AS 3761—1990

Australian Standard®

Vehicle exhaust system surface temperatures

This Australian Standard was prepared by Committee ME/20, Internal Combustion Engines. It was approved on behalf of the Council of Standards Australia on 12 December 1989 and published on 14 May 1990.

The following interests are represented on Committee ME/20:

Australian Assembly of Fire Authorities
Construction Equipment Importers and Manufacturers of Australia
Department of Agriculture and Rural Affairs, Victoria
Electricity Supply Association of Australia
Federal Chamber of Automotive Industries
Institution of Engineers Australia
Metal Trades Industry Association of Australia
National Farmers Federation
Society of Automotive Engineers—Australasia
Tractor and Machinery Association of Australia
University of Melbourne

Additional interests participating in preparation of Standard:

CSIRO, Division of Forests and Forest Products
Department of Conservation, Forests and Lands

This Standard was issued in draft form for comment as DR 89067.

Australian Standard®

Vehicle exhaust system surface temperatures

First published as AS 3761—1990.

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140

ISBN 0 7262 6093 2

PREFACE

This Standard was prepared by the Standards Australia Committee on Internal Combustion Engines.

Figure 1 has been taken from Figure 1 of The Ford Motor Company Engineering Design Standard DM 3.08-377, Exhaust Component Surface Temperature, and the test procedure (Appendix A) has been based on The Ford Motor Company Engineering Test Procedure P4.30, Vehicle Heat Protection Requirements Test. The test procedure simulates a reasonably hard driving mode followed by a stationary idle period. The exhaust system is required to have surface temperatures below those of Figure 1 during the idle cooling down period.

The graph in DM 3.08-377 is similar to that of the Japanese Ministry of Transport Trias 30—1979, Heat Damage Test Procedure For Motor Vehicles, Page 800, and both graphs have temperature plots similar to those in Figure 2 of the US Department of Agriculture Forest Service, Equipment Development Test Report 5100-15, Danger of Ignition of Ground Cover Fuels by Vehicle Exhaust Systems, which give representative ignition times for dry grass in contact with a surface at specific temperatures.

The Division of Forest and Forest Products of CSIRO carried out some experimental work on motor vehicle exhaust system surface temperature ranges and cooling rates, and were in general agreement with Figure 1, but they did ascertain that under some conditions vegetation in contact with surface at the prescribed times and temperatures could cause ignition (ref. CSIRO Report, DFR User Series No 12).

The Department of Conservation, Forests and Lands, Victoria, carried out field tests with several motor vehicles and reported that while the possibility of ignition existed with some of these vehicles the probability was low (ref. DCFL Report 85/1130 dated 17.3.88).

Statistics on bushfire causes presented by the Country Fire Authority of Victoria showed that fires caused by hot exhaust surfaces were of low incidence.

Figure 1 was therefore adopted as being a reasonable compromise as the motor vehicle manufacturers could economically achieve the temperature limits and because evidence of vegetation ignition was minimal.

CONTENTS

		Page
1	SCOPE	3
2	REFERENCED DOCUMENTS	3
3	DEFINITIONS	3
4	SURFACE TEMPERATURES	3
APPENDIX A.	DETERMINATION OF SURFACE TEMPERATURES	5

STANDARDS AUSTRALIA

Australian Standard

Vehicle exhaust system surface temperatures

1 SCOPE. This Standard specifies the maximum surface temperatures of vehicle exhaust systems to minimize the likelihood of grass and forest fires due to contact of vegetation with the exhaust system. The method for determining the surface temperature is given in Appendix A.

2 REFERENCED DOCUMENTS. The following document is referred to in this Standard:

Australian Design Rules for Motor Vehicles and Trailers, Third Edition

3 DEFINITIONS. For the purpose of this Standard, the definitions below apply.

3.1 Vehicle—any self-propelled wheeled vehicle described as a passenger vehicle or goods vehicle in the vehicle category definitions of Part 1 of the Australian Design Rules for Motor Vehicles and Trailers, Third Edition. These are: Passenger Car (Category MA), Forward Control Passenger Vehicle (Category MB), Off Road Passenger Vehicle (Category MC), Light Omnibus (Category MD), Heavy Omnibus (Category ME), Light Goods Vehicle (Category NA), Medium Goods Vehicle (Category NB) and Heavy Goods Vehicle (Category NC).

3.2 Vegetation—grass, stubble, weeds, undergrowth, and other such vegetation.

3.3 Surface temperature—the exterior surface temperature on the exhaust system components, shielding or shields if fitted.

3.4 Unladen vehicle mass—the mass of the vehicle in running order unoccupied and unladen with all fluid reservoirs filled to nominal capacity including fuel, and with all standard equipment.

3.5 Shield—a component fitted to the exhaust for the purpose of obtaining an acceptable surface temperature.

3.6 Shielding—any vehicle component which acts to prevent contact between any part of the exhaust system and the vegetation.

4 SURFACE TEMPERATURES.

4.1 Temperature limitation. The surface temperature of the underbody exhaust system components shall not exceed the temperatures related to the idle time periods given by the temperature/time curve shown in Figure 1 when determined in accordance with Appendix A.

4.2 Temperature zones. The surfaces of the exhaust system, the shields and shielding that are required to comply with the temperature requirements of Clause 4.1 are delineated as follows:

(a) For vehicle categories MA, MB, MD, and ME, those points that are 300 mm or less above the ground when measured at the unladen vehicle mass.

(b) For vehicle categories MC, NA, NB, and NC, those points that are 450 mm or less above the ground when measured at the unladen vehicle mass.

NOTES:

1. The design of the exhaust system, shields, and shielding should preclude the capture and build-up of flammable vegetation.
2. Exhaust systems which achieve compliance with Clause 4 may not prevent the starting of grass fires under all environmental conditions. It is therefore recommended that vehicle manufacturers inform drivers of the hazards of driving vehicles over dry vegetation. The owner's manual may be a suitable place for such information.