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Matrix Headlights

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Matrix headlights are high-tech developments, thanks to which the motorist began to feel more comfortable and safer when driving in the dark. Unlike standard optics, matrix headlights provide a sophisticated LED system, controllers and intelligent modules. Matrix optics automatically adjusts the brightness and illumination of zones depending on the traffic situation. The driver no longer needs to think about switching between light modes, as the built-in intelligent system is involved. It has such functions as: changing the direction of the light flux, recognizing and illuminating pedestrians, road signs. When vehicles are detected, the system automatically turns off those LEDs which light flows from the maximum to the car. When people or animals are detected, the headlights automatically flash three times in high beam mode. When a sign is detected, the beam of light focuses on it. This increases the attention of both the driver and pedestrian. Advantages over other types of headlights are: a) overall dimensions - halogen and gas-discharge optics require a large mounting space, and LEDs are easy to install even on a small board; b) service life - the system consists of a minimum set of elements susceptible to malfunctions and failure; c) lighting brightness - the indicator is regulated by the characteristics of the LEDs; d) lighting control - using sensors and vehicle recognition systems, objects are automatically analyzed and lighting modes are changed. The matrix completely switches off the adaptive high beam at speeds below 60 km/h. It changes the beam of

light depending on weather conditions. In fog, the headlight shines down under the bumper and to the side. In the city, the beam narrows, but on the suburban highway, on the contrary, it widens and crawls out to the side of the road. If the camera sees a person walking, then one of the modules directs a bright beam at the pedestrian and illuminates him in the dark. This helps a lot when traveling past villages. The possibilities of matrix LED headlights are endless. The design of this type of headlight consists of separate modules - high beam, low beam, direction indicators, overall dimensions. All this is arranged in a single block, the shape of which depends on the vehicle design and design solutions. Each module uses a group of LEDs. For example, in the high beam section, there may be 25 of them, grouped by 5 pieces. Each group has its own reflector and radiator for cooling. Among the disadvantages of optics, only the high cost and use of technology in premium cars can be distinguished. Matrix laser headlights are used in the latest Audi models. In this design, the light is a laser. Its beam, passing through a special lens coated with a special fluorescent compound, acquires white light and becomes safe for the eyes. The matrix laser headlight can selectively create shadow zones, for example, for oncoming cars. Moreover, it can regulate the beam propagation. For example, when driving on a highway at high speed, the beam becomes narrower, the light is concentrated in a narrower beam, shines farther and brighter. When moving slowly the beam expands to cover most of the surrounding area. Matrix headlights make driving on the road much easier, especially in bad weather conditions or at night. The driver does not need to switch light modes, but to turn [1].

References:

1. Matrix Headlights. [Electronic resource]. – Mode of access: <http://systemsauto.ru/electric/matrix-headlights.html> – Date of access: 15.03.2021.