



MAKING CHANGES TO THE DASHBOARD OF A COBALT CAR

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Abstract: This article discusses the improvement project of the instrument panel of the Cobalt car, which is widely used in the Republic of Uzbekistan. Drivers of various heights and body dimensions operate the vehicle. In the case of taller drivers, the knee area often contacts the lighting adjustment switch on the instrument panel, frequently resulting in its damage. According to the proposed project, the lighting control component has been relocated to another position, thereby increasing the general usability coefficient of the vehicle.

Keywords: Instrument panel, mannequin, noise and vibration, lighting control lever.

Introduction

Currently, the automotive industry in Uzbekistan is rapidly evolving. Since the country's independence, automotive production has developed significantly, and special attention has been given to the manufacturing of modern vehicles. Among these, the Cobalt car, produced at the "GM Uzbekistan" plant, stands out due to its considerable production volume. Presently, the Cobalt model has gained significant customer interest and is becoming competitive in the global automobile market.

The "Chevrolet Cobalt" is a family sedan model developed by GM's Brazilian division using the corporation's global design standards. It is designed by GM's global team to meet international benchmarks and perform strongly in emerging markets. The model combines comfort, elegance, high dynamic characteristics, and a timeless classic design. To ensure optimal safety, the Chevrolet Cobalt is constructed from high-strength steel and is equipped with ABS and airbags for the driver and front passenger.

Literature Review

The design of the driver's workplace is carried out in accordance with the standards specified in GOST 37.001.413-86. During the design process, a two-dimensional mannequin, based on GOST 20304-85, is used to simulate the postures of drivers of varying body types. The templates consist of major body parts including the head, arms, and legs (Figure 1). Angular rulers are installed for setting and measuring the angles between axes of these elements. A measuring device is attached to the torso component to set and determine the angle between the body axis and vertical axis [1].

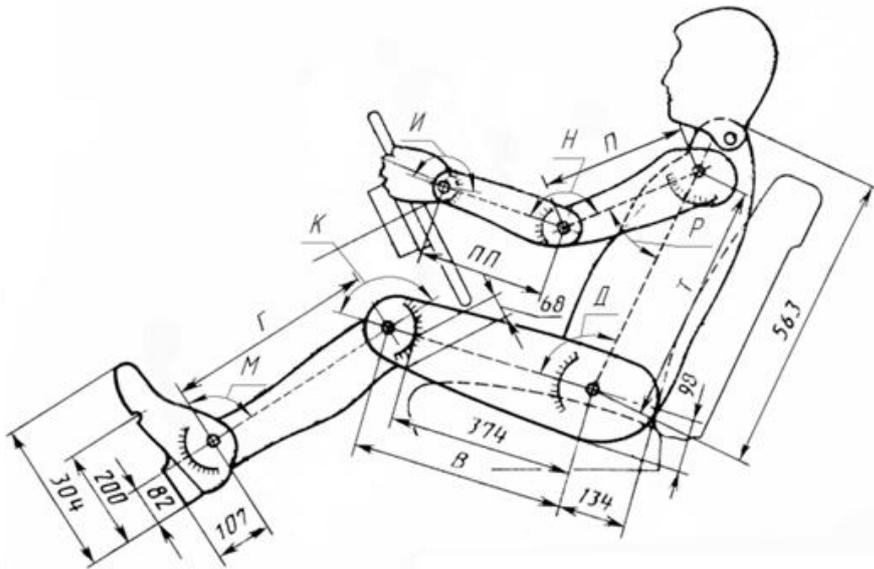


Figure 1. Two-dimensional mannequin

It is well known that individuals vary in height, weight, build, and body part dimensions. Therefore, automotive designers face the complex task of creating vehicle interiors that accommodate drivers and passengers of diverse anthropometric characteristics. Comfort in a vehicle largely depends on ergonomic seating, noise and vibration isolation, and ease of entry. Passengers in the rear seats must also feel comfortable. In many models, the rear seat backrest is already adjustable. The average cabin air temperature ranges from 18°C to 24°C, and the airflow speed is approximately 1 m/s [2].

Problem Statement

When analyzing the lighting control lever of the Chevrolet Cobalt, it has been observed that during driver entry, the driver's knee may contact the lighting adjustment lever, leading to mechanical damage or breakage. While this may not pose a significant issue during daylight hours, it can create a serious safety risk at night. If external light indicators also fail, the risk of accidents increases significantly. A broken lighting lever also disables the vehicle's side lights, license plate illumination, and dashboard backlighting. Malfunctioning tail lights pose a danger to drivers approaching from behind. Replacing the damaged part requires time and resources—an average of 250,000 UZS per repair. Moreover, this problem tends to recur over time, making it a persistent issue.

From a health perspective, forceful knee impact can potentially injure the driver. Although not always severe, the repeated strain over time, especially during long drives (averaging about 3 hours daily), can cause the injury to worsen due to vibrations and body weight pressure. This, in turn, may affect the driver's lower-body mobility. To solve the above-mentioned issues, the relocation of the lever is proposed in a way that avoids interference with other components.



Figure 2. Current Layout of the Cobalt Instrument Panel

Results

Unlike in the Cobalt, similar components in Genra and Nexia 3 are positioned higher, causing no interference. As seen in Figure 2, there is sufficient space above the current location of the lighting lever in the Cobalt, measuring approximately 18 cm in width and 5–6 cm in height. Half of this space is adequate for repositioning the lever, similar to the layout in the Spark model. This space is typically unused, as placing other items there is impractical due to vibration-related inconvenience. Therefore, relocating the control lever to this area is feasible.



Figure 3. Modified Layout of the Cobalt Instrument Panel

Conclusion

This article presents a detailed analysis of the issues related to the placement of the external lighting control lever on the instrument panel of the widely used Chevrolet Cobalt in Uzbekistan. It was scientifically established that the current position of this component is ergonomically inconvenient for tall drivers and may lead to mechanical damage due to contact with the knee. The problem was evaluated from technical, ergonomic, and economic perspectives, highlighting its impact on driver health and overall traffic safety. Based on technical analysis, a proposal to

relocate the lever to the upper section of the instrument panel was developed. This solution is supported by comparisons with the layouts of similar models such as Genra, Nexia 3, and Spark, and is grounded in practical application. The proposed new layout enhances component safety, improves ergonomic comfort for the driver, and does not interfere with other vehicle systems while maintaining aesthetic integrity. Research findings indicate that the new location of the lighting control lever increases overall usability, reduces maintenance costs, and eliminates discomfort affecting driver health. Thus, the proposed design modification may serve as an important step in improving the ergonomics and technological quality of the Chevrolet Cobalt.

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