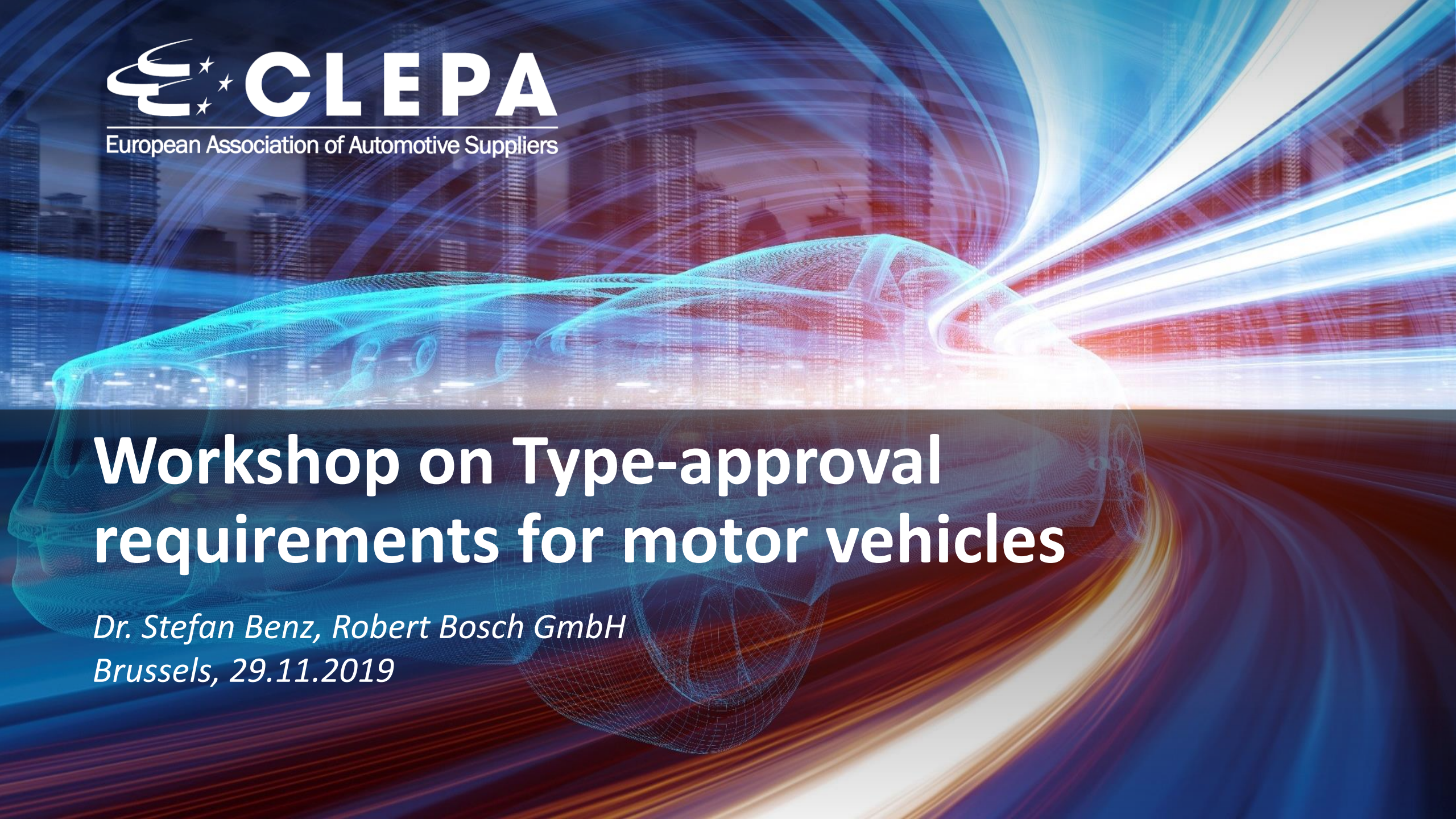


# Workshop on Type-approval requirements for motor vehicles

*Dr. Stefan Benz, Robert Bosch GmbH*

*Brussels, 29.11.2019*

# Workshop on type-approval requirements for motor vehicles

## Importance of the General Safety Regulation

- **CLEPA strongly supports** and urges the revision of the General Safety Regulation as the **main driver for achieving the EU road safety targets in 2020 (or 2030 resp.)**

- It is particularly positive that the Commission proposal includes the **full set of safety measures**, opting for the **maximum reduction** of road fatalities and severe injuries: this will firmly contribute to saving lives across the EU as unfortunately, in the **recent years the casualty reduction has stagnated** therefore further measures are required

- Time is now a critical factor, after the long awaited Commission proposal it may be considered shortening the application timeline in order to **avoid further delay**

- We encourage policy makers to work towards a **swift conclusion of the co-decision** procedure within the current legislative period

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## ESC – an important milestone

- Since November 2014 ESC is mandatory for all new vehicles in the EU

without ESC

with ESC

- Installation rate in EU25 was 40% for passenger cars in 2011
- In 2011: 33.004 accidents with casualties were avoided, 1.069 lives were saved



Image Source: Bosch

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## Topics for Discussion

- **Event (Accident) Data Recorder**
  means a system recording and storing critical crash-related parameters and information before, during and after a collision

- **Driver Drowsiness and Attention Monitoring**
  means a system assessing the driver's alertness through vehicle systems analysis and warning the driver if needed

- **Advanced distraction recognition**
  means a system capable of recognition of the level visual attention of the driver to the traffic situation and warning the driver to the traffic situation and warning the driver if needed

system descriptions quoted from Commission proposal of May 17th 2018

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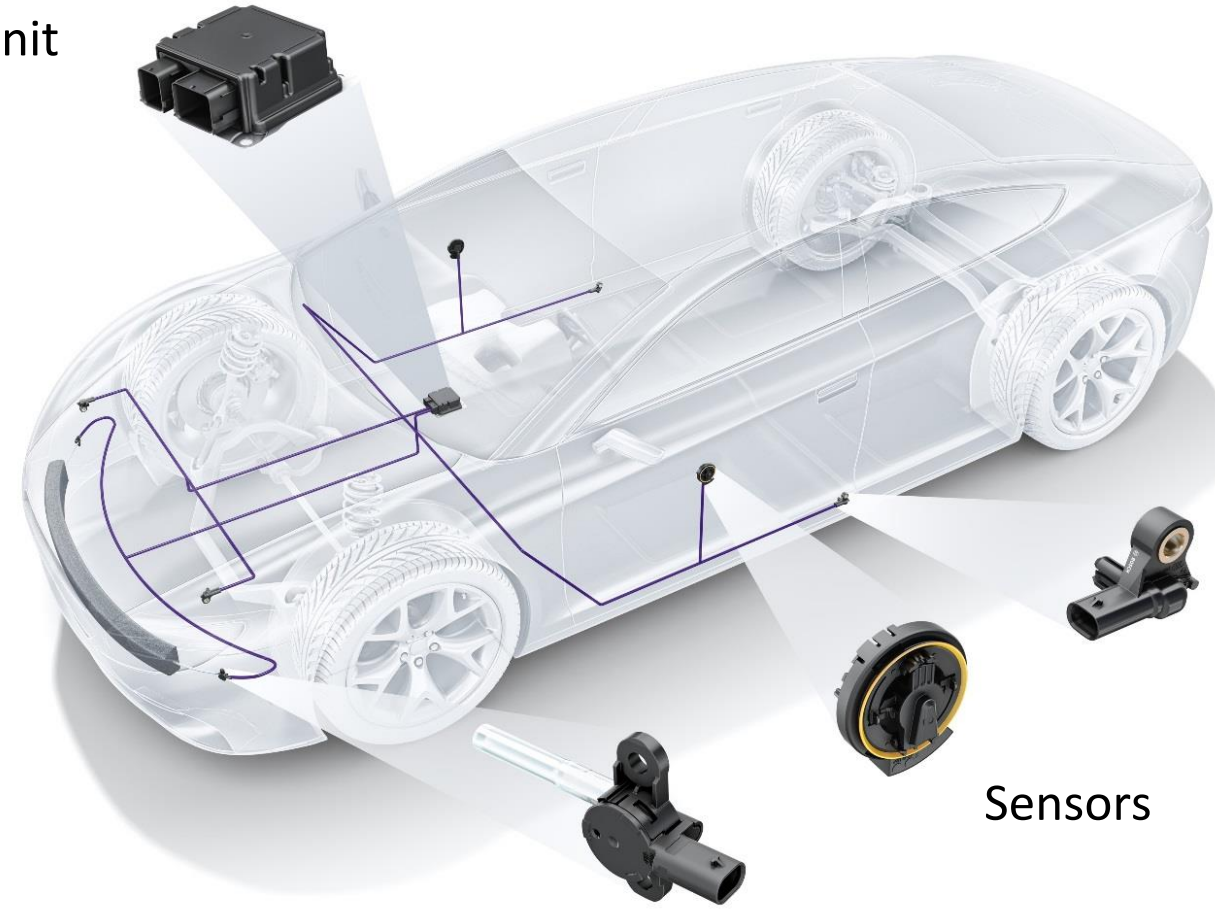
## Event (Accident) Data Recorder

Airbag Control Unit



Sensors

EDR is typically located inside the Airbag Control Unit

Image Source: Bosch

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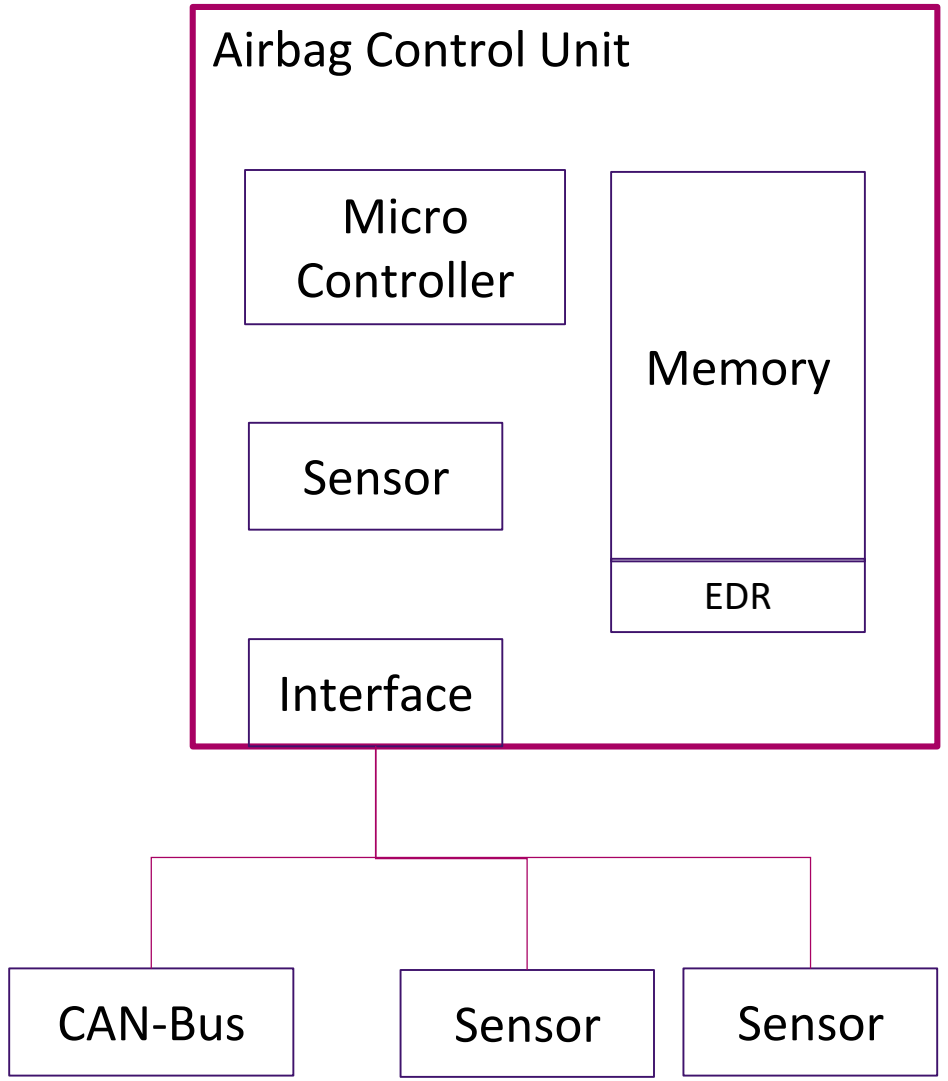
## Event (Accident) Data Recorder

- Collection of crash incident related data prior and during crash:
  - vehicle speed
  - lateral and longitudinal acceleration
  - the vehicle's roll angle
  - ABS or ESC activity status respectively
  - seat belt status
  - airbag or other restraint system activation
  - …
  - No audio or video, no personal data (e.g. age, gender, ID, etc.)
- Content is vehicle-specific
  Best practice for min. requirements:
  U.S. NHTSA 49CFR part 563

Typical architecture:



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# Event (Accident) Data Recorder

- Data access: Example Bosch **C**rash **D**ata **R**etrieval Tool[1]


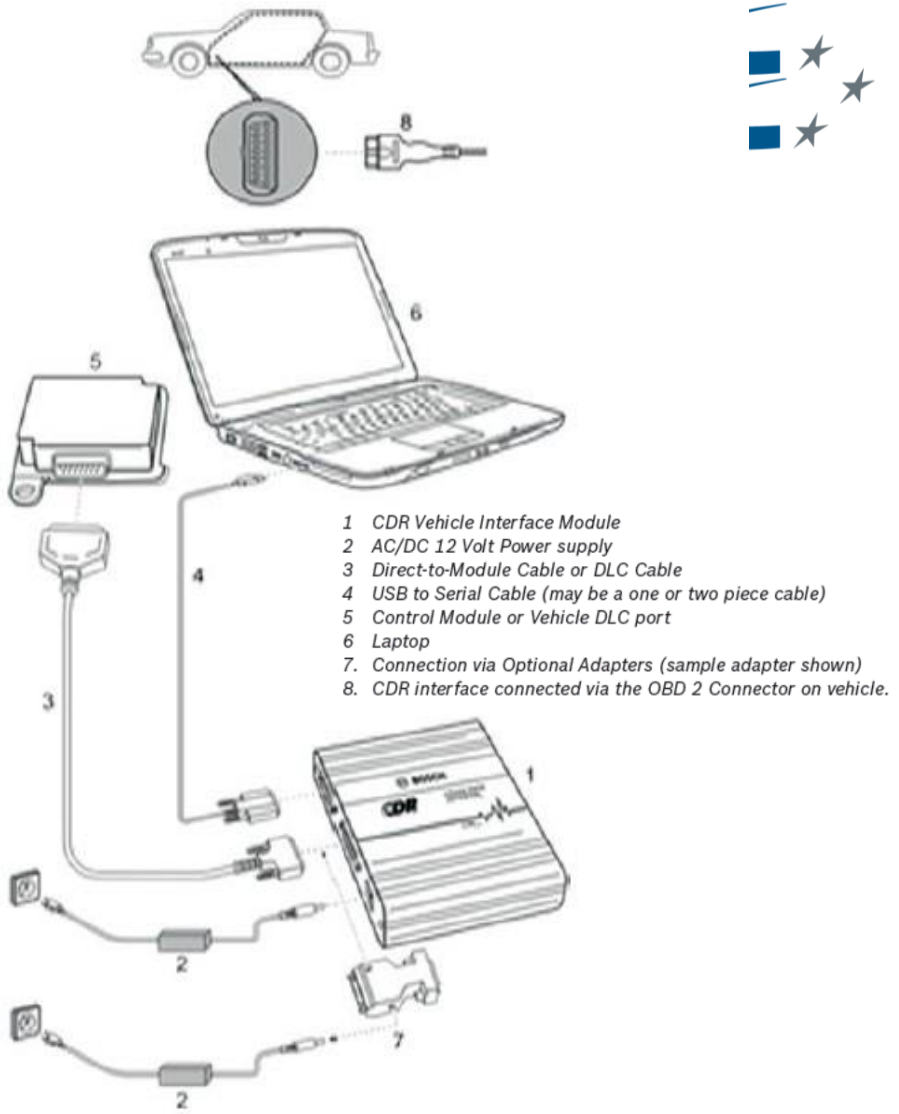


*Fig. 2: Typical connection diagram for CDR data retrieval*

Image Source: Bosch

1: support for >88% of MY 2016 and newer vehicles (Wikipedia)

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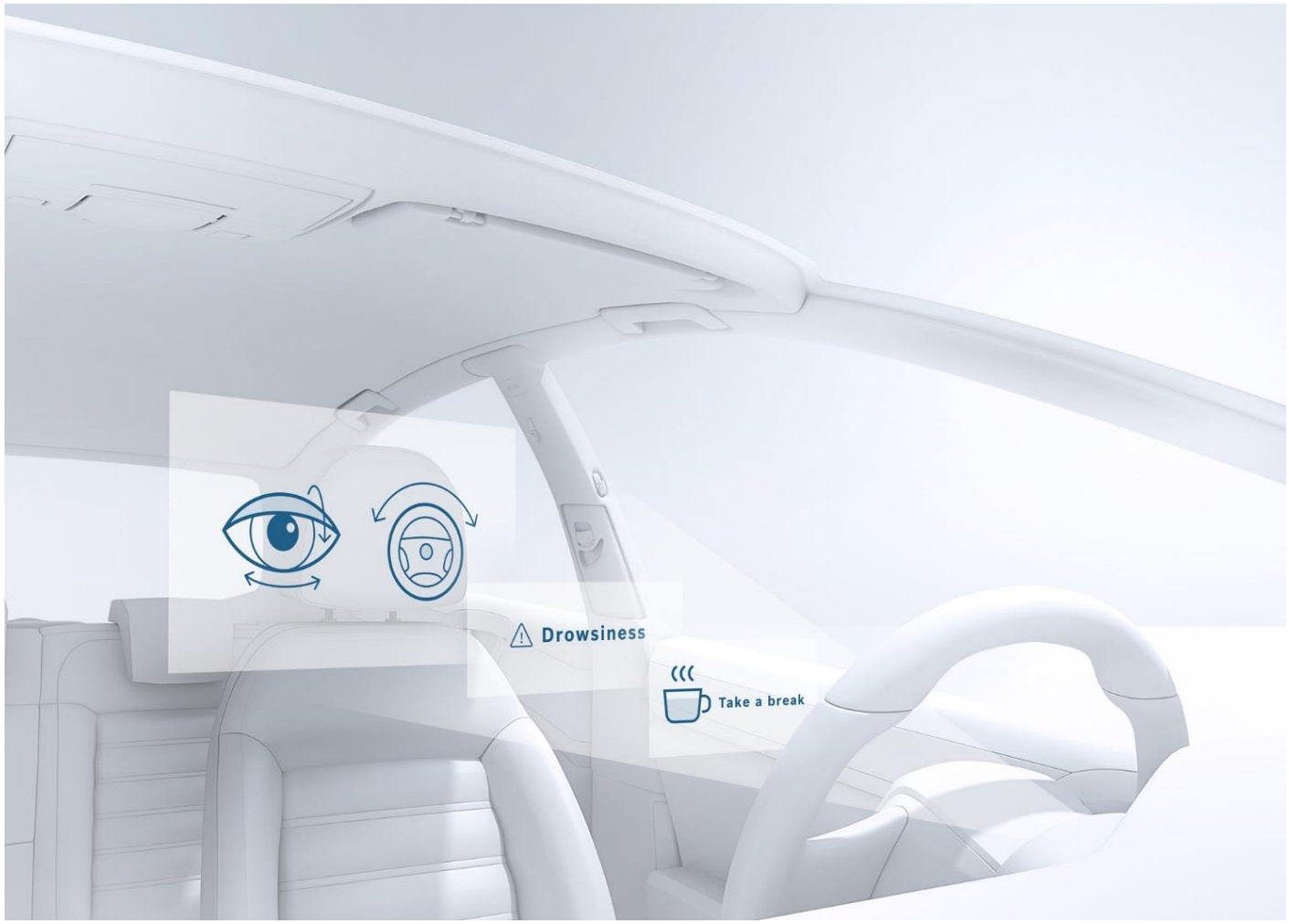
## Driver Drowsiness and Attention Monitoring




**Sensor:**

Steering angle sensor

and/or

Camera facing the driver

**Drowsiness algorithm**

based on:

- Driver behavior:
  Changes of steering angle
- Eyelid opening
- Time of day
- Driving time

Image Source: Bosch

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## Driver Drowsiness and Attention Monitoring

**Steering Data**

High precision SAS

Alternative

**E**lectric **P**ower **S**teering

**Driver Steering Pattern**

Detection of driver's reduced driving ability

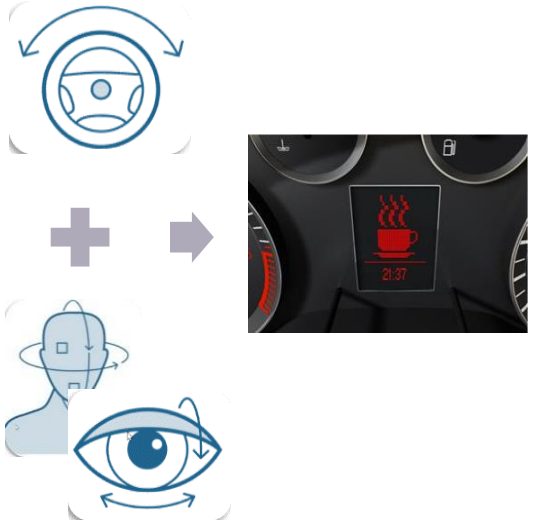
Steering Index

**Video-based**

**Multi-feature approach**

- Multi feature approach
- Eye Opening&Gaze
- Blink detection
- Head behaviour

Video-based Index



**Fusion Drowsiness Index**

Image Source: Bosch

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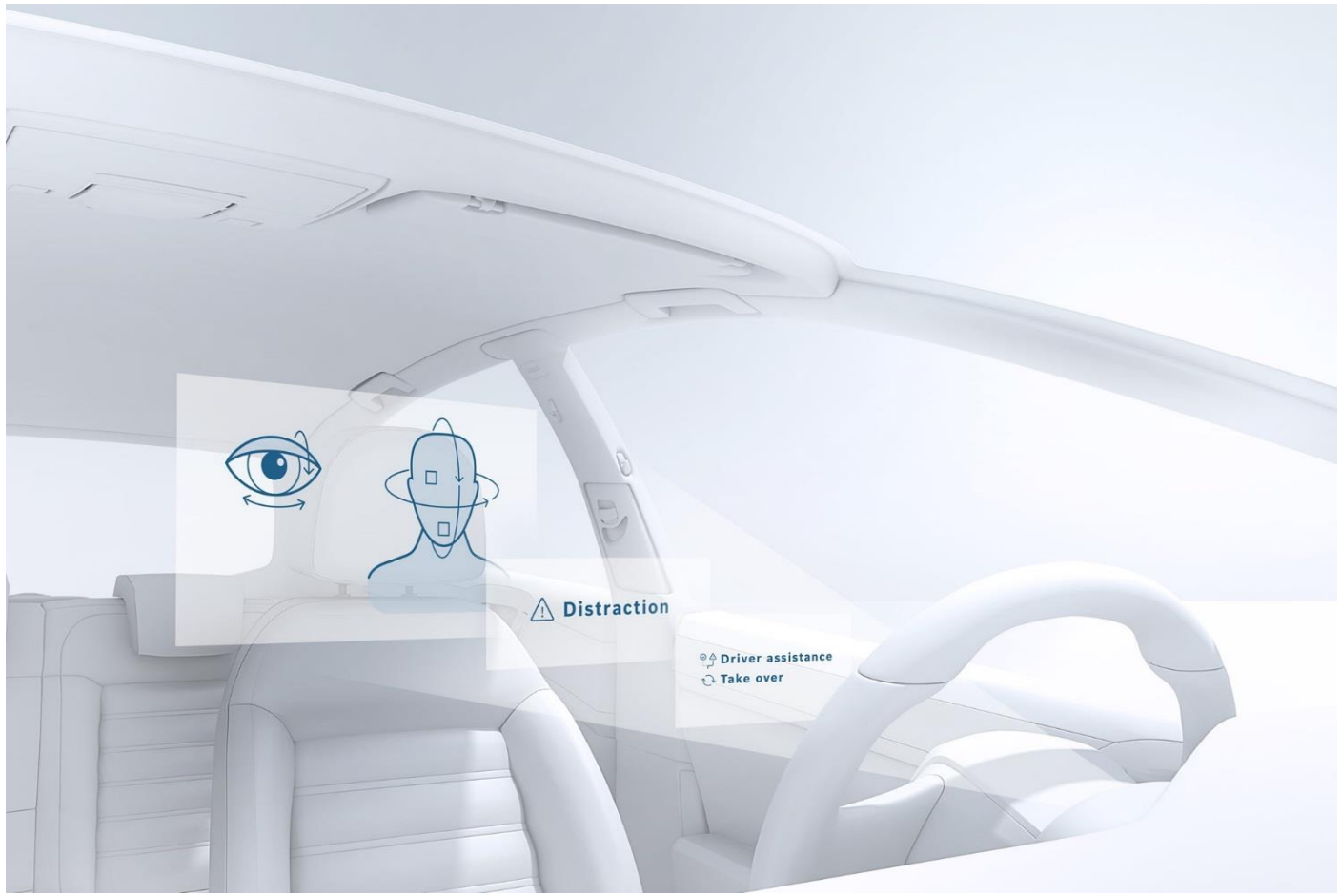
## Advanced Distraction Recognition




**Sensor:**
Camera facing the driver

**Distraction algorithm**
based on:

- Head pose
- Eye gaze
- Face recognition

Systems currently in development mostly targeted towards Automated Driving

Image Source: Bosch

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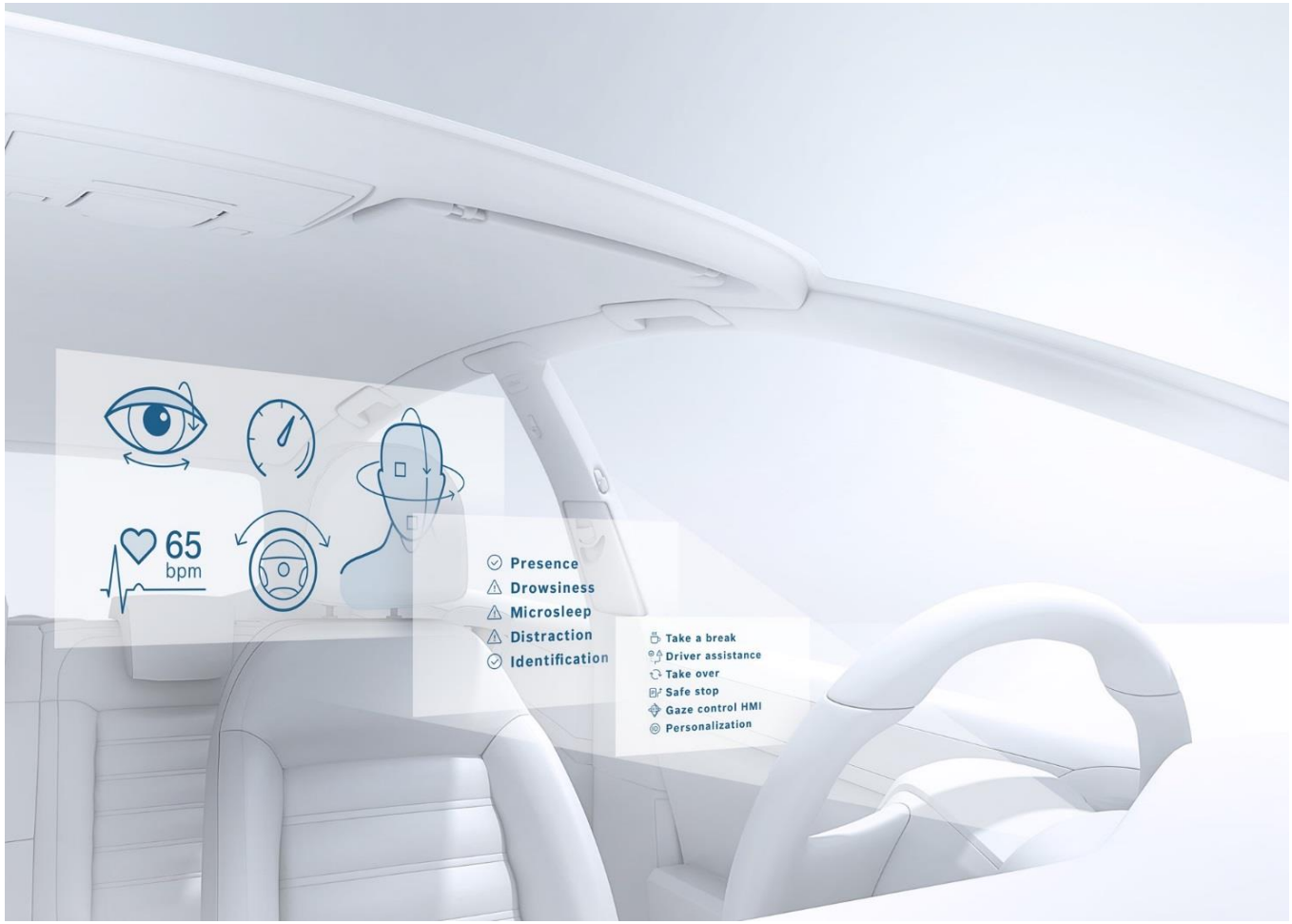
## Advanced Distraction Recognition




**Future systems**
**with additional sensors**
will allow comprehensive information:

- Presence
- Drowsiness
- Microsleep
- Distraction
- Health status
- Identification

Image Source: Bosch