

**Economic and Social Council**

Distr.: General

7 August 2013

Original: English

Economic Commission for Europe**Inland Transport Committee****World Forum for Harmonization of Vehicle Regulations****Working Party on Lighting and Light-Signalling****Seventieth session**

Geneva, 21–23 October 2013

Item 9 of the provisional agenda

Regulation No. 10 (Electromagnetic compatibility)**Proposal for Supplement 1 to the 05 series of amendments to Regulation No. 10 (Electromagnetic compatibility)****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 document ECE/TRANS/WP.29/GRE/2013/3 and extend the scope of Regulation No. 10 (Electromagnetic compatibility) to all power train systems above a certain working voltage level when they are in charging mode. The modifications are marked in bold for new or strikethrough for deleted characters.

* In accordance with the programme of work of the Inland Transport Committee for 2010–2014 (ECE/TRANS/208, para. 106 and ECE/TRANS/2010/8, programme activity 02.4), the World Forum will develop, harmonize and update regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

I. Proposal

Paragraph 4.2.4, shall be deleted:

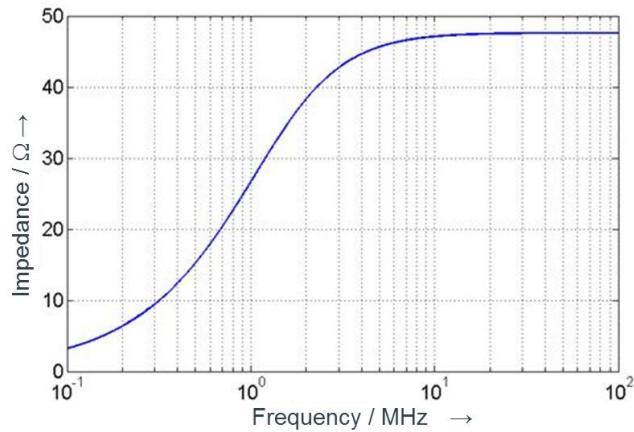
~~"4.2.4. In case an ESA is (part of) a light source and if:~~

- ~~(a) this ESA is subject to approval according to Regulation No. 37, Regulation No. 99 or Regulation No. [128]; and/or,~~
- ~~(b) this ESA is mechanically interchangeable with any (replaceable) approved light source according to Regulation No. 37, Regulation No. 99 or Regulation No. [128];~~

~~then approval according to Regulation No. 10 shall be refused if no approval according to Regulation No. 37, Regulation No. 99 or Regulation No. [128] was granted."~~

Appendix 8, figure 2, delete and replace by:

**"Figure 2
Impedance of HV artificial network**



Paragraph 6.7.1., Table 1, amend to read (inserting the unit "V"):

"Table 1

Maximum allowed pulse amplitude

Polarity of pulse amplitude	Maximum allowed pulse amplitude for	
	Vehicles with 12 V systems	Vehicles with 24 V systems
Positive	+75 V	+150 V
Negative	-100 V	-450 V

Paragraph 7.15.2.2., amend to read:

"7.15.2.2. The ESA representative of its type shall be considered as complying with immunity requirements if, during the tests performed in accordance with Annex 15-21, there shall be no degradation of performance of "immunity related functions", according to paragraph 2.2. of Annex 9."

Paragraph 7.17.1., Table 17, amend to read (inserting the unit "V")

Polarity of pulse amplitude	Maximum allowed pulse amplitude for	
	Vehicles with 12 V systems	Vehicles with 24 V systems
Positive	+75 V	+150 V
Negative	-100 V	-450 V

Annex 4, Table 1 and Annex 5, Table 1, as well as Annex 7, Table 1, the note amend to read:

"Note: ~~If a spectrum~~ **If a spectrum analyser**"

Annex 7, paragraph 4.4., amend to read:

"4.4. Measurements

Unless otherwise specified the configuration with the LV harness closer to the antenna shall be tested.

The phase centre of the antenna shall be in line with the centre of the longitudinal part of the wiring harnesses for frequencies up to 1'000 MHz.

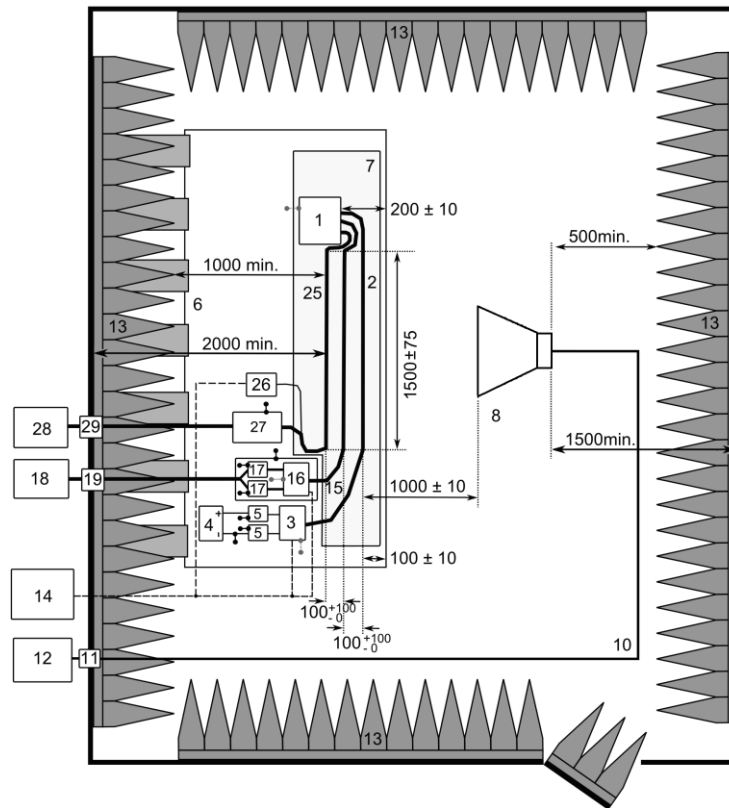
~~The phase centre of the antenna for frequencies above 1'000 MHz shall be in line with the ESA.~~

Annex 8, Table 1 and Annex 13, Table 1 and Annex 14, Table 1 and Annex 19, Table 1, and Annex 20, Table 1, the note amend to read:

"Note: ~~If a spectrum~~ **If a spectrum analyser**"

Annex 9, Appendix 3, figure, to be replaced:

Top view (Vertical polarization)



Annex 9, Appendix 3, Legend, amend to read:

"Legend

- | | |
|---|--------------------------------------|
| 1 ESA (grounded locally if required in test plan) | 13 RF absorber material |
| 2 LV Test harness | 14 Stimulation and monitoring system |
| 3 LV Load simulator (placement and ground connection according to CISPR 25 paragraph 6.4.2.5) | 15 HV harness |
| 4 Power supply (location optional) | 16 HV load simulator |
| 5 LV Artificial network (AN) | 17 HV AN |
| 6 Ground plane (bonded to shielded enclosure) | 18 HV power supply |
| 7 Low relative permittivity support ($\epsilon_r \leq 1,4$) | 19 HV feed-through |
| 8 Biconical Horn antenna | 25 AC/DC charger harness |
| 10 High-quality coaxial cable e.g. double-shielded (50 Ω) | 26 AC/DC load simulator (e.g. PLC) |
| 11 Bulkhead connector | 27 50 μ H LISN (AC) or HVAN (DC) |
| 12 RF signal generator and amplifier | 28 AC/DC power supply |
| | 29 AC/DC feed-through |

"

Annex 9, Appendix 4, amend to read:

"Top view (~~horizontal polarization~~) (example of substitution method)"

Annex 11 para. 2.1, Annex 12 para. 2.1, Annex 15 para. 2.1, Annex 16 para. 2.1, amend to read:

"2.1. The vehicle shall be in configuration "REESS charging mode coupled to the power grid".

The state of charge (SOC) of the traction battery shall be kept between 20 per cent and 80 per cent of the maximum SOC ~~during the whole frequency range measurement (this may lead to split the measurement in different sub bands with the need to discharge the vehicle's traction battery before starting the next sub bands)~~ **during the whole time duration of the measurement (this may lead to split the measurement in different time slots with the need to discharge the vehicle's traction battery before starting the next time slot).** If the current consumption can be adjusted, then the current shall be set to at least **80** per cent of its nominal value."

Annex 11, para. 3.1., amend to read:

"3.1. The observation time to be used for the measurements shall be as for quasi-stationary equipment as defined in IEC 61000-3-2, Table ~~34~~."

Annex 13, para. 13.3., amend to read:

"3.3. The test set-up for the connection of the vehicle in configuration "REESS charging mode coupled to the power grid" is shown in figure ~~41a to 1d~~ of Appendix 1 to this Annex."

Annex 17 para. 2.1., Annex 18 para. 2.1., amend to read:

"2.1. The ESA shall be in configuration "REESS charging mode coupled to the power grid".

The state of charge (SOC) of the traction battery shall be kept between 20 per cent and 80 per cent of the maximum SOC ~~during the whole frequency range measurement (this may lead to split the measurement in different sub bands with the need to discharge the vehicle's traction battery before starting the next sub bands)~~ **during the whole time duration of the measurement (this may lead to split the measurement in different time slots with the need to discharge the vehicle's traction battery before starting the next time slot).**

~~If the test is not performed with a REESS the ESA should be tested at rated current.~~ If the current consumption can be adjusted, then the current shall be set to at least 80 per cent of its nominal value."

Annex 19, para. 3.1., amend to read:

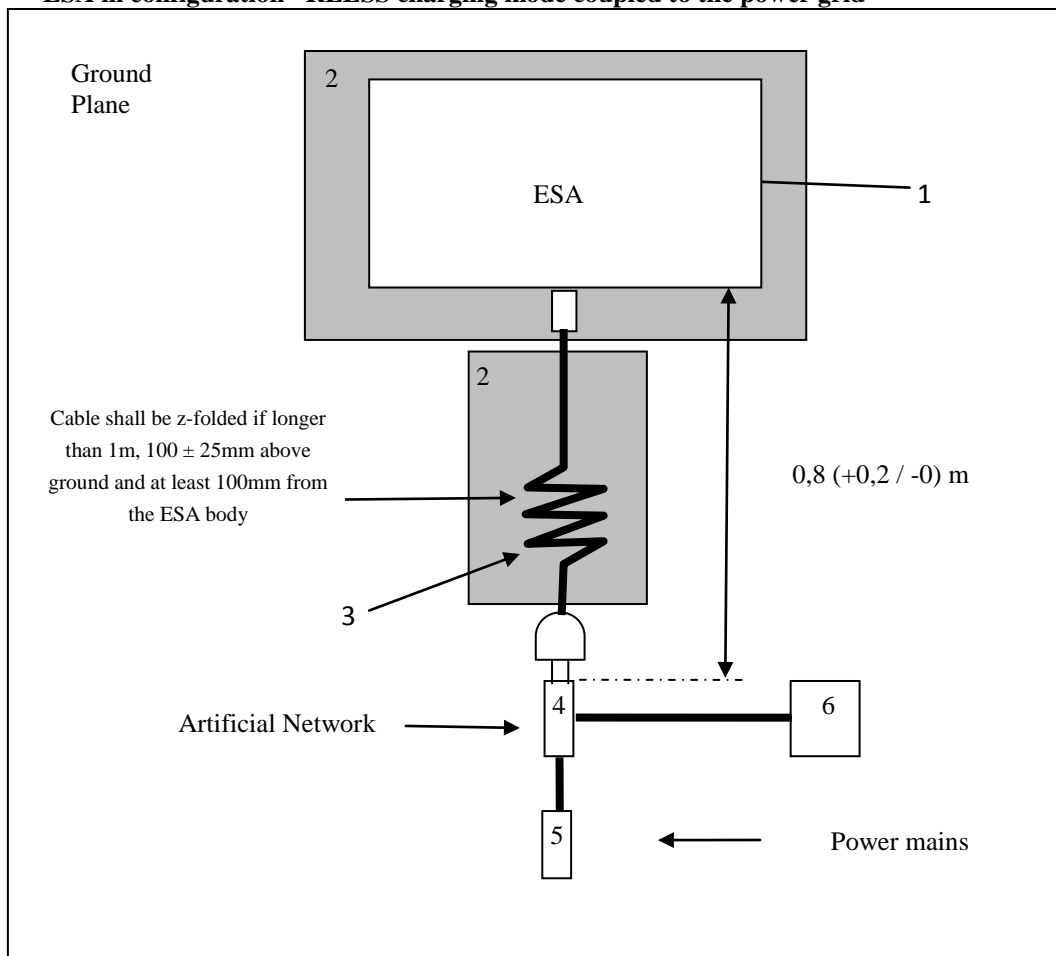
"3.1. The test shall be performed according to CISPR 16-2-1, Clause 7.4.1. as ~~table standing~~ **floor-standing** equipment."

Annex 19, para. 3.3., amend to read:

"3.3. The test set-up for the connection of the ESAs in configuration "REESS charging mode coupled to the power grid" is shown in ~~Figure 2~~ **Figure 1** of Appendix 1 to this annex."

Annex 19, Appendix 1, Figure 1, amend to read:

**"Figure 1
ESA in configuration "REESS charging mode coupled to the power grid"**



Annex 20, paragraph 3.2., amend to read:

"3.2. The impedance stabilization to be used for the measurement on ESA is defined in CISPR 22, paragraph 9.6.2.

Impedance Stabilization

Communication lines shall be applied to the ~~vehicle~~ ESA through IS(s).

The impedance stabilization (IS) to be connected in the network and communication cables is defined in CISPR 22 paragraph 9.6.2.

The IS(s) shall be mounted directly on the ground plane. The case of the IS(s) shall be bonded to the ground plane.

The measuring port of each IS shall be terminated with a 50 Ω load.

The IS shall be placed in front, aligned and on the same side of the vehicle power charging plug."

Annex 20, paragraph 3.5., renumber to paragraph 3.4.

Annex 20, Table 2, amend to read:

"Note: ~~For emissions generated by brush commutator motors without an electronic control unit, the maximum step size may be increased up to 5 times the bandwidth.~~"

Annex 21 para. 2.1., Annex 22 para. 2.1.2, amend to read:

"2.1. Basic ESA conditions

The paragraph defines minimum test conditions (as far as applicable) and failures criteria for ESA immunity tests.

<i>"REESS charging mode" ESA test conditions</i>	<i>Failure criteria</i>
<p>ESA shall be in configuration "REESS charging mode coupled to the power grid".</p> <p>The state of charge (SOC) of the traction battery shall be kept between 20 per cent and 80 per cent of the maximum SOC during the whole frequency range measurement (this may lead to split the measurement in different sub-bands with the need to discharge the vehicle's traction battery before starting the next sub-bands).</p> <p>If the test is not performed with a REESS the ESA should be tested at rated current. If the current consumption can be adjusted, then the current shall be set to at least 20 per cent of its nominal value.</p>	<p>Incorrect charging condition (e.g. over-current, overvoltage)</p>

Annex 21, Appendix 1, Figure 1, amend to read:

"Legend	1	ESA under test
	2	Insulating support
	3	Charging / communication cable
	4	AC or DC Artificial Network(s) grounded
	5	Power mains socket
	6	Impedance Stabilization(s) grounded
	7	Charging Station"

Annex 22, paragraph 4.3., amend to read:

"4.3 The Technical Service shall perform the test as specified in paragraph ~~7.8.2.1~~ **7.16.2.1.**"

Annex 22, Appendix 1, Figures 1-4, amend to read:

Figure 1
ESA in configuration "REESS charging mode coupled to the power grid" - Coupling between lines for DC or AC (single phase) power lines.

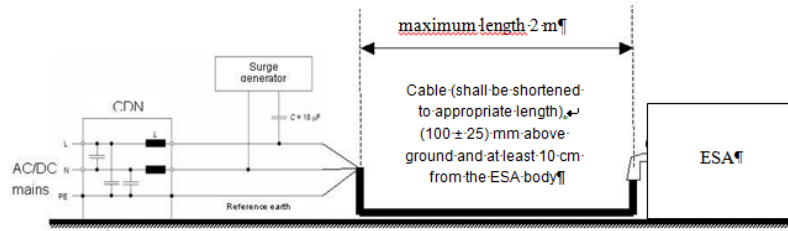


Figure 2
ESA in configuration "REESS charging mode coupled to the power grid" - Coupling between each line and earth for DC or AC (single phase) power lines

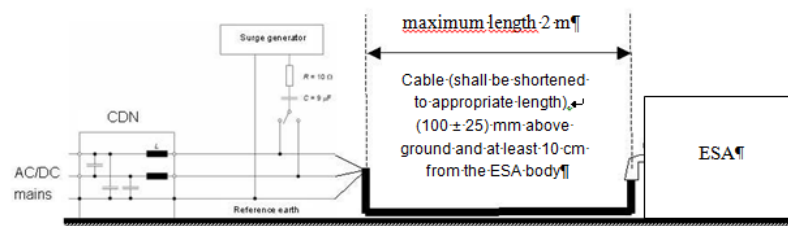


Figure 3
ESA in configuration "REESS charging mode coupled to the power grid" - Coupling between lines for AC (three phases) power lines

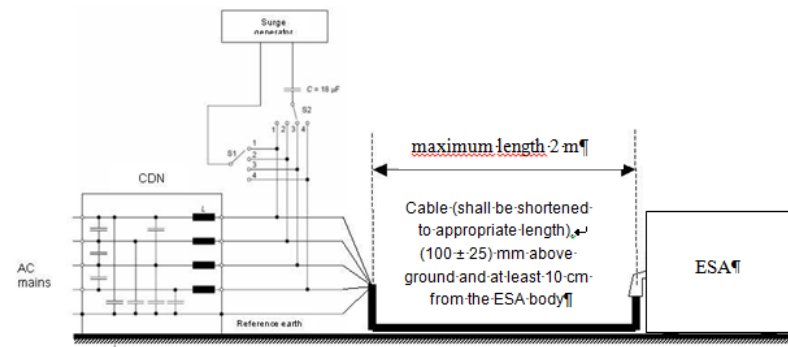
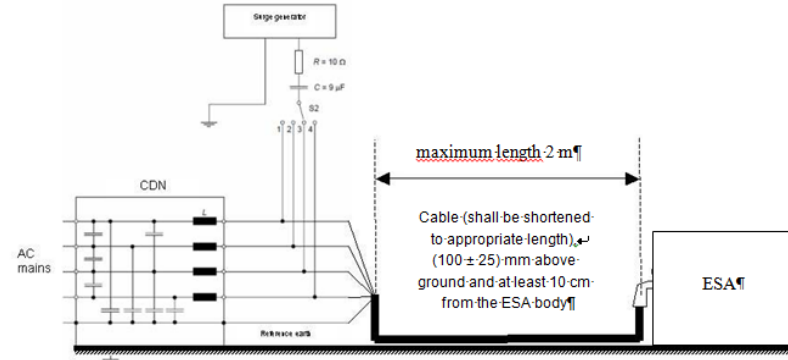


Figure 4
ESA in configuration "REESS charging mode coupled to the power grid" - Coupling between each line and earth for AC (three phases) power lines



II. Justification

1. Paragraph 4.2.4.: Regulation No. 10 concerns the electronic compatibility of all electronics systems included in vehicles or ESA. The problem raised by IEC in their informal document GRE-68-08 (and included in ECE/TRANS/WP.29/GRE/2013/3) has not been solved and cannot be solved by Regulation No. 10. In fact to do so, one should specify all existing regulation concerning equipment (ESA) in Regulation No. 10 (examples UN Regulations Nos. 13-H and 13 for braking systems, European directive No. 72/2010 in Europe for defrosting/defogging systems, UN Regulation No. 48 for lighting systems, UN Regulation No. 34 for prevention of fire risk regarding the charge dissipation, etc.). The aim of UN Regulation No. 10 is not to protect any industry or to complement a lack of any Technical Services or Administrations whose task is, among others, to verify the respect of the parallel regulatory texts such as UN Regulations Nos. 37, 99, 127, 13H, 13, 48, 34, etc.
2. First of all, in paragraph 4.2.4.a. of GRE-68-08, it is not explained how the applicant for the type-approval could demonstrate that the mentioned ESA was already approved according to Regulation No. 37, Regulation No. 99 or Regulation No. [128] and how the authorities could verify it.
3. Furthermore, in paragraph 4.2.4.b. of GRE-68-08, the EMC test-house is required to check that the mentioned ESA is not mechanically interchangeable with any (replaceable) approved light source according to Regulation No. 37, Regulation No. 99 or Regulation No. 128. An EMC test-house cannot possibly verify such a requirement.
4. In addition, in case of Contracting Parties not mandating Regulations Nos. 37, 99 or 128 in their national legislation, any industry should also comply with Regulations No. 37, No. 99 or No. 128 in addition to Regulation No. 10. It is not the role of any UN Regulation, notably UN Regulation No. 10, to create barrier to trade. Consequently, the justification given by IEC in their informal document GRE-68-8 is not meaningful and is in conflict with the first purpose of Regulation No. 10: to verify the design for all electronic systems in regard to their electronic compatibility. This explains why OICA proposes to delete paragraph 4.2.4.
5. Appendix 8: The value of the resistor R_2 shall be increased from 100 k Ω to 1 M Ω because, if the value of this resistor is too low, the isolation protection circuit of a tested high voltage device could be activated and switch off the high voltage system under test. Generally, REESS HV line isolated to the ground or vehicle body by 1M ohm or more to reduce the touch current. R2: 100k ohm in HVAN (High Voltage Artificial Network) will cause some leakage of current from HV lines. A certain level of leakage current will activate the fail-safe function which shut down the HV lines between REESS and HV power module. R2: resistance to the ground earth should apply 1M ohm which is equivalent value to insulation resistance of HV lines of REESS. This HVAN is applied in ESA immunity function test. To confirm the immunity performance in ESA, HVAN should keep the equivalent insulation resistance condition to vehicle test.
6. Appendix 8, figure 2, HV artificial network: editorial correction, from German to English nomenclature.
7. Para. 7.15.2.2.: editorial correction; this clause should refer the ESA Annex.
8. Annex 15: Method of testing for immunity of vehicles
9. Annex 21: Method of testing for immunity of an ESA.
10. Annex 4 Table 1, Annex 5 Table 1, Annex 7 Table 1, Annex 8 Table 1, Annex 13 Table 1, Annex 14 Table 1, Annex 19 Table 1, Annex 20 Table 1: editorial correction; word "analyser" was missing.
11. Annex 7, para. 4.4.: editorial correction; an unnecessary sentence was deleted. Test frequency is below the 1000MHz.

12. Annex 9, Appendix 3: Figure had to be improved because vertical polarization is applied in this regulation. Vertical layout figure should thus be applied in this annex. In vertical layout figures, a horn antenna figure would be better and easier for recognizing the antenna polarization compared with bi-conical antenna in figures.
 13. Annex 9, Appendix 4: editorial correction.
 14. Annex 11 para. 2.1, Annex 12 para. 2.1, Annex 15 para. 2.1, Annex 16 para. 2.1.: editorial correction. Unnecessary sentence of these annexes were deleted; it seems that was wrongly copied and pasted from Annex 12 and 13. Moreover, the missing figure "80" was added.
 15. Annex 11, para. 3.1.: editorial correction, since a wrong table was referred to.
 16. Annex 13, para. 13.3.: editorial correction; missing "a to 1d".
 17. Annex 17 para. 2.1., Annex 18 para. 2.1.: editorial correction. Unnecessary sentences were deleted.
 18. Annex 19, Table 2: editorial correction; an unnecessary sentence was deleted.
 19. Annex 21 para. 2.1., Annex 22 para. 2.1.2: editorial correction. Unnecessary sentence was deleted. This sentence was wrongly copied and pasted from Annex 12, 13.
 20. The other corrections are purely editorial.
-