UNECE GRSP Ad-hoc Group Data on Equitable Occupant Protection (DEOP)

Draft minutes of the 4th meeting held on September 22, 2022.
Digital meeting with 28 participants.

Welcome and introduction
Pernilla Bremer of the Swedish Transportation Agency opened the meeting and welcomed all participants.

Adoption of the agenda
Approved.

Minutes from previous meeting
Approved.

Introduction
Pernilla Bremer introduced the topic of todays' meeting by mentioning that the yearly cost for Whiplash Injuries in EU is estimated to 10 billion €. The occupant category which is most exposed for Whiplash Injuries are woman under the age of 35 year.

Presentations

1. Ines Levallois (FORVIA) presented "Whiplash improvements for females". The presentation showed the result from dynamic whiplash tests with standard BioRID 50th and experimental BioRID 50th Female (BioRID 50F) in a base seat and a seat with improved head restraint design.
    a. The BioRID 50F is based on the BioRID 50M, but with reduced mass (62kg) and reduced height (less vertebras). Distribution of mass yet not as recommended for EvaRID.
    b. Head restraint improvement consists of additional insert adapted to 50%-ile male and female occupants. The free play in the fixation of the head restraint to the backrests was removed.
    c. Test and Evaluation conditions:
        - Whiplash test-pulse according to 16km/h IIWPG.
        - Head restraint adjustment according to Euro NCAP 2012 protocol (BioRID 50M) and lowest position for BioRID 50F.
        - Injury criteria evaluation according to Euro NCAP 2012 protocol.
    d. Result, conclusion, and discussion:
        - The head restraint with the insert adapted to BioRID 50M and 50F show the same tendency of whiplash improvements for both 50th male and 50th female.
        - A significant decrease of shear-force (+F_X upper) for both BioRID 50M and BioRID 50F, but the absolute value remains higher for the BioRID 50F.

- The effect of different seatback angle for males vs. females have not been evaluated (was the same for both BioRID 50M and BioRID 50F) but could influence the results for females.
- The recent changes to R17 and the importance to follow up the results of that were discussed.

2. Marcy Edwards (IIHS) presented “IIHS Crashworthiness evaluations for the protection of occupants in low-severity rear impacts”. The presentation included both a historical review of whiplash injuries, evaluation methods and countermeasures, as well as ongoing and future activities.
    a. Whiplash Injuries over time:
        - From 1999 to 2016 the reported injuries (any) in rear-impact crashes have dropped with over 50%. Females are still at a higher risk.
    b. Geometrical headrest ratings since 1995:
        - Drivers in vehicles with good-rated head restraint are 24% less likely to suffer neck injury than those in poor rated vehicles.
        - The improvement is present for all occupant categories, but females have a greater benefit from good-rated head restraints.
    c. Advanced seat designs from 2003:
        - Active head restraints show an overall 44% reduction of neck injuries.
    d. Dynamic testing:
        - Regardless of Good, Acceptable or Marginal vehicle rating, female seem to benefit a little bit more in terms of injury claims vs. males.
    e. Future of IIHS whiplash evaluation:
        - Today almost all vehicles get a good rating of the head restraint.
        - IIHS whiplash safety research goals are divided into three main areas, 1. Active Safety Technology, 2. Integrated Safety, 3. Robust Seat and Restraint Designs.
    f. NCAP rear impact research review:
        - Overall rating correlates best to mid-size cars.
        - Individual metrics need further analysis.
    g. Virtual testing for rear impacts, research motivations:
        - This can promote seat safety robustness for a range of occupant size, sex, and seating positions.
        - Lay a groundwork for the usage of Human Body Models.
        - Develop a framework for certification and validation.
    h. Key takeaways:
        - Current evaluation tools have reduced injuries in rear impacts for both men and women.
        - Women are still at a higher risk for whiplash injuries than men.
        - Virtual testing provides opportunities to address equity and robustness in crashworthiness evaluations.

Discussion

A general discussion was held related to the following topics:

- Why don’t we have a 50%-ile female ATD in place?
- Could legislation (EU) push for a 50%-ile female ATD?
- How long would it take to get a 50%-ile female ATD in place (accepted and validated)?

- Is there a common acceptance of the Whiplash Injury Criteria?
- Can we use existing “tools” in new/added methods (physical and numerical/virtual) to address equitable occupant protection?
- Is there a crashworthiness “balance-issue” between occupant categories which potentially slows down improvements in equitable occupant protection?

Next step
Discussion and decision how to continue the work in the DEOP Ad-hoc Group vs. starting an informal Working Group. It was decided that Pernilla start working with a draft for a new proposal that is to be discussed at the next meeting in this group. The whiplash topic could potentially be separated from the broader equitable occupant protection topic.

Next meeting
In November. Shall be decided through a poll/doodle.