Euro NCAP Child Presence Detection

70th Session of GRSP

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Background & Timeline

Child Presence Detection (CPD)

2025 Roadmap
Identification of topic

2017

Child Working Group
Discussions began
Reviewing data

2018

Implementation & Rating
Delayed from 2022
Scenarios 1 & 2

2019-2022

Draft Protocol
Drafting began
1st publication early 2021
Points allocation - VBA

2023

Updated assessment
All scenarios
Direct sensing only

2025
Data – Child Vehicular Heatstroke

- On average 38 vehicular heatstroke fatalities per year in the US
  - No systematic tracking of incidents in Europe (near misses not counted)

- Causes:
  - Forgotten (54%) – Memory failure & distraction
  - Knowingly left (18%) – Underestimate risk & ‘back soon’
  - Gained access to car (26%) – Can’t exit vehicle
  - Remaining % unknown

- Majority of victims are below two years old - in CRS, often sleeping

In-Vehicle Heatstroke Fatalities in the US

- Period: 2000 - 2020
- Average: 38 cases per year
- Best: 24 (2020)

Age of In-Vehicle Heatstroke Victims

- < 1 year old
- 1 year old
- 2 years old
- 3 years old
- 4 years old
- 5 years old and over

Data courtesy of https://noheatstroke.org
Protocol Development

Creating a Euro NCAP protocol

Scenarios to cover
1. Forgotten
2. Knowingly left
3. Accessing vehicle

Warnings
- Initial
- Escalation
- Intervention

Technology
- Direct sensing
- Indirect sensing
- Evaluation
Protocol Development

1 Forgotten
2 Knowingly left
3 Accessing vehicle

Scenario 1, 2
CRS
Integral harness:
All likely child positions
1YO in RWF
3YO in FWF

Scenario 3
3-6YO
Unrestrained children

Vehicles with single and optional seat rows

Sleeping, little or no movement

Awake with movement

Children up to 6YO

Informal document GRSP-70-30
70th GRSP, 6-10 December 2021
agenda item 24(f)
Protocol Development

**Warnings**

- **Always active**
  - Deactivation

- **Delays**
  - Signal acknowledged e.g. fuelling

- **Intervention**
  - Direct contact
  - eCall
  - AirCon
  - Open to possibilities

- **Initial warning**
  - Directly after locking
  - Target driver

- **Initial warning**
  - Vehicle based
  - Audio-visual
  - Always required

- **Escalation**
  - Warn others
  - Direct sensing only

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Protocol Development

Technology

- Camera
- Radar
- Lidar
- Ultrasonic
- Infrared
- WLAN
Protocol Development

‘Indirect sensing’ systems
- Derives the potential presence of a subject or object inside the car based on logic
  - Indirect sensing does not distinguish between live persons or objects
- Based on door opening switches, pressure or capacitive sensing etc.
- Specific use cases detailed in protocol – scenarios based on sequential steps
- Assessment performed by laboratory

‘Direct sensing’ systems
- Detecting the absolute presence of a human inside the vehicle by tracking heartbeat, respiration, movement, or any other sign of life
  - Direct sensing may or may not allow categorization and localization of the subject(s)
- Different technologies proposed: (imaging) radar, ultrasonic, camera, lidar, infrared, ...
- Evaluation is technology dependent, based on OEM data submissions
- Validation of test tools needed (where necessary)
Euro NCAP Assessment - CPD

Adoption in 2023 - part of Vehicle Based Assessment

Approach

- System must be standard vehicle equipment
- Focus on forgotten & intentionally left cases first
- Incentive to cover all seating positions (excluding driver seat)
- Action based on increasing risk: Initial Warning, Escalation Warning and Intervention

<table>
<thead>
<tr>
<th>Vehicle Based Assessment</th>
<th>2020</th>
<th>2023</th>
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<tr>
<td>Gabarit Installation on all Passenger Seats</td>
<td>2</td>
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<tr>
<td>THREE i-Size and Top Tether Marking</td>
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<tr>
<td>Two or more ISO/R3 Positions</td>
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<td></td>
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<td>Passenger Airbag Warning Marking and Disabling</td>
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<td>Integrated CRS</td>
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<tr>
<td>Child Presence Detection</td>
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Euro NCAP Child Presence Detection General Requirements

- **Initial Warning**
  - Targets the driver
  - Directly after locking <10s
  - Visual and audible warning for ≥2s
  - Temporary delay or cancellation

- **Escalation Warning**
  - After initial warning, warn driver and others
  - Repeats every 60s for 20 min period
  - Vehicle and/or mobile phone warning

- **Intervention**
  - Supersedes or replaces escalation warning, 10 min from locking
  - Open to possibilities - must actively reduce the threat of hyperthermia
Summary

Technology currently exists to address CPD

- Detection & monitoring of occupants
- Warnings & intervention

2023 & 2024 assessment

- Forgotten & intentionally left cases (Scenario 1 & 2)
- Direct and indirect sensing systems rewarded

2025 assessment

- Children entering an unlocked vehicle case added (Sc. 1,2 & 3)
- Only direct sensing will be rewarded

The End

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