Submitted by the TF S/R
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Supporting information for documents GRE/2020/15, GRE-83-11, GRE-83-12, GRE-83-13
Clarification for High Efficiency light source and Additional Electronics

• Default light source:
  • Minimum power (≈ 50% of filament max) specified; suitable in all applications
  • Only integrated* electronics

• High-Efficiency light source:
  • Marked “HE”
  • Maximum power (≈ 30% of filament max) specified; suitable for limited applications
  • Only integrated* electronics

• HE-light source combined with Additional Electronics:
  • Tested together during type approval
  • “AE” marking on the electronics (similar to “MD” marking for LED headlamps)
  • The combined power has the same requirements as the “default type”
  • Suitable for all applications

* “integrated” means non-separable electronics (in cap or external)
Combination of an HE LEDr with an AE device

High-efficiency LEDr
Marking:

Additional Electronics device
Marking:
Æ E4 1953

Definition in RE5:
“AE device” means an additional electronics device not integrated with but designed to connect to a high-efficiency LED replacement light source with the purpose to augment the electrical current without changing the other characteristics of this light source.

Note: Pictures for visualisation only
Consideration of R.E.5 power limits
for HE-LEDr, default LEDr and combination of HE + AE

<table>
<thead>
<tr>
<th>Device</th>
<th>Max Power Limit</th>
<th>Min Power Limit</th>
<th>Filament Light Source</th>
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<tbody>
<tr>
<td>HE LEDr</td>
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<tr>
<td>Default LEDr</td>
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<tr>
<td>AE Device</td>
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</tbody>
</table>

Note: Power limit is also a current limit e.g. from 12V to 14V
Examples for different failure detection thresholds in vehicles

Vehicle 1: no detection:
HE LEDr and default LEDr can be used

Vehicle 2: low detection threshold:
HE LEDr and default LEDr can be used

Vehicle 3: high detection threshold:
HE LEDr+AE and default LEDr can be used