Draft Proposal ECE-R 100

protection against electric shock

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inf. document GRSP - 45 - 3
ECE-R100 – electric shock

history

• 12/2006: German proposal to GRPE, Japan presents strategy
• 01/2007: GRPE is not longer responsible
• 03/2007: WP.29 agreed responsibility to GRSP
• 10/2007: USA propose amendment (FMVSS 305)
• 11/2007: WP.29 agreed new inf. group ELSA for GTR HFCV
• ELSA:
  - Experts of Canada, CLEPA, China, EU-Commission, France, Germany, ISO, Japan, Korea, OICA, Techn. Service, USA
  - 6 meetings (01/2008 – 04/2009)

45. GRSP – draft proposal by ELSA
ECE-R100 – electric shock

**terms of reference**

- ECE-R100 (German proposal), attachments 101, 110 and 111 (Japan), FMVSS 305 (USA)
- two modules:
  - “in-use“: normal operation (type approval)
  - “post-crash“: after defined crash (self certification)
- time frame:
  - short-term: ECE-R 100 (“in-use“)
  - medium-term: GTR HFCV (“in-use“ and “post-crash“)

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The following prescriptions apply to safety requirements with respect to the **electric power train** of road vehicles of categories M and N, with a maximum design speed exceeding 25 km/h, equipped with one or more traction motor(s) operated by **electric power** and not permanently connected to the grid and the high voltage **components and systems** which are **galvanically connected** to the high voltage bus of the electric power train.
Voltage thresholds

• Class A circuits:  
  (no requirements)  
  $\leq 30 \text{ V AC (alternating current)}$  
  or  
  $\leq 60 \text{ V DC (direct current)}$

• Class B circuits:  
  $> 30 \text{ and } \leq 1000 \text{ V AC}$  
  or  
  $> 60 \text{ and } \leq 1500 \text{ V DC}$
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requirements

• protection against direct contact (e.g. test wire in passengers compartment)

• protection against indirect contact (e.g. enclosure)

• isolation resistance (e.g. 100Ω/V for DC buses, 500 Ω/V for AC buses)

• protection of rechargeable energy storage system against excessive current (e.g. fuses)

• functional safety (e.g. avoid vehicle movement during charging)

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Identification

• Approval mark: 

$E_{\ldots}$

• Warning symbol:

$\triangle$

• Isolation color of voltage class B wires: orange

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next steps

• adoption of ECE-R 100

• further activities on “post-crash”

• incorporation “in-use“ and “post-crash“ into GTR HFCV

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back-up

• test probes

• shared responsibilities

• introduction of ECE-R 100 into EU type approval system

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## test probes

<table>
<thead>
<tr>
<th>First numeral</th>
<th>Addit. letter</th>
<th>Access probe (Dimensions in mm)</th>
<th>Test force</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 B</td>
<td>Jointed test finger</td>
<td>Stop face ($\varnothing$ 50 x 20)</td>
<td>10 N ± 10 %</td>
</tr>
<tr>
<td>4, 5, 6 D</td>
<td>Test wire 1.0 mm diameter, 100 mm long</td>
<td>Sphere 35 ± 0.2</td>
<td>1 N ± 10 %</td>
</tr>
</tbody>
</table>

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shared responsibilities

ISO, IEC, SAE

ECE-R 100

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introduction of ECE-R 100 into EU type approval system

• Electrical safety had become an issue in draft of general safety regulation

• EU commission intend to decide up to October 2009 about inclusion of ECE-R 100 (workplan January 2009)

• Actual ECE-R 100 is only related to battery electric vehicles

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