Proposal for the 05 series of amendments to Regulation No. 10 (Electromagnetic compatibility)

Note by the Secretariat*

The text reproduced below was prepared by the Secretary to GRE, based on the document ECE/TRANS/WP.29/GRE/2013/3. It is proposing some corrections, mainly to the figures, to the original text. The modifications are marked in bold for new or strikethrough for deleted characters. In order to simply the work of the experts, some annexes and appendixes have been completely reproduced.

* In accordance with the programme of work of the Inland Transport Committee for 2010–2014 (ECE/TRANS/208, para. 106, 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 6.10.5., correct to read:

"6.10.5. Emission of transient conducted disturbances generated by ESAs on 12/24 V supply lines

ESAs that are not switched, contain no switches or do not include inductive load need not be tested for transient conducted emission and shall be deemed to comply with paragraph 6.9. 6.7."

Paragraph 13.5., correct to read:

"13.3.1. As from 28 October 2014 (36 months after the official date of entry into force of this Regulation, as amended by the 04 series of amendments), Contracting Parties applying this Regulation shall grant approvals only if the vehicle type, component or separate technical unit, to be approved meets the requirements of this Regulation as amended by the 04 series of amendments."
Annex 4, Appendix, correct to read:

"Annex 4 – Appendix"

Figure 1
Clear horizontal surface free of electromagnetic reflection delimitation of the surface defined by an ellipse

Mid-point of the engine situated on the perpendicular line drawn from the mid-point of the antenna

Large diameter = 2F

Small diameter = F \sqrt{3}

F = 10.0 \pm 0.2 \text{ m} (3.00 \pm 0.05 \text{ m})

Vehicle

Antenna
Figure 2
Position of antenna in relation to the vehicle

Figure 2a
Dipole antenna in position to measure the vertical radiation components

Figure 2b
Dipole antenna in position to measure the horizontal radiation components
Figure 3
Vehicle in configuration "REESS charging mode" coupled to the power grid

Example of test set-up for vehicle with plug located on vehicle side
(AC powered without communication)

Figure 3a
Elevation

Figure 3b
Plane

Legend
1 Vehicle under test
2 Insulating support
3 Charging cable
4 Artificial Network(s) grounded
5 Power mains socket

Vehicle in configuration "REESS charging mode" coupled to the power grid
Example of test setup for vehicle with plug located front/rear of vehicle
(AC powered without communication)

Figure 3c

Figure 3d

Legend
1 Vehicle under test
2 Insulating support
3 Charging cable
4 Artificial Network(s) grounded
5 Power mains socket
Vehicle in configuration "REESS charging mode" coupled to the power grid

Example of test set-up for vehicle with plug located on vehicle side
(AC or DC powered with communication)

Figure 3e

Figure 3f

Legend
1 Vehicle 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
Vehicle in configuration "REESS charging mode" coupled to the power grid
Example of test setup for vehicle with plug located front/rear of the vehicle
(AC or DC powered with communication)
Figure 3g

Figure 3h

Legend
1 Vehicle under test
2 Insulating support
3 Charging / communication cable
4 AC or DC Artificial Network(s) grounded
5 Power mains socket
6 Impedance Stabilisation(s) grounded
7 Charging Station
Annex 6, Appendix 1, correct to read:

"Annex 6 – Appendix 1

Figure 1

The reference point is in this plane

1.0 ± 0.2 m

Vertical axis of the front wheel (point C)
Figure 2

Vertical axis of the front wheel (point D)

0.2 ± 0.2 m

The reference point is in this plane
Figure 4
Vehicle in configuration "REESS in charging mode coupled to the power grid"

Example of test set-up for vehicle with plug located on the vehicle side
(AC power charging without communication)

Figure 4a

Legend
1 Vehicle under test
2 Insulating support
3 Charging cable
4 Artificial Network(s) grounded
5 Power mains socket
Example of test set-up for vehicle with plug located front / rear of vehicle
(AC power charging without communication)

**Figure 4c**

**Figure 4d**

Legend
1 Vehicle under test
2 Insulating support
3 Charging cable
4 Artificial Network(s) grounded
5 Power mains socket
Example of test set-up for vehicle with plug located on vehicle side 
(AC or DC power charging with communication)

**Figure 4e**

![Diagram](image)

**Figure 4f**

![Diagram](image)

**Legend**

1. Vehicle under test
2. Insulating support
3. Charging / communication cable
4. AC or DC Artificial Network(s) grounded
5. Power mains socket
6. Impedance Stabilisation(s) grounded
7. Charging Station
Example of test set-up for vehicle with plug located front/rear of the vehicle
(AC or DC power charging with communication)

Figure 4g

Figure 4h

Legend
1 Vehicle under test
2 Insulating support
3 Charging/communication cable
4 AC or DC Artificial Network(s) grounded
5 Power mains socket
6 Impedance Stabilisation(s) grounded
7 Charging Station
Annex 7, Appendix, new Figure 2, correct to read

"Figure 2
Test configuration for ESAs involved in "REESS charging mode coupled to the power grid" (example for biconical antenna)

Legend:
1 ESA (grounded locally if required in test plan)
2 LV Test harness
3 LV Load simulator (placement and ground connection according to CISPR 25 paragraph 6.4.2.5)
4 Power supply (location optional)
5 LV Artificial network (AN)
6 Ground plane (bonded to shielded enclosure)
7 Low relative permittivity support ($\varepsilon_r \leq 1.4$)
8 Biconical antenna
10 High-quality coaxial cable e.g. double-shielded (50 Ω)
11 Bulkhead connector
12 Measuring instrument
13 RF absorber material
14 Stimulation and monitoring system
15 HV harness
16 HV load simulator
17 HV AN
18 HV power supply
19 HV feed-through
25 AC/DC charger harness
26 AC/DC load simulator (e.g. PLC)
27 50µH LISN (AC) or HVAN (DC)
28 AC/DC power supply
29 AC/DC feed-through
Annex 11, Appendix 1, correct to read:

**Annex 11 – Appendix 1**

Figure 1
Vehicle in configuration "REESS charging mode coupled to the power grid" – Single phase charger test set-up

![Diagram 1](image1.png)

Figure 2
Vehicle in configuration "REESS charging mode coupled to the power grid" – Three-phase charger test set-up

![Diagram 2](image2.png)
Annex 12, Appendix 1, correct to read:

"Annex 12 – Appendix 1

Figure 1a
Vehicle in configuration "REESS charging mode coupled to the power grid" – Single phase test set-up

Figure 1b
Vehicle in configuration "REESS charging mode coupled to the power grid" – Three phase test set-up

0.8 (+0.2 / -0.0) m
Maximum length 10m

Cable shall be z-folded if longer than 10m, 100 ± 25mm above ground and at least 100mm from the car body

Maximum length 10m

Cable shall be z-folded if longer than 10m, 100 ± 25mm above ground and at least 100mm from the car body
Annex 13, Appendix 1, correct to read:

"Annex 13 – Appendix 1

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

Example of test setup for vehicle with plug located on vehicle side
(AC powered without communication)

Figure 1a

Figure 1b

Legend
1 Vehicle under test
2 Insulating support
3 Charging cable
4 Artificial Network(s) grounded (for AC or DC power lines)
5 Power mains socket
6 Measuring receiver
Vehicle in configuration "REESS charging mode coupled to the power grid"

Example of test setup for vehicle with plug located front / rear of vehicle
(AC powered without communication)

Figure 1c

Figure 1d

Legend
1 Vehicle under test
2 Insulating support
3 Charging cable
4 Artificial Network(s) grounded (for AC or DC power lines)
5 Power mains socket
6 Measuring receiver
Annex 14, Appendix 1, correct to read:

*Annex 14 – Appendix 1

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

Example of test setup for vehicle with plug located on vehicle side (AC or DC powered with communication)

Figure 1a

Figure 1b

Legend
1 Vehicle under test
2 Insulating support
3 Charging / communication cable
4 AC or DC Artificial Network(s) grounded (for AC or DC power lines)
5 Power mains socket
6 Impedance Stabilization(s) grounded (for communication lines)
7 Charging Station
8 Measuring receiver
Vehicle in configuration "REESS charging mode coupled to the power grid"

Example of test set-up for vehicle with plug located front/rear of vehicle (AC or DC powered with communication)

Figure 1c

Figure 1d

Legend

1. Vehicle under test
2. Insulating support
3. Charging / communication cable
4. AC or DC Artificial Network(s) grounded (for AC or DC power lines)
5. Power mains socket
6. Impedance Stabilisation(s) grounded (for communication lines)
7. Charging Station
8. Measuring receiver
Figure 2
Alternative measurement for vehicle in configuration "REESS charging mode coupled in the power grid"

Example of test setup for vehicle with plug located on vehicle side (AC or DC powered with communication)

Figure 2a

Legend
1 Vehicle under test
2 Insulating support
3 Charging / communication cable
4 AC or DC Artificial Network(s) grounded (for AC or DC power lines)
5 Power mains socket
7 Charging Station
8 Current probe
9 Communication lines
10 Measuring receiver
11 Capacitive voltage probe
Alternative measurement for vehicle in configuration "REESS charging mode coupled in the power grid"

Example of test setup for vehicle with plug located front / rear of vehicle (AC or DC powered with communication)

Figure 2c

Figure 2d

Legend

1 Vehicle under test
2 Insulating support
3 Charging / communication cable
4 AC or DC Artificial Network(s) grounded (for AC or DC power lines)
5 Power mains socket
6 Charging Station
7 Current probe (or capacitive voltage probe)
8 Communication lines
9 Measuring receiver
10 Capacitive voltage probe

Cable shall be z-folded if longer than 1m, 100 ± 25 mm above ground and at least 100mm from the car body.
"Annex 15 – Appendix 1

Figure 1
Vehicle in configuration "REESS charging mode" coupled to the power grid coupling on AC/DC power lines

Cable shall be z-folded if longer than 1m, 100 ± 25 mm above ground and at least 100mm from the car body
Annex 16, Appendix 1, correct to read:

"Annex 16 – Appendix 1

Vehicle in configuration "REESS charging mode coupled to the power grid

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

Figure 2
Vehicle 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
Vehicle in configuration "REESS charging mode coupled to the power grid" – Coupling between lines for AC (three phases) power lines

Figure 4
Vehicle in configuration "REESS charging mode coupled to the power grid" – Coupling between each line and earth for AC (three phases) power lines
Annex 17, Appendix 1, correct to read:

"Annex 17 – Appendix 1

Figure 1
ESA in configuration "REESS charging mode coupled to the power grid" – Single phase test set-up

Figure 2
ESA in configuration "REESS charging mode coupled to the power grid" – Three-phase test set-up
"Annex 18 – Appendix 1

Figure 1a
ESA in configuration "REESS charging mode coupled to the power grid" - Single phase test set-up

Power supply with open circuit voltage G and \((R_P + jX_P)\) impedance

Figure 1b
ESA in configuration "REESS charging mode coupled to the power grid" - Three-phase test set-up

Power supply with open circuit voltage G and \((R_P + jX_P)\) impedance
"Annex 20 – Appendix 1

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

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

Cable shall be z-folded if longer than 1m, 100 ± 25mm above ground and at least 100mm from the ESA body.
"Annex 21 – Appendix 1

II. Justification

1. Some corrections are proposed by the secretariat and OICA to clarify the proposal.