SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35.

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DEPARTMENT OF AUTOMOBILE ENGINEERING

COURSE NAME : 19AUB204 – AUTOMOTIVE ELECTRICAL AND ELECTRONICS ENGINEERING

II YEAR / IV SEMESTER

Unit 5 – Electronics Systems

Topic : Electronic Dashboard Instruments

ELECTRONIC DASHBOARD INSTRUMENT

- Electronic dashboard instruments, often referred to as digital instrument clusters, are essential components of modern vehicles, providing critical information to the driver through a combination of digital displays, analog gauges, and various indicators.
- These instruments enhance the driving experience by delivering real-time data and improving the readability and accessibility of vehicle information.

DIGITAL INSTRUMENT CLUSTER

- **LCD/OLED Displays:** High-resolution screens that can display various types of information in digital format.
- **Customizable Layouts:** Allows drivers to customize the display to show preferred information such as speed, RPM, navigation, and multimedia.
- **Themes and Graphics:** Different themes and graphical representations to enhance aesthetics and readability.

ANALOG DIGITAL HYBRID CLUSTER

- **Combination of Analog Gauges and Digital Displays:** Provides a blend of traditional analog gauges (such as speedometer and tachometer) with digital screens for additional information.
- **Enhanced Legibility:** Digital displays can complement analog gauges by providing more precise readings and additional data.

DRIVER INFORMATION

- **Speedometer:** Displays the vehicle's speed, often with both analog and digital representations.
- **Tachometer:** Shows engine RPM (Revolutions Per Minute).
- **Odometer:** Tracks the total distance traveled by the vehicle.
- **Fuel Gauge:** Indicates the remaining fuel level.
- **Temperature Gauge:** Monitors engine coolant temperature.

STATUS INDICATORS

- **Warning Lights:** Indicators for various vehicle conditions such as low oil pressure, battery charge, ABS (Anti-lock Braking System), and check engine light.
- **Turn Signals and High Beam Indicator:** Visual cues for turn signals and high beam status.
- **Door Ajar and Seatbelt Reminder:** Alerts for open doors and unfastened seatbelts

ADVANCED DRIVER ASSISTANCE SYSTEM

- **Lane Departure Warning:** Visual and auditory warnings when the vehicle drifts out of its lane.
- **Forward Collision Warning:** Alerts the driver to potential collisions with vehicles or obstacles ahead.
- **Blind Spot Monitoring:** Indicators that light up when a vehicle is detected in the driver's blind spot.
- **Adaptive Cruise Control:** Displays set speed and following distance.

DRIVER BEHAVIOUR MONITORING

- **Turn-by-Turn Navigation:** Real-time navigation instructions directly on the instrument cluster.
- **Multimedia Information:** Displays information about the current media playback, such as song title and artist.
- **Communication Alerts:** Notifications for incoming calls, messages, and other communications.

VEHICLE PERFORMANCE DATA

- **Trip Computer:** Provides information such as trip distance, average speed, fuel consumption, and driving time.
- **Tire Pressure Monitoring System (TPMS):** Displays the air pressure in each tire.
- **Efficiency Displays:** Shows fuel economy data and driving efficiency tips.

ADVANCED FEATURED AND INNOVATIONS

- **Head-Up Display (HUD):** Projects critical driving information onto the windshield or a dedicated screen, allowing the driver to keep their eyes on the road.
- **Augmented Reality (AR) Displays:** Integrates AR technology to overlay navigation instructions, traffic signs, and hazard alerts onto a live view of the road.
- **Gesture and Voice Control:** Allows drivers to interact with the dashboard instruments using gestures or voice commands, minimizing distractions.
- **Personalization and Connectivity:** Saves individual driver settings and preferences. Integration with smartphones and other devices for enhanced functionality.

BENEFITS

- **Improved Safety:** Clear and concise information reduces driver distraction and enhances situational awareness.
- **Enhanced User Experience:** Customizable and intuitive interfaces improve driver satisfaction.
- **Real-time Data Access:** Provides immediate feedback and alerts on vehicle performance and status.
- **Aesthetic Appeal:** Modern, sleek designs contribute to the overall look and feel of the vehicle's interior.

FUTURE TRENDS

- **Integration with Autonomous Driving Systems:** More advanced displays to support semi-autonomous and fully autonomous driving features.
- **Increased Use of AI and Machine Learning:** Predictive maintenance alerts and smarter driver assistance features.
- **Enhanced Connectivity:** Greater integration with IoT devices and smart home systems for a more connected driving experience.

THANK YOU !!!