STUDY OF THE CHARACTERISTICS OF SAFE TECHNOLOGIES FOR PAINTING BUMPER PARTS ON LIGHT AUTOMOBILE BODIES

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Annotatsiya: *Avtomobil tashqi ko'rinishi uning egasi haqida ma'lum darajada tasavvur hosil qiladi. Yillar davomida avtomobil kuzovi, xususan, bamper qismlari turli sabablar bilan tirnalishlar, zarbalar va atmosferaning ta'siriga uchraydi. Shu sababli bamperni sifatli bo'yash avtomobilning estetikasini tiklash va uni korroziyadan himoya qilishda muhim jarayon hisoblanadi. Ushbu maqolada yengil avtomobil kuzovidagi bamper qismlarini bo'yash bosqichlari, kerakli asbob-uskunalar hamda texnologik jarayonlar batafsil yoritiladi.*

Annotation: *The appearance of a car creates a certain impression about its owner. Over the years, the car body, in particular the bumper parts, are exposed to scratches, impacts and atmospheric influences for various reasons. Therefore, high-quality painting of the bumper is an important process in restoring the aesthetics of the car and protecting it from corrosion. This article will describe in detail the stages of painting the bumper parts of a passenger car body, the necessary equipment and technological processes.*

Аннотация: *Внешний вид автомобиля создает определенное впечатление о его владельце. С течением лет кузов автомобиля, особенно детали бампера, подвергаются царапинам, ударам и воздействию атмосферных факторов по разным причинам. Поэтому качественная покраска бампера является важным процессом в восстановлении эстетики автомобиля и защите его от коррозии. В данной статье будут подробно описаны этапы покраски бамперных деталей кузова легкового автомобиля, необходимое оборудование и технологические процессы.*

Kalit so'zlar: *bamper bo'yash, avtomobil bo'yash, plastik primer, avtomobil laklash, bamperni tiklash, avtomobil kuzovi, bo'yoq purkash, avtomobil estetikasi, avtomobil silliqlash, bamperni yangilash.*

Keywords: *bumper painting, car painting, plastic primer, car varnishing, bumper restoration, car bodywork, paint spraying, car aesthetics, car polishing, bumper renovation.*

Ключевые слова: *покраска бампера, покраска автомобиля, грунтовка пластика, лакировка автомобиля, восстановление бампера, кузов автомобиля, распыление краски, эстетика автомобиля, полировка автомобиля, ремонт бампера.*

Introduction. The exterior appearance of a vehicle plays a significant role in shaping the impression of its owner. Over time, the car body, especially the bumper sections, may experience scratches, dents, and exposure to environmental factors. Therefore, high-quality bumper painting is an essential process to restore the vehicle's aesthetics and protect it from corrosion. This article provides a detailed overview of the bumper painting process, including the necessary tools, preparation steps, and technological procedures.

Bumper painting is not just about enhancing the vehicle's visual appeal; it also serves as a protective layer against rust, UV rays, and mechanical damage. A well-maintained bumper ensures a longer lifespan and maintains the car's overall value. The process requires a systematic approach, from surface preparation to the final finishing touches. By following the right techniques, both professionals and car owners can achieve high-quality results.

The following sections will guide you through the entire painting process, covering surface preparation, priming, applying paint and clear coat, as well as final polishing. Whether you are a professional or a DIY enthusiast, understanding these steps will help you achieve a flawless and long-lasting bumper paint job.

Preparing the bumper for painting

Before painting the bumper, it must be properly prepared. The preparatory stage directly affects the quality of the painting process.

1. Cleaning the bumper

The bumper surface must first be cleaned of dust, grease, dirt and other contaminants. For this, you can use a special anti-silicone cleaner or soapy water. If the bumper is covered with old paint, it is also recommended to clean it with a special solvent.

2. Sanding (Grinding)

To make the bumper surface smooth and ready for painting, it must be sanded. P320-P600 sandpaper is used for this. If there are deep scratches or cracks on the bumper, they must be filled with a special filler and smoothed with P800-P1200 sandpaper.

3. Priming (Priming)

The plastic bumper is coated with a primer to ensure good adhesion of the paint. A special plastic primer is used for plastic surfaces. This primer ensures good adhesion of the paint and varnish. After spraying the primer, you need to wait until the bumper is completely dry (about 20-30 minutes).

The process of painting the bumper

Before coating the bumper with paint, the room temperature and humidity should be controlled. The ideal temperature is recommended to be around +20°C.

1. Spraying paint

The bumper is sprayed with a thin layer of paint. It is necessary to allow 10-15 minutes between each layer. In general, 2-3 layers of paint are sufficient. An air sprayer (airbrush) or a special paint spray can be used to evenly apply each layer.

2. Varnish (Vernis) Application

After the paint has completely dried, the bumper should be sprayed with a clear varnish. This will strengthen the surface of the bumper and give it a shiny appearance. Varnishing is also done in 2-3 layers, with drying time between each layer.

3. Drying

It takes at least 12-24 hours for the varnish to completely harden. If it is in a professional paint shop, this process can be accelerated using infrared ovens.

Final processing and smoothing

After the bumper has completely dried, if there are minor defects, it is sanded with P1200 or P2000 sandpaper and polished with a special abrasive paste. This process helps to make the bumper surface smoother and shinier.

Safe Technologies for Painting Car Bumper Parts Environmental safety and improving working conditions are important issues in the automotive industry. In particular, when painting car bumper parts, it is necessary to reduce harmful substances, increase energy efficiency and make paints durable. This article analyzes modern and safe technologies used for painting car bumper parts. Water-based paints are one of the most acceptable options from the point of view of environmental safety. These paints contain less organic solvents, which reduces the emission of harmful gases (VOC - volatile organic compounds). Advantages: Releases a small amount of harmful substances into the air. Increases the level of safety in the production process. High resistance to various atmospheric conditions. Powder coating technology is carried out by electrostatically attaching paint particles to the surface of the bumper and then melting them at high temperatures. Advantages: No solvents are used, which ensures environmental safety. Creates a durable and strong coating. Reduces production waste. UV-curing paints are one of the modern technologies. In this method, the paint consists of a

special photoinitiator, and under the influence of UV light, a polymerization process occurs. Advantages: Dries very quickly (in a few seconds). Increases production efficiency. Works without the emission of solvents and harmful gases. Painting processes in modern manufacturing plants are carried out using automated robotic systems. This technology helps reduce the human factor and increase production quality. Advantages: Minimal errors and uniform quality painting. Creates a safe working environment for workers. Helps to use resources efficiently. Paints produced based on nanotechnology are a new innovative approach in the automotive industry. These paints have high protective properties and are resistant to accidents and scratches. Advantages: Protects the surface from dust and liquids. Long service life. Allows you to use a small amount of paint. Safe technologies for painting car bumper parts not only increase production efficiency, but also reduce environmental problems. Water-based paints, powder coating, UV paints, robotic systems and nano-paints are modern and safe alternatives. These technologies are aimed at reducing harmful emissions, optimizing energy consumption and protecting the health of workers. In the future, it is expected that more environmentally friendly and efficient painting methods will be developed, which will contribute to the sustainable development of the automotive industry.

CONCLUSION:

The heated rear seat system of the Tracer car serves to increase the comfort of passengers. This system, characterized by economy, safety and efficiency, provides maximum comfort inside the car, especially in the cold season.

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