EUROPEAN NEW CAR ASSESSMENT PROGRAMME (Euro NCAP)

FILM & PHOTO PROTOCOL

Version 1.1
November 2014

Preface

This document should always be used in conjunction with the relevant current testing protocols for the Front, Side Barrier, Side Pole, Pedestrian, Whiplash and AEB tests.

Note:
This protocol version still contains some example images that do not fully comply with the requirements, in particular regarding the use of labels by laboratories. These photos will be replaced in a future version.

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1 INTRODUCTION

From the start, Euro NCAP test protocols have included requirements for film and photographs. High quality visuals are important to accurately record the kinematics of the impact during the test and to support the vehicle inspection and the analysis of the vehicle performance. Increasingly, however, high resolution media are needed for communication purposes such as publications on internet, social media, TV broadcasting, brochures, etc..

Euro NCAP involves several laboratories that each may have their own internal procedures, quality standards and equipment. In order to improve the consistency of material supplied by the laboratories, all film and photo requirements previously specified by Euro NCAP have been brought together, reviewed and updated. This document summarises the most recent specifications that are compulsory for all official Euro NCAP tests at the accredited Euro NCAP test laboratories.

2 GENERAL FILM AND PHOTO REQUIREMENTS

2.1 Digital Data Format, Encoding and Sampling Requirements

All films should be produced in HD format, apart from onboard camera footage. The films should be sampled at a rate of a minimum of 500 frames per second. All files should be promptly sent to the Euro NCAP office after the tests.

2.1.1 Full-Scale Crash Test Films (ODB, FW, MDB and Pole Tests)

Three sets of films should be supplied:

a) Inspection Films

- Format: MP4 or AVI.
- Codec: H.264, Data rate: 2 Mbps.
- Resolution: Native camera resolutions.
- Frame rate: 25 fps.
- Must include burnt in timers.

b) Media Films (For Publication)

- Format: Prores422, or Avid DNxHD-145 QuickTime as an alternative.
- Codecs : Apple Prores422 / Avid DNxHD-145 Quicktime*.
- Resolution: Native camera resolutions.
- Frame rate (time base): 25 fps.
- Display mode: Progressive.
- YUV Format: 4:2:2.
- Colour Depth: 10 bit.
- Films should be supplied without “burnt in” timers, laboratory logos or text.

** If a first conversion pass is necessary prior to convert to prores422/DNxHD: Please use a minimum 10-bit codec / format, or 16-bit image sequences to maintain quality.*

c) Real-Time Films (Supplementary Camera, For Publication)[1]

- Format: Native shooting format, directly from the recording SD/CF card.
- Resolution: HD resolution minimum (1920x1080) or higher.
- Frame rate (time base): 25 fps.
- Display mode: Progressive (if possible).
- YUV Format: 4:2:2. Or 4:2:0 if 4:2:2 is not available.
- Sound: Yes.
- Films should be supplied without "burnt in" timers, laboratory logos or text.

** If a first conversion pass is necessary prior to convert to prores422/DNxHD: Please use a minimum 10-bit codec / format, or 16-bit image sequences to maintain quality.*

2.1.2 Pedestrian Impact and Whiplash Test Films

Two sets of films should be supplied: a) inspection films and b) media films, as specified in section 2.1.1 above.

2.1.3 Track Test Films (AEB)

To avoid errors, the following film file name convention should be followed to identify the different AEB test scenarios:

- City_test speed;
- IU_CCRS_FCW_test speed;
- IU_CCRM_AEB_test speed;
- IU_CCRM_FCW_test speed;
- IU_CCRB_AEB_distance_decel;
- IU_CCRB_FCW_distance_decel.

Only the necessary recordings should be made available: please remove bad takes and unusable video files. Only video/audio files should be shared, no other files or directory structure from the shooting card (.SIF, .XML files, etc.). Two sets of films should be supplied[2]:

a) Inspection Films

- Format: MP4 or AVI.
- Codec: H.264.
- Data rate: 2 Mbps.
- Resolution: Native camera resolutions.
- Frame rate: 25 fps.
- Must include burnt in timers.

b) Media Films (For Publication)

- Format: Native shooting format, directly from the recording SD/CF card.
- Codecs : Native shooting codec.

1. Currently only required for the ODB test.
2. These specifications also apply to testing of Electronic Stability Control systems (if required).

- Resolution: HD resolution minimum (1920x1080) or higher.
- Frame rate (time base): 25 fps.
- Display mode: Interlaced, when possible (for example, GoPro cameras only shoot in progressive mode).
- YUV Format: 4:2:2 or 4:2:0 if 4:2:2 is not available.
- Sound: Yes.
- Films should be supplied without "burnt in" timers, laboratory logos or text.

2.2 Vehicle Markings

2.2.1 Euro NCAP markings

Euro NCAP markings will be attached to the exterior of the vehicle in a contrasting colour (black or white) to the test vehicle such that it is clearly visible in the high speed films. Only standardised Euro NCAP (transparent) markings are allowed as supplied by the Euro NCAP Secretariat (dimensions 600 x 300 mm). Alternatively, magnets on black background can be used for AEB testing, pedestrian testing and placed on barriers or trolleys or walls (for whiplash testing for example).

Old sticker labels on white background shall no longer be used.

Euro NCAP markings should be attached to the exterior of the vehicle as shown in Figure 1 below. The unique Euro NCAP test reference number should be placed below each Euro NCAP logo (see section 2.2.3).

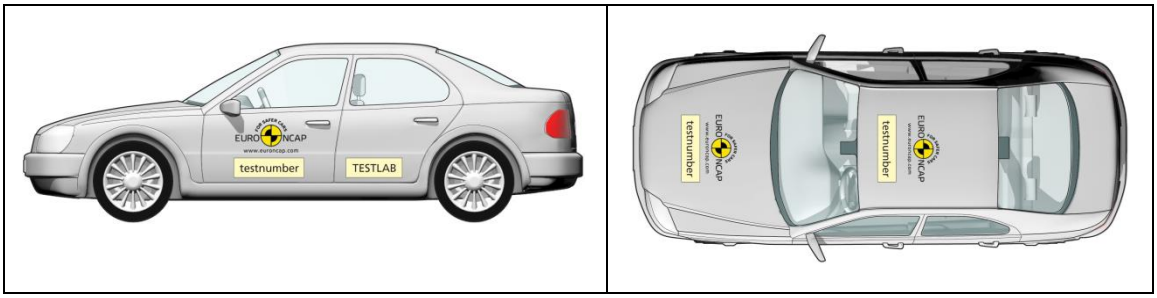


Figure 1: Standardized labels on L/R side, the bonnet and roof area of the test vehicle.

2.2.2 Test house logos

Test house logos may be added to the vehicle on the lower half of the rear doors/rear ¼ panel only.

Test house logos should not to be placed on the roof area, on the bonnet or anywhere else on the tested vehicle.

The size of test house logos should not exceed that of the Euro NCAP official logo.

2.2.3 Test numbers

The Euro NCAP Secretariat shall inform the laboratory of the unique Euro NCAP test number prior to the test and this should be used as the main test reference number. This number should also appear on all test data and documents. The test number should be placed in close proximity to each Euro NCAP logo, preferably underneath – if placed

underneath leave a space between the logo and the test number equivalent to the font height of the URL.

Reference numbers are provided by Euro NCAP to each laboratory as PDF documents, in order for the font type (Etelka Text Pro) and font size to be respected (do not scale or use different font type). Please cut out the numbers so that the full number appears on *a single line*. The sequence of characters of reference number should always follow the same convention, as shown in this example:

"14-NIS-123-OD1",

where "14" is the year of test, "NIS" refers to the car brand, "123" is Euro NCAP unique key number and "OD1" is the code for the type of (re-)test. Figure 2 below illustrates examples of good and bad reference number size and spacing. Appendix A lists the example reference numbers used for each test.

Additional internal test house numbers should be kept as small as possible (never be larger in size than the official reference number) and always be placed below the test house logo (see section 2.2.2).

Figure 2: Examples showing correct (left) and incorrect (right) font size and reference number spacing.

2.3 Camera Locations

In this document, high speed camera layout diagrams are provided for each full scale, sled or track test as a guide to show what part of the vehicle and the surroundings should be in view for each particular camera at T0. Also an example frame from each camera is provided.

When attaching on-board cameras, the vehicle manufacturer should be consulted to ensure that no damage is caused to the vehicle that would influence the impact performance. Additionally, the test laboratory should be informed if the side curtain airbags are expected to deploy during the impact. Where additional equipment is added, the mass shall be compensated when achieving the final test weight. On-board lighting may also be required depending on the vehicle type and camera specification (e.g. use on-board LED illumination when side curtains block light from outside).

No personnel shall be visible in ANY of the high speed camera views. Sufficient lighting shall be provided so as the vehicle and occupants are clearly visible throughout the impact.

Back-up cameras are not required and it is up to the test laboratory to decide if they are necessary.

2.4 Still Photographs

Pre-test photographs will be taken with the dummies in their final positions. A list of the required photos pre-, on- and post-test is provided in each relevant test section.

If necessary, tall blank screens should be placed behind the vehicle to get a “clean” photo to avoid other test equipment or personnel appearing in the photos.

No personnel should be visible in ANY of the pre and post-test still photographs.

All stills provided should have the following specifications:

- Format: JPEG.
- Resolution: maximum resolution that the camera allows.
- Image quality: no compression or as little compression as possible (Superfine)
- The original still should not be edited.

3 FRONTAL OFFSET DEFORMABLE BARRIER IMPACT

3.1 Vehicle Marking Locations

Euro NCAP markings should be attached to the exterior of the vehicle as shown in Figure 1, section 2.2.1. The unique Euro NCAP test reference number should be placed below each Euro NCAP logo (see section 2.2.3).

3.2 Camera Locations and Views

A minimum of 7 cameras should be installed around the test vehicle, positioned as indicated in Figure 3 below. Two (2) additional on-board cameras for child dummy views are to be used. A separate camera (not listed) must record the crash in real time.

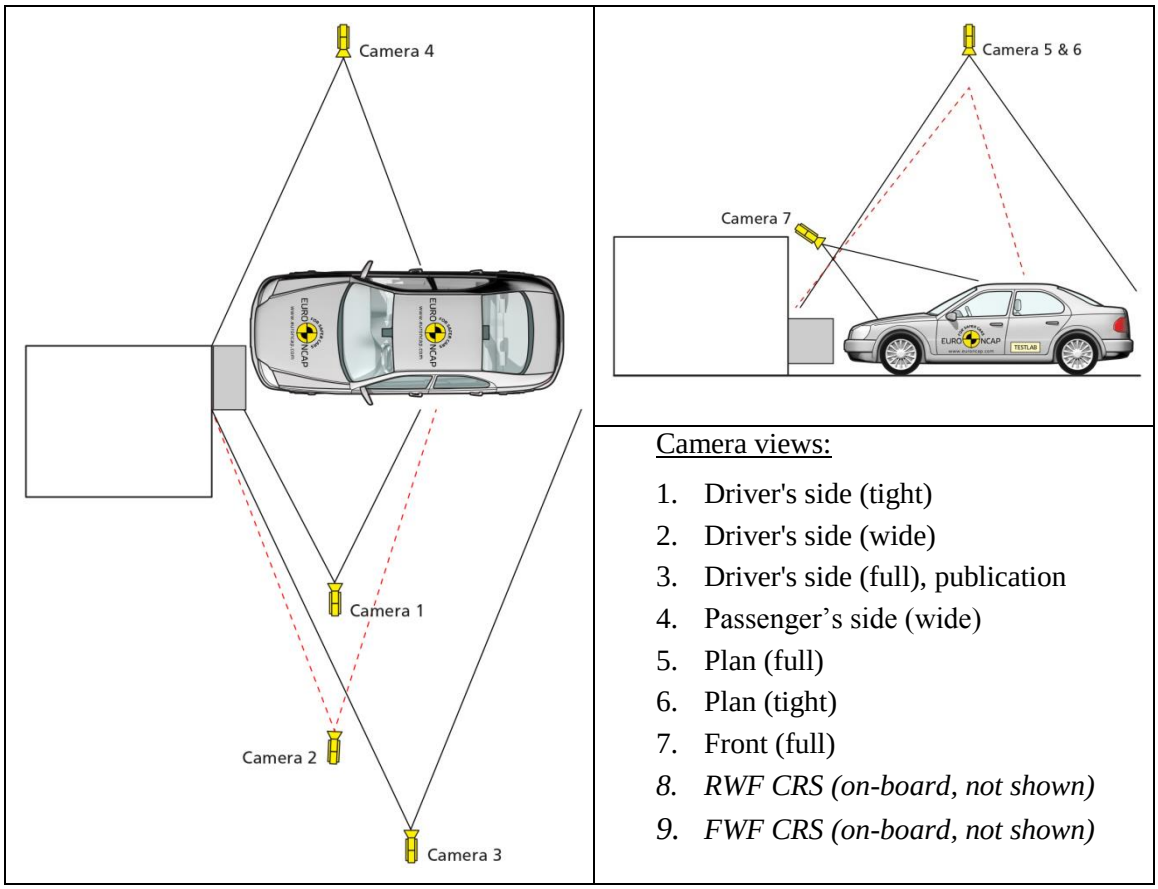


Figure 3: Locations for Cameras 1 to 7 (Frontal Offset Deformable Barrier).

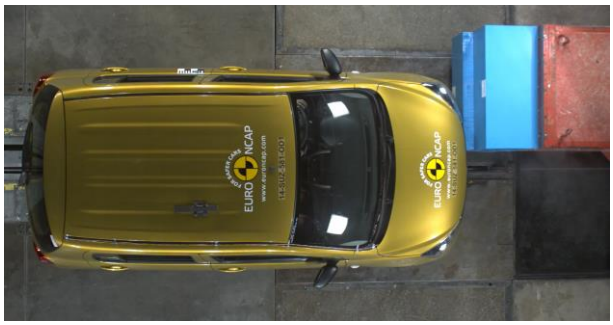
Table 1: List of camera views (Frontal Offset Deformable Barrier).

	Camera:	1
	Title:	Driver's side (tight)
	Description:	The front of barrier to the front of the b-pillar @ T0

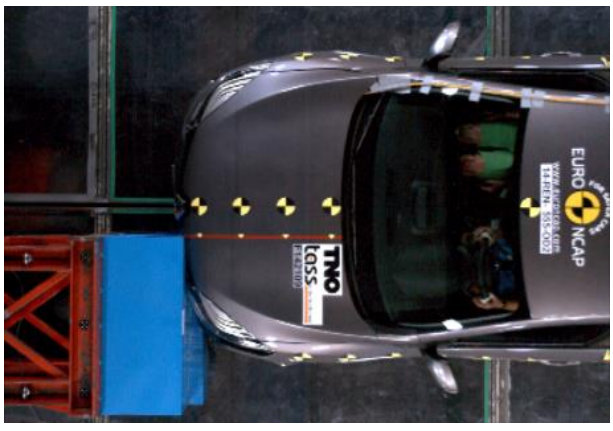
Camera:	2
Title:	Driver's side (wide)
Description:	The rear edge of barrier to the rear of the b-pillar @ T0

Camera:	3
Title:	Driver's side (full); publication view
Description:	Rear edge of the barrier and the whole vehicle @ T0

Camera:	4
Title:	Passenger's side (wide)
Description:	Just rear of the B-Pillar to the rear edge of the barrier mount @ T0



Camera:	5
Title:	Plan (full)
Description:	Rear of the vehicle to the rear edge of barrier. Allow room on passenger side for rotation of vehicle @ T0



Camera:	6
Title:	Plan (tight)
Description:	From b-pillar to the rear edge of barrier @ T0

	Camera:	7
	Title:	Front (full)
	Description:	Front edge of the roof to rear edge of the barrier @ T0

	Camera	8 (onboard)
	Title:	RWF CRS
	Description:	Centered on head excursion line, CRS, front seat and child head must be visible

	Camera:	9 (onboard)
	Title:	FWF CRS
	Description:	Camera should be centered on excursion line with CRS, child dummy and line in view

	Camera:	10 (supplementary)
	Title:	Real-time, publication view
	Description:	Camera should be mounted just above barrier, looking towards the vehicle. Check for unwanted objects or persons in view. Record sound.

3.3 Still Photographs

Table 2: List of photos (Frontal Offset Deformable Barrier).

No.	Pre	Post	View
1	•	•	Front view of barrier.
2	•	•	Side view of barrier.
3	•	•	Side view of barrier at 45 degrees to front.
4		•	Wide view of car and barrier from LHS (for publication).
5	•	•	Car LHS, with camera centred on junction of B-post waist, showing full car (for publication).

No.	Pre	Post	View
6	•	•	Car LHS, with camera centred on B-post waist, showing rear passenger compartment (for publication).
7	•	•	Car LHS, with camera aimed at waist height, showing driver's compartment (for publication).
8	•	•	Car LHS at 45 degrees to front (for publication).
9	•	•	Front view of car (for publication).
10	•	•	Car RHS at 45 degrees to front (for publication).
11	•	•	Car RHS, with camera aimed at waist height, showing front passenger's compartment (for publication).
12	•	•	Car RHS, with camera centred on B-post waist, showing rear passenger compartment (for publication).
13	•	•	Car RHS, with camera centred on B-post waist, showing full car (for publication).
14	•	•	Driver and seat to show driver compartment and position of seat relative to the sill.
15	•	•	To show area immediately in front of driver.
16	•	•	To show driver's footwell area and location of dummy's feet and pedals.
17	•	•	Passenger and seat to show compartment and position of seat relative to sill.
18	•	•	To show area immediately in front of passenger.
19	•	•	To show passenger footwell area and dummy's feet.
20	•	•	To show both child dummies and restraints through LHS rear door.
21	•	•	To show both child dummies and restraints through RHS rear door
22		•	Overall view of where the car has come to rest after impact (including barrier).
23		•	To show position of all door latches and/or open doors.
24		•	To show driver knee contacts with facia (airbag should be lifted if obscuring view)
25		•	To show passenger knee contacts with facia (airbag should be lifted if obscuring view).
26	•		LHS rear seat belt anchorage with child restraint and dummy in place.
27	•		RHS rear seat belt anchorage with child restraint and dummy in place.
28		•	Q3 dummy and restraint through RHS rear door.
		•	Q1 ½ dummy and restraint through LHS rear door.

After Dummy Removal:

No.	Pre	Post	View
31		•	Passenger compartment from rear window.
32		•	RHS interior from LHS of car.
33		•	LHS interior from RHS of car.
34		•	RHS front door area.
35		•	LHS front door area.

No.	Pre	Post	View
36		•	Facia.
37		•	Passenger footwell.
38		•	Driver footwell.
39		•	Steering wheel taken perpendicular to driver's side.
40		•	Driver right knee impact point.
41		•	Driver left knee impact point.
42		•	Passenger knee impact area.

Screen Captures / On Test Stills:

In addition to the pre- and post-test stills, a set of pictures captured during the crash (driver's view full) need to be provided, as follows: (1) the car well into the barrier, (2) the airbag in deployment, (3) airbag fully deployed and (4) head of the dummy reaching the full extent of forward motion.

The list of photos is intended to be used as a guide and if the laboratory photographer finds some other interesting or unusual test occurrences these should also be photographed.

4 FRONTAL FULL WIDTH RIGID BARRIER IMPACT

4.1 Vehicle Markings

Euro NCAP markings should be attached to the exterior of the vehicle as shown in Figure 1, section 2.2.1. The unique Euro NCAP test reference number should be placed below each Euro NCAP logo (see section 2.2.3).

4.2 Camera Locations and Views

A total of 7 cameras views are required as indicated in Figure 4 below. In addition, two (2) onboard camera views are specified, for driver and rear passenger respectively.

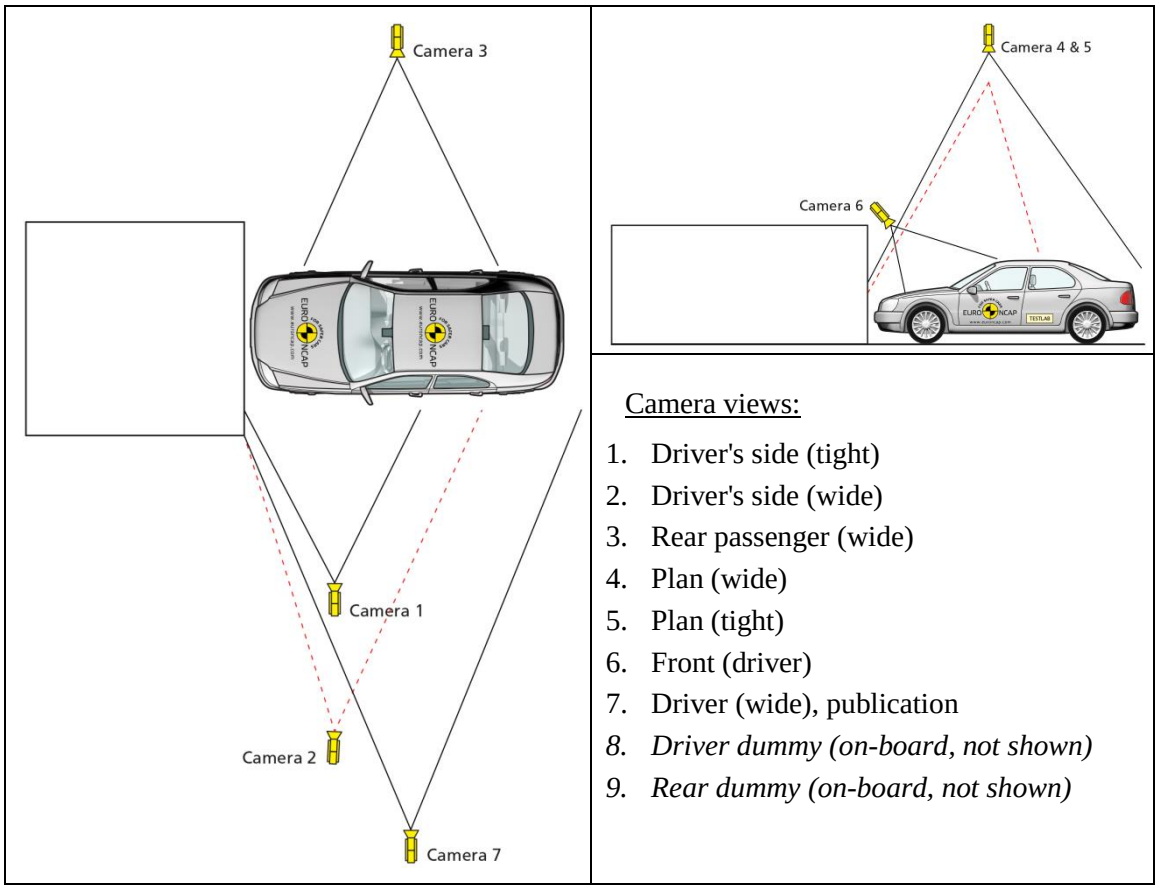


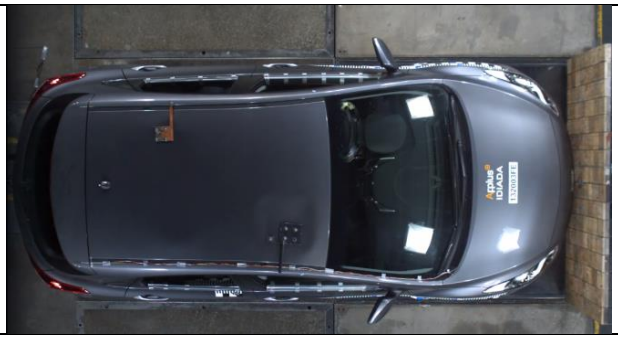
Figure 4: Locations for Cameras 1 to 7 (Frontal Full Width Rigid Barrier).

Table 3: List of camera views (Frontal Full Width Rigid Barrier).

Camera:	1
Title:	Driver's side (tight)
Description:	The rear of driver dummy head to block @ T0

Camera:	2
Title:	Driver's side (wide)
Description:	Front and rear occupants in view @ T0

Camera:	3
Title:	Rear passenger (wide)
Description:	Just rear of the passenger head to centre of front wheel



Camera:	4
Title:	Plan (wide)
Description:	Rear of the vehicle to the block. The entire vehicle should be in view @ T0

Camera:	5
Title:	Plan (tight)
Description:	B-pillar to the block

Camera:	6
Title:	Front (driver)
Description:	Front edge of the roof to base of windscreen/edge of bonnet

Camera:	7
Title:	Driver (wide), publication view
Description:	Rear of vehicle to block. The entire vehicle should be in view @ T0

Camera:	8 (on-board)
Title:	Driver dummy
Description:	Required view @ T0: Camera centred on driver head CoG. Driver seat, belt buckle and majority of driver dummy should be in view. Required view @ max forward movement: Driver seat, belt buckle and majority of driver dummy should be in view. Care should be taken to secure or route dummy cables so they do not obscure view of dummy during impact.

Camera:	9 (on-board)
Title:	Rear dummy

	Description:	Required view @ T0: Camera should be centred on excursion line with dummy head, *both* femurs and belt buckle in view. Required view @ max head excursion: dummy head & arms

4.3 Still Photographs

Table 4: List of photos (Frontal Full Width Rigid Barrier).

No.	Pre	Post	View
1	•	•	Front view of block.
2	•	•	Side view of block.
3	•	•	Side view of block at 45 degrees to front.
4	•	•	Side view of block with vehicle (for publication).
5		•	Wide view of car and block LHS (for publication).
6	•	•	Car LHS, with camera centred on junction of B-post waist, showing full car (for publication).
7			Car LHS, with camera centred on B-post waist, showing rear passenger compartment (for publication).
8	•	•	Car LHS, with camera aimed at waist height, showing driver's compartment (for publication).
9	•	•	Car LHS at 45 degrees to front (for publication).
10	•	•	Front view of car (for publication).
11	•	•	Car RHS at 45 degrees to front (for publication).
12	•	•	Car RHS, with camera aimed at waist height, showing front passenger's compartment (for publication).
13	•	•	Car RHS, with camera centred on B-post waist, showing rear passenger compartment (for publication).
14	•	•	Car RHS, with camera centred on B-post waist, showing full car (for publication).
15	•	•	Driver and seat to show driver compartment and position of seat relative to the sill.
16	•	•	To show area immediately in front of driver.
17	•	•	To show driver's foot well area and location of dummy's feet and pedals.
18	•	•	Rear passenger and seat to show compartment.
19	•	•	To show passenger foot well area and dummy's feet.
20	•	•	To show rear passenger through LHS rear door.
21	•	•	To show rear passenger through RHS rear door.
22		•	Overall view of where the car has come to rest after impact (including block).
23		•	To show position of all door latches and/or open doors.
24		•	To show driver knee contacts with facia (airbag should be lifted if obscuring view).

After Dummy Removal:

No.	Pre	Post	View
25		•	Passenger compartment from rear window.
26		•	RHS interior from LHS of car.
27		•	LHS interior from RHS of car.
28		•	RHS front door area.
29		•	LHS front door area.
30		•	Facia.
31		•	Steering wheel taken perpendicular to driver's side.
32		•	Driver right knee impact point.
33		•	Driver left knee impact point.
34		•	Rear Passenger knee impact area on rear of front seat.

Note: The above requirements are for a LHD car, for a RHD car camera locations will switch sides.

Screen Captures / On Test Stills:

In addition to the pre- and post-test stills, a set of pictures captured during the crash (driver's view full) need to be provided, as follows: (1) the car well into the barrier, (2) the airbag in deployment, (3) airbag fully deployed and (4) head of the dummy reaching the full extent of forward motion.

The list of photos is intended to be used as a guide and if the laboratory photographer finds some other interesting or unusual test occurrences these should also be photographed.

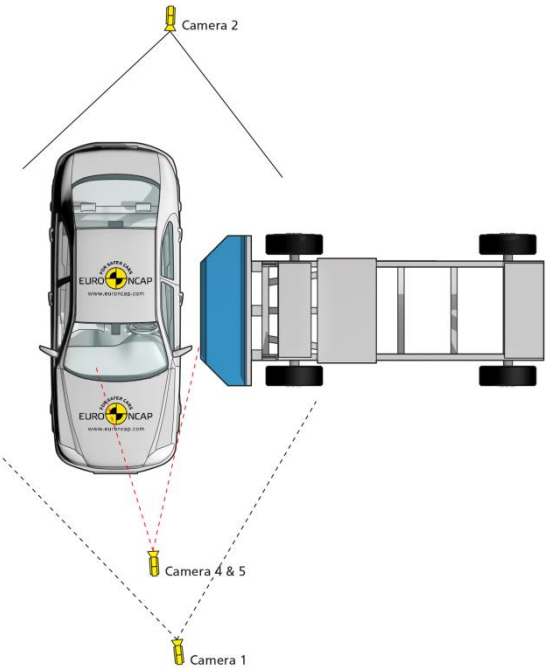
5 SIDE MOVING DEFORMABLE BARRIER IMPACT

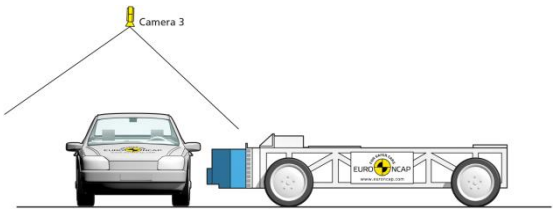
5.1 Vehicle and Barrier Markings

Euro NCAP markings should be attached to the exterior of the vehicle as shown in Figure 1, section 2.2.1. The unique Euro NCAP test reference number should be placed below each Euro NCAP logo (see section 2.2.3). Euro NCAP markings should also be stuck to the front of the trolley on both sides. Test house logos may be added to the trolley provided that they do not detract attention from the Euro NCAP markings.

5.2 Camera Locations and Views

A minimum of 5 cameras should be installed around the test vehicle, positioned as indicated in Figure 5 below. Two (2) additional on-board cameras to assess child dummy head containment are to be used.





Camera views:

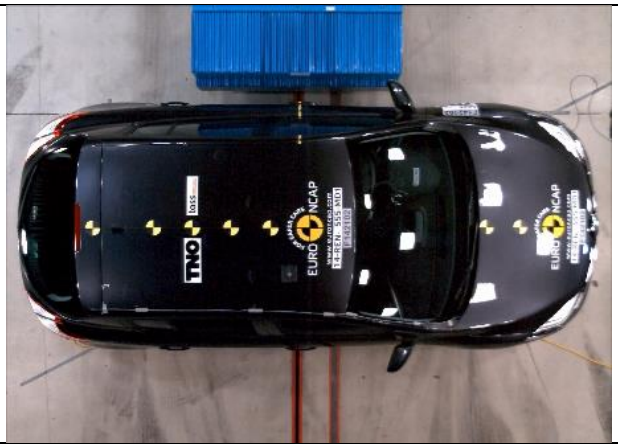
1. Front (wide), publication
2. Rear (wide)
3. Plan (full)
4. Front driver (body)
5. Front driver (head)
6. *FWF CRS (on-board, not shown)*
7. *RWF CRS (on-board, not shown)*

Figure 5: Locations for Cameras 1 to 7 (Side Moving Deformable Barrier).

Table 5: List of camera views (Side Moving Deformable Barrier).

Camera:	1
Title:	Front (wide), publication view
Description:	Trolley logo to 3m beyond non-struck side of vehicle @ T0

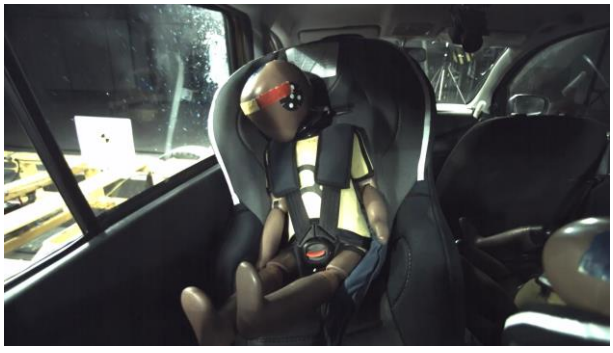
	Camera:	2
	Title:	Rear (wide)
	Description:	Trolley logo to 3m beyond non-struck side of vehicle @ T0

	Camera:	3
	Title:	Plan (full)
	Description:	Rearward of front trolley wheels to 3m beyond non-struck side of vehicle. The entire vehicle should be in view @ T0.

	Camera:	4
	Title:	Front driver (body)
	Description:	Edge of driver's door to at least the outboard edge of front passenger seat. The driver's thorax and abdomen should be visible @ T0

	Camera:	5
	Title:	Front driver (head)
	Description:	Edge of driver's door to at least the outboard edge of front passenger seat. The driver's head should be visible @ T0

 	Camera:	6 (on-board)
	Title:	FWF CRS
	Description:	Required view @ T0: Passenger head restraint may be removed if possible. The wings of CRS should be visible, possibly by marking with white tape. Required view @ max head rotation: Child head and CRS wing must be visible throughout the impact; Consideration should be given to CRS rotation.

 	Camera:	7 (on-board)
	Title:	RWF CRS
	Description:	Required view @ T0: The wings of CRS should be visible, possibly by marking with white tape. Required view @ max head rotation: Child head and CRS wing must be visible throughout the impact.

5.3 Still Photographs

Table 6: List of photos (Side Moving Deformable Barrier).

No.	Pre	Post	View
1	•	•	Front view of barrier.
2	•	•	Side view of barrier.

No.	Pre	Post	View
3	•	•	Side view of barrier at 45 degrees to front.
4	•	•	Side view of barrier with vehicle, from front of vehicle (for publication).
5		•	Side view of barrier with vehicle, from rear of vehicle (for publication).
6		•	Wide view of entire trolley and entire vehicle, from front of vehicle (for publication).
7		•	Wide view of entire trolley and entire vehicle, from rear of vehicle (for publication).
8	•	•	Car LHS, with camera centred on B-post waist, showing full car (for publication).
9	•	•	Car LHS, with camera centred on B-post waist, showing the rear passenger compartment (for publication).
10	•	•	Car LHS, with camera aimed at waist height, showing driver's compartment (for publication).
11	•	•	Car LHS at 45 degrees to rear (for publication).
12	•	•	Car LHS at 45 degrees to front (for publication).
13	•	•	Front view of car (for publication).
14	•	•	Car RHS, with camera centred on B-post waist, showing full car (for publication).
15	•	•	Car RHS, with camera centred on B-post waist, showing the rear passenger compartment (for publication).
16		•	To show position of all door latches and/or open doors.
17	•	•	Driver & seat through open driver's door to show driver compartment and position of seat relative to the sill.
18	•	•	To show area immediately in front of driver.
19	•	•	To show child dummies and restraints through LHS rear door.
20	•	•	To show child dummies and restraints through RHS rear door.
21		•	Car and barrier at rest at 45 degrees to front of car.
22		•	Car and barrier at rest at 45 degrees to rear of car.

After Dummy Removal:

No.	Pre	Post	View
23		•	View through RHS front passenger door of driver's door interior panel & paint marks from dummy ribs.

Note: The above photos are for a LHD car, for a RHD car camera locations will switch sides.

Screen Captures / On Test Stills:

In addition to the pre- and post-test stills, a set of pictures captured during the crash (front wide view) need to be provided, as follows: (1) barrier well into the car, (2) the airbag in deployment, (3) airbag fully deployed and (4) dummy's head in airbag.

The list of photos is intended to be used as a guide and if the laboratory photographer finds some other interesting or unusual test occurrences these should also be photographed.

6 SIDE OBLIQUE POLE IMPACT

6.1 Vehicle and Pole Markings

Euro NCAP markings should be attached to the exterior of the vehicle as shown in Figure 1, section 2.2.1. The unique Euro NCAP test reference number should be placed below each Euro NCAP logo (see section 2.2.3). No markings, targets excluded, are allowed on the pole itself. This includes test house logos.

6.2 Camera Locations and Views

A minimum of 6 cameras should be installed around the test vehicle, positioned as indicated in Figure 6 below. No on-board cameras are required.

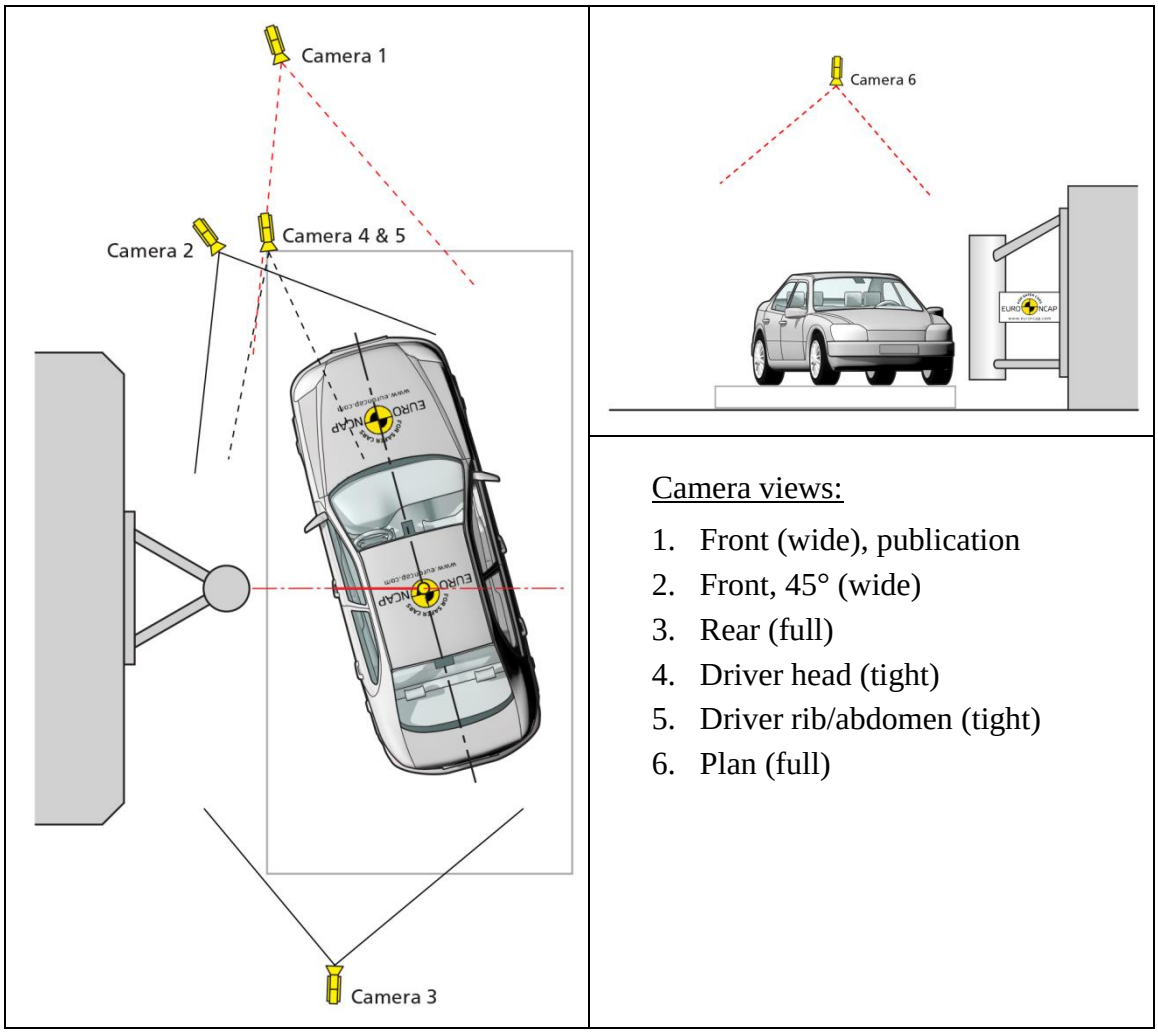


Figure 6: Locations for Cameras 1 to 6 (Side Oblique Pole).

Table 7: List of camera views (Side Oblique Pole).

	Camera:	1
	Title:	Front (wide), publication view
	Description:	Camera aligned with vehicle centerline @ T0. Rear of pole to 1m beyond non-struck side of vehicle
	Camera:	2
	Title:	Front, 45° (wide)
	Description:	Camera positioned at 45° to vehicle centreline @ T0. Rear of pole to 1m beyond non-struck side of vehicle
	Camera:	3
	Title:	Rear (full)
	Description:	Rearward of pole to 1m beyond non-struck side of vehicle. The entire vehicle should be in view @ T0 and the camera should be positioned to be perpendicular to direction of moving floor.
	Camera:	4
	Title:	Driver head (tight)
	Description:	Pole to the passenger side of the vehicle @ T0. Camera should be positioned to be perpendicular to direction of moving floor.

	Camera:	5
	Title:	Driver rib/abdomen (tight)
	Description:	Passenger side of vehicle to the rear of the pole. The driver's thorax and abdomen should be visible @ T0
	Camera:	6
	Title:	Plan (full)
	Description:	Entire vehicle should be in view @ T0

6.3 Still Photographs

Table 8: List of photos (Side Oblique Pole).

No.	Pre	Post	View
Car on carrier against pole:			
1	•	•	Top view of full car, carrier and pole (for publication).
2	•	•	Front view of full car, carrier and pole (for publication).
3	•	•	Rear view of full car, carrier and pole (for publication).
4	•	•	Side view of car, carrier and pole at 45 ° to front, impact side (for publication).
5	•	•	Side view of car, carrier and pole at 45 ° to rear, impact side (for publication).
6		•	Wide view of pole and entire vehicle, from front of vehicle (for publication).
7		•	Wide view of pole and entire vehicle, from rear of vehicle (for publication).
Car and carrier away from pole:			
8	•	•	Side view car/carrier impact side, showing full car (for publication).
9	•	•	Side view car/carrier non-impact side, showing full car (for publication).
10		•	To show position of all door latches and/or open doors.
11	•		Side view through open driver's door on driver & seat to show driver compartment and position of seat relative to the sill.

No.	Pre	Post	View
12	•		Detail view on driver's legs and feet through open door.
13	•	•	Side view through open front passenger door to show driver.
14	•	•	Side view of car/carrier impact side centred on impact line showing front door and B-post.
15	•		Front/side view of pole.
16		•	Front view of dummy through front windscreen.
17	•	•	Inside car view on abdomen/pelvis area.

After Dummy Removal:

No.	Pre	Post	View
18		•	Detail view(s) on paint marks on the driver's door and seat

Note: The above photos are for a LHD car, for a RHD car camera locations will switch sides.

Screen Captures / On Test Stills:

In addition to the pre- and post-test stills, a set of pictures captured during the crash (front wide or front 45° wide) need to be provided, as follows: (1) showing car well into pole, (2) the airbag in deployment, (3) airbag fully deployed and (4) dummy's head in airbag.

The list of photos is intended to be used as a guide and if the laboratory photographer finds some other interesting or unusual test occurrences these should also be photographed.

7 WHIPLASH TESTS

7.1 Sled, Seat and Dummy Markings

In order to monitor the seat and the dummy film targets should be applied to seat, sled and dummy. Targets should be securely affixed to areas of the seat which will not be deformed by the dummy during the test. The required target definitions are illustrated in Figure 7a and are given along with their reference points in Table 9. A plain light coloured, even surface and non-reflective screen or wall should be placed behind the sled with the Euro NCAP logo and the official test reference number below clearly in view.

In order to track the trajectories of the dummy and seat with reference to the sled the dimensions in Table 10, Figure 7b should be recorded. All measurements shall be measured from the camera film plane to the reference targets and recorded in mm.

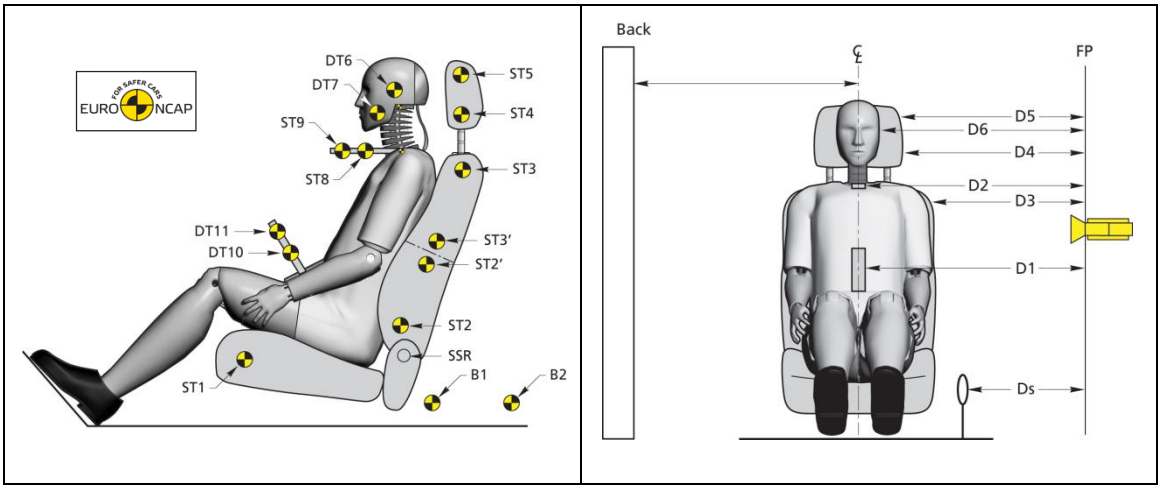


Figure 7: (a) Video motion targets and Euro NCAP label placement, left;
(b) Video tracking measurements, right.

Table 9: Video motion target placement description (Whiplash).

Designation	Description
B1	Sled base #1
B2	Sled base #2
DT6	Head CoG
DT7	Cheek
DT8	T1 bracket proximal
DT9	T1 bracket distal
DT10	Pelvis bracket proximal
DT11	Pelvis bracket distal
ST1	Seat base forward
ST2	Seat back lower
ST2’	Seat back mid #1 *
ST3	Seat back upper
ST3’	Seat back mid #2 *
ST4	Lower head restraint
ST5	Upper head restraint
SRR	Seat recliner centre

* These target locations are required only for 2 part hinged seatbacks.

Table 10: Video tracking measurement description (Whiplash).

Description	Measure	Reference
DS	Sled reference to focal plane	Sled – FP
D1	Pelvis to focal plane	DT11 – FP
D2	T1 bracket to focal plane	DT9 – FP
D3	Seatback upper to focal plane	ST3 – FP
D4	Head restraint lower to focal plane	ST4 – FP
D5	Head restraint upper to focal plane	ST5 – FP
D6	Head CoG to focal plane	DT6 - FP

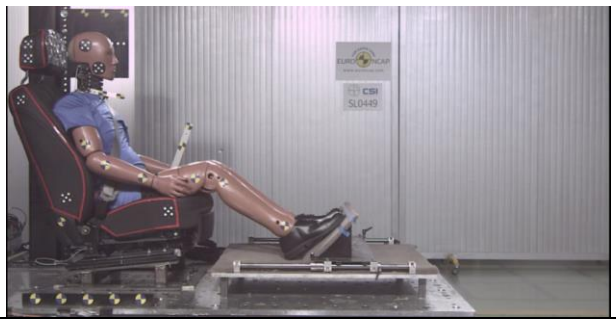
7.2 Camera Locations and Views

Two off-board cameras are required (with acceleration sled system):

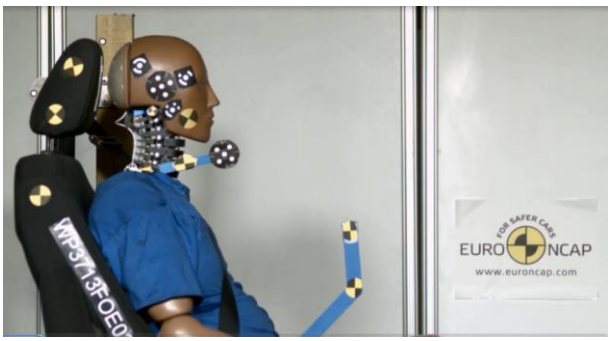
- Camera 1: The camera shall record a view of the entire test and the seat on the sled. The view should be such that 300ms of the test are in complete view from T0.
- Camera 2: The camera shall frame the head and neck of the dummy, and track the entire movement of the dummy during the test. The view should be such that 300ms of the test are in complete view from T0.

Care should be taken to ensure that that camera placement is perpendicular to the direction of sled travel. Camera measurements should be taken to the film plane of the camera, from both the fixed targets and the head Centre of Gravity target. For off board camera views, compensation must be included in the film analysis to take account of parallax effects due to sled motion relative to the cameras.

Table 11: List of camera views (Whiplash).



Camera:	1
Title:	Whiplash (wide), publication view
Description:	The publication view is usually taken from the high severity pulse test.



Camera:	2
Title:	Whiplash (tight)
Description:	Verify whether Euro NCAP logo and test reference number are in view. The use of ad-hoc logos (as shown) is strongly discouraged.

7.3 Still Photographs

The following photographs will be taken pre and post-test unless otherwise indicated. Pre-test photographs will be taken with the dummy in the final position.

Table 12: List of photos (Whiplash).

No.	Pre	Post	View
1	•	•	Seat structure reference point
2	•	•	Seat track markings (both sides)
3	•	•	Close view of Head restraint test position (identifiable point and any visible notches)
4	•	•	Dummy and seat at 45 degrees to rear
5	•	•	Side view of dummy and seat
6	•	•	Dummy and seat at 45 degrees to front
7	•	•	Front view of dummy and seat
8	•	•	Front view of dummy showing top of head down to knees
9	•	•	Dummy head down to thorax and seat at 45 degrees to rear
10	•	•	Dummy head down to thorax and seat at 20 degrees to rear
11	•	•	Side view of dummy head down to thorax
12	•	•	Dummy head down to thorax and seat at 45 degrees to front
13	•	•	Dummy head down to thorax and seat at 20 degrees to front
14	•	•	Side view of dummy showing thorax down to feet, camera centred on seat base
15	•	•	Tight side view of dummy showing thorax down to feet, camera centred on seat base
16	•	•	Side view of dummy and seat (portrait) showing seat back to knees
17	•	•	Tight side view of dummy and seat (portrait) showing seat back to pelvis
18		•	Any damage to seat (multiple aspects required)
19		•	Any damage to dummy (multiple aspects required)
20		•	Seat variant and trim condition (multiple aspects required)
21		•	Seat adjustment controls (multiple aspects required)

Screen Captures / On Test Stills:
In addition to the pre- and post-test stills, a picture captured during travel needs to be provided, as follows: (1) high severity pulse - maximum seat deflection.

8 PEDESTRIAN SUBSYSTEM TESTS

8.1 Vehicle and Other Markings

To hide any background test equipment or personnel, a plain light coloured, non-reflective screen should be placed near (behind) the vehicle test area with the Euro NCAP logo and official test reference number clearly visible in view. Test house logos and/or test number may be shown provided that they do not detract attention from the Euro NCAP markings (see section 2.2.2). There should be no markings on the vehicle, including test house logos.

8.2 Camera Locations and Views

A single camera is required to record the impact events. The camera orientation should be aligned perpendicular to the vehicle centreline and adjusted in height in accordance with the type of test. Euro NCAP requires at least one HD quality high speed film recording per pedestrian impactor type for each vehicle model tested (4 in total).

Care should be taken that the pedestrian test area is sufficiently lit.

Table 13: List of camera views (Pedestrian Subsystem).

Camera:	1
Title:	Lower leg side (tight), publication view
Description:	Camera perpendicular to vehicle centerline @ T0. Launcher plate should be visible. Left or right side views are allowed.

	Camera:	2
	Title:	Upper leg side (tight), publication view
	Description:	Camera perpendicular to vehicle centerline @ T0. Impactor should be completely visible. Left or right side views are allowed
	Camera:	3
	Title:	Child head form side (tight), publication view
	Description:	Camera perpendicular to vehicle centreline @ T0. Left or right side views are allowed.
 	Camera:	4
	Title:	Adult head form side (tight), publication view
	Description:	Camera perpendicular to vehicle centreline @ T0. Left or right side views are allowed. Tests on windscreen may alternatively be filmed from the vehicle inside.

8.3 Still Photographs

Pre- and post-test photos should be taken to show the undamaged/damaged test area pre/post-test (bonnet, A-pillars, glazing, leading edge and bumper). These must include at least one overview photo of each of the pre-test grid markings on the impact test zones.

9 AUTONOMOUS EMERGENCY BRAKING TESTS

9.1 Vehicle Markings

Euro NCAP markings should be attached to the exterior of the vehicle as shown in Figure 1, section 2.2.1, except for the roof logo which is optional. The unique Euro NCAP test reference number should be placed below each Euro NCAP logo (see section 2.2.3).

9.2 Camera Locations and Views

Off-board HD camera (camera 1):

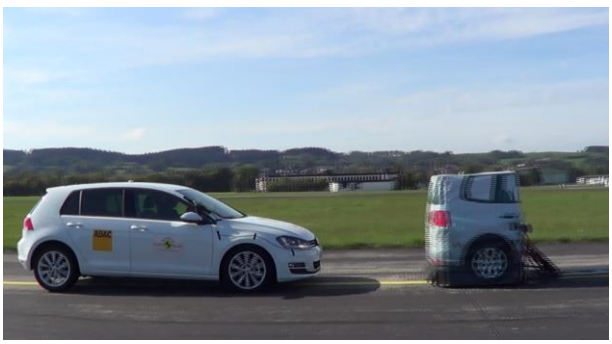
- Start filming from far away, when the car approaches the target, both the car & target should be in view. When the car is about to brake, view should start close up until the car has stopped. Only the car & target should be in view. The angle should be as perpendicular as possible to the car and target.

On-board camera (cameras 2 and 3):

- Camera 2: "Go Pro" or equivalent inside the car filming the view in front. No test equipment (e.g. steering robot) should be in view. Alternatively, this shot can be taken from a camera mounted on the vehicle roof.
- Camera 3: "Go Pro" or equivalent inside the car filming the dashboard.

For publication purposes, additional views (e.g shot from different angles) are preferred for the most interesting test runs, i.e. maximum avoidance, maximum mitigation tests.

Table 14: List of camera views (Autonomous Emergency Braking).

 	Camera:	1
	Title:	Wide to Car and target HD
	Description:	Wide view initially. When the car is about to brake, zoom in until the car has stopped. Only car and target in view. Angle should be as perpendicular as possible to the car and target.

	Camera:	3 (on-board)
	Title:	Forward outside
	Description:	"Go pro" (or equivalent type camera) inside, looking in forward direction. No test equipment should be in view.

	Camera:	4 (on-board)
	Title:	Forward inside
	Description:	"Go pro" (or equivalent type camera) inside, looking in forward direction towards dashboard, instrumentation cluster, HUD, etc. Visual warning must be captured.

9.3 Still Photographs

Post test photos should be taken in case of suspected damage to vehicle front-end or sensor array.

APPENDIX A

Examples of test reference numbers applied to test vehicles:

"15-CAR-123-OD1",
- ➔ 2015 ODB test (#1) on brand "CAR" with unique key number "123".

"15-CAR-123-FW1",
- ➔ 2015 FW test (#1) on brand "CAR" with unique key number "123".

"15-CAR-123-MD1",
- ➔ 2015 MDB test (#1) on brand "CAR" with unique key number "123".

"15-CAR-123-PO1",
- ➔ 2015 Pole test (#1) on brand "CAR" with unique key number "123".

"15-CAR-123-WH1, "15-CAR-123-WM1", "15-CAR-123-WL1",
- ➔ 2015 Whiplash test, High/Medium/Low Speed (#1) on brand "CAR" with unique key number "123".

"15-CAR-123-PP1",
- ➔ 2015 Pedestrian subsystem test (#1) on brand "CAR" with unique key number "123".

"15-CAR-123-EB1",
- ➔ 2015 AEB test (#1) on brand "CAR" with unique key number "123".