EUROPEAN NEW CAR ASSESSMENT PROGRAMME
(Euro NCAP)

ASSESSMENT PROTOCOL – CHILD OCCUPANT PROTECTION

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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).

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TABLE OF CONTENTS

1 INTRODUCTION

1.1 Background

Euro NCAP has carried out a child occupant safety assessment since its very first test to ensure that manufacturers take responsibility for the children travelling in their vehicles. In November 2003, Euro NCAP introduced a child occupant protection rating to provide clearer information for consumers about the results of these tests. As part of this assessment, Euro NCAP has used 18 month old and 3 year old sized dummies, placed in manufacturers 'recommended' child restraint systems (CRS), in the frontal and side impact tests. As well as studying the results from the impact tests, Euro NCAP verified the clarity of instructions on the CRS and vehicle as well as the CRS installation in the vehicle to ensure that the CRS could be fitted safely and securely. In 2009, the child score became integral part of the overall rating scheme but the technical assessment remained the same.

Starting from 2013, the assessment of child safety was extended by an installation check of a selection of popular, well performing seats available in Europe. This will assess the vehicle's ability to safely and correctly accommodate a broader range of CRS instead of a single combination of recommended CRS and car. For this purpose, a so-called 'installation' list is populated with widely available, well performing child restraints that represent most common types of products available on the European market. The particular CRS included on the installation list are published on Euro NCAP's website and will be checked every year for availability of the CRS. Every 2 years the list will be reviewed and updated. Each update will occur at the start of the year preceding the year of application. The installation list may be extended to include manufacturer's recommended seats and/or regionally popular seats.

In 2016, the dynamic test part of the assessment was revised, replacing the 1.5 and 3 years old dummies by 6 and 10 years old respectively. Also, from this date only fully i-Size compliant vehicles are rewarded in the relevant vehicle based assessments.

1.2 Overview

This protocol defines how protection for children is assessed in Euro NCAP. The principle behind the Child Occupant Protection assessment is that children should be as equally well protected as adults in the event of a crash. The protocol is applicable to all classes of vehicles currently assessed by Euro NCAP, including vehicles where there is no rear bench or where there is limited space for carrying CRS on the rear seats.

As part of the assessment, various types of child restraints will be installed in the vehicle to assess its ability to accommodate restraints for all ages of children. Instrumented Q6 and Q10 dummies will be used to assess the protection offered in the event of front and side crashes. During a post-crash vehicle inspection, the car will be assessed on aspects such as labelling, airbag disabling, ISOFIX usability, i-Size readiness and more. The results from these tests are separately assessed as follows:

- Vehicle based assessment (Chapter 2),
- Problem-free installation of child restraints (Chapter 3),
- Dynamic performance (Chapter 4).

The application of the requirements in this protocol to vehicles with limited rear space and two seaters is detailed in Chapter 5.

2 VEHICLE BASED ASSESSMENT

All vehicle-based assessments will be only performed on vehicles that meet the relevant fitment requirements at the time of assessment. Hence, before the assessment starts, the total number of passenger seating positions in the vehicle must be identified including 1st, 2nd and 3rd row if available. Where a vehicle is available with optional seat rows and/or floor storage compartments, the assessment will be based on the worst performing configuration.

2.1 Preconditions

2.1.1 Provision of Three-point Seat Belts

If any passenger seat is not equipped with (at least) three-point lap and diagonal seatbelts, **0 points** shall be awarded for the vehicle based assessment.

2.1.2 Website Information Form TB 033

The OEM is required to complete a website information form that details the vehicle's ability to accommodate CRS of all types, e.g. belted, i-Size etc. Information must not conflict with information detailed in the vehicle handbook. Were the OEM has not completed the website information form, **0 points** shall be awarded for the vehicle based assessment.

2.1.3 Vehicle Handbook Information

Where any of the applicable vehicle handbook information is either not present or not in compliance with R16, the CRS installation and vehicle-based assessments will not be performed and **0 points** shall be awarded in these areas. It is acceptable for the information to be annexed in the vehicle handbook or provided on a permanent website provided that clear references are provided in the vehicle handbook.

2.1.3.1 Airbag Disabling

a) Where a passenger frontal airbag is fitted (both front and rear seats if applicable) all CRS tables in the vehicle handbook must clearly indicate that when these passenger airbags are active the seat is NOT suitable for any rearward facing CRS. This is to be done with the use of either two separate columns in the relevant CRS tables, belt attached, ISOFIX and i-size where appropriate. One column shall indicate the CRS installation options with the airbag ON and the second column with the airbag OFF. Alternatively, pictograms may be used to indicate the airbag status and equivalent readiness of the passenger seat for accommodating CRS providing the pictograms meet the requirements of Section 2.5.

b) Where the passenger airbag cannot be activated and deactivated by either the user, or a fully automatic disabling system (assessed in accordance with TB023), the RWF CRS installations on the front passenger seat will automatically be deemed a fail.

c) Where a vehicle is equipped with a low-risk deployment frontal airbag, it is not necessary to deactivate the airbag but there must be information in the handbook indicating that this airbag can remain active when installing a RWF CRS. A clear explanation as to why it is safe for the airbag to remain enabled must also be provided in the handbook. The vehicle manufacturer must provide convincing data to Euro NCAP to show that the frontal airbag can indeed be considered as low risk.

2.2 Gabarit Installation on All Passenger Seats

Where the 2nd row outboard seats are in compliance with the requirements in UN Regulation 16 Annex 17 - Appendix 1 and meet the additional requirements specified below, **1 point** shall be awarded. Where, in addition, all other passenger seats comply, an additional **1 point** shall be awarded. For gabarit installations on the 3rd row seats, it is acceptable to move or fold the 2nd row seats to enable installation provided the vehicle handbook instructs the user to do so.

2.2.1 Additional Requirements for Gabarit Installation:

a) Once the belt is correctly routed around the Gabarit fixture, it should be possible to draw a further 150mm of belt webbing from the reel.
b) Where a passenger frontal airbag is fitted, it must be possible to activate and deactivate the passenger airbag, either automatically or manually. The requirements of Section 2.4 need not be met to qualify for this award, but the airbag disabling equipment must be standard and the requirements of 2.1.3.1 a) must also be met.
c) In the case of an adult seat belt that is capable of being switched from an emergency locking retractor (ELR) to an automatic locking retractor (ALR), clear advice, obvious to the user, about how the ALR feature should be used needs to be present on any labels attached to the seat belt (information given in the handbook is not sufficient as reading of the handbook cannot be assumed for all users).

2.3 i-Size and TopTether Marking

2.3.1 Preconditions

Where i-Size seating positions are offered, they will be assessed on variants fitted with optional floor storage compartments and need to comply with the following requirements to be eligible for scoring the available points specified below.

a) The location of each i-Size approved anchorage must be marked.
b) The location of each top tether anchorage must be marked and include both text and a pictogram.
c) The i-Size markings must show the relevant i-Size pictogram detailed in UN Regulation 145. It is allowed to add the word ISOFIX adjacent to the i-Size pictogram.
d) All markings must be of conspicuous design and both the text and pictogram must have colours which contrast with their background.
e) All markings must be permanently visible. Flag type labels are not acceptable.
f) All markings must be permanently attached to the vehicle.
g) The presence of floor storage compartments, optional or otherwise, must not preclude the installation of i-Size CRS or require the user to check compatible vehicle lists.
h) Floor storage compartments must satisfy the requirements of R14 or R145. They shall be tested with the lid in the closed position. No preparatory actions are permitted, such as opening the lid or the additional of storage space fillers.

2.3.2 i-Size Availability

Where the vehicle offers two or more i-Size seating positions that can accommodate the ISO/B2 i-Size fixture, defined in R16 supplement 9, **2 points** are awarded.

2.3.3 Three i-Size Seating Positions & Accommodation of Two ISO/R3 positions

Where the vehicle is provided with three fully independent, correctly marked i-Size seating positions (Section 2.3.1) that can correctly accommodate i-Size CRS including top-tether (2.3.2)

with at least two of those positions also accommodating the ISO/R3 fixture (Class C), **1 point** shall be awarded.
It will not be acceptable for any anchorages and the top-tether to be shared between seating positions. The vehicle handbook must inform the user that the vehicle is capable of accommodating the ISO/R3 fixture.

When checking a CRF behind the driver seat, it may be adjusted longitudinally forward but not further than the mid position between its 95th and foremost positions. The seat backrest angle may also be adjusted, but not to a more upright angle than corresponding to a torso angle of 15 degrees. The full range of seat height adjustment can be used. All adjustments of any passenger seats are permissible to install the fixture.

2.4 Passenger Airbag Warning Marking and Disabling

If the vehicle is fitted with a passenger's frontal protection airbag as standard or optional, it must be marked with a permanent airbag warning label that meets the requirements of UN Regulation 94 to be eligible for scoring points under this section. For automatic switches, **4 points** will be awarded when the below requirements in sections 2.4.1 and 2.4.3 are met. For manual switches, **2 points** will be awarded when requirements for manual switches in sections 2.4.1 and 2.4.2 are met. If no passenger airbag is available on the entire model range, **2 points** will be awarded.

2.4.1 General Requirements for Automatic and Manual Switches

a) Any text, labelling and instructions in relation to airbag disabling must be permanently attached to the vehicle.
b) The information provided must be clear, without reference to the vehicle's handbook or other source.
c) The information and warnings must be provided in such a way that they are visible for both the driver and front seat passenger, showing the status of the airbag.
d) 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.
e) The AIRBAG ON pictogram must be based upon that of the sun visor label (ECE R94) as shown below:

f) The AIRBAG OFF pictogram must be based upon that detailed in ECE R121 as shown below:

g) 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.

h) If the information to indicate that the airbag is enabled is provided by a visual signal, the signal is only required to be shown for a period of 60 seconds after the ignition is switched on.
i) Information to indicate that the airbag is disabled must be permanently displayed, when the ignition is on and the seat is occupied.
j) If at any time the airbag is switched from the OFF position to the ON position, the status indicator showing that the airbag is ON must signal this immediately after checking period for at least 60 seconds, regardless of the length of time the ignition has been switched on, or until the ignition is switched off again.

2.4.2 Additional Requirements for Manual Switches Only

a) Where a manual switch is used, it must be labelled with the words 'Passenger AIRBAG OFF/ON' and the same pictograms detailed above indicating ON and OFF.
b) The individual switch positions must be marked with the same pictograms that are used to indicate the airbag status. The two positions must be marked with the text ON & OFF along with the corresponding pictogram.
c) 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.
d) Where a hardware switch is used, it must be accessible and clearly visible when installing 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
e) It must not be possible for a rearward facing child; restrained on the front passenger seat; to operate the switch at any time.
f) Where a software based 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.
g) If, with the ignition on and with engine running or not, the airbag status can be changed, the system must react correctly to the change immediately. Systems will be checked once the vehicle diagnostics/system checks have been completed.

2.4.3 Additional Requirements for Automatic Switches Only

a) The system must ensure that the airbag is OFF for ANY rearward facing CRS and obviate any risk associated with airbag deployment
b) If, with the ignition on and with engine running or not, the airbag status can be changed, the entire system must immediately react to the change correctly. Up to 10 seconds will be permitted from the change of occupant status to the corresponding signal from the airbag status indicator. Systems will be checked once the vehicle diagnostics/system checks have been completed.
c) The system must automatically re-activate the airbag when the seat is occupied by a person who is not required to use a child restraint.
d) The method for assessing automatic systems is detailed in TB023.

2.5 Child Presence Detection

Where the vehicle is equipped with a Child Presence Detection (CPD) system that meets the requirements detailed in the Euro NCAP CPD Test and Assessment protocol, up to **4 points** shall be awarded.

The score available is dependent upon the type of detection system used, the areas of vehicle covered and which of the identified scenarios are covered by the system.

2.5.1 Scoring (2023-2024)

Sensing	**Warnings and intervention**	**Points**	
		All seats (excluding driver)	**Without front passenger seat(s)**
Direct and/or indirect sensing	Initial warning	1	0.5
Direct sensing only	Initial and escalation warnings	3	1.5
	Initial, escalation and Intervention	4	2

2.5.2 Scoring (2025 and later)

From 2025 onwards, no points will be awarded to either vehicles with indirect sensing or where a vehicle is equipped with an initial warning only.

Sensing	**Warnings and intervention**	**Points**	
		All seats	**Without front row**
Direct sensing only Coverage of Scenario 1, 2 & 3	Initial and escalation warnings	3	1.5
	Initial, escalation and Intervention	4	2

Sensing	**Warnings and intervention**	**Points**	
		All seats (excluding driver)	**Without front passenger seat(s)**
Direct sensing only Coverage of Scenario 1, 2	Initial and escalation warnings	2	1
	Initial, escalation and Intervention	3	1.5

3 INSTALLATION OF CHILD RESTRAINTS

Euro NCAP rewards vehicles that can accommodate a broad variety of child restraints available on the European market. For this purpose, a limited number of popular CRS are installed in the vehicle. All CRS selected for the Euro NCAP fitment tests have demonstrated good (crash test) performance in leading independent consumer tests and are readily available in certain regions of the Euro NCAP Application Area (EAA), TB002. The groups and recommended installation modes of the CRS selected represent those commonly most observed on the market, including some belt attached, ISOFIX and i-Size seats. This installation list of CRS, how it is compiled and updated is explained in section 3.2 below.

3.1 Application of the Assessments

Where a vehicle is available with optional equipment, the CRS installation assessment will be based on the worst performing configuration. The following optional equipment will be considered for the assessment:

Seat rows – e.g. 3rd row
Additional seating positions – e.g. position 2 in row 1
ISOFIX/i-Size positions
Top-tether anchorages
Floor storage compartments

3.2 CRS Installation List and OEM Recommended CRS

3.2.1 Installation List

The child restraints used for the fitment assessment are detailed in Euro NCAP Technical Bulletin TB012.

3.2.2 Manufacturer's Recommendation

The overall responsibility of the vehicle manufacturer for safe transport of children is also reflected in the recommendation that the vehicle manufacturer should make to the consumer regarding the CRS to be used in the vehicle. Hence, besides ensuring that vehicles that can accommodate a broad variety of CRSs, Euro NCAP rewards vehicle manufacturers that recommend suitable CRS for each weight group and/or size range.

Any recommended CRS must meet the following requirements:

a) The CRS must be recommended by the vehicle manufacturer, to their customers, in all countries within the EAA, where the vehicle is sold.
b) Where the recommended CRS are not on the installation list, the CRS must be available for purchase by the public from both vehicle dealers and independent retail outlets in all countries defined in TB 002 where the vehicle is sold. The CRS system must be available to the public within 5 working days of an order being made.
c) With the exception of booster cushions[1], the recommended CRS must have been fully type approved according to R129 and evaluated by the ETC (or similar) programme (including dynamic tests) and obtain a 'good' performance rating. This is the case for CRS on the installation list. For CRS not on the installation list, it is the vehicle

1) For all vehicles published after 1st January 2025, all OEM recommended CRS must be R129 approved.

manufacturer's responsibility to provide evidence of 'good performance' at the time of CRS recommendation, following the procedure described in Technical Bulletin 012. For Integrated CRS, booster seat with detachable backrests or booster cushion CRS no ETC testing is necessary.

d) The recommended CRS must be rearward facing for children up to a stature of 83cm.
e) Recommendation of 'OEM rebranded' CRS that are already on the installation list can be accepted. Information will be added to the results to highlight the equivalency between original installation list seat and 'OEM rebranded' seats to the consumer.
f) Euro NCAP verifies the problem-free installation of manufacturer's recommended CRS for Q6 and Q10 on the 2nd row rear outboard positions only. The installations will be performed using the CRS installation mode and settings/adjustments recommended by the vehicle manufacturer for dynamic testing in the same way as it does installation list seats but a separate score will be attributed (see section 3.4). The other recommended CRS will not be installed.
g) Recommended CRS must either still be in production at the time of publication or available for at least 12 months from the end of CRS production.

3.2.3 CRS for dynamic tests

a) The Q6 dummy shall be seated in an appropriate CRS for a six year old child or a child with a stature of 125cm. This will be the CRS recommended by the vehicle manufacturer in the vehicle handbook. If there is no recommendation made in the vehicle handbook for a six year old child a suitable CRS will be chosen from the installation list (TB012).
b) The Q10 dummy shall be seated on a booster cushion only. This will be the booster cushion recommended by the vehicle manufacturer in the vehicle handbook. Where the vehicle manufacturer recommends, in the vehicle handbook, a high back booster seat with detachable backrest, it will be used without the backrest. If there is no recommendation made in the vehicle handbook or a booster seat with a non-removable backrest is recommended, a suitable booster cushion will be chosen from the list of booster cushions in TB012. Booster cushions will be accepted for use in the tests provided that when the Q10 dummy is seated on the booster, no part of the head is higher than 840mm vertically above the Cr-point. Booster cushions that have R129 approval will not need to meet this requirement.
c) Where a vehicle is equipped with an integrated CRS covering the Q6 and/or Q10 on the rear outboard 2nd row test positions, the integrated CRS will be used in the dynamic tests. Integrated CRS will be used even if they are optional equipment. Where a vehicle is equipped with only one integrated CRS on either outboard position covering both or only one of two child ages, the integrated CRS will be used only where applicable. If only one integrated CRS is present, the vehicle manufacturer shall recommend a suitable CRS to accommodate the other child dummy. Where this is not the case the steps detailed in a) and/or b) will be followed.

3.3 Installation Matrix

The Vehicle Based Assessment (Section 2) determines the eligibility for scoring for the combinations of CRS's and seating positions in the vehicle. The following provides an overview of the relationship between the Vehicle Based Assessments and the Installation Matrix.

3.3.1 Belt attached CRS

The belt attached CRS detailed in TB 012 will be installed in all available seating positions.

Seating positions must meet the extended Gabarit check (Section 2.2) to be included in the Installation Matrix for the belt attached CRS's. A combination of belt attached CRS group and seating positions that do not meet these requirements will automatically fail the CRS installation assessment for belt attached CRS of that group on the installation list. Where a vehicle can be equipped with optional inflatable seatbelts or other advanced adult restraint systems, this equipment will not be assessed provided that the vehicle handbook clearly states that CRS cannot be installed when this equipment is present. The vehicle manufacturer is asked to contact Euro NCAP in advance of the vehicle assessment to confirm this exemption.

Exemptions for CRS on the installation list that are installed with the adult belt and support leg (R129 specific vehicle belted) are only permitted where the following occur:

2nd row, position 5 – transmission tunnel only

3rd row, where applicable all positions – transmission tunnel, shallow floor and/or interaction with seat rails

Belt attached ISO/R3 size class CRS listed on the installation list will be exempted from installation on any seating position when the CRF ISO/R3 cannot be installed according to Section 2.3.3 and is clearly identified with an "X" in the CRS table as unsuitable for this size. When this is the case, the combination of ISO/R3 size class CRS given installation score on that seating position will be awarded the available points (see section 3.4).

The above exemptions will only be permitted providing that the vehicle handbook clearly indicates that on the above seating positions, it is not permitted to install a belted CRS with a support leg. These exemptions cannot be applied to any other seating positions.

3.3.2 I-Size CRS

The i-Size CRS detailed in TB 012 will only be installed on seating positions equipped either as standard or optionally, with i-Size approval. Seating positions without i-Size approval will be termed NA in the installation spreadsheet. There are no exemptions permitted for i-Size CRS.

3.3.3 R129 ISOFIX CRS

Other CRS detailed in TB 012 that can be installed using ISOFIX anchorages with and without the seatbelt will be installed on all seating positions equipped either as standard or optionally, with ISOFIX and/or i-Size approval.

Exemptions for CRS on the installation list that are installed using ISOFIX anchorages with and without the seatbelt are only permitted where the following occur:

2nd row, position 5 – transmission tunnel only

3rd row, where applicable all positions – transmission tunnel, shallow floor and/or interaction with seat rails

The above exemptions will only be permitted providing that the vehicle handbook clearly indicates that on the above seating positions, it is not permitted to install a CRS with a support leg. These exemptions cannot be applied to any other seating positions.

ISOFIX attached ISO/R3 size class seats listed on the installation list will be exempted from installation on any seating position when the CRF ISO/R3 cannot be installed according to Section 2.3.3 and is clearly identified with an "X" in the ISOFIX CRS table as unsuitable for this size. When this is the case, the combination of ISO/R3 size class CRS given installation score on that seating position will be awarded the available points (see section 3.4).

3.3.4 Passenger Airbag Warning and Disabling

Seating positions which have a frontal passenger airbag present must meet the requirements for Passenger Airbag Warning Marking and Disabling (Section 2.4) to be included in the CRS installation assessment. A seating position that does not meet these requirements will automatically fail the CRS installation assessment for all rearward facing belted, ISOFIX and i-Size seats on the installation list for these seating positions.

3.3.5 Integrated Child Restraints

Where an integrated CRS is offered as standard and indicated as such in the vehicle handbook, this seating position will automatically pass the assessments and no installation check is required with the installation List-CRS of the child stature covered by the integrated CRS.

3.4 CRS Installation Scoring

Each CRS-seating position combination from the Installation Matrix will be used for scoring. When all of the requirements are met for a given CRS-seating position, it is awarded the points available and is shown as a "Pass".[2]

Where the vehicle based assessment result prevented scoring or where the requirements are not met and the requirements on which the CRS installation failed are considered to be safety critical, the CRS-Seating position combination is considered a "Fail". When a non-safety critical requirement is not met, it is considered to be a "Partial Fail" (P Fail). For both cases, "Fail" and "P Fail", no points are awarded for the CRS-seating position combination, however the results will be differently communicated.

The score for each individual CRS on the installation matrix, CRS_i, will be calculated by dividing the number of successful installations in the vehicle by the total number of suitable passenger seating positions in the vehicle. All CRS will be awarded equally in the assessment and the maximum score for installation of CRS detailed on the installation list is **10 points.**

Where the manufacturer recommends appropriate CRS for all child statures up to and including 135cm (section 3.2.2) **1 point** will be awarded. For statures up to 83cm, the recommended CRS must be rearward facing. An additional **1 point** will be awarded where the recommended CRS are for all statures up to and including 150cm. If any the recommended CRS are to be used in the dynamic tests, they MUST meet the installation requirements on the 2nd row rear outboard positions.

The maximum available score for the installation assessment will be **12 points** and is independent of the number of seats on the installation list. If there is no OEM recommendation for CRS the maximum available score for CRS installation will be **10 points**.

3.4.1 Rounding

The resulting point score per CRS is expressed as numbers, with 3 decimal points. The total score for CRS installation is the sum of the points for fitment all CRS's.

2) ISO/R3 size class exemptions and those detailed in Sections 3.3.1 & 3.3.3 will be treated as "Exempt" when calculating the CRS installation score.

Table 1. Example of installation list results

CRS Installation Assessment					SEATING POSITION									SCORING			
					Front			2nd row			3rd row						
					Left	Centre	Right	Left	Centre	Right	Left	Centre	Right	Pass	Fail	Exempt	Score
					N/A	Belt	Belt	i-Size	Belt	i-Size	ISOFIX	Belt	ISOFIX				
1	< 83cm	Maxi Cosi Pebble 360	B _ _ _	ISO/R2	N/A	Pass	Pass	Pass	Pass	Pass	Pass	P Fail	Pass	7	1	NA	87.5%
2	135cm	Britax Kidfix i-Size	B _ _ _	ISO/B2	N/A	Pass	Pass	Pass	Fail	Pass	Pass	P Fail	Pass	6	2	NA	75.0%
3	150cm	Cybex Solution Z i-Fix	B _ _ _	ISO/B3	N/A	Pass	Pass	Pass	Pass	Pass	Pass	Fail	Pass	7	1	NA	87.5%
4	135cm	Cybex Solution Z i-Fix	B I _ _	ISO/B3	N/A	N/A	N/A	Pass	N/A	Pass	Pass	N/A	Pass	4	0	NA	100.0%
5	150cm	Cybex Solution Z i-Fix	B I _ _	ISO/B3	N/A	N/A	N/A	Pass	N/A	Pass	Pass	N/A	Pass	4	0	NA	100.0%
6	40-105cm	Maxi Cosi Pearl 360 & FamilyFix 360	_ I L _	ISO/R2	N/A	N/A	N/A	Pass	N/A	Pass	Exempt	N/A	Exempt	2	0	2	100.0%
7	150CM	Maxi Cosi Pearl 360 & FamilyFix 360	_ I L _	F2X	N/A	N/A	N/A	Pass	N/A	Pass	Exempt	N/A	Exempt	2	0	2	100.0%
8	61-105cm	BeSafe iZi Kid X2 i-Size	_ I L _	ISO/R2	N/A	N/A	N/A	Pass	N/A	Pass	Exempt	N/A	Exempt	2	0	2	100.0%
9	76-105cm	Britax Römer TriFix^2 i-Size	_ I _ S	F2X	N/A	N/A	N/A	Pass	N/A	Pass	Pass	N/A	Pass	4	0	NA	100.0%
10	100-135cm	BeSafe iZi Flex FIX i-Size	B I _ _	ISO/B2	N/A	N/A	N/A	Pass	N/A	Pass	Pass	N/A	Pass	4	0	NA	100.0%
	< 83cm	Maxi Cosi Pebble 360	B _ _ _	ISO/R2													
	76-105cm	Britax Römer TriFix^2 i-Size	_ I _ S	F2X													1.000
	< 135cm	Cybex Solution Z i-Fix	B I _ _	ISO/B3				Pass		Pass				2	0		
	< 150cm	Cybex Solution Z i-Fix	B I _ _	ISO/B3				Pass		Pass				2	0		1.000

SUMMARY	
Installation assessment	9.500
OEM assessment	2.000

TOTAL INSTALLATION ASSESSMENT	11.500

Legend:

Pass	CRS can be installed correctly
P Fail	CRS can be installed correctly but more actions are needed that do not meet the requirements of Euro NCAP and 0 points are awarded
Fail	Safety critical issues exist, 0 points awarded
Exempt	Vehicle handbook exempts the CRS from being installed on that seating position
N/A	This combination of CRS and seating position is not applicable

4 DYNAMIC ASSESSMENT

The starting point for the dynamic assessment of child occupant protection is the dummy response data recorded in two different test configurations: frontal impact in offset and side impact. All criteria used are calculated according to Technical Bulletin 21. Initially, each relevant body area is given a score based on the measured dummy parameters. These scores can be adjusted after the test based on the defined modifiers.
From the information collected in the two test scenarios, individual test scores are computed for both the Q6 and Q10 dummy. Where a vehicle is available with optional 2nd seat row on any variant, the dynamic assessment will be based on a vehicle fitted with the optional seats.

4.1 Points Calculation

A sliding scale system of points scoring is used to calculate points for each measured criterion where a higher and lower performance limit exists. Where a value falls between the two limits, the score is calculated by linear interpolation. If only a lower performance limit is available for a criterion, this limit is used as a "Pass"/ "Fail" criteria.

Capping limits are applied to both child dummies and exceeding a capping limit generally indicates unacceptable high risk of injury. Where a dummy measurement has exceeded a capping limit, the score of that entire dummy will be 0 points in the impact in which the limit was exceeded.

4.2 Criteria and Limit Values

The basic assessment criteria used for frontal impact, with the upper and lower performance limits for each parameter, are summarised below. Where multiple criteria exist for an individual body region, the lowest scoring parameter is used to determine the performance of that region. Injury parameter assessments highlighted in Table 2 and Table 3 will not be evaluated during the rebound phase.

4.2.1 Precondition

If the restraint system is unable to keep the child dummy restrained that dummy will be penalised for its dynamic performance in the impact in which the issue occurred.

4.2.1.1 Restraint

a) During the forwards movement of the dummy only, the diagonal belt slips off the shoulder. Where this occurs **zero points** will be awarded to the dummy. Slipping of the shoulder is when the belt moves below the shoulder joint down the upper arm.
b) During the forwards movement of the dummy only, the diagonal belt moves into the gap between the clavicle and upper arm with folding of the belt webbing. Where this occurs a penalty of **-4 points** will be applied to the overall dummy score of the impact in which it occurs.
c) At any time throughout the impact either the pelvis of the dummy submarines beneath the lap section of the belt or the lap section does not prevent the dummy from moving upwards during rebound and is no longer restraining the pelvis. Where this occurs **zero points** will be awarded to the dummy.

4.2.1.2 Ejection

Dummy ejection will be evaluated at any time throughout both the front and side impacts.

a) The dummy pelvis does not remain in the booster seat or on the booster cushion and is not correctly restrained by the lap section of the seatbelt.
b) The CRS does not remain within the same seating position or is no longer correctly restrained by the adult belt. It must not be displaced onto the floor or any other part of the rear seat/occupant compartment.

4.2.1.3 Failure of restraint system components

Failure of the restraint system components will be evaluated at any time throughout both the front and side impacts.

a) There is any breakage or fracturing of load-bearing parts of the belt system including buckles, webbing and anchorage points.
b) There is any breakage or fracturing of any seat belt lock-offs, tethers, straps, ISOFIX anchorages, backrest to booster cushion connections or any other attachments which are specifically used to anchor the CRS to the vehicle fail.

4.2.2 Frontal Impact

4.2.2.1 Head contact

If there is no hard contact seen on the high speed film, the head score is based on the Resultant 3ms acceleration only.

4.2.2.2 Head excursion modifier

The head score is reduced for excessive forward excursion. Where the head of the Q6 exceeds the 550mm forward excursion line a **4 point modifier** is applied. For the Q10 a stepped modifier is used, where the Q10 head exceeds the 450mm or 550mm forward excursion line, a 2 or 4 point modifier respectively is applied. The excursion will be measured from the H-point location of the 5th female occupant with the rear seats adjusted in accordance with the Frontal MPDB test protocol.

4.2.2.3 Frontal Impact Criteria

Table 2. Frontal impact criteria, limits and available points per body region for Q6, Q10

	Criteria	Performance limits			Available points
		Higher	Lower	Capping	
Head Score	HIC_{15} (with hard contact)	500	700	800	4 points
	Resultant 3ms acceleration	60g	80g	80g	
	Head excursion Q6 Q10	 NA 450mm	 550mm 550mm	 NA NA	
Upper Neck	Tension Fz	1.7kN	2.62kN	NA	2 points
	Extension My (with head to interior contact) Q6 Q10	 NA NA	 36Nm 49Nm	 NA NA	
Chest (T4)	Resultant 3ms acceleration* Q6 Q10	 NA 41g	 NA 55g	 NA 55g	2 points
	Deflection - max Dres, upper and lower Q6 Q10	 30mm NA	 42mm 56mm	 NA NA**	
Pelvis	ASIS load	NA	NA	NA	
TOTAL					**8 points/dummy**

*Chest acceleration peaks caused by the firing of seatbelt pretensioners early in the loading event will be ignored.

**Capping, as defined in Section 4.1, will be applied to the Q10 chest deflection on 1st January 2025. The limitation to star rating as defined in Section 2.3 the Euro NCAP Assessment Protocol - Overall rating, will not be applied to Q10 chest deflection.

4.2.3 Side Impact

4.2.3.1 Head contact

If there is no hard contact seen on the highspeed film, the score is based on the Resultant 3ms acceleration only.

4.2.3.2 Side Impact Criteria

Table 3. Side impact criteria, limits and available points per body region for Q6, Q10

	Criteria	**Performance limits**			**Available points**
		Higher	**Lower**	**Capping**	
Head Score	HIC_{15} (with hard contact)	500	700	800	2 points
	Resultant 3ms acceleration	60g	80g	80g	
Upper Neck	Resultant Force Q6 Q10	NA NA	2.4kN 2.2kN	NA	1 point
Chest (T4)	Resultant 3ms acceleration*		67g	NA	1 point
TOTAL					**4 points/dummy**

*Chest acceleration peaks caused by the firing of seatbelt pretensioners early in the loading event will be ignored.

The contribution of the Dynamic Score to the Child Occupant Protection Score is calculated by summing the body scores for the relevant body regions for the Q6 and Q10 in both front and side impact (24 in total).

5 TWO SEATERS AND VEHICLES WITH LIMITED REAR SPACE

This Section details how protection for children is assessed by Euro NCAP in vehicles equipped with two seats and in vehicles where space is limited in the rear.

5.1 Vehicles with only Two Seats

5.1.1 Vehicle based assessments

For two seater vehicles, the same precondition as described in Section 2.1 apply for the passenger seat. Furthermore an adjusted vehicle based assessment will be applied to two seater vehicles:

5.1.1.1 Gabarit Installation on all Passenger Seats

Where the passenger seat is in compliance with the requirements in Section 2.2, **2 points** shall be awarded.

5.1.1.2 i-Size and TopTether Marking

Where the passenger seat is in compliance with the requirements in Section 2.3 and is suitable for use the ISO B2 fixture, **2 points** shall be awarded. Alternatively, where the passenger seat is in compliance with the requirements in Section 2.3 and is suitable for use with the largest size of rearward facing ISO B2 & R3 fixtures, **3 points** shall be awarded.

5.1.1.3 Passenger Airbag Warning Marking and Disabling

Where the vehicle is in compliance with the requirements in Section 2.4, **4 points** shall be awarded to fully automatic systems, **2 points** shall be awarded to manual systems.

5.1.1.4 Child Presence Detection

5.1.2 Where a vehicle is provided with a CPD system that meets the requirements of the CPD Test and Assessment Protocol, **4 points** shall be awarded. CRS installation assessment

For two seater vehicles, all of the requirements and scoring principle in Chapter 3 apply (front passenger seat only).

5.1.3 Dynamic assessment

For two seater vehicles the dynamic assessment will be performed with the Q6 dummy sitting on the front passenger seat in both MPDB and AE-MDB impacts. The dynamic performance in the MPDB impact will be based on Manufacturer's in house data. The official AE-MDB test, conducted by Euro NCAP, will include the Q6 dummy for side impact assessment. Where the manufacturer provides no data zero points will be awarded for the dynamic tests.

The head excursion in the MPDB impact will be measured from the H-point location of 5th female dummy with the front passenger seat adjusted in accordance to the user manual information for the seating position with child restraints. The passenger frontal airbag will be set by the manual switch according user manual, in case of automatic deactivation systems, the airbag status will be determined by the vehicle.

5.2 Vehicles with Limited Rear Space

A vehicle will be deemed as having limited rear space as defined in Section 3.5 of the COP Testing protocol. Where this is the case, the test laboratory will confirm that child dummy cannot be installed in the frontal MPDB and/or side AE-MDB test without interference from the vehicle.

All assessments will be applied as normal, except the assessment of dynamic performance which will be based on Manufacturers data from test(s) with modified seating settings, as described in the Testing Protocol – COP. Where the manufacturer provides no data zero points will be awarded for the dynamic tests.

A "hybrid rating" would be produced using the adult data from the official full scale test (performed without CRS but with compensation for the reference mass) and the child data from the additional tests. In the final vehicle rating, Euro NCAP will indicate that it was not possible to install the CRS and/or child dummy with and adult in the normal Euro NCAP front seat test position.

6 SCORING & VISUALISATION

6.1 Scoring

The maximum number of points available for child protection (including limited rear space and two seaters) is 49. The maximum points available in each assessment area is as follows:

	With rear seats	without rear seats
• Dynamic Assessment	24	24
• Installation of Child Restraints	12	12
• Vehicle Based Assessments	13	13

The child protection score will be the sum of all three areas. The tables below summarise the maximum possible score in each (sub)category.

6.1.1 Normal and Limited Rear Space Vehicles

Category	**Total points 49**
Dynamic Assessment	**(24)**
Frontal Impact	16
Side Impact	8
Vehicle Based Assessments	**(13)**
Gabarit Installation on all Passenger Seats	2
i-Size and TopTether Marking & Two or more ISO/B2 Positions, or i-Size and TopTether Marking & Two or more ISO/B2 & R3 Positions	2 or 3
Passenger Airbag Warning Marking and Disabling	4 or 2
Child Presence Detection	4
Installation of Child Restraints	**(12)**
TB 012 CRS	10
OEM Recommended seats	2

6.1.2 Two Seater Vehicles

Category	**Total points 49**
Dynamic Assessment	**(24)**
Frontal Impact	16
Side Impact	8
Vehicle Based Assessments	**(13)**
Gabarit Installation on all Passenger Seats	2
i-Size and TopTether Marking & One ISO/R3 Position, or i-Size and TopTether Marking & One ISO/B2 & R3 Position	2 or 3
Passenger Airbag Warning Marking and Disabling	4 or 2
Child Presence Detection	4
Installation of Child Restraints	**(12)**
TB 012 CRS	10
OEM Recommended seats	2

6.2 Visualisation

6.2.1 Dynamic protection

The dynamic protection provided to children for each body region is presented visually using coloured segments within body outlines. The colour used is based on the points awarded for that body region (rounded to three decimal places), as follows:

Number of points available for body region:		4 points	2 points	1 point
Green	'Good'	4.000	2.000	1.000
Yellow	'Adequate'	2.670 – 3.999	1.335 – 1.999	0.667 – 0.999
Orange	'Marginal'	1.330 – 2.669	0.665 – 1.334	0.333 – 0.666
Brown	'Weak'	0.001 – 1.329	0.001 – 0.664	0.001 – 0.332
Red	'Poor'	0.000	0.000	0.000

6.2.2 TB 012 CRS installation

The results of the CRS installation check will be shown in terms of "Pass", "P Fail", "Fail", "Exempt" or "N/A" in tabular format.

6.2.3 Visualisation of CRS installation.

The website will present the installation results of each CRS in a map of the vehicle. The CRS will be anonymised and given a generic description containing the stature and attachment method. Four possible outcomes will be presented to indicate the following:

🟢 Install without problem

The CRS could be installed on that seating position safely, easily and without any issues.

🔴 Safety critical problem

The CRS could not be installed on that seating position. Issues arose that prevented the CRS from being installed correctly and safely.

🟠 Install with care

The CRS could be installed on that seating position but it could not be done easily and without problems. The vehicle may not be on the list of approved vehicle for that particular CRS.

❌ Installation prohibited - Where X is in handbook –

It is prohibited to install a CRS on this seating position. The vehicle handbook indicated X for that particular seating position or the CRS approved vehicle list indicated that a belt or ISOFIX attached CRS with support leg cannot be installed on that position. Also, indicates there are no ISOFIX/i-Size positions fitted to that seating position.