EURO NCAP

#FORSAFERCARS

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Passive Safety Definitions

Crash Protection

Technical Bulletin CP 001

Implementation 1st 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

1 GENERAL

Channel amplitude class CAC

The designation for a data channel that meets certain amplitude characteristics as specified by this document. The CAC number is numerically equal to the upper limit of the measurement range that is, equivalent to the data channel full scale.

Unladen kerb mass

The nominal mass of a complete vehicle with bodywork and all factory fitted equipment, electrical and auxiliary equipment for normal operation of the vehicle, including liquids, tools, fire extinguisher, standard spare parts, chocks and spare wheel, if fitted. The fuel tank is filled to 90 per cent of manufacturer rated capacity and the other liquid containing systems (except those for used water) to 100 per cent of the capacity specified by the manufacturer. See Technical Bulletin CP 004.

Reference mass

The target mass of the VUT with the mass of the relevant occupants and luggage included as defined in Technical Bulletin CP 004.

Normal Ride Attitude

The vehicle is in its normal ride attitude when the vehicle attitude is in running order positioned on the ground, with the tyres inflated to the recommended pressures, the front wheels in the straight-ahead position, with maximum capacity of all fluids necessary for operation of the vehicle, with all standard equipment as provided by the vehicle manufacturer, with a 75kg mass placed on the driver's seat and with a 75kg mass placed on the front passenger's seat, and with the suspension set for a driving speed of 40km/h in normal running conditions specified by the manufacturer (especially for vehicles with an active suspension or a device for automatic levelling).

Manufacturer’s design position MDP

The intended position of each seat adjustment for a particular stature of occupant.

2 FULL SCALE TESTING

R-point

The seating reference design point defined by the vehicle manufacturer for each seating position and established with respect to the three-dimensional reference system. It corresponds to the theoretical position of the point of torso/thighs rotation (H-point) for the lowest and most rearward normal driving position or position of use given by the vehicle manufacturer for each seating position.

H-point manikin

The device used for the determination of H-points and torso angles in a vehicle seating position. This device is described in Addendum 6 of Mutual Resolution 1.

H-point

The pivot centre of the torso and thigh of the H-point manikin. The H-point is located in the centre of the centre line of the device which is between the sight buttons on either side of the H-point manikin.

Centre plane of occupant CPO

The median plane of the H-point manikin positioned in each designated seating position; it is represented by the co-ordinate of the H-point on the Y axis. For individual seats, the centre plane of the seat coincides with the centre plane of the occupant. For other seats, the centre plane of the occupant is specified by the manufacturer.

3 REAR IMPACT

Head restraint

A device that limits rearward displacement of a seated occupant's head relative to the occupant's torso and that has a height equal to or greater than 700 mm at any point between two vertical longitudinal planes passing at 85 mm on either side of the torso line, in any position of backset and height adjustment.

Integrated head restraint or fixed head restraint - A head restraint formed by the upper part of the seat back, or a head restraint that is not height adjustable and/or cannot be detached from the seat or the vehicle structure except by the use of tools or following the partial or total removal of the seat furnishings.

Adjustable head restraint - a head restraint that is capable of being positioned to fit the anthropometry of the seated occupant. The device may permit horizontal displacement, referred to as “tilt” adjustment and/or vertical displacement, known as “height” adjustment.

Re-active head restraint - a device designed to improve head restraint geometry during an impact. It will usually be deployed by the occupant’s mass within the seat operating a mechanism during the crash. They also usually re-set after loading to a pre-accident condition.

Pro-active head restraint - a device designed to automatically improve head restraint geometry prior to an impact, which utilises sensors to trigger pyrotechnics, magnetic or other device to release stored energy in order to deploy head restraint or seatback elements. Such systems require no input from the occupant to operate. They are usually not re-settable following a deployment and remain in their deployed state.

Automatically adjusting head restraint - means a head restraint that automatically adjusts its position depending on the stature of the seated occupant.

Locking - an adjustable head restraint fitted with a device to prevent inadvertent downward or rearward movement from its adjusted position, i.e. when a rear seat occupant uses a front seat head restraint as a hand hold to facilitate easy entry or exit from the vehicle. A locking device may be fitted to both the horizontal and vertical adjustments of the head restraint. A locking device shall incorporate a mechanism that requires intervention to allow downward/rearward head restraint adjustment after which the mechanism shall re-engage automatically.

Head restraint height - means the distance from the R50-point, measured parallel to the torso line to the effective top (IP) of the head restraint on a plane normal to the torso line.

Intended for occupant use - when used in reference to the adjustment of a seat and head restraint, adjustment positions used by seated occupants while the vehicle is in motion, and not those intended solely for the purpose of allowing ease of ingress and egress of occupants; access to cargo storage areas; and or storage of cargo in the vehicle.

Head restraint measurement positions

Down - the lowest achievable position of an adjustable head restraint regardless of other adjustments (e.g. tilt) and without using tools. The lowest position should be assessed from the point of view of a seated occupant, and without using a third hand.

Up - the highest adjusted détente position of an adjustable head restraint taking into account locking détente positions, as defined below.

Back - the most rearward adjusted position of an adjustable head restraint, or if this is difficult to ascertain, “back” should be taken as the position which results in the greatest backset when set at the test height.

Forward - the most forward locking adjusted position of an adjustable head restraint, or if this is difficult to ascertain, “forward” should be taken as the position which results in the least backset when set at the test height.

Effective top of the head restraint

The highest point on the centreline of the head restraint and is designated as the intersection point (IP).

Backset

The horizontal distance between the front surface of the head restraint and the rearmost point of the head. Specifically, Backset is the difference between the Contact Point CPx (marked on the headrest for the different positions to be assessed) and the X-coordinate obtained from applying the formula in the Euro NCAP Rear Impact protocol.

BioRID reference backset

The target backset for the BioRID as determined in the Euro NCAP Rear Impact protocol.

BioRID backset

The horizontal measurement between the back surface of the BioRID head and the selected reference point on the front surface of the head restraint.

Design torso angle

The angle with the H-point manikin between a vertical line through the R-point and the torso line in a position which corresponds to the design position of the seat back specified by the vehicle manufacturer.

Torso line

The centreline of the probe of the H-point manikin with the probe in the fully rearward position.

Actual torso angle

The angle measured between a vertical line through the H-point and the torso line using the back angle quadrant on the H-point manikin. The actual torso angle corresponds theoretically to the design torso angle.

Rebound

Forward movement of either the seat or dummy in relation to the sled. Specifically head rebound is forward movement between the head and head restraint after contact.

4 VRU

Dynamic pedestrian tests

Synchronisation of the headform propulsion device and system deployment to achieve correct head impact time.

Static pedestrian tests

Test to be carried out without the need to trigger the bonnet in due time. Bonnet is deployed and maintained in place with appropriate systems recommended by vehicle manufacturer.

Locking devices

Deployable pedestrian protection systems that reach and remain in the intended position before head impact.

Non locking devices

Deployable pedestrian protection systems that do not remain in a permanent deployed position or systems that do not reach the intended position before head impact.

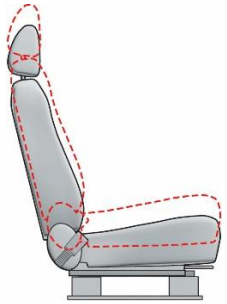
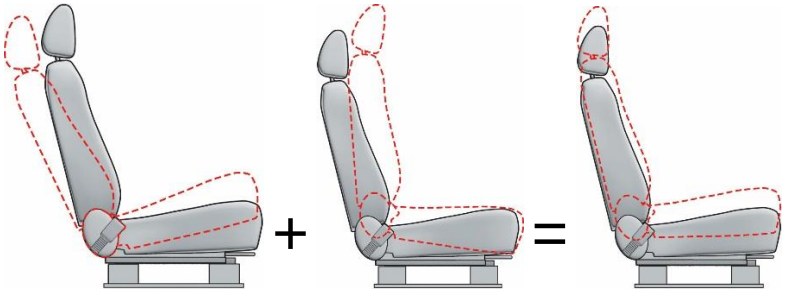
Initiate deployment

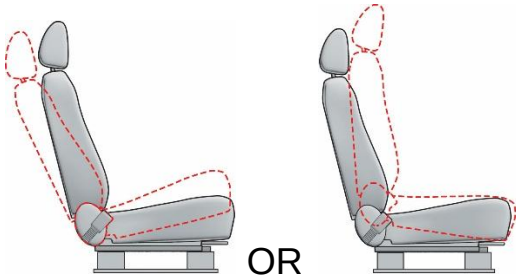
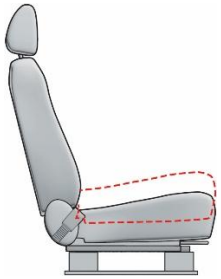
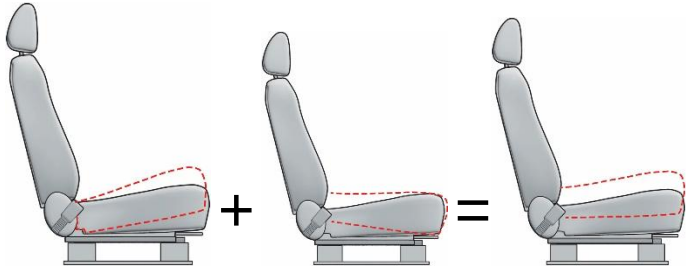
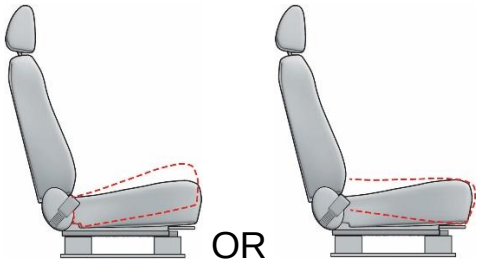
Visible movement of the deployable component(s), such as the bonnet top. The signal sent from the ECU to the deployable components alone is NOT considered as ‘initiation of deployment’.

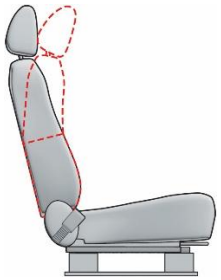
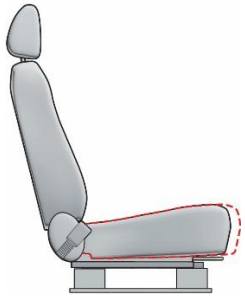
Deployment time

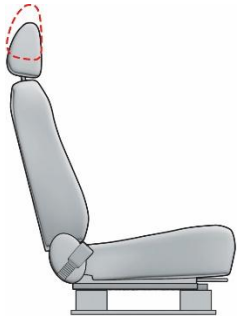
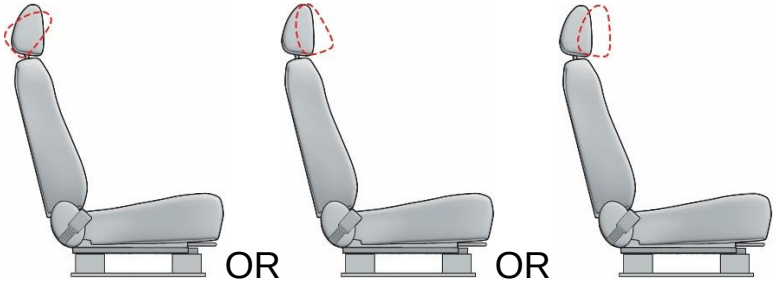
The duration from the initiation (triggering) of the deployment module to when the deployable pedestrian protection system reaches the locked position or final position. For example, where there is a movable bonnet, the end of the deployment time would be where the bonnet has passed any locking devices and does not travel below this point. It is not necessarily the highest point of travel.

5 SEAT MOVEMENT DEFINITIONS

Seat Track – An adjustment that moves the entire seat (seat cushion and seat back) in the fore and aft directions.		
Seatback – An adjustment that rotates the entire seat back, independently of the seat cushion, about a pivot at the seat back/seat cushion joint, therefore, changing the angle of the seat back relative to the seat cushion.		
Seat Height – An adjustment that moves the entire seat vertically (seat cushion and seat back in unison). This adjustment must keep the angle of the seat cushion similar relative to the ground. This can be one control (2-way) that moves the whole seat in unison or a combination of controls (4-way – a toggle or multiple knobs) that, when used together, keep the angle of the seat cushion the similar relative to the ground. NOTE: It is not possible to have 4-way seat height and seat tilt.	 2-way (one control)	 4-way (toggle or multiple knobs)

Seat Tilt – An adjustment that rotates the entire seat (seat cushion and seat back in unison). This adjustment rotates a seat in such a way to significantly change the angle of the seat cushion, relative to ground, from its full-down position. This adjustment can move either the front or rear of the seat in order to change the angle.		
Seat Cushion Height – An adjustment that moves the seat cushion vertically, independent of the seat back, while keeping angle of the seat cushion similar relative to the ground. This can be one control (2-way) that moves the whole seat cushion in unison or a combination of controls (4-way – a toggle or multiple knobs) that, when used together, keep the angle of the seat cushion similar relative to the ground. NOTE: It is not possible to have 4-way seat cushion height and seat cushion tilt.	 2-way (one control)	 4-way (toggle or multiple knobs)
Seat Cushion Tilt – An adjustment that moves the seat cushion, independent of the seat back, in such a way to significantly change the angle of the seat cushion, relative to ground, from its full-down position. This adjustment can move either the front or rear of the seat cushion in order to change the angle.		

Lumbar Support – An adjustment that causes the lower centre portion of the seat back to protrude in order to provide support to the lumbar section of an occupant's spine.		
Upper Seat Back – An adjustment that rotates only the upper portion of the seat back about a pivot point in the seat back. This adjustment will change the angle of the upper seat back relative to the lower portion of the seat back.		
Cushion Extension – An adjustment that moves or extends a portion of the seat cushion forward so that the overall length of the cushion can be increased.		

Side Bolsters – An adjustment the moves the sides of the seat back or seat cushion so that the contour of the seat can be changed.		
Head Restraint Height – An adjustment that moves the head restraint vertically.		
Head Restraint Tilt – An adjustment that moves the head restraint horizontally.		

6 ARM-REST DEFINITIONS

Seat mounted	
Not in use	In use
	

Centre console and tunnel	
Not in use	In use
	

	
Not in use	In use
	 

Not in use	In use
	 
	

Not in use	In use
	
Not in use	In use