



C L E P A
*European Association of
Automotive Suppliers*



Effect of ISOFIX on booster seat performance

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18-19 March 2015

On behalf of CLEPA members

Presented by

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Aim

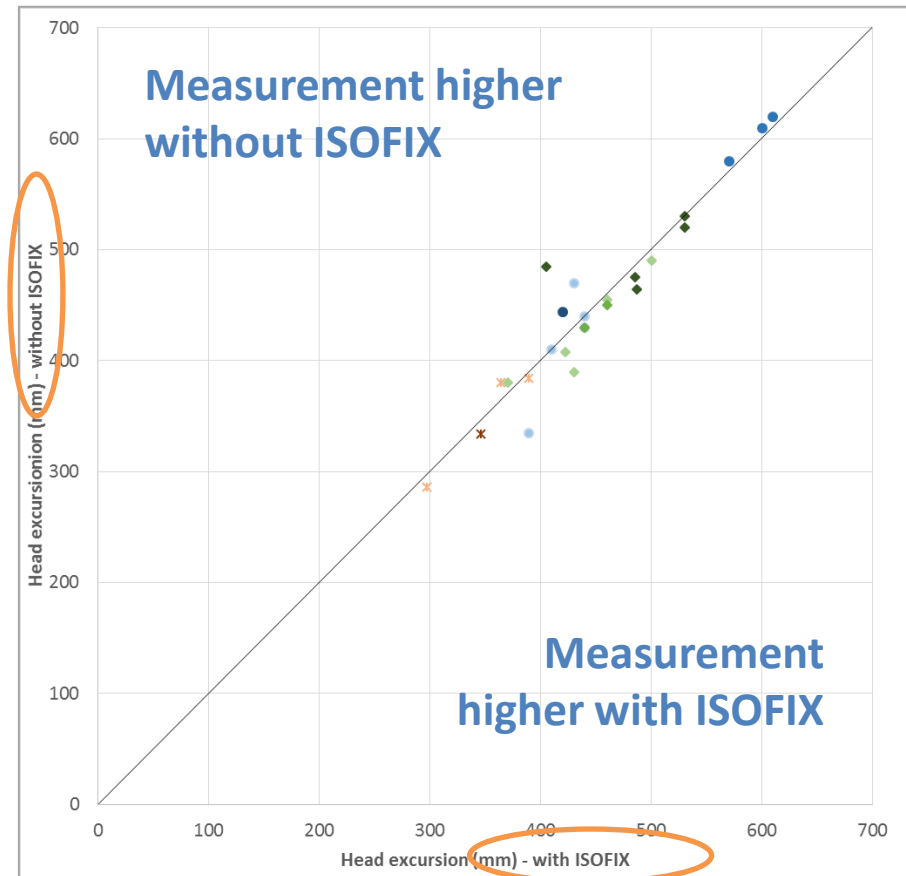


- Investigate effect of ISOFIX on booster seat performance in front and side impact
 - First analysis of existing tests to highlight gaps / where further tests might be needed
 - Same product – two attachment methods (with ISOFIX vs. without ISOFIX)
 - Data shared among CLEPA partners – products anonymised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

Analysis method

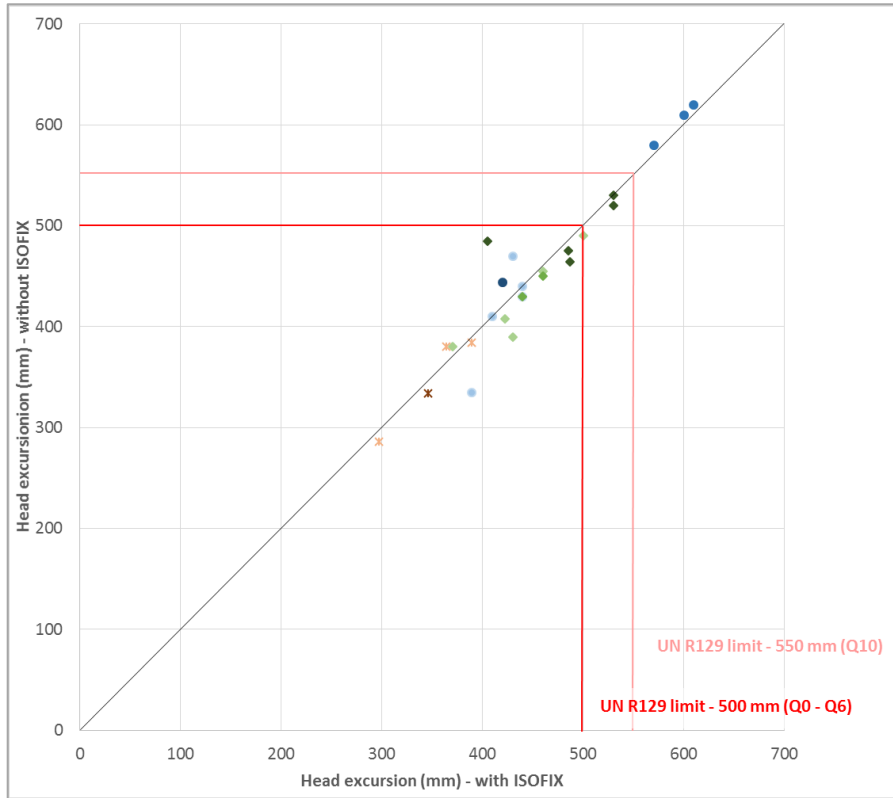


- Paired tests plotted for each parameter
 - Each data point is two tests with same product (w/ ISOFIX; w/o ISOFIX)
 - Data points on black line are equal
 - Above line = w/o ISOFIX result higher
 - Below line = w/ ISOFIX result higher

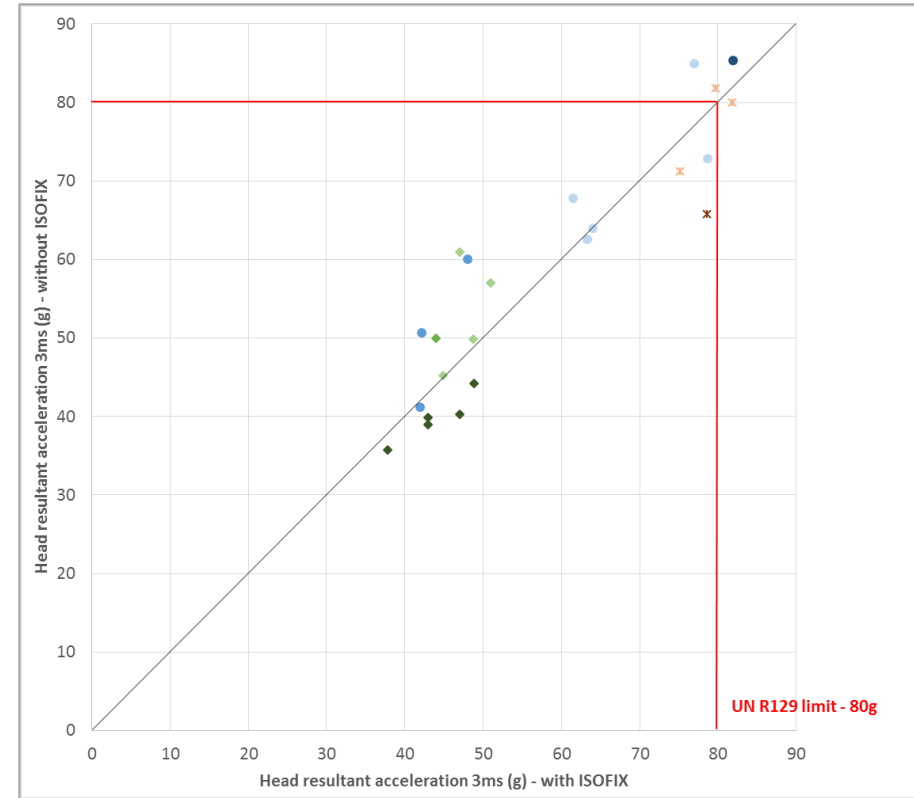


Front impact

Head measurements



Head excursion (horizontal)

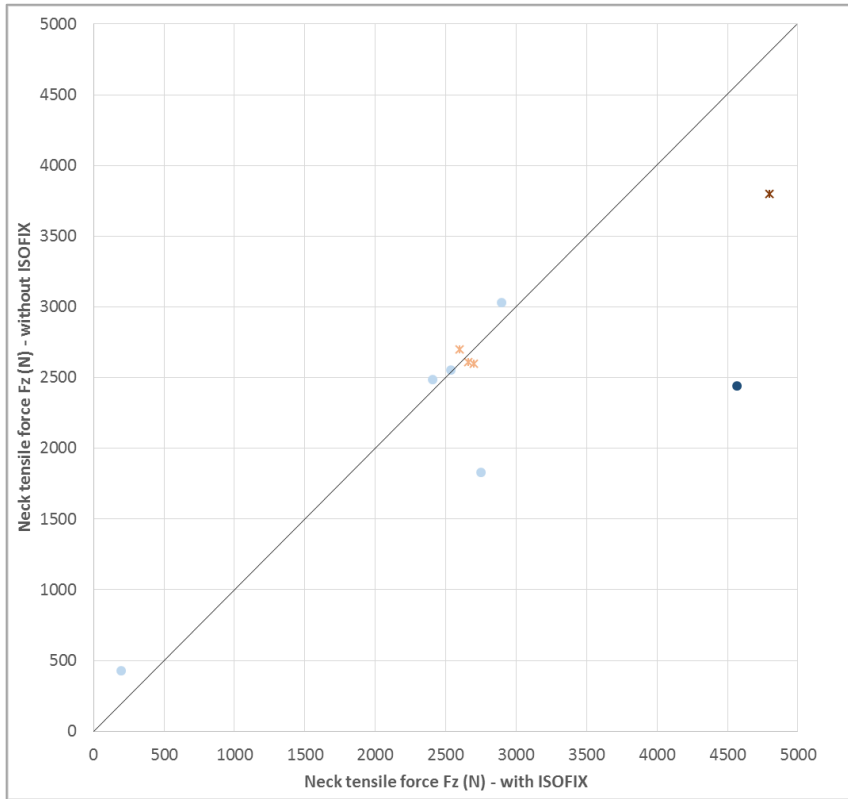


Head resultant acceleration (3ms)

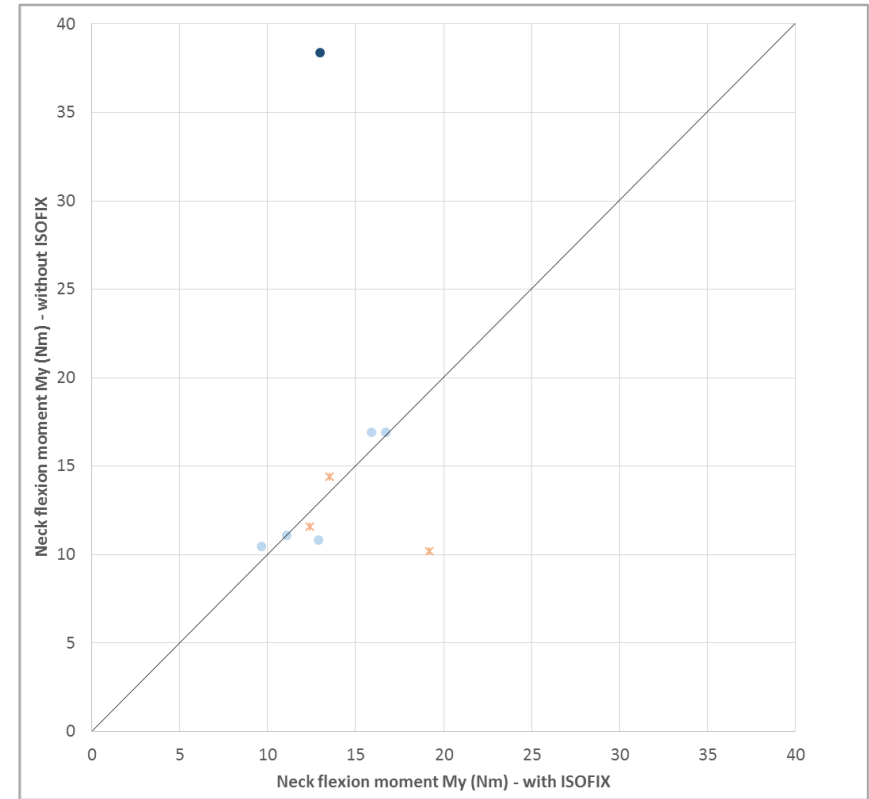
● ADAC - Q3 ● ADAC - P10 ● ADAC - Q10 ◆ R44 - P3 ◆ R44 - P6 ◆ R44 - P10 ✕ R129 - Q3 ✕ R129 - Q10



Neck measurements



Neck tensile force (Fz)

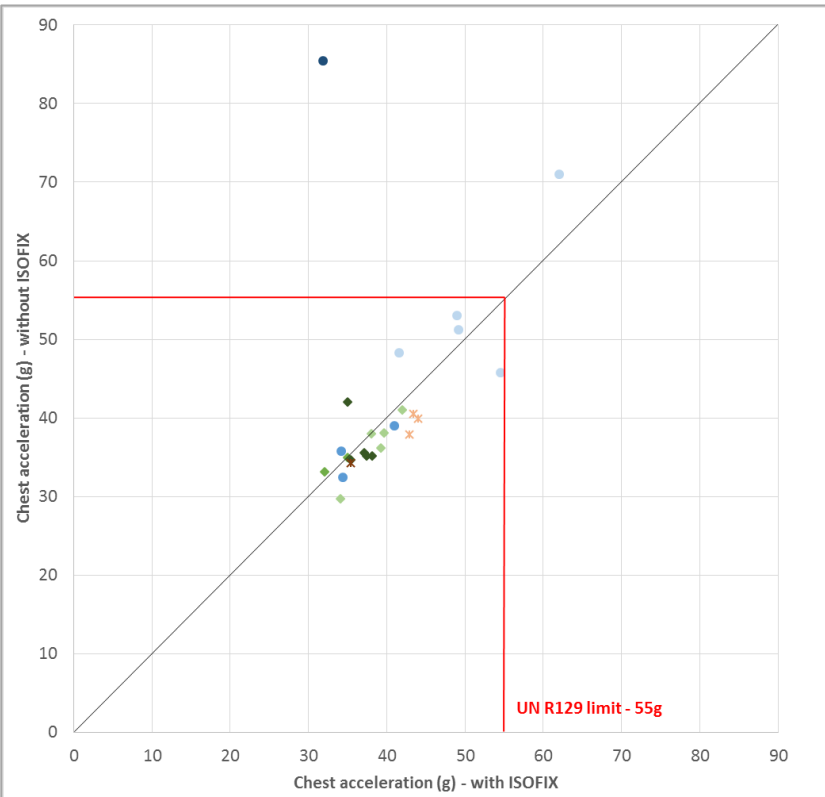


Neck flexion moment (My)

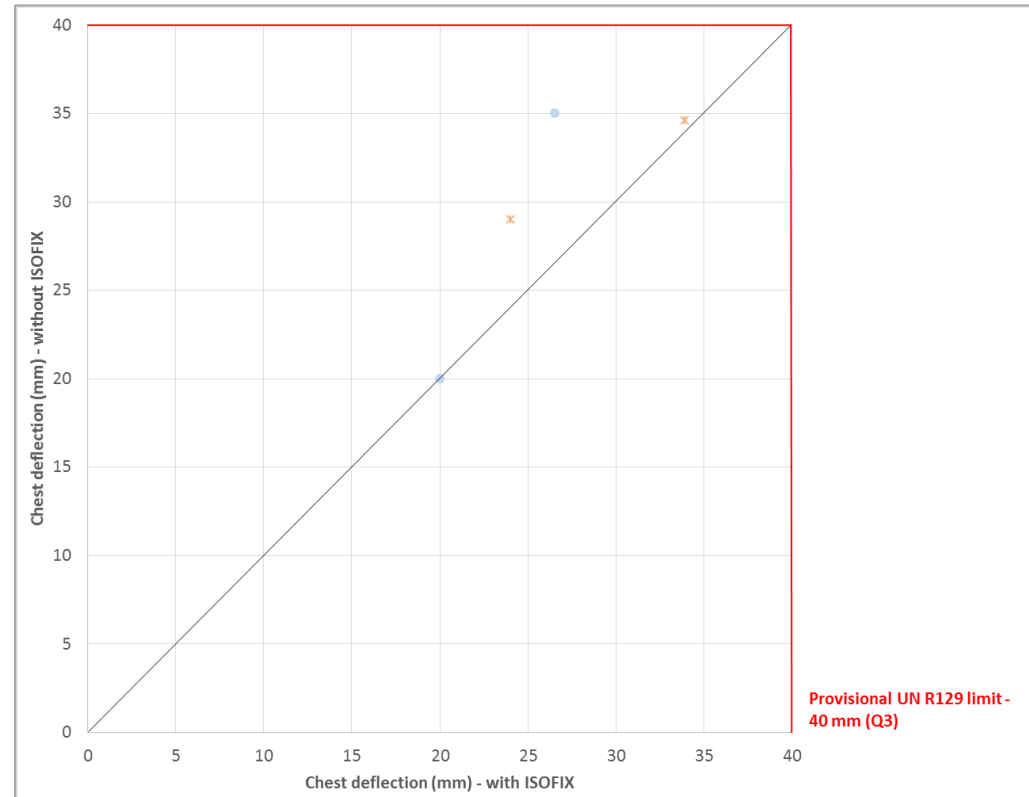
● ADAC - Q3 ● ADAC - Q10 ✕ R129 - Q3 ✕ R129 - Q10



Chest measurements



Chest resultant acceleration (3ms)

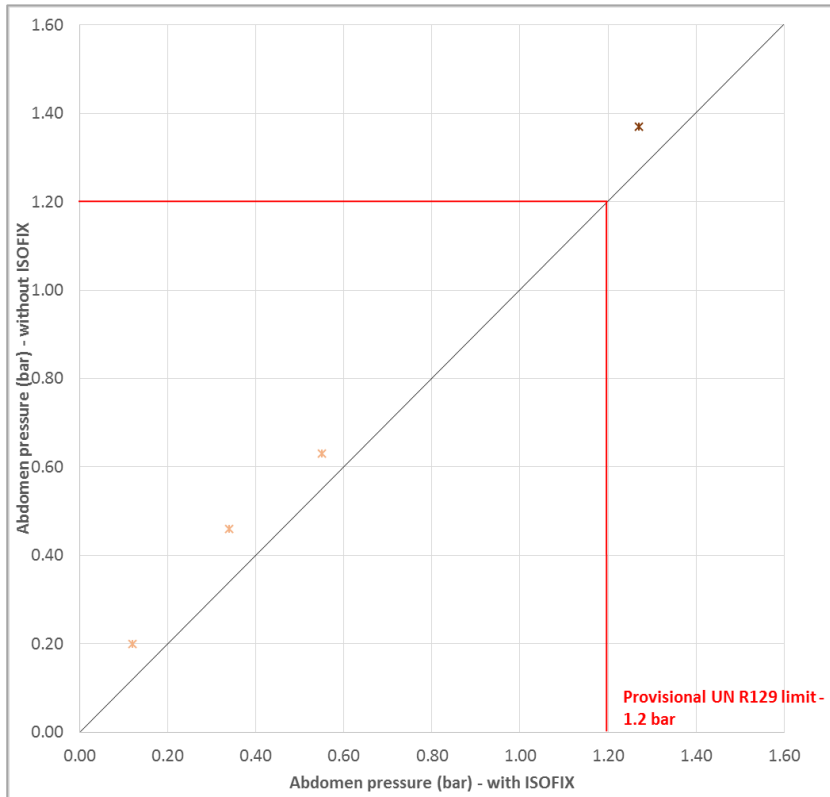


Chest deflection (before chin to chest contact)

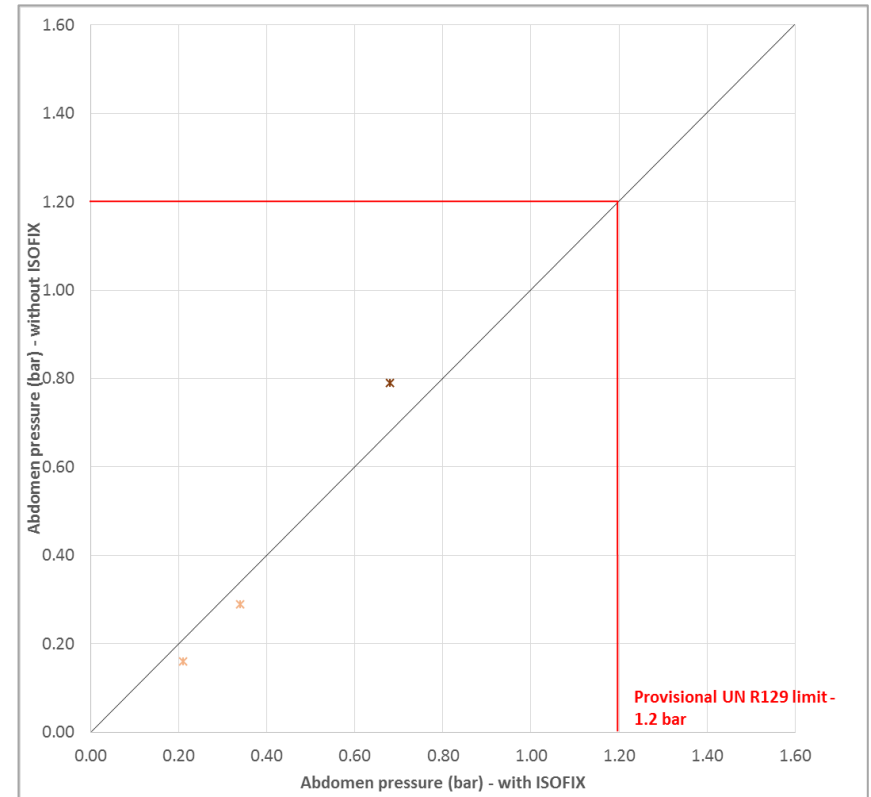
- ADAC - Q3
- ADAC - P10
- ADAC - Q10
- ◆ R44 - P3
- ◆ R44 - P6
- ◆ R44 - P10
- ✕ R129 - Q3
- ✕ R129 - Q10



Abdomen measurements



Abdomen pressure (buckle side)

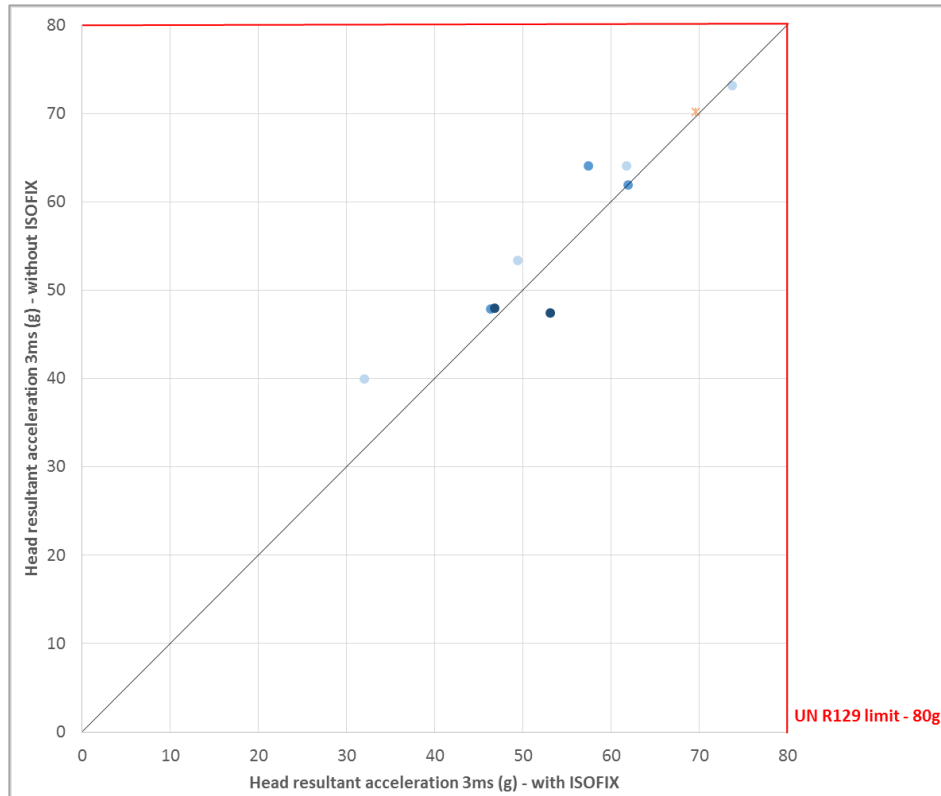
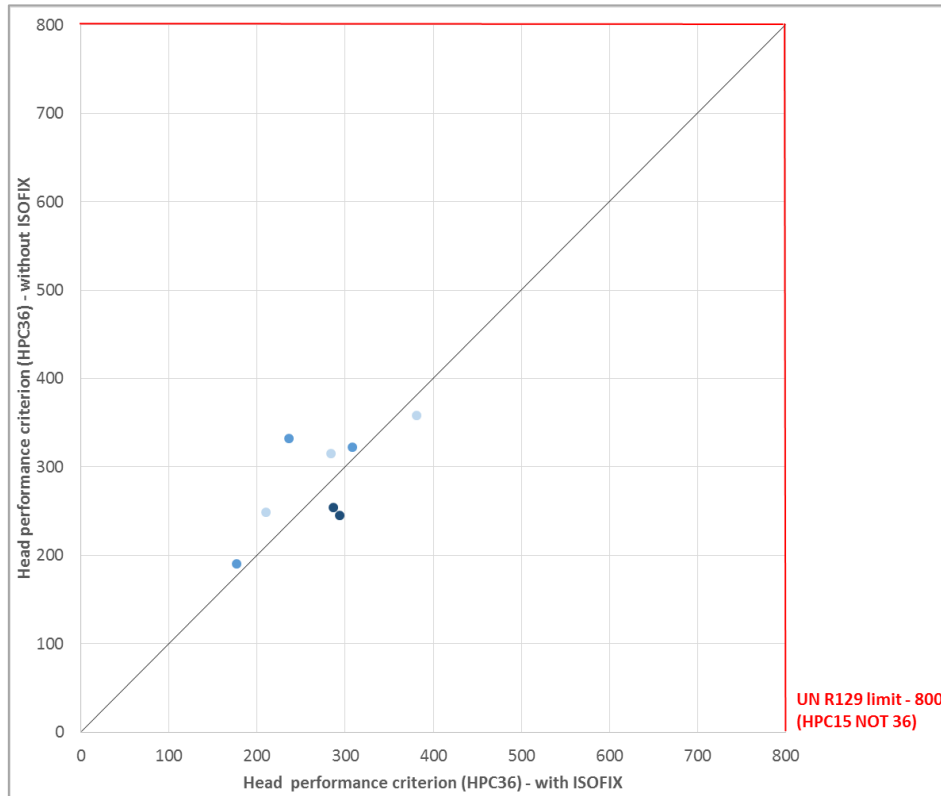


Abdomen pressure (non buckle side)

* R129 - Q3 * R129 - Q10

Side impact

Head measurements



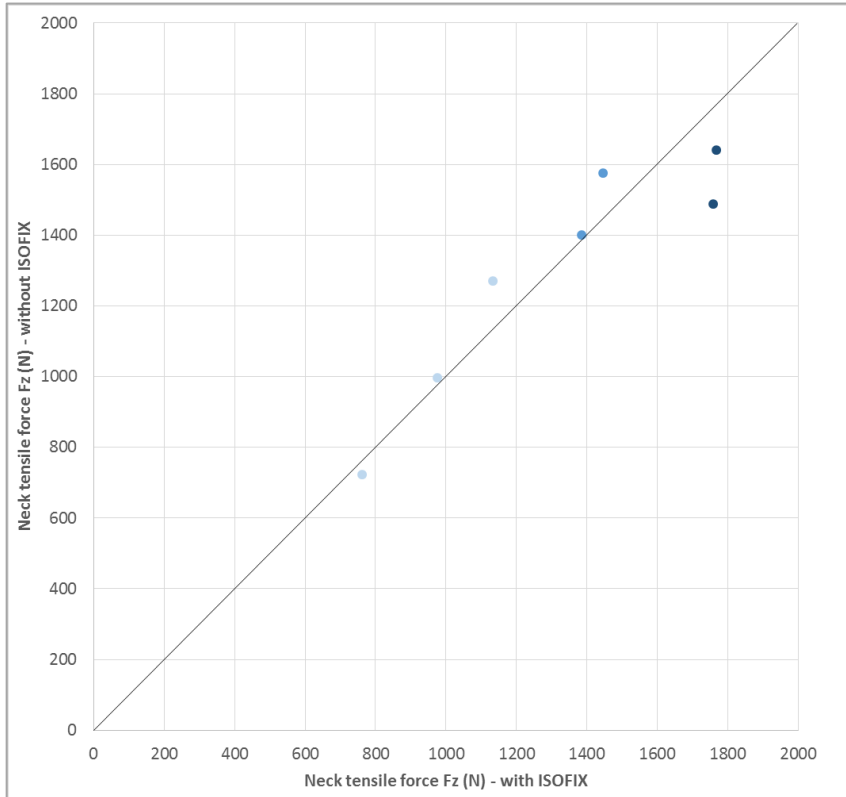
Head performance criterion (HPC36)

Head resultant acceleration (3ms)

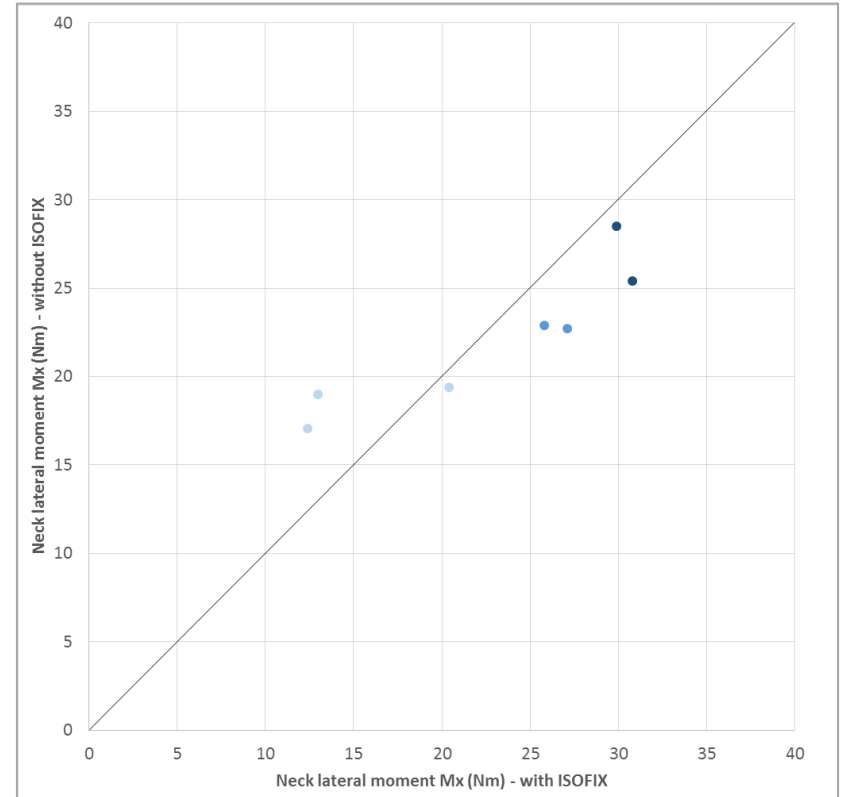
● ADAC - Q3 ● ADAC - Q6 ● ADAC - Q10 ✖ UN R129 - Q3



Neck measurements



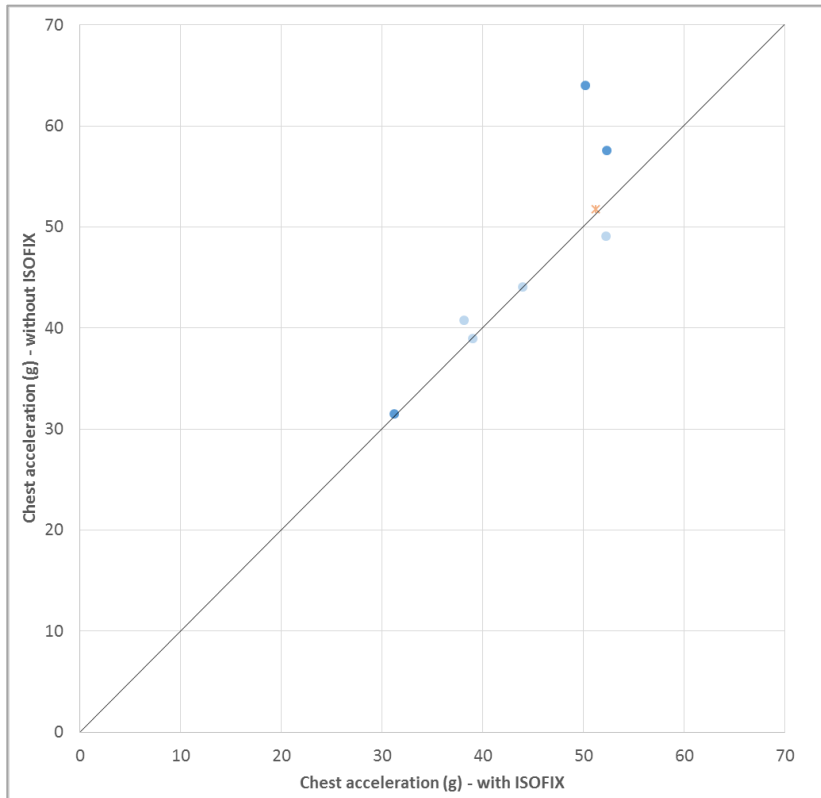
Neck tensile force (Fz)



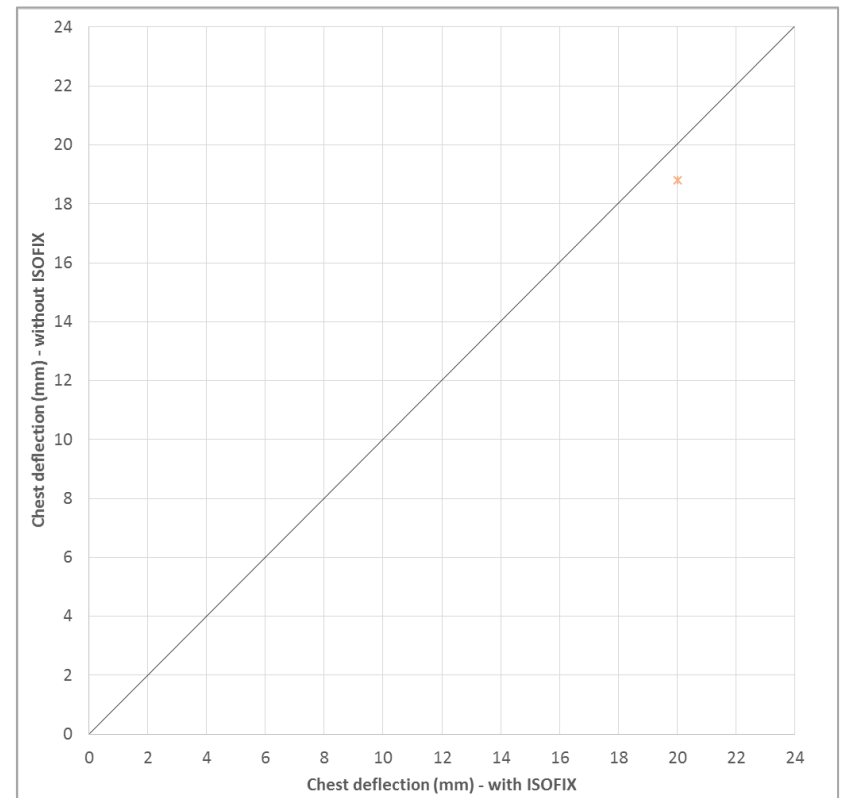
Neck moment (Mx)

● ADAC - Q3 ● ADAC - Q6 ● ADAC - Q10

Chest measurements



Chest resultant acceleration (3ms)



Chest deflection

● ADAC - Q3 ● ADAC - Q6 ✕ UN R129 - Q3

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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