DRAFT AMENDMENT NO. 02

TO

IS 15901:2010 AUTOMOTIVE VEHICLES — BUMPER FITMENT ON M1 CATEGORY OF VEHICLES — TEST METHODS

(*Second Cover Page, Foreword, Para* 3) — Substitute the following for the existing:

UN R 42 Uniform Provisions Concerning the Approval of Vehicles with regard to their Front and Rear Protective Devices (Bumpers etc.) Supplement 2 to the original version of the Regulation – Date of entry into force: 3 January 2021

(*Page* 1, *clause* **2.2***)* — Substitute the following for the existing:

2.2 Vehicle Type — M1 category of vehicles which do not differ in such essential respects as,

a) The size, material and mass of the bumpers;
b) The type of mounting and mountingfasteners for the bumpers;
c) The length and width of the vehicle, and the structure, dimensions, lines and materials of the front and rear parts of the vehicle in so far as they have an effect on the results of the impact test prescribed in this standard;
d) The siting (front, rear or centre) and weight of the engine; and
e) The characteristics of the suspension, to the extent that they affect the results of the impact test prescribed in this standard.

(*Page* 1, *clause* **2.2**) — Add following **2.3** to **2.7** after **2.2**:

2.3 Unladen weight — means the weight of the vehicle in running order, unoccupied and unladen but complete with fuel, coolant, lubricant, tools and a spare wheel (if provided as standard equipment by the vehicle manufacturer);

2.4 Laden test weight — means the weight of the vehicle when it is loaded to the conditions indicated in **2.4** plus, the weight of the passengers (taking 75 kg. per passenger) distributed as follows:

Sl No.	Number of seating positions	Number of passengers	Distribution
(1)	(2)	(3)	(4)
i)	2 and 3	2	2 in the front seats
ii)	4 and 5	3	2 in the front seats 1 in the back seats
iii)	6 and 7	4	2 in the front seats 2 in the rearmost seats
iv)	8 and 9	5	2 in the front seats 3 in the rearmost seats When the rear row of seats has only two seating positions, one person shall be on the second row from the rear.

2.5 Vehicle corner — means the vehicle's point of contact with a tangent vertical plane which makes an angle of 60° with the longitudinal median plane of the vehicle;

2.6 Reference height — means the height above the ground at which the vehicle should embody sufficient protective devices, both at "unladen kerb weight" and at "laden test weight". This reference height is that of the horizontal plane passing through the reference line of the impactor described in **D-2.3** to this standard;

2.7 Reference line — means a line outside the impactor at the intersection of the horizontal plane of symmetry of the impact contour with the impact contour itself, plane A of the impactor being vertical.

(Page 1, *clause* **4.2***)* — Substitute the following for the existing:

4.2 Specifications of **4.1** are deemed to be met if the vehicle equipped with the same design of bumpers and their anchorages complies with the specifications below, when it is tested either by moving barrier method or pendulum method as laid out in Annex D.

4.2.1 The lighting and signalling devices shall continue to operate correctly and to remain visible. Should the adjustment of the factory-fitted lighting devices be disturbed, it may be corrected to conform to the required specifications, provided this can be done by the normal means of adjustment. Bulbs may be replaced in the event of filament failure.

4.2.2 The vehicle's bonnet (hood), boot lid (trunk lid) and doors shall be operable in the normal manner; in addition, the side doors of the vehicle shall not be able to open under the effect of the impact.

4.2.3 The vehicle's fuel and cooling systems shall have neither leaks nor constricted fluid passages which prevent normal functioning; their sealing devices and caps shall be operable in the normal manner.

4.2.4 The vehicle's exhaust system shall not suffer any damage or displacement which would prevent its normal function.

4.2.5 The vehicle's propulsion, suspension (including tyres), steering and braking systems shall remain in adjustment and shall operate in a normal manner.

NOTE — "This requirement does not apply to sensors, cameras, radar devices, etc. being part of driver assist systems. They may become damaged, disoriented or broken due to an impact carried out according to Annex D as long as the basic braking and steering performance are still intact.

(*Page* 2, *clause* 5.1) — Add following **5.1** f) after **5.1** e):

f) Any increase in Unladen weight of vehicle by more than 8 percent.

(*Page* 2, Annex A, *Clause* A-1.2) — Add following **A-1.3** to **A-1.6** after **A-1.2**:

A-1.3 A detailed description of the vehicle type with respect to its structure, dimensions, lines and constituent materials;

A-1.4 drawings of the vehicle showing the vehicle type in front, side and rear elevation and design details of the forward and rear parts of the structure;

A-1.5 particulars of the vehicle's unladen weight; and

A-1.6 Detailed description of the protective devices: their dimensions, lines, constituent materials and position on the vehicle.

(*Page* 3, *clause* **C-2.1**) — Substitute the following for the existing:

C-2.1 To ensure repeatability, Belgian Pave Test Track at NCAT, VRDE-Ahmednagar or NATRAX-Indore or any equivalent specification test track shall be used for the road load data collection at a speed of 35 km/ h (± 1 km/h).

(*Page* 3, *clause* **C-2.3**) — Substitute the following for the existing:

C-2.3 Refer Fig. 1 & Fig. 2 for details of Belgian Pave Track at VRDE & NATRAX respectively.

(*Page* 4, *after* **Fig. 1**) — Add Fig. 2 (the illustration of NATRAX-Indore Test Track) and Annex D.

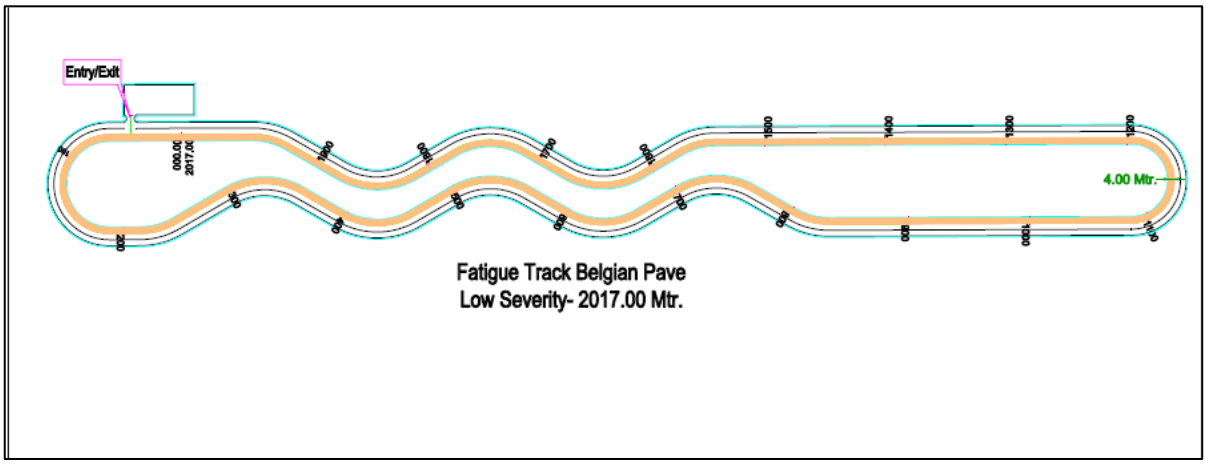


FIG. 2 NATRAX-INDORE TEST TRACK

ANNEX D
(*Clause* **4.2** *and* **4.2.5**)

LOW-SPEED-IMPACT TEST PROCEDURE

D-1 SCOPE AND PURPOSE

The purpose of this test is to simulate frontal and rearward low- speed-impact conditions with another vehicle. The test shall make it possible to verify whether the protective devices of the vehicle meet the requirements of this standard.

D-2 INSTALLATIONS, PROCEDURES AND MEASURING INSTRUMENTS

D-2.1 Testing ground

The test area shall be large enough to accommodate the impactor (striker) propulsion system and to permit after-impact displacement of the vehicle impacted and installation of the test equipment. The vehicle shall be placed on a horizontal and level rigid smooth surface.

D-2.2 State of the Vehicle

D-2.2.1 The vehicle shall be at rest.

D-2.2.2 The front wheels shall be in the straight-ahead position.

D-2.2.3 The tyres shall be inflated to the pressure recommended by the vehicle manufacturer.

D-2.2.4 The brakes shall be disengaged and the transmission control shall be in neutral position.

D-2.2.5 Vehicles equipped with hydro pneumatic, hydraulic or pneumatic suspension or a device for automatic levelling according to load shall be tested in the normal running conditions specified by the manufacturer.

D-2.3 Impactor (striker)

D-2.3.1 The impactor shall be of rigid construction, the impact contour being of hardened steel.

D-2.3.2 The impacting surface shall conform to the diagram in Figure 3.

D-2.3.3 The effective mass shall be equal to the mass corresponding to the “unladen weight" of the vehicle to be tested.

D-2.3.4 With plane A of the impactor vertical, the reference line shall be horizontal.

D-2.3.5 The first contact of the impactor with the vehicle shall be by the impact contour on the protective device. In the two vehicle-loading conditions the protective device between the corners, as defined in **2.5** of this standard, shall be intersected by the horizontal plane passing through the reference line.

D-2.3.6 The reference height is 445 mm.

D-2.4 Propulsion of the Impactor

The impactor may either be secured to a carriage (moving barrier) or form part of a pendulum.

D-2.5 Special provisions applicable where a moving barrier is used

D-2.5.1 If the impactor is secured to a carriage (moving barrier) by a restraining element, the latter must be rigid and be incapable of being deformed by the impact; the carriage shall at the moment of impact be capable of moving freely and no longer be subject to the action of the propelling device.

D-2.6 Special provisions applicable where a pendulum is used

D-2.6.1 The distance between the pivot and the centre of percussion shall be at least 3.3m. The reference line shall coincide with the centre of percussion.

D-2.6.2 Plane A of the pendulum shall remain parallel with its axis of rotation throughout the test.

D-2.6.3. In the case of a parallelogram-suspended pendulum, the trajectory described by any point on the reference line shall be constant with a radius of at least 3.3m.

D-2.7 Longitudinal impact test

D-2.7.1 This test consists of two impacts on the front surface and two impacts on the rear surface of the vehicle. On each surface one impact is made with the vehicle under "unladen weight", as defined in **2.3** of this standard, and the other is made with the vehicle under "laden test weight", as defined in **2.4**.

D-2.7.2 For the impacts on the front and rear surfaces, the choice of location of the impactor for the first impact is free, but for the second impact the median plane of the impactor shall be at a distance at least 300 mm from the first, provided that during these impacts the extremities of the impactor do not pass outside a zone defined by two planes parallel to the longitudinal median plane and passing through the corners of the vehicle.

D-2.7.3 The impactor shown in the figure 3 should be placed so that plane A is vertical and the reference line is horizontal at the reference height of 445 mm.

D-2.7.4 The vehicle should be aligned so that a point between the vehicle corners touches, but does not move, the impactor, the longitudinal median plane of the vehicle being perpendicular to plane A of the impactor.

D-2.7.5 The vehicle should be impacted at a speed of $4.0^{+0.25}_{-0}$ km/h

D-2.8 Corner impact test

D-2.8.1 This test consists of an impact at one front corner and an impact at one rear corner of the vehicle, which is at unladen weight (*see* **2.3**), and an impact at the other front corner and the other rear corner with the vehicle at the weight given in **2.4**.

D-2.8.2 The impactor (*see* figure 3) should be placed so that plane A is vertical and the reference line is horizontal and at the reference height of 445 mm.

D-2.8.3 The vehicle should be aligned so that a corner of the vehicle touches the impactor without moving it. In addition, the following conditions shall be met:

a) Plane A of the impactor shall make an angle of 60±5° with the longitudinal median plane of the vehicle; and
b) The point of the first contact shall be in the vertical median plane of the impactor (within a tolerance of ± 25 mm).

D-2.8.4 The vehicle should be impacted at a speed of $2.5^{+0.1}_{-0}$ km/h

D-3 CONDITIONS GOVERNING REPAIR, REPLACEMENT AND MEASUREMENT

D-3.1 The protective devices and the mountings attaching them to the vehicle structure may be repaired or replaced between the tests.

D-3.2 If the protective devices include self-restoring materials, the permitted recovery time between tests shall be as stated by the manufacturer.

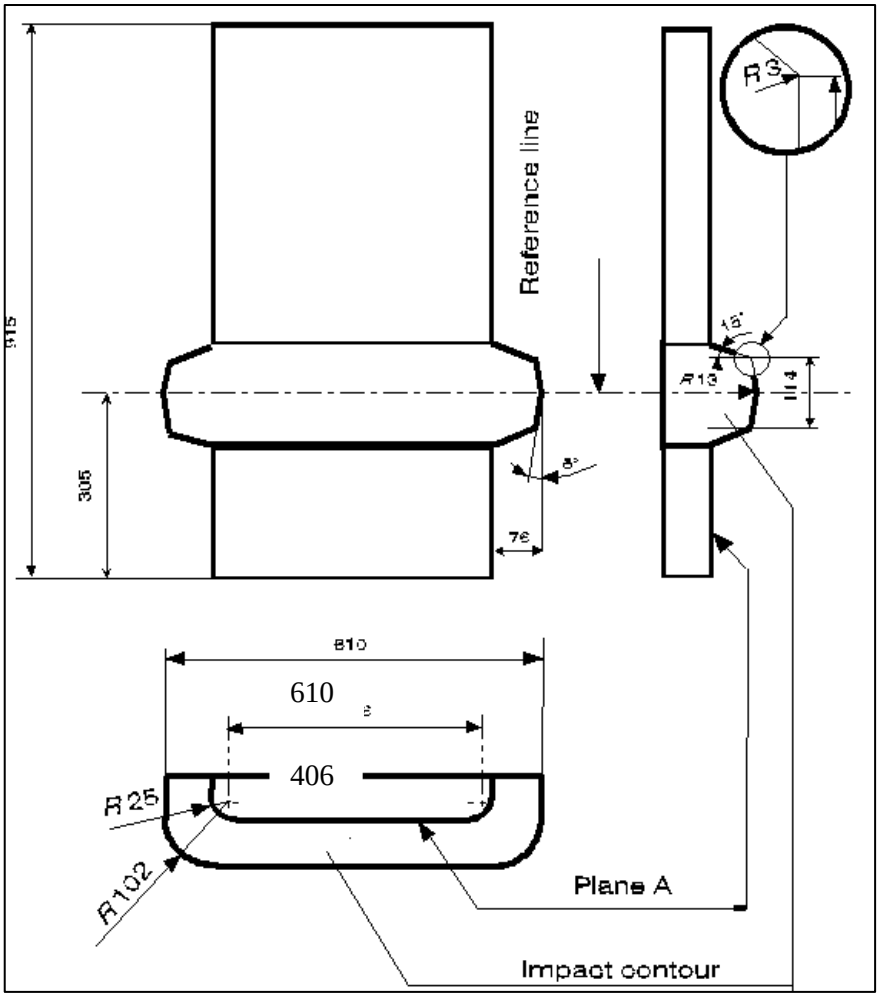
D-3.3 If the manufacturer so requests, a vehicle of the same type may be used for each test.

D-3.4 If the manufacturer so requests, the testing agency responsible for conducting the tests may allow the same vehicle as is used for tests prescribed by other standards (including tests capable of affecting its structure) to be used also for the tests prescribed by this standard.

D-3.5 If the test has been carried out at an impact speed or with an impact mass exceeding those indicated in **D-2.7.5** and **D-2.8.4** above, and the vehicle has satisfied the conditions prescribed, the test is considered satisfactory.

D-3.6 Measuring instruments

The instrument used to record the speed referred to in **D-2.7.5** and **D-2.8.4** above shall be accurate to within one per cent.



All Dimensions in millimeters.
FIG. 3 IMPACTOR

(TED 29)