

No. 4789. AGREEMENT CONCERNING THE ADOPTION OF UNIFORM CONDITIONS OF APPROVAL AND RECIPROCAL RECOGNITION OF APPROVAL FOR MOTOR VEHICLE EQUIPMENT AND PARTS. DONE AT GENEVA, ON 20 MARCH 1958 ¹

REGULATION No. 12 : ² UNIFORM PROVISIONS CONCERNING THE APPROVAL OF VEHICLES WITH REGARD TO THE PROTECTION OF THE DRIVER AGAINST THE STEERING MECHANISM IN THE EVENT OF IMPACT

Authentic texts : English and French.

Registered ex officio on 1 July 1969.

1. SCOPE

This Regulation applies to the behaviour of the steering mechanism of passenger cars and conversions of such vehicles, other than forward-control vehicles, when subjected to two types of force, viz. :

- 1.1. forces produced by a head-on collision which may cause rearward movement of the steering control ;
- 1.2. forces due to the inertia of the mass of the driver in the event of impact against the steering control in a head-on collision.

2. DEFINITIONS

For the purposes of this Regulation,

- 2.1. " Approval of a vehicle " means the approval of a vehicle type with regard to the protection of the driver against the steering mechanism in the event of impact ;
- 2.2. " Vehicle type " means a category of motor vehicles which do not differ in such essential respects as :
 - 2.2.1. the structure, dimensions, lines and constituent materials of that part of the vehicle forward of the steering control ;
 - 2.2.2. the maximum permissible weight of the vehicle ;
- 2.3. " Steering control " means the steering device, usually the steering wheel, which is actuated by the driver ;
- 2.4. " Steering column " means the housing enclosing the steering shaft ;

¹ United Nations, *Treaty Series*, vol. 335, p. 211 ; for subsequent actions relating to this Agreement, see references in Cumulative Indexes Nos. 4 to 8, as well as annex A in volumes 601, 606, 607, 609, 630, 631, 652, 656, 659, 667, 669, 672 and 673.

² Came into force on 1 July 1969 in respect of France, the Netherlands and the United Kingdom of Great Britain and Northern Ireland, in accordance with article 1, paragraph 5.

- 2.5. "Steering shaft" means the component which transmits to the steering gear housing the torque applied to the steering control ;
- 2.6. "Steering mechanism" means the aggregate comprising the steering control, the steering column, the assembly accessories, the steering shaft, the steering gear housing, and all other components such as those designed to contribute to the absorption of energy in the event of impact against the steering wheel ;
- 2.7. "Forward control" means a configuration in which more than half of the engine length is rearward of the foremost point of the windshield base and the steering wheel hub is in the forward quarter of the vehicle length.

3. APPLICATION FOR APPROVAL

- 3.1. The application for approval of a vehicle type with regard to the protection of the driver against the steering mechanism in the event of impact shall be submitted by the vehicle manufacturer or by his duly accredited representative.
- 3.2. It shall be accompanied by the undermentioned documents in triplicate and the following particulars :
 - 3.2.1. a detailed description of the vehicle type with respect to the structure, the dimensions, the lines and the constituent materials of that part of the vehicle forward of the steering control ;
 - 3.2.2. drawings, on an appropriate scale and in sufficient detail, of the steering mechanism and of its attachment to the vehicle chassis and body ; and
 - 3.2.3. a technical description of the mechanism.
- 3.3. A vehicle, representative of the vehicle type to be approved, shall be submitted to the technical service conducting approval tests for the test referred to in paragraph 5.1 below ;
- 3.3.2. at the manufacturer's discretion, either a second vehicle, or those parts of the vehicle regarded by him as essential for the test referred to in paragraph 5.2 below.

4. APPROVAL

- 4.1. If the vehicle type submitted for approval pursuant to this Regulation meets the requirements of paragraphs 5 and 6 below, approval of that vehicle type shall be granted.
- 4.2. An approval number shall be assigned to each type approved. The same Contracting Party may not assign the same number to the same vehicle type equipped with another type of steering mechanism, or to another vehicle type.
- 4.3. Notice of approval or of refusal of approval of a vehicle type pursuant to this Regulation shall be communicated to the Parties to the Agreement which apply this Regulation by means of a form conforming to the model in Annex 1

to the Regulation and of drawings of the steering mechanism (supplied by the applicant for approval) in a format not exceeding A 4 (210 × 297 mm) or folded to this format and on an appropriate scale.

- 4.4. There shall be affixed, conspicuously and in a readily accessible place specified on the approval form, to every vehicle conforming to a vehicle type approved under this Regulation, an international approval mark consisting of:
 - 4.4.1. a circle surrounding the letter "E" followed by the distinguishing number of the country which has granted approval;¹
 - 4.4.2. the number of this Regulation, followed by the letter "R", a dash and the approval number, below the circle.
- 4.5. The approval mark shall be clearly legible and be indelible.
- 4.6. Annex 2 to this Regulation gives an example of the arrangement of the approval mark.

5. SPECIFICATIONS

- 5.1. When the unladen car without a dummy is collision-tested against a barrier at a speed of 48.3 km/h (30 mph), the top of the steering column and its shaft shall not move backwards, horizontally and parallel to the longitudinal axis of the vehicle, by more than 12.7 cm (5 inches) in relation to a point of the vehicle not affected by the impact, the distance being determined by dynamic measurement.
- 5.2. When the steering control is struck by a body block released against this control at a relative speed of 24.1 km/h (15 mph), the force exerted on the "chest" of the body block by the steering control shall not exceed 1,135 kgf (2,500 lb. 1,111 daN.).
 - 5.2.1. The steering control shall be so designed, constructed and fitted as not to comprise either any dangerous roughness or sharp edges likely to increase the danger or severity of injuries to the driver in the event of impact.
 - 5.2.2. The steering control shall be so designed, constructed and fitted as not to embody components or accessories, including the horn control and assembly accessories, capable of catching in the driver's clothing or jewellery in normal driving movements.

6. TESTS

Compliance with the requirements of paragraph 5 above shall be checked in accordance with the methods set out in Annexes 3 and 4 to this Regulation.

¹ 1 for the Federal Republic of Germany, 2 for France, 3 for Italy, 4 for the Netherlands, 5 for Sweden, 6 for Belgium, 7 for Hungary, 8 for Czechoslovakia, 9 for Spain, 10 for Yugoslavia and 11 for the United Kingdom; subsequent numbers shall be assigned to other countries in the chronological order in which they ratify the Agreement concerning the Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts, or in which they accede to that Agreement, and the numbers thus assigned shall be communicated by the Secretary-General of the United Nations to the Contracting Parties to the Agreement.

7. CONFORMITY OF PRODUCTION

- 7.1. Every vehicle bearing an approval mark as prescribed under this Regulation shall conform to the vehicle type approved, more particularly as regards features contributing to the protection of the driver against the steering mechanism in the event of impact.
- 7.2. In order to verify conformity as prescribed in paragraph 7.1 above, a sufficient number of serially-produced vehicles, bearing the approval mark required by this Regulation, shall be subjected to random checks.
- 7.3. As a general rule the checks as aforesaid shall be confined to the taking of measurements. However, if necessary, the vehicles shall be subjected to the test prescribed in paragraph 5 above.

8. PENALTIES FOR NON-CONFORMITY OF PRODUCTION

- 8.1. The approval granted in respect of a vehicle type pursuant to this Regulation may be withdrawn if the requirements laid down in paragraph 7.1 are not complied with, or if the vehicle fails to pass the test provided for in paragraphs 7.2 and 7.3 above.
- 8.2. If a Party to the Agreement which applies this Regulation withdraws an approval it has previously granted, it shall forthwith notify the other Contracting Parties applying this Regulation thereof by means of a copy of the approval form bearing at the end, in large letters, the signed and dated annotation "APPROVAL WITHDRAWN".

9. NAMES AND ADDRESSES OF TECHNICAL SERVICES CONDUCTING APPROVAL TESTS AND OF ADMINISTRATIVE DEPARTMENTS

The Parties to the Agreement applying this Regulation shall communicate to the United Nations Secretariat the names and addresses of the technical services conducting approval tests and of the administrative departments which grant approval and to which forms certifying approval or refusal or withdrawal of approval, issued in other countries, are to be sent.

ANNEX 1

[Maximum format : A 4 (210 × 297 mm)]



NAME OF ADMINISTRATION

COMMUNICATION CONCERNING THE APPROVAL
(OR REFUSAL OR WITHDRAWAL OF APPROVAL)
OF A VEHICLE TYPE WITH REGARD TO THE PROTECTION
OF THE DRIVER AGAINST THE STEERING MECHANISM
IN THE EVENT OF IMPACT,
PURSUANT TO REGULATION No. 12

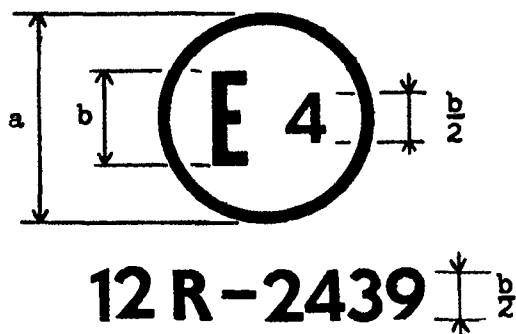
Approval No.

1. Trade name or mark of the motor vehicle
2. Vehicle type
3. Manufacturer's name and address
4. If applicable, name and address of the manufacturer's representative
5. Brief description of the steering mechanism and the components of the vehicle contributing to the protection of the driver against the steering mechanism in the event of impact
6. Vehicle presented for approval on
7. Technical service conducting approval tests
8. Date of report issued by that service
9. Number of report issued by that service
10. Approval granted /refused *
11. Position of approval mark on the vehicle
12. Place
13. Date
14. Signature
15. The following documents, bearing the approval number shown above, are annexed to this communication :
 - ... drawings, diagrams and plans of the steering mechanism ;
 - ... photographs of the steering mechanism and other components contributing to the protection of the driver against the steering mechanism in the event of impact.

* Strike out whatever does not apply.

ANNEX 2

ARRANGEMENT OF THE APPROVAL MARK



	a	b
Minimum dimensions	12	5.6

(millimetres)

The above approval mark affixed to a vehicle shows that, pursuant to Regulation No. 12 the vehicle type concerned has, with regard to the protection of the driver against the steering mechanism in the event of impact, been approved in the Netherlands (E 4) under approval No. 2439.

ANNEX 3

FRONT IMPACT TEST AGAINST A BARRIER

1. *Purpose*

The purpose of this test is to verify whether the vehicle satisfies the requirements set forth in paragraph 5.1 of this Regulation.

2. *Installations, procedures and measuring instruments*2.1. *Testing site*

The test area must be enough to accommodate the run-up track, barrier and technical installations necessary for the test. The last part of the track, for at least 5 m before the barrier must be horizontal, flat and stabilized.

2.2. *Barrier*

The barrier shall consist of a block of reinforced concrete at least 3 m (10 ft) wide, at least 1.5 m (5 ft) high and at least 0.6 m (2 ft) thick. The collision wall must be perpendicular to the last part of the run-up track and be covered with plywood 2 cm (3/4 inch) thick. At least 90 tons (200,000 lb) of earth must be banked up behind the concrete block. The concrete and earth barrier may be replaced by obstacles having the same frontal area and producing equivalent results.

2.3. *Propulsion of vehicle*

At the moment of impact the vehicle must be moving freely as a result of its propulsion. It must reach the obstacle on a course perpendicular to the collision wall ; the maximum lateral disalignment tolerated between the vertical median line of the front of the vehicle and the vertical median line of the collision wall is ± 30 cm (± 12 inches).

2.4. *State of vehicle*

During the test, the vehicle must be fitted with all its normal parts and equipment. In addition, objects in the passenger compartment must not accidentally strike the steering wheel (tip-up driver's seat, rear seat cushion, etc.).

2.5. *Speed*

The speed at the time of impact must be between 48.3 km/h (30 mph) and 53.1 km/h (33 mph).

2.6. *Measuring instruments*

2.6.1. The instrument used to record the measurements referred to in paragraph 3.1 below must have the following degrees of accuracy :

2.6.1.1. Speed of vehicle : within 1/100.

2.6.1.2. Time recording : within 1/1,000 second.

2.6.1.3. The beginning of the impact (zero point) at the moment of first contact of the vehicle with the obstacle, shall be reproduced on the recordings and films used for evaluating the test.

2.6.2. The distance referred to in paragraph 3.1 below must be measured to within ± 5 mm.

3. *Results*

3.1. To determine the rearward movement of the steering control, a recording shall be made,¹ during the collision, of the variation in the distance — measured horizontally and parallel to the longitudinal axis of the vehicle — between the top of the steering column (and shaft) and a point on the vehicle which is not affected by the impact. If the speed measured is higher than the nominal speed of 48.3 km/h (30 mph), this displacement shall be reduced to the corrected value appropriate to the nominal speed by multiplying it by the square of the ratio between this nominal speed and the speed measured.

3.2. After the test, the damage sustained by the vehicle shall be described in a written report ; at least one photograph must be taken of each of the following views of the vehicle :

3.2.1. sides (right and left),

3.2.2. front,

3.2.3. bottom,

3.2.4. affected area inside the passenger compartment.

¹ This recording may be replaced by maximum and minimum measurements.

4. *Equivalent test methods*

Equivalent non-destructive test methods are permitted, provided that the results referred to in paragraph 3 above can be obtained either entirely by means of the substitute test, or by calculation from the results of the substitute test. If a method other than that described in paragraphs 2 and 3 above is used, its equivalence must be demonstrated.

ANNEX 4

TEST FOR ENERGY ABSORPTION CAPACITY IN THE EVENT OF IMPACT AGAINST THE STEERING CONTROL

1. *Purpose*

The purpose of the test is to verify whether the vehicle meets the requirements set forth in paragraph 5.2 of this Regulation.

2. *Installations, procedures and measuring instruments*

2.1. *Mounting of the steering control*

2.1.1. The control shall be mounted on the front section of the vehicle obtained by cutting the body transversely at the level of the front seats, and possibly eliminating the roof, windscreen and doors. This section shall be fixed rigidly to the test bench, so that it does not move under the impact of the body block.

2.1.2. However, at the request of the manufacturer, the steering control may be mounted on a framework simulating the mounting of the steering mechanism, provided that as compared with the real "front body section and steering", the "framework and steering" assembly has :

2.1.2.1. the same geometrical lay-out,

2.1.2.2. a greater rigidity.

2.2. During the first test, the steering control shall be turned so that its most rigid spoke is perpendicular to the point of contact with the body block ; if the steering control is a steering wheel, the test shall be repeated with the most flexible part of the steering wheel perpendicular to this point of contact. In the case of an adjustable steering control, both tests shall be made with the wheel adjusted to the middle position.

2.3. *Body block*

The body block shall have the shape, dimensions, weight and characteristics shown in the appendix to this Annex.

2.4. *Measurement of forces*

2.4.1. Measurements shall be made of the maximum force, acting horizontally and parallel to the longitudinal axis of the vehicle, applied to the body block as a result of impact against the steering control.

2.4.2. This force may be measured directly or indirectly, or may be calculated from values measured during the test.

2.5. *Propulsion of the body block*

Any method of propulsion may be used, provided that when the body block strikes the steering control it is free from all connexion with the propelling device. The body block must strike this control after an approximately straight trajectory, parallel to the longitudinal axis of the front section of the car. The initial contact of the body block with the steering control must take place at the point where contact will normally occur when a man weighing 75.3 kg (166 lb) and having a height of 1.73 m (68.3 inches),¹ occupying the driver's seat of the vehicle (set at the most forward position), is thrown forward, parallel to the longitudinal axis of the vehicle until he touches the steering wheel.

2.6. *Speed*

The body block must strike the steering control at a speed of at least 24.1 km/h (15 mph).

2.7. *Measuring instruments*

2.7.1. The instrument used to record the measurements referred to in paragraph 3.2 below must have the following degrees of accuracy :

2.7.1.1. Speed of body block : within 2/100.

2.7.1.2. Time recording : within 1/1000 second.

2.7.1.3. The beginning of the impact (zero point) at the moment of first contact of the body block with the steering control shall be reproduced on the recordings and films used for evaluating the test.

2.7.1.4. Measurement of force : the measuring range shall be 4,000 kg (8818 lb, 3,920 daN). The force must be recorded without distortion for phenomena having frequencies up to 1,000 cycles, with an accuracy of 2.5 per cent of the maximum measuring range or ± 5 per cent of the real value.

2.7.1.5. Transverse sensitivity : below 5 per cent of the measuring range.

3. *Results*

3.1. After the test, the damage sustained by the steering mechanism shall be ascertained and described in a written report ; at least one side view and one front view of the " steering control /steering column /instrument panel " area shall be photographed.

3.2. A recording shall be made, during the collision, of the total forces applied to the chest of the body block by the steering control, measured as described in paragraph 2.7 above.

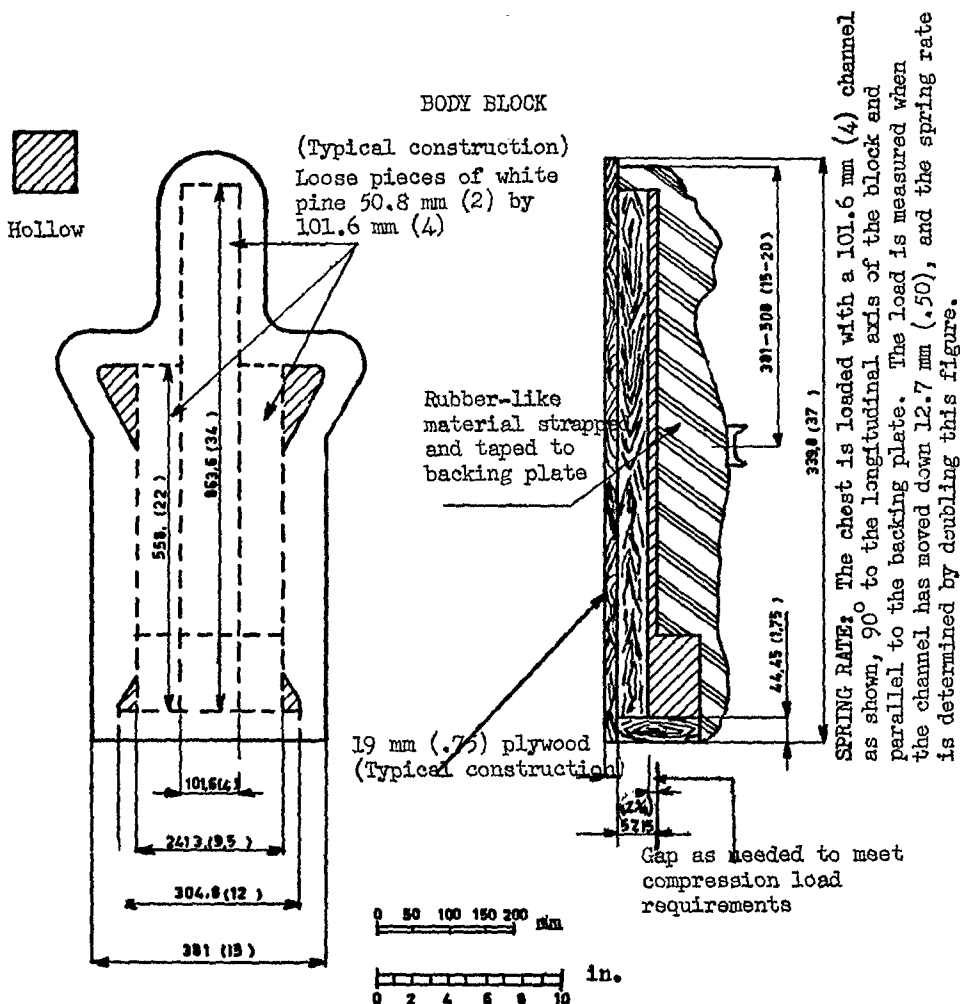
4. *Equivalent test methods*

Equivalent non-destructive test methods are permitted, provided that the results referred to in paragraph 3 above can be obtained either entirely by means of the substitute test, or by calculation from the results of the substitute test. If a method other than that described in paragraphs 2 and 3 is used, its equivalence must be demonstrated.

¹ These dimensions correspond to the 50th percentile body block with the specifications of the *National Centre for Health Statistics, series 11, No. 8*, United States of America Centre for Health, Education and Welfare, 12 May 1967.

ANNEX 4 Appendix

(Values indicated in millimetres,
in brackets, corresponding values in inches)



Body block, 34-36.3 kg (75-80 lb) weight. 50th percentile torso shape block, spring rate: 107-142 kg/cm (600-800 lb)