

Council Directive of 20 May 1975 on the suppression of
radio interference produced by agricultural or forestry tractors
(electromagnetic compatibility) (75/322/EEC) (repealed)

Status: EU Directives are published on this site to aid cross referencing from UK legislation. Since IP completion day (31 December 2020 11.00 p.m.) no amendments have been applied to this version.

[^{F1}ANNEX VI U.K.]

METHOD OF TESTING FOR IMMUNITY OF VEHICLES TO ELECTROMAGNETIC RADIATION

Textual Amendments

F1 Substituted by Commission Directive 2000/2/EC of 14 January 2000 adapting to technical progress Council Directive 75/322/EEC relating to the suppression of radio interference produced by spark-ignition engines fitted to wheeled agricultural or forestry tractors and Council Directive 74/150/EEC relating to the type-approval of wheeled agricultural or forestry tractors (Text with EEA relevance).

1. General U.K.

1.1. The test method described in this Annex shall only be applied to vehicles.

1.2. Test method

This test is intended to demonstrate the immunity to degradation in the direct control of the vehicle. The vehicle shall be subject to electromagnetic fields as described in this Annex. The vehicle shall be monitored during the tests.

2. Expression of results U.K.

For the test described in this Annex, field strengths shall be expressed in volts/m.

3. Measuring location U.K.

The test facility shall be capable of generating the field strengths over the frequency ranges defined in this Annex. The test facility shall comply with (national) legal requirements regarding the emission of electromagnetic signals.

Care shall be taken so that the control and monitoring equipment shall not be affected by radiated fields in such a way as to invalidate the tests.

4. Vehicle state during tests U.K.

4.1. The vehicle shall be in an unladen condition except for necessary test equipment.

4.1.1. [^{F1}The engine shall turn the driving wheels normally at a constant speed corresponding to three quarters of the maximum speed of the vehicle if there is no technical reason for the manufacturer to prefer another speed. The vehicle's engine must be loaded with an appropriate torque. If need be, the transmission shafts may be disengaged (for example, in the case of vehicles with more than two axles), provided they do not drive a component emitting interference.]

4.1.2. Headlamps shall be on dipped beam.

4.1.3. Left or right direction indicator shall be operating.

4.1.4. All other systems which affect the driver's control of the vehicle shall be (on) as in normal operation of the vehicle.

4.1.5. The vehicle shall not be electrically connected to the test area and no connections shall be made to the vehicle from any equipment, except as required by paragraph 4.1.1 or 4.2. Tyre contact with the test area floor shall not be considered to be an electrical connection.

- 4.2. If there are vehicle electrical/electronic systems which form an integral part of the direct control of the vehicle, which will not operate under the conditions described in paragraph 4.1, it will be permissible for the manufacturer to provide a report or additional evidence to the testing authority that the vehicle electrical/electronic system meets the requirements of this Directive. Such evidence shall be retained in the type-approval documentation.
- 4.3. Only non-perturbing equipment shall be used while monitoring the vehicle. The vehicle exterior and the passenger compartment shall be monitored to determine whether the requirements of this Annex are met (e.g. by using (a) video camera(s)).
- 4.4. The vehicle shall normally face a fixed antenna. However, where the electronic control units and the associated wiring harness are predominantly in the rear of the vehicle, the test should normally be carried out with the vehicle facing away from the antenna. In the case of long vehicles (i.e. excluding cars and light vans), which have electronic control units and associated wiring harness predominantly towards the middle of the vehicle, a reference point (see paragraph 5.4 of this Annex) may be established based on either the right side surface or the left side surface of the vehicle. This reference point shall be at the midpoint of the vehicle's length or at one point along the side of the vehicle chosen by the manufacturer in conjunction with the competent authority after considering the distribution of electronic systems and the layout of any wiring harness.

Such testing may only take place if the physical construction of the chamber permits. The antenna location must be noted in the test report.

5. Field generating device type, position and orientation **U.K.**
 - 5.1. Field generating device type
 - 5.1.1. The field generating device type(s) shall be chosen such that the desired field strength is achieved at the reference point (see paragraph 5.4 of this Annex) at the appropriate frequencies.
 - 5.1.2. The field generating device(s) may be an antenna(s) or a transmission line system (TLS).
 - 5.1.3. The construction and orientation of any field generating device shall be such that the generated field is polarized:
from 20 to 1 000 MHz horizontally or vertically
 - 5.2. Height and distance of measurement
 - 5.2.1. Height
 - 5.2.1.1. The phase centre of any antenna shall not be less than 1,5 m above the plane on which the vehicle rests or not less than 2,0 m above the plane on which the vehicle rests if the vehicle roof exceeds 3 m in height.
 - 5.2.1.2. No part of any antenna's radiating elements shall be closer than 0,25 m to the plane on which the vehicle rests.
 - 5.2.2. Distance of measurement
 - 5.2.2.1. In-service conditions may be best approximated by placing the field generating device as far from the vehicle as practical. This distance will typically lie within the range 1 to 5 m.

Status: EU Directives are published on this site to aid cross referencing from UK legislation. Since IP completion day (31 December 2020 11.00 p.m.) no amendments have been applied to this version.

5.2.2.2. If the test is carried out in an enclosed facility, the field generating device's radiating elements shall be no closer than 1,0 m to any radio absorbent material and no closer than 1,5 m to the wall of the enclosed facility. There shall be no absorbent material between the transmitting antenna and the vehicle under test.

5.3. Antenna location relative to vehicle

5.3.1. The field generating device's radiating elements shall not be closer than 0,5 m to the outer body surface of the vehicle.

5.3.2. The field generating device shall be positioned on the vehicle's centre line (plane of longitudinal symmetry).

5.3.3. No part of a TLS, with the exception of the plane on which the vehicle rests, shall be closer than 0,5 m to any part of the vehicle.

5.3.4. Any field generating device which is placed over the vehicle shall extend centrally over at least 75 % of the length of the vehicle.

5.4. Reference point

5.4.1. For the purposes of this Annex the reference point is the point at which the field strength shall be established and shall be defined as follows:

5.4.1.1. at least 2 m horizontally from the antenna phase centre or at least 1 m vertically from the radiating elements of a TLS,

5.4.1.2. on the vehicle's centre line (plane of longitudinal symmetry),

5.4.1.3. at a height of $1,0 \pm 0,05$ m above the plane on which the vehicle rests or $2,0 \pm 0,05$ m if the minimum height of the roof of any vehicle in the model range exceeds 3,0 m,

[^{F1}5.4.1.4] for front illumination, either:

— $\pm 0,2$ m inside the vehicle, measured from the point of intersection of the windscreen and bonnet (point C in Appendix 1 to this Annex), or

— $0,2 \pm 0,2$ m from the centre line of the front axle of the tractor measured towards the centre of the tractor (point D in Appendix 2 to this Annex),

whichever results in a reference point closer to the antenna,]

[^{F2}5.4.1.5] for rear illumination, either:

— $\pm 0,2$ m inside the vehicle, measured from the point of intersection of the windscreen and bonnet (point C in Appendix 1 to this Annex), or

— $0,2 \pm 0,2$ m from the centre line of the rear axle of the tractor, measured towards the centre of the tractor (point D in Appendix 2 to this Annex),

whichever results in a reference point closer to the antenna.]

Textual Amendments

F2 Inserted by [Commission Directive 2000/2/EC of 14 January 2000 adapting to technical progress Council Directive 75/322/EEC relating to the suppression of radio interference produced by spark-ignition engines fitted to wheeled agricultural or forestry tractors and Council Directive 74/150/EEC relating to the type-approval of wheeled agricultural or forestry tractors \(Text with EEA relevance\).](#)

5.5. If it is decided to radiate the rear of the vehicle, the reference point shall be established as in paragraph 5.4. The vehicle shall then be installed facing away from the antenna and positioned as if it had been horizontally rotated 180° around its centre point, i.e. such that the distance from the antenna to the nearest part of the outer body of the vehicle remains the same. This is illustrated in Appendix 3 to this Annex.

6. Test requirements **U.K.**

6.1. Frequency range, dwell times, polarization

The vehicle shall be exposed to electromagnetic radiation in the 20 to 1 000 MHz frequency range.

6.1.1. To confirm that the vehicle meets the requirements of this Annex, the vehicle shall be tested at up to 14 spot frequencies in the range, e.g.:

27, 45, 65, 90, 120, 150, 190, 230, 280, 380, 450, 600, 750 and 900 MHz.

The response time of the equipment under test shall be considered and the dwell time shall be sufficient to allow the equipment under test to react under normal conditions. In any case, it shall not be less than two seconds.

6.1.2. One mode of polarization shall be used at each frequency — see paragraph 5.1.3.

6.1.3. All other test parameters shall be as defined in this Annex.

6.1.4. If a vehicle fails the test defined in paragraph 6.1.1 of this Annex, it must be verified as having failed under the relevant test conditions and not as a result of the generation of uncontrolled fields.

7. Generation of required field strength **U.K.**

7.1. Test methodology

7.1.1. The ‘substitution method’ shall be used to establish the test field conditions.

7.1.2. Calibration phase

At each test frequency, a level of power shall be fed into the field generating device to produce the required field strength at the reference point (as defined in paragraph 5) in the test area with the vehicle absent, the level of forward power, or another parameter directly related to the forward power required to define the field, shall be measured and the results recorded. Test frequencies shall lie in the range 20 to 1 000 MHz. Calibration shall be made, starting at 20, in steps not greater than two per cent of the previous frequency finishing at 1 000 MHz. These results shall be used for type approval tests unless changes occur in the facilities or equipment which necessitate this procedure being repeated.

7.1.3. Test phase

The vehicle shall then be introduced into the test facility and positioned in accordance with the requirements of paragraph 5. The required forward power defined in paragraph 7.1.2 at each frequency as defined in paragraph 6.1.1 shall then be applied to the field generating device.

7.1.4. Whatever parameter was chosen in paragraph 7.1.2 to define the field, the same parameter shall be used to establish the field strength during the test.

7.1.5. The field generating equipment and its layout employed during the test shall be to the same specification as that used during the operations performed in paragraph 7.1.2.

Status: EU Directives are published on this site to aid cross referencing from UK legislation. Since IP completion day (31 December 2020 11.00 p.m.) no amendments have been applied to this version.

7.1.6. Field strength measuring device

A suitable compact field strength measuring device shall be used to determine the field strength during the calibration phase of the substitution method.

7.1.7. During the calibration phase of the substitution method, the phase centre of the field strength measuring device shall be positioned at the reference point.

7.1.8. If a calibrated receiving antenna is used as the field strength measuring device, readings shall be obtained in three mutually orthogonal directions and the isotropic equivalent value of the readings shall be taken as the field strength.

7.1.9. To take account of different vehicle geometries, a number of antennae positions or reference points may need to be established for a given test facility.

7.2. Field strength contour

7.2.1. During the calibration phase of the substitution method (prior to a vehicle being introduced into the test area), the field strength in at least 80 % of the calibration steps shall not be less than 50 % of the nominal field strength, at the following locations:

- (a) for all field generating devices, $0,5 \pm 0,05$ m either side of the reference point on a line passing through the reference point and at the same height as the reference point, and perpendicular to the vehicle plane of longitudinal symmetry;
- (b) in the case of a TGLS, $1,50 \pm 0,05$ m on a line passing through the reference point at the same height as the reference point and along the line of longitudinal symmetry.

7.3. Chamber resonance

Notwithstanding the condition expressed in 7.2.1, tests shall not be performed at chamber resonant frequencies.

7.4. Characteristics of the test signal to be generated.

7.4.1. Maximum envelope excursion

The maximum envelope excursion of the test signal shall equal the maximum envelope excursion of an unmodulated sine wave whose rms value in volts/m is defined in paragraph 6.4.2 of Annex I (see Appendix 4 to this Annex).

7.4.2. Test signal wave form

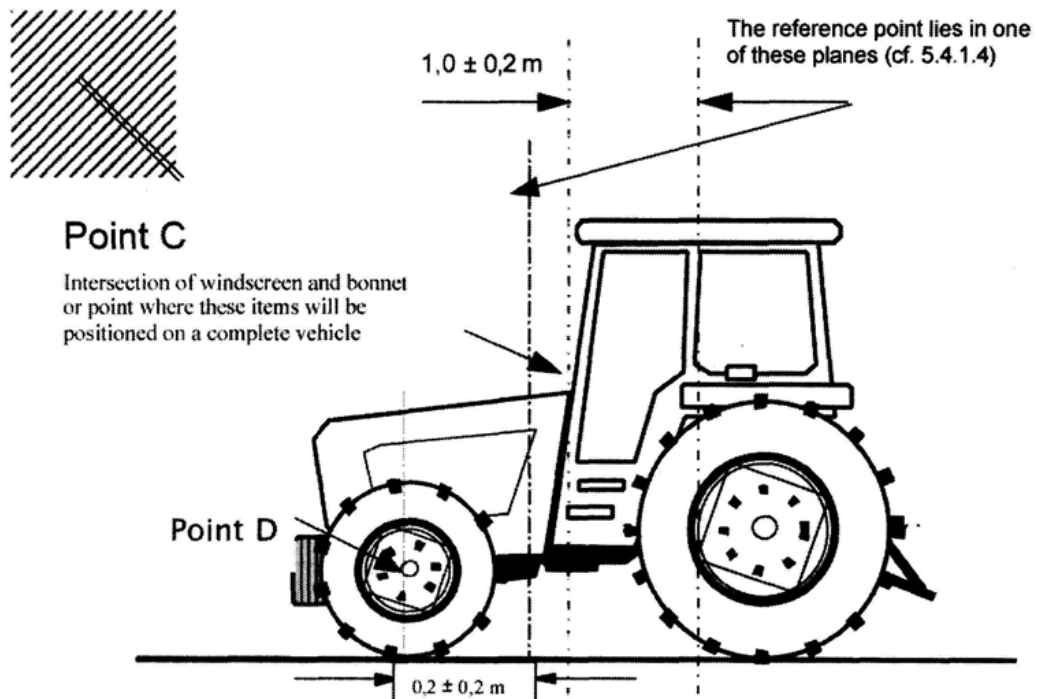
The test signal shall be a radio frequency sine wave, amplitude modulated by a 1 kHz sine wave at a modulation depth m of $0,8 \pm 0,04$.

7.4.3. Modulation depth

The modulation depth m is defined as:

$$m = \frac{\text{maximum envelope excursion} - \text{minimum envelope excursion}}{\text{maximum envelope excursion} + \text{minimum envelope excursion}}$$

[^{F1}Appendix 1 U.K.]



Status: EU Directives are published on this site to aid cross referencing from UK legislation. Since IP completion day (31 December 2020 11.00 p.m.) no amendments have been applied to this version.

Appendix 2] U.K.

The reference point lies in one of these planes (cf. 5.4.1.5)

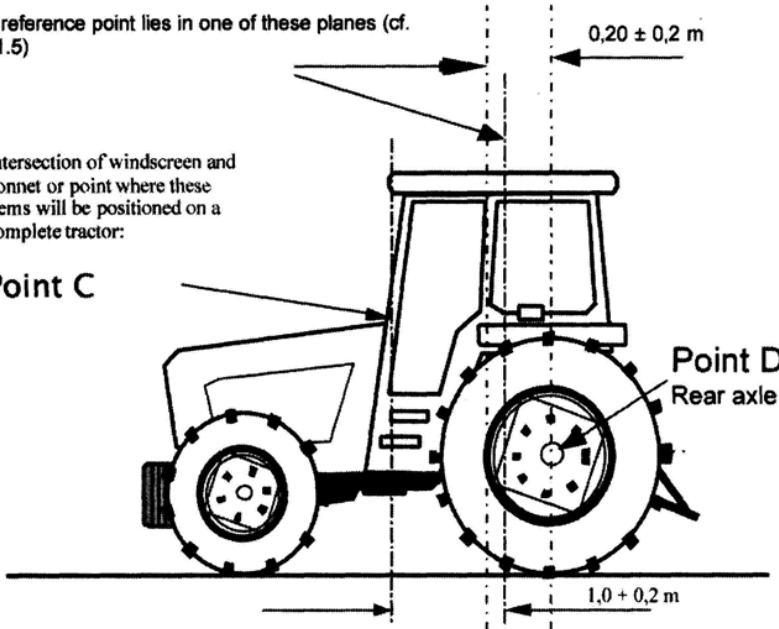
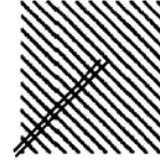
$0,20 \pm 0,2$ m

Intersection of windscreen and bonnet or point where these items will be positioned on a complete tractor:

Point C

Point D
Rear axle

$1,0 \pm 0,2$ m



Status: EU Directives are published on this site to aid cross referencing from UK legislation. Since IP completion day (31 December 2020 11.00 p.m.) no amendments have been applied to this version.

^{F3}Appendix 3 **U.K.**

[^{F3}.....]

Status: EU Directives are published on this site to aid cross referencing from UK legislation. Since IP completion day (31 December 2020 11.00 p.m.) no amendments have been applied to this version.

Appendix [F13] U.K.

