Effect of ISOFIX on booster seat performance

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On behalf of CLEPA members

Presented by
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Aim

- Investigate effect of ISOFIX on booster seat performance in front and side impact
  - First analysis of existing tests to highlight gaps / where further tests might be needed
  - Same product – two attachment methods (with ISOFIX vs. without ISOFIX)
  - Data shared among CLEPA partners – products anonymised
    - Supplemented with published TRL experiments for EC
Analysis method

- Paired tests plotted for each parameter
  - Each data point is two tests with same product (w/ ISOFIX; w/o ISOFIX)
  - Data points on black line are equal
    - Above line = w/o ISOFIX result higher
    - Below line = w/ ISOFIX result higher

[Graph showing measurement higher with ISOFIX and without ISOFIX]
Front impact
Head measurements

Head excursion (horizontal)

Head resultant acceleration (3ms)

- ADAC - Q3
- ADAC - P10
- ADAC - Q10
- R44 - P3
- R44 - P6
- R44 - P10
- R129 - Q3
- R129 - Q10

Front impact

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Neck measurements

Neck tensile force ($F_z$)

Neck flexion moment ($M_y$)

Front impact
Chest measurements

Chest resultant acceleration (3ms)

Chest deflection (before chin to chest contact)

Front impact
Abdomen measurements

Abdomen pressure (buckle side)  Abdomen pressure (non buckle side)

Provisional UN R129 limit - 1.2 bar

Front impact
Side impact
Head measurements

Head performance criterion (HPC36)

Head resultant acceleration (3ms)

- ADAC - Q3
- ADAC - Q6
- ADAC - Q10
- UN R129 - Q3

Side impact
Neck measurements

Neck tensile force ($F_z$)

Neck moment ($M_x$)

- ADAC - Q3
- ADAC - Q6
- ADAC - Q10

Side impact
Chest measurements

Chest resultant acceleration (3ms)

- ADAC - Q3
- ADAC - Q6
- UN R129 - Q3

Chest deflection

Side impact
Summary

• Little evidence of a consistent effect of ISOFIX on booster seat performance; but
  – Chest deflection lower with ISOFIX in front impact (3 out of 4 products)
  – Abdomen pressure (buckle side) lower with ISOFIX - No significant abdomen loading occurred

• Further data might reveal more / different trends
  – Are further data available within the Informal Group?
  – Do we need more experiments?
Any Questions?

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