

Vehicle Standard (Australian Design Rule 109/00 – Electric Power Train Safety Requirements) 2023

Made under section 12 of the *Road Vehicle Standards Act 2018*

Explanatory Statement

Pending approval by the Hon Carol Brown MP, Assistant Minister for Infrastructure and
Transport

2023

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1. LEGISLATIVE AUTHORITY

1.1. National Road Vehicle Standards

Vehicle Standard (Australian Design Rule 109/00 – Electric Power Train Safety Requirements) 2022, also referred to as ADR 109/00, is made under the *Road Vehicle Standards Act 2018* (RVSA). The RVSA enables the Australian Government to establish nationally uniform standards that apply to new road vehicles or road vehicle components when they are provided to the market in Australia. The RVSA applies to vehicles or components whether they are manufactured in Australia or imported.

The making of the vehicle standards necessary for the RVSA’s effective operation is provided for in section 12, which empowers the Minister to “determine standards for road vehicles or road vehicle components”.

1.2. Exemption from Sunsetting

ADR 109/00 is exempt from the sunseting provisions of the *Legislation Act 2003*. It is appropriate that standards made under section 12 of the RVSA, also known as the Australian Design Rules (ADRs), remain enduring and effective to regulate ongoing road worthiness of vehicles throughout their useful life and reduce regulatory burden on vehicle manufacturers.

Source of the Exemption

A standard made under section 12 of the RVSA is not subject to the sunseting provisions of section 50 of the *Legislation (Exemptions and Other Matters) Act 2003* through section 12 of the *Legislation (Exemptions and Other Matters) Regulation 2015* (table item 56C). A similar exemption was previously granted in respect of national road vehicle standards made under section 7 of the *Motor Vehicle Standards Act 1989* (MVSA) (item 40, section 12 of the *Legislation (Exemptions and Other Matters) Regulation 2015*). This exemption is important to ensure that ADR 109/00 continues to remain in force, and available to regulators and industry.

Intergovernmental dependencies

The exemption concerns ADRs which facilitate the establishment and operation of the intergovernmental vehicle standard regime that Commonwealth, State and Territory governments rely on to regulate the safety of vehicles on public roads.

The Commonwealth uses the ADRs as the basis on which approvals to supply types of road vehicles to the market are granted under the *Road Vehicle Standards Rules 2019*. States and territories use the ADRs as the primary criteria on which vehicles are assessed for road worthiness. This ‘in-service’ aspect is dependent on the date of manufacture, which determines the applicable version of the ADRs against which the vehicle can be assessed. The ability to rely on national standards is particularly relevant given the long service life of vehicles – the average age of vehicles in Australia is 12.1 years.

While the ADRs are regularly updated to reflect changes in technology, it is not possible to apply these new standards retrospectively to vehicles that are already in use. With former ADRs kept on the Federal Register of Legislation, State and Territory governments can use them to ensure vehicles continue to comply with the ADRs that were in force when they were first supplied to the market.

In the event that the Commonwealth could not justify the maintenance of the ADRs, State and Territory governments would be compelled to create their own vehicle standards. Whilst this could mean adopting the substance of the lapsed ADRs as an interim measure, the differing needs and agendas of each State and Territory government may result in variations to in-service regulations. Having different vehicle standards across the states and territories would make the scheme operate contrary to the underlying policy intent of the RVSA which is to set nationally consistent performance-based standards.

Commercial dependencies

The effect on vehicle manufacturers to redesign existing models to comply with new ADRs would present a burden and be a costly and onerous exercise. Manufacturers should not be expected to continually go back to redesign existing vehicles. Furthermore, ongoing product recalls to comply with new ADRs would undermine consumer confidence with significant financial impact to manufacturers. This exemption allows vehicle manufacturers to focus their efforts to ensure new models supplied to the market continue to comply.

Effect on parliamentary oversight

The exemption from sunseting does not mean that ADRs do not undergo regular evaluations. ADRs are subject to regular reviews, as resources permit, and when developments in vehicle technology necessitates updates to requirements. Comprehensive parliamentary scrutiny is available through these reviews.

Reviews of the ADRs ensure the ongoing effectiveness of a nationally consistent system of technical regulations for vehicle design, which are closely aligned, wherever appropriate with leading international standards such as United Nations regulations. This method facilitates the rapid introduction of the latest safety devices and technological advances into the Australian market, while also contributing to the industry's cost competitiveness in the domestic market.

1.3. International Harmonisation

A majority of Australian road vehicle standards such as ADR 109/00, harmonise closely with international regulations. This is so that manufacturers can more easily comply with regulation, and so that regulations capture the well-developed views of the international community. This ultimately leads to safer and cheaper products for Australians.

ADR often directly incorporate United Nations (UN) Regulations as an appendix, where the appendix provides the technical requirements of the ADR and the rest of the ADR facilitates its application to Australia. To this end, Section 6 creates exemptions and alternate procedures. For instance, manufacturers are exempt from requirements that pertain to UN type approvals, and instead, need to comply with the approval process set out in the RVSA. Likewise, Section 7 provides for the acceptance of certain alternate standards that have equivalent requirements to the appendix. For instance, a vehicle covered by a type approval under the UN Regulation would be deemed to comply with the ADR.

2. PURPOSE AND OPERATION

2.1. Overview of the ADR

All vehicles equipped with an electric power train and a Rechargeable Electric Energy Storage System (REESS) must adhere to the following safety requirements:

- a) Protection against electric shock; occupant protection against direct contact with the high voltage live parts.
- b) Post-crash safety requirements of road vehicles.

The intent of Electric Power Train Safety Requirements is to ensure that vehicle occupants have safety protection during impact, as well as post-crash, against electric shock, fire, explosion and electrolyte leakage from the REESS into the passenger compartment. In addition to vehicle occupants these safety requirements also extends to first responders attending crash scenes and the public. This includes no external electrolyte leakage from the REESS for a period of 60 minutes after impact.

2.2. Design Requirement – Electric Power Train Safety Requirements

Vehicle normal operating conditions, includes operating modes and conditions that can reasonably be encountered during typical operation of the vehicle including driving at legally posted speeds, parking and standing in traffic, as well as, charging using chargers that are compatible with the specific charging ports installed on the vehicle. This safe guard's vehicle operators, which includes the charging from mains power supply connection to the vehicle as well as operation in all vehicle modes.

Passenger compartment is the space for the occupant accommodation, bounded by the roof, floor, side walls, doors, window glass, front bulkhead and rear bulkhead, or rear gate, as well as by the barriers and enclosures provided for protecting the occupants from direct contact with live parts preventing electric shock.

Electric Power Train Safety Requirements with vehicle on-board isolation resistance monitoring system, monitors the isolation resistance between the high voltage buses and the electrical chassis. Rechargeable Electrical Energy Storage System (REESS) is essentially the rechargeable battery that provides electrical energy for vehicle propulsion. The REESS may include the necessary system for physical support, thermal management, electronic controls and casing. The specific voltage condition is that the maximum voltage of a galvanically connected electrical circuit between a DC live part and any other live part (DC or AC) is equal to or less than 30 V Alternating Current (AC) Root-Means-Square (square root of the time average of the voltage

squared (rms)), and equal to or less than 60 V Direct Current (DC). There is acceptance globally amongst experts in industry and governments that these voltage limits are generally considered safe working voltages in preventing electric shock and ensuring safe handling.

Clause 5.1 requires that all applicable vehicles equipped with an electric power train and a REESS meet the requirements set out in Appendix A of this standard, as varied by Section 6 Exemptions and Alternative Procedures. Appendix A is the UN Regulation No. 100 – UNIFORM PROVISIONS CONCERNING THE APPROVAL OF MOTOR VEHICLES WITH REGARD TO SPECIFIC REQUIREMENTS FOR THE ELECTRIC POWER TRAIN FOR M₁, M₂, M₃, N₁ AND N₂ VEHICLES (R100), incorporating the 03 series of amendments.

2.3. Electric Power Train System Requirements – Driver warnings

To inform the driver of a malfunction failure warning event from the REESS, an optical warning will occur. When illuminated the tell-tale shall be sufficiently bright to be visible to the driver under both daylight and night-time driving conditions, when the driver has adapted to the ambient roadway light conditions. This tell-tale shall be activated as a check of lamp function either when the propulsion system is turned to the “On” position, or when the propulsion system is in a position between “On” and “Start” that is designated by the manufacturer as a check position. This requirement does not apply to the tell-tale or text shown in a common space.

In the event that the energy content of the REESS for pure electric vehicles is low, a warning to the driver in the event of low REESS State of Charge (SoC) shall be provided. Based on engineering judgment, the manufacturer shall determine the necessary level of REESS energy remaining, when the driver warning is first provided. If the warning is notified optically, the tell-tale shall, when illuminated, be sufficiently bright to be visible to the driver under both daylight and night-time driving conditions, when the driver has adapted to the ambient roadway light conditions. The purpose of this warning is to inform the driver of this low SoC and that vehicle charging is required.

To prevent accidental or unintended vehicle movement at least a momentary indication shall be given to the driver each time when the vehicle is first placed in “active driving possible mode” after manual activation of the propulsion system. When leaving the vehicle, the driver shall be informed by a signal (e.g. optical or audible signal) if the vehicle is still in the “active driving possible mode”. Moreover, for light omnibus and heavy omnibus vehicles with a capacity of more than 22 passengers in addition to the driver, this signal shall already be given when the driver leaves their seat.

If the REESS can be externally charged, vehicle movement by its own propulsion system shall be impossible as long as the vehicle charge connector is physically connected to the vehicle inlet. The purpose of this requirement is to prevent any unintentional trapping of vehicle and bystanders during charging.

2.4. Requirements of the REESS – Regards to its safety

Tests are to be conducted for vibration, thermal shock and cycling, external short circuit protection, overcharge protection, over-discharge protection, over-temperature protection tests with the acceptance criteria. During the tests, there shall be no evidence of:

- a) Electrolyte leakage;
- b) Rupture (applicable to high voltage REESS(s) only);
- c) Venting (for REESS other than open-type traction battery);
- d) Fire;
- e) Explosion.

This ensures integrity of the REESS under all vehicle and drive conditions.

The evidence of electrolyte leakage shall be verified by visual inspection without disassembling any part of the Tested-Device. An appropriate technique shall, if necessary, be used in order to confirm if there is any electrolyte leakage from the REESS resulting from the test. The evidence of venting shall be verified by visual inspection without disassembling any part of the Tested-Device. This ensures the REESS maintains its sealing properties.

An overcurrent protection test is required for REESS intended for use on passenger cars and light goods vehicles that have the capability of charging by DC external electricity supply. The vehicle testing to meeting these following criteria to indicate no evidence of:

- a) Electrolyte leakage;
- b) Rupture (applicable to high voltage REESS(s) only);
- c) Venting (for REESS other than open-type traction battery);
- d) Fire;
- e) Explosion.

This ensures integrity of the REESS under all vehicle, drive and charge conditions.

The evidence of electrolyte leakage shall be verified by visual inspection without disassembling any part of the Tested-Device. An appropriate technique shall, if necessary, be used in order to confirm if there is any electrolyte leakage from the REESS resulting from the test. The evidence of venting shall be verified by visual inspection without disassembling any part of the Tested-Device.

Vehicle impact test: this requirement is deemed to be met if the vehicle equipped with electric power train operating on high voltage is approved in accordance with UN Regulation No. 94 (04 series amendments or later) or UN Regulation No. 137 (01 series of amendments or later) for frontal impact and UN Regulation No. 95 (05 series of amendments or later) for lateral impact. Compliance with the requirements of the acceptance criteria during the test there shall be no evidence of:

- a) Fire;
- b) Explosion;
- c) Electrolyte leakage.

2.5. Exemptions and Alternative Procedures

Exemptions

Section 6 creates exemptions from some requirements of Appendix A (UN R100) which pertain to gaining a Type Approval in the UN context. This is because they are not required in the Australian context where the Commonwealth administers approvals through the RVSA and the ADRs. Consequently, manufacturers supplying new vehicles to Australia are exempt from most administrative (non-technical) requirements of UN R100.

Clause 6.1 states that, sections 3, 4, 7, 8, 9, 10, 11, 12, annex 1 part 1, annex 1 part 2 and annex 2 of UN R100 are not required for the purposes of complying with ADR 109/00. This is because they refer to gaining a Type Approval in the UN context.

Alternative Procedures

Section 6 identifies procedures to which vehicles may comply, which are acceptable alternatives to those created by UN R100. These have been adapted for the Australian market to enable vehicle manufacturer to demonstrate compliance to ADR 109/00 where they have not gained a type approval in the UN context.

Clauses 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 6.10, 6.13, 6.15 and 6.16 clarifies that a “technical service” referred to in Appendix A is equivalent to an “Approved Testing Facility” under the RVSA.

With the REESS located between a line from the rear edge of the vehicle, perpendicular to the centre line of the vehicle, and is 300 mm forward to this line. Demonstration of the mechanical integrity performance of the REESS in the vehicle is required.

The UN Regulation requires the REESS monitors and appropriately controls REESS operations at low temperatures at the safety boundary limits of the REESS.

The REESS or vehicle shall provide a signal to activate a warning that manages the safe operation of the REESS.

Warning in the case of a thermal event within the REESS. The REESS or vehicle system shall provide a signal to activate the advance warning indication in the vehicle to allow egress or 5 minutes prior to the presence of a hazardous situation inside the passenger compartment caused by thermal propagation which is triggered by an internal short circuit leading to a single cell thermal runaway such as fire, explosion or smoke. The purpose of this warning is to allow sufficient time for the driver and any occupants safe passage out of the vehicle.

The REESS or vehicle system shall have functions or characteristics in the cell or REESS intended to protect vehicle occupants in conditions caused by thermal propagation which is triggered by an internal short circuit leading to a single cell thermal runaway, as defined in Appendix A.

Clause 6.14 clarifies that the chassis dynamometer requirements in paragraph 4.1 of Annex 8 in Appendix A, shall meet the requirements of the 06 series of amendments to UN Regulation No. 83 or equivalent ADR 79/04. This allows vehicle manufacturers to more easily demonstrate compliance to ADR 109/00.

Clauses 6.16 Appendix A paragraph 6.4.1.3. and 6.4.1.1. refers to “Acceptance Criteria” and “Vehicle Based Test” where during the test there shall be no evidence of fire, explosion and electrolyte leakage. For a high voltage REESS the isolation resistance of the Tested-Device shall ensure at least 100 Ω /Volt for the whole REESS measured after the test. For the Vehicle based test, this requirement is deemed to be met if the vehicle equipped with electric power train operating on high voltage is approved in accordance with UN Regulation No. 94 (04 series amendments or later) or UN Regulation No. 137 (01 series of amendments or later) for frontal impact and UN Regulation No. 95 (05 series of amendments or later) for lateral impact. This allows vehicle manufacturers to more easily demonstrate compliance to ADR 109/00.

Clause 6.17 Appendix A paragraph 6.4.2.3. and 6.4.2.1.1. refers to “Acceptance Criteria” and “Vehicle Based Dynamic Test” where during the test there shall be no evidence of fire, explosion and electrolyte leakage. For a high voltage REESS, the isolation resistance of the Tested-Device shall ensure at least 100 Ω /Volt for the whole REESS measured. For the Vehicle based dynamic test, this requirement is deemed to be met if the vehicle equipped with electric power train operating on high voltage is approved in accordance with UN Regulation No. 94 (04 series amendments or later) or UN Regulation No. 137 (01 series of amendments or later) for frontal impact and UN Regulation No. 95 (05 series of amendments or later) for lateral impact. This allows vehicle manufacturers to more easily demonstrate compliance to ADR 109/00.

Clause 6.18 Appendix A paragraph 6.4.2.1.2. refers to “Vehicle Specific Component Test”. The test shall be conducted in accordance with Annex 9D of UN R100. The crush force specified in paragraph 3.2.1. of Annex 9D of UN R100 may be replaced with the values using the data obtained from Annex 3 of UN Regulations Nos. 94 or 137 in the direction of travel and according to Annex 4 to UN Regulation No. 95 in the direction horizontally perpendicular to the direction of travel. This allows vehicle manufacturers to more easily demonstrate compliance to ADR 109/00.

Clause 6.19 clarifies that in Appendix A paragraph 6.4.2.2. refers to “Component Based Test”. The test shall be conducted in accordance with Annex 9D of UN R100. The crush force specified in paragraph 3.2.1. of Annex 9D of UN R100 may be replaced with the value declared by the manufacturer, where the crush force shall be documented in Annex 1, Appendix 2 as a mounting restriction. In this case, the vehicle manufacturer who uses such REESS shall demonstrate, during the process of approval for Part I of UN R100 that the contact force to the REESS will not exceed the figure declared by the REESS manufacturer. Vehicle manufacturers may use the data obtained from either actual crash tests or its simulation values from Annex 3 of UN Regulations Nos. 94 or 137 in the direction of travel and according to Annex 4 of UN Regulation No. 95 in the direction horizontally perpendicular to the direction of travel. This allows vehicle manufacturers to more easily demonstrate compliance to ADR 109/00.

2.6. Alternative Standards

Section 7 sets out standards which are considered to be equivalent to ADR 109/00. If a vehicle meets the requirements of one of these standards, it also complies with ADR 109/00. These alternative standards are acceptable because they do not compromise the performance requirements set out in UN R100. Vehicle manufacturers have the flexibility to gain compliance to ADR 109/00 through clause 5.1 and Appendix A as varied by Section 6 Exemptions and Alternative Procedures, or through Section 7 Alternative Standards.

Clause 7.1 states that vehicles equipped with an electric power train and a Rechargeable Electrical Energy Storage System (REESS) complying with the technical requirements of the United Nations Regulation No. 100 – UNIFORM PROVISIONS CONCERNING THE APPROVAL OF VEHICLES WITH REGARD TO SPECIFIC REQUIREMENTS FOR THE ELECTRIC POWER TRAIN, incorporating the 03 series of amendments are deemed equivalent to the technical requirements of this standard.

Clause 7.2 states that vehicles equipped with an electric power train and a Rechargeable Electrical Energy Storage System (REESS) complying with the technical requirements of the United Nations Regulation No. 100 – UNIFORM PROVISIONS CONCERNING THE APPROVAL OF VEHICLES WITH REGARD TO SPECIFIC REQUIREMENTS FOR THE ELECTRIC POWER TRAIN, incorporating the 02 series of amendments are deemed to be equivalent to the technical requirements of this standard.

Clause 7.3 states that vehicles equipped with an electric power train and a Rechargeable Electrical Energy Storage System (REESS) complying with the technical requirements of the United Nations Global Technical Regulation No. 20 – ELECTRIC VEHICLE SAFETY (EVS), are deemed to be equivalent to the technical requirements of this standard.

3. MATTERS INCORPORATED BY REFERENCE

3.1. Other Legislative Instruments

Clause 4.1.2 of ADR 109/00 includes a reference to the Vehicle Standard (Australian Design Rule Definitions and Vehicle Categories) 2005 (which may also be cited as the Australian Design Rule – Definitions and Vehicle Categories). This sets out definitions for many terms used in the ADRs, including the vehicle categories used in ADR applicability tables.

Clauses 6.11, 6.12 and 6.14 under Exemptions and Alternative Procedures/in Appendix A of ADR 109/00 each include references to the following ADRs:

- Australian Design Rule 69/... – Full Frontal Impact Occupant Protection, which prescribes crashworthiness requirements for passenger cars, forward-control passenger vehicles, off-road passenger vehicles (other than omnibuses) and light goods vehicles to minimise the likelihood of injury to occupants of those seating positions in full frontal impact.
- ADR 72/... – Dynamic Side Impact Occupant Protection, which prescribes crashworthiness requirements for passenger cars, forward-control passenger vehicles, off-road passenger vehicles (other than omnibuses) and light goods vehicles to minimise the likelihood of injury to occupants in side impact.
- ADR 73/... – Offset Frontal Impact Occupant Protection, which prescribes crashworthiness requirements for passenger cars to minimise the likelihood of injury to occupants in offset frontal impacts.
- ADR 79/... – Emission Control for Light Vehicles, which prescribes the exhaust and evaporative emissions requirements for light vehicles in order to reduce air pollution.

The purpose of these clauses (6.11, 6.12 and 6.14 of ADR 109/00) is to provide the manufacturer a choice on how to conduct the mechanical impact test for the REESS to ensure safety for occupants following a crash. Should a manufacturer choose to conduct a vehicle-based test, compliance with the crash test requirements of the respective UN regulation or ADR is deemed acceptable.

The ADRs may be freely accessed online through the Federal Register of Legislation. The website is www.legislation.gov.au.

In accordance with subsection 12 of the RVSA, each of these ADRs are incorporated as in force or existing from time to time. The ellipses (...) indicates the version(s) (e.g. 00, 01 etc.) of the ADR in force at the time.

3.2. Other Documents

International Organization for Standardization

Paragraph 6.15.2.1. of Appendix A includes a reference to ISO standards. A risk reduction analysis using appropriate industry standard methodology (for example, IEC 61508, MIL-STD 882E, ISO 26262, AIAG DFMEA, fault analysis as in SAE J2929, or similar), which documents the risk to vehicle occupants caused by thermal propagation which is triggered by an internal short circuit leading to a single cell thermal runaway and documents the reduction of risk resulting from implementation of the identified risk mitigation functions or characteristics.

ISO standards are available for purchase only from the International Organization for Standardization (ISO) and various associated national standards bodies. While not freely available, these ISO standards are all readily accessible and widely used by vehicle manufacturers and test facilities as part of their professional libraries.

In accordance with subsections 14(1)(b) and 14(2) of the *Legislation Act 2003*, each of these ISO standards are incorporated as in force on the date this national road vehicle standard is made.

Clause 11 of the RVSA allows the Minister to incorporate a broad range of documents, both as in force at a particular time and as in force from time to time, when making national vehicle standards. This ensures that Australia's legislative framework is well-prepared for future developments in the international road vehicle space.

United Nations Regulations and/or Resolutions

Clauses 7.1 includes a reference to the 03 series of UN Regulation No. 100 – UNIFORM PROVISIONS CONCERNING THE APPROVAL OF VEHICLES WITH REGARD TO SPECIFIC REQUIREMENTS FOR THE ELECTRIC POWER TRAIN FOR M₁, M₂, M₃, N₁, N₂ AND N₃ VEHICLES (UN R100). This is an international standard for Specific Requirements for the Electric Power Train to passenger vehicles, forward-control passenger vehicles, off-road passenger vehicles, light and heavy omnibus and light, medium and heavy goods vehicles with a maximum design speed exceeding 25 km/h, excluding vehicles permanently connected to the grid.

Clauses 7.2 includes a reference to the 02 series of UN Regulation No. 100 – UNIFORM PROVISIONS CONCERNING THE APPROVAL OF VEHICLES WITH REGARD TO SPECIFIC REQUIREMENTS FOR THE ELECTRIC POWER TRAIN FOR M₁, M₂, M₃, N₁, N₂ AND N₃ VEHICLES (UN R100). This is an international standard for Specific Requirements for the Electric Power Train to passenger vehicles, forward-control passenger vehicles, off-road passenger vehicles, light and heavy omnibus and light, medium and heavy goods vehicles with a maximum design speed exceeding 25 km/h, excluding vehicles permanently connected to the grid.

Clause 7.3 includes a reference to the technical requirements of the United Nations Global Technical Regulation UN GTR No. 20 – ELECTRIC VEHICLE SAFETY (EVS), for vehicles equipped with an electric power train and a Rechargeable Electrical Energy Storage System (REESS).

Paragraph 1 of Appendix A includes a reference to the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.6. This includes definitions for the UN vehicle category classifications used in Appendix A and the alternative standard under clause 7 of ADR 109/00.

Paragraph 2.23 of Appendix A clarifies that a flammable electrolyte means an electrolyte that contains substances classified as Class 3 “flammable liquid” under “UN Recommendations on the Transport of Dangerous Goods – Model Regulations (Revision 17 from June 2011), Volume I, Chapter 2.3
www.unece.org/trans/danger/publi/unrec/rev17/17files_e.html

The Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.6, and the UN Regulations (including UN R94, R95, R137 and R100), may be freely accessed online through the UN World Forum for the Harmonization of Vehicle Regulations (WP.29). The WP.29 website is www.unece.org/trans/main/welcwp29.html.

In accordance with subsections 14(1)(b) and 14(2) of the *Legislation Act 2003*, each of these UN documents are incorporated as in force on the date this national road vehicle standard is made.

4. CONSULTATION

4.1. General Consultation Arrangements

It has been longstanding practice to consult widely on proposed new or amended vehicle standards. For many years, there has been active collaboration between the Commonwealth and the state/territory governments, as well as consultation with industry and consumer groups. Much of the consultation takes place within institutional arrangements established for this purpose. The analysis and documentation prepared in a particular case, and the bodies consulted, depend on the degree of impact the new or amended standard is expected to have on industry or road users.

Proposals that are regarded as significant need to be supported by a Preliminary Assessment (PA) meeting the requirements of the Office of Impact Analysis (OIA) as published in the *Australian Government Guide to Regulatory Impact Analysis* or the *Regulatory Impact Analysis Guide for Ministers’ Meetings and National Standard Setting Bodies*.

4.2. Specific Consultation Arrangements

A PA conducted by the Department identified that regulatory and trauma savings and productivity gains would be achieved by ensuring that an ADR for Electric Power Train Safety is implemented prior to the predicted increase in Electric Vehicle sales in Australia. This increase is based on the global transition to Zero Emission Vehicles and aligns with the Australian Government's objectives to reduce road trauma, provide certainty for industry and transition the fleet to Zero Emission Vehicles. The Department undertook consultation through the Technical Liaison Group (TLG) and the Strategic Vehicle Safety and Environment Group (SVSEG), (SVSEG 24 and TLG 55) where members noted their full support for implementation of an ADR for Electric Power Train Safety Requirements.

TLG consists of technical representatives of government (Australian and state/territory), the manufacturing and operational arms of the industry (including organisations such as the Federal Chamber of Automotive Industries and the Australian Trucking Association) and of representative organisations of consumers and road users (particularly through the Australian Automobile Association).

SVSEG consists of senior representatives of government (Australian and state/territory), the manufacturing and operational arms of the industry and of representative organisations of consumers and road users (at a higher level within each organisation as represented in TLG).

4.3. Public Consultation

A public consultation for Electric Power Train Safety Requirements was posted on the Department's website for an eight-week public comment period, which closes on 27 March 2023.

5. REGULATORY IMPACT

Mandating an ADR for Electric Power Train Safety Requirements, will have a positive net benefit to the economy due to the safety requirements in the UN Regulation. A Preliminary Assessment (OIA22-03727) conducted by the Department considered the impacts of mandating a new ADR on a "must comply, if fitted" basis for EVs. The impacts were considered minor in nature on industry while market penetration of EVs are still low in Australia. This view is supported by the light and heavy vehicle industry.

Based on the information provided, the OIA determined the proposal is unlikely to have a more than minor regulatory impact, as all light EV suppliers and most heavy EV suppliers already meet UN Regulation No. 100 that this ADR would align with. Further, if regulatory action is not taken, the future is likely to involve fragmented state/territory safety standards for 'in-service' use of EVs. While the avoided cost of complying with multiple standards could be significant, the costs of future regulatory activities of states and territories is beyond the scope of Commonwealth impact analysis. As such, the preparation of an Impact Analysis (IA) is not required by the OIA.

6. STATEMENT OF COMPATIBILITY WITH HUMAN RIGHTS

The following Statement is prepared in accordance with Part 3 of the *Human Rights (Parliamentary Scrutiny) Act 2011*.

6.1. Overview

ADR 109/00 prescribes safety requirements with respect to the electric power train to passenger cars, forward-control passenger vehicles, off-road passenger vehicles, light and heavy omnibus and light, medium and heavy goods vehicles with a maximum design speed exceeding 25 km/h, excluding vehicles permanently connected to the grid.

The purpose of the regulation is to protect against electric shock, protect occupants against direct contact with the high voltage live parts and ensure the post-crash safety of road vehicles.

6.2. Human Rights Implications

As such, ADR 109/00 does not engage any of the human rights and freedoms recognised or declared in the international instruments listed in section 3 of the *Human Rights (Parliamentary Scrutiny) Act 2011*.

6.3. Conclusion

ADR 109/00 is compatible with human rights, as it does not raise any human rights issues.