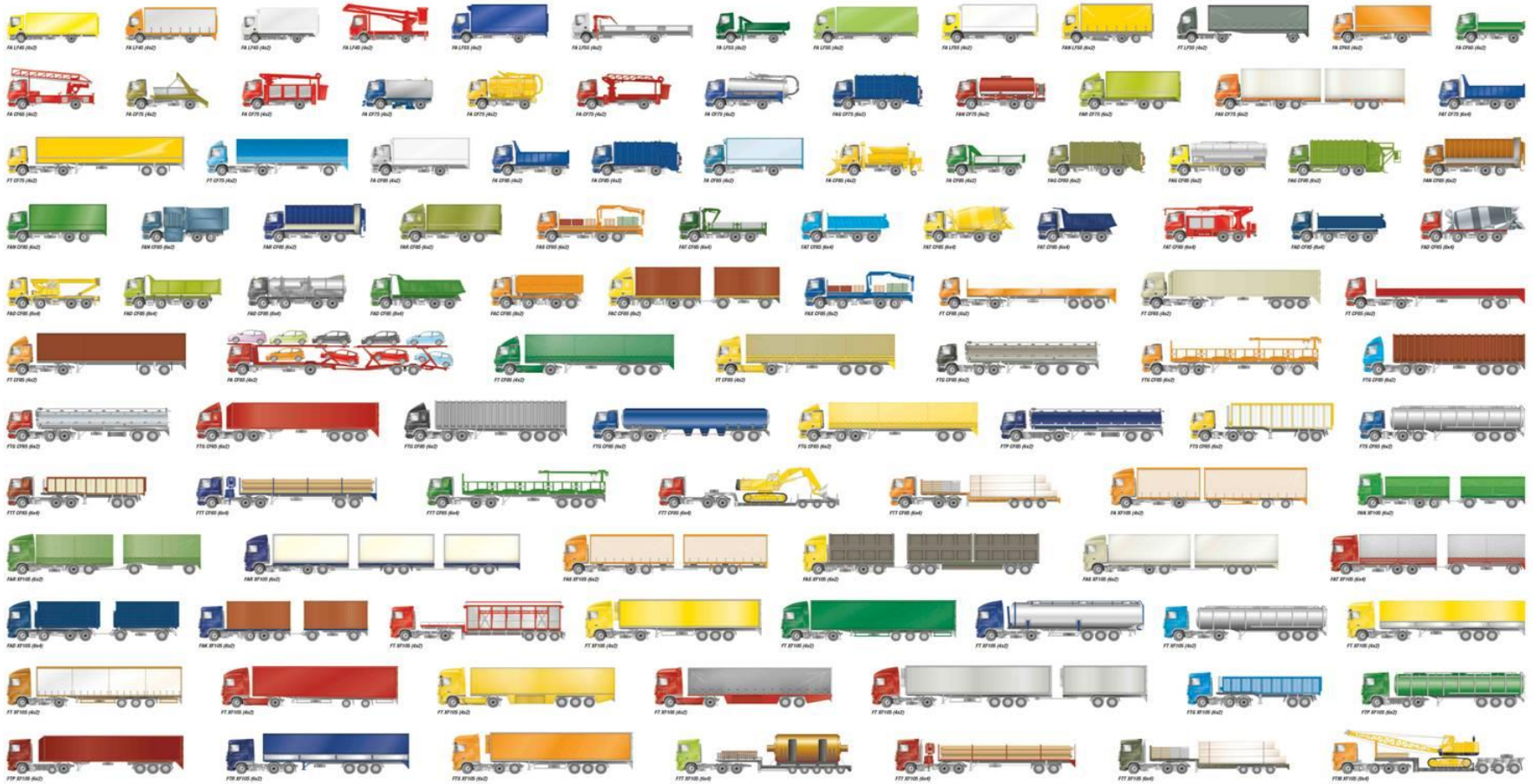


# TF8 – Heavy/commercial vehicles: Progress report to 6th IWG EVS-GTR Meeting



*driven by quality*

|  |  |   |  |
|--|--|---|--|
| <ul style="list-style-type: none"> <li>⦿ steered axle</li> <li>⦿ driven axle</li> <li>⦿ trailing axle</li> </ul> | <br>DAF LF Series | <br>DAF CF Series | <br>DAF XF Series |
|--|--|---|--|



# A commercial vehicles is...

- A work tool designed to perform a specific task
- Optimized for effective performance of the specified task
  - Load efficiency 3X higher compared to personal vehicle
- Used by trained professionals (personal responsibility!)
- Subject to regular monitoring and maintenance as part of a professional vehicle fleet

...these are some of the important factors that differentiate commercial vehicles from personal cars.

# Conclusions (1/2)

- Heavy / commercial vehicles is a very divergent product group including a large range of vehicle types; e.g. distribution trucks, long haulage trucks, buses, coaches, speciality vehicles...
- The applicability of EVS-GTR requirements must be analyzed for all vehicle types in the segment since the energy storage technology conditions and usage may vary a lot between different vehicle types.
- Heavy vehicles face different challenges compared to personal vehicles and it is likely that future energy storage technology developments for electrification will follow, at least in parts, different directions from those of personal cars. Although the intent of the EVS-GTR is to be technology agnostic, it may be difficult to foresee potential technology limitations imposed by evaluation methodology and acceptance criteria.

# Conclusions (2/2)

- It is reasonable to consider application of in-use requirements to the extent of R100\_02 for heavy vehicles in order to achieve an acceptable level of safety. However, flexibility in test conditions and acceptance criteria is needed in some tests in order to be relevant for these vehicle types.
- Heavy vehicles must be exempted from all proposed EVS-GTR requirements based on post crash scenarios in R12, R94 and R95 since there are no equivalent crash scenarios defined for heavy vehicles
- To avoid unreasonable amounts of testing as a consequence of different design concepts and the extensive number of possible vehicle types
  - Important to allow component based test option as far as possible
  - Definitions of what constitutes a "vehicle type" and a "battery type" is required

# Initial comments on the EVS-GTR draft: Proposed tests (1/x)

## ■ TF1 – Water resistance

- Relevant but need to be analyzed further and modifications are required to be applicable to heavy vehicles
- Vehicle based testing may be challenging depending on test conditions (e.g. submersion testing). Equivalent component tests should be considered.
- HD vehicles needs exemption for the vehicle equipped with an isolation resistance monitoring system from the view that many kinds of rear body variants might affect the water-crossing test result.
- "HV power-off requirement" when the isolation resistance is failed shall not be adopted
- Applicability must consider vehicle type and position of REESS (e.g. mounted on frame, roof, inside chassis...).

# Initial comments on the EVS-GTR draft: Proposed tests (2/x)

- **TF2 – Low energy**
  - If based on crash scenario – not applicable to heavy vehicles and they should be exempted from performing test
  - If based on perspective of general electric safety and hazardous voltage – relevant but needs analysis of how this can be applied consistently.

# Initial comments on the EVS-GTR draft: Proposed tests (3/x)

- **TF4 – In use**
  - **Vibration** – Relevant (applicable) but flexibility is needed in terms of vibration profile
    - Vehicle type
    - Placement of REESS
  - **Thermal shock and cycling** – Applicable
  - **Mechanical shock** – Relevant (applicable) but test pulse parameters must be specified based on vehicle category
  - **Mechanical integrity** – Not applicable: based on R12, 94 and 95 crash conditions; no equivalent conditions defined for heavy vehicles.
  - **Fire resistance** – Applicable but consideration of applicability based on position of REESS (compare 1.5m exemption in R100\_02)

# Initial comments on the EVS-GTR draft: Proposed tests (3/x)

- **TF5 – Cell/module safety**
  - Not applicable – If safety of vehicle or REESS is demonstrated, then no subcomponent testing is necessary for certification purposes



# Initial comments on the EVS-GTR draft: Conditions and criteris

- **TF3 – Leakage**
  - Applicable.
- **TF6 – SOC**
  - Applicable but concerns regarding HEV testing procedures
- **Thermal propagation**
  - Relevant but be analyzed further in order to prevent potential design and technology limitations

# Proposal

- EVS-GTR has so far been developed primarily with category M1 and N1 vehicles in mind
- Suggested to keep the main text with the current focus of the EVS-GTR and to draft a separate Annex with requirements for heavy/commercial vehicles

Conclusion: If the proposed approach is taken, then the task for TF8 is the draft the Heavy / commercial vehicle Annex

# Questions to the IWG

- According to the ToR for the EVS-GTR, the purpose is to ensure occupant safety. Is this applicable to heavy vehicles?
- In order to avoid delaying the EVS-GTR progress for personal cars, should heavy vehicle/commercial vehicle application be limited in / lifted out of the initial scope of the EVS-GTR?
  - Parallel processes are facilitated by treating heavy vehicles in a separate Annex
  - TF8 must consider the work of all other TF groups and the applicability to heavy vehicles
- Are heavy vehicles "different enough" to merit a separate GTR?