ANCAP
Crash testing for safety

# GUIDELINES FOR RECORDING COMPLIANCE WITH CRASH TEST PROTOCOL

-

# SIDE IMPACT CRASH TEST

| | | |
|---|---|---|
| Test Organisation Reference No.: | | |
| Test Organisation | | |
| Vehicle Make & Model: | | |
| ANCAP Reference Code: | | |
| Date of ANCAP authorisation to proceed with test: | | |
| Euro NCAP Test Protocol | Version: | Date: |
| Test Date: | | |
| Test Engineer (name): | | |
| Task | Date Completed | Initials |
| A. Vehicle Specification Checks | | |
| B. Vehicle Preparation & marking | | |
| C. Barrier/Trolley Preparation | | |
| D. Passenger Compartment Setup | | |
| E. Dummy installation | | |
| F. Final pre-test checks (OK to "fire") | | |
| G. Post-test tasks | | |
| H. Data processing & reporting | | |

# INTRODUCTION

This document sets out the *information that is required to be recorded* in association with the mobile deformable barrier (MDB) side impact crash test. *It is not intended to be a description of how the tests are to be performed.* Test organisations must develop their own documentation for this purpose.

The test is to be conducted in accordance with the version of the published Euro NCAP Test Protocol that has been agreed to by ANCAP, subject to variations described in this document and in the ANCAP Test Lab Protocol.

Test organisations may use this document or their own checklists, provided that the in-house checklists cover all items described in this document and that the checklists are made available to authorised ANCAP personnel for inspection, if requested.

Requirements that are additional to the Test Protocol are shown in red text.

# A. VEHICLE SPECIFICATION CHECKS

**Purpose:**

- To record delivery information
- To ensure that the vehicle meets the specifications required by ANCAP
- To ensure that manufacturer's settings have been sought and received
- To record safety-related features of the vehicle

| ITEM | PROTOCOL | DESCRIPTION | CHECKED | PHOTO |
|---|---|---|---|---|
| **A1 Delivery information & manufacturer's settings** | | | | |
| A1.1 | - | Delivery date | (date) | |
| A1.2 | - | Name of motor dealer | | |
| A1.3 | - | Date manufacturer's settings requested | (date) | |
| A1.4 | - | Date manufacturer's setting received (see A4) | (date) | |
| A1.5 | - | Name of manufacturer's representative | | |

| | | | | |
|---|---|---|---|---|
| **A2. Vehicle specifications** | | | | |
| A2.1 | - | Variant (eg "GLX") | | |
| A2.2 | - | Body type (eg "5 door hatch") | | |
| A2.3 | - | Photographs of vehicle (without signage) | | |
| | | Front | | A2.3a |
| | | Front ¾ | | A2.3b |
| | | Driver's side | | A2.3c |
| | | Rear ¾ | | A2.3d |
| | | Passenger side | | A2.3e |
| | | Underside - front | | A2.3f |

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| ITEM | PROTOCOL | DESCRIPTION | CHECKED | PHOTO |
|---|---|---|---|---|
| | | Underside - rear<br>Under bonnet<br>Plan view | | A2.3g<br>A2.3h<br>A2.3i |
| A2.4 | - | Build date (photo of build plate) | | A2.4 |
| A2.5 | - | ADR Compliance Plate date (photo of plate) | | A2.5 |
| A2.6 | - | VIN (& photo): | | A2.6 |
| A2.7 | - | Engine number (& photo): | | A2.7 |
| A2.8 | - | Engine size & configuration | | |
| A2.9 | - | Transmission type and number of gears | | |
| A2.10 | - | Odometer reading | km | |
| A2.11 | - | Wheels (type & size) | | |
| A2.12 | - | Tyres (type & size) | | |
| A2.13 | - | Tyre placard pressures Front:<br>for "normal" load (photo of placard) Rear | kPa<br>kPa | A2.13 |
| A2.14 | - | Is steering column tilt (vertical) adjustable?<br>Is steering column reach adjustable? (X) | Y / N<br>Y / N | |
| A2.15 | - | Function of instrument warning lights | | |
| A2.16 | - | Vehicle roadworthy | | |
| A2.17 | - | Vehicle clean outside, inside & underneath | | |
| A2.18 | - | Condition of bodywork (eg dents)<br>Have pedestrian tests been performed? | Y / N | |

| A3 Seats and Restraints | | | | |
|---|---|---|---|---|
| Item | Driver | Front Passenger | Rear Outboard | Rear Centre |
| A3.1 Seat style (BU=bucket or BE=bench) | | | | |
| A3.2 Seat back angle adjustment* | | | | |
| A3.3 Seat fore/aft adjustment* | | | | |
| A3.4 Seat height adjustment* | | | | |
| A3.5 Seat cushion tilt adjustment* | | | | |
| A3.6 Head restraint fitted? | | | | |
| A3.7 Head restraint height adjustment | | | | |
| A3.8 Head restraint tilt adjustment | | | | |
| A3.9 Active head restraint? | | | | |
| A3.10 Seat belt type# | | | | |

| | | | | |
|---|---|---|---|---|
| A3.11 Upper anchorage height adjustable | | | | |
| A3.12 Seat belt pretensioner | | | | |
| A3.13 Seat belt load limiter | | | | |
| A3.14 Front airbag | | | | |
| A3.15 Side airbag - thorax | | | | |
| A3.16 Side airbag - head (Curtain, Tube, Bag or None) | | | | |
| A3.17 Knee airbag | | | | |
| A3.18 Anti-submarining seat design<br>(where claimed by manufacturer) | | | | |
| A3.19 Top tether anchorage location@ | | | | |
| A3.20 ISOFIX anchorages | | | | |

* E=electrical adjustment, M=manual adjustment F=fixed (non-adjustable)

# ELR=3 point emergency locking retractor. ALR=3 point automatic locking retractor, L=2 point LS=fixed 3 point

@ P=parcel shelf, S=back of seat, F=floor, T=tailgate sill, R=roof/ceiling

## A4. Manufacturer-specified settings (for tyre pressures see A2.13)

Where "page number" is requested, indicate the page number in the owner's handbook that explains *how to adjust* the item concerned.

Where the manufacturer provides set-up information this must be retained for archive purposes but should not be included in the report, unless to explain a variation to the set-up.

It is recommended that the R-point data (item 4.12) is checked by physically measuring the vehicle early in the set-up process. In particular the Y value of the R-point should match the centreline of the driver's seat. Resolve with manufacturer if there is a discrepancy.

| ITEM | PROTOCOL | DESCRIPTION | CHECKED | PHOTO |
|---|---|---|---|---|
| A4.1 | 1.1.1 | Fuel tank capacity<br>Page number | litres | |
| A4.2 | 1.1.7 | Unladen kerb weight | kg | |
| A4.3 | 6.1.1 | H-point machine torso angle<br>(if only seat back angle is provided then the reference system must be described)<br>Page number (seat back angle adjustment) | degrees | |
| A4.4. | 5.1.1 | Seat fore/aft position for 95%ile male (distance from foremost point of travel)<br>Page number | mm | |
| A4.5 | 5.2.5 | Seat base tilt angle (from horizontal) or position of control(s)<br>Page number | degrees | |

| | | | | |
|---|---|---|---|---|
| A4.6 | 5.2.6 | Seat lumbar support setting<br>Page number | | |
| A4.7 | 6.3.1.2 | Height of seat belt upper anchorage (if adjustable) (distance from highest setting)<br>Page number | mm | |
| A4.8 | - | Whether front seat belts have pretensioners, webbing grabbers and load limiters | | |
| A4.9 | - | Whether rear seat belts have pretensioners, webbing grabbers and load limiters | | |
| A4.10 | 5.3 | Steering wheel horizontal adjustment (eg diagram of mid-point, if adjustable)<br>Page number | | |
| A4.11 | 5.4 | Steering wheel vertical adjustment (eg diagram of mid-point, if adjustable)<br>Page number | | |
| A4.12 | 1.3.1 | Location of R-point (XYZ) and associated reference ("lock-in") points for co-ordinate system (1 "origin" and at least 2 alignment points)<br>Diagrams or photographs provided? | R-point?<br>Number of reference points:<br>Diagram/Photo | |
| A4.13 | 5.2.1 | Is driver's seat height adjustable?<br>If NO then skip to next item<br>If YES, then determine the height setting in the following order:<br>a) Height of a non-adjustable driver's seat for this vehicle model (i.e. another variant of this model)<br>b) Height of a non-adjustable passenger seat for this variant<br>c) Mid-point of driver's seat height adjustment<br>If a) or b):<br>Driver or passenger seat?<br>Height of H-point of non-adjustable seat OR<br>Description of of control settings<br>(For H-point, use same reference points as R-point measurement)<br>If manufacturer does not provide a setting then a H-point machine will need to be used in the non-adjustable passenger | Y / N<br><br>a / b / c<br><br>Driver/Passn<br>mm | |

| | | | | |
|---|---|---|---|---|
| | | seat to determine the required setting. | | |
| A.4.14 | 9.4.2 | Door handle pull angle - from horizontal<br>from vertical | degrees<br>degrees | |
| A.4.15 | - | Acceptable battery voltage range 5 minutes prior to test (measured at terminals) | V to<br>V | |
| A4.16 | - | Does the engine need to be run just prior to the test? (eg for suspension system).<br>If YES, see manufacturer's instructions (eg providing fuel to the engine, running time) | Y / N | |
| A4.17 | 6.4 | Make & model of CRS for TNO P1.5 dummy | | |
| A4.18 | 6.4 | Make & model of CRS for TNO P3 dummy | | |
| A4.19 | - | Can rear seat head restraints be removed or modified to improve the view of the child dummy movement?<br>If YES, describe the allowed modifications | Y / N | |
| A4.20 | 1.4.1 | Does spare wheel need to be retained for crash performance? | | |
| A4.21 | 1.4.7 | Expected Test Mass<br>Expected front axle load<br>Expected rear axle load | kg<br>kg<br>kg | |
| A4.22 | - | Does vehicle have "pre-crash" features (eg pre-emptive firing of pre-tensioners or application of brakes)?<br>If YES, how can this be dis-engaged, if necessary? | Y / N | |

| | | |
|---|---|---|
| A5 | - | Special instructions/requests from manufacturer:<br><br>Recommendation from test organisation:<br><br>Authorised by ANCAP on (date): |

| A6 Notes about vehicle specifications |
|---|
| |

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# B. VEHICLE MASS CALCULATIONS AND PREPARATION

**Purpose:**

- To measure vehicle unladen mass
- To calculate the reference (test) mass and simulate the test mass distribution
- To prepare the vehicle and add ballast, if necessary
- To determine the R point and mark the side of the vehicle

## B1. Measuring unladen mass

| ITEM | PROTOCOL | DESCRIPTION | CHECKED | PHOTO |
|---|---|---|---|---|
| B1.1 | 1.1.1 | Fuel tank capacity (see A4.1) | litres | |
| B1.2 | 1.1.1 | Mass of fuel in full tank = B1.1 x 0.745 for Petrol. Use 0.8 for diesel. | kg | |
| B1.3 | 1.1.1 | Mass of fuel at 90% of capacity = B.1.2 x 0.9 | kg | |
| B1.4 | 1.1.1 | Volume of fuel substitute = B1.3 / density<br>(density of water is 1 kg/litre) | litres<br>of [water] | |
| B1.5 | 1.1.3 | Fuel tank drained and refilled to the equivalent of 90% of capacity (B1.4)<br>Dye colour | litres<br>of [water] | |
| B1.6 | 1.1.4 | Other liquids at maximum<br>Engine oil<br>Coolant<br>Power steering<br>Brake reservoir<br>Transmission<br>Washer bottle(s)<br>Others | | |
| B1.7 | 1.1.5 | Spare wheel & tools present | | |
| B1.8 | 1.1.6 | Tyres pressures (+/-10kPa of A2.13)<br>Front L<br>Front R<br>Rear R<br>Rear L | <br>kPa<br>kPa<br>kPa<br>kPa | |

| B1.9 | 1.1.7 | Close bonnet, boot and doors. Rock vehicle to settle suspension then measure unladen wheel loads |
|---|---|---|

| kg | Left | Right | Total |
|---|---|---|---|
| Front | | | |
| Rear | | | |
| Total | | | UKM |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | **Unladen Kerb Mass** | | | | | |
| B1.10 | - | Difference between measured kerb mass and stated kerb mass (A4.2) | | | kg | | |
| B1.11 | 1.1.8 | Mark body panel at top of wheelarch, in same vertical line as wheel centreline. Measure height of this point above the ground ("ride height")<br>Photograph 2 measurements<br>Front L<br>Front R<br>Rear R<br>Rear L | | | mm<br>mm<br>mm<br>mm | | B1.9a<br>B1.9b |

## B2. Measuring reference (laden) mass

Caution: Do not switch on ignition with battery, airbag or pretensioner disconnected
Vehicle should have equivalent of 90% of capacity in fuel tank (B1.4)

| ITEM | PROTOCOL | DESCRIPTION | | | CHECKED | | PHOTO |
|---|---|---|---|---|---|---|---|
| B2.2 | 1.2.1 | Determine mid-position (fore/aft) of driver seat and place in mid-position (or first notch rearward). Photograph position of seat (note this is not necessarily the final test position) | | | | | B2.2 |
| B2.3 | 1.2.1 | Determine mid-position (fore/aft) of front passenger seat and place in mid-position (or first notch rearward). Photograph seat. | | | | | B2.3 |
| B2.4 | 1.2.2 | Place 80kg ballast on driver's seat<br>Photograph ballast on seat | | | | | B2.4 |
| B2.5 | 1.2.3 | Evenly distribute 20kg of ballast in luggage compartment (ballast is required to raise vehicle mass to 100kg more than the UKM - explain if other than 20kg is used)<br>Photograph ballast in luggage compartment | | | kg | | B2.5 |
| B2.6 | 1.2.4 | Fit CRS to outboard rear seat and install P1.5 dummy (or 11kg ballast). Assume CRS is an extra 3kg, if one is not available.<br>Photograph CRS/ballast | | | | | B2.6 |
| B2.7 | 1.2.4 | Fit CRS to inboard rear seat and install P3 dummy (or 15kg ballast) ). Assume CRS is an extra 3kg, if one is not available.<br>Photograph CRS/ballast | | | | | B2.7 |
| B2.9 | 1.2.5 | Close bonnet, boot and | kg | Left | Right | Total | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | doors. Rock vehicle to settle suspension then measure laden wheel loads<br><br>Reference laden mass | Front | | | FRM | |
| | | | Rear | | | RRM | |
| | | | Total | | | RLM | |
| B2.10 | - | Difference between RLM and unladen kerb mass (B1.9)<br>(with ballast and child restraints, should be about 132kg) | | | kg | | |
| B2.10a | 1.4.7 | Calculate acceptable ranges for final test masses (see B4.12). Round to nearest kg.<br>Front axle is FRM +/- lesser of<br>FRM x 0.05 or 20kg (= kg)<br>Rear axle is RRM +/- lesser of<br>RRM x 0.05 or 20kg (= kg)<br>Total mass is RLM +/-<br>RLM x 0.01 (= kg) | kg | Min | Max | | |
| | | | Front range | | | | |
| | | | Rear range | | | | |
| | | | Total range | | | | |
| B2.11 | 1.1.8 | Measure laden ride heights (see B1.11)<br>Front L<br>Photograph 2 measurements<br>Front R<br>Rear R<br>Rear L | | | mm<br>mm<br>mm<br>mm | | B2.11a<br><br>B2.11b |
| B2.12 | 1.2.8 | Remove all weights from driver's seat and luggage compartment (CRS may remain in place) | | | | | |

## B3. R- Point Marking

Usually the vehicle should be supported on jack stands whenever 3D measurements are being taken. The vehicle should be supported in a manner maintains the same attitude as the laden (test) condition. There should be 3 reference points - one is the origin and the other two are for alignment purposes.

While the 3D measuring device (eg Co-ordinate Measuring Machine or CMM) is in use some reference marks will be placed on the seat, dashboard and windscreen.

It is possible that the manufacturer-supplied co-ordinate system is not aligned exactly with the ground plane. Therefore the Z axis should not be assumed to be vertical and a 3D machine is not appropriate for establishing some locations. These are indicated in the table.

| ITEM | PROTOCOL | DESCRIPTION | CHECKED | PHOTO |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| B3.1 | - | Ensure laden vehicle is level and support it on jacks | | |
| B3.2 | 1.3.1 | Locate reference points for determining R-point (see A4.12). Align 3D measuring device with reference system provided by the manufacturer. Set measuring device at "origin" reference point<br>Photograph the device & reference point | | B3.2 |
| B3.5 | 1.3.2 | Close door and move the measuring device along door panel to the manufacturer's X-Z settings for the R-point and record co-ordinates | X: / Y: / Z: | |
| B3.6 | 1.3.2 | Mark R-point on outside of door. Label "R" | | |
| B3.7 | 1.3.3 | Draw short vertical line through R-point (approx 100mm above and below) & photograph | | B3.7 |
| B3.8 | 1.3.4 | Mark points on roof gutter and door sill in same transverse vertical plane as R-point. Use a laser level or similar device – not 3D machine (unless it has been shown to align with ground plane when set to manufactuer's reference system) | | |
| B3.9 | 1.3.5 | Apply contrasting tape to connect these points (in a vertical line, with front edge aligned with R-point). | | B3.9 |
| B3.10 | ANCAP | Mark lateral centeline (symmetry point) of seat at three points where they will be visible with the dummy installed:<br>Photograph marks 1. Near front of cushion:<br>2. At top of seat back:<br>3. Head restraint<br>Check that they align reasonably well with the R-point Y value provided by the manufacturer. | | B3.10 |
| B3.11 | ANCAP | Apply three marks in line with the lateral centreline of the seat cushion (point 1 in B3.10). One should be on the windscreen at about dummy nose height. The second shoiuld be on top of the instrument panel vertically below (Z) the windscreen mark. *Install string between these two marks.* The third mark should be on the windscreen at about mid-height between the other two points. These will be used to visually check dummy alignment. | | |

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|---|---|---|---|---|
| | |  | | |
| B3.10 | - | Remove jack stands | | |

## B4. Vehicle preparation

| ITEM | PROTOCOL | DESCRIPTION | CHECKED | PHOTO |
|---|---|---|---|---|
| B4.1 | 1.4.1 | Remove carpet, tools and jack from luggage compartment | | |
| B4.2 | 1.4.1 | Remove spare wheel, unless manufacturer indicated otherwise (see A2.16) | | |
| B4.3 | 1.4.2 | Battery connected and fully charged<br>ANCAP does not permit an auxiliary battery. | | |
| B4.5 | 1.4.3 | Switch ignition on and check airbag warning light | | |
| B4.6 | 1.4.3 | Install on-board data acquisition system and related components in luggage area and route cabling to seats | | B4.6 |
| B4.8 | 3.2.4 | Install accelerometer on the unstruck b-pillar in the Y-direction. Remove carpet and trim. Fit mounting plate to sill at bottom of B-pillar, inside the vehicle. Fix accelerometer to mounting plate. Ensure accelerometer horizontal to ± 5°. Photograph accelerometer | | B4.8 |
| B4.9 | 1.4.4 | Place 80kg ballast on driver's seat | | |
| B4.10 | 1.4.5 | Fit CRS to outboard rear seat and install P1.5 dummy (or 11kg ballast) | | |
| B4.11 | 1.4.5 | Fit CRS to inboard rear seat and install P3 dummy (or 15kg ballast) | | |
| B4.12 | 1.4.6 | Close bonnet, boot and doors. Rock vehicle to settle suspension and measure laden wheel loads. Adjust ballast to achieve required axle and total masses | | |

| kg | Left | Right | Total |
|---|---|---|---|
| Front | | | FTM |
| Rear | | | RTM |
| Total | | | TTM |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Total Test Mass | | | | | |
| B4.13 | 1.4.7 | Is TTM within required range (B2.10a)? | | | | Y / N | |
| B4.14 | 1.4.7 | Is FTM within required range (B2.10a)? | | | | Y / N | |
| B4.15 | 1.4.7 | Is RTM within required range (B2.10a)? | | | | Y / N | |
| B4.18 | - | Difference between final test masses and manufacturer' expectations (A4.19)<br>Front<br>Rear<br>Total | | | | kg<br>kg<br>kg | |

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**B5. Vehicle Marking** (see example photographs, see specifications for logos and identification lettering)

| ITEM | PROTOCOL | DESCRIPTION | CHECKED | PHOTO |
|---|---|---|---|---|
| B5.1 | 1.5.1 | Attached ANCAP logo to bonnet and roof (front half). | | |
| B5.2 | - | Attach vehicle and test identification sheets to bonnet and roof (Vehicle model, test date, test identification number) | | |
| B.5.3 | 1.5.2 | Attach test organisation logos of a size and location that does not detract from the other markings | | |
| B5.4 | 8.4.1 | From manufacturer's reference points, or by using several symmetrical points on the vehicle body, mark a point at the front of the vehicle thatis in the longitudinal centreline of the vehicle. Repeat for a point at the rear of the vehicle. These will be used to check that the vehicle angle is correct (90 degrees to impact). | | |
| B5.5 | ANCAP | **If requested by ANCAP, m**ark grid points on the side of the vehicle for measuring crush profile. There should be 7 vertical lines spread along the length of the vehicle (lines 1 and 7 correspond to each end of the side of the vehicle and line 3 or 4 should correspond to the R-point). There should be 3 horizontal lines at heights of 300, 550 and 800mm above the ground. This gives a total of 21 points to be measured before and after the crash. Record the 3D positions of these grid points (electronic record is acceptable) | | |

| B6 Notes about vehicle preparation |
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# C. Barrier, trolley and camera preparation

**Purpose:**

- To check certification of deformable barrier
- To prepare trolley and mount barrier
- To check trolley wheel loads
- To check camera types and positions

## C1. Barrier and trolley

Average wheelbase of trolley must be 3000mm ± 10mm
Front and rear track must be 1500 ± 10mm
Total mass of trolley and barrier must be 920 ± 20kg
C of G of trolley and barrier must be 1000mm ± 10mm from centre of front axle
After the barrier is in place it is recommended that it be lightly supported to prevent sag.

| ITEM | PROTOCOL | DESCRIPTION | CHECKED | PHOTO |
|---|---|---|---|---|
| C1.1 | 7 | Barrier certification Manufacturer:<br>Certificate no.: Serial No: | | |
| C1.2 | 7.1.3 | Inflate all tyres on trolley to the same pressure | kPa | |
| C1.3 | 7.1.2 | Check abort/brake system components | | |
| C1.4 | 7.1.4 | Mount deformable barrier such that the bottom edge is 300mm ± 5mm from the ground. A vented backplate must be used<br>Record & photograph height measurement | mm | C1.4 |
| C1.5 | 7.1.5 | Mark a line along vertical centreline of barrier (to check alignment with R-point) | | |
| C1.6 | 9.3.1 | Mount rivet or pin at barrier centreline<br>Photograph line and rivet/pin | | C1.6 |
| C1.7 | 7.1.7 | Measure left & right wheelbase and calculate average<br>Left:<br>Right<br>**WB** = (L + R)/2: | mm<br>mm<br>mm | |
| C1.8 | 7.1.8 | Measure front & rear track (centre of tyre tread)<br>Front:<br>Rear: | mm<br>mm | |
| C1.9 | 7.1.9 | Measure trolley masses | | |

| kg | Left | Right | Total |
|---|---|---|---|
| Front | | | BFM |
| Rear | | | BRM |
| Total | | | BTM |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| C1.10 | 7.1.10 | Calculate and record the fore/aft position of the centre of gravity using:<br>X = BRM x WB / BTM | | | mm | | |
| C1.11 | - | Are trolley and barrier measurements within tolerances?<br>If not, describe remedial action at C2 | | | Y / N | | |
| C1.12 | 3.3.1 | Mount accelerometer inX-direction at Centre of Gravity ± 100mm<br>Photograph installed accelerometer | | | | | C1.12 |
| C1.12 | 7.2.1 | Attach ANCAP logo on each side near front<br>(test organisation logos must not detract from ANCAP logo) | | | | | |
| | | | | | | | |

C2 Camera preparation pending

| **C3 Notes about trolley, barrier & camera preparation** |
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# D. Passenger Compartment Setup

**Purpose:**

- To set seats in required positions
- To set steering wheel in required position
- To seat belt upper anchorage in required position
- To determine H-point position

## D1. Seat adjustments

Refer to settings and owner's handbook page numbers at A4.3 to A4.6

Driver head restraint is adjusted after dummy is installed

The seat fore/aft adjustment is made after the seat height adjustment to ensure that alignment marks are still valid at test time (most seats move longitudinally when height is adjusted).

Only test organisation personnel are permitted to adjust vehicle settings. With ANCAP approval. manufacturer's representatives may observe and advise on adjustments but must not touch any controls.

"Set" stickers or masking tape should be applied to controls after they have been adjusted to the required test position.

| ITEM | PROTOCOL | DESCRIPTION | CHECKED | PHOTO |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| D1.1 | 5.2.5 | Is seat base tilt adjustable?<br>If YES, set seat base tilt at flattest (or any point up to mid-range, if specified by manufacturer - see A4.5) | Y / N | |
| D1.2 | 5.2.5 | If seat is tilt adjustable, mark and photograph the adjustment devices to clearly show their position<br>Least tilt<br>Largest tilt<br>Test position | | D1.2a<br>D1.2b<br>D1.2c |

| | | | | |
|---|---|---|---|---|
| D1.3 | 5.2 | Is a driver or front passenger seat with *non-adjustable* height available for this vehicle model? (see A4.13)<br>If YES then did the manufacturer provide instructions for setting seat height?<br>If YES then follow these instructions<br>If NO then the H-point machine needs to be installed in order to set the seat height - see part XX. Skip item D1.11. | Y / N<br>Y / N | |
| D1.3b | 5.2 | If D1.10 answer was "no", then seat height adjustment is done now. Place a reference mark on the seat for this purpose.<br>Mark & photograph lowest position of seat<br>Mark & photograph highest position of seat<br>Calculate mid-height position (from lowest setting)<br>Set seat at mid-height & photograph | mm | D1.3a<br>D1.3b<br>D1.3c |
| D1.4 | 5.2.6 | Is lumbar support adjustable?<br>If YES set lumbar support to manufacturers setting (A4.6) or fully retracted & photograph control position | Y / N | D1.4 |
| D1.5 | Table 5 | Set armrest in lowered position (unless interferes with dummy positioning) | | |
| D1.6 | 5.2 | *Front passenger seat* adjusted to same setting as driver seat, where applicable<br>Fore/aft adjustment<br>Height adjustment<br>Base tilt adjustment<br>Lumbar support adjustment<br>Head restraint - remove, unless specified by manufacturer<br>Armrest in lowered position<br>Photograph test position of passenger seat., showing alignment marks | | D1.6 |
| D1.7 | Table 5 | Rear seat adjustments, where applicable<br>Fore/aft - mid-point (move rearward to latch)<br>Height adjustment - mid-travel<br>Base tilt adjustment - flattest<br>Lumbar support adjustment - retracted<br>Head restraints - lowest, unless specified | | |

| | | | | |
|---|---|---|---|---|
| | | by manufacturer<br>Armrests stowed<br>Photograph the test position of the rear seat(s), showing set-up marks | | D1.7 (if adjusted) |
| D1.8 | 5.1.4 | Mark mechanical foremost seating position on the door sill or seat runner | | |
| D1.9 | ANCAP | Mark mechanical rearmost seating position on the door sill or seat runner | | |
| D1.10 | 5.1.6 | Mark 95%ile seating position (Manufacturer Settings A4.3) on door sill or seat runner. Label "95" | | |
| D1.11 | 5.1.7 | Measure distance between foremost and 95%ile points<br>Half of distance = | mm<br>mm | |
| D1.12 | 5.1.7 | Mark centre position between foremost and 95%ile position on sill tape and adjust seat to this position | | |
| D1.13 | 5.1.9 | Ensure seat is latched on both rails (move rearward if required to latch)<br>Photograph seat and marks | | D1.13 |
| **D2 Steering Wheel Adjustments** | | | | |
| **ITEM** | **PROTOCOL** | **DESCRIPTION** | **CHECKED** | **PHOTO** |
| D2.1 | 5.3 | Is horizontal adjustment provided?<br>If YES, mark steering column fully forward<br>Mark steering column fully rearward<br>Calculate distance (X) between marks<br>Mark mid-position and adjust steering column to this position. Lock in place<br>Photograph marks and steering column position | Y / N<br><br><br>mm<br><br> | D2.1 |
| D2.2 | 5.4 | Is vertical adjustment provided?<br>If YES, mark steering column fully down<br>Mark steering column fully up<br>Calculate distance (X) between marks<br>Mark mid-position and adjust steering column to this position. Lock in place<br>Photograph marks and steering column position | Y / N<br><br><br>mm<br><br> | D2.2 |
| D2.3 | - | Determine axis of steering wheel and mark a cross on the hub, in line with this axis (eg the mark should not move when the steering wheel is rotated) | | |

| D3 Seat belt upper anchorage (driver) | | | | |
|---|---|---|---|---|
| **ITEM** | **PROTOCOL** | **DESCRIPTION** | **CHECKED** | **PHOTO** |
| D3.1 | Table 5 | Is vertical adjustment provided?<br>Did manufacturer specify a setting?<br>If provided, adjust to manufacturer's setting<br>If adjustable but no manufacturer's setting, mark anchorage fully down<br>Mark anchorage fully up<br>Calculate distance (X) between marks<br>Mark mid-position and adjust anchorage to this position. Ensure it is locked in place (nearest notch upwards)<br>Photograph marks and seat belt anchorage position | Y / N<br>Y / N<br><br><br><br>mm | D3.1 |

## D4 H-Point position

Install H-Point machine as described in SAE J826 and section 6.1 of Test Protocol

Seat must not be loaded and must be at room temp for 1 hour before H-Point check

Only test organisation personnel are permitted to install and adjust the H-point machine. With ANCAP approval, manufacturer's representatives may observe but must not touch the H-point machine. Remove machine and repeat procedure if this occurs).

| ITEM | PROTOCOL | DESCRIPTION | CHECKED | PHOTO |
|---|---|---|---|---|
| D4.1 | 6.1 | New seat cycled by 65-85kg person for 1 minute on two occasions | | |
| D4.2 | 6.1 | Place jack stands under vehicle | | |
| D4.3 | 6.1.1 | Did manufacturer provide seat back angle setting? (see A4.3) | | |
| D4.4 | 6.1.1 | Set seat back angle to manufacturer's setting or 25 degrees (default) | | |
| D4.5 | 6.1.2 | Muslin cloth placed on seat | | |
| D4.6 | 6.1.3 | Install seat and back components of H-point machine | | |
| D4.7 | 6.1.4 | Set leg lengths 401mm thigh and 414mm lower leg. Photograph setting | | D4.7 |
| D4.8 | 6.1.5 | Attach lower legs to H-point machine and check that t-bar is horizontal | | |
| D4.9 | 6.1.6 | Place right foot on undepressed accelerator pedal with heel as far forwards as possible | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| D4.10 | 6.1.6 | Measure Y distance from foot to centreline of machine | | mm | | |
| D4.11 | 6.1.7 | Place left foot at same distance from centreline, foot flat on footwell | | | | |
| D4.12 | 6.1.8 | Install lower leg and thigh weights | | | | |
| D4.13 | 6.1.9 | Tilt back pan fully forward and draw machine away from seat back | | | | |
| D4.14 | 6.1.10 | Push machine back against seat back | | | | |
| D4.15 | 6.1.11 | Apply (nominal) 100N load twice as specified | | | | |
| D4.16 | 6.1.12 | Return back pan to normal position, against seat back | | | | |
| D4.17 | 6.1.13 | Install buttock weights | | | | |
| D4.18 | 6.1.14 | Install torso weights (alternatively) | | | | |
| D4.19 | 6.1.15 | Tilt back pan fully forwards, rock 5 degrees side to side (feet unrestrained). Return upright so T-bar is horizontal. Ensure machine is at lateral centreline of seat | | | | |
| D4.20 | 6.1.16 | Reposition feet by lifting then lowering so heel contacts floor and sole on undepressed accelerator pedal | | | | |
| D4.21 | 6.1.18 | Return back pan to normal position, against seat back | | | | |
| D4.22 | 6.1.18 | Check that the machine is horizontal | | | | |
| D4.23 | 6.1.19 | Using the spirit level on the machine, adjust torso angle to manufacturer's setting or 25 degrees. Ensure back pan stays in contact with seat and is level. Record angle | | degrees | | |
| D4.24 | 6.1.20 | Measure H-Point (relative to reference point A4.12)<br>Photograph measurement of H-Point | | X | Y | Z |
| | | | | | | D4.24 |
| D4.25 | - | Mark and record one point on seat back and two points on seat base/cushion (points chosen to B3.10 may be used for this purpose). These can be used to check if seat has been moved out of position, if necessary. | mm | X | Y | Z |
| | | | Seat back | | | |
| | | | Seat base 1 | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Photograph alignment marks | Seat base 2 | | | | D4.25 |
| D4.26 | - | Remove H-point machine. Jack stands may also be removed. | | | | | |

| **D5 Vehicle settings** - see Table 5 of Test Protocol | | | | |
|---|---|---|---|---|
| D5.1 | - | Set all glazing to raised (Closed) position. Sunroof must be closed. | | |
| D5.2 | - | Set transmission to neutral | | |
| D5.3 | - | Set parking brake to disengaged | | |
| D5.4 | - | Set pedals to normal position of rest | | |
| D5.6 | - | Set roof to raised (convertibles) | | |
| D5.7 | - | Set sunvisors to stowed | | |
| D5.8 | - | Set rear view mirror to normal position of use | | |
| D5.9 | - | Set all other adjustments to mid position (record these components): | | |
| D5.10 | - | Remove any extra keys/key rings from ignition key | | |
| D5.11 | - | Remove or modify rear head restraints in accordance with manufacturer's instructions (see A4.19), where they may obscure the view of the child dummies through the rear window. | | |

| **D6 Notes about passenger compartment setup** |
|---|
| |

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# E. Dummy installation

**Purpose:**

- To install child dummies in vehicle
- To install EuroSID 2 dummy in vehicle
- Align vehicle with mobile barrier
- To mark and paint dummies

## E1 Child dummy installation

It is usually easiest to install the child dummies before the ES2 dummy. Order is not important.

See A4.16 & A4.17 for make and model of child restraint.

| ITEM | PROTOCOL | DESCRIPTION | CHECKED | PHOTO |
|---|---|---|---|---|
| E1.1 | 6.4 | TNO P1.5 dummy Serial No.<br>Date of last calibration:<br>Child restraint model: | | |
| E1.2 | 6.4 | TNO P3 dummy Serial No.<br>Date of last calibration:<br>Child restraint model | | |
| E1.3 | - | Close-fitting stretch cotton clothing fitted to both child dummies | | |
| E1.4 | - | Will child dummies be at controlled temperature for at least the same duration as ES-2? (If not justify) | Y / N | |
| E1.5 | 6.4.1 | Check handbook for CRS installation instructions | | |
| E1.6 | 6.4.1 | Install child restraints according to CRS/handbook instructions, including top tether (6.4.1) | | |
| E1.7 | 6.4.3 | Do rear outboard seats have automatic locking retractors?<br>If instructions on a label near seat belt then follow them to engage automatic lock and photograph label<br>Otherwise, install without locking | Y/ N<br>Label Y / N | E1.7 (label) |
| E1.8 | 6.4.5.1 | Set 50N tension in both lap and sash portions of seat belt and then apply CRS clamps, if fitted | | |
| E1.9 | - | Apply 50N tension to top tether adjuster | | |
| E1.10 | - | Install P1.5 dummy behind driver seat & P3 behind passenger seat (note different to offset test) | | |

| | | | | |
|---|---|---|---|---|
| E1.11 | 6.4.4.1 | Install 25x60mm flexible spacer between dummy back and CRS | | |
| E1.12 | 6.4.4.1 | Apply 250+/-50N tension to harness adjusters (or less if CRS manual indicates) | | |
| E1.13 | 6.4.4.2 | Release harness and remove spacer | | |
| E1.14 | 6.4.4.2 | Re-fasten harness push dummy back in seat and distribute harness slack evenly | | |
| E1.15 | 6.4.4.2 | Lift legs and allow to drop naturally | | |
| E1.16 | 6.4.4.2 | Lightly tape hands onto thighs | | |
| E1.17 | 6.4.4.2 | Check dummy is visually upright and legs are parallel | | |

## E2 ES2 adult dummy installation

Note that H-point on the ES-2 dummy is 21mm forward of that on the H-point machine. The ES-2 dummy backplate is marked with an "Hm" point that corresponds to the H-point machine and is used to set the dummy position.

Dummy should not be sitting on seat for more than 2 hours before the test.

Only test organisation personnel are permitted to install and adjust the dummies. With ANCAP approval, manufacturer's representatives may observe but must not touch any dummy.

If the dummy is moved in a way that might cause the neck or spine to be unusually distorted, then remove dummy, hang by crown to straighten neck and spine and repeat procedure.

Dummy temperature must be stabilised at least 5 hours prior to setting joint stiffness and holding force. Record dates as well as times if not all events on same day. Recording temperature inside dummy flesh is not necessary if ambient temperature is continuously recorded within 1 metre of the dummy and remains with the specified range of 18 to 26 degrees. This is a NHTSA provision.

| ITEM | PROTOCOL | DESCRIPTION | CHECKED | PHOTO |
|---|---|---|---|---|
| E2.1 | | ES-2 dummy Serial no.:<br>Date since last calibration:<br>Number of times used since last calibration (prior to this test): | | |
| E2.2 | 6.3.1 | ES-2 rubber wetsuit fitted to dummy | | |
| E2.3 | 6.3.1 | Calf-length cotton pants and shoes fitted to dummy | | |
| E2.4 | 6.3.1 | Dummy temperature stabilised between 18 to 26 deg - Start date & time<br>Measurement method (ambient temperature or dummy flesh):<br>Photograph temperature measuring device | Date<br>Time | E2.4 |
| E2.5 | 2.5.2.4 | Dummy joint stiffness set at (time)<br>Time elapsed since temperature stablised | Date<br>Time<br>Hours | |

| | | | | |
|---|---|---|---|---|
| E2.6 | 2.5.2.2 | Dummy shoulder screw torque set to obtain 1-2g holding force (2.5.2.2) | Date<br>Time | |
| E2.7 | | Dummy installed in vehicle at (time) | Date<br>Time | |
| E2.8 | 6.3.1.1 | Position the ES2 so its centreline is coincident with the seat centreline marks (6.3.1.1) | | |
| E2.9 | 6.3.1.2 | Fasten seat belt and check that the dummy does not move. Seat belt may then be unfastened to facilitate adjustments, measurements and painting. | | |
| E2.10 | - | Support vehicle on jacks | | |
| E2.11 | 6.3.1.3 | Manoeuvre dummy until Hm point is within a 10mm radius of Target H Point, relative to the defined reference point on the vehicle | | |
| E2.12 | 6.3.2 | Visually check ES2 for a square, central and level positioning and that the transverse instrument platform of the dummy head is level +/- 0.5 degrees.(* under review)<br>The line through the dummy Hm points should be horizontal with a maximum inclination of +/-2 degrees (equivalent to a vertical (Z) difference of 12mm). | | |
| E2.13 | 6.3.3.2 | Initially move the legs to adjust knee gap (measured from inner metal plate) so that each is 75mm (+/-5mm) from the seat centreline.<br>Position right foot on accelerator centre line with the heel on the floor as far forward as possible. | | |
| E2.14 | 6.3.3.1 | Position left foot perpendicular to lower leg and left heel in same transverse plane as right heel. | | |
| E2.15<br>(no E2.16) | 6.3.3.3 | If necessary, move each leg to adjust knee gap (inner plate to seat centreline) to 75+/-5mm. | mm | |
| E2.17 | 6.3.3.4 | If possible, dummy thighs should touch seat cushion. Do they touch? | Y / N | |
| E2.18 | - | Check all cables to ensure they are unlikely to become trapped or interfere with dummy movement | | |
| E2.19 | 6.3.3.5 | Visually check ES2 for a square and level positioning | | |
| E2.20 | 6.3.3.5 | Check that Hm point is still within 10mm | | |

| | | | | |
|---|---|---|---|---|
| | | radius of target H-point | | |
| E2.21 | 6.3.4 | Set both arms to 40 degree indent position (6.3.4) (40 degrees +/-5 degrees from torso arm reference line) | | |
| E2.22 | Table 5 | If tilt adjustable, adjust tilt angle of head restraint to mid-position. Where only two locking tilt positions are available set it to the rearmost position. | | |
| E2.23 | Table 5 (see also the Whiplash Protocol) | If height adjustable, determine the highest and lowest lockable positions. Move the head restraint to the first lockable position at or above the mid-point. If this is more than 10mm above the mid-point then move the head restraint to the next lockable position below the mid-point. Where there are only two locking height positions the lowest should be used.<br>The head restraint may touch the dummy head in this test. | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| E2.24 | 6.5 | *With 3D machine*, measure & record dummy reference points (see diagram below). Photograph measurement of right Hm. | X | Y | Z | E2.24 |
| | | a) Right H-point Hm | | | | |
| | | b) Left H-point Hm (Z value should be within 12mm of point a) | | | | |
| | | c) Head C of G (outboard side of head) | | | | |
| | | d) Front centre of lower neck | | | | |
| | | e) Outboard knee outer pivot | | | | |
| | | f) Rearmost point of head at C of G height | | | | |
| | | g) Foremost point of b-pillar window opening, at head C of G height | | | | |
| | | h) Centre of steering wheel (D2.3) | | | | |
| | | i) Y value of lateral centreline of seat cushion (not illustrated - see B3.10) | | | | |

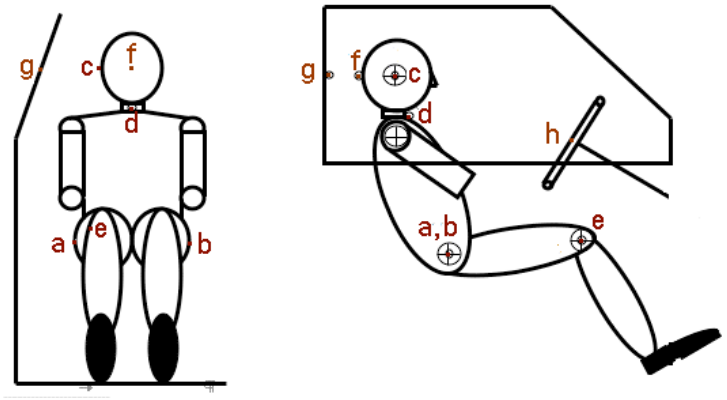


Diagram for E2.24

| | | | | |
|---|---|---|---|---|
| E2.25 | - | Compare Y values of points d and f with the Y value of the seat centreline (B3.10)<br>difference for d:<br>difference for f: | <br>mm<br>mm | |

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|---|---|---|---|---|
| E2.26 | 6.5 | Measure and record dummy to vehicle clearances (see diagram and notes overleaf). Where horizontal measurements are taken with a tape measure use a spirit level or similar to ensure accuracy. | | |
| | | A. Top of head to roof lining (Z) | mm | |
| | | B. Tip of nose to windscreen joint (XZ plane) | mm | |
| | | C. Tip of nose to centre of steering wheel | mm | |
| | | E. Chest to centre of steering wheel(X) | mm | |
| | | F. Hm point to door opening (Z) | mm | |
| | | G. Knee bolt to floor covering (Z) | mm | |
| | | H. Head (C of G decal) to side window or interior trim (Y) | mm | |
| | | J. Shoulder bolt to side window or interior trim (Y) | mm | |
| | | L. Hm point to interior door trim/handle (Y) | mm | |
| | | M. Knee bolt to interior door trim (Y) | mm | |
| | | N. Back of head (C of G point) to window opening (X) (points f & g from E2.24) | mm | |
| | | P. Minimum knee gap (see E2.15) (Y) | mm | |
| | | Q. Minimum ankle gap (Y) | mm | |

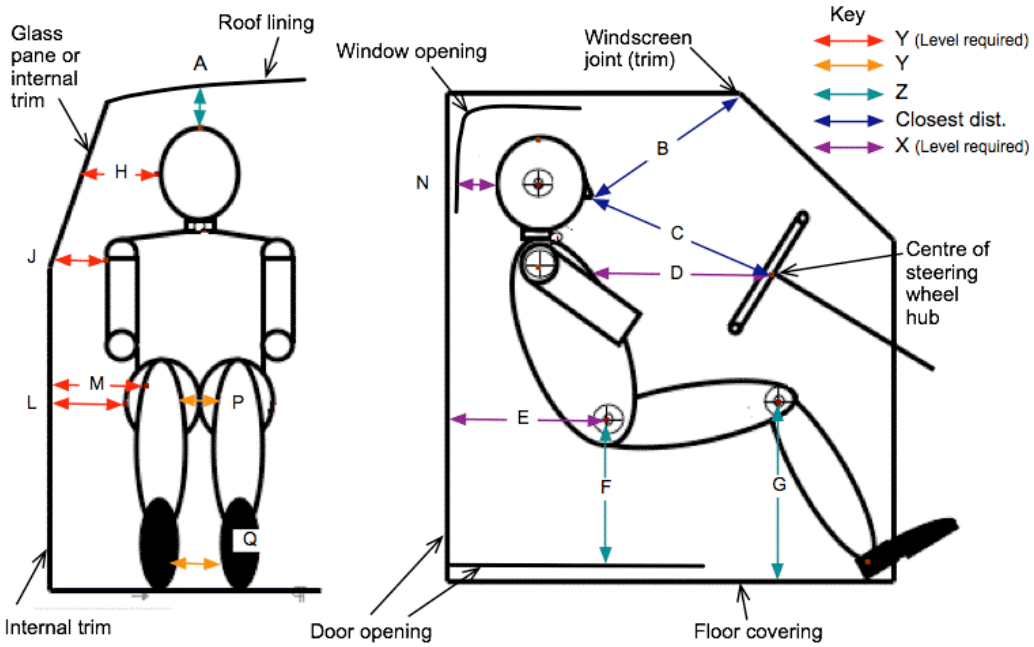
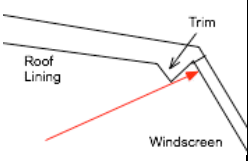



Diagram for E2.26

Notes for dimension measurements: (I, K & O are not used)

A. Locate topmost point of dummy head. Project a line vertically above this point. Measure the vertical (Z) distance to where this line intersects the interior roof lining (ceiling)

B. Locate the nose point on the dummy (foremost point of nose). In the same longitudinal (XZ) plane, locate the point where the windscreen glazing meets the roofline. Measure the distance to the *interior of the glass*, as close as possible to this point (that is, glancing the trim, if necessary - see diagram)




C. Locate the nose point on the dummy. Locate the centre mark on the steering wheel hub (D2.3). Measure the distance between these points (not necessarily in XZ plane if steering wheel is off-centre)

D. Locate the centre mark on the steering wheel hub (D2.3). Using a level (or similar device) project a line directly rearwards from this point (X direction). Measure the distance to where this line intersects the exterior of the wet-suit material on the dummy chest (this might not be the centreline of the dummy, if the steering wheel is off-centre).

E. Locate outboard Hm point on dummy. With door open, locate the foremost point on the door opening that is at the same height as the Hm point. Use a level, or similar device, to ensure alignment is horizontal. Measure the longitudinal (X) distance between these points.

F. Locate outboard Hm point on dummy. With door open, locate the highest point on the door sill that is at the same X-dimension as the Hm point. Measure the vertical (Z) distance between these points.

G. Locate centre of the top of the outboard knee bolt on dummy. Project a line vertically below this point. Measure the distance where this line intersects the firm upper surface of the carpet or floor covering.

H. Locate C of G decal on outboard side of dummy head. Project a line transversely outboard (Y) from the C of mark. Measure the distance between the mark and the first point of contact with the vehicle (interior of window pane or interior trim). The window may be wound down partially to take this measurement. Use a level, or similar device, to ensure measurement is horizontal.

J. Locate centre of the top of the shoulder bolt on outboard side of dummy. Project a line transversely outboard (Y). Measure the distance along this line between the *exterior of the wet-suit material* and the first point of contact with the vehicle (interior window pane or interior trim). Use a level, or similar device, to ensure measurement is horizontal.

L. Locate the outboard Hm point. Project a line transversely outboard (Y). Measure the distance between the Hm point and the first point of contact with the vehicle (interior trim). Use a level, or similar device, to ensure measurement is horizontal.

M. Locate centre of the top of the knee bolt on outboard side of dummy. Project a line transversely outboard (Y). Measure the distance between the bolt head and the first point of contact with the vehicle (interior trim). Use a level, or similar device, to ensure measurement is horizontal.

N. Difference in X values between points f & g for item E2.24. Record -ve value if head is behind window opening.

P. Measure the minimum transverse gap between the inside surface of the knees within a radius (about Y axis) of 50mm of the knee bolts. .

Q. Measure the minimum transverse gap between inner surface of the ankles within a radius (about Y axis) of 50mm of the ankle bolts.

| | | | | |
|---|---|---|---|---|
| E2.27 | - | Compare dummy position measurements with manufacturer's target values (if any). Resolve any major discrepancy. | | |
| E2.28 | - | Does dummy positioning comply with protocol and reasonably match manufacturer's data? If not notify ANCAP before proceeding with test. | | |
| E2.29 | - | Photograph dummy in position<br>side view - driver's side<br>side view - from passenger side<br>front view (through windscreen) in line with seat centreline<br>dummy feet position - driver side<br>dummy feet position - from passenger side | | <br>E2.29a<br>E2.29b<br>E2.29c<br>E2.29d<br>E2.29e |
| E2.30 | 9.3 | Note: this task can be performed at any time after the vehicle is at its laden test mass (either with ballast or ES2 dummy in place)<br>With the vehicle in place at the impact location and at 90 degrees (+/-1 degree or | | |

| | | | | |
|---|---|---|---|---|
| | | 90mm over a 5m span) to the impact direction (see B5.4), roll the trolley barrier up to the vehicle. Move the vehicle sideways so that the centreline of the barrier (pin) aligns with the R-point of the vehicle.<br>Using the mark from B5.4 (centreline, near the front) drop a vertical line to the ground from this point. Mark the ground. Repeat for the point at the rear of the vehicle. These will be used to check the alignment of the vehicle prior to the test.<br>Photograph the alignment marks | | E2.20a<br>E2.30b |
| E2.31 | 3.1 | Check that the data for all dummies and vehicle accelerometer are being acquired | Right side (49ch) | Left side (7ch) |

**E3 DUMMY PAINTING (Protocol 2.5.3)**

Dummy painting must be done just prior to the test (or moistened) so that the paint is still wet during the impact. Alernatively. paint may be sprayed with water just prior to test or slow-drying paint used.

Apply masking tape to the parts of the dummy to be painted. The paint should completely cover the tape, except for the square of tape on the dummy head. In this case only the outer edge of the square should be painted.

Take care to not move the dummy during painting. If the arm is moved or the seat belt is unfastened to facilitate painting then the person who installed the dummy must restore the arm to the original position and fasten the seat belt.

| Paint on tape location | Size | Colour | Checked |
|---|---|---|---|
| ES2 struck side of head - lower edge of square at c of g | 100x100 | Red edge | |
| ES2 struck side shoulder - down from fixing hole | 25x150 | Blue | |
| ES2 struck side upper rib - start from seat back contact point | 150 strip | Red | |
| ES2 struck side mid rib - start from seat back contact point | 150 strip | Yellow | |
| ES2 struck side lower rib - start from seat back contact point | 150 strip | Green | |
| ES2 struck side Abdomen | 50x50 | Red | |
| ES2 struck side pelvis - centred on hip point | 50x100 | Orange | |
| Child dummy (x2) top of head | 50x50 | Blue | |
| Child dummy (x2) head band - eyebrow level (cog to cog) left to right thirds | 25 strip | red/yell/green | |

| ITEM | PROTOCOL | DESCRIPTION | CHECKED | PHOTO |
|---|---|---|---|---|
| E3.1 | 2.5.3 | Paper tape on CRS sides for head contact evaluation | | |
| E3.2 | - | All dummy painting completed to protocol (record time) | Time | |
| E3.3 | - | Seat belt fastened by person who installed dummy | | |
| E3.4 | | Arms returned to test position by person who installed dummy (see E2.21) | | |
| E3.5 | - | Visually check ES2 once more for square and level positioning | | |

**E4 Notes about dummy installation**

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# F. Final checks prior to crash test

**Purpose:**

- To check that all tasks have been completed
- To secure the area
- To manage witnesses
- To check vehicle items

F1 Final checks

Witnesses to an ANCAP test may include test contractor personnel, ANCAP members, manufacturer's representatives and approved ANCAP contractors, No other individuals shall be allowed to witness any ANCAP vehicle test unless specifically authorized by an ANCAP member.

It is the contractor's responsibility to secure the test site area during a test and to shield the impact area from the public view.

Any witnesses to the test must be informed that, unless authorised by ANCAP, they must not :

- touch the vehicle or dummies at any time
- take any photographs or any other record of the test and
- divulge any aspects of the test to another party.

An attendance book with a statement based on the above wording may be used for this purpose.

| ITEM | PROTOCOL | DESCRIPTION | CHECKED | PHOTO |
|---|---|---|---|---|
| F1.1 | | Sections A to E of cover sheet completed? | | |
| F1.2 | | All pre-crash photos taken | | |
| F1.3 | | Test area secured (all access points locked, all visitors in secure area) | | |
| F1.4 | | All witnesses signed in and briefed about confidentiality and safety | | |
| F1.5 | | Check alignment marks at front and rear of vehicle (E2.30). Adjust vehicle position if necessary. | | |
| F1.6 | | Child dummies correct position (P1.5 behind driver for side impact test) | | |
| F1.7 | | Seat belts / harnesses fastened | | |
| F1.8 | | Windows up (for side impact test) | | |
| F1.9 | | Ignition on<br>Witnessed/performed by manufacturer's representative: | | |
| F1.10 | | Check airbag warning light functions correctly (if applicable) | | |
| F1.11 | | Remove external power supply. Check battery voltage within manufacturer's recommendation (A4.15)<br>Run engine, *if specified by manufacturer* (eg to charge suspension system) | | |

| | | | | |
|---|---|---|---|---|
| F1.12 | | Bonnet and boot closed | | |
| F1.13 | | Temperature sensor removed & temperature reading confirmed within tolerances | | |
| F1.14 | | Temperature-controlled conditions ceased at<br>(eg record time that air-conditioning ceases and/or prep-room door is opened) | Date<br>Time | |
| F1.15 | | Vehicle doors closed but not locked | | |
| F.16 | - | All jacks and other obstacles removed | | |
| F.17 | 1.1.8 | Measure laden ride heights<br>Front L<br>Front R<br>Rear R<br>Rear L<br>Do any of the values differ from those measured at B2.11 by more than 10mm?<br>If YES delay test and investigate problem. | <br>mm<br>mm<br>mm<br>mm<br>Y / N | |
| F1.18 | | Time elapsed since dummy was seated | hh:mm | |
| F1.19 | | Time of test | Time | |

## F2 Notes about test

Name of manufacturer's representative:

Comments by representative

Test organisation response/comments/recommendations

Name of ANCAP representative:

Comments by / Decision of ANCAP representative

Date & initial cover page when this section is complete

# G. Post-crash checks & measurements

**Purpose:**

- To check that impact parameters were within tolerances
- To check and record vehicle items
- To remove dummies from vehicle

## G Immediate post-crash checks and measurements

Vehicle and impact area should be secured. In particular, ensure that there is no danger from broken glass, leaked fluids (such as battery acid) or stored energy in deformed panels.

Ensure that only test organisation personnel touch the vehicle and dummies after the impact and that only authorised personnel take photographs or video - visitors with authority should be clearly identified by tag or similar means. Avoid moving the dummies and airbags before photographs have been taken.

| ITEM | PROTOCOL | DESCRIPTION | CHECKED | PHOTO |
|---|---|---|---|---|
| G1 | - | Photograph vehicle and barrier in post-crash positions | | G1 |
| G2 | 9.3 | Locate pin marks and determine alignment difference (pin mark to R-point vertical line)<br>Within +/-25mm?<br>Photograph pins marks or alternative method of determining alignment | mm<br>Y / N | G2 |
| G3 | 9.1 | Record test speed measurement<br>Within 50km/h +/-1km/h | km/h<br>Y/ N | |
| G4 | 9.2 | Examine video and check for secondary impacts. If a major secondary impact occurs than this should be reported, together with possible effects on injury measurements. | Y / N | |
| G5 | 9.4 | Check whether any doors have opened during impact, including tailgate<br>Photograph all doors, clearly showing the latch position if any are deemed to be "open" | Y / N | G5 (one for each door) |
| G6 | 9.4.1 | Check if any doors have locked<br>Photograph any controls that have locked | Y / N | G6 (if locked) |
| G7 | 9.4.2 | Measure the opening force for each door on the unstruck side Front unlatch<br>Front 45°<br>Rear unlatch<br>Rear 45° | N<br>N<br>N<br>N | |

| | | | | |
|---|---|---|---|---|
| G8 | 9.5 | Removal of ES2 dummy. Use the following order:<br>a) removed without any vehicle adjustments<br>b) recline seat back<br>c) slide seat back on runners<br>d) remove seat from vehicle | <br>Y / N<br>Y / N<br>Y / N<br>Y / N | |
| G9 | - | Record seat belt condition<br>Did pretensioners fire? | <br>Y / N | |
| G10 | - | Record airbag deployments<br>Photograph deployed airbags and any contact marks | | G10 |
| G11 | - | Examine ES2 dummy for damage and record any damage<br>Photograph damage | | G11 (each item) |
| G12 | - | Examine vehicle interior for paint marks and other signs of contacts with dummy<br>Photograph contact marks | | G12 (each contact) |
| G13 | - | Check for fuel leaks<br>Photograph any leaks | | G13 (if leak) |
| G14 | ANCAP | Locate the crush profile grid points from B5.5. Measure the 3D co-ordinates of points that are accessible and report the amount of crush (Y axis difference). Photograph measurement of crush. | | G14 |

## H. Data processing and reporting

**Purpose:**

- To process injury data, prepare graphs and calculate injury parameters
- To process crash test video and prepare edited footage in digital format
- To take remaining post-crash photographs
- To conduct post-crash damage inspection and record observations
- To prepare Crash Test Report and data CD/DVD
- To archive crash test data
- To store and dispose wrecked vehicle

No ANCAP checklists are associated with this section