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Contents

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Acts whose titles are printed in light type are those relating to day-to-day management of agricultural matters, and are generally valid for a limited period.

The titles of all other acts are printed in bold type and preceded by an asterisk.

II

(Non-legislative acts)

ACTS ADOPTED BY BODIES CREATED BY INTERNATIONAL AGREEMENTS

Only the original UN/ECE texts have legal effect under international public law. The status and date of entry into force of this Regulation should be checked in the latest version of the UN/ECE status document TRANS/WP.29/343, available at: https://unece.org/status-1958-agreement-and-annexed-regulations

UN Regulation No 161 – Uniform provisions concerning the protection of motor vehicles against unauthorized use and the approval of the device against unauthorized use (by mean of a locking system) [2021/2274]

Date of entry into force: 30 September 2021

This document is meant purely as documentation tool. The authentic and legally binding text is: ECE/TRANS/WP.29/2021/48.

CONTENTS

Annexes

1. Scope

This Regulation applies to:

1.1. Approval of a vehicle of category M_1 and N_1 [1] with regard to its devices to prevent unauthorized use.

1.2. The fitting of devices to vehicles of other categories is optional but any such device fitted is required to comply with all relevant provisions of this Regulation.

1.3. At the request of the manufacturer, Contracting Parties may grant approvals according to this Regulation to vehicles of other categories and devices for fitment to such vehicles.

1.4. This Regulation does not apply to radio transmission frequencies, whether or not related to the protection of vehicles against unauthorized use.

2. Definitions

2.1. '*Component*' means a device subject to the requirements of this Regulation and intended to be part of a vehicle, which may be type-approved independently of a vehicle where this Regulation makes express provisions for so doing.

2.2. '*Separate technical unit*' means a device subject to the requirements of this Regulation and intended to be part of a vehicle, which may be type-approved separately, but only in relation to one or more specified types of vehicle where this Regulation makes express provisions for so doing.

2.3. '*Manufacturer*' means the person or body who is responsible to the approval authority for all aspects of the type approval process and for ensuring conformity of production. It is not essential that the person or body is directly involved in all stage of the construction of the vehicle, system, component or separate technical unit which is the subject of the approval process.

2.4. '*Vehicle type*' means a category of motor vehicles which do not differ in such essential respects as:

2.4.1. The manufacturer's type designation,

2.4.2. The arrangement and design of the vehicle component or components on which the device to prevent unauthorized use acts,

2.4.3. The type of device to prevent unauthorized use.

2.5. '*Device to prevent unauthorized use*' means a locking system designed to prevent unauthorized normal activation of the engine or other source of main engine power of the vehicle in combination with at least one system which:

(a) locks the steering; or

(b) locks the transmission; or

(c) locks the gearshift control; or

(d) locks brakes.

In the case of a system which locks brakes, deactivation of the device shall not automatically release the brakes contrary to the driver's intention.

2.6. '*Steering*' means the steering control, the steering column and its accessory cladding, the steering shaft, the steering gearbox and all other components which directly affect the effectiveness of the device to prevent unauthorized use.

2.7. '*Combination*' means one of the specifically developed and constructed variations of a locking system which, when properly activated, permits operation of the locking system.

[1] As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3), document ECE/TRANS/WP.29/78/Rev.6. https://unece.org/transport/standards/transport/vehicle-regulations-wp29/resolutions.

2.8. '*Key*' means any device designed and constructed to provide a method of operating a locking system which is designed and constructed to be operated only by that device.

2.9. '*Rolling code*' means an electronic code consisting of several elements the combination of which changes at random after each operation of the transmitting unit.

3. Application for approval

3.1. The application for approval of a vehicle or component type with regard to this Regulation shall be submitted by the manufacturer.

3.2. It shall be accompanied by an information document established in accordance with the model shown in Annex 1, and giving a description of the technical characteristics of the device to prevent unauthorized use and the method(s) of installation for each make and type of vehicle on which the protective device is intended to be installed.

3.3. Vehicle(s)/component(s) representative of the type(s) to be approved shall be submitted to the technical service responsible for conducting the approval tests.

4. Approval

4.1. If the type submitted for approval to this Regulation meets the requirements of this Regulation, approval of that type shall be granted.

4.2. An approval number shall be assigned to each type approved. Its first two digits (at present 00, corresponding to the Regulation in its original form) shall indicate the series of amendments incorporating the most recent major technical amendment made to the Regulation at the time of issue of the approval. The same Contracting Party shall not assign the same number to another type of vehicle or component as defined in this Regulation.

4.3. Notice of approval or of extension of approval of a type pursuant to this Regulation shall be communicated to the Contracting Parties to the Agreement applying this Regulation by means of a form conforming to the model in Annex 2 to this Regulation.

4.4. There shall be affixed, conspicuously and in a readily accessible place specified on the approval form, to every vehicle or component conforming to a 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 ([2]), and

4.4.2. the number of this Regulation, followed by the letter 'R', a dash and the approval number, to the right of the circle prescribed in paragraph 4.4.1.

4.5. If a type conforms to a type approved, under one or more other UN Regulations annexed to the Agreement, in the country which has granted approval under this Regulation, the symbol prescribed in paragraph 4.4.1. need not be repeated; in such a case, the Regulation under which approval has been granted in the country which has granted approval under this Regulation shall be placed in vertical columns to the right of the symbol prescribed in paragraph 4.4.1.

4.6. The approval mark shall be clearly legible and be indelible.

4.7. In the case of a vehicle, the approval mark shall be placed close to or on the vehicle data plate affixed by the manufacturer.

4.8. Annex 3 to this Regulation gives examples of arrangements of approval marks.

5. Approval of a vehicle of category M_1 and N_1 with regard to its devices to prevent unauthorized use

5.1. General specifications

5.1.1. The device to prevent unauthorized use shall be so designed that it is necessary to put it out of action in order to enable:

([2]) The distinguishing numbers of the Contracting Parties to the 1958 Agreement are reproduced in Annex 3 to the Consolidated Resolution on the Construction of Vehicles (R.E.3), document ECE/TRANS/WP.29/78/Rev.6 - https://unece.org/transport/standards/transport/vehicle-regulations-wp29/resolutions.

5.1.1.1. the engine to be started by means of the normal control, and

5.1.1.2. the vehicle to be steered, driven or moved forward under its own power.

5.1.1.3. The requirement of paragraph 5.1.1. can be achieved at the same time as or before to the actions described at paragraphs 5.1.1.1. and 5.1.1.2.

5.1.2. The requirements of paragraph 5.1.1. shall be met by the application of a single key.

5.1.3. Except in the case provided for in paragraph 5.2.1.5., a system operated with a key inserted in a lock shall not permit removal of the key before the device referred to in paragraph 5.1.1. has come into action or has been set to act.

5.1.4. The device to prevent unauthorized use referred to in paragraph 5.1.1. above, and the vehicle components on which it operates, shall be so designed that it cannot rapidly and without attracting attention be opened, rendered ineffective or destroyed by, for example, the use of low-cost, easily concealed tools, equipment or fabrications readily available to the public at large.

5.1.5. The device to prevent unauthorized use shall be fitted to the vehicle as an item of original equipment (i.e. equipment installed by the vehicle manufacturer prior to first retail sale). It shall be fitted in such a way that even after removal of its housing it cannot, when in the blocked condition, be dismantled other than with special tools. If it is possible to render the device to prevent unauthorized use ineffective by the removal of screws, those screws shall, unless they are of the non-removable type, be covered by parts of the blocked protective device.

5.1.6. Mechanical locking systems shall provide at least 1 000 different key combinations or a number equal to the total number of vehicles manufactured annually if less than 1 000. In vehicles of one type the frequency of occurrence of each combination shall be roughly one per 1 000.

5.1.7. Electrical/electronic locking systems, e.g. remote control, shall have at least 50 000 variants and shall incorporate a rolling code and/or have a minimum scan time of 10 days, e.g. a maximum of 5 000 variants per 24 hours for 50 000 variants minimum.

5.1.8. Regarding the nature of the device to prevent the unauthorized use, paragraph 5.1.6. or 5.1.7., shall be applied.

5.1.9. The key and lock shall not be visibly coded.

5.1.10. The lock shall be so designed, constructed and fitted that turning of the lock cylinder, when in the locked position, with a torque of less than 2,45 Nm is not possible with any key other than the mating key, and

5.1.10.1. For lock cylinders with pin tumblers no more than two identical tumblers operating in the same direction shall be positioned adjacent to each other, and in a lock there shall not be more than 60 per cent identical tumblers;

5.1.10.2. For lock cylinders with disc tumblers no more than two identical tumblers operating in the same direction shall be positioned adjacent to each other, and in a lock there shall not be more than 50 per cent identical tumblers.

5.1.11. Devices to prevent unauthorized use shall be such as to exclude any risk of accidental operating failure while the engine is running, particularly in the case of blockage likely to compromise safety.

5.1.11.1. It shall not be possible to activate devices to prevent unauthorized use without first setting the engine controls to a stop condition and then performing an action which is not an uninterrupted continuation of stopping the engine or without first setting the engine controls to a stop condition and when the vehicle is stationary with the parking brake applied or the speed of the vehicle does not exceed 4 km/h.

5.1.11.2. In the case of devices to prevent unauthorized use, if the action of key withdrawal activates the device it shall either necessitate a minimum movement of 2 mm before activation of the device or incorporate an override facility to prevent accidental removal or partial withdrawal of the key.

5.1.11.3. Paragraphs 5.1.10., 5.1.10.1. or 5.1.10.2., and 5.1.11.2. are only applicable to devices which include mechanical keys.

5.1.12. Power assistance may be used only to activate the locking and/or unlocking action of the device to prevent unauthorized use. The device shall be kept in its operating position by any suitable means which does not need a power supply.

5.1.13. It shall not be possible to activate the motive power of the vehicle by normal means until the device to prevent unauthorized use has been deactivated.

5.1.14. Devices to prevent unauthorized use by preventing release of the brakes of the vehicle shall only be permitted when the working parts of the brakes are held in a locked position by a purely mechanical device. In this case the prescriptions of paragraph 5.1.13. do not apply.

5.1.15. If the device to prevent unauthorized use is equipped with a driver warning feature it shall be activated when the operator opens the driver's side door, unless the device has been activated and the key removed by the operator.

5.2. Particular specifications

In addition to the general specifications prescribed in paragraph 5.1., the device to prevent unauthorized use shall meet the particular conditions prescribed below:

5.2.1. Devices to prevent unauthorized use acting on the steering

5.2.1.1. A device to prevent unauthorized use acting on the steering shall render the steering inoperative. Before the engine can be started, the normal steering operation shall be restored.

5.2.1.2. When the device to prevent unauthorized use is set to act, it shall not be possible to prevent the device from functioning.

5.2.1.3. The device to prevent unauthorized use shall continue to meet the requirements of paragraphs 5.1.11., 5.2.1.1., 5.2.1.2. and 5.2.1.4. after it has undergone 2 500 locking cycles in each direction of the wear producing test specified in Part 1 of Annex 4 to this Regulation.

5.2.1.4. The device to prevent unauthorized use shall, in its activated position, satisfy one of the following criteria:

5.2.1.4.1. It shall be strong enough to withstand, without damage to the steering mechanism likely to compromise safety, the application of a torque of 300 Nm about the axis of the steering spindle in both directions under static conditions.

5.2.1.4.2. It shall incorporate a mechanism designed to yield or slip, such that the system will withstand, either continuously or intermittently, the application of a torque of at least 100 Nm. The locking system shall still withstand the application of this torque after the test specified in Part 2 of Annex 4 to this Regulation.

5.2.1.4.3. It shall incorporate a mechanism designed to permit the steering wheel to rotate freely on the blocked steering spindle. The blocking mechanism shall be strong enough to withstand the application of a torque of 200 Nm about the axis of the steering spindle in both directions under static conditions.

5.2.1.5. If the device to prevent unauthorized use is such that the key can be removed in a position other than the position in which the steering is inoperative, it shall be so designed that the manoeuvre required to reach that position and remove the key cannot be effected inadvertently.

5.2.1.6. If a component fails such that the torque requirements specified in paragraphs 5.2.1.4.1., 5.2.1.4.2. and 5.2.1.4.3. cannot be easily applied, yet the steering system remains blocked, the system shall satisfy the requirements.

5.2.2. Devices to prevent unauthorized use acting on the transmission or on brakes

5.2.2.1. A device to prevent unauthorized use acting on the transmission shall prevent the rotation of the vehicle's driving wheels.

5.2.2.2. A device to prevent unauthorized use by acting on brakes shall brake at least one wheel on each side of at least one axle.

5.2.2.3. When the device to prevent unauthorized use is set to act, it shall not be possible to prevent the device from functioning.

5.2.2.4. It shall not be possible for the transmission or brakes to be blocked inadvertently when the key is in the lock of the device to prevent unauthorized use, even if the device preventing starting of the engine has come into action or been set to act. This does not apply wherever the requirements of paragraph 5.2.2. of this Regulation are met by devices used for another purpose in addition and the lock under the conditions above is necessary for this additional function (e.g. electrical parking brake).

5.2.2.5. The device to prevent unauthorized use shall be so designed and constructed that it remains fully effective even after some degree of wear as a result of 2 500 locking cycles in each direction. In the case of a protective device acting on brakes, each mechanical or electrical sub-part of the device is concerned.

5.2.2.6. If the device to prevent unauthorized use is such that the key can be removed in a position other than the position in which the transmission or brakes are locked, it shall be so designed that the manoeuvre required to reach that position and remove the key cannot be effected inadvertently.

5.2.2.7. In the case when the protective device acting on the transmission is used, it shall be strong enough to withstand, without damage likely to compromise safety, the application in both directions and in static conditions of a torque 50 per cent greater than the maximum torque that can normally be applied to the transmission. In determining the level of this testing torque account shall be taken not of the maximum engine torque, but of the maximum torque that can be transmitted by the clutch or by the automatic transmission.

5.2.2.8. In the case of a vehicle equipped with a protective device acting on brakes, the device shall be capable of holding the laden vehicle stationary on a 20 per cent up- or down-gradient.

5.2.2.9. In the case of a vehicle equipped with a protective device acting on brakes, the requirements of this Regulation shall not be construed as a departure from the requirements of UN Regulation No 13 or 13-H even in the case of a failure.

5.2.3. Devices to prevent unauthorized use acting on the gearshift control

5.2.3.1. A device to prevent unauthorized use acting on the gearshift control shall be capable of preventing any change of gear.

5.2.3.2. In the case of manual gearboxes, it shall be possible to lock the gearshift lever in reverse only; in addition locking in neutral shall be permitted.

5.2.3.3. In the case of automatic gearboxes provided with a 'parking' position it shall be possible to lock the mechanism in the parking position only; in addition, locking in neutral and/or reverse shall be permitted.

5.2.3.4. In the case of automatic gearboxes not provided with a 'parking' position it shall be possible to lock the mechanism in the following positions only: neutral and/or reverse.

5.2.3.5. The device to prevent unauthorized use shall be so designed and constructed that it remains fully effective even after some degree of wear as a result of 2 500 locking cycles in each direction.

5.3. Electromechanical and electronic devices to prevent unauthorized use shall be submitted to the tests described in Annex 6.

6. Modification of the type and extension of approval

6.1. Every modification of the vehicle type or component type shall be notified to the Type Approval Authority which approved the vehicle or component type. The Type Approval Authority shall then either:

(a) decide, in consultation with the manufacturer, that a new type approval is to be granted; or

(b) apply the procedure contained in paragraph 6.1.1. (Revision) below and, if applicable, the procedure contained in paragraph 6.1.2. (Extension) below.

6.1.1. Revision

When particulars recorded in the information documents have changed and the Type Approval Authority considers that the modifications made are unlikely to have appreciable adverse effects and that in any case the foot controls still meet the requirements, the modification shall be designated a 'revision'.

In such a case, the Type Approval Authority shall issue the revised pages of the information documents as necessary, marking each revised page to show clearly the nature of the modification and the date of re-issue. A consolidated, updated version of the information documents, accompanied by a detailed description of the modification, shall be deemed to meet this requirement.

6.1.2. The modification shall be designated as an 'extension' if, in addition to the change of the data recorded in the information documents:

(a) further inspections or tests are required; or

(b) any information on the communication document (with the exception of its attachments) has changed; or

(c) approval to a later series of amendments is requested after its entry into force.

6.2. Confirmation or refusal of approval, specifying the alteration, shall be communicated by the procedure specified in paragraph 4.3. above to the Contracting Parties to the Agreement applying this Regulation.

6.3. The Type Approval Authority issuing the extension of approval shall assign a serial number to each communication form drawn up for such an extension.

7. Conformity of production procedures

The conformity of production procedures shall comply with those set out in the Agreement, Schedule 1 (E/ECE/TRANS/505/Rev.3), with the following requirements:

7.1. Vehicles/components under this Regulation shall be so manufactured as to conform to the type approved by meeting the requirements of the relevant part(s) of this Regulation.

7.2. For each type of vehicle or component the tests prescribed in the relevant part(s) of this Regulation shall be carried out on a statistically controlled and random basis, in accordance with one of the regular quality assurance procedures.

7.3. The authority which has granted approval may at any time verify the conformity control methods applied in each production facility. The normal frequency of these verifications shall be one every 2 years.

8. Penalties for non-conformity of production

8.1. The approval granted in respect of a vehicle/component type pursuant to this Regulation may be withdrawn if the requirements laid down in paragraph 7. above are not complied with.

8.2. If a Contracting Party to the Agreement applying this Regulation withdraws an approval it has previously granted, it shall forthwith so notify the other Contracting Parties applying this Regulation, by means of a form conforming to the model in Annex 2.

9. Production definitively discontinued

9.1. If the holder of the approval completely ceases to manufacture a vehicle/component type approved in accordance with this Regulation, he shall so inform the authority which granted the approval. Upon receiving the relevant communication, that authority shall inform thereof the other Contracting Parties to the Agreement applying this Regulation by means of a form conforming to the model in Annex 2.

10. Names and addresses of Technical Services responsible for conducting approval tests, and of the Type Approval Authorities

10.1. The Contracting Parties to the Agreement applying this Regulation shall communicate to the United Nations secretariat the names and addresses of the Technical Services responsible for conducting approval tests and of Type Approval Authorities which grant approval and to which forms certifying approval or extension or refusal or withdrawal of approval, issued in other countries are to be sent.

ANNEX 1

Information document

(Maximum format: A4 (210 mm × 297 mm))

In accordance with UN Regulation No 161 on uniform provisions concerning the protection of motor vehicles against unauthorized use and the approval of the device against unauthorized use (by mean of a locking system)

1. General

1.1. Make (trade name of manufacturer): .....

1.2. Type: .....

1.3. Means of identification of type, if marked on the device ([1]): .....

1.3.1. Location of that marking: .....

1.4. Category of vehicle ([2]): .....

1.5. Name and address of the manufacturer: .....

1.6. Location of the ECE approval mark: .....

1.7. Address(es) of assembly plant(s): .....

2. General construction characteristics of the vehicle

2.1. Photographs and/or drawings of a representative vehicle: .....

2.2. Hand of drive: left/right ([3]) .....

3. Miscellaneous

3.1. Devices to prevent unauthorized use of the vehicle

3.1.1. Protective device:

3.1.1.1. A detailed description of the vehicle type with regard to the arrangement and design of the control or of the unit on which the protective device acts: .....

3.1.1.2. Drawings of the protective device and of its mounting on the vehicle: .....

3.1.1.3. A technical description of the device: .....

3.1.1.4. Details of the lock combinations use: .....

([1]) If the means of identification of type contains characters not relevant to describe the vehicle, component or separate technical unit types covered in this information document, such characters shall be represented in the documentation by the symbol '?' (e.g. ABC??123??).

([2]) As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.6.

([3]) Strike out what does not apply.

ANNEX 2

Communication

(Maximum format: A4 (210 × 297 mm))

issued by: Name of administration:

.....

.....

.....

concerning (2): approval granted

approval extended

approval refused

approval withdrawn

production definitively discontinued

of a vehicle type with regard to its devices to prevent unauthorized use pursuant to UN Regulation No 161.

Approval No ..... Extension No .....

Reason for extension:

SECTION I

1. General

1.1. Make (trade name of manufacturer): .....

1.2. Type: .....

1.3. Means of identification of type, if marked on the vehicle/component/separate technical unit (2) (3): .....

1.3.1. Location of that marking: .....

1.4. Category of vehicle (4): .....

1.5. Name and address of manufacturer: .....

1.6. Location of the ECE approval mark: .....

1.7. Address(es) of assembly plant(s): .....

SECTION II

1. Additional information (where applicable): see addendum

2. Technical service responsible for carrying out the tests: .....

(1) Distinguishing number of the country which has granted/extended/refused/ withdrawn approval (see approval provisions in the Regulation).
(2) Strike out what does not apply (there are cases where nothing needs to be deleted, when more than one entry is applicable).
(3) If the means of identification of type contains characters not relevant to describe the vehicle, component or separate technical unit types covered in this information document, such characters shall be represented in the documentation by the symbol '?' (e.g. ABC??123??).
(4) As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3) document ECE/TRANS/WP.29/78/Rev.6.

3. Date of test report: .....

4. Number of test report: .....

5. Remarks (if any): see addendum

6. Place: .....

7. Date: .....

8. Signature: .....

9. The index to the information package lodged with the approval authority, which may be obtained on request, is attached.

Addendum

to UN type approval certificate No …

concerning the type approval of a vehicle with regard to UN Regulation No 161

1. Additional information: .....

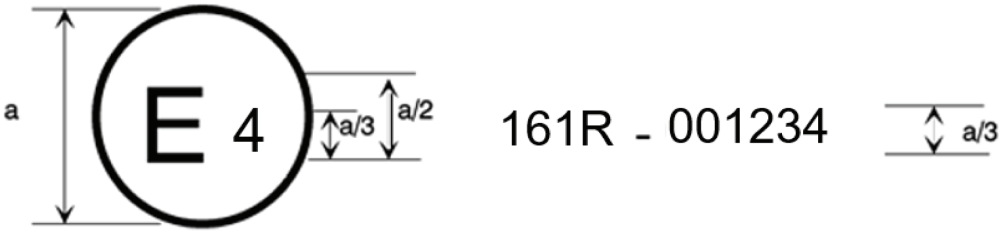
1.1. Brief description of the device(s) against unauthorized use and the vehicle parts on which it (they) act(s): .....

2. Remarks: .....

ANNEX 3

Arrangements of approval marks

(see paragraphs 4.4. to 4.4.2. of this Regulation)



a = 8 mm min.

The above approval mark affixed to a vehicle shows that the type concerned was approved in the Netherlands (E 4) pursuant to UN Regulation No 161 under approval No 001234. The first two digits (00) of the approval number indicate that the approval was granted in accordance with the requirements of UN Regulation No 161 in its original form.

ANNEX 4

PART 1

Wear producing test procedure for devices to prevent unauthorized use acting on the steering

1. Test equipment

The test equipment shall consist of:

1.1. A fixture suitable for mounting the sample steering complete with the device to prevent unauthorized use attached, as defined in paragraph 2.5. of this Regulation.

1.2. A means for activating and deactivating the device to prevent unauthorized use which shall include the use of the key.

1.3. A means for rotating the steering shaft relative to the device to prevent unauthorized use.

2. Test method

2.1. A sample of the steering complete with the device to prevent unauthorized use is attached to the fixture referred to in paragraph 1.1. above.

2.2. One cycle of the test procedure shall consist of the following operations:

2.2.1. Start position. The device to prevent unauthorized use shall be deactivated and the steering shaft shall be rotated to a position which prevents engagement of the device to prevent unauthorized use, unless it is of the type which permits locking in any position of the steering.

2.2.2. Set to activate. The device to prevent unauthorized use shall be moved from the deactivated to the activated position, using the key.

2.2.3. ([1]) Activated. The steering spindle shall be rotated such that the torque on it, at the instant of engagement of the device to prevent unauthorized use, shall be 40 Nm ± 2 Nm.

2.2.4. Deactivated. The device to prevent unauthorized use shall be deactivated by the normal means, the torque being reduced to zero to facilitate disengagement.

2.2.5. ([1]) Return. The steering spindle shall be rotated to a position which prevents engagement of the device to prevent unauthorized use.

2.2.6. Opposite rotation. Repeat procedures described in paragraphs 2.2.2., 2.2.3., 2.2.4. and 2.2.5, but in the opposite direction of rotation of the steering spindle.

2.2.7. The time interval between two successive engagements of the device shall be at least 10 seconds.

2.3. The wear-producing cycle shall be repeated the number of times specified in paragraph 5.2.1.3. of this Regulation.

PART 2

Test procedure for devices to prevent unauthorized use acting on the steering using a torque limiting device

1. Test equipment

The test equipment shall consist of:

1.1. A fixture suitable for holding the relevant parts of a steering system or, if the test is carried out on a complete vehicle, a jacking system capable of lifting all the steered wheels clear of the ground, and

([1]) If the device to prevent unauthorized use permits locking in any position of the steering, the procedures described in paragraphs 2.2.3. and 2.2.5. shall be omitted.

1.2. A device or devices capable of producing, and measuring, a torque applied to the steering control as prescribed in paragraph 2.3. The measurement precision shall be less than or equal to 2 per cent.

2. Test procedure description

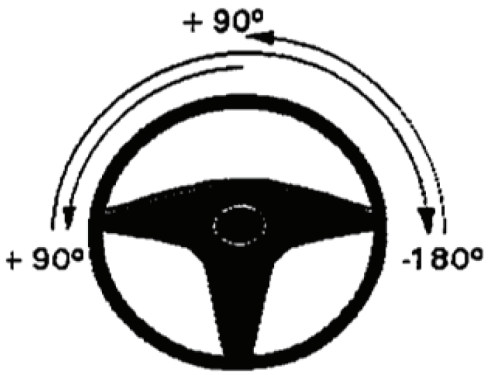
2.1. If the test is carried out on a complete vehicle, the test shall be carried out with all the steered wheels of the vehicle held clear of the ground.

2.2. The steering lock shall be activated such that the steering is blocked.

2.3. A torque shall be applied to the steering control such that it rotates.

2.4. The test cycle includes a rotation of the steering control of 90° followed by a rotation in the opposite direction of 180°, and a new rotation of 90° in the original direction (see figure);

1 cycle = + 90°/– 180°/+ 90° with a tolerance of ± 10 per cent.



2.5. A cycle duration is equal to 20 s ± 2 s.

2.6. Five test cycles shall be carried out.

2.7. During each of the test cycles the minimum recorded value of the torque shall be higher than that given in paragraph 5.2.1.4.2. of this Regulation.

ANNEX 5

(reserved)

ANNEX 6

Operation parameters and test conditions for devices to prevent unauthorized used (by mean of a locking system)

1. Operation parameters

The requirements below do not apply to:

(a) those components that are fitted and tested as part of the vehicle, whether or not a locking system is fitted (e.g. lamps, alarm system, immobilizer); or

(b) those components that have previously been tested as part of the vehicle and documentary evidence has been provided.

All components of the locking system shall operate without any failure under the following conditions.

1.1. Climatic conditions

Two classes of environmental temperature are defined as follows:

(a) – 40 °C to + 85 °C for parts to be fitted in the passenger or luggage compartment;

(b) – 40 °C to + 125 °C for parts to be fitted in the engine compartment unless otherwise specified.

1.2. Degree of protection for installation

The following degrees of protection in accordance with IEC publication 60529:1989 shall be provided:

(a) IP 40 for parts to be fitted in the passenger compartment;

(b) IP 42 for parts to be fitted in the passenger compartment of roadsters/convertibles and cars with moveable roof-panels if the installation location requires a higher degree of protection than IP 40;

(c) IP 54 for all other parts.

The locking system manufacturer shall specify in the installation instructions any restrictions on the positioning of any part of the installation with respect to dust, water and temperature.

1.3. Weatherability

7 days according to IEC publication 60068-2-30:1980.

1.4. Electrical conditions

Rated supply voltage: 12 V

Operation supply voltage range: from 9 V to 15 V in the temperature range according to paragraph 1.1.1

Time allowance for excess voltages at 23 °C:

U = 18 V, max. 1 h

U = 24 V, max. 1 min.

2. Test conditions

All the tests shall be carried out in sequence on a single locking system. However, at the discretion of the test authority, other samples may be used if this is not considered to affect the results of the other tests.

2.1. Normal test conditions

Voltage U = (12 ± 0,2) V

Temperature T = (23 ± 5) °C

3. Operation test

All components of the locking system shall comply with prescriptions given in paragraphs 3.2. to 3.9.

3.1 Upon completion of all the tests specified below, the locking system shall be tested under the normal test conditions specified in paragraph 2.1. to check that it continues to function normally. Where necessary, fuses may be replaced prior to the test.

If some of the tests required in each of these paragraphs prior to the operation tests are performed in series on a single locking system, the operation test may be carried out one time only after the chosen tests are completed instead of performing the operation tests required in the paragraphs after each of the chosen tests. Vehicle manufacturers and suppliers have to guarantee satisfactory results only on non-accumulated procedures.

3.2. Resistance to temperature and voltage changes

Compliance with the specifications defined under paragraph 3.1. shall also be checked under the following conditions:

3.2.1. Test temperature T (– 40 ± 2) °C

Test voltage U = (9 ± 0,2) V

Storage duration 4 hours

3.2.2. For parts to be fitted in the passenger or luggage compartment:

Test temperature T = (+ 85 ± 2) °C

Test voltage U = (15 ± 0,2) V

Storage duration 4 hours

3.2.3. For parts to be fitted in the engine compartment unless otherwise specified:

Test temperature T = (+ 125 ± 2) °C

Test voltage U = (15 ± 0,2) V

Storage duration 4 hours

3.2.4. The locking system, in both set and unset state, shall be submitted to an excess voltage equal to (18 ± 0,2) V for 1 hour.

3.2.5. The locking system, in both set and unset state, shall be submitted to an excess voltage equal to (24 ± 0,2) V for 1 min.

3.3. Safe operation after foreign body and water-tightness testing

After the test for tightness to foreign body and water according to IEC publication 60529:1989, for degrees of protection as in paragraph 1.1.2., the operation tests according to paragraph 3.1. shall be repeated.

With the agreement of the Technical Service this requirement need not apply in the following circumstances:

(a) Type Approval of a locking system which is to be type approved as a separate technical unit

In this case, the manufacturer of the locking system shall:

(i) specify in item 4.5. of the information document (Annex 1), that the requirement of this paragraph was not applied to the locking system (in accordance with paragraph 7. of this Regulation); and

(ii) specify in item 4.1. of the information document, the list of vehicles to which the locking system is intended to be fitted and the relevant installation conditions in item 4.2.

(b) Type approval of a vehicle in respect of a locking system

In this case, the vehicle manufacturer shall specify in item 3.1. of the information document (Annex 1), that the requirement of this paragraph does not apply to the locking system due to the nature of installation conditions and the vehicle manufacturer shall prove it by submitting related documents.

(c) Type approval of a vehicle in respect of the installation of a locking system which is type approved as a separate technical unit.

In this case, the vehicle manufacturer shall specify in item 3.1. of the information document (Annex 1), that the requirement of this paragraph does not apply to the installation of the locking system where the relevant installation conditions are met.

This requirement does not apply in cases where the information required in item 3.1. of Annex 1 has already been submitted for the approval of the separate technical unit.

3.4. Safe operation after condensed water test

After a resistance-to-humidity test to be carried out according to IEC publication 60068-2-30:1980 the operation tests according to paragraph 3.1. shall be repeated.

3.5. Test for safety against reversed polarity

The locking system and components thereof shall not be destroyed by reversed polarity up to 13 V during 2 min. After this test the operation tests according to paragraph 3.1. shall be repeated with fuses changed, if necessary.

3.6. Test for safety against short-circuits

All electrical connections of the locking system must be short-circuit proof against earth, max. 13 V and/or fused. After this test the operation tests according to paragraph 3.1. shall be repeated, with fuses changed if necessary.

3.7. Energy consumption in the set condition

The energy consumption in set condition under the conditions given in paragraph 2.1. shall not exceed 20 mA on average for the complete locking system including status display.

With the agreement of the Technical Service this requirement need not apply in the following circumstances:

(a) Type Approval of a locking system which is to be type approved as a separate technical unit

In this case, the manufacturer of the locking system shall:

(i) specify in item 4.5. of the information document (Annex 1), that the requirement of this paragraph was not applied to the locking system (in accordance with paragraph 7. of this regulation); and

(ii) specify in item 4.1. of the information document, the list of vehicles to which the locking system is intended to be fitted and the relevant installation conditions in item 4.2.

(b) Type approval of a vehicle in respect of a locking system

In this case, the vehicle manufacturer shall specify in item 3.1. of the information document (Annex 1), that the requirement of this paragraph does not apply to the locking system due to the nature of installation conditions and the vehicle manufacturer shall prove it by submitting related documents.

(c) Type approval of a vehicle in respect of the installation of a locking system which is type approved as a separate technical unit.

In this case, the vehicle manufacturer shall specify in item 3.1. of the information document (Annex 1), that the requirement of this paragraph does not apply to the installation of the locking system where the relevant installation conditions are met.

This requirement does not apply in cases where the information required in item 3.1. of Annex 1 has already been submitted for the approval of the separate technical unit.

3.8. Safe operation after vibration test

3.8.1. For this test, the components are subdivided into two types:

Type 1: components normally mounted on the vehicle,

Type 2: components intended for attachment to the engine.

3.8.2. The components/ locking system shall be submitted to a sinusoidal vibration mode whose characteristics are as follows:

3.8.2.1. For Type 1

The frequency shall be variable from 10 Hz to 500 Hz with a maximum amplitude of ± 5 mm and maximum acceleration of 3 g (0-peak).

3.8.2.2. For Type 2

The frequency shall be variable from 20 Hz to 300 Hz with a maximum amplitude of ± 2 mm and maximum acceleration of 15 g (0-peak).

3.8.2.3. For both type 1 and type 2

The frequency variation is 1 octave/min.

The number of cycles is 10, the test shall be performed along each of the 3 axes.

The vibrations are applied at low frequencies at a maximum constant amplitude and at a maximum constant acceleration at high frequencies.

3.8.3. During the test the locking system shall be electrically connected and the cable shall be supported after 200 mm.

3.8.4. After the vibration test the operation tests according to paragraph 3.1. shall be repeated.

3.9. Electromagnetic compatibility

The locking system shall be submitted to the tests described in Annex 7.

ANNEX 7

Electromagnetic compatibility

1. Immunity against disturbances conducted along supply lines

Tests shall be performed according to the technical prescriptions and transitional provisions of UN Regulation No 10, 06 series of amendments and according to the test methods described in Annex 10 for an Electrical/Electronic Sub-Assembly (ESA).

The VAS/AS shall be tested in unset state and in set state.

2. Immunity against radiated high frequency disturbances

Testing of the immunity of a VAS/AS in a vehicle may be performed according to the technical prescriptions and transitional provisions of UN Regulation No 10, 06 series of amendments and test methods described in Annex 6 for the vehicles or Annex 9 for an Electrical/Electronic Sub-Assembly (ESA).

The VAS/AS shall be tested with operating conditions and failure criteria as defined in Table 1

Table 1

Operating conditions and failure criteria for VAS/AS

Test type	VAS/AS operating conditions	Failure criteria
Vehicle test	VAS/AS in unset state Key ON or Vehicle at 50 km/h [1]	Unexpected activation of the VAS/AS
	VAS/AS in set state Key OFF	Unexpected deactivation of the VAS/AS
	VAS/AS in set state Vehicle in charging mode (if applicable)	Unexpected deactivation of the VAS/AS
ESA Test	VAS/AS in unset state	Unexpected activation of the VAS/AS
	VAS/AS in set state	Unexpected deactivation of the VAS/AS

[1] This test can be covered by the UN Regulation No 10, 50 km/h mode.

3. Electrical disturbance from electrostatic discharges

Immunity against electrical disturbances shall be tested in accordance with ISO 10605:2008/AMD 1:2014 using the test severity levels from table 2.

ESD tests shall be performed either at vehicle level or at Electrical/Electronic Sub-Assembly (ESA) level.

Table 2

ESD Test levels

Discharge type	Discharge points	VAS/AS state	Discharge network	Test Level	Failure criteria
Air discharge	Points that can easily be accessed only from the inside of the vehicle	VAS/AS in unset state (if test performed on vehicle then vehicle shall be Key ON or Vehicle at 50 km/h or engine in idle mode)	330 pF, 2 kΩ	± 6 kV	Unexpected activation of the VAS/AS
	Points that can easily be touched only from the outside of the vehicle	VAS/AS in set state (if test performed on vehicle then vehicle shall be locked and Key OFF)	150 pF, 2 kΩ	± 15 kV	Unexpected deactivation of the VAS/AS without reactivation, within 1s, after each discharge
Contact discharge	Points that can easily be accessed only from the inside of the vehicle	VAS/AS in unset state (if test performed on vehicle then vehicle shall be Key ON or Vehicle at 50 km/h or engine in idle mode)	330 pF, 2 kΩ	± 4 kV	Unexpected activation of the VAS/AS
	Points that can easily be touched only from the outside of the vehicle	VAS/AS in set state (if test performed on vehicle then vehicle shall be locked and Key OFF)	150 pF, 2 kΩ	± 8 kV	Unexpected deactivation of the VAS/AS without reactivation, within 1s, after each discharge

Each test shall be performed with 3 discharges with a minimum of 5 s interval between each discharge.

4. Radiated emissions

Tests shall be performed according to the technical prescriptions and transitional provisions of UN Regulation No 10, 06 series of amendments and according to the test methods described in Annexes 4 and 5 for vehicles or Annexes 7 and 8, for an Electrical/Electronic Sub-Assembly (ESA).

The VAS/AS shall be in set state.

UN Regulation No 162 – Uniform technical prescriptions concerning approval of immobilizers and approval of a vehicle with regard to its immobilizer [2021/2275]

Date of entry into force: 30 September 2021

This document is meant purely as documentation tool. The authentic and legally binding text is: ECE/TRANS/WP.29/2021/49.

CONTENTS

1. Scope

This UN Regulation applies to:

1.1. Approval of

(a) 'If fitted' immobilizers primarily dedicated to vehicles of Categories M_1 and N_1 with a maximum mass of not more than 2 tonnes; and

(b) Vehicles of Category M_1 and vehicles of Category N_1 with a maximum mass of not more than 2 tonnes with regard to fitted immobilizers [1] [2].

1.2. At the request of the manufacturer, Contracting Parties may grant approvals to vehicles of other categories and to immobilizers for fitment to such vehicles.

1.3. This Regulation does not apply to radio transmission frequencies, whether or not related to the protection of vehicles against unauthorized use.

2. Definitions

2.1. '*Component*' means a device subject to the requirements of this regulation and intended to be part of a vehicle, which may be type-approved independently of a vehicle where this regulation makes express provisions for so doing;

2.2. '*Separate technical unit*' means a device subject to the requirements of this regulation and intended to be part of a vehicle, which may be type-approved separately, but only in relation to one or more specified types of vehicle where this regulation makes express provisions for so doing;

2.3. '*Manufacturer*' means the person or body who is responsible to the approval authority for all aspects of the type approval process and for ensuring conformity of production. It is not essential that the person or body is directly involved in all stage of the construction of the vehicle, system, component or separate technical unit which is the subject of the approval process.

2.4. '*Immobilizer*' means a device which is intended to prevent normal driving away of a vehicle under its own power (prevention of unauthorized use).

2.5. '*Control equipment*' means equipment necessary for the setting and/or unsetting of an immobilizer.

2.6. '*Status display*' means any device intended to indicate the status of the immobilizer (set/unset, change of set to unset and vice versa).

2.7. '*Set state*' means the state in which the vehicle cannot be driven normally under its own power.

2.8. '*Unset state*' means the state in which the vehicle can be driven normally.

2.9. '*Key*' means any device designed and constructed to provide a method of operating a locking system, which is designed and constructed to be operated only by that device

[1] As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.6, para. 2 - https://unece.org/transport/standards/transport/vehicle-regulations-wp29/resolutions.

[2] Only vehicles with 12 volts electrical systems are considered.

2.10. '*Override*' means a design feature which locks the immobilizer in the unset condition.

2.11. '*Rolling code*' means an electronic code consisting of several elements the combination of which changes at random after each operation of the transmitting unit.

2.12. '*Type of immobilizer*' means systems which do not differ significantly in such essential aspects as:

(a) The manufacturer's trade name or mark;

(b) The kind of control equipment;

(c) The design of their operation on the relevant vehicle system(s) (as referred to in paragraph 5.2.1. below).

2.13. '*Vehicle type with regard to its immobilizer*' means vehicles which do not differ significantly in such essential aspects as:

(a) The manufacturer's trade name or mark;

(b) Vehicle features which significantly influence the performances of the immobilizer;

(c) The type and design of the immobilizer.

3. Application for approval

3.1. The application for approval of a vehicle or component type with regard to this Regulation shall be submitted by the manufacturer.

3.2. It shall be accompanied by an information document established in accordance with the model shown in Annex 1, and giving a description of the technical characteristics of the immobilizer and the method(s) of installation for each make and type of vehicle on which the immobilizer is intended to be installed.

3.3. Vehicle(s)/component(s) representative of the type(s) to be approved shall be submitted to the technical service responsible for conducting the approval tests.

4. Approval

4.1. If the type submitted for approval to this Regulation meets the requirements of this Regulation, approval of that type shall be granted.

4.2. An approval number shall be assigned to each type approved. Its first two digits (at present 00, corresponding to the Regulation in its original form) shall indicate the series of amendments incorporating the most recent major technical amendment made to the Regulation at the time of issue of the approval. The same Contracting Party shall not assign the same number to another type of vehicle or component as defined in this Regulation.

4.3. Notice of approval or of extension of approval of a type pursuant to this Regulation shall be communicated to the Contracting Parties to the Agreement applying this Regulation by means of a form conforming to the model in Annex 2 to this Regulation.

4.4. There shall be affixed, conspicuously and in a readily accessible place specified on the approval form, to every vehicle or component conforming to a 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 ([3]), and

4.4.2. The number of this Regulation, followed by the letter 'R', a dash and the approval number, to the right of the circle prescribed in paragraph 4.4.1.

4.5. If a type conforms to a type approved, under one or more other Regulations annexed to the Agreement, in the country which has granted approval under this Regulation, the symbol prescribed in paragraph 4.4.1. need not be repeated; in such a case, the Regulation under which approval has been granted in the country which has granted approval under this Regulation shall be placed in vertical columns to the right of the symbol prescribed in paragraph 4.4.1.

4.6. The approval mark shall be clearly legible and be indelible.

4.7. In the case of a vehicle, the approval mark shall be placed close to or on the vehicle data plate affixed by the manufacturer.

4.8. In the case of a component approved separately as an immobilizer, the approval mark shall be affixed by the manufacturer to the major element(s) of the device. In the case of a component approved as an immobilizer under this regulation and an alarm system under UN Regulation No 163 or UN Regulation No 116, Supplement 7 to the original version, or UN Regulation No 97 Supplement 8 to the 01 series of amendments both approval marks shall be affixed by the manufacturer to the major element(s) of the device.

4.9. Annex 3 to this Regulation gives examples of arrangements of approval marks.

4.10. As an alternative to the approval mark described in paragraph 4.4. above, a certificate of conformity shall be issued for every immobilizer offered for sale.

Where an immobilizer manufacturer supplies an unmarked immobilizer approved to this Regulation to a vehicle manufacturer, for fitment by that manufacturer as original equipment for a vehicle model or range of vehicle models, the immobilizer manufacturer shall supply a number of copies of the certificate of conformity to the vehicle manufacturer, sufficient for that manufacturer to obtain the vehicle approval of this Regulation.

If the immobilizer is made up of separate components, its main component(s) shall bear a reference mark and the certificate of conformity shall provide a list of such reference marks.

A model of the certificate of conformity is given in Annex 4 to this Regulation.

4.11. When an immobilizer, approved to this Regulation or UN Regulation No 116, Supplement 7 to the original version, or UN Regulation No 97, Supplement 8 to the 01 series of amendments as a separate technical unit, is installed in a vehicle submitted for approval to this Regulation, tests required to be passed by an immobilizer in order to obtain approval to this Regulation shall not be repeated.

([3]) The distinguishing numbers of the Contracting Parties to the 1958 Agreement are reproduced in Annex 3 to the Consolidated Resolution on the Construction of Vehicles (R.E.3), document ECE/TRANS/WP.29/78/Rev.6 - https://unece.org/transport/standards/transport/vehicle-regulations-wp29/resolutions.

5. Specifications

5.1. General Specifications

5.1.1. It must be possible to set and unset the immobilizer in accordance with these requirements.

5.1.2. An immobilizer and its installation shall be so designed that any equipped vehicle continues to meet the technical requirements.

5.1.3. It shall not be possible for an immobilizer to enter the set state when the ignition key is in the engine running mode, except when:

(a) The vehicle is equipped or intended to be equipped for ambulance, fire brigade or police purposes; or

(b) The engine is required to:

(i) Drive machinery forming part of, or mounted on, the vehicle for purposes other than driving the vehicle; or

(ii) Maintain the electrical power of the batteries of the vehicle at a level required for driving that machinery or apparatus;

and the vehicle is stationary with the parking brake applied. When this exception is used, this fact shall be stated under item 2 of the addendum to the communication document (Annex 2 to this Regulation).

5.1.4. It shall not be possible to permanently override an immobilizer.

5.1.5. The immobilizer shall be designed and built such that when installed it shall not adversely affect the designed function and the safe operation of the vehicle, even in the case of malfunction.

5.1.6. An immobilizer shall be designed and built such that, when installed on a vehicle, according to the manufacturer's instructions, it cannot rapidly and without attracting attention be rendered ineffective or destroyed by, e.g. the use of low cost easily concealed tools, equipment or fabrications readily available to the public at large. It shall be difficult and time consuming to replace a major component or assembly in order to bypass the immobilizer.

5.1.7. An immobilizer shall be so designed and built such that when installed as specified by the manufacturer it is able to withstand the environment within the vehicle for a reasonable lifetime (for testing see paragraph 5.3.). More particularly the electrical properties of the on-board circuitry shall not be adversely affected by the addition of the immobilizer (lead cross-sections, contact safety, etc.)

5.1.8. An immobilizer may be combined with other vehicle systems or may be integrated into them (e.g. engine management, alarm systems).

5.1.9. It shall not be possible for an immobilizer to prevent the release of the brakes of the vehicle, except in the case of an immobilizer which prevents the release of pneumatically released spring brakes ([4]) and functions in such a way that in normal operation, or in failure conditions, the technical requirements of UN Regulation No 13 in force at the time of application for type approval under this Regulation are satisfied.

Compliance with this paragraph does not exempt an immobilizer which prevents the release of pneumatically released spring brakes from the technical requirements set out in this Regulation.

5.1.10. It shall not be possible for an immobilizer to operate in such a manner as to apply the brakes of the vehicle.

([4]) As defined in Annex 8 of UN Regulation No 13, as amended.

5.2. Particular Specifications

5.2.1. Extent of disablement

5.2.1.1. An immobilizer shall be designed so as to prevent the operation of the vehicle under its own power by at least one of the following means:

5.2.1.1.1. disable, in the case of after-market fitting, or vehicle equipped with diesel engine, at least two separate vehicle circuits that are needed for vehicle operation under its own power (e.g. starter motor, ignition, fuel supply, pneumatically released spring brakes, etc.);

5.2.1.1.2. interference by code of at least one control unit required for the operation of the vehicle.

5.2.1.2. An immobilizer for fitment to a vehicle equipped with a catalytic converter shall not cause unburnt fuel to enter the exhaust.

5.2.2. Operating reliability

Operating reliability shall be achieved by suitable design of the immobilizer, account being taken of specific environmental conditions in the vehicle (see paragraphs 5.1.8. and 5.3.).

5.2.3. Operating safety

It shall be ensured that the immobilizer does not change its state (set/unset) as a result of any of the tests in paragraph 5.3.

5.2.4. Setting of the immobilizer

5.2.4.1. The immobilizer must be set without supplementary action from the driver by at least one of the following means:

(a) At rotation of the ignition key into the '0' position in the ignition lock and activation of a door; in addition, immobilizers which unset immediately before or during the normal starting procedure of the vehicle are permitted to set on turning the ignition off;

(b) A maximum of 1 minute after removing the key of the ignition lock.

5.2.4.2. If the immobilizer can enter the set state when the ignition key is in the engine running mode as provided for in paragraph 5.1.3., the immobilizer may also be set by the opening of the driver's door and/or the authorised user carrying out a deliberate action.

5.2.5. Unsetting

5.2.5.1. Unsetting shall be achieved by using one or a combination of the following devices. Other devices with an equivalent level of security giving equivalent performance are permitted.

5.2.5.1.1. A key pad for inputting an individually selectable code having at least 10 000 variants.

5.2.5.1.2. Electrical/electronic device, e.g. remote control, with at least 50 000 variants and shall incorporate rolling codes and/or have a minimum scan time of ten days, e.g. a maximum of 5 000 variants per 24 hours for 50 000 variants minimum.

5.2.5.1.3. If unsetting can be achieved via a remote control, the immobilizer must return to the set condition within 5 minutes after unsetting if no supplementary action on the starter circuit has been undertaken.

5.2.6. Status display

5.2.6.1. To provide information on the status of the immobilizer (set/unset, change of set to unset and vice versa), optical displays inside and optical signals outside the passenger compartment are allowed. Any optical signal or any use of lighting and light-signalling devices outside the passenger compartment shall fulfil the requirements of Regulation No 48.

5.2.6.2. If an indication of short-term 'dynamic' processes such as changes from 'set' to 'unset' and vice versa is provided, it shall be optical, according to paragraph 5.2.6.1. Such optical indication may also be produced by the simultaneous operation of the direction indicators and/or passenger compartment lamp(s), provided that the duration of the optical indication by the direction indicators does not exceed 3 seconds.

5.3. Operation parameters and test conditions

All components of the immobilizer shall be submitted to the tests described in Annex 6.

5.4. Instructions

(Paragraphs 5.4.1. to 5.4.3. for the purposes of aftermarket installation only).

Each immobilizer shall be accompanied by:

5.4.1. Instructions for installation.

5.4.1.1. The list of vehicles and vehicle models for which the device is intended. This list may be specific or generic, e.g. 'all cars with petrol engines and 12 V negative earth batteries'.

5.4.1.2. The method of installation illustrated by photographs and/or very clear drawings.

5.4.1.3. Detailed installation instructions provided by the supplier shall be such that when correctly followed by a competent installer, the safety and reliability of the vehicle is not affected.

5.4.1.4. The supplied installation instructions shall identify the electrical power requirements of the immobilizer and, where relevant, shall advise an increasing of battery size.

5.4.1.5. The supplier shall provide post installation procedures for checking the vehicle. Particular attention shall be drawn to safety related features.

5.4.2. A blank installation certificate, an example of which is given in Annex 5.

5.4.3. A general statement to the immobilizer purchaser calling his attention to the following points:

5.4.3.1. The immobilizer should be installed in accordance with the manufacturer's instructions;

5.4.3.2. The selection of a good installer is recommended (the immobilizer manufacturer may be contacted to indicate appropriate installers);

5.4.3.3. The installation certificate supplied with the immobilizer should be completed by the installer.

5.4.4. Instructions for use.

5.4.5. Instructions for maintenance.

5.4.6. A general warning regarding the dangers of making any alterations or additions to the immobilizer; such alterations and additions would automatically invalidate the certificate of installation referred to in paragraph 5.4.2. above.

6. Modification of the type and extension of approval

6.1. Every modification of a vehicle or component type with regard to this Regulation shall be notified to the Type Approval Authority which approved the vehicle or component type. The Type Approval Authority may then either:

6.1.1. Consider that the modifications made are unlikely to have an appreciable adverse effect and that in any case the component or the vehicle still complies with the requirements, or

6.1.2. Require a further report from the technical service responsible for conducting the tests.

6.2. Confirmation or refusal of approval, specifying the alteration, shall be communicated by the procedure specified in paragraph 4.3. above to the Contracting Parties to the Agreement applying this Regulation.

6.3. The competent authority issuing the extension of approval shall assign a serial number to each communication form drawn up for such an extension.

7. Conformity of production

7.1. Procedures concerning conformity of production shall comply with those set out in the 1958 Agreement, Schedule 1 (E/ECE/TRANS/505/Rev.3) and meet the following requirements:

7.2. For each type of vehicle or component the tests prescribed in the relevant part(s) of this Regulation shall be carried out on a statistically controlled and random basis, in accordance with one of the regular quality assurance procedures;

7.3. The Type Approval Authority which has granted approval may at any time verify the conformity of control methods applicable to each production unit. The normal frequency of such inspections shall be once every two years.

8. Penalties for non-conformity of production

8.1. The approval granted in respect of a vehicle/component type pursuant to this Regulation may be withdrawn if the requirements laid down in paragraph 7 above are not complied with.

8.2. If a Contracting Party to the Agreement applying this Regulation withdraws an approval it has previously granted, it shall forthwith so notify the other Contracting Parties applying this Regulation, by means of a form conforming to the model in Annex 2.

9. Production definitively discontinued

If the holder of the approval completely ceases to manufacture a vehicle/component type approved in accordance with this Regulation, he shall so inform the authority which granted the approval. Upon receiving the relevant communication, that authority shall inform thereof the other Contracting Parties to the Agreement applying this Regulation by means of a form conforming to the model in Annex 2.

10. Names and addresses of Technical Services responsible for conducting approval tests, and of Type Approval Authorities

The Contracting Parties to the Agreement applying this Regulation shall communicate to the United Nations secretariat the names and addresses of the Technical Services responsible for conducting approval tests and of Type Approval Authorities which grant approval and to which forms certifying approval or extension or refusal or withdrawal of approval, issued in other countries are to be sent.

ANNEX 1A

Information document

(Maximum format: A4 (210 mm × 297 mm))

In accordance with paragraph 5. of UN Regulation No 162 relating to system type approval of a vehicle type with regard to an immobilizer system

1. General

1.1. Make (trade name of manufacturer):

1.2. Type: .....

1.3. Means of identification of type, if marked on the device (b): .....

1.3.1. Location of that marking: .....

1.4. Name and address of manufacturer: .....

1.5. Location of the ECE approval mark: .....

1.6. Address(es) of assembly plant(s): .....

2. General construction characteristics of the vehicle

2.1. Photographs and/or drawings of a representative vehicle: .....

2.2. Hand of drive: left / right (Strike out what does not apply)

3. Miscellaneous

3.1. Vehicle immobilizer: .....

3.1.1. type approval number, if available: .....

3.1.1.1. A detailed description of the vehicle type with regard to the arrangement of the installed Immobilizer illustrated by photographs and/or drawings (where the immobilizer is already type approved as a separate technical unit, reference may be made to the description in paragraph 4.2. of the immobilizers manufacturer's information document): .....

3.1.2. For immobilizers not yet approved

3.1.2.1. A detailed technical description of the vehicle immobilizer and of the measures taken against inadvertent activation: .....

3.1.2.2. The system(s) on which the vehicle immobilizer acts: .....

3.1.2.3. Number of effective interchangeable codes, if applicable: .....

ANNEX 1B

Information document

(Maximum format: A4 (210 mm × 297 mm))

In accordance with paragraph 5. of Regulation No 162 on uniform technical prescriptions concerning approval of immobilizers and approval of a vehicle with regard to its immobilizer (relating to UN component or separate technical unit type approval of an immobilizer system).

1. General

1.1. Make (trade name of manufacturer): .....

1.2. Type: .....

1.3. Means of identification of type, if marked on the device ([1]): .....

1.3.1. Location of that marking: .....

1.4. Name and address of manufacturer: .....

1.5. Location of the UN approval mark: .....

1.6. Address(es) of assembly plant(s): .....

2. Description of the device

2.1. A detailed technical description of the vehicle immobilizer and of the measures taken against inadvertent activation: .....

2.2. The vehicle system(s) on which the vehicle immobilizer acts: .....

2.3. Method of setting/unsetting the device: .....

2.4. Number of effective interchangeable codes, if applicable: .....

2.5. List of main components comprising the device and, if applicable, their reference marks: .....

3. Drawings

3.1. Drawings of the main components of the device (the drawings must show the intended space for UN type approval mark): .....

4. Instructions

4.1. List of vehicles to which the device is intended to be fitted: .....

4.2. Description of the method of installation illustrated by photographs and/or drawings: .....

4.3. Instructions for use: .....

4.4. Instructions for maintenance, if any: .....

4.5. Test pulse 5a/5b according to the International Standard ISO 7637-2:2004: applied/not applied .....

([1]) If the means of identification of type contains characters not relevant to describe the component or separate technical unit types covered in this information document, such characters shall be represented in the documentation by the symbol '?' (e.g. ABC??123??).

ANNEX 2A

Communication

(Maximum format: A4 (210 × 297 mm))

issued by: Name of administration:

.....

.....

.....

Concerning (2): Approval granted

Appoval extended

Approval refused

Approval withdrawn

Production definitively discontinued

of a type of vehicle with regard to its immobilizer pursuant to UN Regulation No 162

Approval No .....

SECTION I

1. General

1.1. Make (trade name of manufacturer): .....

1.2. Type: .....

1.3. Means of identification of type, if marked on the vehicle/component/separate technical unit (2)/(a): .....

1.3.1. Location of that marking: .....

1.4. Category of vehicle (b): .....

1.5. Name and address of manufacturer: .....

1.6. Location of the ECE approval mark: .....

1.7. Address(es) of assembly plant(s): .....

SECTION II

1. Additional information (where applicable): see addendum

2. Technical service responsible for carrying out the tests: .....

(1) Distinguishing number of the country which has granted/extended/refused/withdrawn approval (see approval provisions in the Regulation).

(2) Strike out what does not apply (there are cases where nothing needs to be deleted, when more than one entry is applicable).

3. Date of test report: .....

4. Number of test report: .....

5. Remarks (if any): see addendum

6. Place: .....

7. Date: .....

8. Signature: .....

9. The index to the information package lodged with the approval authority, which may be obtained on request, is attached: .....

Addendum

to UN type approval certificate No …

Concerning the type approval of a vehicle with regard to Regulation No 162

1. Additional information: .....

1.1. Brief description of the immobilizer: .....

2. Remarks: .....

Notes for approval certificate/communication form:

(a) If the means of identification of type contains characters not relevant to describe the vehicle, component or separate technical unit types covered in this information document, such characters shall be represented in the documentation by the symbol '?' (e.g. ABC??123??).

(b) As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.6, para. 2.

ANNEX 2B

Communication

(Maximum format: A4 (210 × 297 mm))

issued by: Name of administration:

.....

.....

.....

concerning (2): approval granted

Approval extended

Approval refused

Approval withdrawn

Production definitively discontinued

of a type of component or separate technical unit as an immobilizer pursuant to UN Regulation No. 162

Approval No. .....

Reason for extension:

SECTION I

1. General .....

1.1. Make (trade name of manufacturer): .....

1.2. Type: .....

1.3. Means of identification of type, if marked on the device (a): .....

1.3.1. Location of that marking: .....

1.4. Name and address of manufacturer: .....

1.5. Location of the ECE approval mark: .....

1.6. Address(es) of assembly plant(s): .....

SECTION II

1. Additional information (where applicable): see addendum

2. Technical service responsible for carrying out the tests: .....

3. Date of test report: .....

(1) Distinguishing number of the country which has granted/extended/refused/withdrawn approval (see approval provisions in the Regulations).

(2) Strike out what does not apply (there are cases where nothing needs to be deleted, when more than one entry is applicable).

4. Number of test report: .....

5. Remarks (if any): see addendum

6. Place: .....

7. Date: .....

8. Signature: .....

9. The index to the information package lodged with the approval authority, which may be obtained on request, is attached.

Addendum

to UN type approval certificate No …

concerning the type approval of an immobilizer with regard to Regulation No 162

1. Additional information: .....

1.1. Brief description of the immobilizer: .....

1.2. List of vehicles to which the immobilizer is intended to be fitted: .....

1.3. Types of vehicles on which the immobilizer has been tested: .....

1.4. List of main components, duly identified, comprising the immobilizer: .....

2. Remarks: .....

Notes for approval certificate/communication form:

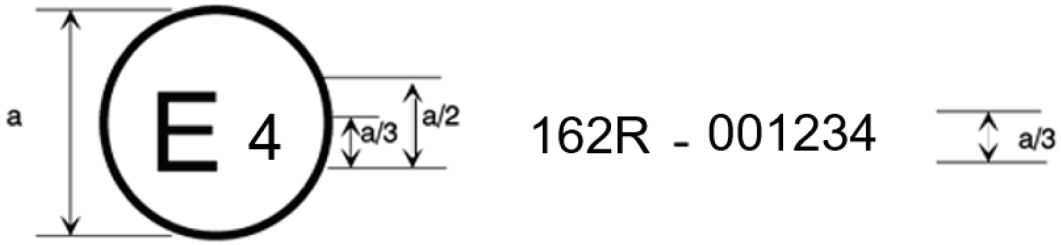
(a) If the means of identification of type contains characters not relevant to describe the component or separate technical unit types covered in this information document, such characters shall be represented in the documentation by the symbol '?' (e.g. ABC??123??).

ANNEX 3

Arrangements of approval marks

Figure 1

(see paragraph 4.2. of this Regulation)



a = 8 mm min

The above approval mark figure 1 affixed to a vehicle shows that the type concerned was approved in the Netherlands (E 4) pursuant to UN Regulation No 162 under approval No 001234. The first two digits (00) of the approval number indicate that the approval was granted in accordance with the requirements of UN Regulation No 162 in its original form.

ANNEX 4

Model of certificate of conformity

I the undersigned .....

(surname and name)

Testify that the vehicle immobilizer described below:

Make: .....

Type: .....

is in total conformity with the type approved

at ..... on .....

(place of approval) (date)

as described in the communication form bearing approval No .....

Identification of the main component(s):

Component: ..... Marking: .....

Done at: ..... on: .....

Manufacturer's full address and stamp: .....

Signature: ..... (please specify position).

ANNEX 5

Model of installation certificate

I the undersigned .....

professional installer, certify that the installation of the immobilizer described below has been carried out by myself pursuant to the mounting instructions supplied by the manufacturer of the system.

Description of the vehicle

Make: .....

Type: .....

Serial number: .....

Registration number: .....

Description of the immobilizer

Make: .....

Type: .....

Approval number: .....

Done at: ..... on: .....

Installer's full address and stamp: .....

.....

.....

Signature: ..... (please specify position)

ANNEX 6

Operation parameters and test conditions for an immobilizer

1. Operation parameters

The requirements below do not apply to:

(a) Those components that are fitted and tested as part of the vehicle, whether or not an immobilizer is fitted (e.g. lamps, alarm system, device to prevent unauthorized use by mean of a locking system); or

(b) Those components that have previously been tested as part of the vehicle and documentary evidence has been provided.

All components of the immobilizer shall operate without any failure under the following conditions.

1.1. Climatic conditions

Two classes of environmental temperature are defined as follows:

(a) – 40 °C to + 85 °C for parts to be fitted in the passenger or luggage compartment,

(b) – 40 °C to + 125 °C for parts to be fitted in the engine compartment unless otherwise specified.

1.2. Degree of protection for installation

The following degrees of protection in accordance with IEC publication 60529:1989 shall be provided:

(a) IP 40 for parts to be fitted in the passenger compartment,

(b) IP 42 for parts to be fitted in the passenger compartment of roadsters/convertibles and cars with moveable roof-panels if the installation location requires a higher degree of protection than IP 40,

(c) IP 54 for all other parts.

The immobilizer manufacturer shall specify in the installation instructions any restrictions on the positioning of any part of the installation with respect to dust, water and temperature.

1.3. Weatherability

7 days according to IEC publication 60068-2-30:1980.

1.4. Electrical conditions

Rated supply voltage: 12 V

Operation supply voltage range: from 9 V to 15 V in the temperature range according to paragraph 1.1.1

Time allowance for excess voltages at 23 °C:

U = 18 V, max. 1 h

U = 24 V, max. 1 min.

2. Test conditions

All the tests shall be carried out in sequence on a single immobilizer. However, at the discretion of the test authority, other samples may be used if this is not considered to affect the results of the other tests.

2.1. Normal test conditions

Voltage U = (12 ± 0,2) V

Temperature T = (23 ± 5) °C

3. Operation test

All components of the immobilizer shall comply with prescriptions given in paragraphs 3.2. to 3.9. of this Regulation.

3.1. Upon completion of all the tests specified below, the immobilizer shall be tested under the normal test conditions specified in paragraph 2.1. of this Regulation to check that it continues to function normally. Where necessary, fuses may be replaced prior to the test.

If some of the tests required in each of these paragraphs prior to the operation tests are performed in series on a single immobilizer, the operation test may be carried out one time only after the chosen tests are completed instead of performing the operation tests required in the paragraphs after each of the chosen tests. Vehicle manufacturers and suppliers have to guarantee satisfactory results only on non-accumulated procedures.

3.2. Resistance to temperature and voltage changes

Compliance with the specifications defined under paragraph 3.1 shall also be checked under the following conditions:

3.2.1. Test temperature T (– 40 ± 2) °C

Test voltage U = (9 ± 0,2) V

Storage duration 4 hours

3.2.2. For parts to be fitted in the passenger or luggage compartment:

Test temperature T = (+ 85 ± 2) °C

Test voltage U = (15 ± 0,2) V

Storage duration 4 hours

3.2.3. For parts to be fitted in the engine compartment unless otherwise specified:

Test temperature T = (+ 125 ± 2) °C

Test voltage U = (15 ± 0,2) V

Storage duration 4 hours

3.2.4. The immobilizer, in both set and unset state, shall be submitted to an excess voltage equal to (18 ± 0,2) V for 1 hour.

3.2.5. The immobilizer, in both set and unset state, shall be submitted to an excess voltage equal to (24 ± 0,2) V for 1 min.

3.3. Safe operation after foreign body and water-tightness testing

After the test for tightness to foreign body and water according to IEC publication 60529:1989 for degrees of protection as in paragraph 1.1.2., the operation tests according to paragraph 3.1. shall be repeated.

With the agreement of the Technical Service this requirement need not apply in the following circumstances:

(a) Type Approval of an immobilizer which is to be type approved as a separate technical unit

In this case, the manufacturer of the immobilizer shall:

(i) Specify in item 4.5. of the information document (Annex 1 b), that the requirement of this paragraph was not applied to the immobilizer (in accordance with paragraph 7. of this Regulation), and

(ii) Specify in item 4.1. of the information document, the list of vehicles to which the immobilizer is intended to be fitted and the relevant installation conditions in item 4.2.

(b) Type approval of a vehicle in respect of an immobilizer

In this case, the manufacturer shall specify in item 3.1.1.1. of Annex 1a of the information document (Annex 1a), that the requirement of this paragraph does not apply to the immobilizer due to the nature of installation conditions and the vehicle manufacturer shall prove it by submitting related documents.

(c) Type approval of a vehicle in respect of the installation of an immobilizer which is type approved as a separate technical unit.

In this case, the vehicle manufacturer shall specify in item 3.1.1.1. of Annex 1a of the information document (Annex 1a), that the requirement of this paragraph does not apply to the installation of the immobilizer where the relevant installation conditions are met.

This requirement does not apply in cases where the information required in item 3.1.3.1.1. of Annex 1a has already been submitted for the approval of the separate technical unit.

3.4. Safe operation after condensed water test

After a resistance-to-humidity test to be carried out according to IEC publication 60068-2-30:1980 the operation tests according to paragraph 3.1. shall be repeated.

3.5. Test for safety against reversed polarity

The immobilizer and components thereof shall not be destroyed by reversed polarity up to 13 V during 2 min. After this test the operation tests according to paragraph 3.1. shall be repeated with fuses changed, if necessary.

3.6. Test for safety against short-circuits

All electrical connections of the immobilizer must be short-circuit proof against earth, max. 13 V and/or fused. After this test the operation tests according to paragraph 3.1. shall be repeated, with fuses changed if necessary.

3.7. Energy consumption in the set condition

The energy consumption in set condition under the conditions given in paragraph 2.1. shall not exceed 20 mA on average for the complete immobilizer including status display.

With the agreement of the Technical Service this requirement need not apply in the following circumstances:

(a) Type Approval of an immobilizer which is to be type approved as a separate technical unit

In this case, the manufacturer of the immobilizer shall:

(i) Specify in item 4.5. of the information document (Annex 1, Part 2), that the requirement of this paragraph was not applied to the immobilizer (in accordance with paragraph 7. of this regulation), and

(ii) Specify in item 4.1. of the information document, the list of vehicles to which the immobilizer is intended to be fitted and the relevant installation conditions in item 4.2.

(b) Type approval of a vehicle in respect of an immobilizer

In this case, the manufacturer shall specify in item 3.1.3.1.1. of the information document (Annex 1a), that the requirement of this paragraph does not apply to the immobilizer due to the nature of installation conditions and the vehicle manufacturer shall prove it by submitting related documents.

(c) Type approval of a vehicle in respect of the installation of an immobilizer which is type approved as a separate technical unit.

In this case, the vehicle manufacturer shall specify in item 3.1.3.1.1. of the information document (Annex 1a), that the requirement of this paragraph does not apply to the installation of the immobilizer where the relevant installation conditions are met.

This requirement does not apply in cases where the information required in item 3.1.3.1.1. of Annex 1a has already been submitted for the approval of the separate technical unit.

3.8. Safe operation after vibration test

3.8.1. For this test, the components are subdivided into two types:

Type 1: components normally mounted on the vehicle,

Type 2: components intended for attachment to the engine.

3.8.2. The components/immobilizer shall be submitted to a sinusoidal vibration mode whose characteristics are as follows:

3.8.2.1. For Type 1

The frequency shall be variable from 10 Hz to 500 Hz with a maximum amplitude of ± 5 mm and maximum acceleration of 3 g (0-peak).

3.8.2.2. For Type 2

The frequency shall be variable from 20 Hz to 300 Hz with a maximum amplitude of ± 2 mm and maximum acceleration of 15 g (0-peak).

3.8.2.3. For both type 1 and type 2

The frequency variation is 1 octave/min.

The number of cycle is 10, the test shall be performed along each of the 3 axes.

The vibrations are applied at low frequencies at a maximum constant amplitude and at a maximum constant acceleration at high frequencies.

3.8.3. During the test the immobilizer shall be electrically connected and the cable shall be supported after 200 mm.

3.8.4. After the vibration test the operation tests according to paragraph 3.1. shall be repeated.

3.9. Electromagnetic compatibility

The immobilizer shall be submitted to the tests described in Annex 7.

ANNEX 7

Electromagnetic compatibility

1. Immunity against disturbances conducted along supply lines

1.1. Tests shall be performed according to the technical prescriptions and transitional provisions of Regulation No 10, 06 series of amendments and according to the test methods described in Annex 10 for an Electrical/Electronic Sub-Assembly (ESA).

1.2. The immobilizer shall be tested in unset state and in set state

2. Immunity against radiated high frequency disturbances

2.1. Testing of the immunity of an immobilizer in a vehicle may be performed according to the technical prescriptions and transitional provisions of Regulation No 10, 06 series of amendments and test methods described in Annex 6 for the vehicles or Annex 9 for an Electrical/Electronic Sub-Assembly (ESA)

2.2. The immobilizer shall be tested with operating conditions and failure criteria as defined in table 1

Table 1

Operating conditions and failure criteria for immobilizer

Test type	Immobilizer operating conditions	Failure criteria
Vehicle test	Immobilizer in unset state Key ON or Vehicle at 50 km/h ([1])	Unexpected activation of the immobilizer
	Immobilizer in set state Key OFF	Unexpected deactivation of the immobilizer
	Immobilizer in set state Vehicle in charging mode (if applicable)	Unexpected deactivation of the immobilizer
ESA Test	Immobilizer in unset state	Unexpected activation of the immobilizer
	Immobilizer in set state	Unexpected deactivation of the immobilizer

([1]) This test can be covered by the UN Regulation No 10 50 km/h mode

3. Electrical disturbance from electrostatic discharges

3.1. Immunity against electrical disturbances shall be tested in accordance with ISO 10605:2008/AMD 1:2014 using the test severity levels from table 2.

3.2. ESD tests shall be performed either at vehicle level or at Electrical/Electronic Sub-Assembly (ESA) level.

Table 2

ESD Test levels

Discharge type	Discharge points	Immobilizer state	Discharge network	Test Level	Failure criteria
Air discharge	Points that can easily be accessed only from the inside of the vehicle	Immobilizer in unset state (if test performed on vehicle then vehicle shall be Key ON or Vehicle at 50 km/h or engine in idle mode)	330 pF, 2 kΩ	± 6 kV	Unexpected activation of the immobilizer
	Points that can easily be touched only from the outside of the vehicle	Immobilizer in set state (if test performed on vehicle then vehicle shall be locked and Key OFF)	150 pF, 2 kΩ	± 15 kV	Unexpected deactivation of the immobilizer without reactivation, within 1s, after each discharge
Contact discharge	Points that can easily be accessed only from the inside of the vehicle	Immobilizer in unset state (if test performed on vehicle then vehicle shall be Key ON or Vehicle at 50 km/h or engine in idle mode)	330 pF, 2 kΩ	± 4 kV	Unexpected activation of the immobilizer
	Points that can easily be touched only from the outside of the vehicle	Immobilizer in set state (if test performed on vehicle then vehicle shall be locked and Key OFF)	150 pF, 2 kΩ	± 8 kV	Unexpected deactivation of the immobilizer without reactivation, within 1s, after each discharge

Each test shall be performed with 3 discharges with a minimum of 5 s interval between each discharge

4. Radiated emissions

4.1. Tests shall be performed according to the technical prescriptions and transitional provisions of Regulation No 10, 04 series of amendments and according to the test methods described in Annexes 4 and 5 for vehicles or Annexes 7 and 8, for an Electrical/Electronic Sub-Assembly (ESA).

4.2. The immobilizer shall be in set state.

UN Regulation No 163 – Uniform provisions concerning the approval of vehicle alarm system and approval of a vehicle with regard to its vehicle alarm system [2021/2276]

Date of entry into force: 30 September 2021

This document is meant purely as documentation tool. The authentic and legally binding text is: ECE/TRANS/WP.29/2021/50.

CONTENTS

Annexes

1. Scope

This Regulation applies to:

1.1. Approval of

(a) If fitted vehicle alarm systems primarily dedicated to vehicles of category M_1 and vehicles of category N_1 ([1]) with a maximum mass of not more than 2 tonnes, and

(b) Vehicles of category M_1 and vehicles of category N_1 with a maximum mass of not more than two tonnes with regard to fitted vehicle alarm system ([2]).

1.2. At the request of the manufacturer, Contracting Parties may grant approvals to vehicles of other categories and to Vehicle Alarm Systems for fitment to such vehicles.

1.3. This Regulation does not apply to radio transmission frequencies, whether or not related to the protection of vehicles against unauthorized use.

2. Definitions

2.1. '*Component*' means a device subject to the requirements of this Regulation and intended to be part of a vehicle, which may be type-approved independently of a vehicle where this Regulation makes express provisions for so doing.

2.2. '*Separate technical unit*' means a device subject to the requirements of this Regulation and intended to be part of a vehicle, which may be type-approved separately, but only in relation to one or more specified types of vehicle where this Regulation makes express provisions for so doing.

2.3. '*Manufacturer*' means the person or body who is responsible to the approval authority for all aspects of the type approval process and for ensuring conformity of production. It is not essential that the person or body is directly involved in all stage of the construction of the vehicle, system, component or separate technical unit which is the subject of the approval process.

2.4. '*Vehicle alarm system (VAS)*' means a system intended for installation on (a) type(s) of vehicle(s), designed to indicate intrusion into or interference with the vehicle; these systems may provide additional protection against unauthorized use of the vehicle.

2.5. '*Sensor*' means a device which senses a change which could be caused by intrusion into or interference with a vehicle.

2.6. '*Warning device*' means a device indicating that intrusion into or interference has occurred.

2.7. '*Control equipment*' means equipment necessary for the setting, unsetting and testing of a VAS and for sending an alarm condition to warning devices.

([1]) As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.6. https://unece.org/transport/standards/transport/vehicle-regulations-wp29/resolutions

([2]) Only vehicles with 12 volts electrical systems are considered.

2.8. '*Set*' means the state of a VAS in which an alarm condition can be transmitted to warning devices.

2.9. '*Unset*' means the state of a VAS in which an alarm condition cannot be transmitted to warning devices.

2.10. '*Key*' means any device designed and constructed to provide a method of operating a locking system which is designed and constructed to be operated only by that device.

2.11. '*Type of vehicle alarm system*' means systems which do not differ significantly in such essential aspects as:

(a) The manufacturer's trade name or mark;

(b) The kind of sensor;

(c) The kind of warning device;

(d) The kind of control equipment.

2.12. '*Approval of a vehicle alarm system*' means the approval of a type of VAS with respect to the requirements laid down in paragraphs 5, 6, 7 below.

2.13. '*Immobilizer*' means a device which is intended to prevent the vehicle being driven away powered by its own engine.

2.14. '*Panic alarm*' means a device which enables a person to use an alarm, installed on the vehicle, to summon assistance in an emergency.

3. Application for approval

3.1. The application for approval of a vehicle or component type with regard to this Regulation shall be submitted by the manufacturer.

3.2. It shall be accompanied by an information document in accordance with the model shown in Annex 1, and giving a description of the technical characteristics of the VAS and the method(s) of installation for each make and type of vehicle on which the VAS is intended to be installed.

3.3. Vehicle(s)/component(s) representative of the type(s) to be approved shall be submitted to the technical service responsible for conducting the approval tests.

4. Approval

4.1. If the type submitted for approval to this Regulation meets the requirements of the relevant part(s) of this Regulation, approval of that type shall be granted.

4.2. An approval number shall be assigned to each type approved. Its first two digits (at present 00, corresponding to the Regulation in its original form) shall indicate the series of amendments incorporating the most recent major technical amendment made to the Regulation at the time of issue of the approval. The same Contracting Party shall not assign the same number to another type of vehicle or component as defined in this Regulation.

4.3. Notice of approval or of extension of approval of a type pursuant to this Regulation shall be communicated to the Contracting Parties to the Agreement applying this Regulation by means of a form conforming to the model in Annex 2 to this Regulation.

4.4. There shall be affixed, conspicuously and in a readily accessible place specified on the approval form, to every vehicle or component conforming to a 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 ([3]), and

4.4.2. The number of this Regulation, followed by the letter 'R', a dash and the approval number, to the right of the circle prescribed in paragraph 4.4.1.

([3]) The distinguishing numbers of the Contracting Parties to the 1958 Agreement are reproduced in Annex 3 to the Consolidated Resolution on the Construction of Vehicles (R.E.3), document ECE/TRANS/WP.29/78/Rev.6 - https://unece.org/transport/standards/transport/vehicle-regulations-wp29/resolutions

4.5. If a type conforms to a type approved, under one or more other UN Regulations annexed to the Agreement, in the country which has granted approval under this Regulation, the symbol prescribed in paragraph 4.4.1 need not be repeated; in such a case, the Regulation under which approval has been granted in the country which has granted approval under this Regulation shall be placed in vertical columns to the right of the symbol prescribed in paragraph 4.4.1.

4.6. The approval mark shall be clearly legible and be indelible.

4.7. In the case of a vehicle, the approval mark shall be placed close to or on the vehicle data plate affixed by the manufacturer.

4.8. In the case of a component approved separately as an alarm system, the approval mark shall be affixed by the manufacturer to the major element(s) of the device.

4.9. Annex 3 to this Regulation gives examples of arrangements of approval marks.

4.10. As an alternative to the approval mark described in paragraph 4.4 above, a certificate of conformity shall be issued for every VAS offered for sale.

4.10.1. Where a VAS manufacturer supplies an unmarked VAS approved to this Regulation to a vehicle manufacturer, for fitment by that manufacturer as original equipment for a vehicle model or range of vehicle models, the VAS manufacturer shall supply a number of copies of the certificate of conformity to the vehicle manufacturer, sufficient for that manufacturer to obtain the vehicle approval to this Regulation.

4.10.2. If the VAS is made up of separate components, its main component(s) shall bear a reference mark and the certificate of conformity shall provide a list of such reference marks.

4.10.3. A model of the certificate of conformity is given in Annex 4 to this Regulation.

Part I – Approval of vehicle alarm systems

5. General specifications

5.1. VAS shall, in the event of intrusion into or interference with a vehicle, provide a warning signal. The warning signal shall be audible and in addition may include optical warning devices, or be a radio alarm or any combination of the above.

5.2. VASs shall be designed, constructed and installed in such a way that the vehicle when equipped shall continue to comply with the relevant technical requirements, especially with regard to electromagnetic compatibility (EMC).

5.3. The installation of a VAS in a vehicle shall not be capable of influencing the vehicle's performance (in the unset state), or its safe operation.

5.4. The VAS and components thereof shall not activate inadvertently, particularly whilst the engine is in its running mode.

5.5. Failure of the VAS, or failure of its electrical supply shall not affect the safe operation of the vehicle.

5.6. The VAS, its components and the parts controlled by them shall be designed, built and installed in such a way as to minimize the risk for anyone to make them inoperable or to destroy them rapidly and without calling attention, e.g. using low-cost, easily-concealed tools, equipment or fabrications readily available to the public at large.

5.7. The means of setting and unsetting of the VAS shall be designed in such a way that it does not invalidate the requirements of this Regulation. Electrical connections to components covered by Part II of this Regulation are allowed.

5.8. The system shall be so arranged that the shorting out of any warning signal circuit shall not render inoperative any aspects of the alarm system, other than the circuit which is shorted out.

5.9. VAS may include an immobilizer which shall comply with the requirements of UN Regulation No 162 (Immobilizers) or UN Regulation No 116, Supplement 7 to the original version, or UN Regulation No 97 Supplement 8 to the 01 series of amendments.

6. Particular specifications

6.1. Protection range

6.1.1. Specific requirements

The VAS shall at least detect and signal the opening of any vehicle door, engine bonnet and luggage compartment. The failure or switching off of light sources, e.g. passenger compartment light, shall not impair the control operation.

Additional efficient sensors for information/display, e.g.:

(a) Of intrusions into the vehicle, e.g. passenger compartment control, window glass control, breakage of any glazed area; or

(b) Of attempted vehicle theft, e.g. inclination sensor

are allowed, taking account of measures to prevent any unnecessary sounding of the alarm (= false alarm, see paragraph 6.1.2 below).

Insofar as these additional sensors generate an alarm signal even after an intrusion has occurred (e.g. by breakage of a glazed area) or under external influences (e.g. wind), the alarm signal, activated by one of the above-mentioned sensors, shall be activated not more than 10 times within the same activation period of the VAS.

In this case the activation period shall be limited by the authorized unsetting of the system as a result of the vehicle user's action.

Some kinds of additional sensors, e.g. passenger compartment control (ultrasonic, infrared) or inclination sensor, etc., may be intentionally deactivated. In this case, separate deliberate action shall be taken each time before the VAS is set. It shall not be possible to deactivate the sensors while the alarm system is in a set state.

6.1.2. Safety against false alarm

6.1.2.1. By adequate measures, e.g.

(a) Mechanical design and design of the electrical circuit according to conditions specific to motor vehicles;

(b) Selection and application of operation and control principles for the alarm system and components thereof;

It shall be ensured that the VAS both in set and unset conditions, cannot cause the alarm signal to sound unnecessarily, in the event of:

(a) An impact on the vehicle: test specified in paragraph 7.2.13;

(b) Electromagnetic compatibility: tests specified in paragraph 7.2.12;

(c) Reduction of battery voltage by continuous discharge: test specified in paragraph 7.2.14;

(d) False alarm of the passenger compartment control: test specified in paragraph 7.2.15.

6.1.2.2. If the applicant for approval can demonstrate, e.g. by technical data, that safety against false alarm is satisfactorily ensured, the technical service responsible for conducting approval tests may not require some of the above tests.

6.2. Audible alarm

6.2.1. General

The warning signal shall be clearly audible and recognizable and shall differ significantly from the other audible signals used in road traffic.

In addition to the original equipment audible warning device, a separate audible warning device may be fitted in the area of the vehicle which is controlled by the VAS, where it shall be protected against easy, rapid access by persons.

If a separate audible warning device according to paragraph 6.2.3.1 below is used, the original equipment standard audible warning device may additionally be actuated by the VAS, provided that any tampering with the standard audible warning device (generally more easily accessible) does not affect the operation of the additional audible warning device.

6.2.2. Duration of the audible signal

Minimum: 25 s

Maximum: 30 s

The audible signal may sound again only after the next interference with the vehicle, i.e. after the above-mentioned time span (Restrictions: see paragraphs 6.1.1 and 6.1.2 above).

Unsetting of the alarm system shall immediately cut the signal.

6.2.3. Specifications concerning the audible signal

6.2.3.1. Constant tone signal device (constant frequency spectrum), e.g. horns: acoustical, etc., data according to UN Regulation No 28, Part I.

Intermittent signal (on/off):

Trigger frequency (2 ± 1) Hz

On time = off time ± 10 per cent

6.2.3.2. Audible signal device with frequency modulation: acoustical, etc., data according to UN Regulation No 28, Part I but equal passage of a significant frequency range within the above-mentioned range (1 800 through 3 550 Hz) in both directions.

Passage frequency (2 ± 1) Hz

6.2.3.3. Sound level

The sound source shall be:

(a) Either an audible warning device approved under UN Regulation No 28, Part I;

(b) Or a device meeting the requirements of UN Regulation No 28, Part I, paragraphs 6.1 and 6.2.

However, in the case of a different sound source from the original equipment audible warning device, the minimum sound level may be reduced to 100 dB(A), measured under the conditions of UN Regulation No 28, Part I.

6.3. Optical alarm - if fitted

6.3.1. General

In the event of intrusion into or interference with the vehicle, the device shall activate an optical signal as specified in paragraphs 6.3.2 and 6.3.3 below.

6.3.2. Duration of the optical signal

The optical signal shall have a duration between 25 s and 5 minutes after the alarm has been activated. The unsetting of the alarm system shall immediately stop the signal.

6.3.3. Type of optical signal

Flashing of all direction indicators and/or passenger compartment light of the vehicle, including all lamps in the same electrical circuit.

Trigger frequency: (2 ± 1) Hz

In relation to the audible signal, also asynchronous signals are allowed.

On time = off time ± 10 per cent

6.4. Radio alarm (pager) - if fitted

The VAS may include a facility generating an alarm signal by radio transmission.

6.5. Alarm system setting lock

6.5.1. When the engine is in its running mode, deliberate or inadvertent setting of the alarm system shall be impossible.

6.6. Setting and unsetting of the VAS

6.6.1. Setting

Any suitable means of setting of the VAS is allowed, provided that such means does not inadvertently cause false alarms.

6.6.2. Unsetting

Unsetting of the VAS shall be achieved by one or a combination of the following devices. Other devices giving an equivalent performance are permitted.

6.6.2.1. A mechanical key (complying with the requirements of Annex 6 to this Regulation) which can be coupled with a centralized vehicle locking system comprising at least 1 000 variants, operated from the outside.

6.6.2.2. Electrical/electronic device, e.g. remote control, with at least 50 000 variants and shall incorporate rolling codes and/or have a minimum scan time of ten days, e.g. a maximum of 5 000 variants per 24 hours for 50 000 variants minimum.

6.6.2.3. A mechanical key or an electrical/electronic device within the protected passenger compartment, with timed exit/entry delay.

6.7. Exit delay

If the switching device for setting the VAS is fitted within the protected area, an exit delay shall be provided. It shall be possible for the exit delay to be set to between 15 seconds and 45 seconds after the switch has been operated. The delay period may be adjustable to suit individual operators' circumstances.

6.8. Entry delay

If the device for unsetting the VAS is fitted within the protected area, a delay of 5 seconds minimum and 15 seconds maximum shall be allowed before the activation of the audible and optical signals. The delay period may be adjustable to suit individual operators' circumstances.

6.9. Status display

6.9.1. To provide information on the status of the VAS (set, unset, alarm setting period, alarm has been activated), optical displays inside and outside the passenger compartment are allowed. Any optical signal or any use of lighting and light-signalling devices outside the passenger compartment shall fulfil the requirements of UN Regulation No 48.

6.9.2. If an indication of short-term 'dynamic' processes such as changes from 'set' to 'unset' and vice versa is provided, it shall be optical, according to paragraph 6.9.1. Such optical indication may also be produced by the simultaneous operation of the direction indicators and/or passenger compartment lamp(s), provided that the duration of the optical indication by the direction indicators does not exceed 3 seconds.

6.10. Power supply

The source of power for the VAS shall be either the vehicle battery or a rechargeable battery. Where provided, an additional rechargeable or non-rechargeable battery may be used. These batteries shall by no means supply energy to other parts of the vehicle electrical system.

6.11. Specifications for optional functions

6.11.1. Self-check, automatic failure indication

On setting the VAS, irregular situations, e.g. open doors, etc., can be detected by a self-check function (plausibility control), and this situation is indicated.

6.11.2. Panic alarm

An optical and/or audible and/or radio alarm is allowed independent of the state (set or unset) and/or function of the VAS. Such an alarm shall be triggered from within the vehicle and shall not affect the state (set or unset) of the VAS. Also it shall be possible for the vehicle user to switch off the panic alarm. In the case of an audible alarm, its sounding duration per activation shall not be restricted. A panic alarm shall not immobilize the engine or stop it if it is running.

7. Operation parameters and test conditions

7.1. Operation parameters

All components of the VAS shall operate without any failure under the following conditions.

7.1.1. Climatic conditions

Two classes of environmental temperature are defined as follows:

(a) − 40 °C to + 85 °C for parts to be fitted in the passenger or luggage compartment;

(b) − 40 °C to + 125 °C for parts to be fitted in the engine compartment unless otherwise specified.

7.1.2. Degree of protection for installation

The following degrees of protection in accordance with IEC publication 60529:1989 shall be provided:

(a) IP 40 for parts to be fitted in the passenger compartment;

(b) IP 42 for parts to be fitted in the passenger compartment of roadsters/convertibles and cars with moveable roof-panels if the installation location requires a higher degree of protection than IP 40;

(c) IP 54 for all other parts.

The VAS manufacturer shall specify in the installation instructions any restrictions on the positioning of any part of the installation with respect to dust, water and temperature.

7.1.3. Weatherability

7 days according to IEC publication 60068-2-30:1980.

7.1.4. Electrical conditions

Rated supply voltage: 12 V

Operation supply voltage range: from 9 V to 15 V in the temperature range according to paragraph 7.1.1.

Time allowance for excess voltages at 23 °C:

U = 18 V, max. 1 hours

U = 24 V, max. 1 minute

7.2. Test conditions

7.2.1. Operation tests

For the operation tests required according to paragraphs 7.2.3, 7.2.4, 7.2.5, 7.2.6 and 7.2.8.4, if some of the tests required in each of these paragraphs prior to the operation tests are performed in series on a single VAS, the operation test may be carried out one time only after the chosen tests are completed instead of performing the operation tests required in the paragraphs after each of the chosen tests. Vehicle manufacturers and suppliers have to guarantee satisfactory results only on non-accumulated procedures.

7.2.1.1. Compliance of the VAS with the following specifications shall be checked:

Alarm duration according to paragraphs 6.2.2 and 6.3.2;

Frequency and on/off ratio according to paragraphs 6.3.3 and 6.2.3.1 or 6.2.3.2 respectively;

Number of alarm cycles according to paragraph 6.1.1, if applicable;

Alarm system setting lock check according to paragraph 6.5.

7.2.1.2. Normal test conditions

Voltage: U = (12 ± 0,2) V

Temperature: T = (23 ± 5) °C

7.2.2. Resistance to temperature and voltage changes

Compliance with the specifications defined under paragraph 7.2.1.1 shall also be checked under the following conditions:

7.2.2.1. Test temperature: T (– 40 ± 2) °C

Test voltage: U = (9 ± 0,2) V

Storage duration: 4 hours

7.2.2.2. For parts to be fitted in the passenger or luggage compartment:

Test temperature: T = (+ 85 ± 2) °C

Test voltage: U = (15 ± 0,2) V

Storage duration: 4 hours

7.2.2.3. For parts to be fitted in the engine compartment unless otherwise specified:

Test temperature: T = (+ 125 ± 2) °C

Test voltage: U = (15 ± 0,2) V

Storage duration: 4 hours

7.2.2.4. The VAS, in both set and unset state, shall be submitted to an excess voltage equal to (18 ± 0,2) V for 1 hour.

7.2.2.5. The VAS, in both set and unset state, shall be submitted to an excess voltage equal to (24 ± 0,2) V for 1 minute.

7.2.3. Safe operation after foreign body and water-tightness testing

After the test for tightness to foreign body and water according to IEC publication 60529:1989, for degrees of protection as in paragraph 7.1.2, the operation tests according to paragraph 7.2.1 shall be repeated.

With the agreement of the Technical Service this requirement need not apply in the following circumstances:

(a) Type Approval of a VAS which is to be type approved as a separate technical unit.

In this case, the manufacturer of the VAS shall:

(i) Specify in item 4.5 of the information document (Annex 1), that the requirement of this paragraph was not applied to the VAS (in accordance with paragraph 7 of this Regulation); and

(ii) Specify in item 4.1 of the information document, the list of vehicles to which the VAS is intended to be fitted and the relevant installation conditions in item 4.2.

(b) Type approval of a vehicle in respect of an AS

In this case, the vehicle manufacturer shall specify in item 4.5 of the information document (Annex 1), that the requirement of this paragraph does not apply to the AS due to the nature of installation conditions and the vehicle manufacturer shall prove it by submitting related documents;

(c) Type approval of a vehicle in respect of the installation of a VAS which is type approved as a separate technical unit.

In this case, the vehicle manufacturer shall specify in item 4.5 of the information document (Annex 1), that the requirement of this paragraph does not apply to the installation of the VAS where the relevant installation conditions are met.

This requirement does not apply in cases where the information required in item 4.5 of Annex 2 has already been submitted for the approval of the separate technical unit.

7.2.4. Safe operation after condensed water test

After a resistance-to-humidity test to be carried out according to IEC publication 60068-2-30:1980 the operation tests according to paragraph 7.2.1 shall be repeated.

7.2.5. Test for safety against reversed polarity

The VAS and components thereof shall not be destroyed by reversed polarity up to 13 V during 2 min. After this test the operation tests according to paragraph 7.2.1 shall be repeated with fuses changed, if necessary.

7.2.6. Test for safety against short-circuits

All electrical connections of the VAS shall be short-circuit proof against earth, max. 13 V and/or fused. After this test the operation tests according to paragraph 7.2.1 shall be repeated, with fuses changed if necessary.

7.2.7. Energy consumption in the set condition

The energy consumption in set condition under the conditions given in paragraph 7.2.1.2 shall not exceed 20 mA on average for the complete alarm system including status display.

With the agreement of the Technical Service this requirement need not apply in the following circumstances:

(a) Type Approval of a VAS which is to be type approved as a separate technical unit;

In this case, the manufacturer of the VAS shall:

(i) Specify in item 4.5 of the information document (Annex 1), that the requirement of this paragraph was not applied to the VAS (in accordance with paragraph 7 of this Regulation);

(ii) Specify in item 4.1 of the information document, the list of vehicles to which the VAS is intended to be fitted and the relevant installation conditions in item 4.2; and

(iii) Prove the energy consumption requirements are not exceeded by submitting related documents.

(b) Type approval of a vehicle in respect of an AS

In this case, the manufacturer shall specify in item 4.3.1.1 of the information document (Annex 2), that the requirement of this paragraph does not apply to the AS due to the nature of installation conditions and the vehicle manufacturer shall prove it by submitting related documents;

(c) Type approval of a vehicle in respect of the installation of a VAS which is type approved as a separate technical unit.

In this case, the vehicle manufacturer shall specify in item 4.3.1.1 of the information document (Annex 2), that the requirement of this paragraph does not apply to the installation of the VAS where the relevant installation conditions are met.

This requirement does not apply in cases where the information required in item 4.3.1.1 of Annex 2 has already been submitted for the approval of a separate technical unit.

7.2.8. Safe operation after vibration test

7.2.8.1. For this test, the components are subdivided into two types:

Type 1: components normally mounted on the vehicle,

Type 2: components intended for attachment to the engine.

7.2.8.2. The components/VAS shall be submitted to a sinusoidal vibration mode whose characteristics are as follows:

7.2.8.2.1. For type 1

The frequency shall be variable from 10 Hz to 500 Hz with a maximum amplitude of ± 5 mm and maximum acceleration of 3 g (0-peak).

7.2.8.2.2. For type 2

The frequency shall be variable from 20 Hz to 300 Hz with a maximum amplitude of ± 2 mm and maximum acceleration of 15 g (0-peak).

7.2.8.2.3. For both type 1 and type 2

The frequency variation is 1 octave/min.

The number of cycles is 10, the test shall be performed along each of the 3 axes.

The vibrations are applied at low frequencies at a maximum constant amplitude and at a maximum constant acceleration at high frequencies.

7.2.8.3. During the test the VAS shall be electrically connected and the cable shall be supported after 200 mm.

7.2.8.4. After the vibration test the operation tests according to paragraph 7.2.1 shall be repeated.

7.2.9. Durability test

Under the test conditions specified in paragraph 7.2.1.2, triggering of 300 complete alarm cycles (audible and/or optical) with a rest time of the audible device of 5 min.

7.2.10. Tests for external key switch (installed on the outside of the vehicle)

The following tests shall only be performed if the locking cylinder of the original equipment door lock is not used.

7.2.10.1. The key switch shall be so designed and constructed that it remains fully effective even after 2 500 set/unset cycles in each direction, followed by 96 hours minimum of exposure to salt spray test according to IEC 68-2-11-1981, corrosion resistance test.

7.2.11. Test of systems for the protection of the passenger compartment

The alarm shall be activated, when a vertical panel of 0,2 × 0,15 m is inserted for 0,3 m (measured from the centre of the vertical plane) through an open front door window into the passenger compartment, towards the front and parallel to the road at a speed of 0,4 m/s and at an angle of 45° with the longitudinal median plane of the vehicle. (See drawings in Annex 8 to this Regulation).

7.2.12. Electromagnetic compatibility

The VAS shall be submitted to the tests described in Annex 7.

In this case, a VAS which meets all the functional status of the tests in Annex 7 is deemed not to cause the alarm signal to sound unnecessarily in association with the requirements in paragraph 6.1.2.1.

With regard to the conformity to the functional status in each test, a VAS, which is designed to sound the alarm in the set state in some of the test conditions given in Annex 7 and sound the alarm signal in the tests, is deemed to function as designed in the tests and thus deemed to meet the functional status of the tests. In this case, the manufacturer of the VAS shall prove it by submitting related documents.

7.2.13. Safety against false alarm in the event of an impact on the vehicle

It shall be verified that an impact of up to 4,5 Joules of a hemispherical body with 165 mm in diameter and 70 ± 10 Shore A applied anywhere to the vehicle bodywork or glazing with its curved surface does not cause false alarms.

7.2.14. Safety against false alarm in the event of a voltage reduction

It shall be verified that slow reduction of the main battery voltage by continuous discharge of 0,5 V per hour down to 3 V does not cause false alarms.

Test conditions: see paragraph 7.2.1.2 above.

7.2.15. Test for safety against false alarm of the passenger compartment control

Systems intended for the protection of the passenger compartment according to paragraph 6.1.1 above shall be tested together with a vehicle under normal conditions (paragraph 7.2.1.2).

The system, installed according to the manufacturer's instructions, shall not be triggered when subjected 5 times to the test described in paragraph 7.2.13 above at intervals of 0,5 s.

The presence of a person touching or moving around the outside of the vehicle (windows closed) shall not cause any false alarm.

8. Instructions

Each VAS shall be accompanied by:

8.1. Instructions for installation:

8.1.1. The list of vehicles and vehicle models for which the device is intended. This list may be specific or generic, e.g. 'all cars with petrol engines and 12 V negative earth batteries'.

8.1.2. The method of installation illustrated by photographs and/or very clear drawings.

8.1.3. In the case of VAS which includes an immobilizer, additional instructions regarding compliance with the requirements of UN Regulation No 162 (immobilizer) or UN Regulation No 116, Supplement 7 to the original version, or UN Regulation No 97, Supplement 8 to the 01 series of amendments.

8.2. A blank installation certificate, an example of which is given in Annex 5.

8.3. A general statement to the VAS purchaser calling his attention to the following points:

(a) The VAS should be installed in accordance with the manufacturer's instructions;

(b) The selection of a good installer is recommended (the VAS manufacturer may be contacted to indicate appropriate installers);

(c) The installation certificate supplied with the VAS should be completed by the installer.

8.4. Instruction for use

8.5. Instruction for maintenance

8.6. A general warning regarding the danger of making any alterations or additions to the system; such alterations or additions would automatically invalidate the certificate of installation referred to in paragraph 8.2 above.

8.7. Indication of the location(s) of the international approval mark mentioned in paragraph 4.4 of this Regulation and/or the international certificate of conformity mentioned in paragraph 4.10 of this Regulation.

Part II – Approval of a vehicle with regard to its alarm system

When a VAS approved to Part I of this Regulation or UN Regulation No 116 Supplement 7 to the original version, or UN Regulation No 97 Supplement 8 to the 01 series of amendments is installed in a vehicle submitted for approval to Part II of this Regulation, tests required to be passed by a VAS in order to obtain approval to Part I of this Regulation shall not be repeated.

9. Definitions

For the purpose of Part II of this Regulation,

9.1. '*Alarm system(s)*' (AS) means an arrangement of components fitted as original equipment in a vehicle type, designed to indicate intrusion into or interference with the vehicle; these systems may provide additional protection against unauthorized use of the vehicle.

9.2. '*Vehicle type with regard to its alarm system*' means vehicles which do not differ significantly in such essential aspects as:

(a) The manufacturer's trade name or mark;

(b) Vehicle features which significantly influence the performances of the AS;

(c) The type and design of the AS or VAS.

9.3. '*Approval of a vehicle*' means the approval of a vehicle type with regard to the requirements laid down in paragraphs 10, 11 and 12 below.

9.4. Other definitions applicable to Part II are contained in paragraph 2 of this Regulation.

10. General specifications

10.1. ASs shall be designed and built in such a way that they, in the event of intrusion into or interference with a vehicle, provide a warning signal, and may include an immobilizer.

The warning signal shall be audible and in addition may include optical warning devices, or be a radio alarm, or any combination of the above.

10.2. Vehicle which are equipped with alarm systems shall comply with the relevant technical requirements, especially with regard to electromagnetic compatibility (EMC).

10.3. The AS and components thereof shall not activate inadvertently, particularly whilst the engine is in its running mode.

10.4. Failure of the AS, or failure of its electrical supply shall not affect the safe operation of the vehicle.

10.5. The alarm system, its components and the parts controlled by them shall be so installed as to minimize the risk for anyone to make them inoperable or to destroy them rapidly and without calling attention, e.g. using low-cost, easily-concealed tools, equipment or fabrications readily available to the public at large.

10.6. The system shall be so arranged that the shorting out of any warning signal circuit shall not render inoperative any aspects of the alarm system, other than the circuit which is shorted out.

11. Particular specifications

11.1. Protection range

11.1.1. Specific requirements

The AS shall at least detect and signal the opening of any vehicle door, engine bonnet and luggage compartment. The failure or switching off of light sources, e.g. passenger compartment light, shall not impair the control operation.

The installation of additional efficient sensors for information/display, e.g.:

(a) Of intrusion into the vehicle, e.g. passenger compartment control, window glass control breakage of any glazed area; or

(b) Of attempted vehicle theft, e.g. inclination sensor;

are allowed, taking account of measures to prevent any unnecessary sounding of the alarm (= false alarm, see paragraph 11.1.2 below).

Insofar as these additional sensors generate an alarm signal even after an intrusion has occurred (e.g. by breakage of a glazed area) or under external influences (e.g. wind), the alarm signal, activated by one of the above-mentioned sensors, shall be activated not more than 10 times within the same activation period of the AS.

In this case the activation period shall be limited by the authorized unsetting of the system as a result of the vehicle user's action.

Some kinds of additional sensors, e.g. passenger compartment control (ultrasonic, infrared) or inclination sensor, etc., may be intentionally deactivated. In this case, separate deliberate action shall be taken each time before the AS is set. It shall not be possible to deactivate the sensors while the alarm system is in a set state.

11.1.2. Safety against false alarm

11.1.2.1. It shall be ensured that the AS both in set and unset conditions, cannot cause the alarm signal to sound unnecessarily, in the event of:

(a) An impact on the vehicle: test specified in paragraph 7.2.13;

(b) Electromagnetic compatibility: tests specified in paragraph 7.2.12;

(c) Reduction of battery voltage by continuous discharge: test specified in paragraph 7.2.14;

(d) False alarm of the passenger compartment control: test specified in paragraph 7.2.15.

11.1.2.2. If the applicant for approval can demonstrate, e.g. by technical data, that safety against false alarm is satisfactorily ensured, the technical service responsible for conducting approval tests may not require some of the above tests.

11.2. Audible alarm

11.2.1. General

The warning signal shall be clearly audible and recognizable and shall differ significantly from the other audible signals used in road traffic.

In addition to the original equipment audible warning device, a separate audible warning device may be fitted in the area of the vehicle which is controlled by the AS, where it shall be protected against easy, rapid access by persons.

If a separate audible warning device according to paragraph 11.2.3.1 below is used, the original equipment standard audible warning device may additionally be actuated by the AS, provided that any tampering with the standard audible warning device (generally more accessible) does not affect the operation of the additional audible warning device.

11.2.2. Duration of the audible signal

Minimum: 25 s

Maximum: 30 s

The audible signal may sound again only after the next interference with the vehicle, i.e. after the above-mentioned time span. (Restrictions: see paragraphs 11.1.1 and 11.1.2 above).

Unsetting of the alarm system shall immediately cut the signal.

11.2.3. Specifications concerning the audible signal

11.2.3.1. Constant tone signal device (constant frequency spectrum), e.g. horns: acoustical, etc., data according to UN Regulation No 28, Part I.

Intermittent signal (on/off):

Trigger frequency: (2 ± 1) Hz

On time = off time ± 10 per cent

11.2.3.2. Audible signal device with frequency modulation: acoustical, etc., data according to UN Regulation No 28, Part I but equal passage of a significant frequency range within the above-mentioned range (1 800 through 3 550 Hz) in both directions.

Passage frequency: (2 ± 1) Hz

11.2.3.3. Sound level

The sound source shall be:

(a) Either an audible warning device approved under UN Regulation No 28, Part I;

(b) Or a device meeting the requirements of UN Regulation No 28, Part I, paragraph 6.1 and 6.2.

However, in the case of a different sound source from the original equipment audible warning device, the minimum sound level may be reduced to 100 dB(A), measured under the conditions of UN Regulation No 28, Part I.

11.3. Optical alarm - if fitted

11.3.1. General

In the event of intrusion into or interference with the vehicle the device shall activate an optical signal as specified in paragraphs 11.3.2 and 11.3.3 below.

11.3.2. Duration of the optical signal

The optical signal shall have a duration between 25 s and 5 minutes after the alarm has been activated. The unsetting of the alarm system shall immediately stop the signal.

11.3.3. Type of optical signal

Flashing of all direction indicators and/or passenger compartment light of the vehicle, including all lamps in the same electrical circuit.

Trigger frequency: (2 ± 1) Hz

In relation to the audible signal, also asynchronous signals are allowed.

On time = off time ± 10 per cent

11.4. Radio alarm (pager) - if fitted

The AS may include a facility generating an alarm signal by radio transmission.

11.5. Alarm system setting lock

11.5.1. When the engine is in its running mode, deliberate or inadvertent setting of the alarm system shall be impossible.

11.6. Setting and unsetting of the AS

11.6.1. Setting

Any suitable means of setting of the AS is allowed, provided that such means does not inadvertently cause false alarms.

11.6.2. Unsetting

Unsetting of the AS shall be achieved by one or a combination of the following devices. Other devices giving equivalent performance are permitted.

11.6.2.1. A mechanical key (complying with requirements of Annex 6 to this Regulation) which can be coupled with a centralized vehicle locking system comprising of at least 1 000 variants, operated from the outside.

11.6.2.2. Electrical/electronic device, e.g. remote control, with at least 50 000 variants and shall incorporate rolling codes and/or have a minimum scan time of ten days, e.g. a maximum of 5 000 variants per 24 hours for 50 000 variants minimum.

11.6.2.3. A mechanical key or an electrical/electronic device within the protected passenger compartment, with timed exit/entry delay.

11.7. Exit delay

If the switching device for setting the AS is fitted within the protected area, an exit delay shall be provided. It shall be possible for the exit delay to be set to between 15 seconds and 45 seconds after the switch has been operated. The delay period may be adjustable to suit individual operators' circumstances.

11.8. Entry delay

If the device for unsetting the AS is fitted within the protected area, a delay of 5 seconds minimum and 15 seconds maximum shall be allowed before the activation of the audible and optical signals. The delay period may be adjustable to suit individual operators' circumstances.

11.9. Status display

11.9.1. To provide information on the status of the AS (set, unset, alarm setting period, alarm has been activated), optical displays inside and outside the passenger compartment are allowed. Any optical signal or any use of lighting and light-signalling devices outside the passenger compartment shall fulfil the requirements of UN Regulation No 48.

11.9.2. If an indication of short-term 'dynamic' processes such as changes from 'set' to 'unset' and vice versa is provided, it shall be optical according to paragraph 11.9.1. Such optical indication may also be produced by the simultaneous operation of the direction indicators and/or passenger compartment lamp(s), provided that the duration of the optical indication by the direction indicators does not exceed 3 seconds.

11.10. Power supply

The source of power for the AS shall either be the vehicle battery or a rechargeable battery. Where provided, an additional rechargeable or non-rechargeable battery may be used. These batteries shall by no means supply energy to other parts of the vehicle electrical system.

11.11. Specifications for optional functions

11.11.1. Self-check, automatic failure indication

On setting the AS, irregular situations, e.g. open doors, etc., can be detected by a self-check function (plausibility control), and this situation is indicated.

11.11.2. Panic alarm

An optical and/or audible and/or radio alarm is allowed independent of the state (set or unset) and/or function of the AS. Such an alarm shall be triggered from within the vehicle and shall not affect the state (set or unset) of the AS. Also it shall be possible for the vehicle user to switch off the panic alarm. In the case of an audible alarm, its sounding duration per activation shall not be restricted. A panic alarm shall not immobilize the engine or stop it if it is running.

12. Test conditions

All components of the VAS or AS shall be tested in accordance with procedures described in paragraph 7.

This requirement does not apply to:

12.1. Those components that are fitted and tested as part of the vehicle, whether or not a VAS/AS is fitted (e.g. lamps); or,

12.2. Those components that have previously been tested as part of the vehicle and documentary evidence has been provided.

12.3. Components that are not embedded in the vehicle, e.g. keys.

13. Instructions

Each vehicle shall be accompanied by:

13.1. Instructions for use.

13.2. Instructions for maintenance.

13.3. A general warning regarding the danger of making any alterations or additions to the system.

14. Modification of vehicle type and extension of approval

14.1. Every modification of the vehicle type or component type shall be notified to the Type Approval Authority which approved the vehicle or component type. The Type Approval Authority shall then either:

(a) Decide, in consultation with the manufacturer, that a new type approval is to be granted, or

(b) Apply the procedure contained in paragraph 14.1.1 (Revision) below and, if applicable, the procedure contained in paragraph 14.1.2 (Extension) below.

14.1.1. Revision

When particulars recorded in the information documents have changed and the Type Approval Authority considers that the modifications made are unlikely to have appreciable adverse effects and that in any case the vehicle alarm system still meets the requirements, the modification shall be designated a 'revision'.

In such a case, the Type Approval Authority shall issue the revised pages of the information documents as necessary, marking each revised page to show clearly the nature of the modification and the date of re-issue. A consolidated, updated version of the information documents, accompanied by a detailed description of the modification, shall be deemed to meet this requirement.

14.1.2. The modification shall be designated as an 'extension' if, in addition to the change of the data recorded in the information documents:

(a) Further inspections or tests are required; or

(b) Any information on the communication document (with the exception of its attachments) has changed; or

(c) Approval to a later series of amendments is requested after its entry into force.

14.2. Confirmation or refusal of approval, specifying the alteration, shall be communicated by the procedure specified in paragraph 4.3 above to the Contracting Parties to the Agreement applying this Regulation. In addition, the index to the information documents and to the test reports, attached to the communication document, shall be amended accordingly to show the date of the most recent revision or extension.

14.3. The Type Approval Authority granting the extension of approval shall assign a series number to each communication form drawn up for such an extension.

15. Conformity of production procedures

The conformity of production procedures shall comply with those set out in the Agreement, Schedule 1 (E/ECE/TRANS/505/Rev.3), with the following requirements:

15.1. Vehicles/components under this Regulation shall be so manufactured as to conform to the type approved by meeting the requirements of the relevant part(s) of this Regulation.

15.2. For each type of vehicle or component the tests prescribed in the relevant part(s) of this Regulation shall be carried out on a statistically controlled and random basis, in accordance with one of the regular quality assurance procedures.

15.3. The authority which has granted approval may at any time verify the conformity control methods applied in each production facility. The normal frequency of these verifications shall be one every two years.

16. Penalties for non-conformity of production

16.1. The approval granted in respect of a vehicle/component type pursuant to this Regulation may be withdrawn if the requirements laid down in paragraph 15 above are not complied with.

16.2. If a Contracting Party to the Agreement applying this Regulation withdraws an approval it has previously granted, it shall forthwith so notify the other Contracting Parties applying this Regulation, by means of a form conforming to the model in Annex 2.

17. Production definitively discontinued

If the holder of the approval completely ceases to manufacture a vehicle/component type approved in accordance with this Regulation, he shall so inform the authority which granted the approval. Upon receiving the relevant communication, that authority shall inform thereof the other Contracting Parties to the Agreement applying this Regulation by means of a form conforming to the model in Annex 2.

18. Names and addresses of the Technical Services responsible for conducting approval tests and of Type Approval Authorities

The Contracting Parties to the Agreement applying this Regulation shall communicate to the United Nations Secretariat the names and addresses of the Technical Services responsible for conducting approval tests and of the Type Approval Authorities which grant approval and to which forms certifying approval or extension or refusal or withdrawal of approval are to be sent.

ANNEX 1A

Information document

(Maximum format: A4 (210 mm × 297 mm))

In accordance with paragraph 11 of this Regulation relating to system type approval of a vehicle type with regard to an alarm system

1. General

1.1. Make (trade name of manufacturer): .....

1.2. Type: .....

1.3. Means of identification of type, if marked on the device: .....

1.3.1. Location of that marking: .....

1.4. Name and address of manufacturer: .....

1.5. Location of the ECE approval mark: .....

1.6. Address(es) of assembly plant(s): .....

2. General construction characteristics of the vehicle

2.1. Photographs and/or drawings of a representative vehicle:

2.2. Hand of drive: left/right (Strike out what does not apply)

3. Miscellaneous

3.1. Type approval number, if available:

3.1.1. A detailed description of the vehicle type with regard to the arrangement of the installed alarm system illustrated by photographs and/or drawings (where the alarm system is already type approved as a separate technical unit, reference may be made to the description in item 4.2 of the alarm system manufacturer's information document):

3.2. For alarm systems not yet approved

3.2.1. A detailed description of the alarm system and of the vehicle parts related to the alarm system installed:

3.2.2. A list of the main components comprising the alarm system:

ANNEX 1B

Information document

(Maximum format: A4 (210 mm × 297 mm))

In accordance with paragraph 6 of this Regulation relating to ECE component or separate technical unit type approval of an alarm system

1. General

1.1. Make (trade name of manufacturer): .....

1.2. Type: .....

1.3. Means of identification of type, if marked on the device ([1]): .....

1.3.1. Location of that marking: .....

1.4. Name and address of manufacturer: .....

1.5. Location of the ECE approval mark: .....

1.6. Address(es) of assembly plant(s): .....

2. Description of the device

2.1. A detailed description of the alarm system and of the vehicle parts related to the alarm system installed: .....

2.1.1. A list of the main components comprising the alarm system: .....

2.1.2. The measures taken against false alarms: .....

2.2. Range of protection offered by the device: .....

2.3. Method of setting/unsetting the device: .....

2.4. Number of effective interchangeable codes, if applicable: .....

2.5. List of main components comprising the device and, if applicable, their reference marks: .....

3. Drawings

3.1. Drawings of the main components of the device (the drawings shall show the intended space for UN type approval mark or reference mark, as applicable): .....

4. Instructions

4.1. List of vehicles to which the device is intended to be fitted: .....

([1]) If the means of identification of type contains characters not relevant to describe the component or separate technical unit types covered in this information document, such characters shall be represented in the documentation by the symbol '?' (e.g. ABC??123??).

4.2. Description of the method of installation illustrated by photographs and/or drawings: .....

4.3. Instructions for use: .....

4.4. Instructions for maintenance, if any: .....

4.5. List of paragraphs of this Regulation which do not apply by virtue of the installation conditions for a VAS, which is to be installed in specified places in specified vehicles.

ANNEX 2A

Communication

(Maximum format: A4 (210 × 297 mm))

issued by: Name of administration:

.....

.....

.....

concerning (2): Approval granted

Approval extended

Approval refused

Approval withdrawn

Production definitively discontinued

of a type of vehicle with regard to its Vehicle Alarm System pursuant to UN Regulation No 163

Approval No ..... Extension No .....

1. Trademark: .....

2. Type and trade name(s): .....

3. Name and address of manufacturer: .....

4. If applicable, name and address of manufacturer's representative: .....

4.1. Photographs and/or drawings of a representative vehicle: .....

4.2. Hand of drive: left/right (2)

4.3. Alarm system: .....

4.3.1. Type approval number, if available: .....

4.3.1.1. A detailed description of the vehicle type with regard to the arrangement of the installed VAS illustrated by photographs and/or drawings (where the VAS is already type approved as a separate technical unit, reference may be made to the description in item 4.2 of the VAS manufacturer's information document):

4.3.2. For alarm systems not yet approved

4.3.2.1. A detailed description of the alarm system and of the vehicle parts related to the alarm system installed: .....

(1) Distinguishing number of the country which has granted/extended/refused/withdrawn an approval (see approval provisions in the Regulation).
(2) Strike out what does not apply.

4.3.2.2. A list of the main components comprising the alarm system: .....

5. Brief description of vehicle: .....

6. Date of submission of vehicle for approval: .....

7. Technical Service performing the approval tests: .....

8. Date of report issued by that Service: .....

9. Number of report issued by that Service: .....

10. Approval granted/refused/extended/withdrawn ([2]):

11. Place: .....

12. Date: .....

13. Signature: .....

14. Annexed to this communication are the following documents, bearing the approval number indicated above: ...

15. Any remarks: .....

ANNEX 2B

Communication

(Maximum format: A4 (210 × 297 mm))

issued by: Name of administration:

.....

.....

.....

Concerning (2): Approval granted

Approval extended

Approval refused

Approval withdrawn

Production definitively discontinued

of a type of component or separate technical unit as an alarm system pursuant to Regulation No 163

Approval No ..... Extension No .....

1. Trademark: .....

2. Type and trade name(s): .....

3. Name and address of manufacturer: .....

3.1. If applicable, name and address of manufacturer's representative: .....

3.2. Address(es) of assembly plant(s): .....

4. Alarm system: .....

4.1. Means of identification of type, if marked on the device:

4.1.1 Location of that marking:

4.2. Description of the alarm system:

4.2.1. A detailed description of the alarm system and of the vehicle parts related to the alarm system installed: .....

4.2.2. A list of the main components comprising the alarm system: .....

4.2.3. List of vehicles to which the alarm is intended to be fitted: .....

4.2.4. Types of vehicles on which the alarm system has been tested: .....

5. Technical Service performing the approval tests: .....

(1) Distinguishing number of the country which has granted/extended/refused/withdrawn an approval (see approval provisions in the Regulation).

(2) Strike out what does not apply.

6. Date of report issued by that Service: .....

7. Number of report issued by that Service: .....

8. Approval granted/refused/extended/withdrawn ([2]):

9. Place: .....

10. Date: .....

11. Signature: .....

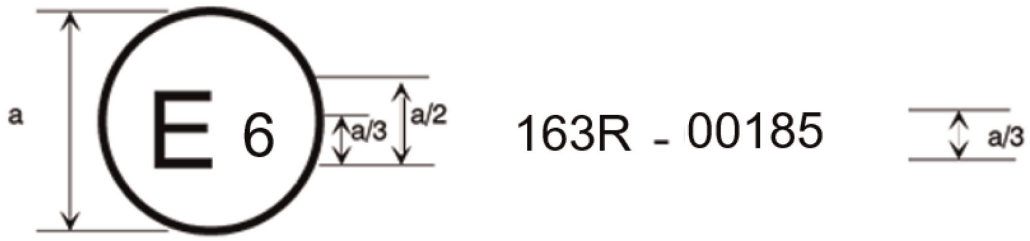
12. Annexed to this communication are the following documents, bearing the approval number indicated above: ...

13. Any remarks: .....

ANNEX 3

Arrangements of approval marks

(see paragraphs 4.4 to 4.4.2 of this Regulation)



a = 8 mm min.

The above approval mark affixed to a vehicle shows that the type concerned was approved in Belgium (E 6) pursuant to UN Regulation No 163 under approval No 00185. The first two digits (00) of the approval number indicate that the approval was granted in accordance with the requirements of UN Regulation No 163 in its original form.

ANNEX 4

Model of certificate of conformity

I the undersigned .....

(surname and name)

Testify that the vehicle alarm system described below:

Make: .....

Type: .....

is in total conformity with the type approved

at ..... on .....

(place of approval) (date)

as described in the communication form bearing approval No .....

Identification of the main component(s):

Component: .....

..... Marking:

Done at: ..... on: .....

Manufacturer's full address and stamp: .....

Signature: ..... (please specify position).

ANNEX 5

Model of installation certificate

I the undersigned .....

professional installer, certify that the installation of the vehicle alarm system described below has been carried out by myself pursuant to the mounting instructions supplied by the manufacturer of the system.

Description of the vehicle

Make: .....

Type: .....

Serial number: .....

Registration number: .....

Description of the vehicle alarm system

Make: .....

Type: .....

Approval number: .....

Done at: ..... on: .....

Installer's full address and stamp: .....

Signature: (please specify position).

ANNEX 6

Specifications for mechanical key switches

1. The cylinder of the key switch shall not protrude by more than 1 mm from the cowling, and the protruding part shall be conical.

2. The joint between the cylinder core and the cylinder casing shall be capable of withstanding a tensile force of 600 N and a torque of 25 Nm.

3. The key switch shall be provided with a cylinder drill obstruction.

4. The key profile shall have at least 1 000 effective permutations.

5. The key switch shall not be operable by a key which differs by only one permutation from the key matching the key switch.

6. The key aperture to an external key switch shall be shuttered or otherwise protected against the penetration of dirt and/or water.

ANNEX 7

Electromagnetic compatibility

1. Immunity against disturbances conducted along supply lines

Tests shall be performed according to the technical prescriptions and transitional provisions of UN Regulation No 10, 06 series of amendments and according to the test methods described in Annex 10 for an Electrical/Electronic Sub-Assembly (ESA).

The VAS/AS shall be tested in unset state and in set state.

2. Immunity against radiated high frequency disturbances

Testing of the immunity of a VAS/AS in a vehicle may be performed according to the technical prescriptions and transitional provisions of UN Regulation No 10, 06 series of amendments and test methods described in Annex 6 for the vehicles or Annex 9 for an Electrical/Electronic Sub-Assembly (ESA).

The VAS/AS shall be tested with operating conditions and failure criteria as defined in Table 1

Table 1

Operating conditions and failure criteria for VAS/AS

Test type	VAS/AS operating conditions	Failure criteria
Vehicle test	VAS/AS in unset state Key ON or Vehicle at 50 km/h [1]	Unexpected activation of the VAS/AS
	VAS/AS in set state Key OFF	Unexpected deactivation of the VAS/AS
	VAS/AS in set state Vehicle in charging mode (if applicable)	Unexpected deactivation of the VAS/AS
ESA Test	VAS/AS in unset state	Unexpected activation of the VAS/AS
	VAS/AS in set state	Unexpected deactivation of the VAS/AS

[1] This test can be covered by the UN Regulation No 10, 50 km/h mode.

3. Electrical disturbance from electrostatic discharges

Immunity against electrical disturbances shall be tested in accordance with ISO 10605:2008/AMD 1:2014 using the test severity levels from table 2.

ESD tests shall be performed either at vehicle level or at Electrical/Electronic Sub-Assembly (ESA) level.

Table 2

ESD Test levels

Discharge type	Discharge points	VAS/AS state	Discharge network	Test Level	Failure criteria
Air discharge	Points that can easily be accessed only from the inside of the vehicle	VAS/AS in unset state (if test performed on vehicle then vehicle shall be Key ON or Vehicle at 50 km/h or engine in idle mode)	330 pF, 2 kΩ	± 6 kV	Unexpected activation of the VAS/AS
	Points that can easily be touched only from the outside of the vehicle	VAS/AS in set state (if test performed on vehicle then vehicle shall be locked and Key OFF)	150 pF, 2 kΩ	± 15 kV	Unexpected deactivation of the VAS/AS without reactivation, within 1s, after each discharge
Contact discharge	Points that can easily be accessed only from the inside of the vehicle	VAS/AS in unset state (if test performed on vehicle then vehicle shall be Key ON or Vehicle at 50 km/h or engine in idle mode)	330 pF, 2 kΩ	± 4 kV	Unexpected activation of the VAS/AS
	Points that can easily be touched only from the outside of the vehicle	VAS/AS in set state (if test performed on vehicle then vehicle shall be locked and Key OFF)	150 pF, 2 kΩ	± 8 kV	Unexpected deactivation of the VAS/AS without reactivation, within 1s, after each discharge

Each test shall be performed with 3 discharges with a minimum of 5 s interval between each discharge.

4. Radiated emissions

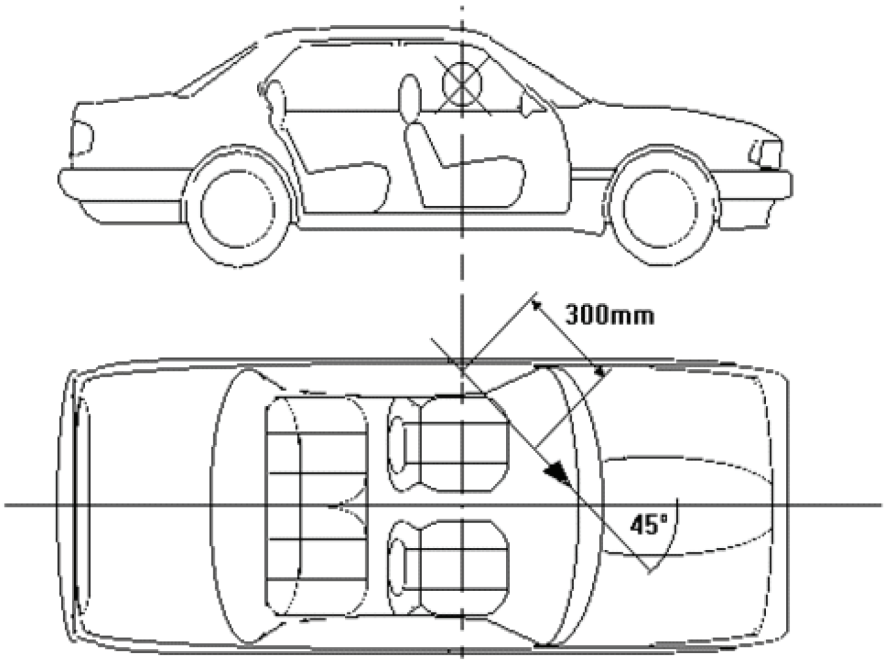
Tests shall be performed according to the technical prescriptions and transitional provisions of UN Regulation No 10, 06 series of amendments and according to the test methods described in Annexes 4 and 5 for vehicles or Annexes 7 and 8, for an Electrical/Electronic Sub-Assembly (ESA).

The VAS/AS shall be in set state.

ANNEX 8

Test of systems for the protection of the passenger compartment

Paragraph 7.2.11.



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