AS 1019—1985

Australian Standard®

INTERNAL COMBUSTION ENGINES—SPARK EMISSION CONTROL DEVICES

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The following interests are represented on Committee ME/20:

Australian Assembly of Fire Authorities
Australian Chamber of Commerce
Building Owners and Managers Association of Australia Limited
Confederation of Australian Industry
Construction Equipment Importers and Manufacturers of Australia
Department of Agriculture, Vic.
Department of Defence
Electricity Supply Association of Australia
Federal Chamber of Automotive Industries
Federation of Automotive Products Manufacturers
Institution of Engineers Australia
Metal Trades Industry Association of Australia
National Farmers Federation
Society of Automotive Engineers Australasia
State Insurance Office, Vic.
Tractor and Machinery Association of Australia
University of Melbourne
Victoria Police

Representatives of the following interests also participated in the drafting of this standard:

Users and manufacturers of spark arresters

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INTERNAL COMBUSTION ENGINES—SPARK EMISSION CONTROL DEVICES

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PREFACE

This standard was prepared by the Associations Committee on Internal Combustion Engines, to supersede AS 1019—1970, Spark Emission Control Devices for Internal Combustion Engines.

The principal changes in this standard are editorial changes and clarification of test methods. During the course of the preparation of the standard, tests were carried out by the Agricultural Engineering Centre at Werribee which showed that turbochargers acted as spark arresters on compression-ignition engines; these results are reflected in the standard.

CONTENTS

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
INTERNAL COMBUSTION ENGINES—SPARK EMISSION CONTROL DEVICES

1 SCOPE. This standard specifies requirements for the materials, design, construction and performance of spark arresters for controlling the emission of sparks from internal-combustion engines. A method of testing the performance of spark arresters is set out in Appendix A.

It does not cover the following:

(a) The risk of ignition of combustible materials by hot surfaces of the engine, the exhaust pipe, or the spark arrester.

(b) Aspects of installation.

(c) Applications in explosive atmospheres which may require flame arresting, exhaust gas cooling or isolation.

(d) The effect of the spark arrester on engine noise levels.

NOTE: Recommended maintenance procedures are given in Appendix B.

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

AS 1152 Test Sieves

AS 1449 Wrought Alloy Steels—Stainless and Heat-resisting Steel Plate, Sheet and Strip

3 DEFINITION. For the purpose of this standard, the following definition applies:

Spark arrester—a device, system or method which controls the emission from an engine exhaust of particles potentially capable of igniting combustible material in the vicinity by virtue of their size and temperature.

4 RATING. Spark arresters shall be rated according to—

(a) the type of engine to which the spark arrester may be fitted (i.e. spark-ignition engine or compression-ignition engine); and

(b) the highest net power output of the engine equipped with the standard production auxiliaries necessary for its operation for the particular application.

5 MATERIALS. Materials used in the construction of spark arresters shall be suitable for the conditions of use (e.g. high temperature, acidic corrosion, weather). In particular—

(a) screens where used shall be made of stainless steel AS 1449/304L or AS 1449/316L or equivalent; and

(b) screwed connections and fasteners shall be made of material that facilitates disassembly.

6 DESIGN AND CONSTRUCTION.

6.1 Quality of construction. Construction, fitting and welding shall be such as will ensure that—

(a) gaps in the construction do not result in a failure to comply with the requirements for retention of particles (see Clause 7.1); and

(b) the assembly of the components and the method of fixing to the engine are capable of withstanding the expected service vibration conditions.

6.2 Durability of components. All components shall have adequate heat resistance performance and be of a suitable gauge for the application.

6.3 Disassembly. Screens shall be removable. Components such as inspection hatches and plugs which may require removal for inspection and cleaning shall be—

(a) capable of withstanding repeated disassembly and reassembly without damage or distortion;

(b) designed so that they cannot be reassembled incorrectly; and

(c) fixed and assembled so that they are resistant to loosening by vibration.

6.4 Capacity. Spark arresters that are designed to store the retained particles shall provide for easy clearing of the stored material. Storage capacity shall be sufficient to accommodate at least one test sample, as detailed in Appendix A, Table A2.

7 PERFORMANCE.

7.1 Particle retention. When a spark arrester is tested in accordance with Appendix A, not more than 0.1 g of large carbon particles (i.e. passing a 2.36 mm sieve (see AS 1152) and retained on a 1.18 mm sieve), and not more than 10 percent by mass of small carbon particles (i.e. passing a 1.18 mm sieve (see AS 1152) and retained on a 600 µm sieve) shall be discharged from the exhaust system.

7.2 Back-pressure. When a spark arrester is tested in accordance with Appendix A, the back-pressure shall not exceed the value recommended by the manufacturer of the engine with which the arrester is intended to be used.

NOTES:

1. High back-pressure can reduce the power output of an engine, but the tolerable value of back-pressure varies with engine type and size.
2. Where an arrester is to be used on an engine of a type or size different from the engine used during the test described in Appendix A, the maximum allowable back-pressure for the prospective engine is to be correlated with a reference back-pressure for the test engine in order to establish compliance with the above requirement.

8 MARKING. Each spark arrester shall be clearly and permanently marked with the following information:

(a) Manufacturer's identification.

(b) Rating (see Clause 4).