LATIN AMERICAN & CARIBBEAN
NEW CAR ASSESSMENT PROGRAMME
(Latin NCAP)

SLED TEST PROCEDURE – ADULT OCUPANT PROTECTION
2026 - 2029

Version 2.0.1
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AKNOWLEDGEMENT

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1 INTRODUCTION

This sled test aims to assess the protection offered to small adults in the rear seat. The original FW test performed by Euro NCAP serves as a baseline to assess specific vehicle features in relation to adults in the rear seat.

Vehicle manufacturers must inform Latin NCAP in advance if the vehicle is fitted, as optional or standard equipment, with seat belt systems with devices such as double pretensioners, inflatable seat belts, automatic locking restraints or any other ´advanced´ safety technology.

All sled testing is performed according to a medium representative pulse of various models subject to a 50km/h FW test. The pulse requirements are detailed in Section 5.

2 PREREQUISITES

2.1 All safety systems and features, including airbags, seat belt systems, seat cushions, headrests and structural reinforcements, must be final production and/or properly installed and functional, if needed, considering their potential effects on rear occupants. This includes considering the positioning of both front seats that may interact with rear passengers during the forward movement of the test.

2.2 The OEM is required to submit comprehensive documentation outlining the vehicle's specifications, safety features, and any additional enhancements relevant to the evaluation process.

2.3 Technical specifications, including vehicle and sled dimensions, weight distribution, and safety system details, must be provided for review by Latin NCAP.

2.4 Any testing facility utilized for conducting assessments must adhere to Euro NCAP's standards for safety testing protocols and equipment calibration.

2.5 Verification of the facility's accreditation and compliance is essential prior to test commencement.

2.6 All test dummies and associated equipment, including sensors and instrumentation, must undergo regular calibration and maintenance to ensure accuracy and reliability during testing procedures.

2.7 Calibration certificates and maintenance records must be provided upon request to demonstrate compliance with established standards.

2.8 A detailed test execution plan outlining the sequence of assessments, testing parameters, and safety protocols must be developed and submitted for approval by Latin NCAP.

2.9 The plan should include contingency measures for unexpected events or deviations from the testing protocol.

2.10 Testing personnel responsible for conducting assessments must undergo comprehensive training and certification to ensure proficiency in test procedures and safety protocols.

2.11 Records of training completion and certification status should be maintained and made available for review upon request.

3 HARDWARE SETUP

3.1 Sled facility

An acceleration or deceleration-based sled rig may be used. A “body in white” (BIW) of the car model being assessed shall be mounted on the sled. All features which may influence rear occupants’ protection must be installed in the BIW.

3.2 Body in white preparation

The bodyshell must be mounted on the sled to ensure no permanent deformation of the body or its mounts during the test program, ensuring good repeatability. The pitch angle of the bodyshell shall be set to 0 degrees, according to the OEM’s specification.

The default yaw angle for the sled shall be 0 degrees. If the OEM can identify the need for a yaw angle other than 0 degrees must notify the Secretariat for approval, this can be used throughout the main test program. In no cases, would Latin NCAP allow the yaw angle to be greater than 30 degrees.

Parts can be removed from the BIW, if there is no question that their removal could influence the performance of the test. Any structural or inertial support must be fully simulated.

The doors may be removed, and the door aperture reinforced, to provide a clear view for the cameras. All components added to the bodyshell shall be of the same specification as those used in the Latin NCAP frontal impact test.

3.3 Active restraints

Any active components of restraint systems must be identical to those used in the Latin NCAP frontal impact test. However, it is acceptable for them to be triggered remotely to match the full frontal impact test firing times within ± 3ms. Where remote triggering is used, full details of the firing time, proportion of charge used and any other relevant details should be supplied, along with a comparison with relevant data from in-house frontal full width test and Latin NCAP frontal impact test.

4 MAIN TEST PROGRAMME

4.1 Sled Acceleration

The pulse performed on the sled facility shall be at least as severe as the representative FW test generic pulse described in Section 5, measured at the driver side B-pillar.

4.2 Dummy and instrumentation

4.2.1 A Hybrid III 05F (5^{th} percentile Female) test dummy shall be used at the second-row passenger seat, on the opposite side to the driver according to the *Euro NCAP FULL WIDTH FRONTAL IMPACT TESTING PROTOCOL, version 1.1.1, November 2021*. No dummy is required in the front seats. Dummy shall be equipped fully instrumented. Shoulder belt loads shall also be recorded to demonstrate that the pre-tensioning and load limiting characteristics of the restraint system are like those in the Latin NCAP frontal impact test. Head excursion needs to be measured and detailed in the report as well as evidence of detection, or absence, of submarining or seat belt slippage from the shoulder or in dummy´s hip gap.

4.2.2 Hybrid III 05F dummy preparation, certification and instrumentation must be done according to Section 3 and 4 of the *Euro NCAP FULL WIDTH FRONTAL IMPACT TESTING PROTOCOL, version 1.1.1, November 2021* when referring to the rear occupants.

4.2.3 Hybrid III 05F dummy positioning and measurements must be done according to Section 6 of the *Euro NCAP FULL WIDTH FRONTAL IMPACT TESTING PROTOCOL, version 1.1.1, November 2021* when referring to the rear occupant. Dummy removal must be checked according to Section 7.4 of the Euro NCAP *FULL WIDTH FRONTAL IMPACT TESTING PROTOCOL, version 1.1.1, November 2021* when referring to the rear occupants.

4.2.4 The sled must be instrumented according to Section 4.2 of the *Euro NCAP FULL WIDTH FRONTAL IMPACT TESTING PROTOCOL, version 1.1.1, November 2021.*

4.3 Passenger compartment adjustments

The adjustment of the passenger compartment on the sled will follow the same procedure and settings as described in Section 5 of the *Euro NCAP FULL WIDTH FRONTAL IMPACT TESTING PROTOCOL for both the front and rear seats.*

5 SLED PULSE REQUIREMENTS

5.1 Generic pulse

The pulse used for the sled test must be based on the predefined generic pulse illustrated in figure 1 below, derived from average FWT pulses. Latin NCAP has also made the point by point raw data pulse available to download along with this document.

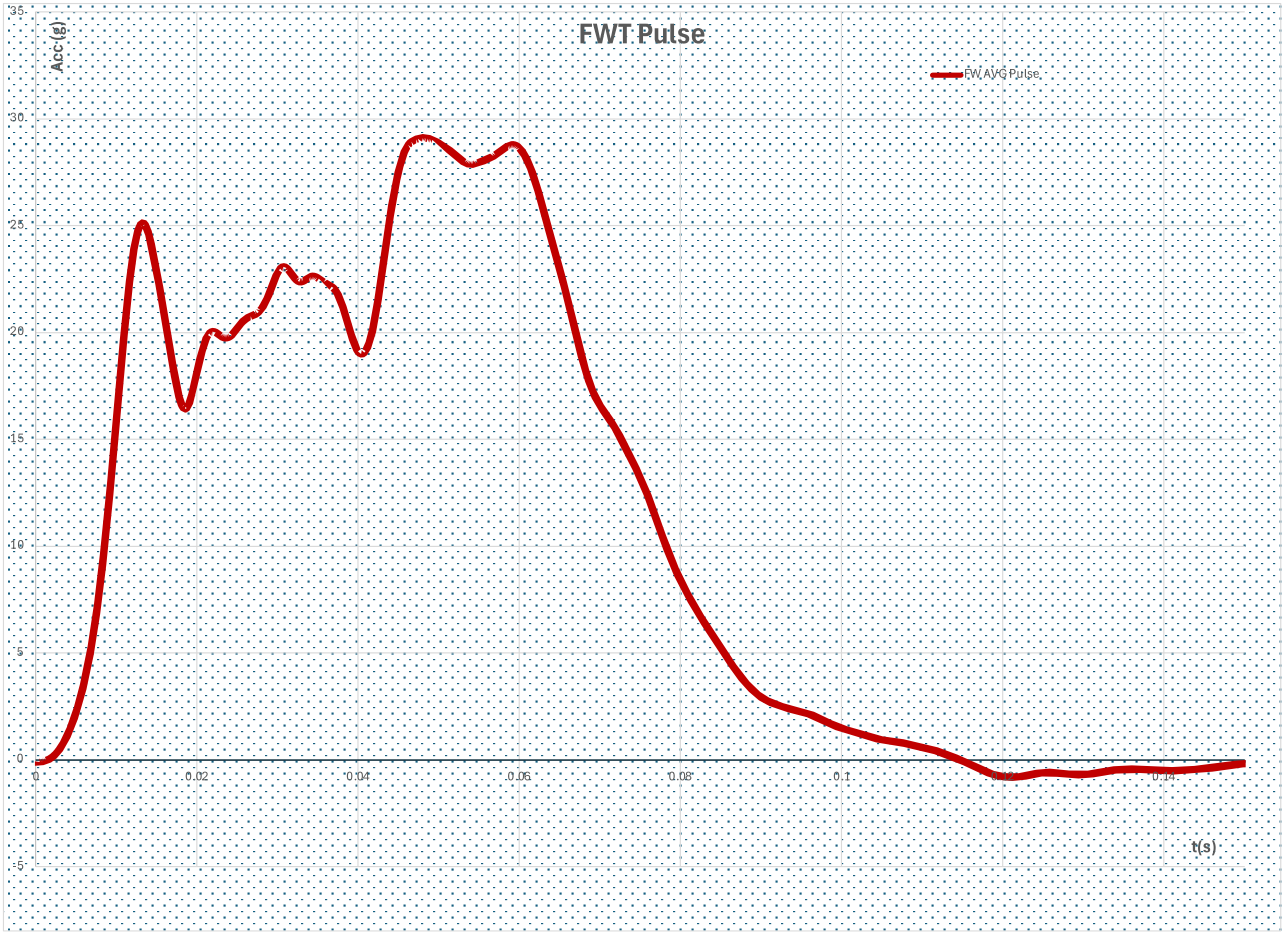

Figure 1 - FWT average pulse

The pulse performed on the sled facility should be close to or more severe as the generic test pulse. To validate this point, the following process should be used:

- Change the orientation to have sled pulse and generic pulse in globally positive values
- Calculate by integration the Delta V from generic pulse DV1(t), setting the initial velocity to 0
- Calculate by integration the Delta V from sled test DV2(t), setting the initial velocity to 0
- Calculate the difference DV = DV1 – DV2

Requirement #1:

- If all the DV values up to 60 ms are in the zone as shown below, requirement #1 is OK – check requirement #2

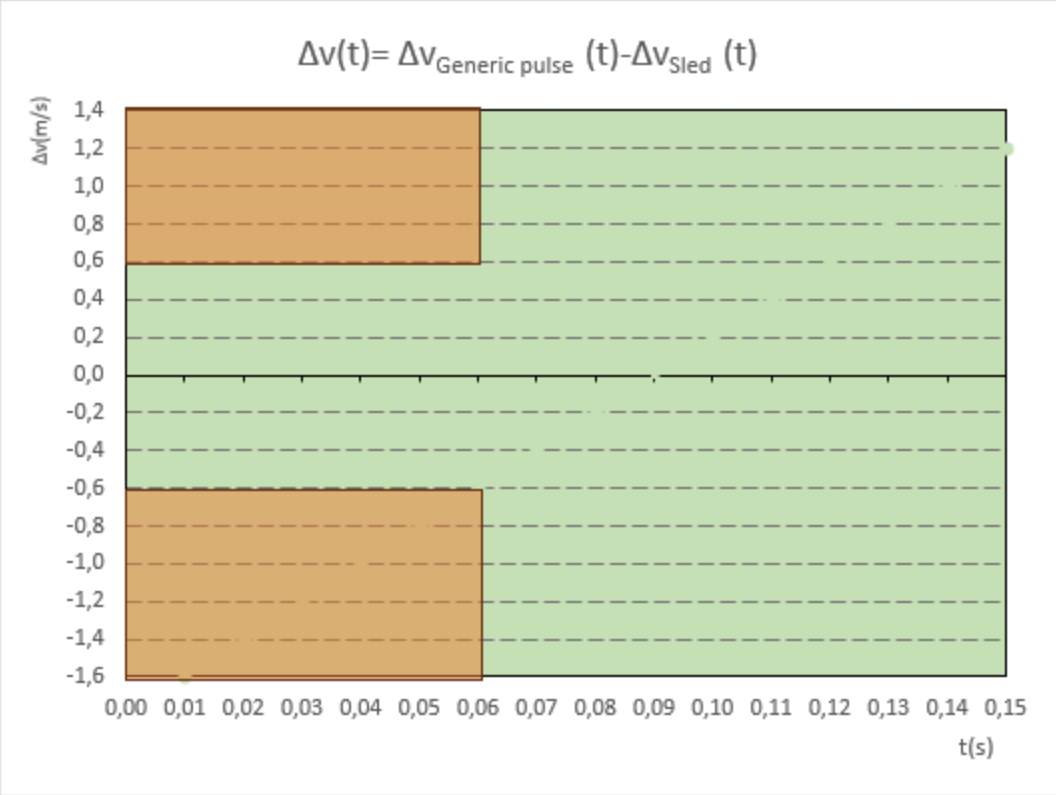

Figure 2 - Requirement #1, Delta V requirement

Requirement #2:
The sled pulse must meet the requirements of table 1 below:

Table 1 - Pulse requirements

time (s)	Acceleration (g)
0	-0.25g ≦ Accel (g) ≦ 0.25g
0.013	Accel (g) ≧ 22.13g
0.054	24.90g ≦ Accel (g) ≦ 30.90g
0.1	-0.25g ≦ Accel (g) ≦ 3.50 g

5.2 **Speed**

This speed should be 58.5km/h ± 1km/h including the rebound (-8.5km/h rebound). Actual test speed must be recorded in the test details.

6 PHOTOGRAPHIC RECORD

6.1 High speed film requirements must be according to Section 4.2 of the Euro NCAP FILM & PHOTO PROTOCOL, Version 1.4, July 2013.

6.2 Still photography requirements must be according to Section 4.3 of the Euro NCAP FILM & PHOTO PROTOCOL, Version 1.4, July 2013.

Aditionally, pre and post test still photography should clearly depict the sled set-up and BIW construction. Photographs must show the fixings of the BIW to the sled, particularly all rear seating positions and any body reinforcements before and after the tests. Interior structures that may affect the dummy behavior must be visible to demonstrate the sled setup's representativeness of a production vehicle. The position of the dummy must be clearly shown, along with photographic evidence of paint applied to head, knees, and tibias.

Recordings of the paint transfer marks, and any damage to the dummy or any other components must be made after each test. Broken, damaged, or fatigued components should be fully documented using photographs, and in some cases, removed for better visibility.

Insufficient high speed or still photography could result in the sled test not being accepted by the Latin NCAP Secretariat.

7 DATA PROCESSING AND REPORTING

7.1 **Data processing**

Test data must be sampled and filtered as specified in the Euro NCAP frontal impact test protocol.

7.2 **Reporting**

Full information about the test set up shall be provided to Latin NCAP, including graphical plots. This must include details of any work that has been done to compensate for supportive intrusion and any special arrangements related to dummy positioning. Anything which could influence the assessment should be fully reported.

8 INTERACTION WITH LATIN NCAP

Any manufacturer who intends to present sled test results to Latin NCAP is required to advise the Secretariat when completing the vehicle matrix.

Manufacturers are also encouraged to reach out to Latin NCAP secretariat in advance if any of the items described in this document are not clear or requiring special consideration.

Where additional Latin NCAP inspector or Secretariat time or resources are required to consider sled test data or to hold additional meetings, the costs will have to be funded by the manufacturer.