not as much as the front one. As with the front bumper, the rear featured a separate apron, but rather than having lights, the rear apron had an exhaust tail pipe cut out and a towing hook on the other side. The designers did a good job with these types of communization and nearly all of them would put retro value to the vehicle but many of them disappeared in the production model.

Figure 3.74. The old Beetle, Concept 1 and New Beetle's rear bumper and fenders

The rear stop lamps and boot-lid have similar shape with the original one. However, at the clay models, J. Mays and Thomas Freeman planed a boot-lid that there were some air flow slots on it that makes the vehicle more retro. The vehicle was front wheel drive and there was no need to make this type of ornamentation at the deck-lid.

The rockers on the sides appear naturally due to the geometry of the front and the rear fenders. These parts are also another retro feature coming from the original Beetle. The side doors were heightened from the rockers smoothly and meet the roof on the top.

3.2.3.2. Interior Design

Figure 3.75. The New Beetle interior

The retro touches on the New Beetle exterior continue in its interior. The main principle of the original Beetle; “Design simple” also defines the styling strategy of the New Beetle. The interior design should be totally different than the original since during last twenty years there were various changes in vehicle interior standards. Some of them are obligatory changes such as front and side airbags and pull controlled seat belts and the other options are the AM/FM stereo with cassette/CD/MP3 player, power outs, CFC-free air conditioning, a micron air filtration system with air blowers, tinted glass, anti thief alarm, power door locks, cruise control, leather interior, heated front seats, power windows, a power glass sunroof and all controls of these equipment due to customer satisfaction. The interior design of the New Beetle should be as simple as it can be with all these inputs, and the interior designers achieved a really good job.

It is so obvious that the main retro feature inside the vehicle is the bud vase that is located on the right side of the steering wheel. There is no other feature that can describe the main link between this luxury front engine vehicle with the original ugly bug that is loved by all hippies and was the main icon of the piece, love and freedom. This bud vase carries the flower power of the hippies. This vehicle should have attracted the baby boomers in America so it needed these types of small tricks to be more influential on the customers. In original Concept 1, this vase was a part of the grab handle that is attached to the passenger side of the instrument panel.

Figure 3.76. The main retro design in the New Beetle, the bud vase

Not far from the bud vase, there is another major design element that carries the retro characteristic can be seen. This is the round single cluster that contains a big speedometer, small tachometer on the right, and the display of the road computer with all warning signals. This one piece, round design is completely originated from the original Beetle with minor changes. In the original one there was no tachometer to keep the vehicle price lower and make it affordable for more people. This display panel remained the same in the transfer from the Concept 1 to the normal production vehicle and also this shows how it is important for the retro design of the whole vehicle interior.

Figure 3.77. Instrument panels of the New Beetle and original Beetle

The steering wheel was also designed in the same way of the original Beetle in Concept 1. It had two spokes with a round air bag cover. This was not only inspired from the original Beetle but it was chosen since all vehicles in 1960's were used these type of steering wheels. Another reason was to keep the design style for whole vehicle the same from exterior to interior with these types of details. All round clusters, round

steering wheel center, air blowers, air conditioning controls are used to give this effect to the customers.

Figure 3.78. Concept 1 Interior

There are so many differences between the Concept 1 and the production New Beetle. Lots of retro features had been lost while the Concept 1 was turned into the production Beetle. Round and two-spoke steering wheel is one of them. The other big difference is the door trims. In original Concept 1, the door trims are so simple. There is no map pocket or any storage space. The lower part of the door is trimmed with a plastic cover and the center portion of the door trim is wrapped by a fabric with the same color of the plastic trim below while making the body colored sheet metal visible. There are only one grab handle, window operator handle and door handle attached to that fabric portion. This design is nearly the same with the original design. Except body-colored door inners, all features could not be transferred to the production New Beetle. However, that very important retro feature could remain untouched and helps the New Beetle to carry the legend that its predecessor had.

Figure 3.79. Door inner panels of the New Beetle and original one

The seats are the most difficult elements since they are rarely affected by trends in current vehicle production. The reason is that they have to meet some specifications stated by the governments for safety reasons. The Concept 1 seats were quite well-designed that is not so different in style from the original Beetle. However, the production vehicle seats are completely the same with the other VW vehicles.

Figure 3.80. Concept 1 Seats and New Beetle seats

Volkswagen decided to use common parts with other VW models in the market where it can be understood why the New Beetle is constructed on the Golf 4 platform. In production New Beetle it was forced not to use specifically designed components for it and to use the interior elements which are common with other car-lines of Volkswagen. This is another obstacle that Concept 1, well designed by all means of retro, could not turn a reality.

When it is compared the exterior design of the New Beetle with the interior, it is so obvious that the main retrospective design of that vehicle is focused on the outside. To attract customers to buy this vehicle the designers know how to give more importance to the exterior design than inside of the vehicle. In other words, Volkswagen's "Function follows form" strategy works really well.

3.2.4. Other New Beetle Vehicles and Concepts

It is so clear that there will be new and improved models in the New Beetle after intention to that vehicle started to increase. The surprise is that this new modeling was started in the beginning. After Concept 1 project was approved, J Mays decided to create a cabriolet version of Concept 1 like the original Beetle family.

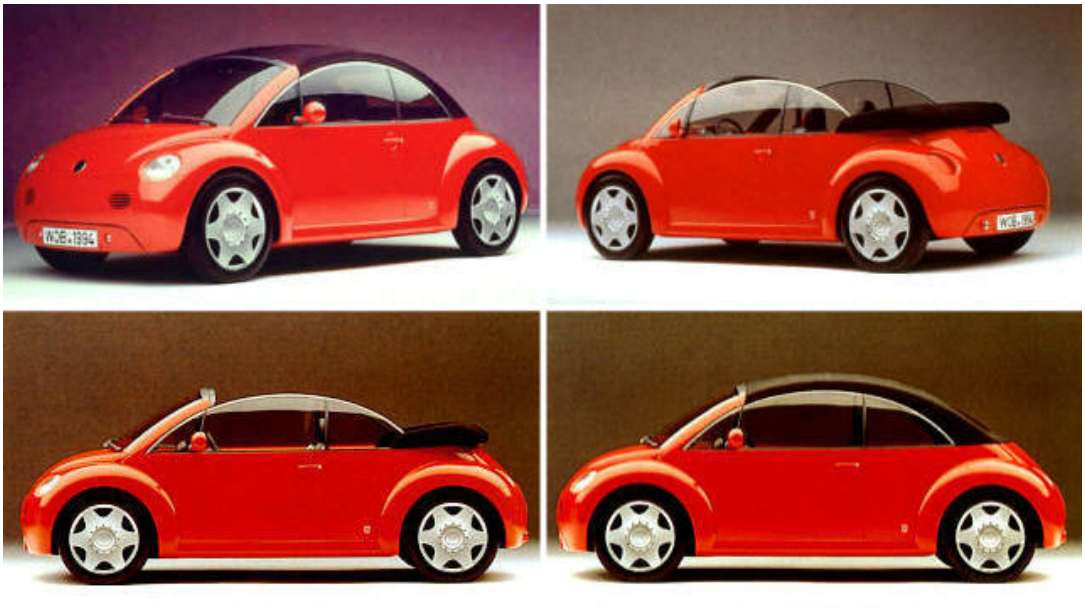

Figure 3.81. Concept 1 Cabriolet

After the original New Beetle was unveiled to the public at Detroit Auto Show, the car created enormous interest. The reason is that this new car emphasizes the typical qualities of a VW; its honest, reliable, timeless, and youthful design. The next step was to unveil a further study on the Concept 1 theme, the Concept 1 Cabriolet.

The success at Detroit was continued at the Geneva Motor Show in 1994. If going back to its roots worked so well for VW with the sedan, there was little doubt over whether or not a Cabriolet version would create a stir. The prototype gave a general view of the future of VW, a car which was in a class of its own, simple, unique and modern, looking forward optimistically but still showing its heritage.

This vehicle was completely the same as the Concept 1; only the cabriolet version of its brother. There is nothing change in the interior and exterior design of the vehicle. Only a special type of a soft top was integrated to the vehicle's back in the same strategy and same appearance with the original Beetle Cabriolet.

It was so evident that there would be new concept studies in the New Beetle history and the next example was the New Beetle Dune Concept that was unveiled in the Los Angeles Auto Show in 2000. This concept vehicle was aimed directly to the needs of sport-oriented people. With all four wheels driven by a high torque V5 engine, this particular New Beetle takes people on after the road has come to end for the conventional on-road automobile. (DeLorenzo 1998)

Figure 3.82. New Beetle Dune Concept

The basic shape of the New Beetle has not been changed for evident reasons. The modifications started where a vehicle that is designed to operate away from the main highways needs to have different function. In the front, the new radiator grille acts as an underride guard and it is different than the standard model. It's made of aluminum and serves as a particularly strong front bumper. The matching center section of the bumper at the back is also made of aluminum. The entire surface is lined up with aluminum.

Figure 3.83. Aluminum front and rear bumpers

From profile, some functional protections are added such as two protective body side mouldings in the door area, wheel arc liners that extend round to the outside of the

fenders and massive side sills. These are shaped to protect the underside of the outer body edges effectively in off-road driving.

There are so many new equipments inside the car. The variable roof is the best way of identifying the Dune. Light passes through the plastic material on the top and creates a warm yellow glow under the soft top like a sense of sailing in the sun. And with the roof open, the Dune gives a very special kind of open-air feeling.

Figure 3.84. Dune soft top, navigator system on the instrument panel and AC control panel

Many features of this concept study differ from the production car, such as the new central instrument. Where in the standard New Beetle a single circular dial provides the main information, there are three gauges in this unit. The instrument cluster is dominated by a new navigation system in the center of dash board. It has a compass that can certainly tell the driver the way back to civilization if he or she gets lost for some reason. Two more displays indicate the tilt and roll angles reached by the body.

The load compartment is also another feature that should be mentioned since the complete load platform is lined with aluminum. This material was chosen to make the truck suitable for a wide variety of purposes and keep it resistant to dirt and moisture. The interior designers have also paneled the rear seats back with aluminum sheet. When the seats are folded, this yields a large, continues load surface. The Dune's basic concept is that of a 2+2-seater, according to the theory that such vehicles are always occupied by two people who need all the space that the variable load area can provide for the equipment that they want to carry with them. But if the two back seats are in use,

the passengers' comfort and safety are also assured with the integral headrest, and even a cold-store box.

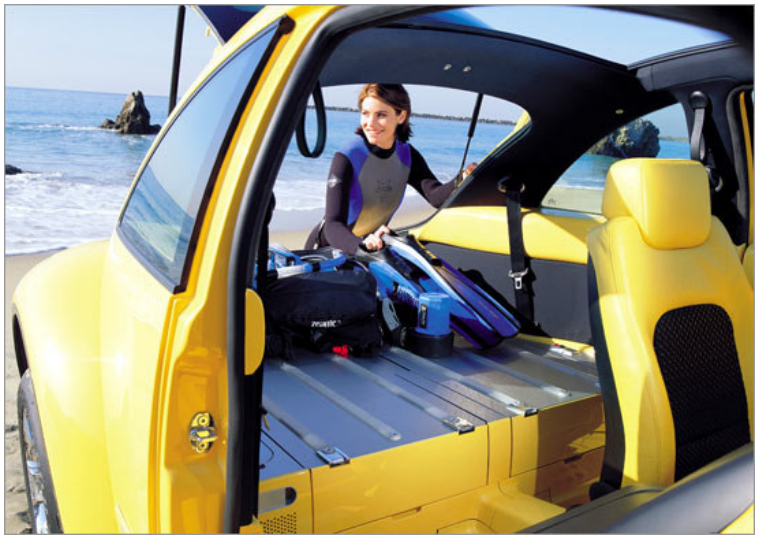

Figure 3.85. Foldable rear seats of the Dune Concept.

The concept car is powered by a 2.3-liter V5 engine and drives all four wheels by the well-known four-motion system, through a six speed manual-shift gearbox. Variable height air suspension provides the Dune's driver to match the ride height to all kinds of terrain. (WEB_5 2000)

After these concept studies, VW decided to work on the production New Beetle. Between 2001 and 2003 Volkswagen produced 250 limited edition New Beetles with the designation RSi in Europe. This RSi was powered by a 225 hp, 3.2 liter V6 engine mated to a six-speed gear box and all wheel drive system four motion.

In exterior, all front and rear fenders were modified to catch the sporty engine and equipment. Bigger bumpers included 80 mm wider front and rear fenders have big air intake grilles in the front and a rear diffuser at the back. In order to improve aerodynamic properties, there is a large rear wing on the hatch and 18 inches big tires finish the exterior design.

Figure 3.86. The New Beetle RSi

This sporty engine and exterior design forced the designers to use a sporty theme rather than focusing on the retro style in vehicle's interior. More chrome used at the air blowers, instrument clusters and controls, gear shift and pedals. Nearly the rest of the other components are wrapped by leather. Black and red seats and door trims put the last touch in interior design of the New Beetle RSi.

Figure 3.87. The New Beetle RSi, Interior

In 2003, VW unveiled the New Beetle Convertible in order to raise their sales in North America. Convertible concept was studied before in the Concept 1 therefore, it wasn't a big process for VW to put the convertible Beetle in production.

Figure 3.88. The New and Original Beetle Convertibles

This iconic convertible recalls the classic drop-top Bugs, complete with its thick folded top bustle and huggable personality. There is nearly nothing change in the original New Beetle in this transform. The most important change that is added to the minor model year improvements is the soft top that uses the same strategy with the original Beetle Convertible. Designers, this time, were more careful to be in line with the original model while integrating the convertible option to the New Beetle.

With the top up, the car maintains the hardtop's distinct semi circular profile. The arching shape preserves generous headroom, lending a spacious uncommon feel in convertibles. Its shape acts as a functional spoiler when the top is open. Some minor differences between the hatchback and convertible Beetle are the rear side turn signals and reverse signal lights of the New Beetle Convertible.

Figure 3.89. The New Beetle Convertible

These changes in the exterior don't continue in the interior design. Except the reinforcement and safety preventions, there is nearly nothing change in the interior of the vehicle than the original New Beetle.

This convertible version helped VW to keep the excitement of the consumers against this retro Bug trend but in 2005, VW was obliged to introduce another concept to the market. The new project was the New Beetle Ragster, which is the hot-rod study of the New Beetle.

This new concept was revealed at the North American International Auto Show in Detroit in January 2005. It is a new generation of New Beetle; a Ragster study which encapsulates a fresh design, sports car attitude and a glimpse into the future design of the New Beetle. The Ragster's name is driven from a combination of Ragtop and Speedster that suits its hot rod design perfectly.

Figure 3.90. The New Beetle Ragster

This concept was not created by cutting a hole on top of the New Beetle. Instead, its designers and engineers used the New Beetle Cabriolet as their base. They shortened the A-pillar by around 90 mm and penned a U-shaped roof fixing as a frame for the canvas top. Overall, this makes the Ragster 103 mm lower than the standard New Beetle, while the wheelarches also have a flatter appearance. (Car Graphics 2005)

The Ragster shows the new visual ways very different from the original New Beetle. There were no smooth lines in the exterior anymore. All of them were replaced by the sharp corners and aggressive lines on the hood, bumpers, fenders, headlights and taillights. These aggressive lines initiated from the single piece hardtop design that

makes the car more sporty and distinct among other hot rods. Even the turn signals have sharper style than the original one. The whole exterior is finished with the two silver double stripes which extend from the spoiler, through the bonnet's VW roundel, and up to the windscreen. At the rear, newly designed taillights are integrated into the bumpers, while chrome plated double exhaust pipes complete the look. This vehicle was designed and unveiled to the public in order to give a general idea to the customers about the coming models of the New Beetle.

Figure 3.91. The New Beetle Ragster, front, rear, and interior

Inside, the Ragster is a 2+2 seater, with leather sports car bucket seats and distinctive controls and dials. Unusually, the rear-view mirror is mounted on the dashboard. The roof can be opened and closed electronically using a switch on the steering wheel, which also incorporates a number of other controls. The steering wheel is a redesigned one with three spokes and achieves to be sporty and oldy with its modern appearance. All these sporty accessories are supported by an extremely clean designed cargo space.

Figure 3.92. The New Beetle Ragster Concept, rear cargo space

Finally, the New Beetle is entering its ninth season in 2006 and all these concept studies should have become a real production car and the result is the New Beetle 2006. This car is the face-lift version of the original New Beetle. It has so many similarities with the Ragster concept and in fact it can be said that the Ragster is the starting point of the 2006 New Beetle.

At first glance, the sharp lines of the wings and bumper elements stand in the forefront and make the new version look more dynamic than before. The new shape is streamlined, more dynamic, and gives the 2006 New Beetle a greater presence with a stronger, slightly more aggressive and masculine appearance. Fenders are more highlighted with those aggressive lines that are started from the hood; continue through the front bumper and fenders and after passing the side sills and rear fenders, and finally end at the rear bumper. Along the sides, shaper wheel arches accent stronger character lines, and an oval fuel filler door replaces the previous rectangular door. The lights are also changed slightly in this new model. The front turn signals are smaller and clear glass headlights have a more oval shape. The rear turn signals are integrated to the main body of the taillight as a white circle inside the red one. That makes the rear of the vehicle has cuter and charming appearance. The VW emblems on the hood and tailgate have also been modified. New color alternatives and aluminum alloy wheels offer the New Beetle customers new and fashionable design options. The side mirrors are the last points in the exterior that has affected from the new styling, with sharp streamline like curves.

Figure 3.93. The 2006 New Beetle, hatchback and convertible

Since this change is a simply a make up for the new model, there is nothing change dramatically inside the car. The new interior has shiny chrome on the air vents and around the instrument cluster. An updated single-bezel instrument cluster houses a large and easy-to-read 140 mile-per-hour speedometer plus a smaller tachometer and fuel gauge and a single LCD info screen. There is a new collection of fabrics for the seat covers and interior elements that is a usual way used in every face-lift operation by all car producers, like new exterior colors. The optional rear leather CD pockets and programmable garage door opener under the sunvisor and tons of new accessories give the vehicle a touch of class what VW wants to make with this new model. For added comfort and convenience, the side sunvisors have been redesigned, and a newly-designed console includes improved cup holders.

Figure 3.94. The 2006 New Beetle interior

3.3. Comparison of the Retro Styling of PT Cruiser and New Beetle

Both PT Cruiser and New Beetle are called “retro vehicles” in today’s car market. Like the word “retro” has some different meanings, these two most popular retro vehicles have differences in the way that their design strategy and design purpose. After reviewing the retrospective designs of the PT Cruiser and New Beetle deeply above, it becomes easier to see how different these two vehicles are although they are put in the same category as “Retro”.

The main difference between these two fantastic vehicles is the design method that is shaped according to the purpose of the products. A very basic and well-known design principle “Form follows function” is the starting point for PT Cruiser unlike it was decided to use completely opposite philosophy “Function follows form” in the New Beetle what was the result of raising an old legend in today’s world just to increase the sales of one automotive brand in U.S.

Chrysler wanted to create a small SUV in exterior size with a huge interior space that was a market need for both Europe and America. The main target was the European users that were looking for small sized vehicles with economic small engines and good driving and luxury interior with style. Unlike the general design style in American muscle and huge cars, PT Cruiser is smaller in size but still carries the classical muscle properties of the American car history. The company Chrysler achieved to create a car with old American basic muscular shapes with curvy fenders, nose hood and curvy roof. However, the idea behind this is to provide a big interior space to customers. In order to reach that target, it was found an excellent solution that had been staying there not far from them. It was decided to make this new SUV as a retro vehicle just looking at the examples in the company’s history. The vehicle should have been high from the ground with its tall profile and huge wheels. A big problem appeared at that time; how these big wheels could be hidden inside the vehicle, in other words how it could be avoided to affect these big wheels to use the interior space and make the interior room useless. A very old strategy came to help as using flared front and rear fenders and moving the big wheels from inside of the vehicle into outer.

Fenders were the initiator of creating an updated contemporary hot rod that comes directly from production line without any modification. Nose hood, front grille, rockers on the sides connected the front and rear fenders through the body side, rounded roof and decklid formed the main shape of this trendy hot rod. With some extras like

chromed door handles; and modernized front/rear lamps and plastic bumpers, final touches took place and a hot-rod SUV that looks small from outside but roomy in inside was born with retro style.

The New Beetle has totally opposite design philosophy than PT Cruiser. Its design constructed according to the philosophy "Function follows form" which is an unusual way in product design. There is, of course, a reasonable explanation for this. The Volkswagen sales in America were decreasing dramatically and they had to find a way to turn back the top fashionable days. The revival of the original Beetle was to arouse interest of the customers to be back at the top of the popularity table and infinite popularity of being a pop culture icon between decades. As a result, the New Beetle had to look like its original predecessor and everyone could share the same feelings as they had with the original. This made the visual languages of the two vehicles need to be the same. It can be seen obviously how the New Beetle looks like its original in the Concept 1 rather than the production Beetle. This means that to be like the original is more important than its function. In fact it was not an easy way to follow to design a car like that. The restrictions in the design made some functions nearly impossible to work properly. In other world, this is the reason why it is nearly impossible to sit in the rear seat of the New Beetle if you are higher than 180 cm and insufficient cargo space in trunk and poor driving vision due to big A pillar arcs.

All these show the second difference between PT Cruiser and New Beetle that is the target market of the car. PT Cruiser was designed for the European people who care the environmental pollution and look for smaller cars for smaller streets and few parking place. The New Beetle, on the contrary, would be resulted as a revival of the unforgettable legend in the American history and was designed to be a pop icon again in U.S. Baby boomers would love it.

Here we come the last and most important difference between these two vehicles. All design items of the PT Cruiser such as curvy fenders, V-shaped hood and front grille were taken from the general dominant characteristics from the vehicles from 50's and 60's. PT Cruiser is the combination of all vehicles from the decade of 50s. It is not a retro of a specific car in the past like the New Beetle. It is a summary and synthesis of a period in automotive design.

The New Beetle has totally different story than PT Cruiser. As it can be seen from its name, New Beetle is the recreation of the original Beetle. It is the answer of what if the Beetle is designed in today's conditions and with new technology. It has the

same design languages as its original and it reflects only its predecessor, nothing more than this.

CHAPTER 4

CASE STUDY 2

RETRO STYLED TURKISH BUGGY; BÖCEK

Böcek, “Bug” in English, was the first car like off-road vehicle that was the result of the Turkish engineering and manufacturing. It was a 4x4 off-road vehicle that was designed to use mainly in the Southern part of Turkey for tourism business. It had no top, no doors open cabin design, and its high cabin and suitable suspension and chassis provided a high drivability in the beaches and highlands.

Figure 4.1. Böcek, 1973

4.1. Brief History of the Turkish Buggy “Böcek”

The story of the Böcek started not far from today, the project started in 1973 as the next step of the local attempt to create a totally domestic automotive industry in Turkey. Otosan, Otomotiv Sanayi A.Ş., started to work on to have a Turkish vehicle in 1959 with making the assembly of the Ford heavy truck in Turkey. This was only a production facility since Turkey, at that time, was not able to design and manufacture a

vehicle with the technology that it has. The country was still trying to come into a good level economically after the foundation of the new Republic. Development a vehicle should have learned how to do it first and doing manufacture was the first step to be taken. While Ford trucks' assembly processes were performed, all people in the management level were trying to find a way to get into car business. The solution would find them soon in an Auto Show in the shape of a simple truck made from fiberglass, a new material used in automotive industry. Till that time Otosan could not get into that business because of the high sheet metal tooling required to built vehicle. After realizing the usage of fiberglass in Automotive Industry by Bernard Nahum and Rahmi Koç, who was the development guy and next generation of the management, the big study started to build first Turkish vehicle with some help from England by using the fiberglass in automotive production. Bertone helped the styling and Ogle Design changed the Bertone's design to make it suitable for producing by fiberglass. After sleepless nights in the Otosan, the first Anadol came out of the assembly line in 1966. (Küçükerman 2004)

Figure 4.2. Anadol, 1966

Anadol was accepted by the Turkish society easily. It was supported with a good advertisement campaign and the biggest advertisement was it was the first Turkish car. The sale targets could be achieved with minor changes and face lifts and also the pick-up version of it was also introduced according to the demand coming from the public.

Figure 4.3. Anadol, 1974; STC-16, 1973

In 1973, Anadol had two brothers. The first one was the STC-16, which was the short form of the Sport Turkish Car, and the other and that the vehicle that is going to be focused and worked on was the Böcek, a Turkish “Buggy”.

Figure 4.4. Some rendered views of the original Böcek

Böcek was a buggy like vehicle and was unexpected at that time. Most of the reporters were talking about it was ahead of the time. This vehicle was mainly designed to be used in the turism business in the Southern part of the Turkey. The designer Jan Nahum, who is the son of the Bernard Nahum, finished his graduate degree at that year and came back and started to work in the Research and Development department of Otosan. This was his first task in his new job. What is required is to design a basic

vehicle that higher than other vehicles and has no door and roof to make it easy to get in and out. This vehicle should have had high maneuver ability in the beaches and highlands. Underneath this main reason, there was another minor reason to produce this weird beach buggy. These vehicles would also be used in the Army for driving trainings for the new drivers. Unfortunately, this would never be real since the Army abandoned to demand more Böcek's after ordering a few of them. (Demirer, Aydoğan 2006)

Jan Nahum didn't want to make this new vehicle from Anadol. He had enough time to design a totally new and different vehicle. He did design it in his apartment in Ulus, Istanbul. He tried to be as simple as he can and avoid using redundant items in his design and the Böcek was born in 1973.

When it was introduced into public, there was a big attention to it. It was on all newspapers and advertisements. It started to be used in the films. However, it had no chance to be sold in high volumes, unfortunately, not due to insufficient demand by the public, it was because of the fact that Ministry of Industry did not allow to produce this vehicle in high amounts in a situation what Turkey was in at that time. It was found that Böcek was a fantasy vehicle and it was senseless to produce Böcek's while a lot of people were waiting for the Anadol. As a result, the production of this funky buggy vehicle could reach only 203 units in its life. Now 10 of them are alive and still being used properly.

Böcek had some other usages except from the tourism transportation. Since it had off-road ability it was designed to be used where 4x4 vehicles were mostly used and it could be modified to be used for the small and far villages from the centers that did not have roads in good condition. Gendarmerie could use it and it might be used as the ambulance for the rough roads. All these proposals could not go further because both the vehicle and those brilliant ideas were behind its time.

4.2. Basic Features of the Original Böcek

The contemporary brochure of the Böcek states that the car was designed to provide a free, easy, enjoyable and inexpensive autonomous vehicle for transportation needs in Tourism. It had a fiberglass simple body with demountable gullwing doors, windshield with the same angle with the hood and a soft top as an option. Its fiberglass and simple and open body provides better driving visibility and ease of access to the

vehicle. Attachable side doors and soft top could protect the driver and passengers from the outer conditions. However, they were all optional however none of Bocek's had been produced with this features.

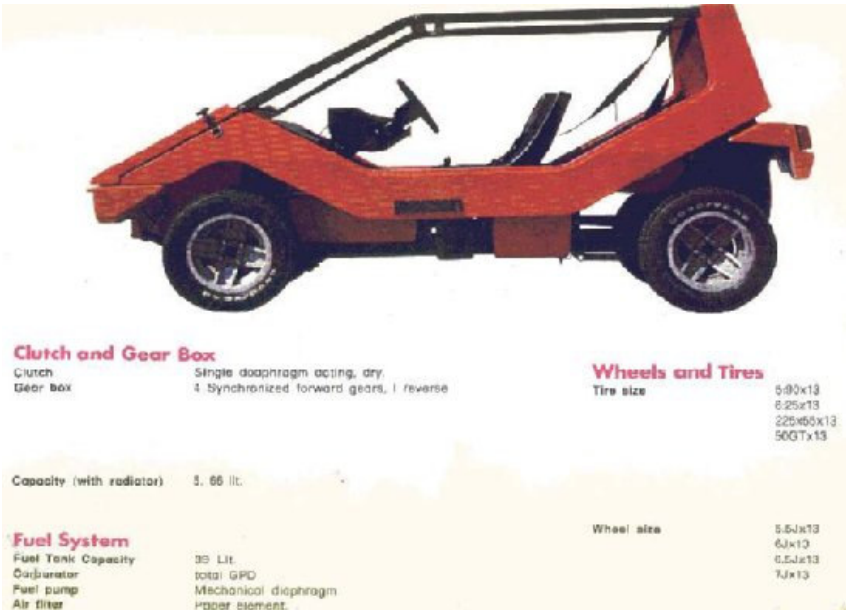

Figure 4.5. Some technical properties of Böcek.

Böcek was based on a separate steel chassis a frame like structure. All this structure was covered by the light fiberglass body. It was powered with 4 cylinder 1298cc Ford 'Kent' engine in front that provides 52HP to the 225x55x13 tires. Front and rear tires had same properties and had steel wheels inside.

The headlamps and front signals were placed to the small bumper that was attached under the lowest point of the hood. The rear lamps were as simple as in front. Behind the rear bumper, there was a spare wheel on the left and on the right, the fuel tank existed.

In the interior, it had four non-foldable seats, two in front and two at the rear trimmed with leather to provide a better protection for the cabriole vehicle usage. The instrument panel was not like the other vehicles in the market and had a very simple one box design. The dashpanel had three gauges, speedometer, tachometer and fuel and heat displays. It had only turn signal arm on the left and wipers were controlled with a button under the button that controlled the front and rear lights.

Figure 4.6. Böcek's interior and instrument panel.

It is strange but all these information is enough to describe this funky and simple vehicle. Although it was always described as a vehicle beyond the time, it needs so many features if it is designed in today's world.

4.3. Turkish Retro Vehicle: The New Böcek

Before starting working on designing a Turkish retro vehicle from original Böcek, first the original vehicle must be investigated completely in detail. All items that create its uniqueness and characteristics that make it different than other vehicles must be determined. After that the special characteristics that are designated to be helpful while shaping the idea of the new concept according to the today's trends to attract customers attention and at the same time to make them think it is an old friend from their past.

What makes Anadol Böcek unique are;

1. It was one of the first vehicles that have a hood and windshield in the same plane.
2. It had no roof and side doors. This feature provides a more open space and visibility to the driver and passengers and this made it to become popular beach buggy in the Southern beaches in Turkey.
3. It had a dominant distinct lines and characteristic body side without B pillar.
4. It had an asymmetric front grille with the headlamps that were also carry over from another Otosan vehicle at that time.

5. The asymmetry in the front was also seen in the rear of the car. It had three rear lamps including reverse lamp on the left and two rear lamps on the right.
6. Interior of the vehicle was basic as it can be.

According to all these items, the New Böcek should be in line with its original but it should be new and suitable to meet the obligatory requirements of today's cars with some smart touches.

The New Böcek should be a combination of an off-road vehicle and SUV (Sport Utility Vehicle) that can be driven in country side. It can be move easily in the beaches, and it should be sustainable for light off-road activities. Therefore, the general shape of the vehicle will look like combination of a SUV and an ATV with a sporty look. This means huge wheels with deep patterns, muscled shaped vehicle with tall profile and highly open space to interact with the environment.

All these properties have shaped the main design of the vehicle. First of all, its smooth windshield continues in the same plane as its hood is. The only difference will be that it connects the hood and darker glass roof with a smooth curve in New Böcek. The foldable roof panels move throughout the profiles that are integrated to bars between the A-pillar and C-pillar. In this new designs, B pillarless body design, which is another trendy features in today's concept cars are used. The sides of the windshield frames define the A-pillars and wide body sides at the rear of the doors define the C-pillars. This seems like it makes the body construction weaker but since this is a two door vehicle body sides provides enough reinforcement to the passenger compartment. B pillarless also provides a better view inside and an illumined atmosphere inside even when the roof is totally closed. When the roof is totally open, it provides the same feel as a cabriolet does. It ensures to feel the wind while seeing the deep blue of the sky on the top and a better exterior interaction. Meanwhile, this foldable glass roof will keep the same visual language with the original Böcek that does not have a closed roof.

The most important modification in the New Böcek appears in the frontal area. While the hood and windshield keep their relation as it was in the original, the whole shape becomes softer but at the same time the sharpness of the corners remains the same to express the similarity with its original. This similarity disappears in the front bumper, headlamps and grille. Since there are some security restrictions and homologation requirements in today's mobile world, bumpers are shaped accordingly to provide enough space for the chassis arms that starts in front of the car. Besides, with the new production technologies, especially highly improved surface qualities of plastic parts; it

is senseless and out-of-date to use a separate bumper from the main body in this vehicle. They can be integrated and become a complimentary element of the whole body shell. Therefore, this new bumper has to look completely different than its original. It is lowered from the original position to give a sportier look and has bigger air intakes. These air intakes are for both to cool the engine under the hood and aggressive styling in the front. The only retro cue from original Böcek is the grille in the big air intake. Original Böcek had asymmetric divided grille that was a really strange feature in its time. There was no logic behind this asymmetry. It was just styling and it was so buggy and helped this strange vehicle look like more different than it was. However, this strange asymmetry cannot be transferred to the New Bocek concept, since it is not compatible with its modern design that is far away from asymmetry. Therefore, a symmetric grille is used in the front and it gives a wild look to the vehicle.

Figure 4.7. The New Böcek, front

This big air intake in the center was supported with two cavities on the sides that also define the background of the headlamps and side signals. These cavities are trimmed with black plastic parts to be in the same visual language with the grille. They are also suitable for the fog lamps or some other features related with lightning with modifying them a bit. Head lamps and side signals use high energetic LED technology, which is very popular in today's concepts. This also express there is no need for big headlamps of today's vehicles where we can see everywhere and they also emphasize the simplicity of the design as a whole.

Figure 4.8. Front bumper of the New Böcek

When it is moved from the front to the rear of the vehicle, the most important retro feature stands out; the profile of the body side. The main lines that form the body side are nothing different than the original ones that had a smooth touch of retro design. Original Böcek has a fiberglass one piece body that is constructed on the main steel structure. This steel structure becomes visible in some points and defines the A-pillars and roof side bars. However, in the new design it is impossible to use a strategy like that. New Böcek structure is totally different than its original. It has a sheet metal chassis being made up of many sub components such as, chassis arms, reinforcements, and floor panel, unlike Böcek's steel tubes structure. Therefore, A-pillars and roof bars are painted with black to keep the similarity between the vehicles. Since current technology let us to built any parts made from sheet metal, it is not a difficult task to built a simple shaped vehicle like New Böcek with this method. The line that went just above the front and rear wheels in original Böcek is also used in the new one, just changing its angle. It is not horizontal now it starts in the nose of the car and rises with a soft angle throughout the body side and finishes in the middle of the rear windows. This also highlights the sporty look of the car. Wide C-pillars keep their originality and provides enough space for the roof panels when they are fully opened.

New Böcek has more snappy body sides unlike its original. It has a narrower frontal area and it becomes wider while moving from front to the rear of the car. It has more amorphous shapes on the body sides.

This new vehicle must have doors to make it feasible and problem-free on the roads without any homologation problems. The biggest difference is the new doors constructed on a steel profile with glasses above and below part of the main center reinforcement. This door reinforcement is defined by a straight line above and a curvy one below. This profile looks like a wing of a bird. Doors open to the side with hinges in the front and have adjustable window on the top and fixed window made of thick

plexyglass. These two windows on the door procure better visibility for driver and passengers as its original. They are designed according to the main strategy of the whole vehicle although the original Böcek did not any doors.

The last retro cue on the body side is the “Böcek” marking under the door where the original had the same emblem. Finally, the high patterned wheels put the final touches to the profile of the vehicle.

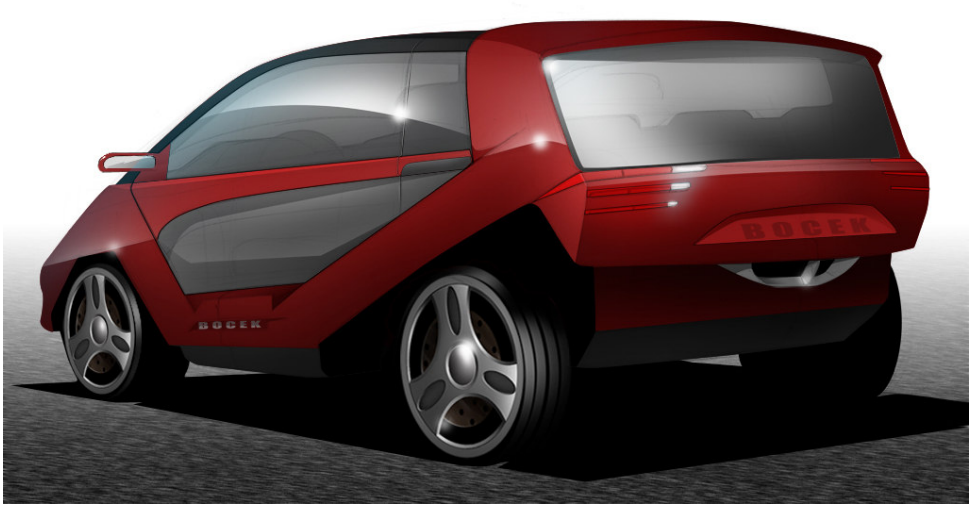

Figure 4.9 The New Böcek, rear

When we look at the back of the car, it is noticed that the same strategy is also used at the rear as keeping the main borders with making them smoother and equipped with some technologically improved items. The spoiler emphasizes the sporty look of the vehicle again while providing better streamline at the back. The rear bumper, which is made of plastic, is also integrated to the rear end of the body shell, unlike its original. Original Böcek had a completely separate rear bumper attached to the rear end of the chassis to hide the spare wheel and gas tank. Unfortunately even for this task, this inserted bumper was not successful since all of them can be easily seen behind the rear bumper in original Böcek. The chromed exhaust exits also help the sporty look of the vehicle. The most important retro item at the back is the rear lamps. The rectangular lamps have converted to three rows of lamps with LED inside keeping the asymmetric distribution of the signals and reversing light. It was kept in its original place on the left hand side of the vehicle. The last touch is the “Böcek” marking in the license plate area at the rear.

Figure 4.10. Rear bumper of the New Böcek

The New Böcek carries some differences in exterior dimensions than its original. Since the seating position moved forward in the new design due to new frontal package, the length of the vehicle decreases to 2755 mm, 115 mm less than its predecessor. The wheelbase dimensions also becomes lower than the original as 125 mm. This difference is due to long overhang of the New Böcek. The height of the vehicle remains the same as it was in its original; 1490 mm. The width of the vehicle increases more than 70 mm due to projections of the body side and its active designs. The New Böcek's sporty look is complimented with bigger and wider wheels as 225x70x17.

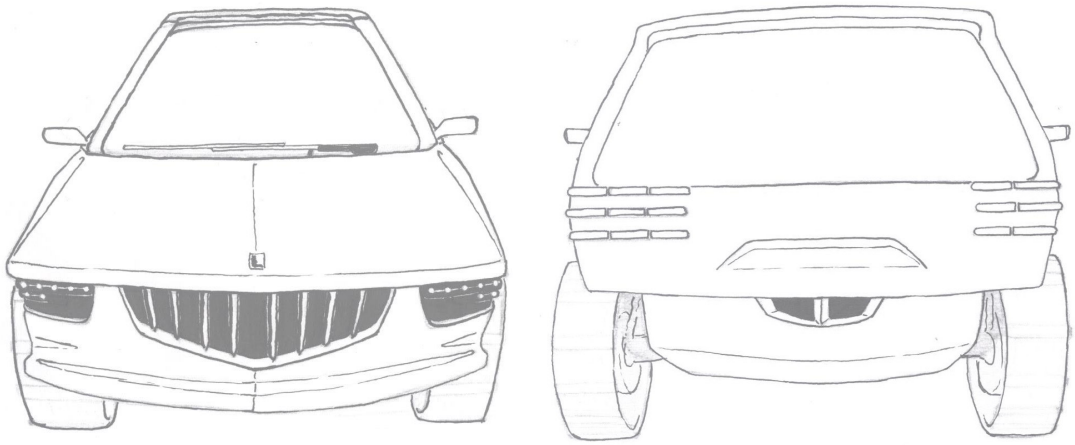

Figure 4.11. Front and rear views of New Böcek

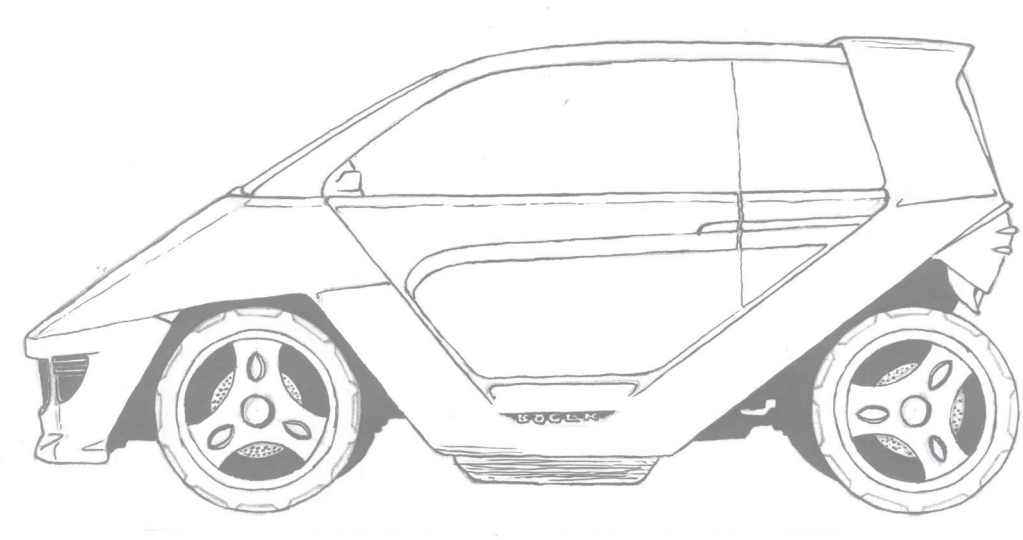

Figure 4.12. Side view of New Böcek

After all these exterior properties, it is expected the same retro cues in its interior. Unfortunately, original Böcek is not a well-equipped vehicle internally. Many standard options in today's cars such as, air conditioning, climate control, sound system including radio, CD player and speakers, storages as cupholders and glowboxes did not exist in original Böcek. In addition to that, the controls of these items are designed so basically at that time to communize the parts with other car models that Otosan was producing. For instance, the gauges in the dash panel are the ones used in Anadol. The windshield and the headlamps are operated by a basic On/Off switch which is very unusual controls when it is compared with the applications in today's cars. Since the whole body was produced from one piece of fiberglass, all necessary details in Böcek's interior had to be designed separately and attached to the body. Therefore, it was given importance to design all interior components of the car as simple as possible. The shape of the instrument panel was very incomplex due to the difficulty of forming of fiberglass for detailed surfaces in the cowl top area. This resulted a separate and dissimilar designed dash panel with displays and it is attached to the steering wheel column. This typical Böcek dash board design, which is the main element of a car interior, unfortunately, cannot be carried over to the New Böcek since it cannot provide a base to construct a totally improved and new instrument panel. There is no way to keep the nostalgia of the vehicle in its interior design and it has no point to be inspired to design a new IP. Therefore, totally different interior is built in the New Böcek.

Today's vehicles have many control points for improved front and rear lightning, wiper operations, warning signals and high technologic user friendly systems such as, navigation systems and easy controls for air conditioning, seats and also side mirror adjustments that provide driver and passenger a comfortable and enjoyable drive. Therefore, the New Böcek has to contain all these features in it to be a competitor vehicle in today's car market. Entirely new designed instrument panel is the only recipe to build a modern interior while keeping some minor and appropriate items the same or a bit changed as it is original. The new instrument panel is made of polyurethane that provides a soft touch and surface pattern. This material is also suitable for this application due to its high formability and sun resistance. The upper portion of the instrument panel is softer than the lower part to ensure soft impact in the crashes.

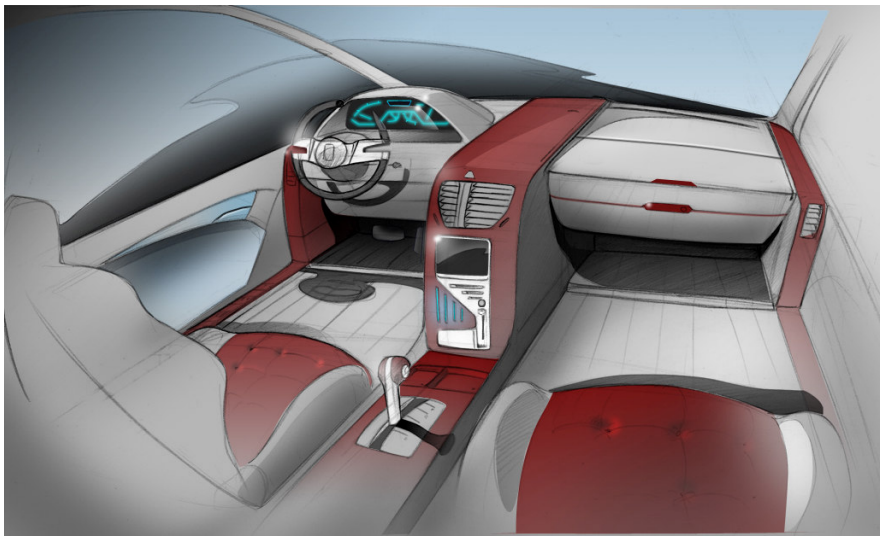

Figure 4.13. Interior of the New Böcek

One of a few retro items that can be kept, in my opinion, is the steering wheel with two wide symmetric spokes divided in their centers to provide an ergonomic handle for the driver. The new steering wheel is built similar in shape with the original one but it is made of polyurethane wrapped by beige and dark black leather. The main form of the original steering wheel is used in its new design by softening the lines and designing the center of the steering wheel to be able to contain the airbag module easily. Gear shift gaiter is also designed to be in line with the steering wheel. It has two different color different on its head and main body.

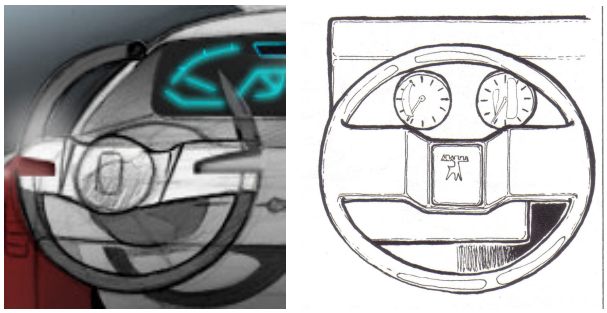

Figure 4.14. Steering wheel of the New Böcek and its original

The storage space on the right hand side of the IP is another element that could be transferred to the New Böcek however today's regulations do not let this type of application in car's interior. The storage spaces must keep the items inside and not let them move when the car accelerates or decelerates. Therefore, the only way to keep that feature is to put a cover on it. This also enables to modify the lower glowbox as a cooler or another feature. It has a dependent lock with central locking system to secure the items inside the glowbox when the car is fully open.

Instrument panel of the New Böcek consists of dash board in driver side and two glowboxes with passenger air bag module in the passenger side. All important controls are gathered in the center IP such as, air conditioning, sound, and navigation system. IP has four air blowers; two big ones in the center and two smaller ones on the sides. There is a big LCD in the center that displays all visual messages of air conditioning, sound and navigation system. This LCD screen simplifies the whole console with providing all information from one source. Just below the LCD screen radio and CD player controls are placed in an order. Buttons for the radio stations, sound adjusters and volume controls followed the main line of the center console. CD player is installed vertical due to the new package. The last item in this control group is the astray and cigar lighter pack which can be served as another storage for mobiles with 12V power output. The center console continues through between the front seats and finishes just in front of the rear seats. There are gear shift and handbrake with cup holders in front of them. The center console and side portions that house the air blowers have the same exterior body color as another reminiscent point with original Böcek.

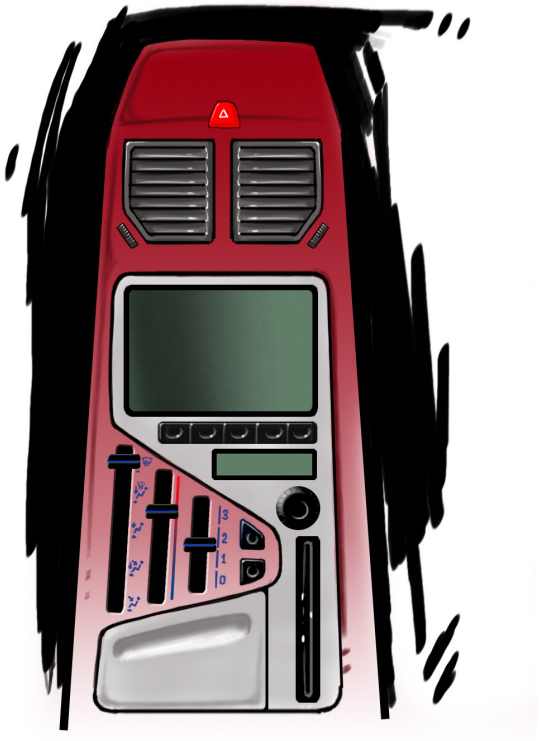

Figure 4.15. Center console of the IP

Since this vehicle is the retro of the original Böcek, the same or similar design approach that was used in creation of New Beetle was applied in this study. It was something like playing around original vehicle and updating the old model with current technology and as a result, a new Böcek is born. However, this time it can also be used another way of doing a retro as taking a feature from another car different than its predecessor but from a car that was produced in the same period of Böcek. Original Böcek had no air conditioning and climate control buttons unlike New Böcek. Since the new vehicle has to have a climate control, it is a really good idea to use a well-known item from other cars in that period, like what was done in PT Cruiser. Therefore, for the climate controls the buttons that can move in a slot is used instead of circular ones which it can be seen in every car in today's world. The controls are for fan direction, temperature and fan speed with their neon blue lights.

The general style continues in the dash board that does not have separate gauges. Dash panel is made of one piece, shows speed of the vehicle, rpm of the engine, temperature of the engine coolant and the amount of gasoline separated with an orange line. All warning signals are got together above of the gas and heat needles. All needles and numbers on the dashboard are bright blue on a black background. The size of the

speed and torque displays are the same since this vehicle is designed to provide enough power in the seaside. The speed has a second priority for that specific usage.

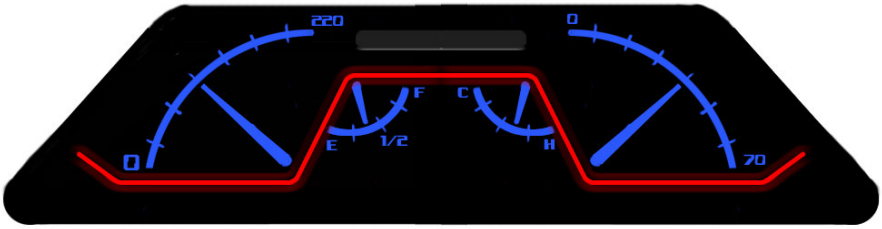

Figure 4.16. Dashboard

All controls for the exterior lights, wiper operations and signals are gathered in both right and left arms under the steering wheel.

Front seats have sporty design and made of fabric with two colors like original Böcek. The sides and back of the seats are covered with a gray fabric and the rest has the same color as its exterior. This style is also repeated in the rear seats. This time all seats have head rests and 6 way control for comfort. Door inners are trimmed with plastic covers in gray color and have matte chromed door inner handles in the same pattern with the instrument panel.

As a general view, the whole interior is designed to be kept the exterior style of the vehicle inside. The lines are mainly soft but sharp in some specific points at the same time to give the sporty look of the vehicle exterior.

CHAPTER 5

CONCLUSION

In this thesis, the aim was to give general information about the main principles of retrospective approach in automotive design. To conclude, the meanings of the word "retro" and the phrase "retrospective design" were defined and analyzed with some examples from a variety of design disciplines that show logic behind the retrospective design. After getting a general view about retrospective design, it was focused on the main aim of this study, which is retrospective automotive design. After comprehending the changes of the car body design according to the historical eras, it was concurred that retrospective styling was the latest trend in the car design that started in the last decade of the 21st century with giving examples of the current car's world.

In order to understand the retrospective approach in automotive design, the study was supported by two case studies. In the first case study, two very well-known retro styled cars, which can also be described the first examples of retrospective automotive design, Chrysler PT Cruiser and Volkswagen New Beetle were taken to be examined according to their retrospective properties. All interior and exterior features were reviewed and it was found how different they are from each other although they are put in the same category called "retro cars". In the second case study, to show what it was gained from all this research about retrospective car design, an old Turkish car, which could not reach high production volumes but had a futuristic design with lack of financial support, Anadol Böcek was redesigned according to the retrospective design approach to become suitable for the needs in today's world.

The first case study showed us that both PT Cruiser and New Beetle have so many retro cues from past and this makes them to put in the retro car category although their designers do not want to describe them as "retro". They both called retro but they have so many differences according to their way of their design. PT Cruiser is carrying a lot of reminiscent cues from the general body design of the vehicles from '30s and '40s. All classical and pronounced design elements from that decade were used properly to create a vehicle in small sized vehicle with compact design and good package. In fact, PT Cruiser used a nugatory feature of the past vehicle as an advantage in today's

car; curvy fenders. The main reason to use curvy fenders in PT Cruiser is to keep the interior space uninterrupted by moving the rear wheels away from the vehicle under the rear fenders of this tall profile vehicle. This is a very good example to use retrospective approach to help solving today's problems in car design. The main design of PT Cruiser is inspired by the classical American hot-rods. However, the main target customers are the Europeans who like economical and small sized cars. PT Cruiser never reached to its target sells in Europe since it was served to the customers who are not familiar and emotionally linked. A car, which was shaped in an American classic, excited not many European users but it succeeded to become a popular vehicle in U.S. Another advantage of PT Cruiser came from the design philosophy of the Chrysler Company. They are always trying to keep the originality of the concept in a new vehicle launch while transferring the concept vehicle to real production vehicle. PT Cruiser has lots of unique parts from other Chrysler models to create the uniqueness of the vehicle in Chrysler products. All these make PT Cruiser a good example for the retro styled vehicle.

Volkswagen New Beetle is the redesign of the original Beetle from '50s. Its exterior design was developed according to the shape of the original Beetle. The main aim of this vehicle was to increase the sales of Volkswagen in U.S. and they were successful on this with selling more than 500.000 New Beetles from 1998. The word "Volkswagen" means "Beetle" for all Americans. The company knew this truth. They did their best to hit American's from their heart and they gave them their peace and simplicity icon. However, the new vehicle had so many differences from its original. In the package of the new vehicle, three circle profile design inspired from old Beetle provides poor visibility due to big side pillars and insufficient head room for the passengers at rear and cargo space in the trunk. They solved so many problems of the original but to keep the exterior design as retro, it was made a concession from some positive properties of the new vehicle. Another disadvantage of this vehicle it has so many common parts with other Volkswagen models to decrease the cost of the model with communizing the parts in all vehicles. This makes New Beetle estrange from its original in its interior. All these negative properties could not hold New Beetle to have a great success in U.S. and this shows that the aim of its design was clearly chosen and the vehicle is successful in the market even it had so many defects.

In the second case study, Anadol Böcek was redesigned according to the same strategy that was applied to the New Beetle. Unfortunately, this vehicle is not perfectly suitable to be retro styled due to what it was. A vehicle should be very well-known for

everyone, especially for the target market when we can see in the PT Cruiser example, to be retro designed. It should be worth to take it back to life if it carried legendary items in its design. For this side, Anadol Böcek is not the right choice but it is the best one with its futuristic and extraordinary design among the other few examples in Turkish car history. The original design has also so many negative points, like unsafe structure, basic-sketch like exterior, chaotic interior design with insufficient options. While designing New Böcek, the main feature of the vehicle; side profile, is kept the same as original and all sharp edges and corners were turned to gentle radius and the general shape of the vehicle was obtained by playing with surfaces into and outward from the car in body side. This is the big part of the retro styling study of this car. Thus, this shows that the main retro styling is occurred in the exterior of the vehicle since the exterior describes the vehicle better than any feature. However for that point of view, Böcek's exterior design provides an advantage for the new design, since it is so simple and discrete and lets the designer change it to various different concepts and still have some reminiscent points with its original.

Unlike Böcek's exterior, its interior does not have enough characteristics that can be inspired for the new design. It is also important that the original design has to have its unique characteristic and features in its interior to be redesigned as retro. Unfortunately, interior design of a retro vehicle has the same problem in common. Since the technology, customer expectations, regulations, legal requirements at the time when the original ones were designed is different than today, it becomes really difficult to keep the interior of a retro vehicle to be reminiscent of its original. Particularly instrument panels had so many design changes through the time passed. Nearly every car today has a center console where air condition, sound system controls and gear shift are fixed onto, unlike the cars from '30s to '60s.

Designing a retro vehicle is difficult and time consuming process. First of all, the original vehicle or group of vehicle needs to be chosen carefully to create another successful vehicle from its successful predecessor. After prosperous vehicle choice, all history of the vehicle needs to be investigated deeply; analyzed and basic parameters need to be determined to structure the retro vehicle. In the design point of view, original design needs to be studied in every tinny details and it is decided which items will be carried over to the new design. While doing this, the most important point is not to use the non-realistic and unacceptable features in order to keep vehicle "retro" with more similar elements with its original. This does not make the new design retro; in fact this

only makes it an unfortunate reputation of a vehicle which is outdated from its time. To use common components with other cars of the same brand is another point that needs to be carefully decided. It should not be forgotten that retro vehicles are concepts that are designed to create an emotional link between customer and product. Therefore, the more reminiscent and smart point the vehicle has the more attractive it is in the market and this emotional relation between customer and vehicle should not be harmed due to using common components with other cars in the market especially while customers prefer this vehicle in order to have a totally different vehicle than others. The main logic in retro is to use the same design parameters of one vehicle from past to create a new and totally modern concept that meets today's needs. While doing this, the right way is to serve the new technology through the filter of past and familiar in shape or logic. This is the only way to reach a successful retro styled vehicle at the end that excites people and become a legend in automotive industry.

Retro styling that has been used in fashion design for a long time is just a transition period of the new century in automotive design. Common design language trends such as "organic", "edgy", "cab-forward" and "retro" were noticeably absent in this year's Auto Shows. This trend occurs due to making a summary of the last century for the car design point of view and it is a really good way to make money for the car manufacturers with attracting customers' attention with creating emotional designs to catch them from their hearts. Retro styling is the brilliant way of making some time to work on the new trends and styles in cars in the future and set up the new century's trends in automotive industry. Anyhow, it will never end but never continue till the end of time since there will be always some flashbacks in the design as long as people continue to miss their past. It is sure that it is not so far from us to see a flying Beetle in the future.

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