Document : Intelligent Driving Posture Experiences

Title: Enhancing Driving Comfort through Adaptive Posture Experiences
Category: Driver Comfort — Dynamic Postural Adjustments

Overview

Modern intelligent seats are no longer static systems. Instead, they adapt dynamically to the driving context. Forvia's AI-based seat comfort system provides postural experiences that automatically adjust key seat parameters based on the driving environment — ensuring ergonomic comfort, posture stability, and reduced fatigue.

Two predefined but customizable posture experiences are designed to enhance comfort in different driving scenarios: **Highway Experience** and **City Experience**.

Highway Driving Experience

Highway driving typically involves long durations at stable speed, limited steering interaction, and minimal braking. These conditions increase the risk of lower-back strain, pressure accumulation, and reduced blood circulation. To compensate, the system performs the following seat adjustments:

- **Backrest**: 45
  A backrest recline to 45 reduces axial load on the spine and helps distribute the driver's weight evenly over the seat. This position lowers lumbar disc compression and supports thoracic relaxation.
- **Track**: 70
  The seat track position is extended forward to 70 units to enhance leg extension and reduce pelvic rotation. This improves circulation in the lower limbs and stabilizes pelvic alignment during static cruising.
- **Tilt**: 10
  A forward seat tilt of 1 maintains knee elevation slightly below hip level, which facilitates blood flow and minimizes numbness in long-duration highway travel.

These adjustments are designed to maintain spinal alignment, prevent static fatigue, and reduce pressure concentration under the thighs and pelvis. Drivers often report enhanced comfort over extended periods with these values.

City Driving Experience

City driving includes frequent stops, starts, and turns, requiring high alertness and mobility. The AI seat system configures the seat to support dynamic motion and upper-body responsiveness:

- **Backrest**: 95
  A backrest angle of 95° positions the torso vertically, which improves reaction time and forward visibility. This angle engages core muscles to maintain posture stability during sudden maneuvers.
- **Track**: 40
  The track is adjusted to 40 units to bring the seat closer to the pedals and steering wheel. This reduces the need for leg extension and allows faster foot transitions between pedals, improving responsiveness in traffic.
- **Tilt**: 5
  A slight tilt of 5 promotes hip engagement while avoiding excessive posterior pressure. This angle keeps the driver grounded while ensuring ergonomic comfort during high-interaction driving.

This posture encourages faster reaction to environmental cues, reduces muscular fatigue in short bursts, and ensures that the driver maintains maximum control over the vehicle.