

SURFACE VEHICLE RECOMMENDED PRACTICE

SAE J2576

ISSUED
APR2002

Issued 2002-04

Blade Fuses - 42 V System

Foreword—This SAE Recommended Practice has been developed by: the Circuit Protection Task Force of the Circuit Protection and Switching Devices Committee. The objectives of the task force are to develop information reports, recommended practices, and standards concerned with the requirements, design, and testing of circuit protection components such as fuses, circuit breakers, or other devices of similar purpose that are intended for use in the electrical systems of vehicles.

This document is intended as a guide toward the adoption of standard practices and is subject to change so as to keep pace with experience and technical advances.

TABLE OF CONTENTS

1.	Scope	2
2.	References	2
2.1	Applicable Documents	2
2.1.1	SAE Publications	2
2.1.2	ASTM Publications	2
2.1.3	ISO Publications	2
2.2	Related Publications	3
2.2.1	SAE Publication	3
2.2.2	ISO Publication	3
3.	Definitions	3
4.	Test Requirements	7
4.1	Test Equipment and Instrumentation	7
4.2	General Conditions	10
4.3	Sample Sizes	10
5.	Test Procedures	10
5.1	Electrical Testing	10
5.2	Mechanical and Environmental Testing	11
6.	Performance Requirements	13
6.1	Electrical Test Requirements	13
6.2	Mechanical and Environmental Test Requirements	14

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.

TO PLACE A DOCUMENT ORDER: +1 (724) 776-4970 FAX: +1 (724) 776-0790
SAE WEB ADDRESS <http://www.sae.org>

7.	General Requirements	14
7.1	Design Parameters	14
7.2	Marking and Identification	15
7.3	Testing Safety and Operational Advisory	15
8.	Test Sequence Chart	16
Figure 1	Miniature Class Blade Fuse	4
Figure 2	Standard Class Blade Fuse	5
Figure 3	Time Lag Class Blade Fuse	6
Figure 4	Miniature Class Blade Fuse Test Slug	7
Figure 5	Standard Class Blade Fuse Test Slug	8
Figure 6	Time Lag Class Blade Fuse Test Slug	9
Figure 7	Transient Cycling Test Duty Cycle Format	11
Figure 8	Blade Strength Test (Axis Orientation)	12
Figure 9	Test Sequence Chart	16

Appendix A	Example of Test Fixture Design	17
Figure A1	Test Fixture Component Reference Drawing	18

- 1. Scope**—This SAE Recommended Practice defines the blade fuse styles, test conditions, procedures, and performance requirements for use in vehicle electrical power systems designed to the new motor vehicle industry 42 V architecture. The intent of this document is to provide a framework for 58 V Blade Fuse characteristics, serving the motor vehicle industry to establish standardization with respect to electrical performance and mechanical requirements. This standardization shall lend itself to safe application practices; e.g., prevention of 32 V devices utilized inappropriately in 42 V electrical systems.

Both the performance and mechanical requirements expressed herein are for the advancement of mobility engineering and the development of safe application practices. They are not intended for the establishment of design exclusions, patent rights, or franchising that engenders restraint of trade.

2. References

- 2.1 Applicable Publications**—The following publications form a part of this specification to the extent specified herein. Unless otherwise specified, the latest issue of SAE publications shall apply.

2.1.1 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001

SAE J1034—Engine Coolant Concentrate - Ethylene-Glycol Type
 SAE J1284—Blade Type Electric Fuses
 SAE J1888—High Current Time Lag Electric Fuses
 SAE J2077—Miniature Blade Type Electrical Fuses

2.1.2 ASTM PUBLICATIONS (OR REFERENCED PROPERTIES)—Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM B 117—Method of Salt Spray (Fog) Testing
 ASTM No. 3 Oil

2.1.3 ISO DOCUMENTS—Available from ANSI, 25 West 43rd Street, New York, NY 10036-8002.

ISO 1817 No. 1 Oil
 ISO 8820-3—Road vehicles—Fuses—Part 3: Fuse-links with tabs (blade-type)

2.2 Related Publications—The following publications are provided for information purposes only and are not a required part of this specification.

2.2.1 SAE PUBLICATION—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001

SAE J726—Air Cleaner Test Code

2.2.2 ISO DOCUMENT—Available from ANSI, 25 West 43rd Street, New York, NY 10036-8002.

ISO 8820-1—Road vehicles—Fuses—Part 1: Definitions and general test requirements

3. Definitions

3.1 Fuse—A device designed to interrupt the electrical circuit when subjected to over-current. This action is to be nonreversible, and the fuse is intended for replacement after the circuit malfunction has been corrected.

3.2 Fuse Holder—An electro-mechanical assembly capable of accepting or otherwise providing termination to a fuse device and providing termination capability to an electrical power source.

3.3 Insulator Body—An electrically non-conductive housing (e.g., plastic) that provides a supporting framework for the conductive sections of the fuse assembly. May provide in supplemental fashion, a mechanical design form to facilitate keying or other interface relationship with a fuse holder or other power distribution module assembly, which would serve to distinguish a 58 V fuse from a 32 V fuse.

3.4 Fuse Element—The section of the fuse conductive path that is by design the most susceptible area to overload current conditions and when subjected to overload current in sufficient amount and duration, becomes disrupted effectively interrupting the current path to a non-conducting state. A 58 V fuse element will provide for safe interruption of current under all conditions of overload.

3.5 Terminal—The terminal is that part of the fuse construction that makes the electro-mechanical conductive connection for the fuse assembly to its respective fuse holder device. The terminals are those portions of the fuse extending from the insulator body on the respective fuse type footprint centerline.

3.6 Rated Current—The rated current is the maximum continuous current the fuse is capable of passing for the minimum specified time as shown in the test procedures and performance requirements. It also serves to identify the fuse nominal rated current value. While being a performance and identification value, end use applications and circuit design factors may necessitate a continuous current rating less than the fuse rated current value.

3.7 Rated Voltage—The rated voltage is the maximum voltage for which the fuse is designed. For this document, the rated voltage is 58 V. Rated voltage is not necessarily the same as operating voltage, which typically is less than the rated voltage in a vehicular electrical system. Rated voltage allows for the periodic voltage rise or transient voltage spikes that occur in vehicular electrical systems.

3.8 Voltage Drop—The voltage drop is the voltage measured across the fuse circuit path passing the full rated current after specified time duration and under specific conditions of test.

3.9 Breaking Capacity—The breaking capacity is a value of the respective fault current that a fuse (fuse element) is capable of interrupting in accordance with a specific test condition and performance criteria.

3.10 Time/Current Characteristics—The relation of time for a fuse to operate (open) in proportion to a specific test current, typically expressed in graphical form to relate a time/current curve.

3.11 Operating Times—An expression of time duration in minimum and maximum terms to indicate when a fuse should operate (open) at a specified value of current in excess of the rated current.

3.12 Miniature Class Blade Fuse—Indicates a 58 V rated fuse that generally corresponds to the class of fuse identified in SAE J2077 as a miniature blade type electrical fuse, however, it is mechanically coded to prevent the 32 V miniature blade type fuse from being interchanged in a 58 V application. Figure 1 depicts this class of fuse basic format without mechanical coding provision incorporated.

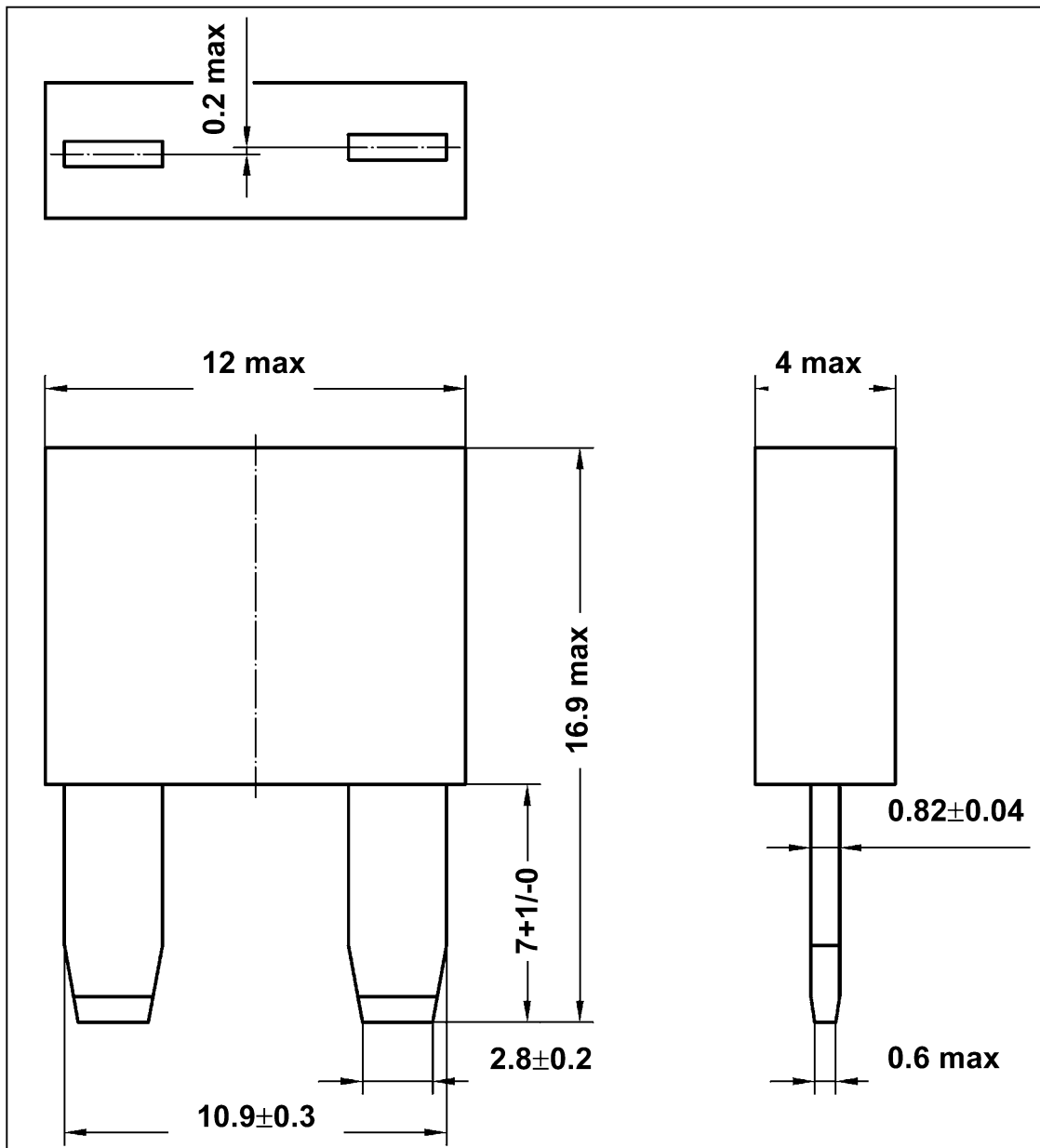


FIGURE 1—MINIATURE CLASS BLADE FUSE

3.13 Standard Class Blade Fuse—Indicates a 58 V rated fuse that generally corresponds to the class of fuse identified in SAE J1284 as a blade type electrical fuse, however, it is mechanically coded to prevent the 32 V version blade type fuse from being interchanged in a 58 V application. The term “standard” in this context is solely intended to indicate that this fuse size is the first and oldest in the family of blade fuses to gain wide use and acceptance in the automotive industry. Figure 2 depicts this class of fuse basic format without mechanical coding provision incorporated.

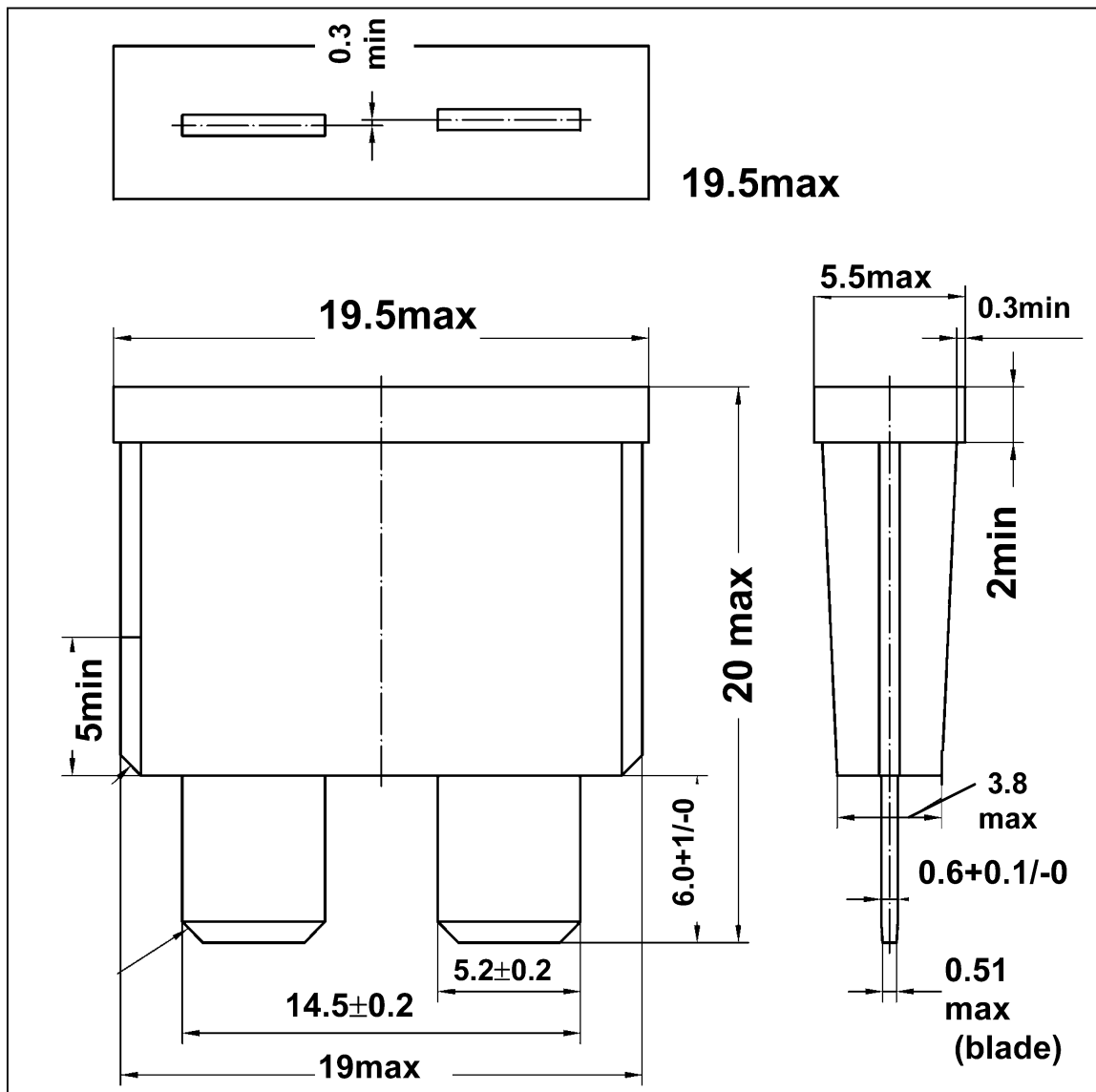


FIGURE 2—STANDARD CLASS BLADE FUSE

3.14 Time Lag Class Blade Fuse—Indicates a 58 V rated fuse that generally corresponds to the class of fuse identified in SAE J1888 as a high current time lag blade type electrical fuse, however, it is mechanically coded to prevent the 32 V high current time lag blade type fuse from being interchanged in a 58 V application. Figure 3 depicts this class of fuse basic format without mechanical coding provision incorporated.

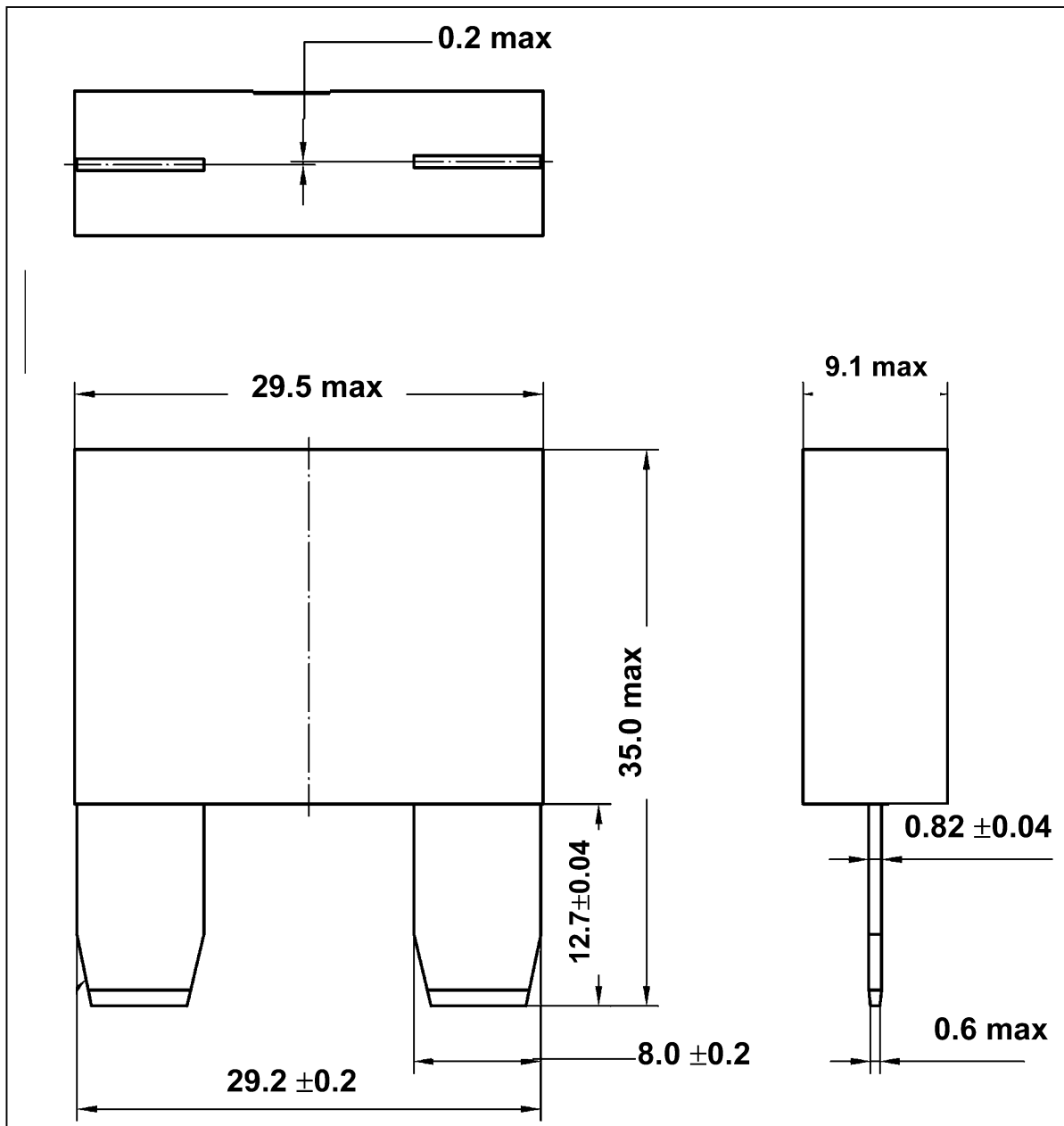


FIGURE 3—TIME LAG CLASS BLADE FUSE