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Item 10 of the provisional agenda

UN Regulation No. 116 (Anti-theft and alarm systems)**Proposal for draft amendments to the document
ECE/TRANS/WP.29/GRSG/2019/21 (Draft new UN
Regulation on devices against unauthorized use)****Submitted by the expert from the International Organization of Motor
Vehicle Manufacturers***

The text reproduced below was prepared by the expert from the International Organization of Motor Vehicle Manufacturers (OICA) to amend the draft new UN Regulation dedicated to the approval of the fitting of devices against unauthorized use, and of vehicles equipped with devices against unauthorized use, in the frame of the process of splitting the UN Regulation No.116 into three separate regulations. It is based on document ECE/TRANS/WP.29/GRSG/2019/20.

* In accordance with the programme of work of the Inland Transport Committee for 2020 as outlined in proposed programme budget for 2020 (A/74/6 (part V sect. 20) para 20.37), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.



I. Proposal

Paragraph 5.3., insert a new sub-paragraph 5.3.3., to read:

“5.3.3. Electromechanical and electronic devices to prevent unauthorized shall be submitted to the tests described in Annex 5.”

Annex 5, insert new paragraphs 1. to 3.9., to read:

"Annex 5

Operation parameters and test conditions for devices to prevent unauthorized (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.

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

1.1.1. 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.

1.1.2. Degree of protection for installation

The following degrees of protection in accordance with IEC Publication 529 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.

1.1.3. Weatherability

7 days according to IEC 68-2-30-1980.

1.1.4. Electrical conditions

Rated supply voltage: 12 V

Operation supply voltage range: from 9 V to 15 V in the temperature range according to paragraph 5.3.1.1.1

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 5.3.3.2. to 5.3.3.9. of this Regulation.

3.1 Upon completion of all the tests specified below, the locking system shall be tested under the normal test conditions specified in paragraph 5.3.2.1. 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 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 5.3.3.1. 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 529-1989, for degrees of protection as in paragraph 5.3.1.1.2., the operation tests according to paragraph 5.3.3.1. 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 locking system 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 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 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 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 3.1.3.1.1. of the information document (Annex 1a), 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 3.1.3.1.1. 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 68 2 30 (1980) the operation tests according to paragraph 5.3.3.1. 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 5.3.3.1. 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 5.3.3.1. 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 5.3.2.1. 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, Part 2), 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 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 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 3.1.3.1.1. of the information document (Annex 1a), 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 3.1.3.1.1. 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/ 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 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 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 5.3.3.1. shall be repeated.

3.9. Electromagnetic compatibility

The locking system shall be submitted to the tests described in Annex 6"

Annex 6, amend, to read:

"Annex 6

Electromagnetic compatibility"

Paragraph 1 should be deleted

Renumber paragraph 1.1 as paragraph 1 and amend to read:

"1. Immunity against disturbances conducted along supply lines

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).

The locking system shall be tested in unset state and in set state."

Paragraphs 1.2. and 1.3. should be deleted

Renumber paragraphs 1.4, 1.5. and 1.6. as 2., 3. and 4., and amend to read:

"2. Immunity against radiated high frequency disturbances

Testing of the immunity of a **locking system** in a vehicle may be performed according to the technical prescriptions and transitional provisions of UN Regulation No. 10, 046 series of amendments and test methods described in Annex 6 for the vehicles ~~and~~ **or** Annex 9 for ~~a separate technical unit~~ **an Electrical/Electronic Sub-Assembly (ESA).**

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

Table 1

Operating conditions and failure criteria for the locking system

Test type	Locking system operating conditions	Failure criteria
Vehicle test	Locking system in unset state Key ON or Vehicle at 50 km/h ⁽¹⁾	Unexpected activation of the locking system
	Locking system in set state Key OFF	Unexpected deactivation of the locking system
	Locking system in set state Vehicle in charging mode (if applicable)	Unexpected deactivation of the locking system
ESA Test	Locking system in unset state	Unexpected activation of the locking system
	Locking system in set state	Unexpected deactivation of the locking system
(1) : this test can be covered by the ECE R10 50 km/h mode		

3. Electrical disturbance from electrostatic discharges

Immunity against electrical disturbances shall be tested in accordance with ~~Technical Report ISO/TR 10605-1993 2008~~ **Technical Report ISO/TR 10605-1993 2008 + corrigendum:2010 + AMD1:2014** 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	Locking system state	Discharge network	Test Level	Failure criteria
Air discharge	Points that can easily be accessed only from the inside of the vehicle	Locking system 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 locking system
	Points that can easily be touched only from the outside of the vehicle	Locking system 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 locking system without reactivation, within 1s, after each discharge
Contact discharge	Points that can easily be accessed only from the inside of the vehicle	Locking system 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 locking system
	Points that can easily be touched only from the outside of the vehicle	Locking system 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 locking system 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, 04 series of amendments prescriptions and according to the test methods described in Annexes 4 and 5 for vehicles or Annexes 7 and 8, for ~~a separate technical unit~~ an **Electrical/Electronic Sub-Assembly (ESA)**.

The locking system shall be in set state."

Paragraph 2 should be deleted