

Current Status of the EEVC WG 20

“Rear Impact test procedure(s) and the mitigation of neck injury”

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- Develop test procedure(s) for rear-end collisions, with a prime focus on neck injury reduction (Whiplash).
- Draft proposal(s) and report to the Steering Committee within one year of the first meeting.
- Evaluate the proposed test procedure(s) in laboratory conditions and, if needed, make appropriate adjustments to the procedure(s).
- Write final test procedure proposal(s) and report to the Steering Committee within two years of the group's first meeting.

- The test procedure(s) should include a dynamic sled based test using generic crash pulses, unless it can be shown to be inappropriate. ^{HR-2-12}
- Test conditions should be appropriate with regard to real world accident data.
- Appropriate injury criteria, to be measured in the dummy, will be selected in association with EEVC WG12.
- In order to ensure that one injury risk (neck) is not reduced with an increase in other injuries (e.g. spine, or soft tissue), due regard should be given to a holistic approach to rear impact injury risk reduction.
- The test procedure(s) must address the range of vehicle properties that can influence occupant loading as a function of the vehicle crash pulse, e.g. use of the seat-belt system and the seat system with vehicle body attachment points.

- The procedure must include consideration of active safety systems that are triggered by crash sensor information, pre-crash sensor information or occupant interaction(s) and position.
- The test procedure(s) assessment parameters must correlate to injury risk.
- A close relationship should be established with EEVC WG12, the Biomechanics group, regarding the selection of the most appropriate dummy, injury criteria and injury risk probability relationships. WG20 will be responsible for co-ordination with WG12.

- WG20/WG12 will select the most appropriate size of dummy for the test procedure(s).
- WG20 will supply WG12 with all the necessary input data regarding crash conditions, instrumentation and requirements and the interface between dummy and test set-up.
- Any procedure(s) must have regard to other impact conditions and impacts severities, to avoid sub-optimisation of safety system design, as well as existing standards and regulations.

- A first draft proposal of a dynamic test procedure has been written, based on the IIWPG test procedure.
- Since the actual injury causing of the well established set of so called "whiplash symptoms" is unknown the biomechanical relationship can not be established.
- WG 20 had long discussions about the acceptability of an injury criterion that is not based on the biomechanical relationship between loading to the body and injury causation. "Black Box Approach" - it denotes the definition of an injury criterion that is based on indirect statistically based evidence.
- WG 20 has received new indications that may delay the selection of an injury criterion (or injury assessment value). Earlier indications of good correlation to field accident data of some criteria appear to be contradicted by recent findings within the EU-Whiplash2 project.

- WG 20 has refined the RCAR procedure (Appendices A & B) and members believe that it could form the basis of a valuable interim upgrade of the current regulation.
- WG 20 believes that stricter geometric requirements could lead to an improvement.

Issues to be solved (by November 2005)

- Repeatability and reproducibility
- Lumbar support
- Seat back angle
- Tilting front seats
- Tilting head restraints
- Cost-benefit
- Geometric limits

Repeatability and reproducibility

- issue will be addressed by a work programme undertaken by 6 labs using a range of seats.

-> Problems to be resolved

- Differences due to H-Point-Manikin
- Differences due to HRMD
- Differences due to staff / labs
- Application of the test procedure

19th ESV Conference

“Challenges in the development of a regulatory test procedure for neck protection in rear impacts: status of the EEVC WG 20 and 12 joint activity

D. Hynd and M. van Ratingen

Next WG 20 meeting – 24th Mai 2005

Thank You
for
Your
Attention !