ANCAP
SAFETY

ANCAP Test & Assessment Protocol.

Rescue, Extrication & Safety v1.1.1

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PREFACE

During the test preparation, vehicle manufacturers are encouraged to liaise with ANCAP and to observe the way cars are set up for testing. Where a vehicle manufacturer feels that a particular feature should be altered, they should raise this with the ANCAP assessor present at the test, or in writing to the ANCAP Chief Executive Officer if no assessor is present. ANCAP will consider the matter and at their sole discretion and give direction to the test facility.

Vehicle manufacturers warrant not to, whether directly or indirectly, interfere with testing and are forbidden from making changes to any feature that may influence the test, including but not limited to dummy positioning, vehicle setting, laboratory environment etc.

Illustrations in this protocol are reproduced from Euro NCAP publications, and therefore show Euro NCAP markings on left-hand-drive vehicles. Where relevant, the layouts depicted should be adapted to right-hand-drive application.

VERSION	PUBLISHED	DETAILS
1.0	August 2019	First version of ANCAP protocol.
1.1.1	July 2020	Changes to reflect delayed introduction of new protocols to 2023. Clarifications s2.6 and 7.3 (MCB deactivation not permitted), 5.4 (Seat belt unlatching), 7.5 (Signal during Frontal test), Renumbering of s7.

DISCLAIMER.

ANCAP has taken all reasonable care to ensure that the information published in this protocol is accurate and reflects the current technical decisions taken by the organisation. In the event this protocol contains an error or inaccuracy, ANCAP reserves the right to make corrections and determine the assessment and subsequent result of the affected requirement(s).

AUSTRALASIAN NEW CAR ASSESSMENT PROGRAM (ANCAP)

TESTING AND ASSESSMENT PROTOCOL – Rescue, Extrication and Safety

CONTENTS

1 INTRODUCTION

The assessments to be performed in the areas of Rescue, Extrication and Safety contribute to the adult occupant protection rating. The requirements detailed in this protocol are divided into three areas:

1. Rescue: Information for First Responders – Rescue Sheet

2. Extrication: Unlocking of automatic door locking, door opening forces & seat belt unbuckling forces

3. Post-crash Safety: Multi Collision Brake technology

note: eCall and Advanced eCall are not assessed by ANCAP until at least 2023.

2 DEFINITIONS

2.1 *Rescue Sheet (ISO 17840 part 1):* Operational Summary sheet for a vehicle produced for rescue services containing relevant information on vehicle hazards such as electrical systems, pyrotechnic devices, material location and properties (high strength steel etc), fuel storage location and properties etc. Rescue Sheet is the main document that first and second responders use at the scene of an accident.

2.2 *Emergency Response Guide (ERG ISO 17840 part 3):* a template for more in-depth emergency response information to be used in combination with the Rescue Sheet for non-conventional engine vehicle. It is generally used by first and second responders as a source of information for training on non-conventional engine vehicles.

2.3 *ISO standard 17840 - Road* vehicles - Information for first and second responders – Containing the following 4 parts: Rescue sheet for passenger cars and light commercial vehicles (Part 1), buses, coaches and heavy commercial vehicles (Part 2), ERG template with all the needed pictograms in ERG and in Rescue Sheet (Part 3) and a standard for identification of the propulsion fuel or energy (Part 4).

2.4 *Automatic Door Locking (ADL):* System in the vehicle whereby the door latches automatically lock once the vehicle has reached a certain speed. They should also automatically unlock in the event of an accident, post impact. Short term deactivation for one single journey is permitted.

2.5 *eCall:* System fitted to a vehicle that sends an automatic message to an emergency call centre in case of a crash of the vehicle. eCall technology capable of sending advanced content, beyond what is legally specified (UN Regulation 144), is referred to as eCall+ or Advanced eCall.

2.6 *Multi Collision Brake (MCB)*: System fitted to a vehicle that applies the brakes to prevent or mitigate a subsequent impact when a vehicle has been involved in a collision. In response to a primary collision (usually if the airbag is fired), information is sent to the electronic stability control system to brake the vehicle. **It must not be possible to deactivate the MCB.**

3 SCORING SCHEME

3.1 The score achieved from the Rescue, Extrication & Safety assessment is directly applied to Adult Occupant Protection (Box1) without scaling. The score ranges from -2 points to +2 points.

3.2 A penalty will be applied, where the Rescue sheet is not available (-2 points) or non-compliant (-1 point) in accordance with the requirements in Chapter 4 of this protocol. No penalty in section 3.2 is a pre requisite to score points (see 3.5).

3.3 A -1 point penalty can be applied in accordance with the Extrication requirements in Chapter 5 of this protocol.

3.4 The sum of the penalties in sections 3.2 and 3.3 cannot exceed -2 points.

3.5 If no penalty in section 3.2 has been applied, 2 points can be scored:

- 1pt is scored by default, in lieu of scoring for Automatic Call Notification (eCall or eCall+) applied by Euro NCAP. The default point is scored as services are not currently available in Australasia to support Automatic Crash Notification. This default point will apply until at least January 2023.
- 1pt can be scored when the vehicle is equipped with Multi-Collision Brake technology in accordance with the requirements in Section 7. MCB must be fitted in accordance with VSSTR requirements for this point to be awarded.

4 RESCUE SHEET

4.1 A Rescue Sheet(s) for the model variant rated by ANCAP, as well as any other variants covered by the rating, must be submitted to ANCAP prior to the commencement of physical testing, including any additional information for database inclusion (i.e. links to OEM website, photos, etc.).

4.2 These Rescue Sheets (final version after inspection) must be available to the general public for the model variant rated by ANCAP as well as other variants covered by the rating that are available at the time of publication.

4.3 Each Rescue Sheet should be provided in PDF format as a unique document i.e. one file per model variant. Each Rescue Sheet should be no more than four A4 sized pages when printed. Where commercial licences and/or exclusive publishing rights exist, these should not infringe on the rights of ANCAP and its members to make Rescue Sheets available at no cost to the general public.

4.4 Rescue Sheets must be supplied in English (where applicable). Additional languages are permitted but not required.

4.5 The Rescue sheet(s) must meet ISO 17840 Part 1 format (layout, order of information and pictograms) and may include a summary following ISO 17840 Part 3. The Rescue Sheet shall be tailored to each vehicle, that is, for a conventional ICE vehicle not all parts of the ISO standard need to be addressed. However for a pure EV, for example, additional information according to the ISO standard is required.

4.6 Content must be correct – The Rescue Sheet will be checked during normal post-crash inspection on tested vehicles. Where a Euro NCAP rating is to be republished by ANCAP, a representative vehicle may be inspected by ANCAP to verify accuracy

of the information provided. The vehicle manufacturer will be permitted to make corrections before publication, as long as all material issued by the company is updated as well. (An assessment checklist for vehicles to be supplied in Australia and/or New Zealand will be provided by ANCAP on request).

5 EXTRICATION

5.1 Automatic Door Locking

5.1.1 Vehicle models may be equipped with automatic locking doors. In the event of an accident the locked doors should automatically unlock, post impact, to allow the occupants to exit but also for entry by first responders.

5.1.2 The ANCAP Secretariat will check with the OEM if their vehicle is fitted with automatic locking door latches as standard and inform the test laboratory accordingly.

5.1.3 If ADL is fitted as standard and by default always ON then the doors will be locked by the lab personnel prior to ALL full-scale tests. The test lab will be informed by the OEM of the procedure to ensure the doors are manually locked for the tests.

5.1.4 If ADL is not fitted as standard but fitted to the test variant then doors will be locked in the frontal MPDB test and the side oblique Pole test. The doors will be left unlocked in the frontal Full Width test and Side Barrier test. If the ADL activates by itself in the Full width frontal test that is not an issue.

5.1.5 Post-test the lab personnel will immediately check if any of the side doors in the front crash tests and any of the non-struck side doors in the side crash tests has remained locked/has not automatically unlocked. A maximum -1 point penalty will be applied if this issue is identified in at least one of the two tests where the doors were locked pre impact. This will follow the procedure for door opening in 5.2.

5.2 Door opening forces

5.2.1 The post impact door opening forces are measured after the two frontal impact tests. Only the side doors (not the tailgate for example) will be checked.

5.2.2 The unlatching/unlocking of the side doors will already have been checked as part of the automatic door locking section.

5.2.3 Using a gauge attached to the door handle pull the door handle until a maximum force of 750N is registered. The opening force should be applied perpendicular to the door, in a horizontal plane, unless this is not possible. If the door opens before the 750N level is reached note down the opening force. If the door does still not open upon reaching 750N then use tools to open the door.

5.2.4 When dealing with a sliding door the opening force of [750N] shall be applied in a direction following the vehicle centreline – door should be pulled in this direction once the door unlatching forces have been carried out (as mentioned previously the unlatching/unlocking check of the side doors will already have been checked as part of the automatic locking doors section.)

5.2.5 An open hinged door is defined as a door that is opened to an angle of at least 45° relative to the door hinge axis, allowing enough room for occupant extraction.

5.2.6 An open sliding door is defined as a door that, when opened, presents a minimum opening of at least 500mm compared to the closed position of the door, that would allow the extrication of an occupant.

5.2.7 To summarise there are 2 stages to the door opening forces procedure: Load gauge up to 750N and then tools.

5.2.8 Penalty only applied if load exceeds 750N and tools are required to open a door.

5.2.9 A maximum -1 point penalty will be applied if this issue is identified for at least one of the side doors in at least one of the two frontal tests.

5.3 Additional requirements for Electric door handles or handles retracting into door panel and having no possibility for physical grip

5.3.1 More and more vehicles are now coming to the market with electric retracting door handles that sink into the door panel flush/level with the door panel surface. This can create an issue in an emergency situation where first responders need to be able to use the door handle to open the door.

5.3.2 The door handle should be in the retracted / vehicle in motion position for the test.

5.3.3 The OEM should inform both the ANCAP Secretariat and the test laboratory if any special action is needed, for example if the engine must be running for the retracting door handles to operate as normal in the test.

5.3.4 For a retracting door handle it is permitted to apply special actions at the handle to have access to it. For example, pushing in one corner to pivot it and then hold the handle (if no tools are needed at all). This needs to be discussed with ANCAP Secretariat prior to tests and it must be explained in the Rescue Sheet and also in the vehicle handbook.

5.3.5 For the full scale tests, with the exception of the struck side doors in the side impacts, the handles of all side doors must be in the extended/ready to open (as explained in 5.2.3) position immediately after the test. It is assumed that by design the door handles will extend outwards ready for use when the SRS system deploys any airbag/detects a severe impact or the door handle remains in its retracted position but can be grabbed nevertheless by the first responder without any tool. The test laboratory personnel will note down the status of each door handle post impact.

5.3.6 A maximum penalty of -1 point will be applied where any of the side door handles listed in 5.2.4 cannot be used as normal or accessed without tools after the test.

5.3.7 It is not acceptable to direct the user/owner of the vehicle to a cable release for the door in the luggage area for example or to have to connect a slave battery to the vehicle in order to extend the door handles. A vehicle equipped with electric door handles will not be given any special treatment compared to a vehicle with conventional door handles.

5.4 Seat belt buckle unlatching (defined force to open a seat belt buckle)

5.4.1 No extrication assessment would be complete without also dealing with the belted occupants and ensuring that the seat belt itself can be unlatched as normal to allow extrication of the occupant.

5.4.2 Any position where the seat belt is used for the full-scale tests shall be checked post-test once all of the door opening forces have been measured. (For both adult and child if car seatbelt is used to restrain child dummy or CRS in test).

5.4.3 **Frontal impacts:** The seat belt buckle shall completely open under a load of no more than 60N applied directly to the centre point and in the direction of the opening movement of the buckle release button. The operator shall hold the buckle with one

hand ensuring the application of the force measurement in the correct orientation with the other hand to measure in the axis of the buckle opening movement.. The measurement shall provide a load versus time / displacement information of the opening behaviour to identify potential measurement artefacts, which could be derived from a second contact of the buckle release button after release with the buckle housing. In such a case the first peak of force should be interpreted as the opening force. The point of contact of the test equipment shall comply with the definition in UN Regulation 16 7.8.2. It is permitted to move the adult dummy, child dummy or CRS in order to access the buckle.

5.4.4 **Side impacts:** The seat belt buckle shall completely open under a load of no more than the limit value applied directly to the buckle release button. As a first step in 2020, 2021 and 2022 the unlatching force value shall be monitored for all side impact vehicles. It is anticipated that for these side tests the unbuckling load limit should be defined as a value between 60N and 100N.

5.4.5 No further steps will be taken to open the buckle or tools allowed to cut the belt, unbolt the buckle from the car etc.

5.4.6 The test laboratory should note the load at which each buckle releases.

5.4.7 A maximum penalty of -1 will be applied where any of used buckles in the frontal tests do not open when a load of up to 60N is applied.

6 POST-CRASH TECHNOLOGY - ADVANCED eCall

6.1 eCall and Advanced eCall (eCall+) are not implemented for scoring under ANCAP protocols until at least 2023. For 2020, 2021 and 2022 a **Default 1pt** will be awarded to all vehicles assessed by ANCAP, including vehicles for which Euro NCAP ratings are to be republished, irrespective of whether eCall or eCall+ is available on the vehicle or vehicle model.

7 POST-CRASH TECHNOLOGY - MULTI COLLISION BRAKE

7.1 Multi Collision Brake systems will be assessed by ANCAP using information provided to ANCAP by the vehicle manufacturer in accordance with sections 7.3 to 7.19 below.

Tests carried out by the OEM need not be witnessed by ANCAP, however MCB performance may be verified by ANCAP in official full scale crash tests.

7.2 The OEM must mention in the vehicle handbook that the vehicle is equipped with an MCB system and it should explain how it works.

Definitions

7.3 *Multi Collision Brake (MCB):* System fitted to a vehicle that applies the brakes to prevent or mitigate a subsequent impact when a vehicle has been involved in a collision of sufficient severity. In response to a primary collision with or without airbag deployment, information is sent to the braking system to decelerate the vehicle with the intention to bring the vehicle to a standstill. **It must not be possible to deactivate the MCB.**

7.4 *MCB trigger signal:* Signal sent from the crash detection function to the braking system during a primary collision.

Overview

7.5 The test procedure for the Multi Collision Brake technology consists of two parts:

- Part A - a destruction-free demonstration of braking caused by the MCB trigger signal,
- Part B - documentation showing that the MCB trigger signal is sent during a Frontal crash test as performed under Part A.

During a *transition period* of three years when the MCB Protocol is active (2020, 2021 and 2022), OEMs can score all MCB points using an in-house full-scale crash-test chosen by the OEM replacing Part A and Part B.

Part A - Destruction-free MCB test

7.6 The vehicle under test drives in a straight line on a dry surface at a velocity of 15km/h ±1km/h.

7.7 The MCB trigger signal is simulated on the vehicle network using test and development equipment of the OEM.

7.8 If declared necessary by the OEM, the acceleration pedal shall be disengaged immediately prior to simulation of the MCB trigger signal.

7.9 The brake pedal must not be engaged by the driver or other means during the entirety of the test.

7.10 The MCB test is passed if the vehicle exceeds a minimum deceleration of $3m/s^2$ with brakes lights on.

Part B Documentation to be provided by the OEM from in-house crash test data

7.11 The OEM can choose any full-scale crash test where the MCB will be activated.

7.12 Video recording of the test at a ¾ angle from the rear on driver side to show the brakes lights are ON.

7.13 Data from a full-scale in-house crash test that shows that the MCB trigger signal is sent on the vehicle network during a crash.

Transition Period

7.14 During a transition period of two years after the MCB Protocol is active (2020, 2021 and 2022), OEMs can score the MCB point using an in-house test.

Additional Requirements and Provisions

7.15 The Multi Collision Brake must be described in the user manual of the tested vehicle.

7.16 An OEM-specific name for the MCB technology can be used in the manual.

7.17 The test procedure is organized and performed by the OEM.

7.18 The test procedure can be performed using a pre-series vehicle.

7.19 Where a Euro NCAP rating is to be republished by ANCAP, MCB points will be awarded as per the original Euro NCAP rating if the OEM provides written advice to ANCAP that MCB functionality for vehicles covered by the rating is the same as that assessed by Euro NCAP. In the event that MCB functionality is different to that assessed by Euro NCAP, ANCAP will conduct a full assessment of Australasian vehicles as outlined in sections 7.3 to 7.18 above.