EURO NCAP

#FORSAFERCARS

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Safe Driving
Occupant Monitoring

Protocol

Implementation January 2026

PREFACE

During the test preparation, vehicle manufacturers are encouraged to liaise with the laboratory and to check that they are satisfied with the way cars are set up for testing. Where a manufacturer feels that a particular item should be altered, they should ask the laboratory staff to make any necessary changes. Manufacturers are forbidden from making changes to any parameter that will influence the test, such as dummy positioning, vehicle setting, laboratory environment etc.

It is the responsibility of the test laboratory to ensure that any requested changes satisfy the requirements of Euro NCAP. Where a disagreement exists between the laboratory and manufacturer, the Euro NCAP secretariat should be informed immediately to pass final judgment. Where the laboratory staff suspect that a manufacturer has interfered with any of the set up, the manufacturer's representative should be warned that they are not allowed to do so themselves. They should also be informed that if another incident occurs, they will be asked to leave the test site.

Where there is a recurrence of the problem, the manufacturer's representative will be told to leave the test site and the Secretary General should be immediately informed. Any such incident may be reported by the Secretary General to the manufacturer and the person concerned may not be allowed to attend further Euro NCAP tests.

DISCLAIMER: Euro NCAP has taken all reasonable care to ensure that the information published in this protocol is accurate and reflects the technical decisions taken by the organisation. In the unlikely event that this protocol contains a typographical error or any other inaccuracy, Euro NCAP reserves the right to make corrections and determine the assessment and subsequent result of the affected requirement(s).

CONTENTS

DEFINITIONS

Journey – A journey starts with activation of the master control switch and lasts until the deactivation of the master control switch and the driver's door being opened.

Vehicle master control switch – Means the device by which the vehicle's on-board electronics system is brought from being switched off, as in the case where a vehicle is parked without the driver being present, to a normal operation mode.

Adult occupant – Means a person of any age with a mass or stature as of at least 47kg and 140cm defined under the UN Regulation No. 16 lower boundary.

Six year old child occupant – Means a person with a mass or stature of that of a 95th percentile 6yo child, 28kg or 125cm respectively. Growth Charts - 2000 CDC Growth Charts - United States.

Direct sensing – The ability to detect the presence of a human inside the vehicle by means of tracking heartbeat, respiration, movement, or any other sign of life. Direct sensing may or may not allow categorisation and localisation of the subject(s).

Vehicle key – A device with which a vehicle can be locked or unlocked and is required inside the vehicle to operate. Can be physical device or an app on a mobile phone.

Child safety locks – For the purposes of this protocol only, Euro NCAP uses the same definition for child safety locks as that detailed in UN Regulation No. 11.

Child Safety Lock System is a locking device which can be engaged and released independently of other locking devices and which, when engaged, prevents operation of the interior door handle or other release device. The lock release/engagement device may be manual or electric and may be located anywhere on or in the vehicle.

SCORING

Occupant monitoring assessment	Total points 30
Seatbelt Usage	**10**
Correct belt routing	5
Rear seat occupancy	5
Occupant classification	**10**
Passenger airbag status	4
Out of position	2
Stature classification	4
Occupant presence	**10**
Child presence detection	5
Crash occupancy information	5

1 SEATBELT USAGE

Seatbelt Usage assessment	Total points 10
Correct belt routing	**5**
Seatbelt buckle only	2
Seatbelt completely behind back	1
Lap belt only, diagonal belt behind back	2
Rear seat occupancy	**5**
Nr of rear seats with occupancy detection / Nr of rear seats x 5 points	5

1.1 General requirements

The seatbelt reminder system must start at the commencement of each 'journey' (excluding the initialisation period) that the vehicle makes. Short breaks in the journey are allowed where the reminder system is not required to start again. Such short breaks, of up to 30 seconds, are to allow for events such as stalling of the engine where passengers may remain in the vehicle.

All seatbelt reminder systems shall be audio-visual with a clear and obvious link between the audible and visual signals. As soon as the audible part of the seatbelt reminder signal starts, the visual signal must flash and be synchronised (not necessarily at the same frequency, but an integer multiple of each other, e.g. two flashes with every chime) with the audible part.

1.1.1 Visual signal

Any visual signal must be clearly visible to the driver, without the need for the head to be moved from the normal driving position (e.g. instrument panel, head-up display, rear-view mirror, centre console).

The visual signal must remain while the seatbelt is not fastened or is worn incorrectly. If a belt has been buckled, the signal must recommence once a seatbelt is unbuckled.

1.1.2 Audible signal

A 'loud and clear' audible signal is to be deployed before at least one of the following (at the choice of the manufacturer):

- The car has reached a forward speed of 40 km/h, or
- The engine has been running for 90 seconds, or
- The car has been in "Forward Motion" for 90 seconds, or
- The car has been in "Forward Motion" for 1000 meters, or
- The regulatory second level warning is finished.

The duration of the audible signal must be at least 90 seconds not counting gaps exceeding 3 seconds and must start with a positive audible signal (not a gap). There must be no gaps greater than 10 seconds.

1.1.3 End of signal

Once the audible part of the SBR signal has started, it must continue while the seatbelt is unbuckled or incorrectly worn. The signal must only stop when the signal has operated for the required duration or when the related belts are buckled and worn correctly.

1.1.4 Occupant detection

In the case of the driver's seat, occupancy can be assumed, therefore the system does not have to be capable of detecting whether or not the seat is in use. For all front seat adult passengers, seat use must be detected.

1.1.5 Secondary buckles

Monitoring of any seat belt secondary buckles is required. Secondary buckles that require a tool to unlock, do not require monitoring.

1.1.6 Airbag deactivation switch

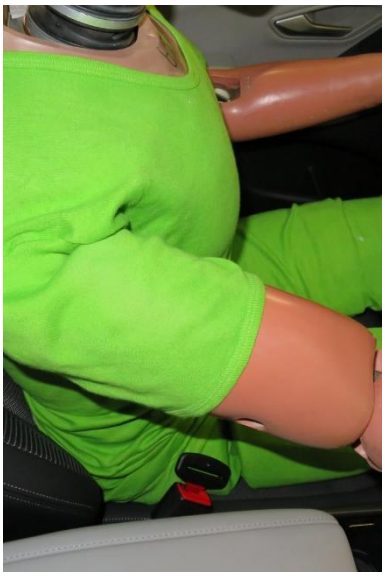
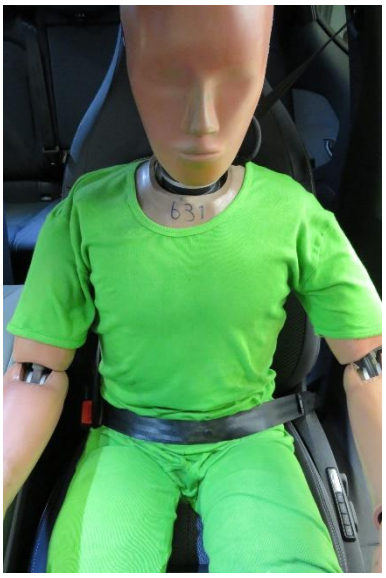
There must be no link between the front seat passenger airbag and the front seat passenger SBR signals. It is NOT acceptable to Euro NCAP for the passenger’s seat SBR to be disabled via the passenger airbag switch.

1.2 Correct seatbelt routing

Correct seatbelt routing	Total points 5
Seatbelt buckle only	2
Seatbelt completely behind back	1
Lap belt only	2

Initially, the seatbelt misuse cases are only assessed for the driver's seating position. Additional positions within the vehicle and misuse cases may be added in 2029.

1.2.1 Seatbelt misuse cases

Seatbelt misuse cases		
		
Seatbelt buckle only	**Seatbelt completely behind back**	**Lap belt only**

The pictures above are for illustration purposes only.

1.2.2 Warning requirements

Where the vehicle detects any of the misuse cases defined above at the start or during a journey, a seatbelt reminder warning or an alternative audiovisual warning that meets the general warning requirements in Section 1.1 shall be issued.

A latency period of 30 seconds is permitted from the moment of misuse to the time of warning to allow the system to assess and decide on the need for warning.

Once the audible part of signal has started, it is permissible for the driver to acknowledge the signal and silence the audible part (only). The visual signal must continue either in a steady or flashing state.

Where a signal has been acknowledged, there is no need for further audible warnings if the occupant continues to misuse the seatbelt with either the same misuse case or changes to a different misuse case. If the seatbelt is unbuckled after this acknowledgement, the SBR warning must recommence in accordance with Section 1.1.

The system performance will be verified with snug fitting clothing. No further specification of either clothing or occupant size & stature is given to avoid sub-optimisation of detection. Where an issue arises regarding the clothing used for the assessment and the sensing system, this shall be discussed with Euro NCAP Secretariat who will determine if further assessment is required on a case by case basis.

1.3 Rear seat occupancy assessment

Rear seat occupancy	Total points 5
Nr of rear seats with occupancy detection / Nr of rear seats x 5 points	5

Any rear seating position with occupant detection and that issues a seatbelt reminder warning that meets the requirements of 1.1 when the seat is occupied by an adult and a belt is not in use, will be awarded points.

2 OCCUPANT CLASSIFICATION

Occupant Classification	Total points 10
Passenger airbag status	**4**
Automatic	4
System advised with manual software switch	3
System advised with manual hardware switch	2
Manual (software or hardware switch)	1
Out of Position	**2**
Close proximity to the airbag	1
Feet on dashboard	1
Stature classification	**4**
Driver	3
Front seat passenger	1

2.1 Passenger airbag status

Passenger airbag status	Total points 4
Automatic	4
System advised with manual software switch	3
System advised with manual hardware switch	2
Manual (software or hardware switch)	1

The passenger airbag deactivation assessment looks at occupancy sensing, the airbag switch and the status indication. If no front passenger airbag is available on the entire model range, 4 points will be awarded.

2.1.1 Occupancy sensing

Automatic and system advised airbag control systems must be able to automatically detect adult occupants and/or children that might be installed in CRS.

For manual-only systems, the driver is responsible for the occupancy classification.

2.1.2 Airbag status

For automatic airbag control systems, the airbag status is fully and automatically controlled by the vehicle.

In the case of advising systems, the driver is prompted to change the airbag status from ON to OFF or vice versa when there is a conflict between the airbag status and the seat occupancy.

Automatic and advising systems should be based on the following strategy:

- The airbag must be OFF for any rearward facing CRS
- The airbag must be ON for a 5th percentile occupant and larger
- For forward facing CRS or occupants smaller than a 5th percentile, the OEM must provide a strategy for an appropriate airbag status

The entire system must immediately react to the change of occupancy correctly. Up to 10 seconds will be permitted from the change of occupant to the corresponding signal from the airbag status indicator. Systems will be checked once the vehicle diagnostics/system checks have been completed.

The method for assessing automatic and advising systems is detailed in Technical Bulletin SD 001.

2.1.3 Airbag status switch

2.1.3.1 Software switches

Where a software switch is used, clear instructions detailing ‘Passenger AIRBAG OFF/ON’ (no abbreviations) must be presented in the menu at the same time as the corresponding pictograms used for the status indicator. Additionally, text and instructions within vehicle menus must meet the official language requirements of the Euro NCAP Application Area, Technical Bulletin G 001 where the vehicle is sold.

2.1.3.2 Hardware switches

Switches must be permanently labelled with the words ‘Passenger AIRBAG OFF/ON’ and the same pictograms as for the airbag status indication in 2.1.4 indicating ON and OFF at the two switch positions.

Where the two switch positions are marked not on the switch but on an adjacent label, the label must be sufficiently close to the switch, such that the user clearly associates one with the other.

The hardware switch must be accessible and clearly visible when installing a CRS. For example, where a switch is located in the glove box, the presence of the switch must be clearly highlighted either by switch itself or an additional, permanent, label when the lid is open. For example, the switch may not be located on the driver’s side of the vehicle

It must not be possible for a rearward facing child; restrained on the front passenger seat; to operate the switch at any time.

2.1.4 Airbag status indication

The status indicator must be labelled with the words ‘Passenger AIRBAG OFF/ON’. Abbreviations such as ‘Pass’, ‘AB’ or any other combination is NOT acceptable. Supplementary warnings will be ignored.

Passenger AIRBAG ON	Passenger AIRBAG OFF
	
Shown for 60 seconds after ignition/master control is switched on and after the airbag is switched from OFF to ON	Permanently displayed when the ignition/master control is on and the seat is occupied.

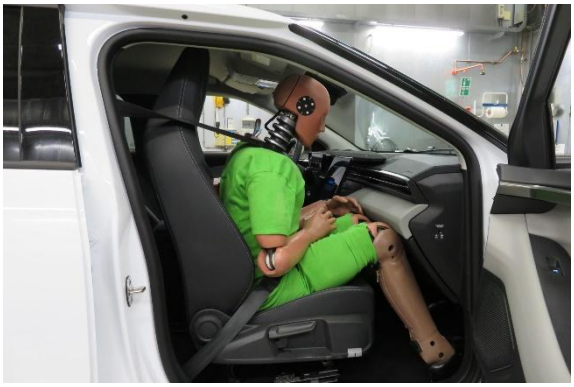
Slight alterations to the ON/OFF pictograms above are acceptable provided that the basic geometry of the pictogram remains the same. Mirroring and monochrome colours are acceptable.

2.2 Out of Position

Out of Position	Total points 2
Close proximity to the airbag	1
Feet on dashboard	1

Initially, the OoP cases are only assessed on the outboard front passenger's seating position. Additional positions and cases may be added in 2029.

2.2.1 Close proximity to the airbag

Close proximity to the airbag	
	

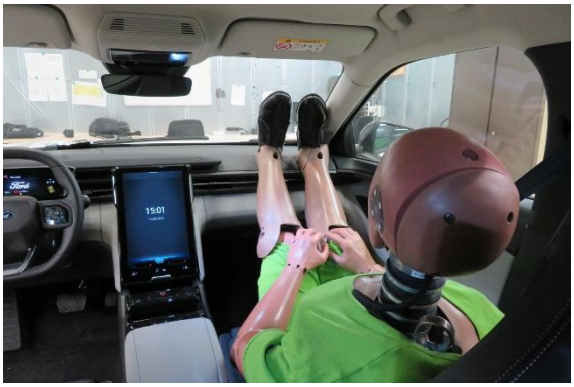
The pictures above are for illustration purposes only.

The system is expected to detect where the passenger is leaning forward and in close proximity to the facia, independent of the position of the front seat.

A warning must be given when any part of an adult occupant's head is within 20CM of the facia. A shorter distance is acceptable where the OEM can provide evidence showing that there is no risk to the occupant from the deploying airbag.

2.2.2 Feet on dashboard

Feet on dashboard



The pictures above are for illustration purposes only.

The system is expected to detect three foot positions on the facia: inboard, along the seat centreline and outboard will be evaluated.

All three foot positions must be detected and warned in order to qualify for rewards. There will be no partial rewards for feet on dashboard. It is not required for system to distinguish between the three foot positions.

2.2.3 Warning requirements

Where the vehicle detects the OoP case(s) above, the vehicle must provide information to either the driver or passenger. Alternatively, countermeasures that adapt the strategy of the occupant restraint system are also eligible for these rewards.

All of the OoP cases identified in Section 2.2.1 and Section 2.2.2 shall be monitored by the vehicle both at the start of a journey and during a journey. See the definitions section for the requirements at the start of a journey.

A visual warning must be accompanied by an audible chime to direct the driver towards the visual warning, both must be given when OoP case has been detected. The visual warning may be a message in the infotainment system, or a pictogram located within the IP or facia. Additionally, where a text message is used, text and instructions within vehicle menus must meet the official language requirements of the Euro NCAP Application Area, G 001 where the vehicle is sold.

The audiovisual warnings must commence within the parameters defined in Section 1.1.2 and throughout the rest of the journey when OoP is detected. A latency period of up to 30 seconds is permitted from the moment of OoP to the time of warning to allow the system to assess and decide on the need for warning. Where an OoP warning has been given and subsequently ignored, a maximum duration of 15 minutes is permitted between subsequent audiovisual OoP warnings.

The system must function with all sizes and statures of occupant, in a realistic range of seating positions for each stature throughout the whole journey.

All checks will be performed with normal clothing, where unrealistic and complex edge cases will be avoided.

2.3 Occupant stature classification

Occupant stature classification	Total points 4
Driver	3
Front seat passenger(s)	1

Driver and front seat passenger(s) adult occupants should be classified by the vehicle and an appropriate restraint system strategy must be applied. The classification and strategies will be evaluated as part of the Frontal Impact and VTC assessments.

The assessment will be based on OEM information, where (when approved) the adaptivity settings will be used in the frontal impact assessment.

2.3.1 Occupant stature classification information

As a minimum requirement for both the driver and front passenger, the restraint system must have at least two adaptivity settings. The OEM must provide information that justify the range of statures that are covered by each adaptation strategy in the restraint system. This information must be provided by the OEM in order for any restraint adaptivity settings to be used in the VTC frontal impact simulations.

The information must contain:

- Occupant classification strategy including a 5^{th}, 50^{th} and 95^{th} percentile occupant
- Restraint adaptivity for the different statures

3 OCCUPANT PRESENCE

Occupant Presence	Total points 10
Child Presence Detection	5
Crash Occupancy information	5

3.1 Child presence detection

Child presence detection		Total points 5	
Scenarios	**Warning/Intervention**	**Rear seats only**	**All passenger seats**
Child left behind	Warning	1.5	3.0
	Warning & Intervention	3.0	4.0
Child enters unlocked vehicle	Warning	0.5	1.0
	Warning & Intervention	0.5	1.0

Prior to assessment, information from the OEM is needed so that the system can be assessed. This is needed to explain system functionality, a description of the CPD warning and how it compares/differs to other signals from the vehicle (e.g. locking).

Where an OEM chooses, a warning sequence using a mobile phone application, it must be provided by the OEM prior to assessment given than in some cases the vehicle under assessment is not yet sold and the application may not be available.

Euro NCAP allows alternative advanced solutions that actively reduce the threat of hyperthermia to any children in the vehicle where it is necessary to mitigate the risk. OEM's can liaise with the Euro NCAP secretariat to discuss the appropriateness of their CPD strategy in case the requirements below are prohibiting such advanced solutions.

3.1.1 General requirements

The CPD system shall use a direct sensing method, must be default ON at the start of each journey and must be able to address children of ages up to and including six years old. The OEM must provide Euro NCAP with a dossier according to Technical Bulletin SD-102.

For CPD a journey is deemed to be finished 15 minutes after the deactivation of the master control switch and the driver's door being opened.

The protocol covers children left behind in a vehicle, either intentionally or unintentionally, and children between three and six years old that have entered an unlocked vehicle and became trapped inside without the knowledge of the carer.

For children left behind, the CPD system must account for all likely child positions inside the vehicle compartment. A CRS will be installed on relevant vehicle seating positions and includes all positions of movable seats and all seat rows as well as optional and removable seats.

In addition to the coverage areas detailed in the paragraph above, the coverage area for children that entered an unlocked vehicle, the coverage area includes also the driver's seat as well as other areas where a child may hide within the cabin such as all footwell areas. The luggage area, accessible from the occupant compartment behind the rearmost seatback, boot or rear door will be excluded.

The functionality of each system and its compliance with warning/intervention requirements is assessed in accordance with the procedures laid out in Technical Bulletin SD-102.

3.1.2 Triggering requirements

Where the system has detected that an unattended child is locked inside a vehicle, a warning sequence by the vehicle is required at the moment the vehicle is locked. The time between locking and the initiation of the warning must be as short as possible. However, a delay of no more than 15 seconds is permissible to allow the system to assess occupancy.

In case a child has gained access to the vehicle, and no doors have been locked, a delay of no more than 10 minutes from door closure, with or without child safety lock engaged, is permitted to the initial warning. Door closure is defined as the door being in the primary latch position, i.e. fully closed.

3.1.3 Warning requirements

The CPD warning consists of an initial and escalation warning.

Both the initial and escalation warning must be heard, seen or felt, by a person exterior to and in the direct vicinity of the vehicle and must be distinctive and differ from that used to signal normal locking or other similar daily functions, e.g. unique use of flashing or vibration pattern and/or audible signal.

3.1.3.1 Initial warning

The initial warning shall be an audible or visual warning from the vehicle and may be a simple beep and/or flash of lights, where the duration of the initial signal must be at least 3 seconds not counting gaps.

The initial warning may be delayed once by the driver/carer for a duration not exceeding 10 minutes, after which the warning sequence shall (re)start. The actions to activate a delay must be a deliberate action and cannot be the same than those for cancelling a signal. For example, this may be done by pushing a specific button or activating a temporary system delay when in the vicinity of vehicle, i.e. not from distance.

3.1.3.2 Escalation warning

The escalation warning shall be issued if the system detects the continued presence of an unattended child after the initial warning has either ended or been cancelled and all doors are closed and locked.

An escalation warning should start no more than 90 seconds after the end of the initial warning, the duration of an escalation warning shall be at least 15 seconds (gaps of less than 3 s are permissible) and shall be repeated at least every 1 minute for no fewer than 20 minutes.

The escalation warning can be an audible or visual warning from the vehicle or alternatively, warnings notifying the driver and/or another carer either on the same journey or located elsewhere with any of the following either independently or a combination of:

- Haptic and audible feedback via the vehicle key
- Mobile device(s) via a dedicated application

During the whole duration of the escalation warning, an internal visual warning that can be observed from outside the vehicle must be shown to explain the reason of the alert emitted by the vehicle. For example, a message stating ‘check rear seats’ or occupant detected located in the instrument panel/facia.

3.1.3.3 Warning cancellation

The initial warning and escalation warning may be cancelled by acknowledging the warning, for example by unlocking the vehicle and/or opening a door when in vicinity of the vehicle. Also cancellation of the initial warning with the vehicle key or vehicle app is allowed, i.e. not from a distance.

Cancellation of the initial warning must not affect the timing of the escalation warning, except when the door was opened, but can never affect the intervention timing.

After an escalation warning has been cancelled and a child occupant’s presence has been detected and the vehicle is locked, the system must trigger another escalation warning within 90 seconds after locking.

3.1.4 Intervention requirements

Additional score is given to vehicles that also initiate an intervention if there is a child in the vehicle.

The intervention must actively reduce the threat of hyperthermia to any children in the vehicle by:

- Controlling the interior temperature with the in-vehicle climate control
- Allowing access to the child by unlocking the doors.
- Instigating rescue of the child. For example, with the use of a mobile application, contact with a third-party service (TPS) or other means of direct contact with other carers located elsewhere (not a driver or passenger on the same journey).

In addition to the intervention(s), any person registered to the vehicle via a dedicated application should be notified on their mobile device(s) with a high critical notification.

The implemented intervention strategy and the additional notification should start no more than 10 minutes of the vehicle being locked or no more than 5 minutes after the first escalation was triggered (including initial warning delay).

Alternatively, when the internal vehicle temperature or temperature gradient becomes critical, the intervention should start immediately.

3.1.5 Temporary and long term deactivation

It is allowed to temporarily deactivate the CPD system for a single journey (that includes 15 minutes after the deactivation of the master control switch) or long term (maximum 30 days).

The process of a single journey deactivation must be more complicated than a short push of a button to avoid deactivation of the system inadvertently. This must be a different process to that required for delay and cancellation of a signal. A long term system deactivation shall be performed via the system menu.

A long term deactivation must last for no more than 30 days after which the vehicle must request acknowledgement from the driver to continue the CPD OFF status. Where the driver dismisses or ignores the acknowledgement, the CPD system must fully re-arm.

When a system is deactivated, the inactive status of the CPD system must be indicated by a dedicated telltale[1] that is clearly visible to the driver. The telltale must be displayed for no less than 10 seconds from the moment of deactivation. The same telltale is also required for a duration of no less than 5 seconds after turning the ignition off.

When there is no physical means to either stop the engine or switch the ignition off at the end of journey, the deactivation telltale must be given when the gear has been set from Drive to Park and/or the driver's belt has been unbuckled. The driver's door opening event cannot be used to trigger the telltale.

Text messages are acceptable providing all of the following conditions are met:

- The text clearly indicates that the system's intended purpose is to warn of an occupant's presence.
- It clearly indicates the system's status ON or OFF.
- The text complies with the language requirements in Technical Bulletin G-001.

[1] When an ISO standard has been developed defining a CPD telltale, this will be adopted by Euro NCAP no more than two years following ISO TS publication and become mandatory for any rewards.

3.2 Crash occupancy information

Crash occupancy information	Total points 5
Number of occupants	**5**
Belted occupants	4
Children in ALL CRS	1

3.2.1 Number of occupants detected

The crash occupancy information giving the number of occupants detected in the vehicle, must be included in the eCall message. The OEM must provide details of how the system detects occupants and how this information is included the MSD content. Further information regarding the MSD content is detailed in the Post-Crash test and assessment protocol. Detection must be determined from the start of the journey and throughout the rest of the journey.

Where a vehicle is available with removable seats and/or optional equipment, the assessment will be based on the worst performing configuration. The following equipment will be considered for the assessment:

Seat rows – e.g. 3rd row

Additional seating positions – e.g. position 2 in row 1

To gain rewards under the sections above, the following occupants must be detected by the vehicle on ALL available seating positions:

Occupants - The number of any adult occupants (see definition) must be detected in both belted and unbelted conditions. This applies to any position of adjustable seats. The number of occupants must also include the number of belts in use.

Children in all CRS –The vehicle must detect children seated in any CRS e.g. integral harness with ISOFIX attachment, booster seats/cushions.