

Australian Standard 2557—1982

ELECTROMAGNETIC INTERFERENCE LIMITS AND MEASUREMENTS

SPARK IGNITION SYSTEMS USED IN MOTOR VEHICLES AND OTHER SIMILARLY POWERED DEVICES



STANDARDS ASSOCIATION OF AUSTRALIA

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Electricity Supply Association of Australia
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AUSTRALIAN STANDARD

**ELECTROMAGNETIC
INTERFERENCE LIMITS
AND MEASUREMENTS**

**SPARK IGNITION SYSTEMS USED IN
MOTOR VEHICLES AND OTHER
SIMILARLY POWERED DEVICES**

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PREFACE

This standard was prepared under the authority of the Telecommunications and Electronics Committee on Electromagnetic Interference as one of a series of standards intended to facilitate the electromagnetic compatibility of electric and electronic equipment.

The limits and methods of measurement given are based on the recommendations of the International Special Committee on Radio Interference (CISPR) in CISPR 12:1978 and acknowledgement is made of assistance obtained therefrom. The standard varies, however, in regard to the following:

1. Limits are extended to cover the range 30 MHz to 1000 MHz, being identical to the CISPR recommendations for the range 40 MHz to 250 MHz. Beyond this range the limits are in accordance with guidance given in CISPR 12.
2. Requirements for suppression devices are not included nor are methods of measurement for such components.
3. A clause (Clause 8) on detection of offending vehicles from the roadside has been included.

Marginal bars indicate a deviation from CISPR 12. In general the changes are editorial in nature, reflecting changed wording or a re-arrangement of material which would prevent ready comparison with the international document.

The purpose of the standard is to establish uniform requirements for electromagnetic interference limits and methods of measurement for interference radiated by the ignition systems of motor vehicles, motor boats and other devices powered by spark-ignition internal combustion engines. The term 'motor vehicles' is understood to include both road transport and off-road vehicles such as tractors, construction vehicles and snow mobiles. The term 'similarly powered devices' is understood to include chainsaws, lawnmowers, irrigation equipment, construction equipment and the like, whether mobile or stationary.

The standard does not apply to diesel-powered equipment. Other items which are sources of interference and which may contribute to the overall level of interference produced by a motor vehicle but are not within the scope of this standard are electric motors, heaters and airconditioners, whether integral or added to the vehicle in question.

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Australian Standard

for

ELECTROMAGNETIC INTERFERENCE LIMITS AND MEASUREMENTS—SPARK IGNITION SYSTEMS USED IN MOTOR VEHICLES AND OTHER SIMILARLY POWERED DEVICES

1 SCOPE. This standard establishes limits for electromagnetic interference radiated by spark ignition systems used in motor vehicles, motor boats and other similarly powered equipment, describes methods of measurement, and gives guidance on methods of interference suppression.

2 APPLICATION. This standard applies to the radiation of electromagnetic energy in the frequency range 30 MHz to 1000 MHz which may cause interference to radiocommunication services, and which is emitted from—

- (a) vehicles propelled by spark-ignition internal combustion engines;
- (b) boats propelled by spark-ignition internal combustion engines; and
- (c) other equipment or devices equipped with spark-ignition internal combustion engines.

The standard does not apply to aircraft, electric traction systems or electrically propelled vehicles.

NOTES:

1. 'Vehicles' includes but is not limited to cars, trucks, buses, motor cycles, agricultural tractors and self-propelled machinery, snowmobiles, etc.
2. 'Devices' includes but is not limited to chainsaws, pumps, air compressors, lawnmowers and stationary or mobile concrete mixers and construction equipment.
3. For the purposes of this standard, unless the context indicates otherwise the word 'equipment' is taken to mean motor vehicle, motor boat and other similarly powered equipment or device within the scope of the standard.

3 REFERENCED DOCUMENTS. The following standards are referred to in this standard:

AS 1052 Electromagnetic Interference Measuring Equipment

Part 1—Equipment for the Frequency Range 10 kHz to 150 kHz

Part 2—Equipment for the Frequency Range 1.15 MHz to 1000 MHz

AS 1852 International Electrotechnical Vocabulary

4 DEFINITIONS. For the purpose of this standard, the definitions given in AS 1852 apply.

5 LIMITS OF INTERFERENCE. The limits for radiation based on quasi-peak measurements are as follows:

- (a) From 30 MHz to 75 MHz 50 μ V/m.
- (b) From 75 MHz to 400 MHz 50 μ V/m at 75 MHz rising linearly to 180 μ V/m at 400 MHz.
- (c) From 400 MHz to 1000 MHz 180 μ V/m.

For peak-type measuring equipment, the corresponding values are 20 dB higher.

6 METHODS OF MEASUREMENT.

6.1 Measuring Equipment. The measuring equipment shall comply with the requirements of AS 1052, Part 2.

6.2 Expression of Results. The results of measurements shall be expressed in microvolts per metre for 120 kHz bandwidth. If the actual bandwidth B (expressed in kilohertz) of the measuring apparatus differs from 120 kHz, the results measured shall be related to the 120 kHz bandwidth by applying a factor 120/B. The variation from 120 kHz shall not exceed ± 30 kHz. For statistical evaluation, the logarithmic unit dB (μ V/m) shall be used.

6.3 Measuring Site. The measuring site shall be a level area free from appreciable wave-reflecting surfaces, within a radius of 30 m measured from a point midway between the equipment under test and the antenna.

The disposition of the equipment and the measuring antenna shall be as shown in Fig. 1. The measuring set, test hut or test vehicle in which the measuring set is located, may be horizontally not closer than 3 m to the antenna and in a direction opposite to the equipment being tested.

To ensure that there is no extraneous noise or signal of a magnitude sufficient to materially affect the measurement, measurements shall be taken before and after the main test, but without the engine under test running. If the maximum reading obtained on the main test exceeds the maximum reading on either of these check tests by at least 10 dB then the maximum reading on the main test is to be regarded as being not materially affected by extraneous noise or signal.

6.4 Equipment.

6.4.1 Conditions of measurement. Only the ancillary electrical equipment necessary to run the engine shall be operating.

The engine shall be at normal operating temperature.

The following conditions shall additionally be taken into account:

- (a) Where the operating position and height are variable, the equipment to be tested shall be positioned so that the spark plug is 1 ± 0.2 m above ground or at minimum height, whichever is the greater.
- (b) No operator shall be present, but, if necessary, a mechanical arrangement shall be made, using non-metallic material as far as possible, to keep the equipment in normal position(s) and at the specified engine speed.