

FUNDAMENTALS OF PROJECTING EXTERIOR DESIGN OF AUTOMOBILE

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Abstract: the content of this article is about how to realize your concepts of outer design of automobile from idea to realization. Furthermore, one can find practical examples of how car designs are usually projected starting from zero, in the chronological order. Throughout this article, those who are interested in designing cars, will find a valuable information about the fundamentals of projecting and sketching those projects both on paper, and three dimensional physical versions. The steps of projecting were given with examples, and graphic illustrations were given where necessary.

Keywords: aerodynamics, automobile, automotive, car, comfort, complex plan, construction, design, ergonomic convenience, exploitation, exterior design, fantasy, fundamentals of projecting, further development, idea, modify, outer design, projecting, quality, realization, safety, the harmony of colors.

ФУНДАМЕНТЫ ПРОЕКТИРОВАНИЯ ВНЕШНЕГО ДИЗАЙНА ЛЕГКОВОГО АВТОМОБИЛЯ

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Аннотация: содержание этой статьи о том, как реализовать свои концепции внешнего дизайна автомобиля от идеи до реализации. Кроме того, можно найти практические примеры того, как обычно проектируются конструкции автомобилей, начиная с нуля, в хронологическом порядке. В этой статье те, кто заинтересован в проектировании автомобилей, найдут ценную информацию об основах проектирования и эскиза этих проектов как на бумаге, так и на трехмерных физических версиях. Шаги проектирования были приведены с примерами, и при необходимости даны графические иллюстрации.

Ключевые слова: аэродинамика, автомобиль, легковой автомобиль, комфорт, комплексный план, конструкция, дизайн, эргономичное удобство, эксплуатация, внешний дизайн, фантазия, основы проектирования, дальнейшая разработка, идея, изменение, проектирование, качество, реализация, безопасность, гармония цветов.

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The importance of the study

Statistically, about 40 countries deal with automobile industry around the world [3], they produce, or at least, assemble cars, the parts of which are collected from other countries. However, only a tiny minority, about 10 of those countries [4], start the production from designing the construction. Those who construct the automobile, have the right to export their products around the globe. But those who only assemble, should at least produce more than 52 percent of the automobile parts locally to have the right to export them. Our country, the Republic of Uzbekistan, is one of the countries which produces cars of different type, starting from sedan to universal type of motor vehicles. The matter is, we have produced millions of cars for 21 years throughout our production history (1996-2017), and we have exported cars globally. Recently, our national brand name and its logo has been approved. However, we haven't produced Uzbek model of automobile under our national brand. Our aim is to work out a new design – national design of automobile and want it to be spread as an internationally renowned automobile. Moreover, we want to encourage the students of higher education to come up with their own model after reviewing this article. It can both be beneficial for the youngsters of this field, as it is going to lead to a creative thinking, and for the development of the automobile industry.

Introduction

Almost everyone, at least once in a lifetime, rides a car, and eventually, want to have their own automobile. However, when it comes to choosing the car, almost all of the customers ask the same question: "What does it look like, a Jeep, a sedan, a pickup, or a hatchback?" Yet others claim some certain factors like the convenience, safety, the use of petrol, etc., as a top priority. When designing the car, however, designers take into consideration everything from the point of safety, which is vital when driving a car, then from the point of efficiency, let's say the lesser use of petroleum, or cheaper prize of automobiles and definitely with good comfort. Bearing that in mind, throughout this article, it is our aim to thoroughly discuss how the outer design of a car is projected from zero to the realization in the market.

Designing and projecting

Everybody has their own taste, fantasy, or an idea of how their imaginary car looks like. Depending on that fantasy, designers first draw the draft, or what we call “image” of the automobile, put their ideas on the paper, or on a board. That is called “sketching” (see Fig. 1). However, it is not only for designers, to design the exterior of an automobile, there is also a direct correlation between the designer and the engineer. If engineers need it, they can sketch in a few details for designers.

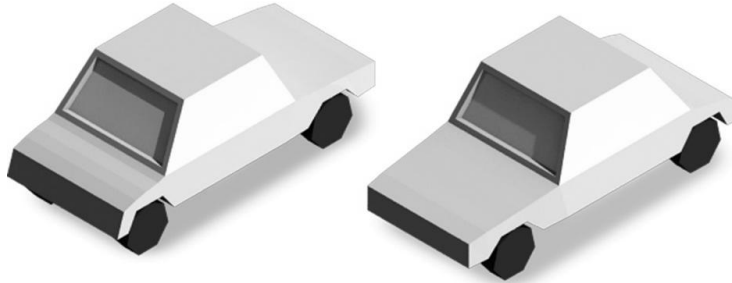


Fig. 1 That is called “sketching” [5]

There are several requirements for the sketch to be approved.

First and foremost, the design should not repeat any of the previous projects of designers, as it is strictly criticized amongst the design developers. Some part should differentiate the design from other projects with clear distinction.

Then, the new design should win the competition amongst other projects for its unique factors which outweigh other designs. As there are some certain factors, to win the competition.

Last but not least, the design project should be based on a complex plan [6], which represent everything in detail, with blueprints. There are exact requirements for the complex plan, as it specifies the main tasks of constructors and designers. There should be certain reasons for any amendments made to the plan by a designer or a constructor. The complex plan should present the technical capabilities of the construction. There are different factors for a design of a car. But the essential ones are: the safety, the comfort, ergonomic convenience, the aerodynamic efficiency, and the fuel efficiency.

After the complex plan is completed, and the design is approved, a 3D model of the construction is worked out [6] (see Fig. 2).

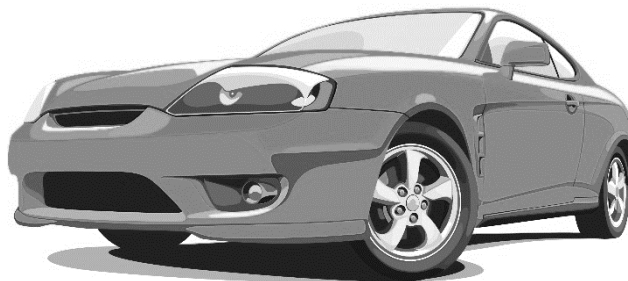


Fig. 2. 3D model of the construction is worked out [7]

The 3 dimensional model is then checked elaborately in detail, and as a whole. The first prototype of the automobile is usually made up of plastics: the frame is prepared from plastics. It is then covered with a special mud, which is easy to use to form the shape of the construction. In other words, the model is sculpted by a sculptor.

After the sculpture work, the body of the construction is wrapped with a special material, which serves to imitate a hard surface. However, before painting and putting into mass production, the model is first approved by a group of specialists, experts of the field. If it is not approved, then it is send for further development.

There is a difference between the optimal version and the perfect version of the model. It is up to the agreement between the engineer and the designer, when to stop developing. Because that is a critical point at which every single step and detail should be taken into account. Until they make sure everything's considered, they experiment a lot of trials, further development, reprocessing, updating, testing, follow-up, etc.

One of such developments is to test the vehicle in Aerodynamic tubes. This process includes checking automobile for a smooth airflow through automobile. While this helps for better passenger safety, it also economizes the fuel [6]. Furthermore, automobile with good aerodynamics has good properties like the stability

when driving. As aerodynamic test defines the points which prevent the airflow which causes to slow down the car.

After the construction is approved, it is then send to further designing of the exterior: painting – a very critical element of the outer design. Selecting a suitable color specifies and reveals all of the hard work, and commitments of the constructor. When painting the body of automobile, it is crucial to follow the harmony of colors between parts. As it should correspond to one another. Moreover, to enrich the elegance of automobile, other decorative accessories are also used.

Realization

In order to be able to sell the product in international markets, the product should have a certificate which proves the product quality. There is a point at which the automobile is tested in some areas where the temperature is not moderate, and has extreme conditions. Besides, there is also a “crash test” which is done to check the level of shockproof in case of an accident. After all kinds of tests are implemented, then it is time to manufacture the product to sell it in the market both: in local markets and in the world market. In order to do that, they announce and advertise via photo and video presentations.

Summary

All in all, projecting the design of automobile is creative work, it should be treated both: creatively and critically. Those who reach the end of the procedure – the end of designing, then without doubt it brings in a lot of income out of marketing, and provides with stable business, creates opportunities for young graduates to be employed, which helps to grow the economy and well-being of a country, so forth.

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