Ergonomic Embodiment of the Car Body Design

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Abstract: The design of the body of a car mainly refers to the design work of the car's own engine and the slave drive structure, the interior assembly and other related components. In addition, it also includes whether the space and parameters for ensuring the body arrangement and design of the car body interior can be met with the standard specification. According to the main purpose of the car body design, the analysis of the design and layout work is carried out, and it is clear that the important goal of the design work is to obtain a larger space for the interior of the car while ensuring that the vehicle is in a similar quality level. Therefore, ergonomics plays an important role in car body design work.

1. Introduction

The size data of the human body plays a decisive role in the size and range of the human body. Through the application of ergonomics, it can ensure sufficient space for the movement of the car body interior, and at the same time ensure the layout design work of the interior of the car. Rationalization, in the actual design of the car body, it is necessary to apply the relevant theoretical knowledge of ergonomics, and to clarify the specific scale and numerical value of the human body, and to produce a representative model of the most valued model, thereby clarifying the design of the car body interior which is the specific structure and size. In the process, the staff is also required to regard the human body as the center of the entire design work in order to effectively prevent the human body from being injured in the car, and to ensure that the driver and the passenger can adjust their posture at will in the body, to an extent in order to achieve the design cost savings. Usually, in the process of designing the car body, different body size models are often used to carry out the design work, and the actual human body size is represented according to the actual situation.

2. Specific Application of Ergonomics in Automobile Body Design

2.1 Application of Ergonomics in Car Door Arrangement

Under normal circumstances, the shape of the door on the side of the car body, the size of the door and the position of the car will be affected by the convenience of the driver and the passenger getting on and off the car. Under the current development stage, the car usually chooses a thin top shape when designing, the lateral curvature of the car roof is relatively small, and the cross-sectional size and height of the car door are gradually reduced, ensuring that the height of the car body does not change, thereby effectively improving on the convenience of getting on and off the bus. In addition, when designing the car body, the designer can add the sill and the door beam to the door of the car according to the actual situation, and a certain offset occurs in the lateral position, thereby increasing convenience. For the two-door car, in order to ensure that the rear passengers of the car get off the train, when designing the door arrangement, the appropriate door opening width can be increased, or the front seat in the car can be designed to be self-contained. In the form of a folded structure, for a four-door car, the designer can place the center column in the rear seat channel so that it can maintain a certain degree of inclination. On the basis of ensuring the scientific rationality of the design, it is convenient for the driver and the driver. Passenger use and travel.

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2.2 Application of Ergonomics on Driving Seats of the Car

First of all, in the process of designing the driver's seat, the ergonomics and the human body model can be directly used to determine the points. On the other hand, it can be determined according to the height of the interior floor of the vehicle body and the position of the pedal, as well as the human body model can also be used to determine the actual height of the lining of the top cover, and the arrangement and design are carried out with the help of the mannequin template. At the same time, it must be noted that the design of the human body should be used as the starting point. after determining the specific position of the human body model, which must also ensure that it has enough space for the movement to continue to determine the seating position.

2.3 Application in Driver Seat Layout Design

Under normal circumstances, the adjustment of the front and rear position and the upper and lower levels is affected by the size of the human body itself, and it is necessary to consider whether the driver has room to adjust the posture. And the lower the posture of the driver sitting on the seat, the more and more the backrest angle will change, the distance between the pedal and the backrest will also be enlarged, and the driver's own riding posture is for the seat. The height will also have an impact. If the backrest angle is continuously increased, the position of the seat will be gradually lowered, the height of the seat during design placement will be reduced, and a larger seat tilt angle will occur. This is also the difference between different car models after the actual design is completed, the driver's posture in the actual driving process will be different, the height of the driver's seat is different. It can be seen that the height and position of the seat in the car are affected by factors such as the size of the human body, the driving posture of the vehicle, and the height of the floor of the vehicle body.

2.4 Application in the Design of the Shape and Position of the Section of the Car Dashboard

In order to ensure the convenience of the driver's operation when designing the car body, it is usually necessary to ensure the scientific rationality of the design of the operation control piece and design the handle control within the limits of the driver's free movement. Look for parts that can save effort. Secondly, when designing and arranging the cross-sectional shape of the car interior instrument, the designer should also pay attention to the design of the control indicator button and the instrument panel. It is necessary to use the scale of the human body model for measurement and design. Under normal circumstances, the car interior dashboard The height of itself should be at the same height as the actual height of the cowl cover. If it is necessary to appropriately increase the range of motion in the car interior, the designer also needs to ensure that the surface of the car dashboard is lowered, thereby increasing the driver's field of view in the car.

2.5 Automotive Top Cover and Front and Rear Wind Window Design Applications

When designing the car roof and windshield, the designer needs to refer to the side view of the car body to clarify the specific position of the driver and the passenger in the car body, and to stay in the car by combining with the occupied space. The gap between the foot and the foot, so that the height of the car roof is designed to ensure its scientific rationality. For the three-box type of car, it is also necessary to design according to the actual situation. First of all, it is necessary to pay attention to the separation of the luggage storage compartment of the automobile body from the seat, and follow the actual size of the rear panel of the vehicle body to carry out the design work. Secondly, when carrying out the control of the windshield and the backrest of the car, it is necessary to pay attention to the need for sufficient space between the two to hold the sundries. In this case, the position under the window of the car is also the main support position of the luggage storage box. . In addition, in order to increase the overall space of the luggage storage box to a certain extent, in the design of the rear panel of the vehicle body, it is also necessary to ensure that it can be flush with the seat back of the vehicle and interconnect with the ground inside the vehicle. status.

2.6 Application in Driver Vision Check

In the process of designing the car body, which is by using the ergonomics, the position of the eye ellipse of the field of view can be clarified directly through the arrangement view of the car body. According to the actual field of vision of the driver during the driving process, comprehensive consideration of various factors to actively carry out the field of vision check for the driver. At the same time, when conducting the check, it should also ensure that the design and layout of the car interior can have a full range of vision. The designer must strictly control the actual installation position of the rear view mirror and the exterior mirror to ensure the mirror surface. The overall size and angle comply with the relevant regulations, strictly follow the relevant standards to grasp the radius of curvature of the mirror surface, so that the installation of the mirror is scientific and reasonable.

2.7 Application in the Arrangement of Other Equipment of Automobile Body

In the process of designing and arranging the car body, the designer needs to follow the actual shape and shape of the car body, and control the specific size of the car body to carry out the layout design work for the engine compartment and the car cabin. At the same time, it should be noted. Proper placement of the car fuel tank and the spare tire. Specifically, in the process of arranging the automobile fuel tank, it is necessary to fully understand the size of the specific space in the vehicle, and then ensure that the luggage storage box has sufficient capacity to be placed, thereby providing convenience for people. Guarantee. In addition, it is necessary to use other fields of expertise to increase the design of the fuel tank of the car, so that the fuel tank can be safely arranged in the arrangement, and at the same time promote the professional level of the car design work, so that the design and operation of the car body can conform to the specification. Demand, while meeting people's needs for travel.

3. Conclusion

All in all, the design work on the car body is a complex project involving multiple fields. In the process of car body design, we need to be able to adapt to the constant development and progress of the times, and actively introduce advanced products and science and technology to achieve innovation and change in design and layout. Under the current development stage, in order to realize the advancement of China's automobile industry, especially the long-term development of the automobile industry and design, designers must attach great importance to the important role that ergonomics can play and actively explore. And the application of new design methods and layout methods, timely change of design concepts, to meet the increasing personal needs of people with the improvement of living standards, so that the design of the car can meet the requirements of people, fully reflect the science of automotive design work Sex and comfort are fundamental to promote the sustainable development of automotive body design work.

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