

AS 5732:2022



Electric vehicle operations — Maintenance and repair



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- Australian Electric Vehicle Association
- Australian Industry Group
- Consumers Federation of Australia
- CSIRO
- Department of Industry, Science and Resources
- Department of Infrastructure, Transport, Regional Development, Communications and the Arts
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- Institute of Automotive Mechanical Engineers
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Preface

This Standard was prepared by the Standards Australia Committee EM-001, Electric Vehicle Operation, to supersede AS 5732:2015.

The objective of this document is to provide requirements and guidance on the safe and appropriate handling procedures for those within the mechanical repair, body repair and refinishing industries when working on plug-in electric vehicles (PEVs), hybrid electric vehicles (HEVs), battery electric vehicles (BEVs), plug-in hybrid electric vehicles (PHEVs), and fuel cell electric vehicles (FCEVs).

The major changes in this edition are as follows:

- (a) Alignment with AS 60903's latest changes regarding insulating gloves.
- (b) Additional guidance on safety and Personal Protective Equipment (PPE), particularly in relation to electrical hazards and the availability of an automated external defibrillator (AED).
- (c) Inclusion of fuel cell electric vehicles.

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NOTES

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Electric vehicle operations — Maintenance and repair

Section 1 Scope and general

1.1 Scope

This document sets out requirements for the premises and procedures for the following types of work or activity associated with plug-in electric vehicles (PEVs), hybrid electric vehicles (HEVs), battery electric vehicles (BEVs), plug-in hybrid electric vehicles (PHEVs), and fuel cell electric vehicles (FCEVs):

- (a) Routine motor vehicle maintenance and repairs not involving the high voltage (HV) rechargeable electric energy storage system (REESS), including lubrication, brake repair, wheel alignment, body or windscreen repairs, cleaning or detailing, and tyre fitting.
- (b) Maintenance, servicing and repairs to vehicles which involve working on or with a HV REESS including the need to disconnect hazardous voltage systems of the PEV, HEV, BEV, PHEV or FCEV.
- (c) Handling procedures and storage precautions required in the event where the vehicle's structural integrity has been compromised, and the REESS is to be removed from the PEV, HEV, BEV, PHEV or FCEV.

NOTE Refer to ENA NENS 09 for potential FCEV hazards related to hydrogen systems. Hydrogen system risks in FCEVs are not addressed in this document, and require additional risk mitigation measures from sources other than this document.

1.2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document.

NOTE Documents referenced for informative purposes are listed in the Bibliography.

AS 1851, *Routine service of fire protection systems and equipment*

AS 2441, *Installation of fire hose reels*

AS/NZS 1221, *Fire hose reels*

AS/NZS 1841.1, *Portable fire extinguishers, Part 1: General requirements*

AS/NZS 1841.5, *Portable fire extinguishers, Part 5: Specific requirements for powder type extinguishers*

AS/NZS 1841.6, *Portable fire extinguishers, Part 6: Specific requirements for carbon dioxide type extinguishers*

AS/NZS 1850, *Portable fire extinguishers — Classification, rating and performance testing*

AS/NZS 2210.1, *Safety, protective and occupational footwear, Part 1: Guide to selection, care and use*

AS/IEC 60903, *Live working — Electrical insulating gloves*

1.3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

1.3.1

acid spill containment mat

flexible, powder-filled cloth mat used to absorb and contain electrolytes

1.3.2**automated external defibrillator****AED**

medical device designed to restore a person's normal heartbeat by sending electrical pulses to the heart

1.3.3**battery electric vehicle****BEV**

vehicle that sources its energy from an internal rechargeable storage system, and can be recharged from an external electrical energy source

1.3.4**competent person**

person who has acquired, through education, training, qualification or experience or a combination of these, the knowledge and skill enabling that person to perform the task required

1.3.5**covered tool**

electrical insulated tool that has not been routinely electrically tested to ensure its integrity for the rated voltage

1.3.6**depower**

isolate the *rechargeable electric energy storage system* ([1.3.20](#)) from a vehicle's *high voltage* ([1.3.9](#)) system and discharge its HV system excluding the rechargeable electric energy storage system

1.3.7**electrical arc hazard**

Note 1 to entry: Refer to ENA NENS 09.

1.3.8**fuel cell electric vehicle****FCEV**

vehicle that combines a fuel cell generating electricity and a battery for electric propulsion

1.3.9**high voltage****HV**

electric component or circuit that has a working voltage of $> 60 \text{ V}$ and $\leq 1\,500 \text{ V d.c.}$ or $> 30 \text{ V}$ and $\leq 1\,000 \text{ V a.c.}$

Note 1 to entry: These thresholds are taken from United Nations Regulation No 100.

Note 2 to entry: These thresholds apply to the automotive industry only and differ to those in electrical standards where HV is above $1\,000 \text{ V a.c.}$ and $1\,500 \text{ V d.c.}$

1.3.10**hybrid electric vehicle****HEV**

vehicle that combines a traditional internal combustion engine system with an electric propulsion system

1.3.11**insulated tool**

electrical insulated tool that is routinely electrically tested to ensure its integrity for the rated voltage

Note 1 to entry: Electrical tests are typically conducted annually.

1.3.12**live circuit**

circuit that has not been isolated and tested

1.3.13**low voltage****LV**

voltage not exceeding 30 V a.c. or 60 V d.c. that still presents a risk of electric shock

Note 1 to entry: These thresholds are taken from United Nations Regulation No 100.

Note 2 to entry: This threshold applies to the automotive industry only and differs to those in electrical standards where LV is above 50 V a.c. and 120 V d.c. and below HV.

1.3.14**may**

indicates the existence of an option

1.3.15**NiMH battery**

rechargeable battery operating on nickel metal hydride chemistry

1.3.16**original equipment manufacturer****OEM**

original manufacturer of the vehicle, battery or rechargeable storage system and related parts

1.3.17**plug-in electric vehicle****PEV**

motor vehicle that can be recharged from an external source of electricity

1.3.18**plug-in hybrid electric vehicle****PHEV**

vehicle that combines a traditional internal combustion engine system with an electric propulsion system and can be recharged from an external electrical energy source

1.3.19**powered down**

condition of components after the *rechargeable electric energy storage system* ([1.3.20](#)) is confirmed to be free of voltage and considered safe to work on

Note 1 to entry: Verification of the vehicle's non-live state may include the residual charge present when the HV REESS has been disconnected.

1.3.20**rechargeable electric energy storage system****REESS**

rechargeable electric energy storage system that provides electric energy for electric propulsion

Note 1 to entry: The REESS may include any subsystem(s) together with the necessary ancillary systems for physical support, thermal management, electronic control and enclosures.

1.3.21**safety data sheet****SDS**

information provided by the original equipment manufacturer on the safe use of equipment

1.3.22**shall**

indicates that a statement is mandatory