



**C L E P A**

*European Association of  
Automotive Suppliers*

# **Further validation of the UMTRI seating procedure**

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On behalf of CLEPA CRS Subgroup  
60<sup>th</sup> Meeting of the UN Informal Group  
on CRS

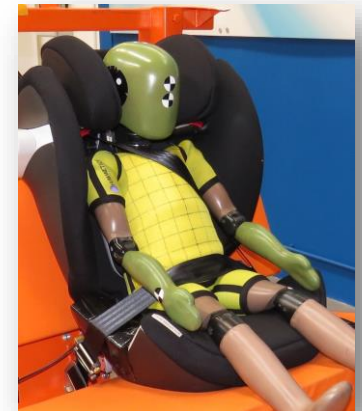
# RESEARCH QUESTIONS



- Does R129 discriminate differences in abdomen protection?
- Does UMTRI seating procedure improve R129's capacity to discriminate?
- What is effect of UMTRI procedure on other body regions?
- Is UMTRI procedure repeatable?



Good booster



Poor booster

|               | R129      | UMTRI    |
|---------------|-----------|----------|
| Belt tension  | 45 – 55 N | 7 – 18 N |
| Pelvis spacer | none      | 20 mm    |

# R129 DID NOT DISCRIMINATE BETWEEN OUR BOOSTERS; THE UMTRI SEATING PROCEDURE DID NOT HELP



| Dummy      | Seating procedure | Booster seat | Belt in abdomen | Pressure L (bar) | Pressure R (bar) |
|------------|-------------------|--------------|-----------------|------------------|------------------|
| <b>Q3</b>  | R129              | Good         | No              | 0.33             | 0.23             |
|            |                   | Poor         | No              | 0.22             | 0.24             |
|            | UMTRI             | Good         | No              | 0.35             | 0.23             |
|            |                   | Poor         | No              | 0.28             | 0.26             |
| <b>Q10</b> | R129              | Good         | No              | 0.97             | 0.48             |
|            |                   | Poor         | No              | 0.70             | 0.36             |
|            | UMTRI             | Good         | No              | 0.69             | 0.38             |
|            |                   | Poor         | No              | 0.34             | 0.34             |

**Q3 with UMTRI in good CRS is average of three tests**

- Higher abdomen pressure on L side – diagonal belt?
- UMTRI procedure reduced abdomen pressure in Q10

# UMTRI SEATING PROCEDURE INCREASED HEAD 3MS VALUE BEYOND LIMIT IN 'GOOD' BOOSTER



| Dummy      | Booster seat | Seating procedure | Hor. head exc. | Res. head acc. 3ms (g) | Res. Chest acc. 3ms (g) |
|------------|--------------|-------------------|----------------|------------------------|-------------------------|
| <b>Q3</b>  | Good         | R129              | 374            | 79.6                   | 44.7                    |
|            |              | UMTRI             | 387            | 76.0                   | 52.5                    |
|            | Poor         | R129              | 338            | 67.1                   | 43.0                    |
|            |              | UMTRI             | 360            | 71.9                   | 53.8                    |
| <b>Q10</b> | Good         | R129              | 395            | 71.1                   | 38.6                    |
|            |              | UMTRI             | 426            | 99.1                   | 45.7                    |
|            | Poor         | R129              | 392            | 89.8                   | 40.5                    |
|            |              | UMTRI             | 375            | 92.4                   | 40.9                    |

**Q3 with UMTRI in good CRS is average of three tests**

- Chest 3ms value also tended to increase (within limit)

# RESULTANT CHEST ACCELERATION INCREASED BEYOND LIMIT IN ONE OF THREE REPEAT TESTS WITH UMTRI SEATING PROCEDURE



| Dummy      | Seating procedure | Booster seat | Hor. head exc. | Res. head acc. 3ms (g) | Res. Chest acc. 3ms (g) |
|------------|-------------------|--------------|----------------|------------------------|-------------------------|
| <b>Q3</b>  | UMTRI             | Good         | 379            | 74.5                   | 48.3                    |
|            |                   |              | 381            | 78.4                   | 50.5                    |
|            |                   |              | 388            | 75.2                   | <b>58.6</b>             |
| <b>CoV</b> |                   |              | <b>1.2%</b>    | <b>2.7%</b>            | <b>10.4%</b>            |

- Implications for production qualification testing?
- Implications for conformity of production testing?
- Effect of UMTRI procedure on reproducibility not investigated

# SUMMARY



- R129 did not discriminate differences in abdomen protection afforded by two booster seats
- No added value of UMTRI seating procedure in assessing abdomen protection
- UMTRI procedure tended to increase measurements in regulated body regions
  - Head 3ms value in Q10 increased beyond limit
- UMTRI procedure delivered mostly repeatable results; but
  - Chest 3ms value in Q3 increased beyond limit in one of three repeat tests
- Larger programme of tests needed to evaluate UMTRI seating procedure fully before it is adopted in regulation