Consolidated explanations of rules for none/manual/automatic levelling in GRE-73-18

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Change of inclination due to vehicle loading

middel class passenger cars

soft suspension
hard suspension

3.5% or 2°

nominal cut-off inclination

ECE Reg. 48 target area

driver only
driver + co-driver
5 passengers
5 passengers + luggage trunk load (max. rear axle load)

A B C D E
GEOMETRICAL BASE FOR PROPOSAL h(eight) vs. l(nclination)
GEOMETRICAL BASE FOR POLISH PROPOSAL h(eight) vs. l(nclination)

WNEN h/I IS ON BLUE LINE
THE ROAD ILLUMINATION
CAUSED BY HEADLAMP
IS THE SAME
AS DURING COMPONENT
TYPE APPROVAL

WNEN h/I IS ON ANOTHER LINE CROSING 0.0 POINT THE ROAD
ILLUMINATION IS THE SAME FOR ANY HEIGHT
BASE FOR PROPOSAL h(eight) vs. l(nclination)

INITIAL AIMING & LEVELLING TOLERANCE

LINES CROSING 0.0 POINT
GTB & OICA

Reg. 48

POLAND
FOR TIME BEING

GTB & OICA

POLAND

GTB & OICA
$\Delta I$ MEASUREMENT PROCEDURE

$\Delta I = I_{\text{max}} - I_{\text{min}}$
Δ$I$ „PLACEMENT IN TOLERANCES BOX“

INITIAL AIM ADJUSTED BY MANUFACTURER TO OBTAIN CUT-OFF POSITION INSIDE „BOX”

$\Delta I = I_{\text{max}} - I_{\text{min}}$

Graph showing the relationship between $h$ (m) and $I$ (% D).
ΔI INSIDE TOLERANCE - NO LEVELLING DEVICE NEEDED
Lowest cut-off position

Highest cut-off position
Highest cut-off position after 1 step manual correction

Lowest cut-off position
ΔI > 2 x tolerance

No possibility to correct with 1 step manual device

AUTOMATIC LEVELLING REQUIRED
# Measurement results

<table>
<thead>
<tr>
<th>Vehicle</th>
<th>Headlamp height (m)</th>
<th>ΔI (Imax - Imin)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.74</td>
<td>1.6</td>
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<tr>
<td>2</td>
<td>0.70</td>
<td>0.9</td>
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<tr>
<td>3</td>
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<td>2.1</td>
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<td>0.84</td>
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<td>1.4</td>
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<td>6</td>
<td>0.88</td>
<td>1</td>
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<tr>
<td>7</td>
<td>0.83</td>
<td>1.1</td>
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<td>8</td>
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<td>1.7</td>
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<tr>
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<td>1.6</td>
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<td>21</td>
<td>0.76</td>
<td>2.2</td>
</tr>
</tbody>
</table>
Example No 6

No levelling device needed
Example No 16

Inside tolerances with two position manual device
Example No 10

Automatic levelling needed
Real example - passenger car
Real example - passenger car
Real example - truck. Spring suspension
Real example - heavy truck. Pneumatic suspension
THANK YOU FOR YOUR ATTENTION