

**United States Comments on Pedestrian Head and Leg Protection GTR
(INF GR/PS/160)**

The United States of America (US) has reviewed the current revision of the technical rationale for the pedestrian head and leg protection global technical regulation (gtr) (INF GR/PS/160). These comments are based on the requirements of the gtr as outlined in the 1998 Global Agreement (98 Agreement) (see Attachment 1 for applicable sections).

The gtr must address the level of safety and stringency of the requirements. (Sect. 4.1.2.1)

Data should be presented to show how the current vehicle fleet meets the gtr requirements.

The current gtr (INF GR/PS/160) includes relaxation zones of 1/3 of the windscreen area, 1/2 of the child headform test area, and 1/3 of the combined child and adult headform test areas. In these relaxation zones, the HIC15 limit would be 1700. The US has conducted head impact testing on a cross-section of our own vehicle fleet and we are concerned that applying a relaxation zone with a HIC of 1700 is not stringent enough (see figure 1)¹.

In addition, the US has also conducted preliminary testing to evaluate the US fleet using the lower legform (see figure 2). Further testing is needed to evaluate the fleet using the current gtr requirements. No data has been presented and the US has not conducted any testing with the upper legform, this data is necessary to fully evaluate this requirement.

The process to determine the gtr requirements must be transparent. (Sect 6.3.4)

a) Head

- The gtr group needs to show that it made an expert, independent determination that the head impact test relaxation zones are the correct zones.
 - The gtr should elaborate on its rationale for choosing the sizes of the relaxation zones as it applies to the current vehicle fleet.
 - Data should be provided to justify that 1/3 of the windscreen, 1/2 of the child headform test area and 1/3 of the combined child and adult headform test areas are needed, rather than an area that is less than those areas.
- The gtr should explain why a HIC of 1700 is needed in the relaxation zone, rather than a lower HIC value.
- The gtr should explain the need for a relaxation zone for windshields and the reasons the relaxation zone HIC is the same as the bonnet.

b) Leg

- Data is required to show that the legforms produce repeatable and reproducible results.
- Data is required to show that the legforms can reliably distinguish between good and poor bumper designs. An explanation is needed on how the injury criteria relates to injury risk.

¹ This data is based on a previous version of the gtr made formal for the May 2005 GRSP (TRANS/WP.29/GRSP/2005/3), since that time changes have been made to the head impact velocity and impact angle.

- The gtr gives manufacturers the option of performing an upper leg form test instead of a lower legform-to-bumper test on bumpers with a lower bumper height of more than 400 mm but less than 500 mm.
 - Data is needed to determine if there is a significant difference between vehicle performances in an upper vs. lower leg test.
 - Data is needed to show the number of vehicles in the fleet that have a bumper height in the 400-500 mm range.
 - Information is needed to show how the upper legform test addresses knee injuries.

Examining Benefits (Section 6.3.4.1.4)

- The gtr must provide a transparent analysis of the benefits and costs of the regulation. The draft states that 1,359 pedestrian and pedal cyclists fatalities would be saved and 34,305 serious injuries avoided, but does not provide a basis for how they were calculated. The benefits and cost estimates need to show how the values were calculated.
 - If the target population is to include pedal cyclists, information is needed to identify the pedal cyclists meeting the above criteria.
- The gtr should consider any disbenefits that may result from changes to noncompliant vehicles to meet this gtr. (i.e. Would the center of gravity of vehicles be raised to meet the head protection requirements, thus increasing the likelihood of rollover?)

GTR Applicability

There was consensus in the informal working group that the gtr apply to vehicles up to 2,500 kg, with the understanding that countries can extend this applicability in their own jurisdiction. The US has tested two vehicles over 2,500 kg and both passed the requirements of the gtr¹. Based on this preliminary data, the US would expect to apply the regulation to vehicles up to 3,500 kg.

Figure 1
GTR Feasibility – Head Tests
Results

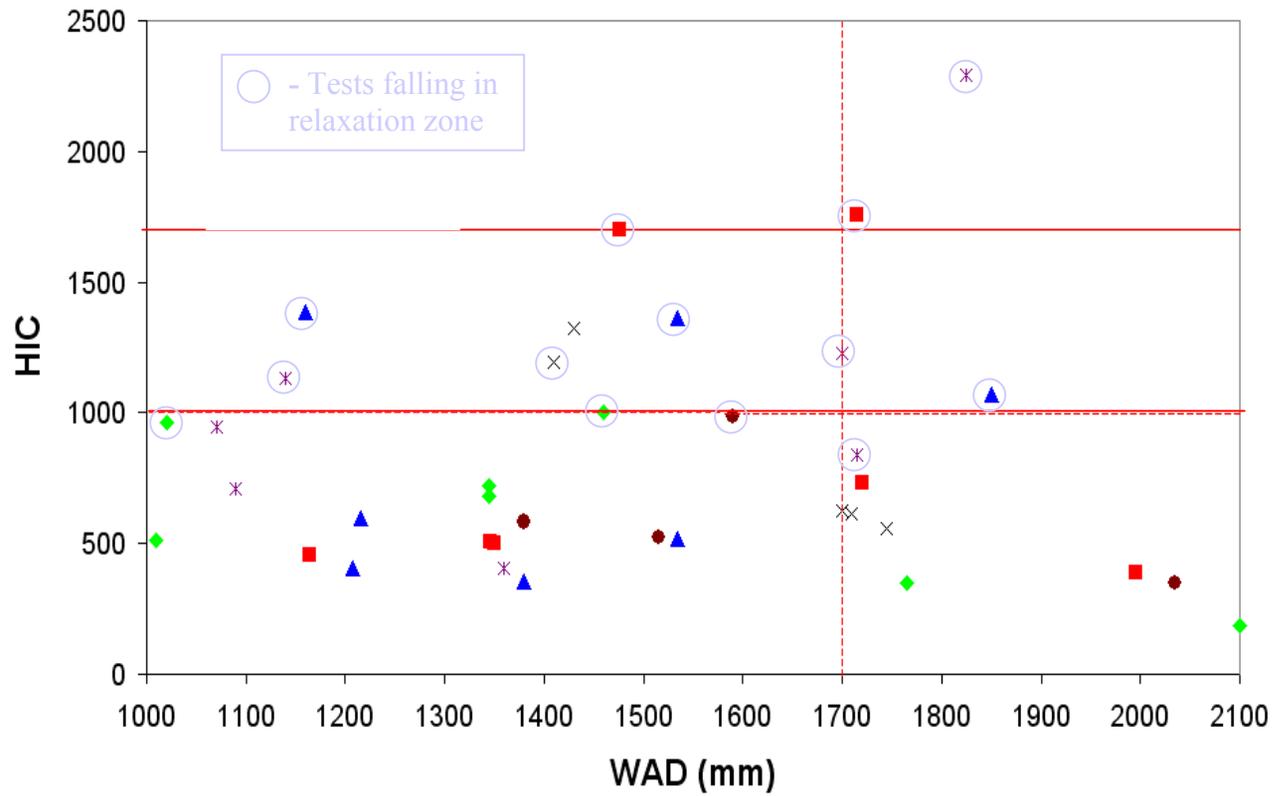
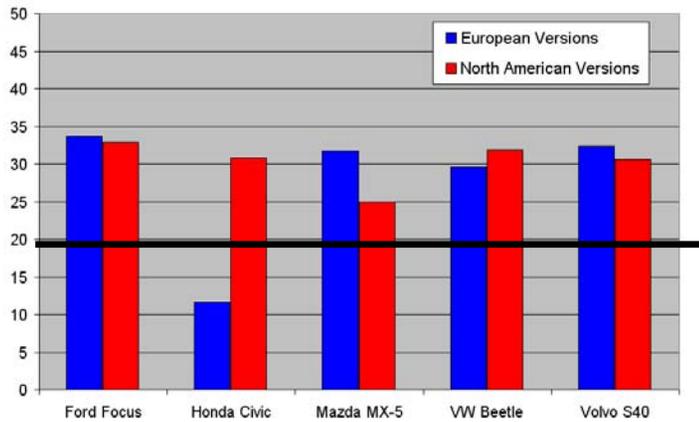
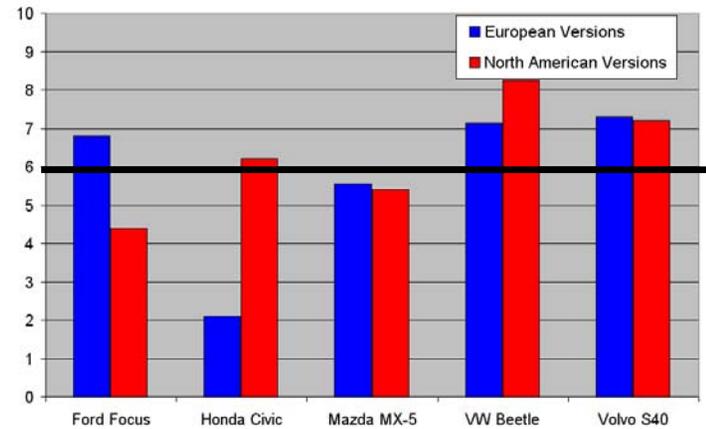


Figure 2
GTR Feasibility - Leg Tests
Results

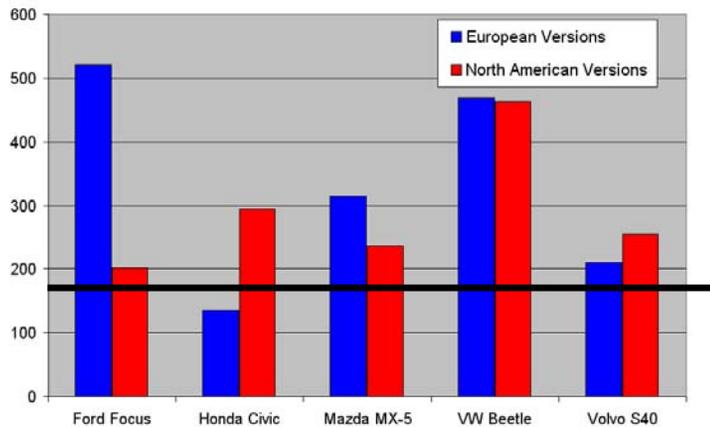
Knee Bending ≤ 19 deg



Knee Shear ≤ 6 mm



Leg Acceleration ≤ 170 g



Out of ten vehicle models examined, only one would meet all 3 GTR requirements (European Civic)

ATTACHMENT 1

1998 Global Agreement, excerpts:

- 4.1.2.1. provide for **high levels of safety**, environmental protection, energy efficiency or anti-theft performance; and
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- 6.3.4. In response to a proposal referred to it for developing a new global technical regulation, the Working Party shall use **transparent procedures** to:
 - 6.3.4.1. develop recommendations regarding a new global technical regulation by:
 - 6.3.4.1.1. giving consideration to the objective of the proposed new global technical regulation and the need for establishing alternative levels of stringency or performance;
 - 6.3.4.1.2. considering technical feasibility;
 - 6.3.4.1.3. **considering economic feasibility**;
 - 6.3.4.1.4. **examining benefits**, including those of any alternative regulatory requirements and approaches considered;
 - 6.3.4.1.5. **comparing potential cost effectiveness** of the recommended regulation to that of the alternative regulatory requirements and approaches considered;
 - 6.3.4.1.6. **verifying whether the new global technical regulation under development satisfies the stated objective of the Regulation and the criteria in Article 4.**

Definitions

13. The term "transparent procedures" means procedures designed to promote the public awareness of and participation in the regulatory development process under this Agreement. They shall include the publication of:

- (1) notices of meetings of the Working Parties and of the Executive Committee; and
- (2) working and final documents.

They shall also include the opportunity to have views and arguments represented at:

- (1) meetings of Working Parties through organizations granted consultative status; and
- (2) meetings of Working Parties and of the Executive Committee through pre-meeting consulting with representatives of Contracting Parties.

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