

[^{F1}ANNEX V

METHOD OF MEASUREMENT OF RADIATED NARROWBAND ELECTROMAGNETIC EMISSIONS FROM VEHICLES

Textual Amendments

- F1** Substituted by [Commission Directive 95/54/EC](#) of 31 October 1995 adapting to technical progress [Council Directive 72/245/EEC](#) on the approximation of the laws of the Member States relating to the suppression of radio interference produced by spark-ignition engines fitted to motor vehicles and amending [Directive 70/156/EEC](#) on the approximation of the laws of the Member States relating to the type-approval of motor vehicles and their trailers.

1. General

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

1.2. Measuring apparatus

The measuring equipment shall comply with the requirements of publication No 16-1 (93), of the International Special Committee on Radio Interference (CISPR).

An average detector or a peak detector shall be used for the measurement of radiated narrowband electromagnetic emissions in this Annex.

1.3. Test method

- 1.3.1. This test is intended to measure narrowband electromagnetic emissions such as might emanate from a microprocessor-based system or other narrowband source.

- 1.3.2. As an initial step the levels of emissions in the FM frequency band (88 to 108 MHz) shall be measured at the vehicle broadcast radio antenna with equipment as specified in paragraph 1.2. If the level specified in paragraph 6.3.2.4 of Annex I is not exceeded, then the vehicle shall be deemed to comply with the requirements of this Annex in respect of that frequency band and the full test shall not be carried out.

- 1.3.3. In the full test procedure two alternative antenna distances are permissible: 10 or 3 m from the vehicle. In either case the requirements of paragraph 3 of this Annex shall be complied with.

2. Expression of results

The results of measurements shall be expressed in dB microvolts/m (microvolts/m).

3. Measuring location

- 3.1. The test site shall be a level, clear area free from electromagnetic reflecting surfaces within a circle of minimum radius 30 m measured from a point midway between the vehicle and the antenna (see Figure 1 of Appendix 1 to Annex IV).

- 3.2. The measuring set, test hut, or vehicle in which the measurement set is located may be within the test site, but only in the permitted region shown in Figure 1 of Appendix 1 to Annex IV.

Other measuring antennae are allowed within the test area, at a minimum distance of 10 m both from receiving antenna and the vehicle/STU under test, provided that it can be shown that the test results will not be affected.

Status: EU Directives are being published on this site to aid cross referencing from UK legislation. After IP completion day (31 December 2020 11pm) no further amendments will be applied to this version.

3.3. Enclosed test facilities may be used if correlation can be shown between the enclosed test facility and an outdoor site. Enclosed test facilities do not need to meet the dimensional requirements of Figure 1 in Appendix 1 of Annex IV other than the distance from the antenna to the vehicle and the height of the antenna. Neither do they need to have ambient emissions checked before or after the test as indicated in paragraph 3.4 of this Annex.

3.4. Ambient

To ensure that there is no extraneous noise or signal of a magnitude sufficient to affect materially the measurement, ambient measurements shall be taken before and after the main test. It will be necessary to ensure that any emissions from the vehicle do not affect significantly the ambient measurements, for example by removing the vehicle from the test area, removing the ignition key, or disconnecting the battery(ies). In both of the measurements, the extraneous noise or signal shall be at least 10 dB below the limits of interference given in paragraph 6.3.2.1 or 6.3.2.2 (as appropriate) of Annex I, except for intentional narrowband ambient transmissions.

4. Vehicle state during tests

4.1. The vehicle's electronic systems shall all be in normal operating mode with the vehicle stationary.

4.2. The ignition shall be switched on. The engine shall not be operating.

4.3. Measurements shall not be made while rain or other precipitation is falling on the vehicle or within 10 minutes after such precipitation has stopped.

5. Antenna type, position and orientation

5.1. Antenna type

Any antenna may be used provided that it can be normalized to the reference antenna. The method described in the CISPR 12 publication, Edition 3, Appendix A, may be used to calibrate the antenna.

5.2. Height and distance of measurement

5.2.1. Height

5.2.1.1. 10 m test

The phase centre of the antenna shall be $3,00 \pm 0,05$ m above the plane on which the vehicle rests.

5.2.1.2. 3 m test

The phase centre of the antenna shall be $1,80 \pm 0,05$ m above the plane on which the vehicle rests.

5.2.1.3. No part of any antenna's receiving 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. 10 m test

The horizontal distance from the tip or other appropriate point of the antenna defined during the normalization procedure described in paragraph 5.1 to this Annex to the outer body surface of the vehicle shall be $10,0 \pm 0,2$ m.

5.2.2.2. 3 m test

The horizontal distance from the tip or other appropriate point of the antenna defined during the normalization procedure described in paragraph 5.1 to this Annex to the outer body surface of the vehicle shall be $3,00 \pm 0,05$ m.

5.2.2.3. If the test is carried out in a facility enclosed for radio frequency electromagnetic screening purposes, the antenna's receiving 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 must be no absorbent material between the receiving antenna and vehicle under test.

5.3. Antenna location relative to vehicle

The antenna shall be located successively on the left and right-hand sides of the vehicle with the antenna parallel to the plane of longitudinal symmetry of the vehicle and in line with the engine mid-point (see Figure 2 in Appendix 1 to Annex IV).

5.4. Antenna position

At each of the measuring points, readings shall be taken both with the antenna in a horizontal and in a vertical polarization (see Figure 2 in Appendix 1 to Annex IV).

5.5. Readings

The maximum of the four readings taken in accordance with paragraphs 5.3 and 5.4 at each spot frequency shall be taken as the characteristic reading at the frequency at which the measurements are made.

6. Frequencies

6.1. Measurements

Measurements shall be made throughout the 30 to 1 000 MHz frequency range. This range shall be divided into 13 bands. In each band one spot frequency may be tested to demonstrate that the required limits are satisfied. To confirm that the vehicle meets the requirements of this Annex, the testing authority shall test at one such point in each of the following 13 frequency bands:

30 to 50, 50 to 75, 75 to 100, 100 to 130, 130 to 165, 165 to 200, 200 to 250, 250 to 320, 320 to 400, 400 to 520, 520 to 660, 660 to 820, 820 to 1 000 MHz.

In the event that the limit is exceeded during the test, investigations shall be made to ensure that this is due to the vehicle and not to background radiation.]