Subjective Evaluation of Affective Satisfaction of the Driver on High-Performance Driving Scenarios on the Racetrack

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In the automotive industry, emotional quality in vehicle development is an important development factor that determines vehicle quality along with basic performance. Emotional quality can be divided into dynamic and static items depending on whether they are driven or not. Driving emotion is included in the dynamic category. Driving emotion has a comprehensive effect on various factors, including the vehicle’s powertrain characteristics, handling, ride comfort, braking, and noise vibration. In this study, a subjective evaluation was conducted to derive a major factor in emotional satisfaction during sports driving under racetrack conditions. The assessment has been performed on Korea International Circuit, using three cars with four skilled drivers for D-segment sports sedans. The assessment items consisted of powertrain, R&H, and NVH categories, and each item and overall satisfaction were assessed using the rating method. Fig. 1 represents the evaluation track and the evaluation scene. T1~T9 shown on the track indicates the position of each assessment item. First, the characteristics of powertrain were evaluated for driveaway acceleration performance and gear shift quality. And from the R&H aspect, steering response, maneuverability, etc. were evaluated. Finally, from the NVH perspective, the main NVH items that can occur during racetrack driving were evaluated, such as the engine sound at acceleration and deceleration, gear shift sounds, and the tire friction sound during the drift. The results of the evaluation showed that affective satisfaction was more affected by sound than by the handling characteristics.

Fig. 1 Test track (left) for the subjective evaluation and test scene (right)