Ministry of Transportation and Communications

Taiwan New Car Assessment Program (TNCAP)

Second Version

3.16 Rescue and Extrication Testing Protocol

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3.16.1 Introduction

Rescue services require detailed but readily-understood information regarding the construction of individual vehicles to extract trapped occupants as quickly and safely as possible. This is becoming more pressing as vehicles become stronger (e.g. use of high strength steels or composite materials), use different sources of power (e.g. electric/hybrid, hydrogen) and are equipped with an increasing number of safety devices (e.g. airbags, pre-tensioners, active pedestrian protection bonnets).

Car makers have invested in "Rescue sheets" but their timely and free-of-charge availability and dissemination is not always guaranteed. Through the application of this protocol, it promotes the appropriate availability of ISO 17840 compliant rescue sheets and response guides for new car models. To further assist the extrication efforts of first responders, the correct functioning of automatic door locks, i.e. unlocking after a crash, is checked.

The requirements detailed in this protocol are divided into two areas:

(1) Rescue: Information for First Responders – Rescue Sheet

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

3.16.2 Definition of Terms

3.16.2.1 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.

3.16.2.2 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.

3.16.2.3 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).

3.16.2.4 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.

3.15.3 Method of Assessment

The results of the compliance assessment based on the implementation of this protocol are disclosed on the TNCAP website.

3.15.4 Rescue Sheet

3.16.4.1 The Rescue Sheet(s) (the model variant rated by TNCAP as well as other variants covered by the rating) must be submitted before inspection with additional information for database (i.e. links to OEM website, photo, etc.).

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

3.16.4.3 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 licenses and/or exclusive publishing rights exist, these should not infringe on the rights of TNCAP and its members to make Rescue Sheets available at no cost to the general public.

3.16.4.4 Rescue Sheets must be supplied in at least Traditional Chinese, or both Traditional Chinese and English.

3.16.4.5 The Rescue sheet(s) must meet ISO 17840 Part 1 format (layout, order of information and pictograms) and should 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 then more information according to the ISO standard is required.

3.16.4.6 Content must be correct - Rescue Sheet will be checked during normal post-crash inspection on tested vehicles. The vehicle manufacturer will be permitted to make corrections before publication, as long as all material issued by the company is updated as well. (Copy of TNCAP Rescue Sheet checklist and Euro NCAP Technical Bulletin TB030 offering guidance are available for reference to create an ISO complaint Rescue Sheet).

3.15.5 Extrication

3.16.5.1 Automatic Door Locking

TNCAP understands the need for vehicles to be equipped with automatic locking doors due to such issues as security when stopped in traffic. However 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.

3.16.5.1.1 Vehicle manufacturers should declare whether the test vehicle is fitted with automatic locking door latches as standard, and this should be confirmed by the TNCAP Executive Agency and Technical Service.

3.16.5.1.2 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 vehicle manufacturer of the procedure to ensure the doors are manually locked for the tests.

3.16.5.1.3 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.

3.16.5.1.4 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. It is not compliant 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 3.16.5.2.

3.16.5.2 Door opening forces

3.16.5.2.1 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.

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

3.16.5.2.3 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.

3.16.5.2.4 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.)

3.16.5.2.5 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.

3.16.5.2.6 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.

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

3.16.5.2.8 It is not compliant if load exceeds 750N and tools are required to open a door.

3.16.5.2.9 It is not compliant if this issue is identified for at least one of the side doors in at least one of the two frontal tests.

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

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. Obviously 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.

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

3.16.5.3.2 The vehicle manufacturer should inform both the TNCAP Executive Agency and Technical Service 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.

3.16.5.3.3 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 TNCAP Executive Agency prior to tests and it must be explained in the Rescue Sheet and also in the vehicle handbook.

3.16.5.3.4 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 3.16.5.3.3) 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.

3.16.5.3.5 It is not compliant where any of the side door handles listed in 5.2.4 cannot be used as normal or accessed without tools after the test.

3.16.5.3.6 It is not acceptable to direct the user/owner/rescuer 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.

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

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.

3.16.5.4.1 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 and/or CRS in test).

3.16.5.4.2 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 behavior 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 UNECE R.16 7.8.2. It is permitted to move the adult dummy, child dummy or CRS in order to access the buckle.

3.16.5.4.3 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.

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

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

3.16.5.4.6 It is not compliant where any of used buckles in the frontal tests do not open when a load of up to 60N is applied.