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Federal Highway Research Institute

Informal document **GRSP-75-27**
(75th GRSP, 27-31 December 2024

GRSP UNECE R14 Workshop

GRSP UNECE R14 Workshop on Extended Use Positions
27.05.2024 | B. Lorenz | BASt

GRSP UNECE R14 Workshop

- **Two-day workshop to discuss OICA's proposal for extending UNECE regulation No. 14 at BASt** (25.-26.04.2024) (Meeting Minutes → WSR14_7)
- **Presentations by experts** on the state of the art:
  - **Usability of ATDs in Extended Use Positions** (WSR14_3 – Dr. Hanna Paul, OICA/Mercedes-Benz)
    - **Current Dummies were developed for upright seating positions**
    - Hybrid III frontal impact dummies can be positioned up to an opening angle of 110° - THOR-50M can be positioned up to an opening angle of 120°
  - **Status of the ENOP Project** (WSR14_5 – D Dr. Andre Eggers, D/BASt)
    - **PMHS tests series to collect biomechanical reference data and to develop new injury risks curves for non-traditional seating positions**
    - Evaluation of different ATDs and HBMs in five different ENOP configurations
  - **OSCCAR** (WSR14_6 – Dr. Andre Eggers, D/BASt)
    - Type-approval of new seating positions by virtual testing methods with HBMs
    - **At the moment, HBMs were not validated to be used in new seating positions**

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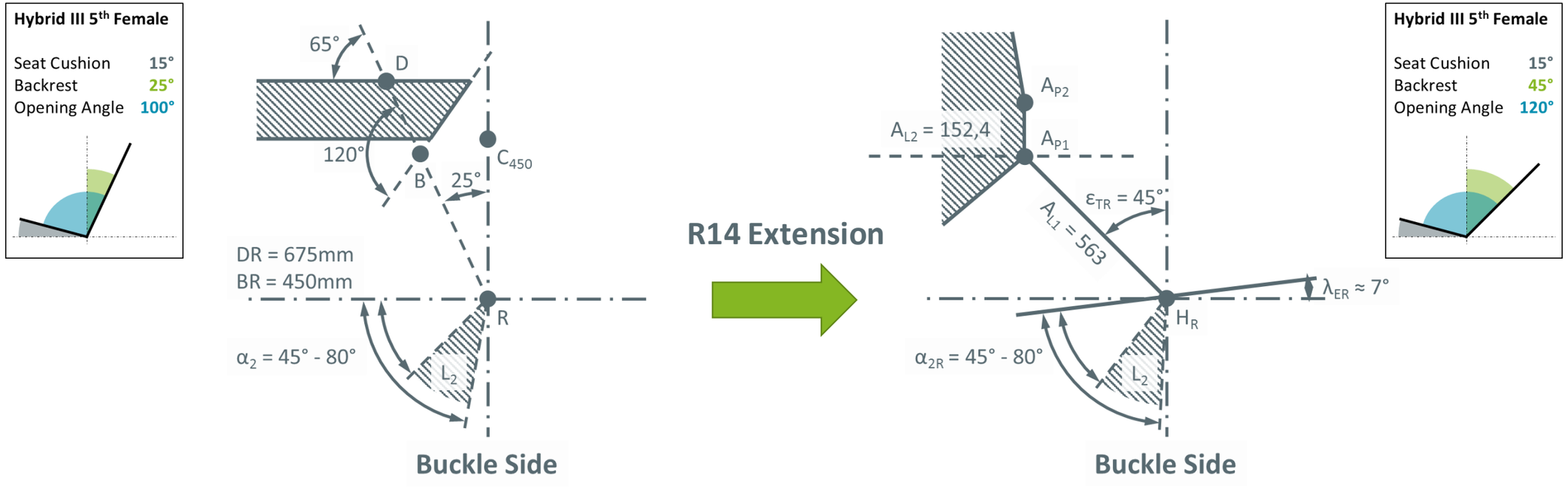
- Presentations by experts on the state of the art:
  - **Relation of the topic to the TF Virtual Testing in the EqOP IWG** (WSR14_4 – Dr. Corina Klug, A/TU Graz)
    - Possible link to EqOP TF3 on Virtual Crash-Testing and TF4 on Restraint System Requirements
    - The introduction of HBMs into regulations will potentially benefit occupant safety, but there is no qualification requirement yet.
  - **Status of the Validation of HBM for Extended Use Positions** (WSR14_4 – Dr. Corina Klug, A/TU Graz)
    - Literature review: Good correlation between HBM and PMHS in extended use positions. Some limitations w.r.t. pelvis rotation and lumbar spine loads.
    - So far, **no clear mechanism for submarining and higher lumbar spine loads identified**.
    - **New injury mechanisms might not be addressed in HBMs** so far and new validation on component level is probably required.
- **Discussion of OICA's proposal (WSR14_8) in a vehicle seat with different configurations and different dummies**

OICA Proposal for R14 Extension

- Permitted area is redefined for extended use positions (WSR14_8):
  - Upper anchorage point rotates with the backrest
  - Lower anchorage points are dependent on the change in the seat cushion and backrest inclination

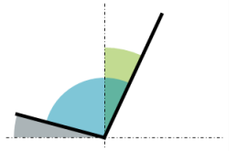


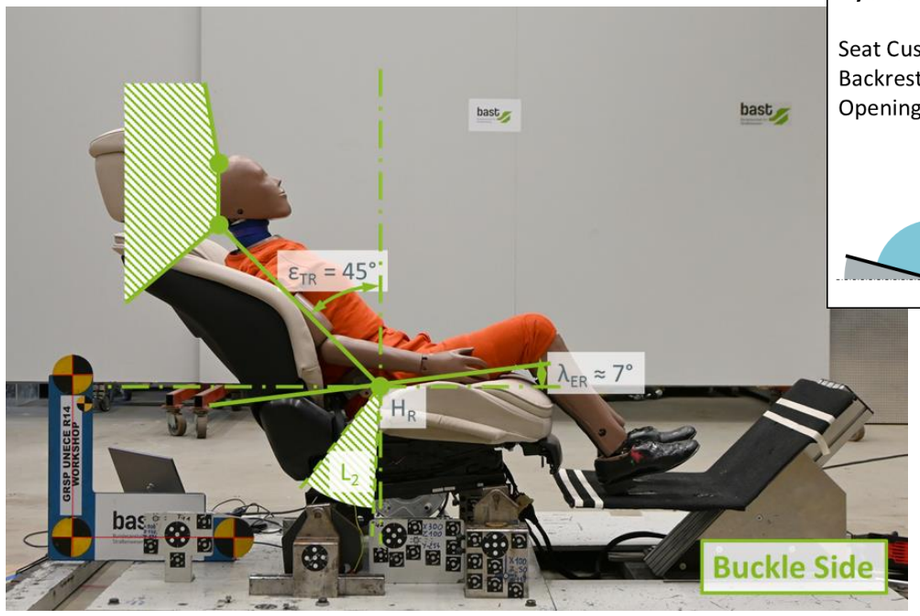
Workshop: OICA Proposal for R14 Extension

- Discussion of OICA's proposal (WSR14_8) in a vehicle seat with different configurations and different dummies:
  - No continuous contact between back and backrest for the Hybrid III family for 120° opening angle
  - Proposal to extend the R14 was positively received
  - Proposed area probably too high for an optimal belt routing for small occupants
  - The proposal allows L1 and L2 to be located in front of the H-point

Hybrid III 5th Female

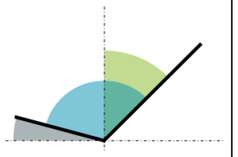
Seat Cushion	15°
Backrest	25°
Opening Angle	100°





Hybrid III 5th Female

Seat Cushion	15°
Backrest	45°
Opening Angle	120°



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25 Participants
(2 virtual)
CPs: Austria, Germany, Netherlands, Sweden

OICA and CLEPA

ATDs used:
Hybrid III 5%, Hybrid III 50%, Hybrid III 95%, THOR 50%, THOR 50% RS

Conclusion

- OICA's proposal (WSR14_8) to extend the R14 was positively received. Some adjustments remain to be discussed:
  - Proposed area might be too high for an optimal belt routing for small occupants
    → reduce A_{L1}?
  - The proposal allows L_1 and L_2 to be located in front of the H-point
    → some clarification needed ('L_1 and L_2 are not permitted to be in front of the H-point')
- No continuous contact between back and backrest for the Hybrid III family for 120° opening angle
- **Discussion on the definition of "care points" and how a link between UNECE Regulation No. 14 and other regulations (p. ex. R94, R95, R135, R137) can be established**

GRSP UNECE R14 Workshop

- All documents from the workshop can be found on the UNECE Wiki page: https://wiki.unece.org/pages/viewpage.action?pageId=246284335
- Documentation for all ATDs in six different configurations is now also available on the Wiki page:
  - **WSR14_9**

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Thank you!

I look forward to the joint discussion.

Bernd Lorenz
Head of Section F2 – Passive Vehicle Safety, Biomechanics
☎ (+49) 2204 43-5200
✉ lorenz@bast.de