UNECE GRSP IWG Equitable Occupant Protection (EqOP)
Task Force 2 – Rear-end impact

Draft minutes of the sixth meeting.
On-line meeting, January 23, 2025.
36 participants.

Adoption of the agenda
Adopted.

Approval the minutes from last meeting
Approved, with one correction.

Presentations

1. Updates on IIHS's rear impact seat parameter project (IIHS/UVA)
   The project goals are to identify factors and injury metrics influencing occupant response and seat safety performance, and correlate injury metrics and make recommendations for their use.
2. Short presentation on how the concerns about Repeatability & Reproducibility of BioRID II (Humanetics) were handled.
   Background is that there were concerns about the R&R of the BioRID II during the 2000's. The GTR7 IWG worked on addressing these concerns. A project led by David Hynd to investigate causes of dummy-to-dummy differences, using a reproducible laboratory seat, led to recommendations for R&R.
3. Roadmap to physical EvaRID (Humanetics)
   The EvaRID V1.5 FE Model originated from the ADSEAT research project. It has been evaluated against ADSEAT volunteer test corridors at Δv 6.8 km/h. Now create a hardware twin to the EvaRID FE model as counterpart to the physical BioRID. The torso and hip shape were adjusted from the original model and are now based on the VIVA+ 50F FE models, which is also the source for the SETs. . The project timeline 2025-2026+ is to build the dummies, test and verify biofidelity and durability; moreover, validate repeatability and reproducibility, and solicit feedback from selected users. Release date is not yet announced.

Discussion
The chair opened the discussion on improving safety performance of head restraints and seatbacks, including the dynamic test with BioRID and the plans to add another ATD size in the long term. The co-chair mentioned closing the geometric gap in December and noted that current rating programs only test one occupant stature, which may lead to suboptimization. OICA stated that we need a clear goal beyond the resolved geometric issue to discuss test method changes. The chair responded that one technical expert's presentation in Stockholm showed that an even energy absorption and load distribution in seatbacks could improve field situations and serve as a goal to better protection for all since rear-end impacts are very common accidents. The chair also said that new field data shows whiplash associated disorders is still an issue and an equity concern, as presented earlier in both DEOP and EqOP.

OICA refers to GTR7 work and questions the need to redo significant work. Emphasizes again the need for a clear goal. Co-chair responded that field data show that WAD is still a common injury and the risk for females is still higher than for males. GTR7 and rating requirements have been positive, but differences in risks remain. IIHS confirms that the number of claims decreased, but it is still high and a substantial difference between females and males is still observed. Co-chair also mentioned that the IWG EqOP secretariat will summarize significant points from previous EqOP meetings in one decision list to avoid that we keep discussing the same things in different meetings. OICA explained that the dynamic test with BioRID should be seen as an equal alternative evaluation method, not just an optional test in current regulations.

The Technical Expert of Germany mentioned that, historically, seat and headrest geometry were key in GTR7. The alternative dynamic test aimed to allow designs that might fail geometric requirements but perform well dynamically.

IIHS explained that the effect of using EvaRID on the seat design is currently investigated in their research project. The co-chair added that Swedish experts have shown in previous presentations that it was possible to distinguish between seats which perform equally well for females and males and those where females are at higher risks using EvaRID together with an FE model for the BioRID and the SET 50M and 50F.

The Technical Expert of NL reminded us that seat and headrest behavior to prevent whiplash associated disorders involves geometry, seatback stiffness, and energy absorption. It is important that good protection is provided for the range of anthropometries, ensuring also a 5^{th} female or 95^{th} percentile male is well protected.

The Technical Expert of CLEPA said that the even energy absorption for whiplash associated disorders requires criteria, which is challenging to define. Chair agreed and noted that criteria will be revisited in future meetings. Chair questioned if the dynamic test with BioRID alone provides the needed answers. Co-chair responded that the dynamic tests with rear impact dummies aim to investigate the relative motion between head and torso which is known to be a key driving factor of soft tissue neck injuries. An even support should be defined as a support which leads to small relative motion between the torso and the head where also sufficient energy absorption to ensure favorable spine kinematics (not an even rigid block) should be ensured. The decreasing risks in the field show that current testing is not on the wrong track, but the differences in risks, and some of the designs with punctual support on the height of the BioRID head, show that the current tests allow suboptimization. We should work together on a testing procedure which avoids that. If we test the relative motion between head and chest for at least one other size, this would be a good step forward and the size should be chosen based on the population which is currently at highest risk.

The chair asked for ideas for the next meeting. Should we revisit the evenness and alternative dynamic test with BioRID and its benefits or should we address new tests? The Technical Expert of OICA asked for documented differences in the field before and after GTR7 phase2. The co-chair remarked that seats are likely designed to meet rating requirements and therefore no big effect on the design due to GTR7 is expected as the current fleet performed very well in the rating tests in the last years. IIHS confirmed that seat designs are probably driven more by rating criteria than GTR7. This should be considered. The chair responded that we've already analyzed and presented real-life data in DEOP. We need to move forward instead of circling backwards. The co-chair echoed and said that the

secretariat will reference DEOP and EqOP studies in the planned decision lists to ensure that we move forward and the findings we already had are clear for everyone.

The Technical Expert of CLEPA highlighted that injury risk may be influenced by how users adjust headrests. Misuse could explain the discrepancy between lab and field performance and research in that area is requested by the CLEPA representative. The Technical Expert of NL agreed and discussed that suggested solutions include integrated headrests for all statures or automatic adjustment. NL emphasized that headrest use often prioritize comfort over safety, leading to misuse. Correct use of headrests should be seriously considered.

The chair concluded that we have the agenda clear for the next meeting, which is as follows:

1. Integrated headrests, which do not need to be adjusted to address potential misuse.
2. Continued discussion on the dynamic test with BioRID or other tests.

Next meeting
Next meeting in March 2025. The secretary will send out a meeting poll regarding dates.