

Vehicle Standard (Australian Design Rule 99/00 – Lane Departure Warning Systems for Heavy Vehicles) 2022

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

Explanatory Statement

Approved by the Hon [name of relevant minister], [title of relevant minister]

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1. LEGISLATIVE AUTHORITY

1.1. National Road Vehicle Standards

Vehicle Standard (Australian Design Rule 99/00 – Lane Departure Warning System for Heavy Vehicles) 2022, also referred to as ADR 99/00, is made under the *Road Vehicle Standards Act 2018* (the Act). Section 12 of the Act allows the Minister to determine National Road Vehicle Standards.

1.2. Exemption from Sunsetting

ADR 99/00 is exempt from the sunsetting provisions of the *Legislation Act 2003*.

Source of the Exemption

A standard made under section 12 of the Act is not subject to the sunsetting 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 99/00 continues to remain in force, and available to regulators and industry.

1.2.1. Justification

It is appropriate that standards made under section 12 of the Act, 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.

1.2.1.1. 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 Act which is to set nationally consistent performance-based standards.

1.2.1.2. 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.

1.2.2. Effect on parliamentary oversight

Despite exemption from sunseting ADRs are subject to regular reviews 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. Aligning with such standards facilitates the rapid introduction of the latest safety devices and technological advances into the Australian market, reducing regulatory burden.

2. PURPOSE AND OPERATION

2.1. Overview of the Regulatory Framework

The Act establishes a framework to regulate the importation and first provision of road vehicles to the market in Australia. The core principle of this framework is that vehicles which comply with appropriate standards are suitable for provision to the market in Australia. The Australian Design Rules (ADRs) have set out those standards since the early 1970s. At that time, they were applied cooperatively by the Australian Motor Vehicle Certification Board representing the Commonwealth and state and territory governments. In 1989, this arrangement was replaced by the Motor Vehicle Standards Act 1989 (the MVSA) and the Australian Design Rules were determined as national standards. As of 2018, the MVSA has been replaced by the Act.

A majority of Australian road vehicle standards such as ADR 99/00 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.

ADRs 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 approvals process set out in the Act. 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 comply with the ADR.

Under the Act, the ADRs are National Road Vehicle Standards intended to make vehicles safe to use, control the emission of gas, particles or noise, secure vehicles against theft, provide for the security marking of vehicles and promote the saving of energy. The ADRs are applied to vehicles as criteria for approval under various regulatory pathways set out in the Road Vehicle Standards legislation. Vehicles approved under these regulatory pathways can be provided to the market in Australia for use in transport. ADRs apply equally to imported and locally manufactured vehicles.

2.2. Overview of the ADR

The purpose of ADR 99/00 is to specify requirements for LDWS for new goods vehicles (ADR vehicle categories ??) to reduce unintentional lane departure. The ADR achieves this by alerting the driver to a potential risk. Unintentional lane departure most often occurs due to a combination of driver distraction and driver fatigue, especially in the field of monotonous driving situations such as on national or state highways and arterial roads. Heavy vehicles are driven by professional drivers but are subject to many challenges such as long distances, scheduling shifts, poor road and infrastructure quality, driver fatigue, inattention and load-related issues. Alerting a fatigued or distracted driver at an early stage of loss of concentration will aid the prevention of a road vehicle accident.

ADR 99/00 specifies the requirements for the fitment of an electronic system in the vehicle that monitors the position within the visible lane markings on the road.

2.3. Lane Departure Warning System

The Lane Departure Warning System (LDWS) fitted to new vehicles is a vision-based, in vehicle, electronic system that monitors the heavy vehicle's position within a roadway with visible lane markings. The function of LDWS is to detect unintentional lane departure. This system alerts the driver to a potential threat but does not take over control of any aspect of the vehicle. The LDWS will activate a warning in some form to warn the driver that they are about to move out of their lane. This allows the driver to adjust their control of the vehicle to avoid a crash or run off road incident.

2.4. Design Requirement – Lane Departure Warning System

LDWS is a driver warning assist safety feature, which is a passive safety system that fits under the broad definition of Advanced Driver Assistance Systems (ADAS). The LDWS can operate in conjunction with other vehicle safety features like the Advanced Emergency Braking System (AEBS).

LDWS conforming to ADR 99/00 is designed to warn the driver, with the end result of reducing the likelihood of lane departure. This will prevent head-on collisions with vehicles travelling in the opposing direction or run off road without driver reaction.

LDWS reads inputs from a forward-facing camera. The LDWS camera has developed into a sophisticated lane marker identification and lane boundary projection system. This provides the driver with a warning if the vehicle has a trajectory that will take it out of its lane. While most LDWS apply video technology, other methods include infrared, Lidar, magnetic and electronic mapping technologies. The warning occurs by at least two modes and may be optical, acoustic and haptic, or one warning means out of haptic and acoustic, with spatial indication about the direction of unintended drift of the vehicle.

The introduction of ADR 99/00 and its incorporated United Nations Regulation No. 130 – UNIFORM PROVISIONS CONCERNING THE APPROVAL OF HEAVY VEHICLES WITH REGARD TO THE LANE DEPARTURE WARNING SYSTEM (LDWS) FOR M₂, M₃, N₂ AND N₃ VEHICLES (UN R130) ensures the benefits provided through this technology is spread across the whole vehicle fleet. This standard provides manufacturers with minimum performance requirements for lane departure warning systems to be installed in new model vehicles. Harmonisation with international regulations minimises costs associated with reversing technologies development, provides manufacturers the flexibility to incorporate or adapt systems that have already been developed and tested for markets with similar requirements. It also enables testing and certification frameworks in other markets to be leveraged.

2.5. LDWS Warnings

LDWS is designed to conform to ADR 99/00 and has a warning due to inclement weather conditions. This warning alerts the driver that the system is temporarily unavailable. Warnings also form an essential part of the core functionality of LDWS.

A ‘failure warning’ occurs when a fault in the LDWS prevents the requirements of ADR 99/00 being met. A fault in this instance may be electrical in nature or a failure in the sensor. The self-check function continuously checks the LDWS for a system failure while the LDWS is active. The LDWS communicates a ‘failure warning’ with a constant yellow optical warning signal. The purpose of the ‘failure warning’ is to alert the driver to a fault in the LDWS.

A ‘deactivation warning’ occurs when the driver deactivates the LDWS. This is only possible if the vehicle is fitted with a means to deactivate the LDWS and such a means is not a requirement of this Standard. The LDWS communicates a ‘deactivation warning’ with a constant yellow optical warning signal. The warning signal used in this instance may be the same as the ‘failure warning’ signal. The purpose of the ‘deactivation warning’ is to alert the driver that the LDWS function has been deactivated.

A ‘lane departure warning’ occurs when the LDWS detects the outside tyre on the front wheel closest to the lane markings has passed more than 0.3 m beyond the outside edge of the lane markings above road speeds of 65 km/h \pm 3 km/h. The warning signal used in this instance must be provided by at least two modes and may be optical, acoustic and haptic or one warning means out of haptic and acoustic, with

spatial indication about the direction of unintended drift of the vehicle. Optical warning signals must be visible even in daylight and be easily verifiable by the driver from the driver's seat.

2.6. LDWS Performance and limitations

ADR 99/00 sets out the environmental conditions in which the LDWS equipped vehicle must demonstrate its warning system to the driver.

The Standard requires LDWS fitted vehicles to perform in the following environment conditions:

- on a flat dry asphalt or concrete surface
- where the ambient temperature is between 0°C and 45°C
- where the lane markings are visible
- where the vehicle is tested with recommended vehicle manufacture tyre pressures.

The intent behind these environmental conditions is to mitigate the contemporary limitations of the technology used to build LDWS. For example, road conditions and/or lane markings may be of a low standard, including no lane markings at all. Therefore, some of the disadvantages of the sensor are difficult to avoid completely as it might fail to detect the vehicle in such lane driving conditions. Even though manufacturers take measures to reduce false or missed detections, the LDWS will not always perform flawlessly.

Traffic situations are complex, and many variables contribute to the outcome of any given traffic incident. Factors such as road curvature, road surface condition and the surrounding environment can affect the performance of LDWS. Manufacturers research the principles of automotive camera systems so that they can identify and study potential weaknesses and improve LDWS. However, it is still a requirement that LDWS shall not deactivate or unreasonably switch the control strategy in these potentially adverse conditions.

A LDWS compliant to ADR 99/00 will be designed for unnecessary 'lane departure warning' signals not to be generated. This will avoid a warning situation where an attentive driver would not anticipate unintentional lane departure.

3. MATTERS INCORPORATED BY REFERENCE

3.1. Legislative Instruments

Clauses 4.1.1 of ADR 99/00 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.

3.2. United Nations Regulations and / or Resolutions

UN Regulation No. 10 - Electromagnetic compatibility. The UN Regulation can be viewed at this website <https://unece.org/un-regulations-addenda-1958-agreement>

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.

United Nations Regulations 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

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 Act, each of these ADRs are incorporated as in force or existing from time to time.

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 Regulation Impact Statement (RIS) meeting the requirements of the Office of Best Practice Regulation (OBPR) as published in the *Australian Government Guide to Regulatory Impact Analysis Second Edition 2020*.

4.2. Specific Consultation Arrangements

[to be completed following consultation]

5. REGULATORY IMPACT

There are costs associated with mandating LDWS for heavy vehicles, but the related RIS shows that there will be positive net benefits. Overall, it is estimated that the implementation of ADR 99/00, will save 63 lives, and avoid 1,732 serious and 5,389 minor injuries. This includes around \$221.2 million in gross benefits.

The Regulatory Burden Measurement show a total increase in cost of \$18.2m per annum associated with the additional cost required for fitment of LDWS. Regulation generated the highest number of lives saved (63) and serious (1,732) and minor (5,389) injuries avoided, as well as the highest likely net benefit (\$17.3 million), while retaining a likely benefit-cost ratio (1.1).

5.1. Regulation Impact Statement

A Regulation Impact Statement (RIS) was completed to analyse the policy options for the fitment of LDWS in heavy vehicles. The best option is implementation of a

mandatory standard under the Act. The OBPR reference number for the RIS is OBPR22-01960.

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 99/00 specifies requirements for the fitment of LDWS to heavy goods vehicles greater than 3.5 tonnes Gross Vehicle Mass (GVM) and all omnibuses, to detected unintentional lane departure.

6.2. Human Rights Implications

ADR 99/00 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 99/00 is compatible with human rights, as it does not raise any human rights issues.