

AUSTRALIAN NEW CAR ASSESSMENT PROGRAM

NOTES ABOUT THE ASSESSMENT PROTOCOL



VERSION 4.0, ISSUED 3 December 2003

PRELIMINARY

(note that documents may not be available on the AAA website until June)

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Crash Test Assessment by ANCAP

The Australian New Car Assessment Program (ANCAP) conducts crash tests and associated assessments in accordance with the protocols issued by EuroNCAP < <http://www.euroncap.com/tests.htm> >

This document sets out clarifications and interpretations determined by the ANCAP Technical Committee.

Minimum scores in offset and side impact tests

Version 4.0 of the EuroNCAP Assessment Protocol introduced a minimum score in each of the offset and side impact tests in order to achieve star ratings. This was suggested by ANCAP to address imbalance between offset and side impact results – a vehicle with a good side impact score and poor offset score could reach 3 stars under the previous protocol. Advice from EuroNCAP is that the minimum scores set out in the Protocol have been rounded to the nearest integer. The breakpoints, *before rounding* are:

Table 1. Breakpoints for star ratings

Star Rating	Minimum score in offset test	Minimum in side impact test	Minimum Combined Score (incl. Pole Test)
5	12.5	12.5	32.5 *
4	8.5	8.5	24.5
3	4.5	4.5	16.5
2	1.5	1.5	8.5
1	-	-	0.5

* To earn 5 stars a vehicle must achieve at least 1 point in the optional pole test (maximum 2 points). This is an ANCAP requirement.

Seat belt reminder

During 2002 EuroNCAP introduced bonus points for seat belt reminders. In essence, one point is earned each for a driver reminder, a front passenger reminder and a status indicator for all rear seats. The requirements for seat belt reminders are set out in EuroNCAP document Doc 61B "Belt reminder assessment protocol" (copy available from <<http://www.aaa.asn.au/ancap.htm>> pending publication on the EuroNCAP website).

ANCAP has prepared a questionnaire to assist in the assessment of seat belt reminder systems. A copy of the questionnaire can be downloaded from <<http://www.aaa.asn.au/ancap.htm>>.

Manufacturers may submit a completed questionnaire, together with digital video of the system in operation, to obtain a provisional assessment of reminder systems by ANCAP.

The EuroNCAP protocol is flexible in the signal requirements for *rear* seat belt reminder systems. These systems need only inform the driver about the status of each rear seat belt. If the system does not detect the presence of an occupant then ANCAP *prefers* a positive indicator that shows a green light for each rear seat belt that is being used and that displays no lights for unused seat belts. This means that the driver can easily check that there is a green light illuminated for each rear seating position that has an occupant.

Where the system detects an occupant then ANCAP *prefers* a negative indicator that shows a red light for any seating position that has an occupant not wearing a seat belt.

A single light may be used to indicate both driver and front passenger seat belt status. However, a separate light for each seating position is preferred.

Knee impact modifiers

~~Notes about the assessment of knee impact modifiers are contained in a separate document available from <<http://www.aaa.asn.au/ancap.htm>>.~~

~~A Variable Contact modifier (1 point each knee) applies where the component is clearly stiffer than the structure at the actual impact point. Metal brackets are generally considered to be stiffer than plastic components, unless they are clearly designed to collapse during a knee impact (such as diamond shaped hollow extrusions).~~

~~Manufacturer's may provide test data to show that the injury criteria (femur force and knee displacement) are unlikely to exceed the prescribed limits, if the component of concern is struck by the knee.~~

~~In brief, a~~An object is regarded as a "concentrated load" if it presents an unyielding impact surface with any linear dimension less than 20mm ~~or otherwise exposes the knee to a risk of a penetrating knee injury.~~

~~Usually the Concentrated Loading modifier (1 point each knee) applies where the component is also found to be a 'Variable Contact' and the double penalty is applied. However, cases have occurred where the point of impact was found to be the stiffest structure and high injury measurements were obtained but the component was also~~

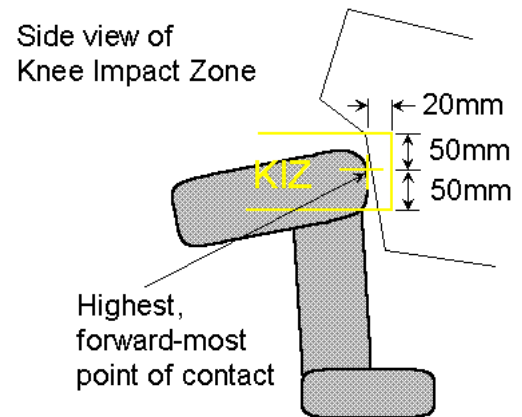
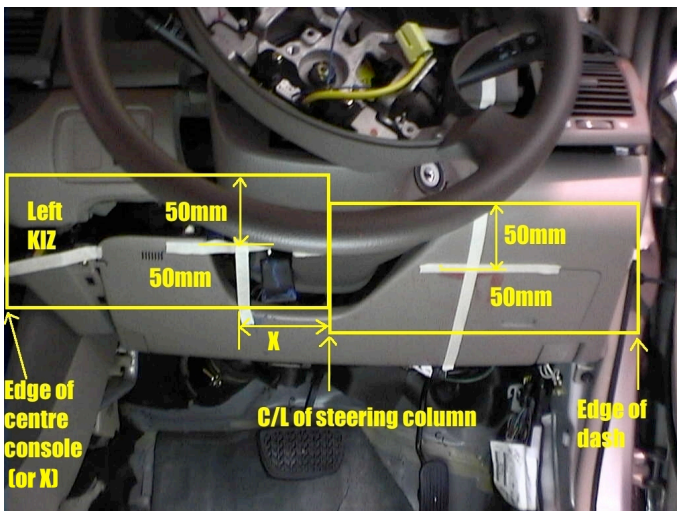


Illustration of Knee Impact Zone (a rectangular prism based on actual points of impact)

found to be a concentrated loading. In this case only the concentrated loading modifier is applied.

Some manufacturers have treated steering column covers and fascia covers with a sandwich of energy absorbing foam and metal sheets (to protect the foam from concentrated loads). In the absence of objective performance criteria from EuroNCAP these have generally been accepted by ANCAP, provided that they protect the knees from hazardous protrusions within the steering column. Results of manufacturer's impact tests that show load distribution and energy absorption would assist in such assessments.

Since the knee assessment depends on the actual points struck by the dummy knees it is possible for the knee impact zone to vary between tests. Several cases have been observed where a component of concern was just outside the knee impact zone but slightly different crash circumstances could have led to a different outcome. Manufacturers should consider such variations when designing steering and fascia components..

Measurement of intrusion

During tests of utility-style vehicles during 2001 and 2002 it became evident that measurement of intrusion (steering column and pedals) from a reference point on the rear of the vehicle was not appropriate. For the utilities, where there was often substantial crush in the load space, intrusion was assessed relative to the rear wall of the cabin. ANCAP has reviewed the method of assessing intrusion for all vehicles and has decided to utilise a method used by the US Insurance Institute for Highway Safety (IIHS) - assessing intrusion relative to the average of the four mounting bolts of the driver's seat. This method is applied to steering column displacement and pedal displacement (in all three dimensions).

In the case of A-pillar displacement, the approach is similar to that used by IIHS (which assesses door opening width reduction) except that displacement is assessed relative to the C-pillar. This gives an indication of the integrity of the whole passenger compartment but excludes any crush to the rear of the compartment. For two-door vehicles the A-pillar displacement is assessed relative to the B-pillar and so is the same as IIHS.

In all cases assessed by ANCAP to date these requirements result in longitudinal (X) displacements that are less than those assessed according to the EuroNCAP protocol (i.e. in the manufacturer's favour). It is possible that vertical (Z) displacements (eg upward movement of steering column) may be greater under the ANCAP system if the driver's seat drops, relative to the original frame of reference. It is considered, however, that this gives a more realistic indication of the hazard from upward movement of the steering column (or brake pedal).

A disadvantage of this approach is that vehicles assessed by ANCAP will not be fully equivalent to vehicles assessed by EuroNCAP. However, ANCAP has maintained a practice of grouping EuroNCAP tested vehicles separately in its brochures ~~and, in future, a note will be added about assessment of intrusion.~~

Breakaway brake pedal

Manufacturers should advise prior to the offset test if the brake pedal (and clutch pedal if applicable) is designed to breakaway in the crash. Successful breakaway avoids a reduced foot score due to rearward displacement of the brake pedal.

Breakaway steering column

Manufacturers should advise prior to the offset test if the steering column is designed to breakaway under load. This will affect the assessment of steering column movement (the modifier is not applied if the post-crash residual displacement cannot be reliably measured AND there is no evidence of excessive steering column movement affecting airbag performance in the crash videos).

Backplate modifier in side impact test

Backplate loads are measured in ANCAP side impact tests but are not included the assessment at this stage. ~~When In July 2003 ANCAP introduces began testing to~~ Version 4 of the EuroNCAP test Protocol (including the EuroSID II dummy) ~~and the modifier is being~~ will be applied to tests conducted according to this protocol. This is planned for the next series, commencing in July 2003.

Since 1991 measured backplate loads have been provided to manufacturers along with dummy injury measurements. In some cases points would have been deducted if Version 4 of the protocol had applied.

Euro NCAP has advised that the backplate modifier applies to the chest score in the side impact test and that the Assessment Protocol will soon be amended to reflect this advice. ANCAP will apply this interpretation for tests conducted from December 2003 [??].

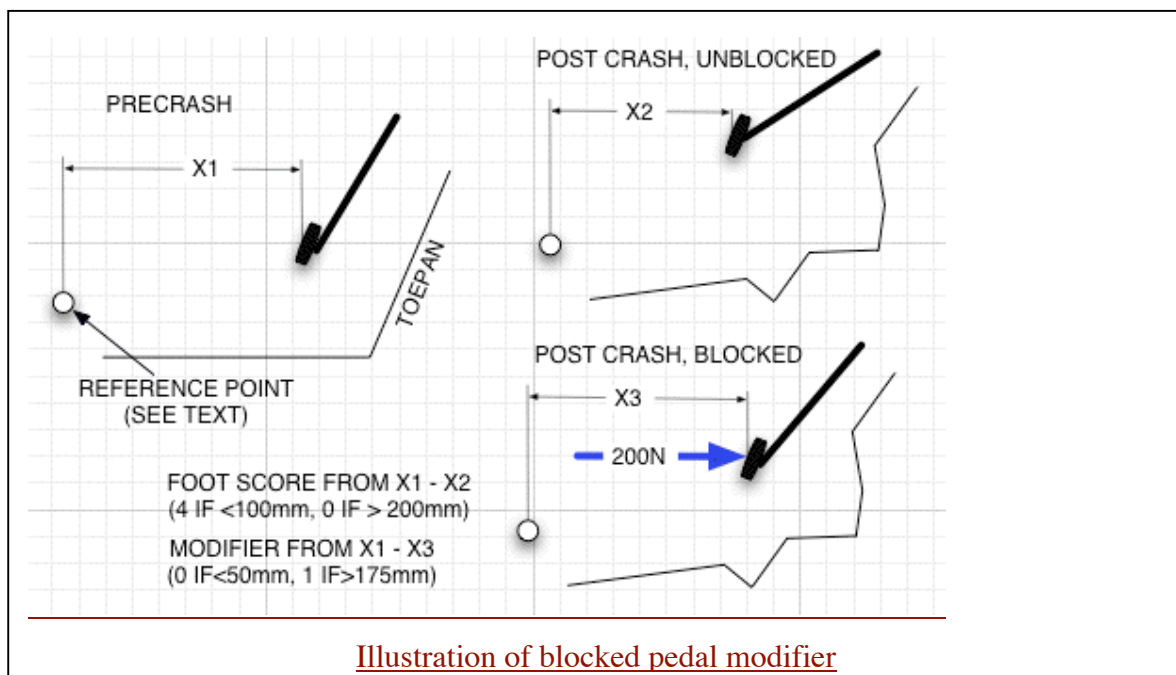
Blocked pedal modifier

For the Phase 13 tests Euro NCAP introduced a blocked pedal modifier for the offset crash test. An amended Assessment Protocol covering this change is expected to be issued by Euro NCAP shortly.

After the crash the displacement of each pedal is measured with no load and with a forward horizontal load of 200N applied. The second measurement is referred to as a “blocked pedal displacement”. The *unblocked* pedal displacement, compared with the pre-crash pedal position, is used to calculate a foot score, as in the previous Assessment protocol (but ANCAP measures both relative to the driver’s seat, as described above (“Measurement of Intrusion”). The second measurement is used to derive a modifier for the foot score. If the *blocked* pedal displacement, compared with the pre-crash position, is less than 50mm then no modifier is applied. If the displacement is more than 175mm then one point is deducted from the foot score. A sliding scale applies between 50mm and 175mm.

This modifier also applies where the pedal mounts are designed to breakaway during the crash but the pedal still offers some resistance to blocking (successful breakaway earns a pre-modified foot score of 4 points).

ANCAP will apply this change for all tests conducted from March 2003 [???].



Calculation of scores

Measured parameters are rounded to a certain number of decimal places prior to calculation of scores. The number of decimal places used for each parameter is shown on the coloured dummy score sheets that are issued to manufacturers during pre-launch consultations. In general injury measurements are rounded to two decimal places but, in the side impact test, abdomen force and pubic symphysis force are

rounded to three decimal places (the sliding scale is very sensitive for these injury parameters). Deformation measurements are taken to the nearest millimetre.

Resulting scores are calculated to three decimal places. These are added together to give a test score to three decimal places. The individual test scores are added together to give a combined score and this is rounded to two decimal places.

Bonus points (currently only available for seat belt reminders) are added to the combined score, if applicable.

Star ratings are assigned according to these rounded, combined scores, [as shown in Table 1.](#)

Child restraint assessment

Manufacturers are encouraged to nominate models of child restraint that have been found to suit the vehicle being tested - and are preferably available from dealers. Otherwise a default model of child restraint will be used by the test organisation.

Child dummies are instrumented and parameters are recorded but they are not currently analysed due to ANCAP's concerns about the EuroNCAP performance criteria.

Enquiries

Enquiries about test and assessment protocols should be addressed to:

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Updates to this document will be posted at:

< <http://www.aaa.asn.au/ancap.htm> >.