



Australian Government

Department of Defence

Comparative Study of ADRs with Selected US Vehicles Standards

This document is a product of a study commissioned by the Australian Department of Defence - Defence Materiel Organisation. The Study compares the requirements applied by United States Federal Legislation, prescribed in the United States Department of Defense, Joint Light Tactical Vehicle Program - Product Description Version 2.0 (21 January 2008), to those requirements applied by the Australian Design Rules.

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EXECUTIVE SUMMARY

The Australian Design Rules are the legislated national standards that any vehicle must demonstrate compliance with in order to be used on public roads in any Australian State or Territory. These Rules are further supplemented by regulations within each State and Territory that specify requirements for maximum axle mass limits on vehicles in order to protect the condition of road infrastructure. The equivalent standards and regulations in the United States of America (USA) are the Federal Motor Vehicle Safety Standards (FMVSS's) and the Federal Motor Carrier Safety Regulations (FMCSR's). These are supplemented by standards issued by the Society of Automotive Engineers (SAE).

Under the Australian Design Rule Classification System, the JLTV would be classified as NB¹ Category "Medium Goods Vehicle". The trailers would be classified as either TB Category (light trailer) or TC² Category (medium trailer), depending on their unladen mass and payload capacity. The comparison in this document is undertaken on basis of these classifications.

Comparison of the Australian Design Rules with the corresponding US standards provides a generally good correlation with the majority of the functional and performance requirements. However, there are a number of differences in key areas, such as vehicle lighting, metric instrumentation requirements, and requirements associated with the right-hand drive configuration used in Australia. There are also some cases where the US Federal Regulations are not directly comparable to the requirements stated in the Australian Design Rules, or they do not include specific requirements; however this does not necessarily mean that a US certified vehicle will not be compliant. In these instances the JLTV would have to be tested to determine compliance with the ADR.

A review of the standards referred to in the current JLTV Purchase Description indicates that a vehicle designed solely from those standards is highly unlikely to be fully compliant with all Australian Design Rules. Therefore additional testing and some modifications will be required in order to achieve compliance. It is expected, however, that the JLTV and its trailers will satisfy the axle mass limits in Australia, since their expected gross masses are significantly less than can be carried legally with 2 axle vehicles and single or 2 axle trailers.

Where the JLTV incorporates special features that are essential to fulfil its function as a specialist military vehicle, and these features result in it not being possible to satisfy some ADR requirements, there is a process whereby the Administrator of Vehicle Standards will make a determination. Where the non-compliance is "minor and inconsequential" in terms of safety and emissions outcomes, then the Administrator may grant a Concession from the specific requirement. With this process, the vehicle is issued with a Compliance Plate Approval as a "standard" vehicle. Where the non-compliance does not satisfy the definition of "minor and inconsequential", then the Administrator would have to grant an Exemption from the rule or the specific requirement on the basis that the non-compliance is essential to the special purpose function of the vehicle. With this process, the vehicle would be granted a Compliance Plate Approval as a "non-standard" vehicle, which would generally place restrictions on its use and supply to the general vehicle market.

In the case of the JLTV it is expected that the areas of seating and seat belts are unlikely to be fully compliant with the ADRs due to the additional restraint typically required to limit upwards acceleration of the occupants in the event of a blast event. This restraint is typically achieved with a 4 point harness type belt incorporated into the seating, which is different to the ADR requirement for a 3 point seat belt assembly incorporating an Emergency Locking Retractor. The JLTV may also be required to run on a range of different fuel grades, which may make compliance with the current engine emission regulations difficult or impossible. It will be an expectation, however, that the areas of non-compliance be minimised and that this should be achieved through the Engineering and Manufacturing Development phase of the program. Where the actual prescribed requirements of the ADR cannot be met, then meeting the intent of these requirements should be the objective.

¹ NB =Truck, 3.5 tonnes to 12 tonnes in gross weight

² TB = Gross Trailer Mass not exceeding 3,500kg; TC = Gross trailer mass between 3,500kg and 10,000kg

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1. INTRODUCTION

Vehicles supplied to the market for use on the road network in Australia must comply with legislated national standards relating to their design. These standards are known as the Australian Design Rules (ADR), and are responsible for setting minimum requirements for the performance of various vehicle systems in order to achieve satisfactory outcomes in the areas of safety and emissions

The administration of the Australian Design Rules is the responsibility of the federal Department of Infrastructure, Transport, Regional Development and Local Government, via the Australian Motor Vehicle Certification Board. This Board includes members from the State and Territory Transport Departments, who are responsible for the registration of the vehicles, and hence grant permission for access to the road network under their Department's jurisdiction.

Other countries around the world have similar vehicle design controls incorporated into their legislation. Some of these standards have formed the historical basis of various Australian Design Rule requirements. Others are gradually being incorporated into the Australian Design Rules through a gradual process of harmonisation with the international United Nations Economic Commission for Europe (UN ECE) Regulations. As a result of this process, compliance with one set of international standards is not a guarantee that all Australian Design Rule requirements will be satisfied.

The scope of this study is to provide a comparison between the Australian Design Rules and the vehicle design rules applicable to a vehicle manufactured for the domestic vehicle market in the United States of America (USA). These vehicles must comply with the Federal Motor Vehicle Safety Standards (FMVSS) that are the US equivalent of the Australian Design Rules and other US federal regulations such as the Federal Motor Carrier Safety Regulations (FMCSR). In addition, there are other Australian regulations, which govern aspects of vehicle configuration, such as axle mass limits, that are not included in the design rules. These will also be compared with the applicable US standards as part of this study.

The study has been structured by consideration of the type of vehicle that will result from the Joint Light Tactical Vehicle (JLTV) programme specification, and by using the Australian Design Rules as the benchmark mandatory standards that must be met. The following sections provide a detailed comparison of the applicable Australian Design Rules to the JLTV Category of vehicle and their corresponding FMVSS and FMCSR equivalent, as well as additional detail, where possible, as to the likely modifications that would be required to a US domestic market vehicle of this type in order to satisfy the ADR requirements.

1.1. Study Scope

This document compares ADRs with the specified standards in JLTV Request for Proposal W56HZV-08-R-0210 - JLTV Purchase Description. This includes Federal Motor Vehicle Safety Standards (FMVSS), Federal Motor Carrier Safety Regulations (FMCSR) and a number of other relevant standards.

The document details the following key elements:

- 1.1.1. a comparison which shows the relationships between the ADRs and the referenced standards;
- 1.1.2. highlights the differences between the ADRs and the referenced standards;
- 1.1.3. lists modifications which **MUST BE UNDERTAKEN** to the vehicles (which are manufactured to referenced standards) in order to meet ADRs;
- 1.1.4. list modifications which **MAY BE DESIRED** to the vehicles (which are manufactured to referenced standards) in order to meet ADRs
- 1.1.5. details the process of having the vehicles classified as a Specialist Military Vehicle and how this would impact on the required changes to the vehicle, and:
- 1.1.6. identifies any other relevant Australian Federal or State legislation that may impact on the importation/operation of JLTV vehicles within Australia.

1.2. Vehicle categorisation

The Australian Design Rules separate vehicles into categories, the classification of which is determined by the vehicle design, features and function. These are expressed as a 2-character identifier, with the first letter identifying the type of vehicle (e.g. passenger carrying or goods carrying) and the second letter identifying the particular size or specification (e.g. light, medium or heavy). For some categories, a third character is used, expressed as a number, to further divide a category into sub-categories. The categories used in the Australian Design Rules shown in Table Table 1-1.

Vehicle Category	ADR Category Code
Moped 2 wheels	LA
Moped 3 wheels	LB
Motor cycle	LC
Motor cycle and sidecar	LD
Motor tricycle	LE
Passenger car	MA
Forward-control passenger vehicle	MB
Off-road passenger vehicle	MC
Light omnibus	MD
up to 3.5 tonnes 'GVM' and up to 12 seats	MD1
up to 3.5 tonnes 'GVM' and more than 12 seats	MD2
over 3.5 tonnes and up to 4.5 tonnes 'GVM'	MD3
over 4.5 tonnes and up to 5 tonnes 'GVM'	MD4
Heavy omnibus	ME
Light goods vehicle	NA
Medium goods vehicle	NB
over 3.5 tonnes up to 4.5 tonnes 'GVM'	NB1
over 4.5 tonnes up to 12 tonnes 'GVM'	NB2
Heavy goods vehicle	NC
Very light trailer	TA
Light trailer	TB
Medium trailer	TC
Heavy trailer	TD

Table 1-1: Australian Design Rules vehicle categories (Source: ADR 14/00)

These categories are used to determine which Australian Design Rules are applicable to a vehicle, as well as the specific requirements contained within the rules. As a broad generalisation, passenger carrying vehicles are required to comply with more stringent safety related requirements than goods carrying vehicles, and lighter vehicles are required to satisfy more requirements than heavy vehicles. This is based on the notion that occupants of a lighter vehicle are exposed to a greater risk of injury than those in a heavier vehicle, and that passenger carrying vehicles require greater occupant protection than goods carrying vehicles.

A manufacturer can always choose to comply with a more stringent requirement than that which is mandatory for the category of vehicle under consideration. To ensure that appropriate minimum safety standards are being satisfied for the primary function of a vehicle, it is necessary to define what constitutes a goods vehicle in order for the manufacturer to be permitted to comply with the less stringent requirements in this regard.

The definition of a goods vehicle is as follows (ref. Australian Design Rules – 3rd Edition – Definitions):

Goods Vehicles

4.5.1. A motor vehicle constructed primarily for the carriage of goods and having at least 4 wheels; or 3 wheels and a 'Gross Vehicle Mass' exceeding 1.0 tonne.

4.5.2. A vehicle constructed for both the carriage of persons and the carriage of goods shall be considered to be primarily for the carriage of goods if the number of seating positions times 68 kg is less than 50 percent of the difference between the 'Gross Vehicle Mass' and the 'Unladen Mass'.

4.5.3. The equipment and installations carried on certain special-purpose vehicles not designed for the carriage of passengers (crane vehicles, workshop vehicles, publicity vehicles, etc.) are regarded as being equivalent to goods for the purposes of this definition.

4.5.4. A goods vehicle comprising 2 or more non-separable but articulated units shall be considered as a single vehicle.

The Gross Vehicle Mass and the Unladen Mass are defined as follows:

GROSS VEHICLE MASS (GVM) - the maximum laden mass of a motor vehicle as specified by the 'Manufacturer'.

UNLADEN 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.

1.2.1. JLTV

The JLTV is assessed as complying with the definition of a goods vehicle. The unladen mass specification and payload capacity will produce a maximum loaded vehicle mass (Gross Vehicle Mass) of between 7500kg and 12000kg. Therefore the vehicle will fit within the classification of a Medium Goods Vehicle, or Category NB2.

It was noted that the JLTV may seat up to 6 occupants, including the driver. For the goods vehicle classification to be satisfied, the occupant load (equal to 6 x 68kg = 408kg) must be less than 50 percent of the total payload (defined as the difference between the Gross Vehicle Mass and the Unladen Mass). This requires the JLTV to have a payload exceeding 816kg, which is believed to be below the minimum payload option available.

The classification of a medium goods vehicle, category NB2, has been used as the basis for the Australian Design Rule review conducted in this study.

1.2.2. JLTV- Trailer

It is understood that the JLTV programme will incorporate the provision of trailers to be towed behind the vehicles. This will require the trailers to satisfy the Australian Design Rules applicable to their category, as well as the tow couplings that are required to connect the trailer to the towing vehicle.

The trailers are expected to have a payload capacity of 2,500kg, which when combined with the unladen mass of the trailer, will result in the trailer being either category TB (Gross Trailer Mass not exceeding 3,500kg) or category TC (Gross trailer mass between 3,500kg and 10,000kg).

For the purpose of this study, the requirements for both categories of trailer have been reviewed.

2. REFERENCES

The present document refers to a number of Standards and Regulations. Below is list of major standards referred to throughout this document together with their common names.

Common Name	Title
JLTV Purchase Description	Purchase Description (PD) for Joint Light Tactical Vehicle (JLTV) Family of Vehicles, VERSION 2.0, 21 January 2008,
Australian Design Rules – 3rd Edition (ADR)	Vehicle Standard (Australian Design Rule No 1/00 – Reversing Lamps) 2005 -- Vehicle Standard (Australian Design Rule 84/00 – Front Underrun Impact Protection) 2009
Federal Motor Vehicle Safety Standards (FMVSS)	Title 49, Codes of Federal Regulations, Subtitle B, Vol 6, Chapter 6, Part 571, Standard No 101 to 500 (10-1-08 Edition)
Federal Motor Carrier Safety Regulations (FMCSR)	Title 49, Codes of Federal Regulations, Subtitle B, Vol 5, Chapter 3, Parts 300 - 399
US98	USCFR 86.098-11, Emission standards for 1998 and later model year diesel heavy-duty engines and vehicles
US04	USCFR 86.004-11, Emission standards for 2004 and later model year diesel heavy-duty engines and vehicles
US07	USCFR 86.007-11, Emission standards and supplemental requirements for 2007 and later model year diesel heavy-duty engines and vehicles
n/a	American National Standard - ANSI Z26.1-1996 - "Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways"
n/a	SAE J 587, License Plate Lamps (Rear Registration Plate Lamps), Aug 1985
n/a	SAE J590, Turn Signal Flashers, Jul 86
n/a	SAE J593, Backup Lamps, Feb 1968
n/a	SAE J849, Connection and Accessory Locations for Towing Multiple Trailers, Nov 1985
n/a	SAE J1319, Fog Tail Lamp (Rear Fog Light) Systems, Aug 1987
n/a	SAE J1292, Automobile, Truck, Truck-Tractor, Trailer, and Motor Coach Wiring, Oct 1981

3. TABULAR COMPARISON OF STANDARDS

The following tables provide a summary of Australian Design Rule compliance by comparison with US Federal Regulations, such as the FMVSS, FMCSR, SAE, USCFR 86 and other referenced standards. A detailed analysis of the individual technical requirements is given in Appendix A .

Appendix B gives an additional tabular summary of the ADRs applicable to the scope of work of this study in the three vehicle categories under consideration along with the corresponding Federal US standards as well as their status of reference as part of the JLTV Purchase Description.

The technical equivalence between the referenced standards can have one of three different results, as listed in Table 3-1.

Symbol	Result	Explanation
f	Technically fully equivalent	The technical requirements stated in each of the standards are either the same, the American standard exceeds the Australian requirements or the American standard is listed as a valid alternative within a specific ADR.
p	Technically partially equivalent	Some technical requirements stated in each of the standards are the same and comply, but others are not stated in the American standards.
n	Technically not equivalent	Some or all technical requirements stated in each of the American standards are contradictory to the requirements stated in the appropriate ADR making the standards technically not equivalent.

Table 3-1: Field codes for the description of technical equivalence

A large number of US Federal Regulations and SAE standards are referred to in the JLTV Purchase Description. While a number of these standards are relevant to the technical compliance of the JLTV vehicle with Australian Design Rules, and as such are listed against the appropriate clauses, many of the standards are not applicable for the purpose of demonstrating compliance.

3.1. NB CLASS VEHICLES (MEDIUM GOODS VEHICLES)

* = Compliance for Vehicles in the NB Type Class: f = technically fully equivalent; p = partially technically equivalent; n = not technically equivalent.

ADR	Name	C*	Standard	Name	Equivalence Summary
01/00	Reversing Lamps	f	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> For NB class vehicles over 6000 mm, both standards are technically equivalent.
02/01	Side Door Latches and Hinges	f	FMVSS 206	Door Locks and Door Retention Components	<ul style="list-style-type: none"> For NB class vehicles, the standards are technically equivalent. However, due to small rounding and conversion errors, some of the metric forces given in the FMVSS are slightly lower than the equivalent values in the ADR.
03/03	Seat and Seat Anchorages	p	FMVSS 207	Seating Systems	<ul style="list-style-type: none"> For NB Class vehicles, the requirements set in the standards are technically equivalent with the exception of the load duration during testing, which is not defined in the FMVSS. Due to the very short duration required in the ADR, any static test for the initial certification process would more than likely satisfy the requirement.
04/04	Seat Belts	f	FMVSS 209	Seat Belt Assemblies	<ul style="list-style-type: none"> FMVSS 209 is classified as an acceptable alternative standard in the ADR for NB Class vehicles and hence is deemed to be technically equivalent.
05/05	Anchorage for Seatbelts	p	FMVSS 210	Seat Belt Assembly Anchorages	<ul style="list-style-type: none"> A number of requirements stated in ADR 05/05 are not covered in any of the FMVSS and hence make the two standards only partially technically equivalent. Outstanding items are the omission of extra strength requirements in centre seats, which have the anchorage mounted to the seat rather than the car body, the option of only having a lap belt in the forward outboard positions, and the complete omission of any requirements for sideways facing seats.
06/00	Direction Indicators	n	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> The ADR and FMVSS are not technically equivalent. Key points are that the FMVSS allows for <u>red</u> rear direction indicators, that no maximum luminous intensity values are given for front indicators, that there is no provision or regulation for side facing indicators, and that the minimum visible angles are different from the FMVSS.

ADR	Name	C*	Standard	Name	Equivalence Summary
08/01	Safety Glazing Material	f	FMVSS 205	Glazing Materials (American National Standard - ANSI Z26.1-1996 - "Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways")	<ul style="list-style-type: none"> The ADR allows for the use of ANSI Z26.1-1996 as an alternative approved standard for safety glazing material. FMVSS 205 calls for the same standard to define the requirements of glazing materials in vehicles. This makes the two standards technically equivalent.
13/00	Installation of Lighting and Light-Signalling Devices on other than L-Group Vehicles	n	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> The ADR and FMVSS/ FMCSR are not technically equivalent. A large number of requirements in the ADR have different or missing requirements in the FMVSS and FMCSR.
			FMCSR 393.11	Lamps and reflective devices.	
			FMCSR 393.22	Combination of lighting devices and reflectors.	
14/02	Rear Vision Mirrors	p	FMVSS 111	Rearview Mirrors	<ul style="list-style-type: none"> The appropriate FMVSS and FMCSR are only partially technically equivalent to the ADR, as a number of requirements called in the ADR are not defined while others are technically equivalent. In addition, the differences between left hand drive and right hand drive field of view requirements would require mirror configuration to be confirmed
			FMCSR 393.80	Rear-vision mirrors.	
18/03	Instrumentation	n	FMVSS 101	Controls and displays	<ul style="list-style-type: none"> The ADR and FMVSS/FMCSR are not technically equivalent. Requirements for the speedometer scale and tolerance on speedometer accuracy are different, while all other ADR requirements are not specified in any FMVSS/FMCSR.
			FMCSR 393.82	Speedometer	
30/01	Smoke Emission Control for Diesel Vehicles	f	USCFR 86.098-11	Emission standards for 1998 and later model year diesel heavy-duty engines and vehicles	<ul style="list-style-type: none"> Subpart A 40CFR 86.098-11; and Subpart I – Emission Regulations for new diesel heavy-duty engines: smoke exhaust test procedure, are deemed to be equivalent to the technical requirements of this vehicle standard.
35/03	Commercial Vehicle Brake Systems	p	FMVSS 105	Hydraulic and electric brake systems	<ul style="list-style-type: none"> The ADR and FMVSS/FMCSR are only partially technically equivalent. Many of the functional requirements of the ADR are not mentioned in any FMVSS/FMCSR, while many of the performance requirements of the ADR are different to the FMVSS
			FMVSS 121	Air Brake Systems	
			FMCSR 393.43	Breakaway and emergency braking	

ADR	Name	C*	Standard	Name	Equivalence Summary
2/04	General Safety Requirements	p	FMVSS 102 FMVSS 103 FMVSS 104 FMVSS 106 FMVSS 113 FMVSS 118 FMVSS 119 FMCSR 393	Transmission Shift Lever, Starter Interlock, and Transmission Braking Effect Windshield Defrosting and Defogging System Windshield Wiping and Washing System Brake Hoses Hood Latch System Power-Operated Window, Partition, and Roof Panel Systems New pneumatic tires for vehicles other than passenger cars Parts and accessories necessary for safe operation	<ul style="list-style-type: none"> The ADR and FMVSS/FMCSR are only partially technically equivalent, as a number of requirements called in the ADR are not defined while others are technically equivalent.
43/04	Vehicle Configuration & Dimensions	n	FMCSR 658	Size and Weight, Route Designations — Length, Width and Weight Limitations	<ul style="list-style-type: none"> The ADR and FMCSR are not technically equivalent. The requirement for the maximum vehicle width is different, while all other ADR requirements are not specified in the FMCSR.
45/01	Lighting & Light-Signalling Devices not covered by ECE Regulations	n	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> The ADR and FMVSS are not technically equivalent. The colours of the lamps, maximum light intensities and viewing angles differ between the two standards, with a number of parameters in regards to the viewing angles omitted in the FMVSS.
46/00	Headlamps	n	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> Significant differences in regards to beam shape and direction exist between the ADR 46/00 and FMVSS 108, emphasised by the difference in left-hand traffic in Australia and right-hand traffic in the USA, making the two standards technically not equivalent.
47/00	Retro-Reflectors	n	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> The requirements for retro-reflectors given in FMVSS 108 are in some parts contradicting the requirements in ADR 47/00, and hence the two standards are technically not equivalent.
48/00	Devices for Illumination of Rear Registration Plates	f	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> The requirements in FMVSS 108 exceed the requirements in ADR 48/00 and hence the standards are technically fully equivalent.

ADR	Name	C*	Standard	Name	Equivalence Summary
			FMVSS 102	Transmission Shift Lever, Starter Interlock, and Transmission Braking Effect	
49/00	Front and Rear Position (Side) Lamps, Stop Lamps and End-outline Marker Lamps	n	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> The requirements in FMVSS 108 are not technically equivalent to ADR 49/00, due to non-existence of some requirements and less stringent requirements in other regards.
50/00	Front Fog Lamps	n	FMVSS 108 FMCSR 393.22	Lamps, Reflective Devices, and Associated Equipment Combination of lighting devices and reflectors.	<ul style="list-style-type: none"> No requirements in relation to front fog lamps are given in FMVSS 108 and hence the two standards are technically not equivalent.
51/00	Filament Lamps	f	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> The two standards are deemed to be technically fully equivalent as the FMVSS is a referenced alternative standard in ADR 51/00.
52/00	Rear Fog Lamps	n	FMVSS 108 FMCSR 393.22	Lamps, Reflective Devices, and Associated Equipment Combination of lighting devices and reflectors.	<ul style="list-style-type: none"> No requirements in relation to rear fog lamps are given in FMVSS 108 and hence the two standards are technically not equivalent.
61/02	Vehicle Markings	p	FMCSR 565	Vehicle Identification Number Requirement	<ul style="list-style-type: none"> The requirements in ADR 61/02 and FMCSR 565 and FMCSR 567 are technically equivalent. However, some requirements, especially in regards to engine numbers and registration plates are not covered in the FMCSR or FMVSS.
			FMCSR 567	Certification	
62/02	Mechanical Connections Between Vehicles	n	FMCSR 393.70	Coupling devices and towing methods, except for driveaway-towaway operations.	<ul style="list-style-type: none"> The FMCSR does not give actual performance requirement values and hence <u>cannot</u> be deemed technically equivalent with ADR 62/00. The JLTV Purchase Description refers to SAE J849 for the requirements of the coupling mechanism. These performance requirements are either significantly lower, or non-existent, when compared with ADR 62/02 and hence the two standards are technically not equivalent.
			SAE J849	Connection and Accessory Locations for Towing Multiple Trailers, Nov 1985	
74/00	Side Marker Lamps	n	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> Side Marker Lamps complying with Clause 7.2.2. of ADR 13/00 and ADR 45/01 do not need to comply with ADR 74. Alternatively UN ECE compliant side marker lamps can comply with this ADR. FMVSS 108 does not specify technically equivalent

ADR	Name	C*	Standard	Name	Equivalence Summary
			FMVSS 102	Transmission Shift Lever, Starter Interlock, and Transmission Braking Effect	
					requirements
75/00	Headlamp Cleaners	n	not specified	/	<ul style="list-style-type: none"> No FMVSS, FMCSR or other standard referenced in the JLTV purchase description covers the requirements for headlamp cleaners. As headlamp cleaners are also not a requirement of the JLTV purchase description, it is highly unlikely that they will be fitted to the vehicle.
76/00	Daytime Running Lamps	n	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> FMVSS 108 and ADR 76/00 are not technically equivalent, mainly due to omission of requirements, different light colours and maximum beam luminosity values.
77/00	Gas Discharge Headlamps	N/A	N/A	/	<ul style="list-style-type: none"> While applicable to NB class vehicles, Gas Discharge Headlamps are not applicable in the case of the JLTV as LED headlamps are required to be installed.
78/00	Gas Discharge Light Sources	N/A	N/A	/	<ul style="list-style-type: none"> While applicable to NB class vehicles, Gas Discharge Light Sources are not applicable in the case of the JLTV as LED headlamps are required to be installed.
80/02	Emission Control for Heavy Vehicles	f	USCFR 86.004-11	Emission standards for 2004 and later model year diesel heavy-duty engines and vehicles	<ul style="list-style-type: none"> The ADR and USCFR 86.004-11 are deemed to be equivalent to the technical requirements of this vehicle standard, subject to clauses 6.2.1 to 6.2.6 inclusive, for engines which operate on diesel, liquefied petroleum gas or natural gas
80/03	Emission Control for Heavy Vehicles	f	USCFR 86.007-11	Emission standards and supplemental requirements for 2007 and later model year diesel heavy-duty engines and vehicles	<ul style="list-style-type: none"> The ADR and USCFR 86.004-11 are deemed to be equivalent to the technical requirements of this vehicle standard, subject to clauses 6.2.1 to 6.2.5 inclusive, for engines which operate on diesel, liquefied petroleum gas or natural gas
83/00	External Noise	n	FMCSR 325	Compliance with interstate motor carrier noise emission standards	<ul style="list-style-type: none"> The ADR and FMCSR are not technically equivalent, as the maximum permitted sound level values in the FMCSR are significantly higher than the levels permitted in the ADR.
= Compliance for Vehicles in the NB Type Class: f = technically fully equivalent; p = partially technically equivalent; n = not technically equivalent.					

3.2. TB CLASS TRAILER (LIGHT TRAILER)

* = Compliance for Vehicles in the NB Type Class: f = technically fully equivalent; p = partially technically equivalent; n = not technically equivalent.

ADR	Name	C*	FMVSS	Name	Equivalence Summary
01/00	Reversing Lamps	n/a	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> Reversing lights are not required on trailers under recent changes to the ADR.
06/00	Direction Indicators	n	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> The ADR and FMVSS are not technically equivalent. Key points are that the FMVSS allows for red rear direction indicators and that the minimum visible angles are different from the FMVSS.
13/00	Installation of Lighting and Light-Signalling Devices on other than L-Group Vehicles	n	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> The ADR and FMVSS/ FMCSR are not technically equivalent. A large number of requirements in the ADR have different or missing requirements in the FMVSS and FMCSR.
			FMCSR 393.11	Lamps and reflective devices.	
			FMCSR 393.22	Combination of lighting devices and reflectors.	
23/02	Passenger Car Tyres	n/a	N/A	/	<ul style="list-style-type: none"> Clause D121 of Annex D in the JLTV Purchase Description requires for the trailers to be fitted with same tires as the towing vehicles and hence excluding Passenger Car Tyres from the TB class trailer as applicable to this project.
38/03	Trailer Braking Systems	p	FMVSS 121	Air Brake Systems	<ul style="list-style-type: none"> The clauses of ADR 38/03 pertaining to TB class trailers are technically equivalent to the FMVSS/FMCSR with the exception of the clause that states the trailer braking force must be modulated by the control signal from the driving vehicle
			FMCSR 393.43	Breakaway and emergency braking	
42/04	General Safety Requirements	n	FMVSS 106	Brake Hoses	<ul style="list-style-type: none"> The ADR and FMVSS/FMCSR are not technically equivalent. All of the applicable ADR Clauses are either not defined in the FMVSS/FMCSR or not equivalent.
			FMVSS 119	New Pneumatic Tires for Vehicles Other Than Passenger Cars	
			FMCSR 393	Parts and accessories necessary for safe operation	
43/04	Vehicle Configuration & Dimensions	n	FMCSR 658	Size and Weight, Route Designations — Length, Width and Weight Limitations	<ul style="list-style-type: none"> The ADR and FMCSR are not technically equivalent. The requirement for the maximum vehicle width is different, while all other ADR requirements are not defined in the FMCSR.

ADR	Name	C*	FMVSS	Name	Equivalence Summary
45/01	Lighting & Light-Signalling Devices not covered by ECE Regulations	n	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> The ADR and FMVSS are not technically equivalent. The colours of the lamps, maximum light intensities and viewing angles differ between the two standards, with a number of parameters in regards to the viewing angles omitted in the FMVSS.
47/00	Retro-Reflectors	n	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> The requirements for retro-reflectors given in FMVSS 108 are in some parts contradicting the requirements in ADR 47/00 and hence the two standards are technically not equivalent.
48/00	Devices for Illumination of Rear Registration Plates	f	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> The requirements in FMVSS 108 exceed the requirements in ADR 48/00 and hence the standards are technically fully equivalent.
49/00	Front and Rear Position (Side) Lamps, Stop Lamps and End-outline Marker Lamps	n	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> The requirements in FMVSS 108 are not technically equivalent to ADR 49/00, due to non-existence and less stringent requirements.
51/00	Filament Lamps	f	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> Both standards refer to the same SAE standard and are technically fully equivalent.
61/02	Vehicle Markings	p	FMCSR 565	Vehicle Identification Number Requirement	<ul style="list-style-type: none"> The requirements in ADR 61/02 and FMCSR 565 and FMCSR 567 are technically equivalent. However, some requirements such as registration plates are not covered in the FMCSR or FMVSS.
62/02	Mechanical Connections Between Vehicles	n	FMCSR 393.70	Coupling devices and towing methods, except for driveway-towaway operations.	<ul style="list-style-type: none"> The FMCSR does not give actual performance requirement values and hence <u>cannot</u> be deemed technically equivalent with ADR 62/00. The JLTV Purchase Description refers to SAE J849 for the requirements of the coupling mechanism. These performance requirements are either significantly lower, or non-existent, when compared with ADR 62/02 and hence the two standards are technically not equivalent.
			SAE J849	Connection and Accessory Locations for Towing Multiple Trailers, Nov 1985	
* = Compliance for Vehicles in the TB Type Class: f = technically fully equivalent; p = partially technically equivalent; n = not technically equivalent.					

3.3. TC CLASS TRAILERS (MEDIUM TRAILER)

* = Compliance for Vehicles in the NB Type Class: f = technically fully equivalent; p = partially technically equivalent; n = not technically equivalent.

ADR	Name	C*	FMVSS	Name	Equivalence Summary
01/00	Reversing Lamps	n/a	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> Reversing lights are not required on trailers under recent changes to the ADR.
06/00	Direction Indicators	n	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment (SAE Standard J1395, Turn Signal Lamps for use on Motor Vehicles 2032 mm or more in overall Width, Apr 1985)	<ul style="list-style-type: none"> The ADR and FMVSS are not technically equivalent. Key points are that the FMVSS allows for red rear direction indicators, that no maximum luminous intensity values are given for front indicators, that there is no provision or regulation for side facing indicators, and that the minimum visible angles are completely omitted from the FMVSS.
13/00	Installation of Lighting and Light-Signalling Devices on other than L-Group Vehicles	n	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> The ADR and FMVSS/ FMCSR are not technically equivalent. A large number of requirements in the ADR have different or missing requirements in the FMVSS and FMCSR.
			FMCSR 393.11	Lamps and reflective devices.	
			FMCSR 393.22	Combination of lighting devices and reflectors.	
38/03	Trailer Braking Systems	p	FMVSS 121	Air Brake Systems	<ul style="list-style-type: none"> The ADR and FMVSS/FMCSR are only partially technically equivalent. Many of the functional and performance requirements of ADR 38/03 are not defined in any FMVSS/FMCSR.
			FMCSR 393.43	Breakaway and emergency braking	
42/04	General Safety Requirements	n	FMVSS 106	Brake Hoses	<ul style="list-style-type: none"> The ADR and FMVSS/FMCSR are not technically equivalent. All of the applicable ADR Clauses are either not defined in the FMVSS/FMCSR or not equivalent.
			FMVSS 119	New Pneumatic Tires for Vehicles Other Than Passenger Cars	
			FMCSR 393	Parts and accessories necessary for safe operation	
43/04	Vehicle Configuration & Dimensions	n	FMCSR 658	Size and Weight, Route Designations — Length, Width and Weight Limitations	<ul style="list-style-type: none"> The ADR and FMCSR are not technically equivalent. The requirement for the maximum vehicle width is different, while all other ADR requirements are not defined in the FMCSR.
45/01	Lighting & Light-Signalling Devices not covered by ECE Regulations	n	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> The ADR and FMVSS are not technically equivalent. The colours of the lamps, maximum light intensities and viewing angles differ between the two standards, with a number of parameters in regards to the viewing angles omitted in the FMVSS.

ADR	Name	C*	FMVSS	Name	Equivalence Summary
47/00	Retro-Reflectors	n	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> The requirements for retro-reflectors given in FMVSS 108 are in some parts contradicting the requirements in ADR 47/00 and hence the two standards are technically not equivalent.
48/00	Devices for Illumination of Rear Registration Plates	f	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> The requirements in FMVSS 108 exceed the requirements in ADR 48/00 and hence the standards are technically fully equivalent.
49/00	Front and Rear Position (Side) Lamps, Stop Lamps and End-outline Marker Lamps	n	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> The requirements in FMVSS 108 are not technically equivalent to ADR 49/00, due to non-existence and less stringent requirements.
51/00	Filament Lamps	f	FMVSS 108	Lamps, Reflective Devices, and Associated Equipment	<ul style="list-style-type: none"> Both standards refer to the same SAE standard and are technically fully equivalent.
61/02	Vehicle Markings	p	FMCSR 565	Vehicle Identification Number Requirement	<ul style="list-style-type: none"> The requirements in ADR 61/02 and FMCSR 565 and FMCSR 567 are technically equivalent. However, some requirements such as registration plates are not covered in the FMCSR or FMVSS.
			FMCSR 567	Certification	
62/02	Mechanical Connections Between Vehicles	n	FMCSR 393.70	Coupling devices and towing methods, except for driveaway-towaway operations.	<ul style="list-style-type: none"> The FMCSR does not give actual requirement values and hence can be deemed technically not equivalent with ADR 62/00. The JLTV Purchase Description refers to SAE J849 for the requirements of the coupling mechanism. These requirements are either significantly lower or non-existent when compared with ADR 62/02 and hence the two standards are technically not equivalent.
			SAE J849	Connection and Accessory Locations for Towing Multiple Trailers, Nov 1985	
63/00	Trailers Designed for Use in Road Trains	n/a	N/A	/	<ul style="list-style-type: none"> While generally applicable to TC Class trailers, the trailers in the JLTV family will not be used in a Road Train set-up and hence this ADR does not apply to JLTV project.

* = Compliance for Vehicles in the TC Type Class: f = technically fully equivalent; p = partially technically equivalent; n = not technically equivalent.

4. REQUIRED MODIFICATIONS FOR ADR TECHNICAL COMPLIANCE

This section contains general recommendations for required modifications to the JLTV family of vehicles to achieve technical compliance with the ADR for the rules for which only partial or technical non-equivalence was determined in Section 3

ADR	03/03	Seat and Seat Anchorages
FMVSS	207	Seating Systems
Recommended remedies to achieve full technical equivalence:		
<ul style="list-style-type: none"> FMVSS 210 (Seat Belt Assembly Anchorages) requires a test-duration of 10 seconds or more for strength verification purposes. These tests are generally combined with the required test for FMVSS 207. As a result, the test time for any approval of seats and seat anchorages in practice exceed the requirements within Clause A-6.3.1 of ADR 3/03. 		

ADR	05/05	Anchorage for Seatbelts
FMVSS	210	Seat Belt Assembly Anchorages
Recommended remedies to achieve full technical equivalence:		
<ul style="list-style-type: none"> To achieve technical compliance with regard to outstanding clauses, technical specifications should be assigned appropriately and the characteristics of finished products verified by a series of tests. 		

ADR	06/00	Direction Indicators
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
Recommended remedies to achieve full technical equivalence:		
<ul style="list-style-type: none"> To achieve full technical compliance using US certified lamps, photometric testing is required to the prescribed requirements of the ADR. Alternatively, fitting ADR or ECE compliant lamps will achieve full technical compliance. 		

ADR	13/00	Installation of Lighting and Light-Signalling Devices on other than L-Group Vehicles
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
FMCSR	393.11	Lamps and reflective devices.
FMCSR	393.22	Combination of lighting devices and reflectors.
Recommended remedies to achieve full technical equivalence:		
<ul style="list-style-type: none"> For a large number of lighting and light-signalling devices required within the ADR as mandatory or optional, the applicable requirements in the US regulations and standards prescribe different locations, device colours and numbers and additional requirements. To achieve technical compliance with ADR 13/00 or ECE regulations, tests are required to verify that the lighting and light-signalling devices are individually compliant. Should tests show that devices are not compliant they will have to be either moved to the correct location or removed if not required as mandatory by ADR 13/00. 		

ADR	14/02	Rear Vision Mirrors
FMVSS	111	Rearview Mirrors
FMCSR	393.80	Rear-vision mirrors.
Recommended remedies to achieve full technical equivalence:		
<ul style="list-style-type: none"> To achieve technical compliance in regards to outstanding clauses, technical specifications should be assigned appropriately and the characteristics of finished products verified by a series of tests. Alternatively fitting ADR or ECE compliant mirrors which protrude from the vehicle within the specified limits will achieve full technical compliance. 		

ADR	18/03	Instrumentation
FMCSR	393.82	Speedometer
Recommended remedies to achieve full technical equivalence:		
<ul style="list-style-type: none"> Only fitting of ADR compliant devices and instrumentation will ensure compliance. 		

ADR	30/01	Smoke Emission Control for Diesel Vehicles
USCFR	86.098-11	Emission Standards for 1998 and later model year diesel heavy-duty engines and vehicles
Recommended remedies to achieve full technical equivalence:		
<ul style="list-style-type: none"> Certification is required to the above USCFR standard as defined in the ADR. 		

ADR	35/03	Commercial Vehicle Brake Systems
FMVSS	105 121	Hydraulic and electric brake systems Air brake systems
FMCSR	393.43	Breakaway and emergency braking
Recommended remedies to achieve full technical equivalence:		
<ul style="list-style-type: none"> To achieve technical compliance in regards to outstanding clauses, technical specifications should be assigned appropriately and the characteristics of finished products verified by a series of tests. To achieve technical compliance in regards to performance requirements, vehicle testing must be completed in accordance with ADR 35/03 requirements 		

ADR	38/03	Trailer Braking Systems
FMVSS	121	Air brake systems
FMCSR	393.43	Breakaway and emergency braking
Recommended remedies to achieve full technical equivalence:		
<ul style="list-style-type: none"> To achieve technical compliance in regards to outstanding clauses, technical specifications should be assigned appropriately and the characteristics of finished products verified by a series of tests. To achieve technical compliance in regards to performance requirements, vehicle testing must be completed in accordance with ADR 38/03 requirements 		

ADR	42/04	General Safety Requirements
FMVSS	102	Transmission Shift Lever, Starter Interlock, and Transmission Braking Effect
	103	Windshield Defrosting and Defogging System
	104	Windshield Wiping and Washing System
	106	Brake Hoses
	113	Hood Latch System
	118	Power-Operated Window, Partition, and Roof Panel Systems
	119	New pneumatic tires for vehicles other than passenger cars
FMCSR	393	Parts and accessories necessary for safe operation
Recommended remedies to achieve full technical equivalence:		
<ul style="list-style-type: none"> The exhaust outlet would have to be designed to exit from the rear or the right hand side. Rear mudflaps would likely be required to satisfy the mudguard coverage requirements. The steering system must be located to the right of the vehicle longitudinal centreline. To achieve technical compliance in regards to other outstanding clauses, technical specifications should be assigned appropriately and the characteristics of finished products verified by a series of tests. 		

ADR	43/04	Vehicle Configuration Dimensions
FMCSR	658	Size and Weight, Route Designations — Length, Width and Weight Limitations
Recommended remedies to achieve full technical equivalence:		
<ul style="list-style-type: none"> To achieve technical compliance in regards to outstanding clauses, technical specifications should be assigned appropriately and the characteristics of finished products verified by a series of tests. 		

ADR	45/01	Lighting & Light-Signalling Devices not covered by ECE Regulations
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
Recommended remedies to achieve full technical equivalence:		
<ul style="list-style-type: none"> To achieve full technical compliance using US certified lamps, photometric testing is required to the prescribed requirements of the ADR. Alternatively fitting ADR or ECE compliant lamps will achieve full technical compliance. 		

ADR	46/00	Headlamps
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
Recommended remedies to achieve full technical equivalence:		
<ul style="list-style-type: none"> To achieve full technical compliance using US certified lamps, photometric testing is required to the prescribed requirements of the ADR. Alternatively fitting ADR or ECE compliant lamps will achieve full technical compliance. 		

ADR	47/00	Retro-reflectors
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
Recommended remedies to achieve full technical equivalence:		
<ul style="list-style-type: none"> To achieve full technical compliance using US certified lamps, photometric testing is required to the prescribed requirements of the ADR. Alternatively fitting ADR or ECE compliant lamps will achieve full technical compliance. 		

ADR	49/00	Front and Rear Position (Side) Lamps, Stop Lamps and End-outline Marker Lamps
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
Recommended remedies to achieve full technical equivalence:		
<ul style="list-style-type: none"> To achieve full technical compliance using US certified lamps, photometric testing is required to the prescribed requirements of the ADR. Alternatively fitting ADR or ECE compliant lamps will achieve full technical compliance. 		

ADR	50/00	Front Fog Lamps
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
FMCSR	393.22	Combination of lighting devices and reflectors.
Recommended remedies to achieve full technical equivalence:		
<ul style="list-style-type: none"> To achieve full technical compliance using US certified lamps, photometric testing is required to the prescribed requirements of the ADR. Alternatively fitting ADR or ECE compliant lamps will achieve full technical compliance. 		

ADR	52/00	Rear Fog Lamps
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
FMCSR	393.22	Combination of lighting devices and reflectors.
Recommended remedies to achieve full technical equivalence:		
<ul style="list-style-type: none"> To achieve full technical compliance using US certified lamps, photometric testing is required to the prescribed requirements of the ADR. Alternatively fitting ADR or ECE compliant lamps will achieve full technical compliance. 		

ADR	61/02	Vehicle Markings
FMCSR	565	Vehicle Identification Number Requirement
FMCSR	567	Certification
Recommended remedies to achieve full technical equivalence:		
<ul style="list-style-type: none"> To achieve technical compliance in regards to outstanding clauses, technical specifications should be assigned appropriately and the characteristics of finished products verified by a series of tests. Alternatively fitting ADR or ECE compliant equipment will achieve full technical compliance. Engine Numbers are a mandatory requirement in Australia at the current time and should be placed on the engine of each JLTV to achieve compliance. 		

ADR	62/02	Mechanical Connections Between Vehicles
FMVSS	n/a	/
FMCSR	393.70	Coupling devices and towing methods, except for driveaway-towaway operations.
SAE	J849	Connection and Accessory Locations for Towing Multiple Trailers, Nov 1985
Recommended remedies to achieve full technical equivalence:		
<ul style="list-style-type: none"> To achieve technical compliance in regards to outstanding clauses, technical specifications should be assigned appropriately and the characteristics of finished products verified by a series of tests. Alternatively fitting ADR or ECE compliant hook couplings and towbars will achieve full technical compliance. 		

ADR	75/00	Headlamp Cleaners
FMVSS	n/a	/
Recommended remedies to achieve full technical equivalence:		
<ul style="list-style-type: none"> Should the JLTV be fitted with LED headlamps that have a luminous flux which exceeds 2000 lumen, ADR compliant headlamp cleaner will need to be installed on the vehicle. 		

ADR	76/00	Daytime Running Lamps
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
Recommended remedies to achieve full technical equivalence:		
<ul style="list-style-type: none"> To achieve full technical compliance using US certified lamps, photometric testing is required to the prescribed requirements of the ADR. Alternatively fitting ADR or ECE compliant lamps will achieve full technical compliance. 		

ADR	80/03	Emission Control for Heavy Vehicles
USCFR	86.007-11	Emission standards and supplemental requirements for 2007 and later model year diesel heavy-duty engines and vehicles
Recommended remedies to achieve full technical equivalence:		
<ul style="list-style-type: none"> Certification is required to the above USCFR standard as defined in the ADR. 		

ADR	83/00	External Noise
FMCSR	325	Compliance with interstate motor carrier noise emission standards
Recommended remedies to achieve full technical equivalence:		
<ul style="list-style-type: none"> To achieve technical compliance in regards to outstanding clauses, technical specifications should be assigned appropriately and the characteristics of finished products verified by a series of tests. 		

5. SPECIAL PURPOSE VEHICLES

The process for being able to use a vehicle on Australian roads requires the vehicle to be registered by a State, Territory or Federal authority. This registration is granted on the basis that the vehicle is fitted with an Australian Compliance Plate or Identification Plate as they are now known. This plate provides proof that the vehicle complies with the applicable Australian Design Rules. The plates are fitted by an entity that has obtained a Compliance Plate Approval for the particular make and model of vehicle.

There are several mechanisms for obtaining a Compliance Plate Approval, depending on the volume planned to be supplied to market and the type of vehicle being considered. Essentially, they all require the applicant to provide evidence that each vehicle will comply with the Australian Design Rule requirements, as well as meeting the standards for registration in each State and Territory in Australia. There are often several methods available to the applicant to demonstrate compliance, such as via testing and providing the results, or by certification to an equivalent, recognised international standard.

In some cases, it may not be possible to demonstrate a vehicle is compliant with all applicable requirements. These vehicles may still be considered for the issue of a Compliance Plate Approval depending on the nature of the non-compliance and the reason for it. There are broadly 2 main types of such non-compliance that would be considered by the Administrator of Vehicle Standards:

1. The vehicle may be non-compliant with a specific prescribed requirement, but this non-compliance is deemed "inconsequential in terms of safety and emissions". In other words, the vehicle will not pose a safety risk or an environmental risk as a result of the minor non-compliance.
2. The vehicle may be designed to fulfil a specialist function, and therefore may possess features that make it impossible to comply with a particular ADR or ADR requirement.

In the case of the minor non-compliance identified in point 1, the applicant would apply to the Administrator for a **Concession**, on the grounds that the non-compliance was "minor and inconsequential in terms of safety and emissions". If granted, the vehicle type would be issued a Compliance Plate Approval as a "Standard Vehicle". In other words, it is considered exactly the same as a fully compliant vehicle that can be supplied to market without restriction. The Compliance Plate Approval document would identify the non-compliances so that all stakeholders were aware of the concessions granted.

For a Special Purpose Vehicle, such as a specialist military vehicle, the functional requirements may make it impossible to satisfy the ADR requirements. In some cases these requirements may be contradictory. In other cases, the vehicle may not be designed in such a way that compliance with the ADR can be demonstrated. With this type of vehicle, the applicant must apply to the Administrator for an **Exemption** from the ADR or the specific requirement that cannot be satisfied. If granted, the vehicle type would be issued with a Compliance Plate Approval as a "Non-Standard Vehicle". The vehicle is treated similarly for registration purposes, and is fitted with a compliance plate as per any other vehicle. However, the special purpose nature of the vehicle would typically place restrictions on its use and they would not be supplied to the general vehicle market.

6. DESIRED MODIFICATIONS FOR ADR TECHNICAL COMPLIANCE

It is desirable that all vehicles used on Australian Roads comply with *all* Australian Design Rules and associated regulations. However, as explained in Section 5, a special purpose vehicle, such as a Specialist Military Vehicle, may not be able to comply with all applicable requirements due to functional or operational characteristics associated with its special purpose or nature.

This section lists the ADR requirements that the JLTV is considered unlikely to be able to comply with. However, it is desirable that all requirements are complied with where possible, or at the very least with the “intent” of the requirements. In other words, there may be items or components that do not satisfy all the ADR performance requirements, but should still function in a manner that the relevant safety or emission objective is met. These vehicles should not pose an unnecessary danger to either the occupants or other road users.

The items listed in this section do not constitute a guarantee or undertaking that the Administrator of Vehicle Standards will grant an Exemption. It is simply the opinion of the authors as to the likely areas of issue based on the JLTV purchase description. To minimise risk in this area, the number of items where an Exemption is required should be minimised through the engineering development process of the JLTV.

ADR	03/03 04/04 05/05	Seat and Seat Anchorages Seat Belts Anchorages for Seatbelts
FMVSS	207 209 210	Seating Systems Seat Belt Assemblies Seat Belt Assembly Anchorages
Technical issue:		
<ul style="list-style-type: none"> • These ADRs specified strength requirements for seats, seat anchorages, seat belts and seat belt anchorages, as well as energy dissipation requirements for the seat back. It has become common practice for seats to incorporate some seat belt anchorages and components of the seat belt assemblies. Road vehicles typically use 3-point seat belts incorporating an Emergency Locking Retractor mechanism to maintain correct belt adjustment. • It is understood that light armoured vehicles commonly include seats that are specially designed to provide protection to the occupant in the event of an upward acceleration caused by a mine blast or similar event. These seats typically incorporate 4-point harness belts for the occupants, some with retractor mechanisms on the 2 shoulder straps. These belt systems typically do not satisfy the requirements under these ADRs with regards to the functional requirements of the belts and the type of retractor unit. In addition, the seat and seat belt system is unlikely to have been tested and certified to the standard for road vehicle use. • However, the special functional requirements for the occupant protection in this vehicle type would likely exceed the performance requirements of the ADRs. It is expected that verification of the strength of the anchorages could be satisfied and that the seat belt webbing be compliant with the requirements of the respective standard as a minimum. 		

ADR	06/00 13/00 46/00 47/00 49/00	Direction Indicators Installation of Lighting and Light-Signalling Devices on other than L-Group Vehicles Headlamps Retro Reflectors Front and Rear Position (Side) Lamps, Stop Lamps and End-outline Marker Lamps
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment

Technical issue:

- The lighting ADRs are now aligned with the ECE regulations. As such, the technical requirements regarding the number of lamps, their positions and the photometric properties are different to the FMVSS regulations. In addition, Australia is left-hand traffic (right-hand drive) unlike the United States.
- It may be possible to use the FMVSS lamps on the JLTV provided the above criteria are met. This will require an assessment of the functional requirements (operation and location) and testing to determine the photometric properties (colour and intensity).
- If all requirements are satisfied except for example some minor photometric intensity requirements, but it can be shown that the lamp fulfils a dual purpose military application (e.g. incorporating a “black out” function), then it may be possible to have a concession granted.
- The headlamps will need to be correctly handed for a left-hand traffic (right-hand drive) application.

ADR	30/01 80/03	Smoke Emission Control for Diesel Vehicles Emission Control for Heavy Vehicles
USCFR	86.098-11	Emission standards for 1998 and later model year diesel heavy-duty engines and vehicles
USCFR	CFR 86.007-11	Emission standards and supplemental requirements for 2007 and later model year diesel heavy-duty engines and vehicles

Technical issue:

- These ADRs specify emission requirements for heavy-duty vehicles in order to achieve objectives of air pollution reduction. The US certified engines can satisfy the requirements of these ADRs provided the technical detail can be verified. A certificate of compliance with the US standard is not sufficient to demonstrate compliance in isolation.
- It is recognised that there are requirements for military vehicles to operate on a range of different fuel grades or specifications, and this can affect the ability of the engine manufacturer to provide an engine that can be certified to the required emission standard. In this instance, it would be expected that the applicant would have to apply for an Exemption from the Administrator of Vehicle Standards, however it would be a reasonable expectation that when the engine was operating on the “standard” fuel for its type, as generally available in the market, that the engine would comply with the required standard.

7. OTHER RELEVANT AUSTRALIAN FEDERAL OR STATE LEGISLATION

The Australian Design Rules are the national standards that must be met in order for a vehicle to be used on the Australian road network, without restriction. The access to this road network is granted by the respective State and Territory Transport Authorities via their vehicle registration systems. These systems also control aspects of vehicle operation that are outside of the Australian Design Rules. These include driver licensing requirements, vehicle roadworthiness inspections, vehicle modification approvals, restricted use permits, and road train and B-double route determinations. In addition, the State and Territory transport authorities specify axle mass limits for all vehicles, since they have the responsibility to maintain the majority of the road infrastructure.

For the purpose of this study, the relevant regulation applicable to the JLTV purchase description that is not otherwise covered by the Australian Design Rule review is the specification of axle mass limits. It is concluded from the purchase description that the JLTV will be configured as a 2-axle vehicle with provision for towing a single trailer, and that the vehicle and trailers will be dimensionally compliant. It is assumed that roadworthiness and ongoing maintenance will be to the highest standard and that the operators of vehicles will be appropriately trained and licensed.

The Australian Design Rules do not place any restrictions on vehicle masses, mass distribution or axle mass loadings, other than those imposed by the category definition, as explained in the previous section.

However, the State and Territory transport authorities have stringent limits on the mass that a vehicle can carry on each individual road wheel. These limits are typically expressed as an axle mass limit and they take into account the design loadings incorporated into road infrastructure. These mass limits are those that must be adhered to for "general access" to the road network, which means that the vehicle can use any part of the road that is not subject to a localised loading limit.

It is possible to operate a vehicle that exceeds the statutory axle mass limits. However, access to the road network is restricted by means of a tightly controlled permit system, administered by each individual State or Territory transport authority. This requires the operator to apply to the local jurisdiction for permission to operate a vehicle over a specific route, and if granted, the permit will specifically prescribe this route and only this route may be used by the nominated vehicle.

The table below lists the standard axle mass limits for vehicles of the type represented by the JLTV and its trailers (ref: Mass and Dimension Limits for General Access Heavy Vehicles Operating in South Australia), and the corresponding US mass limits (ref. Federal Motor Carrier Safety Regulations Part 658.17).

Single Axle Vehicles	Australia	US FMCSR
Single axle fitted with SINGLE tyres with section width of:		
Less than 375mm	6.0 tonnes	9.09 tonnes (20,000lbs)
375mm to < 450mm	6.7 tonnes	9.09 tonnes (20,000lbs)
450mm or greater	7.0 tonnes	9.09 tonnes (20,000lbs)
Single axle fitted with DUAL tyres on:		
a pig trailer	8.5 tonnes	9.09 tonnes (20,000lbs)
any other vehicle	9.0 tonnes	9.09 tonnes (20,000lbs)

8. SUMMARY

This document provides a comparison between the Australian Design Rules and various US regulations, primarily the Federal Motor Vehicle Safety Standards, in relation to the JLTV family of vehicles and their appropriateness for use on Australian roads.

The Australian Design Rules are the legislated national standards that any vehicle must demonstrate compliance with in order to be used on public roads in any Australian State or Territory. These Rules are further supplemented by regulations within each State and Territory that specify requirements for maximum axle mass limits on vehicles in order to protect the condition of road infrastructure. The equivalent standards and regulations in the United States of America (USA) are the FMVSSs and the Federal Motor Carrier Safety Regulations (FMCSRs). These are supplemented by standards issued by the Society of Automotive Engineers (SAE).

Under the Australian Design Rule Classification System, the JLTV would be classified as a NB Category "Medium Goods Vehicle". The trailers would be classified as either TB Category (light trailer) or TC Category (medium trailer), depending on their unladen mass and payload capacity. The comparison in this document is undertaken on basis of these classifications.

Comparison of the Australian Design Rules with the corresponding US standards provides a generally good correlation with the majority of the functional and performance requirements. However, there are a number of differences in key areas, such as vehicle lighting, metric instrumentation requirements, and requirements associated with the right-hand drive configuration used in Australia. There are also some cases where the US Federal Regulations are not directly comparable to the requirements stated in the Australian Design Rules, or they do not include specific requirements; however this does not necessarily mean that a US certified vehicle will not be compliant. In these instances the JLTV would have to be tested to determine compliance with the ADR.

A review of the standards referred to in the current JLTV Purchase Description indicates that a vehicle designed solely from those standards is highly unlikely to be fully compliant with all Australian Design Rules. Therefore additional testing and some modifications will be required in order to achieve compliance. It is expected, however, that the JLTV and its trailers will satisfy the axle mass limits in Australia, since their expected gross masses are significantly less than can be carried legally with 2 axle vehicles and single or 2 axle trailers.

Where the JLTV incorporates special features that are essential to fulfil its function as a specialist military vehicle, and these features result in it not being possible to satisfy some ADR requirements. Where the non-compliance is "minor and inconsequential" in terms of safety and emissions outcomes, then the Administrator of Vehicle Standards may grant a Concession from the specific requirement and the vehicle would then be issued with a Compliance Plate Approval as a "standard" vehicle. Where the non-compliance does not satisfy the definition of "minor and inconsequential", then the Administrator would have to grant an Exemption from the rule or the specific requirement on the basis that the non-compliance is essential to the special purpose function of the vehicle. With this process, the vehicle would be granted a Compliance Plate Approval as a "non-standard" vehicle, which would generally place restrictions on its use and supply to the general vehicle market.

In the case of the JLTV it is expected that the areas of seating and seat belts are unlikely to be fully compliant with the ADRs due to the additional restraint typically required to limit upwards acceleration of the occupants in the event of a blast event. This restraint is typically achieved with a 4 point harness type belt incorporated into the seating, which is different to the ADR requirement for a 3 point seat belt assembly incorporating an Emergency Locking Retractor. The JLTV may also be required to run on a range of different fuel grades, which may make compliance with the current engine emission regulations difficult or impossible. Where the actual prescribed requirements of the ADR cannot be met, then meeting the intent of these requirements should be the objective.

Appendix A

ADR – Detailed Standards Comparison

A.1 Australian Design Rules: Compliance of NB Class Vehicles

ADR	01/00	Reversing Lamps			
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment			
Equivalence Comments: <ul style="list-style-type: none"> Vehicles compliant with FMVSS 108 and built after 1998 are technically equivalent with ADR 01/00*. Requirements for Reversing Lamps are listed in Appendix A of ADR 01/00 (UN/ECE REGULATION NO. 23/00). Clauses listed in the table below starting with “A” refer to clauses in the appendix of the ADR not the main text of the ADR. Location and number of Reversing Lamps are detailed in ADR 13/00. ADR 13/00 Clause 6.4.2.2. in Appendix A (UN/ECE REGULATION NO. 48/02) requires the installation of two (2) reversing lights on vehicles over 6000 mm in length, which is deemed to be appropriate for the current task. Two further reversing lights are optional, bringing the total number of reversing lamps to four (4). 					
ADR Clause	Requirements		ADR Spec.	FMVSS Spec.	FMVSS Clause
A-6.2.	Minimum Light Intensity ***	– along the axis of reference	80 cd**	80cd	T12
A-6.3.	Maximum Light Intensity ***	– in or above the horizontal plane	300 cd	300cd [‡]	T12
		– below the horizontal plane	600 cd	300cd	T12
A-8.	Colour		White	White	T1-a

Additional Notes:

- * Motor Vehicle Standards (Approval to Place Used Import Plates) Guidelines 2006 (No. 1)
- ** cd = Candela, SI base unit of luminous intensity.
- *** Values given are for each lamp as stated per Clause A-6.1. in ADR 01/00.

ADR	02/01	Side Door Latches and Hinges			
FMVSS	206	Door Locks and Door Retention Components			
Equivalence Comments:					
<ul style="list-style-type: none"> •NB class vehicles can comply with either the current version of the rule (ADR 02/01) or the previous version (ADR 02/00) at any given time. •ADR 02/00 states the requirements for any hinged doors and shall be compared to FMVSS 206 in the table below. 					
ADR Clause	Requirements (Hinged Doors)		ADR Spec.	FMVSS Spec.	FMVSS Clause
2.2.1.1.	Latch Positions		2*	2	S4.1.1
2.2.1.1.1.	Longitudinal Load	– fully latched position	11.11 kN	11.0 kN (2500 lbf)**	S4.1.1.1
		– second latched position	4.44 kN	4.45 kN (1000 lbf)	S4.1.1.1
2.2.1.1.2.	Transverse Load	– fully latched position	8.89 kN	8.90 kN (2000 lbf)	S4.1.1.2
		– second latched position	4.44 kN	4.45 kN (1000 lbf)	S4.1.1.2
2.2.1.1.3.	Inertia Load		30 g	30g	S4.1.1.3
2.2.1.2.	Door Hinges	– longitudinal load	11.11 kN	11.0 kN (2500 lbf)**	S4.1.2
		– transverse load	8.89 kN	8.90 kN (2000 lbf)	S4.1.2
2.2.1.3.	Door Locks	Clauses 2.2.1.3 – 2.2.1.3.2.	***	***	S4.1.3ff
Clause	Requirements (“Goods-Type Doors”)		ADR Spec.	FMVSS Spec.	FMVSS Clause
2.2.2.1	Door Latches	– longitudinal load	11.11 kN	11.0 kN (2500 lbf)**	S4.2.1.1
		– transverse load	8.89 kN	8.90 kN (2000 lbf)	S4.2.1.2
2.2.2.2.	Door Hinges	– longitudinal load	11.11 kN	11.0 kN (2500 lbf)**	S4.2.2
		– transverse load	8.89 kN	8.90 kN (2000 lbf)	S4.2.2
Clause	Requirements (Sliding Doors)		ADR Spec.	FMVSS Spec.	FMVSS Clause
2.2.3.	Support Mechanism	– transverse Load	17.8 kN	17.8 kN (4000 lbf)	S4.3

Additional Notes:

- * Each door latch and striker assembly shall be provided with 2 positions, consisting of a fully latched position and a secondary latched position.
- ** The pound-force values given in the FMVSS standard are the equivalent of the kN forces given in ADR (e.g. 2500 lbf = 11.11 kN)
- *** Clauses are technically equivalent

ADR	03/03	Seat and Seat Anchorages			
FMVSS	207	Seating Systems			
Equivalence Comments:					
<ul style="list-style-type: none"> All vehicles complying with ADR 03/03 must also comply with ADR 05/05 or later revision. Requirements for Seat and Seat Anchorages are listed in Appendix A of ADR 03/03 (UN/ECE REGULATION NO. 17/07). Clauses listed in the table below starting with "A" refer to clauses in the appendix not the main text of the ADR. ADR 03/03 does not apply to "[...] folding, side-facing or rearward-facing seats, or to any head restraint fitted to these seats." as set out in Clause A-1. of the ADR. Due to the nature of the vehicle under consideration (JLTV), the clauses referring to "Child Restraint Anchorages" are not considered in this task. Head restraints for forward facing seat are not mandatory for NB class vehicles and are not considered in this task. 					
ADR Clause	Requirements	ADR Spec.	FMVSS Spec.	FMVSS Clause	
A-6.2.1.	Seat Strength – including adjustments	530 Nm	373 Nm	S4.2	
A-6.3.1	Strength of Seat Anchorage – in all seat positions	20 g	20 g	S4.2	
A-6.3.1	Minimum Load Duration – in all seat positions	30 ms	not specified	S4.2	

ADR	04/04	Seatbelts			
FMVSS	209	Seat Belt Assemblies			
Equivalence Comments:					
<ul style="list-style-type: none"> Clause 7.3 of ADR 04/04 states that for NB2 class type vehicles, FMVSS 209 current as at 1999, shall be deemed to be equivalent to the technical requirements of ADR 04/04. 					

ADR	05/05	Anchorage for Seatbelts			
FMVSS	210	Seat Belt Assembly Anchorages			
Equivalence Comments:					
<ul style="list-style-type: none"> Requirements for Seat and Seat Anchorages are listed in Appendix A of ADR 05/05 (UN/ECE REGULATION NO. 14/06). Clauses listed in the table below starting with "A" refer to clauses in the appendix not the main text of the ADR. Requirements and types of seat belts are defined in FMVSS No 209. Paragraph S3 defines that Type 1 seat belt assembly is a lap belt for pelvic restraint and that Type 2 seat belt assembly is a combination of pelvic and upper torso restraints. Requirements for the number and types of seat belt assemblies to be installed in a vehicle are covered in FMVSS No 208. Paragraph S4.3 covers vehicles with a Gross Vehicle Weight of 10,000 lbs (4,545 kg) or more. Requirements for the types of bolts used to secure the seat belt assemblies are also defined in FMVSS No 209. 					

ADR Clause	Requirements (Forward & Backward Facing Seats)	ADR Spec.	FMVSS Spec.	FMVSS Clause	
A-6.4.3.	Lap Anchorages – Lap Belt only	– front facing 11.1 kN	2,500 lbf (11.12 kN)	S4.2.1	
A-6.4.6.1.		– rear facing 11.1 kN	2,500 lbf (11.12 kN)	S4.2.1	
A-6.4.1.2	3 point belt, front facing, outboard	– upper torso anchorage strength 6.75 kN	1,500 lbf (6.67 kN)	S4.2.2	
A-6.4.1.3		– lap belt combined anchorage strength 6.75 kN	1,500 lbf (6.67 kN)	S4.2.2	
A-6.4.6.1.	3 point belt, rear facing, outboard	– upper torso anchorage strength 6.75 kN	1,500 lbf (6.67 kN)	S4.2.2	
A-6.4.6.1.		– lap belt combined anchorage strength 6.75 kN	1,500 lbf (6.67 kN)	S4.2.2	
A-6.4.4.2.	Centre Seats*	Strength requirements additionally to the above. 10 x seat mass	not specified		
A-6.3.3.	Minimum Load Duration	≥ 0.2 sec	10 sec	S5.1	
A-5.5.1.	Anchorage bolt	7/16–20 UNF–2A	7/16–20 UNF–2A or ½-13 UNC-2a	S4.1 (f) (No 209)	
A-A.6.	Minimum Number of Anchor Point, Forward Facing Seats	– Front, Outboard	3	2 or 3 (Type 1 or 2 Seat Belt Assy)	S4.3.2.2 (No 208)
		– Front, Centre	3 or 2	2 or 3 (Type 1 or 2 Seat Belt Assy)	S4.3.2.2 (No 208)
		– Other, Outboard	2	2 or 3 (Type 1 or 2 Seat Belt Assy)	S4.3.2.2 (No 208)
		– Other, Centre	2	2 or 3 (Type 1 or 2 Seat Belt Assy)	S4.3.2.2 (No 208)
A-A.6.	Rear Facing	2	2 or 3 (Type 1 or 2 Seat Belt Assy)	S4.3.2.2 (No 208)	
A-A.6.	Front Seat Lower Anchor Point Angles	– buckle side (α_2)	30° - 80°	30° - 75°	S4.3.1.1
		– other than buckle side (α_1)	30° - 80°	30° - 75°	S4.3.1.1
		– angle constant	50° - 70°	not specified	
		– bench - buckle side (α_2)	20° - 80°	30° - 75°	S4.3.1.1
		– bench - other than buckle side (α_1)	20° - 80°	30° - 75°	S4.3.1.1
	– adjustable seat with seat back angle < 20°	20° - 80°	30° - 75°	S4.3.1.1	
A-A.6.	Rear Seat Lower Anchor Point Angles	20° - 80°	30° - 75°		
A-A.3.	Location of Torso Anchorage Points Specified	yes	Similar to ADR 05/05	S4.3.2	

ADR Clause	Requirements (Sideways Facing Seats)	ADR Spec.	FMVSS Spec.	FMVSS Clause
5.3.	Front Facing Seat Compliant	yes**	not specified ****	/
5.3.1.1.1.	Load direction of tractive device – towards front of vehicle	yes	not specified ****	/
5.3.1.1.2	attached to anchorages – Vertical inbound (max.)	20°***	not specified ****	/
5.3.1.1.3	– horizontal (min)	5°	not specified ****	/
5.3.1.1.3	– horizontal (max)	50°	not specified ****	/

Additional Notes:

- * Centre Seats refer to seat whose anchorages are located wholly within the seat structure or dispersed between the vehicle structure and the seat structure
- ** No upper torso anchorage required, otherwise all requirements as stated for forward facing seats listed above.
- *** In a vertical plane inclined inboard to a vertical longitudinal plane relative to the vehicle.
- **** Requirements for sideways-facing seats are not covered in any of the FMVSS Standards (10-1-08 Edition).

ADR	06/00	Direction Indicators
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
Equivalence Comments:		
<ul style="list-style-type: none"> • Requirements for Direction Indicators are listed in Appendix A of ADR 06/00 (UN/ECE REGULATION NO. 06/00). Clauses listed in the table below starting with “A” refer to clauses in the appendix not the main text of the ADR. • Location and number of Direction Indicators are detailed in ADR 13/00. • Under FMVSS 108, Side Facing Indicators are not mandatory. Where Side Facing Indicators are used, they have to comply with “SAE J914, Side Turn Signal Lamps, Nov 1987”. • Annex 1 of Appendix A of ADR 06/00 (UN/ECE REGULATION NO. 06/00) defines a rear facing indicator category “2b” as “Direction indicators with two levels of intensity for the rear of the vehicle.” This means that the light emits 2 different luminous intensities, one during the daytime and one during the nighttime. Due to the nature of the JLTV project, it is not expected that this type of lamps will be used on the vehicle. As a result, the requirements for direction indicators of type 2b are not covered in this task. • Annex 1 of Appendix A of ADR 06/00 (UN/ECE REGULATION NO. 06/00) further defines a minimum visible vertical sweep angle for indicators of categories 1 and 2 of $\pm 15^\circ$ from the horizontal and of $+30^\circ$ to -5° from the horizontal for indicators of category 6. 		

ADR Clause	Requirements	ADR Spec.	FMVSS Spec.	FMVSS Clause
A-A5	Colour	Amber	Red or Amber	T1-a
A-6.1	– Type 1, min. intensity, central axis	175 cd	200 cd	T6-a
A-6.2.3.2.	– Type 1, max. intensity, single lamp	$\leq 5^\circ$ V & 5° H 700 cd $\geq 10^\circ$ V & 10° H 400 cd	not specified	/
A-6.2.3.2.	– Type 1, max. intensity, single lamp marked “D”*	$\leq 5^\circ$ V & 5° H 490 cd $\geq 10^\circ$ V & 10° H 280 cd	not specified	/
A-6.2.3.2.	– Type 1, max. intensity, total for assembly of 2 lamps	$\leq 5^\circ$ V & 5° H 980 cd $\geq 10^\circ$ V & 10° H 560 cd	not specified	/

ADR Clause	Requirements	ADR Spec.	FMVSS Spec.	FMVSS Clause	
A-6.1	– Type 1a, min. intensity, central axis	250 cd	500 cd	T6-a	
A-6.2.3.	– Type 1a, max. intensity, single lamp	≤ 5° V & 5° H	800 cd	not specified	/
		≥ 10° V & 10° H	400 cd		
		≥ 15° V & 15° H	250 cd		
	– Type 1a, max. intensity, single lamp marked “D”	≤ 5° V & 5° H	560 cd	not specified	/
		≥ 10° V & 10° H	280 cd		
		≥ 15° V & 15° H	70 cd		
	– Type 1a, max. intensity, total for assembly of 2 lamps	≤ 5° V & 5° H	1120 cd	not specified	/
		≥ 10° V & 10° H	560 cd		
≥ 15° V & 15° H		140 cd			
A-6.1	– Type 1b, min. intensity, central axis	400 cd	500 cd	T6-a	
A-6.2.3.	– Type 1b, max. intensity, single lamp	≤ 5° V & 5° H	860 cd	not specified	/
		≥ 10° V & 10° H	400 cd		
		≥ 15° V & 15° H	400 cd		
	– Type 1b, max. intensity, single lamp marked “D”	≤ 5° V & 5° H	600 cd	not specified	/
		≥ 10° V & 10° H	280 cd		
		≥ 15° V & 15° H	280 cd		
	– Type 1b, max. intensity, total for assembly of 2 lamps	≤ 5° V & 5° H	1200 cd	not specified	/
		≥ 10° V & 10° H	560 cd		
≥ 15° V & 15° H		560 cd			
A-6.1	Rear Facing Indicators	– Type 2a, min. intensity, central axis	50 cd	80 cd	T7
		– Type 2a, max. intensity, central axis, single lamp	350 cd	not specified	/
		– Type 2a, max. intensity, central axis, single lamp marked “D”	350 cd	not specified	/
		– Type 2a, max. intensity, central axis, total for assembly of 2 lamps	350 cd	not specified	/
A-A.1	Minimum Vertical Angles		±15°	±15°	T5-b
A-A.1	Front facing Indicator (Type 1), Horizontal Sweep Angle	– Minimum Inboard Angle	45°	45°	T5-b
		– Minimum Outboard Angle	80°	80°	T5-b
	Rear facing Indicator (Type 2), Horizontal Sweep Angle	– Minimum Inboard Angle	45°	45°	T5-b
		– Minimum Outboard Angle	80°	80°	T5-b
ADR Clause	Requirements	ADR Spec.	SAE J914 Spec	SAE Clause	
A-6.1	Side Facing Indicators	– Type 6, min. intensity, central axis	50 cd	15 cd	T2
		– Type 6, max. intensity, central axis, single lamp	200 cd	60 cd	T2
		– Type 6, max. intensity, central axis, single lamp marked “D”	140 cd	60 cd	T2
		– Type 6, max. intensity, central axis, total for assembly of 2 lamps	208 cd	60 cd	T2
A-A.1	Side Facing Indicator (Type 6).Horizontal Sweep Angle	– Minimum Rear facing Outboard Angle	5°	not specified	/
		– Minimum Rear facing Outboard Angle Sweep	55°	not specified	/

Additional Notes:

* “D” refers to lamps, which can either be used on their own or as part of an assembly. Refer ECE Regulation No. 7 in ADR 49/00

ADR	08/01	Safety Glazing Material		
FMVSS	205	Glazing Materials		
Equivalence Comments:				
<ul style="list-style-type: none"> Paragraph 8.3. of ADR 08/01 calls American National Standard - ANSI Z26.1-1996 - "Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways" as an approved alternative standard. FMVSS Standard No 205 calls the same standard in paragraph S5.1.1 as the requirement for any glazing in motor vehicles. Hence ADR 08/01 and FMVSS Standard No 205 are technically equivalent. 				
ADR Clause	Requirements	ADR Spec.	FMVSS Spec.	FMVSS Clause
8.3.	Alternative approved standard: American National Standard - ANSI Z26.1-1996 - "Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways"	yes	yes	8.3.

ADR	13/00	Installation of Lighting and Light-Signalling Devices on other than L-Group Vehicles		
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment		
FMCSR	393.11	Lamps and reflective devices.		
FMCSR	393.22	Combination of lighting devices and reflectors.		
Equivalence Comments:				
<ul style="list-style-type: none"> Requirements for Installation of Lighting and Light-Signalling Devices on other than L-Group Vehicles are listed in Appendix A of ADR 13/00 (UN/ECE REGULATION NO. 48/02). Clauses listed in the table below starting with "A" refer to clauses in the appendix not the main text of the ADR. ADR 13/00 defines the requirements for "Bend Lights", i.e. lights that temporarily change their angles to illuminate parts of a bend in the road ahead of the vehicle. Due to the nature of the vehicle under consideration (JLTV), the clauses referring to "Bend Lights" are not considered in this task. Stop Lamps of types S1, S2 are defined in ADR 49/00 (UN/ECE REGULATION NO. 7) and S3 in ADR 60/00. Due to the nature of the JLTV project and the type of vehicle, it is not expected that lamps of type S2 and S3 will be used on the vehicle. As a result, the requirements for stop lamps of type S2 and S3 are not covered in this task. High-mounted centred stop lamps are not covered in the FMVSS 108 for vehicles over 80 inches in width and are optional under ADR 13. Due to the nature of the JLTV vehicle it is not expected to be equipped with a high-mounted stop lamp. FMVSS 108 does not require front or rear position lamps (parking lamps) on vehicles wider than 2032 mm (80 inches). As a result the position on the vehicle and requirements of these lamps in relation to vehicles of the NB class are not covered in the FMVSS 108. Rear Fog Lamps are not covered in FMVSS 108, but installation and photometric requirements are covered in "SAE J1319, Fog Tail Lamp (Rear Fog Light) Systems, Aug 1987". Due to the fact that road traffic in the USA occurs in the right hand side of the road, where a single rear fog light is used, it is mounted on the wrong side of the car. "End Outline Markers" described in ADR 13/00 are called under the name of "Clearance Lamps" in FMVSS 108. The description for "Side Retro-Reflector" as featured in Cl. A-6.17. of ADR 13/00 is covered by both "Reflex Reflectors" and "Intermediate Side Reflex Reflectors" in FMVSS 108. As a result the FMVSS 108 requires 3 reflex reflectors to be placed on each side of the vehicle (1 front, 1 rear, 1 intermediate). Cornering Lamps, Retro-Reflective Markings and External Cabin Lamps are all optional equipment under ADR 13/00. Due to the proposed use and nature of the JLTV, it is extremely unlikely that any of these items will be fitted to the vehicles and have hence been omitted from the comparison. Installation requirements for Driving Lamps are not covered in the FMVSS 108 or any SAE standard. 				

- FMVCR 393.22 allows for the optical combination of any two lamps or reflectors as long as the individual optical and photometric requirements are fulfilled. Exceptions to this rule are given in FMVCR393.22(b) which state that turn signal lamps are not allowed to be combined with head lamps, other brighter lamps or stop lamps and clearance lamps are not allowed to be combined with a tail lamp or identification lamp.

Reg	Clause	Feature	No off	Height*		Apart**	Edge***	G/ C/ R****
				Max	Min			
ADR	A-6.1.	Main Beam (#)	2 or 4	n/a	n/a	(#) Dipped Beam	n/a	R: Dip
FMVSS	T1-a/ S7		2	54" (1372)	22" (559)	Max. possible	Min. possible	G: Main R: Dip
ADR	A-6.2.	Dipped Beam (#)	2	1200	500	>600	≤400 (#)	G: Main R: Main
FMVSS	T1-a/ S7		2	54" (1372)	22" (559)	Max. possible	Min. possible	G: Main R: Main
ADR	A-6.3.	Front Fog Lamp (+)	2	< Dip. Beam	250	n/a	≤400	G: %f R: Park
FMVSS	n/a		n/a	n/a	n/a	n/a	n/a	n/a
ADR	A-6.4.	Reversing Lamp (#)	2 or 4	1200	250	n/a	n/a	G: %r
FMVSS	T1-a		1	n/a	n/a	n/a	n/a	n/a
ADR	A-6.5.	Direction Indicator Front (#)	2	1500	350	≥600	≤400	G: %f R: Park
FMVSS	T1-a		2	83" (2108)	15" (381)	Max. possible	Min. possible	C: %f
ADR	A-6.5.4.2.3.	Direction Indicator Front (#)	/	≤2100 (where 1500 not possible)	n/a	n/a	n/a	n/a
FMVSS	T1-a		/	83" (2108)	n/a	n/a	n/a	n/a
ADR	A-6.5.	Direction Indicator Rear (#)	2 (+2)	1500	350	600	400	G: %f R: Park
FMVSS	T1-a		2	83" (2108)	15" (381)	Max. possible	Min. possible	C: %r
ADR	A-6.5.4.23..	Direction Indicator Rear (#)	/	≤2100 (where 1500 not possible)	n/a	n/a	n/a	n/a
FMVSS	T1-a		/	83" (2108)	n/a	n/a	n/a	n/a
ADR	A-6.5.	Direction Indicator Side (#)	2	1500 / 2300b (#)	500	n/a	n/a	G: % R: Park
FMVSS	n/a		n/a	n/a	n/a	n/a	n/a	n/a
ADR	A-6.5.4.2.3.	Direction Indicator Side (#)	/	≤2300 (where 1500 not possible)	n/a	n/a	n/a	n/a
FMVSS	n/a		/	n/a	n/a	n/a	n/a	n/a
ADR	A-6.6.	Hazard Warning Signal (#)	≥6	n/a	n/a	n/a	n/a	C: Indic
FMVSS	2. (SAE J910)		≥4	n/a	n/a	n/a	n/a	C: Indic
ADR	A-6.7.	Stop Lamp (#)	2	1500	350	≥600		G: %r R: Park
FMVSS	T2		2	72" (1828)	15" (381)	Max. possible	Min. possible	n/a
ADR	A-6.7.4.2.1.	Stop Lamp (#)	/	≤2100 (where 1500 not possible)	n/a	n/a	n/a	n/a

Reg	Clause	Feature	No off	Height*		Apart**	Edge***	G/ C/ R****
				Max	Min			
FMVSS	T1-a		/	72" (1828)	n/a	n/a	n/a	n/a
ADR	A-6.7.	Centre High Mounted Stop Lamp (+) (ECE R48 approved)	1	Less than 150 below bottom edge of rear screen or > than 850 above ground	n/a	n/a	n/a	n/a
FMVSS	n/a		n/a	n/a	n/a	n/a	n/a	n/a
ADR	A-6.8.	Rear Registration Plate Lamp (#)	1	n/a	n/a	n/a	n/a	C: Rpos R: %r
FMVSS	T1-a		1	n/a	n/a	n/a	n/a	n/a
ADR	A-6.9.	Front Position Lamp (#)	2	1500 (#)	350 (#)	≥600	≤400	G: %f C: SMar R: %f
FMVSS	n/a		n/a	n/a	n/a	n/a	n/a	n/a
ADR	A-6.9.4.2.	Front Position Lamp (#)	/	≤2100 (where 1500 not possible)	n/a	n/a	n/a	n/a
FMVSS	n/a		/	n/a	n/a	n/a	n/a	n/a
ADR	A-6.10.	Rear Position Lamp (#)	2	1500 (#)	350	≥600	≤400	G: %r C: Reg R: %r
FMVSS	T1-a		2	72" (1828)	15" (381)	Max. possible	Min. possible	G: %r R: %r
ADR	A-6.10.	Rear Position Lamp (#)	/	≤2100 (where 1500 not possible)	n/a	n/a	n/a	n/a
FMVSS	T1-a		/	72" (1828)	n/a	n/a	n/a	n/a
ADR	A-6.11	Rear Fog Lamp (+)	1 or 2	1000	250	>100 from Stop	n/a	G: %r R: Rpos R: Park
FMVSS	6.2.2 (SAE J1319)		1 or 2	n/a	n/a	n/a	n/a	n/a
ADR	A-6.12.	Parking Lamp		Prohibited on vehicles more than 6000 mm long.				
ADR	A-6.13.	End-Outline Marker Lamp (#)	2 & 2 †	n/a	n/a	>200 from Position Lamp	≤400	n/a
FMVSS	T1-a		2 & 2	Max Possible	n/a	Max. Possible	Min. Possible	n/a
ADR	A-6.14.	Rear Retro Reflector (#)	2	900	250	≥600	≤400	G: %r C: C/part
FMVSS	T1-a		2	1525 (S5.7.1.4.1)	375 (S5.7.1.4.1)	Max. Possible	Min. Possible	n/a
ADR	A-6.14.4.2	Rear Retro-Reflector (#)	/	≤1500 (where 900 not possible)	n/a	n/a	n/a	n/a
FMVSS	T1-a		/	1525	n/a	n/a	n/a	n/a
ADR	A-6.16.	Front Retro-Reflector (+)	2	900	250	≥600	≤400	G: Fpos C: C/part
FMVSS	n/a		n/a	n/a	n/a	n/a	n/a	n/a

Reg	Clause	Feature	No off	Height*		Apart**	Edge***	G/ C/ R****
				Max	Min			
ADR	A-6.16.4.2	Front Retro-Reflector (+)	/	≤1500 (where 900 not possible)	n/a	n/a	n/a	n/a
FMVSS	n/a		/	n/a	n/a	n/a	n/a	n/a
ADR	A-6.17.	Side Retro-Reflector (#)	‡‡	900	250	n/a	n/a	G: %
FMVSS	T1-a		6	60" (1524)	15" (381)	n/a	n/a	n/a
ADR	A-6.17.4.2	Side Reflex Reflector (#)	/	≤1500 (where 900 not possible)	n/a	n/a	n/a	n/a
FMVSS	T1-a		/	60" (1524)	n/a	n/a	n/a	n/a
ADR	7.2	Side-marker Lamp (+)	2 ‡‡‡	1500	600	Max. possible	< 150	C: C/Part
FMVSS	T1-a		4	n/a	15" (381)	n/a	n/a	C: C/Part (5.3.1 SAE J592)
ADR	7.2	Side-marker Lamp (+)	/	≤2100 (where 1500 not possible)	n/a	n/a	n/a	n/a
FMVSS	n/a		/	n/a	n/a	n/a	n/a	n/a
ADR	A-6.19.	Day Running Lamp (+)	2	1500	250	≥600	≤400	G: %f C: %f
FMVSS	T1-a		2	1067 (if not combined with other lamp)	n/a	n/a	n/a	G: %f C: %f
ADR	A-6.20.	Cornering Lamp (+)	N/A for JLTV (due to purpose of vehicle)					
ADR	A-6.21.	Retro-Reflective Marking (+)	N/A for JLTV (due to purpose of vehicle)					
ADR	7.1.	External Cabin Lamp (+)	N/A for JLTV (due to purpose of vehicle)					
ADR	7.3.	Driving Lamps (+)	2 or 4	n/a	n/a	n/a	n/a	C: Main
FMVSS	n/a		n/a	n/a	n/a	n/a	n/a	n/a
# = Mandatory component + = Optional component * = To highest (Max) and lowest (Min) points on illuminating surface. ** = Distance between innermost edges of illuminating surface. *** = Maximum distance from outer edge of vehicle to illuminating surface. **** = Specific lamps, which may be grouped (G), combined (C), or reciprocally incorporated (R): % = Permitted with any other lamps. →				... Continued: %f = Permitted with any other front lamp. %r = Permitted with any other rear lamp. Dip = Permitted with Dipped Beam. Main = Permitted with Main Beam Fpos = Permitted with Front Position Lamps. C/Part = May have common parts with a lamp. Park = Permitted with Park Lamps SMar = Permitted with Side Marker Lamps. Rpos = Permitted with Rear Position Lamps. Reg = Permitted with Rear Registration Plate Lamp. Indic = Permitted with Indicator Lamps.				

Additional Requirements:

ADR Clause	Requirements (Main Beam)	ADR Spec.	FMVSS Spec.	FMVSS Clause
A-6.1.8.	Closed-circuit tell-tale mandatory	yes	yes	S9.5
ADR Clause	Requirements (Dipped Beam)	ADR Spec.	FMVSS Spec.	FMVSS Clause
A-6.1.7.2.	Functional with Main Beam activated	yes (+)	yes (+)	(S5.5.1 S5.5.8)
A-6.2.8.2.	Closed-circuit tell-tale mandatory (LED)	yes	not specified	
ADR Clause	Requirements (Front Fog Lamps)	ADR Spec.	FMVSS Spec.	FMVSS Clause
A-6.3.7.	Activation independent from any other lamp	yes	not specified	/
A-6.3.8.	Closed-circuit tell-tale mandatory	yes	not specified	/
ADR Clause	Requirements (Reversing Lamps)	ADR Spec.	FMVSS Spec.	FMVSS Clause
A-6.4.2.2.	Required number on vehicles over 6000 mm length	2 or 4	1	T1
A-6.4.8.	Closed-circuit tell-tale mandatory	no	not specified	/
ADR Clause	Requirements (Direction Indicators)	ADR Spec.	FMVSS Spec.	FMVSS Clause
A-6.5.3.	Numbers off			
	- Front, mandatory (Type 1, 1a, 1b)	2	2	T1
	- Rear, mandatory (Type 2a)	2	2	T1
	- Rear, Optional (Type 2a)	2	not specified	/
	- Side, mandatory, minimum (Type 6)	2	not specified	/
A-6.5.4.3.	Spacing			
	- Lengthwise	≤1800	not specified	/
	- Lengthwise (if ≤1800 not possible)	≤2500	not specified	/
A-6.5.9.	Frequency	90 ±30	90 ±30	5.3 (SAE J590)
A-6.5.8.	Closed-circuit tell-tale mandatory	yes	yes	S5.5.6
ADR Clause	Requirements (Hazard Warning Signal)	ADR Spec.	FMVSS Spec.	FMVSS Clause
A-6.6.8.	Closed-circuit tell-tale mandatory	yes	yes	2. (SAE J945)
ADR Clause	Requirements (Stop Lamp)	ADR Spec.	FMVSS Spec.	FMVSS Clause
A-6.7.2.1.	Number of optional stop lamps (Type S1) fitted together with centre-mounted lamps (Type S3)	2	not specified	/
A-6.7.4.1.	S3 sideways offset (in accordance with Cl. A-6.7.2.2.)	≤150	not specified	/
A-6.7.4.2.1.	Minimum distance of optional lamps above mandatory lamps	600	not specified	/
A-6.7.4.2.2.	S3 Type lamp above mandatory Type 1 lamps	yes	not specified	/
A-6.7.8.	Closed-circuit tell-tale mandatory	no	not specified	/

ADR Clause	Requirements (Rear Registration Plate)	ADR Spec.	FMVSS Spec.	FMVSS Clause	
A-6.8.8.	Closed-circuit tell-tale mandatory	no	not specified	/	
ADR Clause	Requirements (Front Position Lamp)	ADR Spec.	FMVSS Spec.	FMVSS Clause	
A-6.9.5.2.	Minimum unobstructed viewing area (each)	12.5 cm ²	not specified	/	
A-6.9.8	Closed-circuit tell-tale mandatory	no	not specified	/	
ADR Clause	Requirements (Rear Position Lamp)	ADR Spec.	FMVSS Spec.	FMVSS Clause	
A-6.10.2.1.	Number of additionally lamps optionally installed (without end-outline markers)	2	not specified	/	
A-6.10.4.2.	Minimum distance of optional lamps above mandatory lamps	600	not specified	/	
A-6.10.5.2.	Minimum unobstructed viewing area (each)	12.5 cm ²	12.9 cm ²	T5-d	
A-6.10.8.	Closed-circuit tell-tale mandatory	yes	not specified	/	
ADR Clause	Requirements (Rear Fog Lamp)	ADR Spec.	FMVSS Spec.	FMVSS Clause	
8.5.1.	Mandatory Rear Fog Lamp	no	no	not specified	
A-6.11.4.1	Side location of single rear fog lamp when installed.	right	left	6.2.2 (SAE J1319)	
A-6.11.8.	Closed-circuit tell-tale mandatory	yes	yes	6.2.5 (SAE J1319)	
ADR Clause	Requirements (End-Outline Marker)	ADR Spec.	FMVSS Spec.	FMVSS Clause	
A-6.13.2.	‡ Numbers off				
	- Front, mandatory	2	2	T1-a	
	- Rear, mandatory	2	2	T1-a	
A-6.13.4.2.	Upper edge of lamp in line with or below upper edge of wind-screen.	yes	not specified	/	
A-6.13.9.	Lamps can be combined on each side (while meeting other requirements)	yes	yes	S6.3	
A-6.13.8	Closed-circuit tell-tale mandatory	no	not specified	/	
ADR Clause	Requirements (Side Retro-Reflectors)	ADR Spec.	FMVSS Spec.	FMVSS Clause	
A-6.17.4.3.	‡‡ Length-wise Positioning	- Middle-third of vehicle	Yes	Yes	T2
		- Max from front of vehicle	3000	Min. possible	T2
		- Max distance between reflectors	3000	not specified	/
		- Max distance from rear	1000	Min. possible	T2

ADR Clause	Requirements (Side-Marker Lamp)	ADR Spec.	FMVSS Spec.	FMVSS Clause
7.2	Mandatory for vehicles less than 7500 mm	no	Yes	T1-a
7.2.3	- Middle-third of vehicle	no	No	T1-a
	‡‡‡ Length-wise Positioning	not specified	Min. possible	T1-a
	- Max from front of vehicle	5000	not specified	/
	- Max distance between reflectors	300	Min. possible	T1-a
A-6.18.8.	Closed-circuit tell-tale mandatory	no	not specified	/
ADR Clause	Requirements (Day Running Lamp)	ADR Spec.	FMVSS Spec.	FMVSS Clause
A-6.19.7.	Independent OFF switch	yes	not specified	/
A-6.19.7.	ON in conjunction with engine	yes	not specified	/
A-6.19.8.	Closed-circuit tell-tale mandatory	no	not specified	/

ADR	14/02	Rear Vision Mirrors			
FMVSS	111	Rearview Mirrors			
FMCSR	393.80	Rear-vision mirrors.			
Equivalence Comments:					
<ul style="list-style-type: none"> Rear Vision Mirrors can optionally comply with Appendix A (UN/ECE REGULATION NO. 46/02) or Appendix B (UN/ECE REGULATION NO. 81). The minimum number of rear vision mirrors is defined in FMCSR 393.80 rather than in FMVSS 111. Left-hand traffic (right hand drive) configuration for Australia will be mirror image to the requirements of the FMVSS. 					
ADR Clause	Requirements	ADR Spec.	FMVSS / FMCSR Spec.	FMVSS / FMCSR Clause	
C-4.2.	Side Rear Vision Mirror	Driver Side	Yes	Yes	393.80 (a)
		Passenger Side	Yes	Yes	393.80 (a)
C-4.2.	Max sideways Extension over body width	150	not specified	/	
C-4.3.	Max sideways Extension over body width when collapsible to 150 mm	250	not specified	/	
C-4.4.	Minimum Mirror Area (each)	150 cm ²	323 cm ²	S7.1	
C-4.5.	Mirror Shape	Driver Side	Flat	not specified	/
		Passenger Side	Flat / Convex	not specified	/
C-2.4.2.1.	Convex Mirrors	Maximum deviation from prescribed curvature	±15%	not specified	/
C-2.4.2.2.	Convex Mirrors	Minimum average radius of curvature	1200	not specified	/
C-2.4.2.2.	Convex Mirrors	Minimum average radius of curvature	1200	not specified	/

ADR	18/03	Instrumentation		
FMVSS	101	Controls and displays		
FMCSR	393.82	Speedometer		
Equivalence Comments:				
<ul style="list-style-type: none"> Requirements for Instrumentation are listed in Appendix A of ADR 18/03 (UN/ECE REGULATION NO. 39/00). Clauses listed in the table below starting with "A" refer to clauses in the appendix not the main text of the ADR. 				
ADR Clause	Requirements	ADR Spec.	FMVSS / FMCSR Spec.	FMVSS/ FMCSR Clause
5.1	Primary scale of the speedometer	km/h	mph	Table 1 of FMVSS 101 393.82
A-5.1.1	Speed graduations on the speedometer	1, 2, 5 or 10 km/h	not specified	/
A-5.1.1	Numerical values shall be displayed on the speedometer at intervals not exceeding 20 km/h or 30 km/h*	Yes	not specified	/
A-5.2	Standardised testing procedure to determine speedometer accuracy	Yes	not specified	/
A-5.3	Tolerance on speedometer accuracy	**	***	393.82

Additional Notes:

- * 20km/h if the maximum speed displayed does not exceed 200 km/h and 30 km/h if the maximum speed displayed does not exceed 300 km/h
- ** $0 \leq (V_1 - V_2) \leq 0.1V_2 + 4 \text{ km/h}$ where V_1 is the speed displayed and V_2 is the true speed
- *** Speedometer must be accurate to within $\pm 8 \text{ km/hr}$ at 80 km/hr

ADR	30/01	Smoke Emission Control for Diesel Vehicles		
USCFR	86.098-11	Emission standards for 1998 and later model year diesel heavy-duty engines and vehicles		
Equivalence Comments:				
<ul style="list-style-type: none"> For M and N category vehicles with a GVM greater than 3.5 tonnes, the technical requirements for the Opacity of Smoke Emission of the USA Code of Federal Regulations, Part 86 – Control of Air Pollution from new and in-use motor vehicles and new and in-use motor vehicle engines certification and test procedures – Subpart A 40CFR 86.098-11 Emission standards for 1998 and later model year diesel heavy-duty engines and vehicles; and Subpart I – Emission Regulations for new diesel heavy-duty engines: smoke exhaust test procedure, are deemed to be equivalent to the technical requirements of this vehicle standard. 				

ADR	35/03	Commercial Vehicle Brake Systems		
FMVSS	105 121	Hydraulic and electric brake systems Air brake systems		
FMCSR	393.43	Breakaway and emergency braking		
Equivalence Comments:				
<ul style="list-style-type: none"> Due to the weight of the JLTV, FMVSS standard 135; Passenger car brake systems is not applicable Requirements for Antilock Systems are listed in Appendix A of ADR 35/03 (Special Provisions for vehicles incorporating an Antilock System). Clauses listed in the table below starting with "A" refer to clauses in the appendix not the main text of the ADR. The required conditions that must cause the Visible Indicator to become operative are defined as Condition A and Condition B of ADR 35/03 Clause 4.2.2. Clauses listed in the table below as 4.2.2 (A.xx) or 4.2.2 (B.xx) refer to these Conditions 				

- A comparison of the performance requirements of the vehicle's brake system is given in the Tabular Comparison of Performance Requirements below. The requirements of the ADR and FMVSS are not technically equivalent, as various tests required by the ADR are not specified in any FMVSS. For those tests that are defined in the FMVSS, differences in the requirements exist due to conversion errors, but are otherwise equivalent for all intensive purposes

ADR Clause	Functional Requirements	ADR Spec.	FMVSS / FMCSR Spec.	FMVSS/ FMCSR Clause	
4.1.1	Every vehicle must be fitted with a service brake system that is operable on all road wheels	yes	yes	S5.1 (105) S5.1.8 (121)	
4.1.2	Every vehicle must have one or more service brake failure visible indicators	yes	yes	S5.3 (105) S5.1.5 (121)	
4.1.3	If separate methods of actuation are provided for any functions of the brake system, actuation of one function must not cause operation of another function	yes	not specified	/	
4.1.4	The service brake system must incorporate devices which compensates for any increased movements of its components due to wear	yes	yes	S5.1 (105) S5.1.8 (121)	
4.1.6	All components in the brake system must meet or exceed at least one of the following standards: SA, SAE, BS, JIS, DIN, ISO or ECE	yes	not specified	/	
4.1.7	Traction control systems may utilize parts of the service brake system providing failure of the traction control system does not interfere with normal braking	yes	not specified	/	
4.1.8	Brake line couplings must not be interchangeable and must comply with AS 4945-2000	yes	not specified	/	
4.1.10	Where the vehicle has a rated towing capacity of more than 4.5 tonnes, it must conform to Clauses 4.1.10.1 – 4.1.10.3 of ADR 35/03	yes	not specified	/	
4.1.11	Where the service brake system incorporates a single brake power unit, an audible warning indicator must accompany the visible warning indicator mentioned in Clause 4.1.2 of ADR 35/03	yes	not specified*	S5.3	
4.1.12	Each air reservoir must be fitted with either a manual or automatic condensate drain valve fitted at the lowest point	yes	not specified**	S5.1.2.4 (121)	
4.2.2 (A.1)	The Visible Indicator must operate when a pressure failure occurs in the Service Brake System, except for a pressure failure caused by a structural failure or failure of a brake power assist unit	yes	yes	S5.3.1 (a) (105)	
4.2.2 (A.2.2)	Maximum differential line pressure allowable between the active and failed brake systems before the Visible Indicator must operate	1.55 MPa	225 psi (1.55 Mpa)	S5.3.1 (a)(1) (105)	
4.2.2 (A.2.2)	In the event of a failure as specified in Clause 4.2.2 (A.1) of ADR 35/03, the Visible Indicator must operate upon a pedal effort of:	Unassisted	225 N	50 lbf (222.4 N)	S5.3.1 (a)(2) (105)
4.2.2 (A.2.3)		Assisted (with brake power unit)	115 N	25 lbf (111.2 N)	S5.3.1 (a)(3) (105)
4.2.2 (B.1)	The Visible Indicator must operate when a drop in the brake fluid in the reservoirs reaches the larger of 25% of the reservoir capacity or the manufactures designated minimum level	yes	yes	S5.3.1 (b) (105)	

ADR Clause	Functional Requirements	ADR Spec.	FMVSS / FMCSR Spec.	FMVSS/ FMCSR Clause
4.2.2 (B.2)	In the case where the master cylinder also contains fluid for use not in the brake system, the Visible Indicator must only operate when there is a drop in the fluid used exclusively for the brake system	yes	not specified	/
4.2.3	Required drop in pressure of a brake power unit to cause operation of the Visible Indicator	65%	50%	S5.3.1 (a)(4) (105)
4.2.4	Where the vehicle is equipped to tow a trailer that also utilises air brakes, when the pressure in the supply line drops to or below 450 kPa, the visible indicator must operate as specified in Clause 4.2 of ADR 35/03	yes	not specified	/
4.2.4.2	The visible indicator must not operate when a trailer is not connected and no other defect is present	yes	not specified	/
4.2.5	Only one Visible Indicator is required provided it operates under all the specified brake failure scenarios	yes	yes	S5.3.5 (b) (105)
4.2.6	The Visible Indicators must operate as a check of function when the ignition switch is in the 'check' position	yes	yes	S5.3.2 (a) (105)
4.2.7	The Visible Indicator is not required to operate as a check of function if a starter interlock is occurring	yes	yes	S5.3.2 (b) (105)
4.2.8	If the Visible Indicator becomes operative due to a brake system failure, it must remain operative until the fault is fixed	yes	yes	S5.3.3 (a) (105)
4.2.10	The Visible Indicator lamp must be labelled with at least the word 'BRAKE' or the symbol for 'BRAKE FAILURE' as specified in ISO 2575-2000	yes	yes***	S5.3.5 (105)
4.2.10.1	Minimum height of letters in the Visible Indicator	3mm	1/8 inch (3.18 mm)	S5.3.5 (a) (105)
4.2.10.2	The letters and the label must be contrasting colours, one of which must be red	yes	yes	S5.3.5 (b) (105)
4.2.10.3	The Visible Indicator may be steady burning or flashing	yes	yes	S5.3.4 (105)
4.2.12	The Visible Indicator must be located within the bounds specified in Clauses 4.2.12.1 – 4.2.12.4 of ADR 35/03	yes	not specified*** *	/
4.3.1	The vehicle must be equipped with a Parking Brake System	yes	yes	S5.2 (105) S5.6 (121)
4.3.2	The parking brake control must be separate from the service brake control	yes	yes	S5.6.4 (121)
4.3.2	At least 2 separate and distinct movements are required to disengage the parking brake	yes	not specified	/
4.3.3	The Parking Brake System must compensate for any increased movement of its components arising from wear	yes	not specified*** **	/
4.3.4	The parking brake control must be readily accessible to the driver in the normal driving position	yes	yes	S5.6.4 (121)
4.3.5	Where the vehicle is equipped to tow a trailer that also utilises air brakes, operation of the parking brake system must cause the pressure in the supply line to drop below 35 kPa	yes	not specified	/

ADR Clause	Functional Requirements	ADR Spec.	FMVSS / FMCSR Spec.	FMVSS/ FMCSR Clause
4.3.6	The pressure in the supply line must be restored to normal when the parking brake system is released	yes	not specified	/
4.3.7	If an independent control is fitted to release the trailer parking brake control, it must restore the supply line to the normal condition once the pressure has dropped to below 35 kPa in accordance with Clauses 4.3.7.1 – 4.3.7.3 of ADR 35/03	yes	not specified	/
4.4.1	Each vehicle not fitted with a spring brake system or a parking brake system utilizing lock actuators, must be fitted with a lamp which indicates when the parking brake is engaged	yes	yes	S5.3.1 (d) (105)
4.4.3	If the parking brake indicator lamp is common with a service brake failure lamp, the lamp must be labelled with 'BRAKE' or the symbol for 'BRAKE FAILURE' as specified in ISO 2575-2000	yes	yes	S5.3.5 (b) (105)
4.4.4	If the parking brake indicator lamp is separate from all other lamps, at least the words 'PARK BRAKE' or 'PARKING BRAKE' or the symbol for 'PARKING BRAKE' as specified in ISO 2575-2000	yes	no [^]	S5.3.5(c)(1) (D) (105)
4.4.5	Minimum letter height of the parking brake indicator lamp	3mm	1/8 inch (3.18 mm)	S5.3.5 (a) (105)
4.4.5	Letters and background of the parking brake indicator lamp must be contrasting colours, one of which must be red	yes	yes	S5.3.5 (b) (105)
4.4.6	The parking brake indicator lamp shall be located as specified in Clause 4.2.12 of ADR 35/03	yes	not specified	/
4.5.1	The vehicle must be equipped with a secondary brake system	yes	yes	S5.7 (121)
4.5.2	A hydraulic service brake system must be a split service brake system	yes	not specified ^{^^}	/
4.5.3	The secondary brake system must be capable of application through the medium of a control	yes	yes	S5.7.2 (121)
4.5.4	The secondary brake control must be so placed that it can be operated by the driver in the normal driving position	yes	yes	S5.7.2 (121)
4.5.6	Where the secondary brake system is a spring brake system, it must comply with Clauses 4.5.6.1 – 4.5.6.3 of ADR 35/03	yes	not specified	/
4.5.7	A backup system capable of energizing the pump used to supply high pressure fluid to the brake power assist units independent of engine operation must be regarded as a secondary brake system	yes	not specified	/
4.5.8	Where the vehicle is equipped to tow a trailer that also utilises air brakes, it must be capable of meeting the secondary brake performance requirements in the event of the trailer becoming disconnected	yes	yes	S5.7.3 (b) (121) (a) (393.43)
4.5.8.1	Venting of the trailer supply line (if it occurs), must not commence until the energy in the supply line falls below 350 kPa, or if the energy in the supply line is reducing at a rate of not less than 100 kPa/sec until the energy in the supply line falls below 420 kPa	yes	not specified	/

ADR Clause	Functional Requirements	ADR Spec.	FMVSS / FMCSR Spec.	FMVSS/ FMCSR Clause
4.5.9	Where the motor vehicle uses a split service brake system as the secondary brake system and is equipped to tow a trailer that also utilises air brakes, it must be so equipped that operation of the secondary brake system causes a control signal proportional to the level of braking to be present in the control line	yes	not specified	/
4.5.10	Where an additional control is fitted for the independent application of a trailer parking brake system, it must cause the pressure in the supply line to drop below 35 kPa	yes	not specified	/
4.5.10.1	The control described in Clause 4.5.10 of ADR 35/03 must be marked with the words 'TRAILER EMERGENCY BRAKES' in letters not less than 5mm high	yes	not specified^^ ^	(b) (393.43)
4.6.1.1	Each service brake sub-system must have a reservoir which contains fluid for the use of that service brake sub-system^^^^	yes	yes	S5.4.1 (121)
4.6.2	The capacity of each reservoir must not be less than the fluid displacement resulting when all the wheel cylinders move from a new-lining, full retracted position, to a fully-worn, fully applied position^^^^^	yes	yes#	S5.4.2 (105)
4.6.3	Each brake power unit must be provided with a reservoir with a capacity not less than that defined in Clause 4.6.2 plus the fluid displacement necessary to charge the pistons provided for the purpose of storing energy	yes	yes	S5.4.2 (105)
4.6.4	Each brake system must have a statement displaying the type of fluids to be used in the brake system and the words "WARNING. Clean filler cap before removing".	yes	yes	S5.4.3 (105)
4.6.4	Minimum height of the letters used to create the words specified in Clause 4.6.4	3mm	1/8 inch (3.18mm)	S5.4.3 (105)
4.6.4	Maximum distance of letters from the brake fluid reservoir plug	300mm##	4 inch###	S5.4.3 (105)
4.7.1	Any Stored Energy device must be so protected that failure of the device generating the energy does not result in depletion of the Stored Energy	yes	not specified	/
4.7.2	The combined volume of all brake power units at positive pressure must not be less than 12 times the combined volume of all the service brake chambers at their maximum travel of the pistons	yes	yes####	S5.1.2.1 (121)
4.7.3	Any device generating energy at a positive pressure for a brake power unit must be of sufficient capacity to increase the pressure in the stored energy devices(s) fitted to the vehicle from 85% of average operating pressure to average operating pressure#####	yes	yes+	S5.1.1
4.7.5.1	A gauge(s) must be fitted to indicate the pressure in each independent storage system that is accurate to within 7% of the compressor cut out pressure	yes	yes	S5.1.4 (121)
4.7.5.2	A pressure test connection complying with Clause 4 of ISO Standard 3583-1984, must be fitted either at the inlet or in the body of the slowest reacting brake chamber in each axle group	yes	not specified	/

ADR Clause	Functional Requirements	ADR Spec.	FMVSS / FMCSR Spec.	FMVSS/ FMCSR Clause
4.7.5.3	A pressure test connection complying with Clause 4 of ISO Standard 3583-1984, must be fitted in the body of the stored energy device used for the service brake system which is charged last	yes	not specified	/
4.7.6	Where the service brake system incorporates brake power assist units, and where the secondary brake is not applied by the service brake control, the volume of all stored energy devices must be such that Clauses 4.7.6.1 and 4.7.6.2 of ADR 35/03 are met	yes	not specified	/
4.7.7	An energy generating device producing energy at a negative pressure must comply with the volume pressure relationship stated in Clause 4.7.6 of ADR 35/03 in accordance with Clauses 4.7.7.1 and 4.7.7.2 of ADR 35/03	yes	not specified	/
4.7.8	Where the energy generating device for any number of brake power units supplies energy to other devices, it must preferentially charge the brake power units to a level not less than 450 kPa	yes	not specified	/
4.7.9	All brake power units must preferentially service the brake system if the energy falls below 450 kPa	yes	not specified	/
A-1.1	At speeds exceeding 15 km/h, the wheels on at least one axle in each axle group must not lock up when a control force of 685 N is applied on the control from an initial speed of 40 km/h and 80 km/h	yes	not specified	/
A-1.2	Any electronic failure of the Antilock system must be signalled to the driver by means of an optical warning signal located in accordance with Clause 4.2.12	yes	not specified ⁺⁺	/
A-1.2.2	The warning device must be either red or yellow	yes	yes ⁺⁺⁺	S5.3.5 (c)(2) (105)
A-1.2.3	The warning device must light up when the Antilock system is energised, and must go off after not less than 2 seconds or at the latest when the vehicle reaches a speed of 15 km/h	yes	not specified	/
A-1.3.1	The vehicle must have a permanent electrical supply system for connection to trailers using a special connector conforming to DIN Standard 72570 configured for 12 volt operation or ISO/DIN Standard 7638:1996 configured for 12 or 24 volt operation	yes	not specified ⁺⁺⁺ ₊	/
A-1.3.1	If the connector is configured for 24 volt operation, this must be marked on the plug and a warning label must be provided in the cabin	Yes	not specified	/
A-1.3.2	The connector must conform to Clause A-1.3.2.1 of ADR 35/03 for 12 volt operation and Clause A-1.3.2.2 of ADR 35/03 for 24 volt operation	yes	not specified	/
A-1.3.3	The optical warning device specified in Clause A-1.2.2 of ADR 35/03, or an additional yellow optical warning signal must light up when Pin 5 of the connector specified in Clause A-1.3.2 of ADR 35/03 is connected to either ground or a negative connector	yes	not specified	/

Additional Notes:

- * FMVSS 105 Clause S5.3 states an audible indicator must accompany the visible indicator for a system that it is not a split service brake system. This a different requirement, and also N.A as ADR requires the vehicle to have a split service brake system (see Clause 4.5.2 of ADR 35/03)
- ** Clause S5.1.2.4 of FMVSS 121 specifies a manual condensate drain must be fitted, but does not specify it must be at the lowest point
- *** FMVSS 105 Clause S5.3.5 specifies the word 'Brake' must be displayed, but does not specify allowable symbols
- **** FMVSS 105 Clause S5.1.5 states the Visible Indicator must be mounted '...in front of and in clear view of the driver...'. This is to general to be considered equivalent to the related ADR Clauses
- ***** FMVSS 105 and 121 have this requirement for the Service Brake System but not the Parking Brake System
 - ^ The relevant Clause in FMVSS 105 only requires the word 'Park' to be displayed if a separate indicator is provided for parking brake application
 - ^^ Although FMVSS 105 has allowance for a split service brake system, it is not a requirement as it is in the ADR
 - ^^^ Clause (b) of FMCSR 393.43 is similar in nature to Clause 4.5.10.1 of ADR 35/03, but is too general to be deemed equivalent
 - ^^^^ Clause 4.6.1 of ADR 35/03 states that the service brake sub-system must comply with either Clause 4.6.1.1 or 4.6.1.2. Clause 4.6.1.2 is not defined in the FMVSS, and hence is N.A
 - ^^^^^ 'Fully-worn, fully applied' is the larger value of that defined in Clauses 4.6.2.1 – 4.6.2.4 of ADR 35/03
 - # Clause 4.6.2.4 of ADR 35/03 is not defined in the FMVSS, which may cause the standards to be non-technically equivalent
 - ## Letters must be partially within 150mm and totally within 300mm
 - ### FMVSS only specifies the letters must be on or within 4 inches (102mm) from the brake fluid reservoir plug
 - #### These Clauses are equivalent except the parameters used to calculate the volume may differ. ADR specifies volume of all the service brake chambers at their maximum travel of the pistons. FMVSS 121 specifies the volume to be read from Table V, if the chamber type is not in the table, then the maximum value is used as stated in the ADR
 - ##### This must happen in a time less than:
$$Time = \frac{(Actual\ brake\ power\ unit\ capacity) \times 25}{Brake\ power\ unit\ test\ capacity}$$

Where the brake power test capacity is defined in Clause 4.7.4 of ADR 35/03
 - + Clause S5.1.1 of FMVSS 121 states the air compressor should have sufficient capacity to increase pressure in the reservoirs from 85 psi to 100 psi in a time not less than:
$$Time = \frac{(Actual\ reservoir\ capacity) \times 25}{Required\ reservoir\ capacity}$$
- ++ Clause S5.3.5(c) of FMVSS 105 and Clause S5.1.6.2 of FMVSS 121 both specify an optical warning device is required for electrical failure of the Antilock system, but does not specify the required location to the detail that Clause 4.2.12 of ADR 35/03 does
- +++ The relevant FMVSS 105 Clause only states the warning device must yellow
- ++++ Clause S5.5.2 of FMVSS 121 states the power for a trailer Antilock system must be obtained from the towing vehicle using one or more electrical circuits, but does not specify appropriate standards as the ADR Clause does

Tabular Comparison of Performance Requirements

Standard	Initial Speed	Minimum average deceleration	Vehicle Mass	Gear	Max control force
Lightly Laden Effectiveness Test					
ADR 35/03	100 km/h	3.78 m/s ²	L	N	685 N
FMVSS 105	60 mph (96.6 km/h)	11.56 ft/s ² (3.52 m/s ²)	L	N	150 lbf (667 N)
FMVSS 121	60 mph (96.6 km/h)	11.56 ft/s ² (3.52 m/s ²)	L	N	-
Lightly Laden Secondary Brake Test (failure of each split system)					
ADR 35/03	50 km/h	1.85 m/s ²	L	N	590 N (hand) 685 N (foot)
FMVSS 105	60 mph (96.6 km/h)	6.32 ft/s ² (1.93 m/s ²)	L	D	150 lbf (667 N) (foot)
FMVSS 121	60 mph (96.6 km/h)	6.32 ft/s ² (1.93 m/s ²)	L	N	-
Lightly Laden Secondary Brake Test (failure of brake power assist unit)					
ADR 35/03	50 km/h	1.85 m/s ²	L	N	590 N (hand) 685 N (foot)
FMVSS 105	not specified				
FMVSS 121	not specified				
Lightly Laden Partial Failure (antilock failure and variable proportioning brake system failure)					
ADR 35/03	50 km/h	1.85 m/s ²	L	N	685 N
FMVSS 105	not specified				
FMVSS 121	not specified				
Service Brake Laden Effectiveness Tests					
ADR 35/03	100 km/h	3.78 m/s ²	M	N	685 N
FMVSS 105	60 mph (96.6 km/h)	12.49 ft/s ² (3.81 m/s ²)	M	N	150 lbf (667 N)
FMVSS 121	60 mph (96.6 km/h)	12.49 ft/s ² (3.81 m/s ²)	M	N	-
Laden Secondary Brake Test (failure of each split system)					
ADR 35/03	50 km/h	1.85 m/s ²	M	N	590 N (hand) 685 N (foot)
FMVSS 105	60 mph (96.6 km/h)	6.32 ft/s ² (1.93 m/s ²)	M	D	150 lbf (667 N)
FMVSS 121	60 mph (96.6 km/h)	6.32 ft/s ² (1.93 m/s ²)	M	N	-
Laden Secondary Brake Test (failure of brake power assist unit)					
ADR 35/03	50 km/h	1.85 m/s ²	M	N	590 N (hand) 685 N (foot)
FMVSS 105	60 mph (96.6 km/h)	6.32 ft/s ² (1.93 m/s ²)	M	D	150 lbf (667 N)
FMVSS 121	not specified				
Laden Partial Failure Test (antilock failure and variable proportioning brake system failure)					
ADR 35/03	50 km/h	1.85 m/s ²	M	N	685 N
FMVSS 105	60 mph (96.6 km/h)	6.32 ft/s ² (1.93 m/s ²)	M	D	150 lbf (667 N)

Standard	Initial Speed	Minimum average deceleration	Vehicle Mass	Gear	Max control force
FMVSS 121	not specified				
Service Brake Fade Test					
ADR 35/03	*	3 m/s ² ***	M	D	***
FMVSS 105	**	10 ft/s ² (3.05 m/s ²)	M	N	150 lbf (667 N)
FMVSS 121	not specified				
Service Brake Fade Effectiveness Test					
ADR 35/03	****	2.63 m/s ²	M	N	685 N
FMVSS 105	**	10 ft/s ² (3.05 m/s ²)	M	N	150 lbf (667 N)
FMVSS 121	not specified				
Parking Brake Test					
ADR 35/03	0 km/h	18% gradient	M	N	590 N (hand) 685 N (foot)
FMVSS 105	0 mph	20% gradient	M	N	150 lbf (667 N) (foot) 125 lbf (556 N) (hand)
FMVSS 121	0 mph	20% gradient	M	N	-
Service Brake Actuating Time Test					
ADR 35/03	N.A, see ***** and ^^				-
FMVSS 105	not specified				
FMVSS 121	N.A, see ^ and ^^^				-
Service Brake Compatibility Test					
ADR 35/03	60 km/h	^^^^	L & M	N	685 N
FMVSS 105	not specified				
FMVSS 121	not specified				

Additional Notes:

- * The vehicle shall decelerate from V1 to V2 in km/h such that $(V1^2 - V2^2) > 2700$
- ** The vehicle shall decelerate from 40 mph to 20 mph. When converted to km/h, this satisfies the ADR test requirement
- *** The deceleration of 3 m/s² is only applicable for the first deceleration. For the subsequent decelerations, the control force used should not be less than that established in the first test, regardless of the deceleration.
- **** The vehicle shall decelerate from 50 km/h to 0 km/h
- ***** Test 1: All stored energy devices are to be charged to not more than the average operating pressure. The pressure in the slowest reacting brake chamber must attain a level of more than 65% of the average operating pressure within 0.6 seconds from the instant the control leaves the initial brake control location
- ^ Test 1: With an initial service reservoir system air pressure of 100 psi, each brake chamber must reach 60 psi in not more than 0.45 seconds measured from the first movement of the service brake control
- ^^ Test 2: For vehicles equipped to tow a trailer that also uses air brakes, the pressure measured at the extremity of 13mm inner diameter, 2.5 m long pipe (20.2 in³) attached to the coupling head of the control line, must reach 420 kPa within 0.4 seconds from the instant the control leaves the initial brake control location
- ^^^ Test 2: For vehicles equipped to tow a trailer that also uses air brakes, the pressure in a 50 in³ reservoir connected to the control line output coupling, must reach 60 psi (414 kPa) in a time not later than the fastest reacting brake chamber from Test 1 or in not more than 0.35 seconds measured from the first movement of the service brake control (manufacturer can choose)
- ^^^^ There is no minimum deceleration required for this test, instead the control signal measured at the coupling head is continually increased for each braking manoeuvre

ADR	42/04	General Safety Requirements
FMVSS	102	Transmission Shift Lever, Starter Interlock, and Transmission Braking Effect
	103	Windshield Defrosting and Defogging System
	104	Windshield Wiping and Washing System
	106	Brake Hoses
	113	Hood Latch System
	118	Power-Operated Window, Partition, and Roof Panel Systems
	119	New pneumatic tires for vehicles other than passenger cars
FMCSR	393	Parts and accessories necessary for safe operation

Equivalence Comments:

- The exhaust geometry requirements of FMCSR Clause 393.83 only apply to buses and are therefore not applicable to the JLTV
- Clause 19.3 of ADR 42/04 and FMVSS 118 are technically equivalent standards (as stated in Clause 19.3.2.6.4 of ADR 42/04)
- Due to the nature of the JLTV Clauses 8 (Rear Bumper for Semi-Trailers), 13 (Lavatory Closets, Urinals, Basins and Sinks), 17 (Sleeper Berths), 21 (Stability Requirements) and 22 (Retractable Axle) of ADR 42/04 are not applicable
- Clause 25.2.1 of ADR 42/04 and FMVSS 119 are technically equivalent standards (as stated in Clause 25.2.1.2 of ADR 42/04)
- FMCSR 393.28: Wiring Systems calls SAE J1292 as the technical requirements. ADR requirements are compared to SAE J1292 in the table below

ADR Clause	Requirements	ADR Spec.	FMVSS /FMCSR Spec.	FMVSS/ FMCSR Clause
6.1	A locking device must be provided which prevents a diesel engine from being started by any accidental or inadvertent means	yes	not specified	/
7.1.1	Centreline of the steering control must be to the left of the centreline of the vehicle	yes	not specified	/
10.3	Exhaust outlet geometry requirements	40 mm	not specified	/
	Distance beyond rearmost joint* Height	**	not specified	/
10.3.2.1	Above cab exhausts must not have a discharge direction to the left of the vehicle and must be above horizontal	yes	not specified	/
10.3.2.2	Other exhausts must not have a discharge direction to the left of the vehicle and must be between the horizontal and 4 degrees downward	yes	not specified	/
12.2	When both seats are in the rearmost position, the seating reference point of any passenger seat must not be more than 100mm in front of the drivers seating position	yes	not specified	/
12.3	No passenger seat shall be to the right hand side of the driver	yes	not specified	/
14.2	Wheel guards for Vehicles other than MA and L-group Vehicles***	yes	not specified	/
15	Brake tubing and brake hoses must conform to SAA, SAE, BS, JIS, DIN, ISO or ECE Standards	yes	not specified****	/
19.1 and 19.2	Methods of ventilation (by means other than opening doors and windows) must be installed on the motor vehicle	yes	not specified	/
18.1	Any television receiver or visual display unit must not obscure the driver's vision or impede the driver or passenger movement. It must be placed in a	yes	not specified	/

ADR Clause	Requirements	ADR Spec.	FMVSS /FMCSR Spec.	FMVSS/ FMCSR Clause
	position unlikely to increase the risk of occupant injury.			
20.1	An audible warning device shall not be fitted where the emitted sound resembles an emergency service vehicle	yes	not specified	/
20.2	The audible warning device must have constant frequency and amplitude characteristics	yes	not specified	/

ADR Clause	Requirements	ADR Spec.	FMVSS 102 Spec.	FMVSS Clause
7.2.1	Engine starter must be inoperative when the transmission lever is in any forward or reverse position	yes	yes	S3.1.3
ADR Clause	Requirements	ADR Spec.	FMVSS 103 Spec.	FMVSS Clause
23	Every motor vehicle must be fitted with a device capable of removing condensed moisture from the inside of the windscreen	yes	yes	S4.1
ADR Clause	Requirements	ADR Spec.	FMVSS 104 Spec.	FMVSS Clause
24	Every motor vehicle must be fitted with a power windscreen wiping system	yes	yes	S4.1
24	The power windscreen system must be capable of directing water onto the area swept by the blades for washing purposes	yes	yes	S4.2

ADR Clause	Requirements	ADR Spec.	FMVSS 113 Spec.	FMVSS Clause
5.1	A latch system must be provided for movable panels forward of the windscreen	yes	yes	S4
ADR Clause	Requirements	ADR Spec.	FMVSS 119 Spec.	FMVSS Clause
25.1	Tyres and rims must be listed in an appropriate Tyre and Rim Standards Manual	yes	yes	S5.1
25.1.2	Manufacturers must not fit tyres that require a cold inflation pressure greater than 825 kPa for radial ply tyres and 700 kPa for other tyres to achieve the manufacturer's rated GVM	yes	not specified	/
ADR Clause	Requirements	ADR Spec.	FMCSR 393 Spec.	FMVSS Clause
11	External and internal protrusions must not be fitted so as to increase the risk of bodily injury to any person, nor have any sharp or pointed edges. Any bumper bar must not be turned away from the vehicle such that hooking or grazing could occur.	yes	not specified**** *	/
18.2	Any visual display unit must not be visible to the driver	yes^	yes^	88
20.2	Every motor vehicle must be fitted with at least one device capable of providing an audible warning	yes	yes	81

ADR Clause	Requirements	ADR Spec.	SAE J1292 Spec.	SAE Clause
9.1.1	Electrical wiring must be supported at intervals of not more than 600mm	yes	not specified ^{^^}	/
9.2.1	Electrical connectors between motor vehicles and trailers may comply with SAE J560 or ISO 1185	yes	yes ^{^^^}	3.1.4

Additional Notes:

- * See ADR 42/04 Clause 10.3.1 for complete definition of distance behind the rearmost joint
- ** The exhaust outlet must be 150 mm above the maximum height or less than 750 mm above the ground.
- *** Complete requirements for Wheel Guards are detailed in Clauses 14.2.1 – 14.2.6 of ADR 42/04, none of these Clauses are mentioned in the FMVSS or FMCSR
- **** FMVSS 106 does not refer to any technical standards called in ADR 42/04 Clause 15, however technical requirements in the FMVSS are mostly comparable to appropriate SAE requirements but will need to be verified in each case
- ***** Although FMCSR 393.3 is similar in nature to ADR 42/04 Clause 11, it is deemed too general to be fully technically equivalent.
- ^ ADR allows visibility of a screen to the driver providing it is a driver's aid, FMCSR or FMVSS does not consider units which can be a driver's aid
- ^^ Although SAE J1292 states the electrical wire must be sufficiently secured in Clause 2.9, it does not specify a required interval
- ^^^ SAE J1292 only specifies SAE J560 as the applicable standard

ADR	43/04	Vehicle Configuration Dimensions		
FMCSR	658	Size and Weight, Route Designations — Length, Width and Weight Limitations		
Equivalence Comments:				
<ul style="list-style-type: none"> • The length restrictions of FMCSR Clause 658.13 only apply to “Truck tractor-semitrailer” and “Truck tractor-semitrailer-trailer” combinations and are therefore not applicable to the JLTV • The relevant definitions and diagrams relating to Rear Overhang are given in ADR – Definitions and Vehicle Categories 				
ADR Clause	Requirements	ADR Spec.	FMCSR Spec.	FMCSR Clause
5	Maximum vehicle turning circle	25 m	not specified	/
6.1.1.1	Maximum vehicle length	12.5 m	not specified	/
6.2.3	Maximum Rear Overhang	*	not specified	/
6.3	Maximum vehicle height	4.3 m	not specified	/
6.4	Minimum ground clearance	**	not specified	/
6.5	Maximum vehicle width	2.5 m	2.6 m	658.15
6.6	Minimum running clearance	100 mm	not specified	/
7.2	Every rigid motor vehicle must be equipped with 2 axles: one towards the front of the vehicle where all wheels are connected to the steering for that part of the vehicle, and one towards the rear of the vehicle	yes	not specified	/

Additional Notes:

- * The Rear Overhang is the lesser of 3.7m or 60% of the distance from the centreline of the front axle to the line from which Rear Overhang is measured
- ** Ground clearance requirements are detailed in Clauses 6.4.2 and 6.4.3 of ADR 43/04

ADR	45/01	Lighting & Light-Signalling Devices not covered by ECE Regulations			
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment			
Equivalence Comments:					
<ul style="list-style-type: none"> Position and numbers of individual lights are given in ADR 13/00 					
ADR Clause	Requirements (Side-Marker Lamp)		ADR Spec.	FMVSS Spec.	FMVSS Clause
45.3.1.1.	Colour of Light Emitted		Amber / Red	Amber (Front, Intermediate) / Red (Back)	T1
45.3.1.2.1	Minimum Light Intensity		0.3 cd	0.25 cd (Red) / 62 cd (Amber)	T10
45.3.1.2.2	Maximum Light Intensity	Lamp on its own	12 cd	not specified	/
		Towards front when combined with front position lamp	60 cd	not specified	/
45.3.1.3.2	Forward facing visible Angle	Maximum Starting Sweep Angle from Vertical Centreline	5°	45°	T10
		Minimum Starting Sweep Angle from Vertical Centreline	85°	90°	T10
45.3.1.3.2	Backward facing visible angle	Maximum Starting Sweep Angle from Vertical Centreline	5°	45°	T10
		Minimum Starting Sweep Angle from Vertical Centreline	85°	90°	T10
45.3.1.3.1	Visible vertical light distribution		±10°	±10°	T10
ADR Clause	Requirements (Day Running Lamp)		ADR Spec.	FMVSS Spec.	FMVSS Clause
45.3.7.1.	Colour of Light Emitted		White	White / Amber	S5.8.11 (a)(3)
45.3.7.2.1	Minimum Light Intensity	0V & 0 H*	130 cd	500 cd	S5.8.11 (a)(1)
		0 V & ±5 H	91 cd	not specified	/
		±5 V & 0 H	117 cd	not specified	/
		±5 V & ±10 H	26 cd	not specified	/
		±10 V & 0 H	45.5 cd	not specified	/
		±10 V & ±5 H	26 cd	not specified	/
		±20 V & ±5 H	13 cd	not specified	/
		Other Angles	0.3 cd	not specified	/
45.3.7.2.2	Maximum Light Intensity		520 cd	3000 cd	S5.8.11 (a)(1)
45.3.7.3.	Angles of light distribution	Vertical	±15°	not specified	/
		Horizontal, inwards	45°	not specified	/
		Horizontal, outwards	80°	not specified	/

Additional Notes:

- * The Abbreviations of "H" & "V" above refer to angles in degree in the horizontal and vertical from the reference axis, respectively.

ADR	46/00	Headlamps
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment

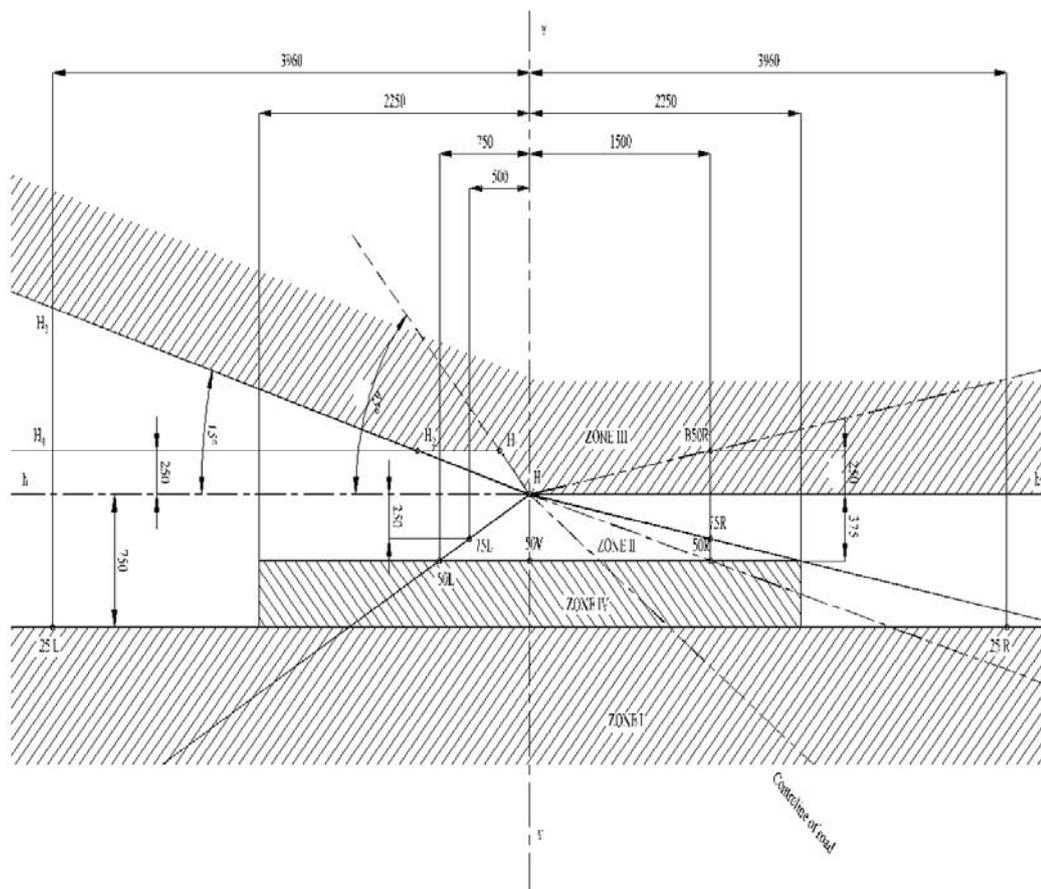
Equivalence Comments:

- Clause PD2834 in the JLTV Purchase Description requires the installation of LED head lamps in the family of JLTV vehicles. As a result only Appendix F of ADR 46/00 (UN ECE Regulation 112/00) and amendments to Appendix F detailed in Appendix H apply to this comparison. Clauses listed in the table below starting with “F” refer to clauses in Appendix F not the main text of the ADR. Clauses listed in Appendix H are treated as if used in Appendix F and hence also have the letter “F” in front of the clause.
- Because of the different side of traffic (Left-hand side in Australia, right-hand side in the USA), the luminosity and beam profile requirements are generally not technically equivalent.
- In addition, the actual beam profiles required in the ADR and FMVSS are so significantly different that a clause by clause comparison is not a useful undertaking and hence has not been executed here.

ADR Clause	Requirements	ADR Spec.	FMVSS Spec.	FMVSS Clause
F-7.1.	Colour of Light Emitted	White	White	T1-a
F-5.9.1.	Minimum Cycle Life-time (in thousands)	50	not specified	/
F-6.2.1.	Standard European left-hand traffic passing beam profile (right hand drive)*	Yes	no	T19

Additional Notes:

*



Standard Asymmetrical European Headlamp Beam for Left-Hand Traffic (UN ECE 112/00, Annex 3.B)

ADR	47/00	Retro-reflectors			
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment			
Equivalence Comments:					
<ul style="list-style-type: none"> Requirements for Retro-reflectors are listed in Appendix A of ADR 47/00 (UN/ECE REGULATION NO. 3/02). Clauses listed in the table below starting with "A" refer to clauses in the appendix not the main text of the ADR. ADR 13/00 states the requirements in terms of types, numbers and locations of retro-reflectors on a vehicle: <ul style="list-style-type: none"> Rear Retro-Reflectors: Types 1A or 1B (ADR 13/00, Cl. A-6.14.2.) Front Retro-Reflectors: Type 1A or 1B (ADR 13/00, Cl. A-6.16.2.) Side Retro-Reflectors: Types 1A or 1B (ADR 13/00, Cl. A-6.17.2.) Additional Requirements with regards to the durability of the used retro-reflectors are given in ADR 47/00. FMVSS 108 contains similar technical requirements. 					
ADR Clause	Requirements (Type 1A & 1B)	ADR Spec.	FMVSS Spec.	FMVSS Clause	
A-6.2.	Device can be dismantled	no	not specified	/	
A-A5-1.	Simple Shape	yes	not specified	/	
A-A6	Colour of light emitted, Front (Cl 6.2. in ADR 13/00)	White	Amber	T1-a	
A-A6	Colour of light emitted, Side (Cl 6.2. in ADR 13/00)	Amber	Amber/ Red	T1-a	
A-A6	Colour of light emitted, Rear (Cl 6.2. in ADR 13/00)	Red	Red	T1-a	
A-A7-	Minimum reflected	0V & 0 H*	300	420	T16-a
3.1.1.	light intensity	$\pm 10 V$ & 0 H	200	280	T16-a
	(minicandelas/ lux)	$\pm 5 V$ & 20 H	100	140	T16-a

Additional Notes:

- * The Abbreviations of "H" & "V" above refer to angles in degree in the horizontal and vertical from the reference axis, respectively.

ADR	48/00	Devices for Illumination of Rear Registrations Plates		
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment		
Equivalence Comments:				
<ul style="list-style-type: none"> Requirements for Devices for Illumination of Rear Registrations Plates are listed in Appendix A of ADR 48/00 (UN/ECE REGULATION NO. 4). Clauses listed in the table below starting with "A" refer to clauses in the appendix not the main text of the ADR. FMVSS 108 refers to "SAE J 587, License Plate Lamps (Rear Registration Plate Lamps), Aug 1985" for requirement in regards license plate lamps 				
ADR Clause	Requirements	ADR Spec.	SAE J587 Spec.	FMVSS Clause
A-6.	Colour of Emitted Light (also ADR 13/00 Cl A-5.15.)	White	White	5.1.7
A-7.	Maximum Angle of Incidence	82°	82°	5.3.3
A-8.	Minimum Luminance	2.5 cd/ m ²	8 lux (8 cd/m ²)	5.1.5.1

ADR	49/00	Front and Rear Position (Side) Lamps, Stop Lamps and End-outline Marker Lamps			
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment			
Equivalence Comments:					
<ul style="list-style-type: none"> Location and number of Front and Rear Position (Side) Lamps, Stop Lamps and End-outline Marker Lamps are detailed in ADR 13/00. ADR 49/00 references Table 1 of Clause 6.2 in ADR 13/00 to supply the requirements of the colour of the emitted light for End-outline Marker Lamps. Requirements for Front and Rear Position (Side) Lamps, Stop Lamps and End-outline Marker Lamps are listed in Appendix A of ADR 49/00 (UN/ECE REGULATION NO. 7). Clauses listed in the table below starting with "A" refer to clauses in the appendix not the main text of the ADR. "End-Outline Marker Lamps" referred in ADR 49/00 are equivalent with "Clearance Lamps" referred to in FMVSS 108 and "Rear Position (Side) lamps" with "Taillamps", respectively. 					
ADR Clause	Requirements (Front Position Side Lamps)		ADR Spec.	FMVSS Spec.	FMVSS Clause
6.2.	Colour of Emitted Light (Cl 6.2. ADR 13/00)		White	not specified	/
6.2.1.	Alternative Colour of Emitted Light		Amber	not specified	
A-6.1.1.	Minimum Light Intensity (Single Lamp)	0 H & 0 V*	4 cd	not specified	/
		0 V & ±5 H	2.8 cd	not specified	/
		±5 V & 0 H	3.6 cd	not specified	/
		±5 V & ±10 H	0.8 cd	not specified	/
		±10 V & 0 H	1.4 cd	not specified	/
		±10 V & ±5 H	0.8 cd	not specified	/
		±20 V & ±5 H	0.4 cd	not specified	/
	Other Angles	0.05 cd	not specified	/	
A-6.1.1.	Maximum Light Intensity (Single Lamp)		60	not specified	/
A-6.1.1.	Minimum Light Intensity (Single "D" Lamp)	0 H & 0 V*	4 cd	not specified	/
		0 V & ±5 H	2.8 cd	not specified	/
		±5 V & 0 H	3.6 cd	not specified	/
		±5 V & ±10 H	0.8 cd	not specified	/
		±10 V & 0 H	1.4 cd	not specified	/
		±10 V & ±5 H	0.8 cd	not specified	/
		±20 V & ±5 H	0.4 cd	not specified	/
	Other Angles	0.05 cd	not specified	/	
A-6.1.1.	Maximum Light Intensity (Single "D" Lamp)		42	not specified	/
A-6.1.1.	Minimum Light Intensity (Assembly of two Lamps)	0 H & 0 V*	4 cd	not specified	/
		0 V & ±5 H	2.8 cd	not specified	/
		±5 V & 0 H	3.6 cd	not specified	/
		±5 V & ±10 H	0.8 cd	not specified	/
		±10 V & 0 H	1.4 cd	not specified	/
		±10 V & ±5 H	0.8 cd	not specified	/
		±20 V & ±5 H	0.4 cd	not specified	/
	Other Angles	0.05 cd	not specified	/	
A-6.1.1.	Maximum Light Intensity (Assembly of two lamps)		84	not specified	/
A-6.1.2.	Minimum Light Intensity (Single Lamp incorporated into headlamp)	0 H & 0 V*	4 cd	not specified	/
		0 V & ±5 H	2.8 cd	not specified	/
		±5 V & 0 H	3.6 cd	not specified	/
		±5 V & ±10 H	0.8 cd	not specified	/
		±10 V & 0 H	1.4 cd	not specified	/
		±10 V & ±5 H	0.8 cd	not specified	/
		±20 V & ±5 H	0.4 cd	not specified	/
	Other Angles	0.05 cd	not specified	/	
A-6.1.2.	Maximum Light Intensity (Single Lamp incorporated into headlamp)		100	not specified	/

A-A.1	Minimum Vertical Viewing Angles		±15°	not specified	/
A-A.1	Minimum Vertical Viewing Angles	– Inboard (Sweep angle from reference axis)	45°	not specified	/
		– Outboard (Sweep angle from reference axis)	80°	not specified	/

ADR Clause	Requirements (Rear Position Side Lamps)	ADR Spec.	FMVSS Spec.	FMVSS Clause	
6.2.	Colour of Emitted Light (CI 6.2. ADR 13/00)	Red	Red	T1-a	
A-6.1.3.	Minimum Light Intensity (Single Lamp)	0 H & 0 V*	4 cd	2 cd	T8
		0 H & ± 5 V	2.8 cd	1.8 cd	T8
		± 5 H & 0 V	3.6 cd	2 cd	T8
		± 5 H & ± 10 V	0.8 cd	0.4 cd	T8
		± 10 H & 0 V	1.4 cd	0.8 cd	T8
		± 10 H & ± 5 V	0.8 cd	0.8 cd	T8
		± 20 H & ± 5 V	0.4 cd	0.3 cd	T8
		Other Angles	0.05 cd	0.3 cd	T8
A-6.1.3.	Maximum Light Intensity (Single Lamp)	12 cd	18 cd	T8	
A-6.1.3.	Minimum Light Intensity (Single “D” Lamp)	0 H & 0 V*	4 cd	not specified	/
		0 H & ± 5 V	2.8 cd	not specified	/
		± 5 H & 0 V	3.6 cd	not specified	/
		± 5 H & ± 10 V	0.8 cd	not specified	/
		± 10 H & 0 V	1.4 cd	not specified	/
		± 10 H & ± 5 V	0.8 cd	not specified	/
		± 20 H & ± 5 V	0.4 cd	not specified	/
		Other Angles	0.05 cd	not specified	/
A-6.1.3.	Maximum Light Intensity (Single “D” Lamp)	8.5 cd	not specified	/	
A-6.1.3.	Minimum Light Intensity (Assembly of two Lamps)	0 H & 0 V*	4 cd	3.5 cd	T8
		0 H & ± 5 V	2.8 cd	3.1 cd	T8
		± 5 H & 0 V	3.6 cd	3.5 cd	T8
		± 5 H & ± 10 V	0.8 cd	0.7 cd	T8
		± 10 H & 0 V	1.4 cd	1.4 cd	T8
		± 10 H & ± 5 V	0.8 cd	1.4 cd	T8
		± 20 H & ± 5 V	0.4 cd	0.5 cd	T8
		Other Angles	0.05 cd	0.5 cd	T8
A-6.1.3.	Maximum Light Intensity (Assembly of two lamps)	17 cd	20 cd	T8	
A-A.1	Minimum Vertical Viewing Angles	±15°	±15°	T5-b	
A-A.1	Minimum Vertical Viewing Angles	– Inboard (Sweep angle from reference axis)	45°	45°	T5-b
		– Outboard (Sweep angle from reference axis)	80°	80°	T5-b

ADR Clause	Requirements (Stop Lamps)	ADR Spec.	FMVSS Spec.	FMVSS Clause
6.2.	Colour of Emitted Light (CI 6.2. ADR 13/00)	Red	Red	T1-a
A-6.1.4.1.	Minimum Light Intensity (Single Lamp)	0 H & 0 V*	60 cd	T9
		0 H & ± 5 V	42 cd	T9
		± 5 H & 0 V	54 cd	T9
		± 5 H & ± 10 V	12 cd	T9
		± 10 H & 0 V	21 cd	T9
		± 10 H & ± 5 V	12 cd	T9
		± 20 H & ± 5 V	6 cd	T9
		Other Angles	0.3 cd	T5-c
A-6.1.4.1.	Maximum Light Intensity (Single Lamp)	185 cd	not specified	/
A-6.1.4.1.	Minimum Light Intensity (Single "D" Lamp)	0 H & 0 V*	54 cd	/
		0 H & ± 5 V	37.8 cd	/
		± 5 H & 0 V	48.6 cd	/
		± 5 H & ± 10 V	10.8 cd	/
		± 10 H & 0 V	18.9 cd	/
		± 10 H & ± 5 V	10.8 cd	/
		± 20 H & ± 5 V	5.4 cd	/
		Other Angles	0.3 cd	/
A-6.1.4.1.	Maximum Light Intensity (Single "D" Lamp)	130 cd	not specified	/
A-6.1.4.1.	Minimum Light Intensity (Assembly of two Lamps)	0 H & 0 V*	54 cd	T9
		0 H & ± 5 V	37.8 cd	T9
		± 5 H & 0 V	48.6 cd	T9
		± 5 H & ± 10 V	10.8 cd	T9
		± 10 H & 0 V	18.9 cd	T9
		± 10 H & ± 5 V	10.8 cd	T9
		± 20 H & ± 5 V	5.4 cd	T9
		Other Angles	0.3 cd	T5-c
A-6.1.4.1.	Maximum Light Intensity (Assembly of two lamps)	260 cd	not specified	/
A-A.1	Minimum Vertical Viewing Angles	±15°	±15°	T5-b
A-A.1	Minimum Vertical Viewing Angles	- Inboard (Sweep angle from reference axis)	45°	T5-b
		- Outboard (Sweep angle from reference axis)	45°	T5-b
A-6.2.4.2.	Minimum light contrast when reciprocally incorporated with rear position (side) lamp (Within bounding field ±5V & ±10H)	5:1	5:1	T9

ADR Clause	Requirements (Front End-outline Marker Lamps)	ADR Spec.	FMVSS Spec.	FMVSS Clause	
6.2.	Colour of Emitted Light, to the front (CI 6.2. ADR 13/00)	White/ Amber	Amber	T1-a	
A-6.1.1.	Minimum Light Intensity (Single Lamp)	0 H & 0 V*	4 cd	0.62 cd	T11
		0 V & ±5 H	3.6 cd	0.62 cd	T11
		0 V & ±10 H	1.4 cd	0.62 cd	T11
		±5 V & ±0 H	2.8 cd	0.62 cd	T11
		±5 V & ±10 H	0.8 cd	0.62 cd	T11
		±5 V & ±20 H	0.4 cd	0.62 cd	T11
		±20 V & ±10 H	0.8 cd	0.62 cd	T11
		Other Angles	0.05 cd	0.62 cd	T11
A-6.1.1.	Maximum Light Intensity (Single Lamp)	60 cd	15 cd	T11	
A-6.1.1.	Minimum Light Intensity (Single "D" Lamp)	0 H & 0 V*	4 cd	0.62 cd	T11
		0 V & ±5 H	2.8 cd	0.62 cd	T11
		±5 V & 0 H	3.6 cd	0.62 cd	T11
		±5 V & ±10 H	0.8 cd	0.62 cd	T11
		±10 V & 0 H	1.4 cd	0.62 cd	T11
		±10 V & ±5 H	0.8 cd	0.62 cd	T11
		±20 V & ±5 H	0.4 cd	0.62 cd	T11
		Other Angles	0.05 cd	0.62 cd	T11
A-6.1.1.	Maximum Light Intensity (Single "D" Lamp)	42	15 cd	T11	
A-6.1.1.	Minimum Light Intensity (Assembly of two Lamps)	0 H & 0 V*	4 cd	0.62 cd	T11
		0 V & ±5 H	2.8 cd	0.62 cd	T11
		±5 V & 0 H	3.6 cd	0.62 cd	T11
		±5 V & ±10 H	0.8 cd	0.62 cd	T11
		±10 V & 0 H	1.4 cd	0.62 cd	T11
		±10 V & ±5 H	0.8 cd	0.62 cd	T11
		±20 V & ±5 H	0.4 cd	0.62 cd	T11
		Other Angles	0.05 cd	0.62 cd	T11
A-6.1.1.	Maximum Light Intensity (Assembly of two lamps)	84	15 cd	T11	
A-A.1	Minimum Vertical Viewing Angles	±15°	±10°	T11	
A-A.1	Minimum Vertical Viewing Angles	- Inboard (Sweep angle from reference axis)	45°	45°	T11
		- Outboard (Sweep angle from reference axis)	80°	45°	T11

ADR Clause	Requirements (Rear End-outline Marker Lamps)	ADR Spec.	FMVSS Spec.	FMVSS Clause	
6.2.	Colour of Emitted Light, to the rear (CI 6.2. ADR 13/00)	Red	Red	T1-a	
A-6.1.3.	Minimum Light Intensity (Single Lamp)	0 H & 0 V*	4 cd	0.25 cd	T11
		0 V & ±5 H	2.8 cd	0.25 cd	T11
		±5 V & 0 H	3.6 cd	0.25 cd	T11
		±5 V & ±10 H	0.8 cd	0.25 cd	T11
		±10 V & 0 H	1.4 cd	0.25 cd	T11
		±10 V & ±5 H	0.8 cd	0.25 cd	T11
		±20 V & ±5 H	0.4 cd	0.25 cd	T11
		Other Angles	0.05 cd	0.25 cd	T11
A-6.1.3.	Maximum Light Intensity (Single Lamp)	12 cd	15 cd	T11	
A-6.1.3.	Minimum Light Intensity (Single "D")	0 H & 0 V*	4 cd	0.25 cd	T11
		0 V & ±5 H	2.8 cd	0.25 cd	T11
		±5 V & 0 H	3.6 cd	0.25 cd	T11

ADR Clause	Requirements (Rear End-outline Marker Lamps)	ADR Spec.	FMVSS Spec.	FMVSS Clause	
	Lamp)				
		±5 V & ±10 H	0.8 cd	0.25 cd	T11
		±10 V & 0 H	1.4 cd	0.25 cd	T11
		±10 V & ±5 H	0.8 cd	0.25 cd	T11
		±20 V & ±5 H	0.4 cd	0.25 cd	T11
		Other Angles	0.05 cd	0.25 cd	T11
A-6.1.3.	Maximum Light Intensity (Single "D" Lamp)	8.5 cd	15 cd	T11	
A-6.1.3.	Minimum Light Intensity (Assembly of two Lamps)	0 H & 0 V*	4 cd	0.25 cd	T11
		0 V & ±5 H	2.8 cd	0.25 cd	T11
		±5 V & 0 H	3.6 cd	0.25 cd	T11
		±5 V & ±10 H	0.8 cd	0.25 cd	T11
		±10 V & 0 H	1.4 cd	0.25 cd	T11
		±10 V & ±5 H	0.8 cd	0.25 cd	T11
		±20 V & ±5 H	0.4 cd	0.25 cd	T11
		Other Angles	0.05 cd	0.25 cd	T11
A-6.1.3.	Maximum Light Intensity (Assembly of two lamps)	17	15	T11	
A-A.1	Minimum Vertical Viewing Angles	±15°	±10°	T11	
A-A.1	Minimum Vertical Viewing Angles	– Inboard (Sweep angle from reference axis)	45°	45°	T11
		– Outboard (Sweep angle from reference axis)	80°	45°	T11

Additional Notes:

- * The Abbreviations of "H" & "V" above refer to angles in degree in the horizontal and vertical from the reference axis, respectively.

ADR	50/00	Front Fog Lamps
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
FMCSR	393.22	Combination of lighting devices and reflectors.
Equivalence Comments:		
<ul style="list-style-type: none"> • Front Fog Lamps are not covered in the FMVSS or FMCVR and the standards hence are not technically equivalent. 		

ADR	51/00	Filament Lamps
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
Equivalence Comments:		
<ul style="list-style-type: none"> • Cl. 7.2 allows for the use filament lamps compliant to FMVSS 108 and "SAE J573, Miniature Lamp Bulbs, Dec89" which in turn is also referenced in FMVSS 108, making the two standards technically equivalent. 		

ADR	52/00	Rear Fog Lamps
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
FMCSR	393.22	Combination of lighting devices and reflectors.
Equivalence Comments:		
<ul style="list-style-type: none"> • Rear Fog Lamps are not covered in the FMVSS or FMCVR and the standards hence are not technically equivalent. 		

ADR	61/02	Vehicle Markings		
FMCSR	565	Vehicle Identification Number Requirement		
FMCSR	567	Certification		
Equivalence Comments:				
<ul style="list-style-type: none"> ADR 61/02 calls FMVSS 115 as a technically equivalent standard. Since the release of ADR 61/02 FMVSS 115 has been withdrawn and the information relocated to FMCSR 565. The attachment of registration plates in the USA is governed by the individual states and hence no FMCSR or FMVSS requirements exist. 				
ADR Clause	Requirements	ADR Spec.	FMCSR Spec.	FMCSR Clause
5.1.	Vehicle Identification Number	Yes	Yes	565.13(a)
6.1.	Compliance Plate	Yes	Yes	567.4(g)
7.1.	Engine Number	Yes	not specified	/
9.1.	Registration Plate Holders	Yes	not specified	/
9.1.1.1.	Max Registration Front	1300	not specified	/
9.1.1.2.	Plate Height Rear	1300	not specified	/

ADR	62/02	Mechanical Connections Between Vehicles		
FMVSS	not specified	/		
FMCSR	393.70	Coupling devices and towing methods, except for driveaway-towaway operations.		
SAE	J849	Connection and Accessory Locations for Towing Multiple Trailers, Nov 1985		
Equivalence Comments:				
<ul style="list-style-type: none"> Clause PD1308 ff. in JLTV Purchase Description – Family of Vehicles requires the JLTV and companion trailers to be provided with a pintle coupling towing system. This is an alternative name for the “Hook Couplings” described in ADR 62/02 and hence any standard comparison will be restricted to this type of coupling. Cl. 5.1. of ADR 62/02 requires all trailers with an aggregate trailer mass of up to 3.5 tonnes to be fitted with quick release couplings, i.e. coupling that do not require tools. By the use of Pintle or Hook Couplings on the JLTV this requirement is implicitly satisfied. FMCSR 393.70 only provides very basic requirements to the performance of trailer couplings in general and a comparison of the ADR and FMCSR standards is not undertaken. Within the JLTV Purchase Description – Family of Vehicles reference is made to standard “SAE J849, Connection and Accessory Locations for Towing Multiple Trailers, Nov 1985” and any design should be carried out this standard. The comparison of standards in this case is hence made between SAE J849 and ADR 62/02. Comparison of the two standards shows large discrepancies between the two standards. SAE J849 does not include specifications in regards to the sizing of individual components, class rating requirements or dynamic loading. Static loading requirements are significantly lower than equivalent ADR requirements and are applicable to the actual towed vehicle mass not the maximum rated. As a result, both standards can be deemed to be technically not equivalent. 				

ADR	75/00	Headlamp Cleaners		
FMVSS	not specified	/		
Equivalence Comments:				
<ul style="list-style-type: none"> Clause A-6.2.9. in ADR 13/00 requires that Headlamp Cleaners shall be installed together with any dipped-beam headlamp having an objective luminous flux which exceeds 2,000 lumen. No FMVSS or FMCSR cover the use and requirements of Headlamp Cleaners. 				

ADR	76/00	Daytime Running Lamps			
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment			
Equivalence Comments:					
<ul style="list-style-type: none"> Requirements for Daytime Running Lamps are listed in Appendix A of ADR 76/00 (UN/ECE REGULATION NO. 87/01). Clauses listed in the table below starting with "A" refer to clauses in the appendix not the main text of the ADR. 					
ADR Clause	Requirements	ADR Spec.	FMVSS Spec.	FMVSS Clause	
A-9.	Colour of light emitted	White	White/ Yellow	T1-a	
A-9.	Minimum Illuminating Surface	40 cm ²	not specified	S7.10.6	
A-7.1.	Minimum Light Intensity	0 H & 0 V*	400 cd	500 cd	S7.10.13
A-7.2.	Intensity	0 V & 5 H	360 cd	not specified	/
		0 V & 1 H	280 cd	not specified	/
		0 V & 1 H	100 cd	not specified	/
		±5 V & ±10 H	80 cd	not specified	/
		±5 V & ±10 H	40 cd	not specified	/
		±10 V & 0 H	80 cd	not specified	/
		±10 V & ±5 H	80 cd	not specified	/
A-7.3.	Maximum Light Intensity	800 cd	3000 cd	7.10.13	

Additional Notes:

- * The Abbreviations of "H" & "V" above refer to angles in degree in the horizontal and vertical from the reference axis, respectively.

ADR	80/02	Emission Control for Heavy Vehicles		
USCFR	86.004-11	Emission standards for 2004 and later model year diesel heavy-duty engines and vehicles		
Equivalence Comments:				
<ul style="list-style-type: none"> Subject to clauses 6.2.1 to 6.2.6 inclusive, for engines which operate on diesel, liquefied petroleum gas or natural gas, the technical requirements of the United States Code of Federal Regulations (CFR), Part 86 – Control of air pollution from new and in-use motor vehicles and new and in-use motor vehicle engines certification and test procedures - Subpart A 40 CFR 86.004-11 Emission standards for 2004 and later model year diesel heavy-duty engines and vehicles, are deemed to be equivalent to the technical requirements of this vehicle standard. <p>6.2.1 - Engines shall meet the emission limits specified in 86.004-11 (a)(1), paragraphs (i)(A) or (i)(C), (ii)(A), and (iii)(B).</p> <p>6.2.2 - Engines shall be tested in accordance with the applicable test procedures as specified in Subpart N 40 CFR 86.1300 series – Emission Regulations for new Otto-cycle and diesel heavy duty engines; gaseous and particulate exhaust test procedures.</p> <p>6.2.3 - Engines which operate on diesel shall also comply with the ESC test specified in Appendix A of ADR 80/02, except that the emission limits specified under clause 6.2.1 of this vehicle standard apply in lieu of the limits in row B1 of Table 1 to section 6.2.1 of Appendix A of ADR 80/02.</p> <p>6.2.4 - Engines which operate on diesel, liquefied petroleum gas or natural gas shall satisfy relevant useful life provisions, not to exceed test requirements, and rules regarding use of emission control devices applicable to 2004 and later model year diesel heavy-duty engines and vehicles under CFR Part 86.</p> <p>6.2.5 - Engines shall not be equipped with a defeat device or utilise a defeat strategy.</p> <p>6.2.6 - Engines which operate on diesel are not permitted to use a consumable reagent in order to achieve the emission limits specified under 86.004-11.</p>				

ADR	80/03	Emission Control for Heavy Vehicles
USCFR	86.004-11	Emission standards for 2004 and later model year diesel heavy-duty engines and vehicles

Equivalence Comments:

- Subject to clauses 6.2.1 to 6.2.5 inclusive, for engines which operate on diesel, liquefied petroleum gas or natural gas, the technical requirements of the United States Code of Federal Regulations (CFR), Part 86 – Control of air pollution from new and in-use motor vehicles and new and in-use motor vehicle engines certification and test procedures - Subpart A 40 CFR 86.007-11 Emission standards and supplemental requirements for 2007 and later model year diesel heavy-duty engines and vehicles, are deemed to be equivalent to the technical requirements of this vehicle standard.

6.2.1 - Except as provided in 6.2.1.1 and 6.2.1.2, engines shall meet the emission limits specified in 86.007-11 (a)(1), paragraphs (i)(A), (ii)(A), (iii)(A) and (iv)(A) and 86.007-11 (a)(3)SET(i).

6.2.1.1 - Engines need not comply with the oxides of nitrogen and particulate limits specified in 86.007-11 (a)(1), paragraphs (i)(A) and (iv)(A), respectively, provided the emissions of oxides of nitrogen and particulates from the engine do not exceed the limits specified for the transient test under either Option 1 or Option 2 in Table 1 when tested in accordance with the transient test cycle specified in Subpart N 86.1333-2007.

6.2.1.2 - Engines need not comply with the weighted average emission limits specified in 86.007-11 (a)(3)SET(i), provided the emissions of oxides of nitrogen and particulates from the engine do not exceed the limits specified for the steady state test under either Option 1 or Option 2 in Table 1 when tested to the supplemental emissions test specified in Subpart N 86.1360-2007.

Table 1 – Emission Limit Options for US Transient and Steady State Tests

		Emission Limits (g/kWh)	
		Oxides of Nitrogen	Particulates
Transient Test	Option 1	2.0	0.03
	Option 2	3.0	0.01
Steady State Test	Option 1	2.0	0.02
	Option 2	3.0	0.01

6.2.2 - Engines shall be tested in accordance with the applicable test procedures as specified in Subpart N 40 CFR 86.1300 series – Emission Regulations for new Otto-cycle and diesel heavy duty engines; gaseous and particulate exhaust test procedures.

6.2.3 - Engines which operate on diesel, liquefied petroleum gas or natural gas shall satisfy the relevant useful life provisions, not to exceed test requirements, and rules regarding use of auxiliary emission control devices applicable to 2007, 2008 and 2009 model year diesel heavy-duty engines and vehicles under CFR Part 86.

6.2.4 - Engines shall not be equipped with a defeat device or utilise a defeat strategy.

6.2.5 - Engines which operate on diesel, liquefied petroleum gas or natural gas, and which require the use of a consumable reagent in order to achieve the emission limits specified under the standards adopted in clause 6.2, shall be equipped with an OBD system meeting the requirements specified in clause 6.1.3.

ADR	83/00	External Noise			
FMCSR	325	Compliance with interstate motor carrier noise emission standards			
Equivalence Comments:					
<ul style="list-style-type: none"> Requirements for External Noise are listed in Appendix A of ADR 83/00 (UN/ECE REGULATION NO. 51). Clauses listed in the table below starting with "A" refer to clauses in the appendix not the main text of the ADR. Although there are some minor differences in the way the noise measurements are undertaken, the requirements stated in ADR 83/00 can be compared with FMCSR 325. All maximum sound level requirements stated in FMCSR 325.7 are higher than the levels stated in ADR 83/00, making the two standards technically not equivalent. 					
ADR Clause	Requirements		ADR Spec.	FMVSS Spec.	FMVSS Clause
A-6.2.2.1.4.2.	Vehicle Engine Power	≥ 75 kW & < 150 kW (+ Cl. A-6.2.2.2.1.)	79 dB(A)	87 – 93 dB(A)	325.7
A-6.2.2.1.4.3.		≥ 150 kW (+ Cl. A-6.2.2.2.2.)	82 dB(A)	87 – 93 dB(A)	325.7
A-A.6.3.	Stationary Noise Limit from Compressed Air		72 dB(A)	not specified	/

A.2 Australian Design Rules: Compliance of TB Class Trailers

ADR	01/00	Reversing Lamps			
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment			
Equivalence Comments:					
<ul style="list-style-type: none"> Requirements for Reversing Lamps are listed in Appendix A of ADR 01/00 (UN/ECE REGULATION NO. 23/00). Clauses listed in the table below starting with "A" refer to clauses in the appendix not the main text of the ADR. Location and number of Reversing Lamps are detailed in ADR 13/00. 					
ADR Clause	Requirements	ADR Spec.	FMVSS Spec.	FMVSS Clause	
A-6.2.	Minimum Light Intensity ***	– along the axis of reference	80 cd**	80cd	T12
A-6.3.	Maximum Light Intensity ***	– in or above the horizontal plane	300 cd	300cd [‡]	T12
		– below the horizontal plane	600 cd	300cd	T12
A-8.	Colour	White	White	T1-a	

Additional Notes:

- * Motor Vehicle Standards (Approval to Place Used Import Plates) Guidelines 2006 (No. 1)
- ** cd = Candela, SI base unit of luminous intensity.
- *** Values given are for each lamp as stated per Clause A-6.1. in ADR 01/00.

ADR	06/00	Direction Indicators			
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment			
Equivalence Comments:					
<ul style="list-style-type: none"> Requirements for Direction Indicators are listed in Appendix A of ADR 06/00 (UN/ECE REGULATION NO. 06/00). Clauses listed in the table below starting with "A" refer to clauses in the appendix not the main text of the ADR. Location and number of Direction Indicators are detailed in ADR 13/00. Annex 1 of Appendix A of ADR 06/00 (UN/ECE REGULATION NO. 06/00) further defines a minimum visible vertical sweep angle for indicators of categories 1 and 2 of $\pm 15^\circ$ from the horizontal and of $+30^\circ$ to -5° from the horizontal for indicators of category 6. 					
ADR Clause	Requirements	ADR Spec.	FMVSS Spec.	FMVSS Clause	
A-A5	Colour	Amber	Red or Amber	T1-a	
A-6.1	Rear Facing Indicators	– Type 2a, min. intensity, central axis	50 cd	80 cd	T7
		– Type 2a, max. intensity, central axis, single lamp	350 cd	not specified	/
		– Type 2a, max. intensity, central axis, single lamp marked "D"	350 cd	not specified	/
		– Type 2a, max. intensity, central axis, total for assembly of 2 lamps	350 cd	not specified	/
A-A.1	Minimum Vertical Angles	$\pm 15^\circ$	$\pm 15^\circ$	T5-b	
A-A.1	Rear facing Indicator (Type 2), Horizontal Sweep Angle	– Minimum Inboard Angle	45°	45°	T5-b
		– Minimum Outboard Angle	80°	80°	T5-b
Additional Notes:					
*	"D" refers to lamps, which can either be used on their own or as part of an assembly. Refer ECE Regulation No. 7 in ADR 49/00				

ADR	13/00	Installation of Lighting and Light-Signalling Devices on other than L-Group Vehicles
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
FMCSR	393.11	Lamps and reflective devices.
FMCSR	393.22	Combination of lighting devices and reflectors.

Equivalence Comments:

- Requirements for Installation of Lighting and Light-Signalling Devices on other than L-Group Vehicles are listed in Appendix A of ADR 13/00 (UN/ECE REGULATION NO. 48/02). Clauses listed in the table below starting with "A" refer to clauses in the appendix not the main text of the ADR.
- Stop Lamps of types S1, S2 are defined in ADR 49/00 (UN/ECE REGULATION NO. 7) and S3 in ADR 60/00. Due to the nature of the JLTV project and the type of vehicle, it is not expected that lamps of type S2 and S3 will be used on the vehicle. As a result, the requirements for stop lamps of type S2 and S3 are not covered in this task.
- FMVSS 108 does not require front or rear position lamps (parking lamps) on vehicles wider than 2032 mm (80 inches). As a result the position on the vehicle and requirements of these lamps in relation to vehicles of the NB class are not covered in the FMVSS 108. Photometric requirements and viewing angles for rear position lamps are covered in "SAE J585, Tail Lamps (Rear Position Lamps), March 1986".
- Rear Fog Lamps are not covered in FMVSS 108, but installation and photometric requirements are covered in "SAE J1319, Fog Tail Lamp (Rear Fog Light) Systems, Aug 1987". Due to the fact that road traffic in the USA occurs in the right hand side of the road, where a single rear fog light is used, it is mounted on the wrong side of the car.
- "End Outline Markers" described in ADR 13/00 are called under the name of "Clearance Lamps" in FMVSS 108.
- The description for "Side Retro-Reflector" as featured in Cl. A-6.17. of ADR 13/00 is covered by both "Reflex Reflectors" and "Intermediate Side Reflex Reflectors" in FMVSS 108. As a result the FMVSS 108 requires 3 reflex reflectors to be placed on each side of the vehicle (1 front, 1 rear, 1 intermediate).
- FMVCR 393.22 allows for the optical combination of any two lamps or reflectors as long as the individual optical and photometric requirements are fulfilled. Exceptions to this rule are given in FMVCR393.22(b) which state that turn signal lamps are not allowed to be combined with head lamps, other brighter lamps or stop lamps and clearance lamps are not allowed to be combined with a tail lamp or identification lamp.
- Clause A-6.12.1. allows for the optional use of Parking Lamps on vehicles that do not exceed 6 m in length and do not exceed 2m in width. Otherwise parking lamps are prohibited.
- FMVSS 108 does not specifically require the fitting of triangular retro-reflectors to the back of any trailers and no location requirements are given.

Reg	Clause	Feature	No off	Height*		Apart**	Edge***	G/ C/ R****
				Max	Min			
ADR	A-6.4.	Reversing Lamp (#)	1	Refer Requirements given in the NB Vehicle Class Analysis Section in Appendix A of this document.				
FMVSS	T1-c		0					
ADR	A-6.5.	Direction Indicator Rear (#)	Refer Requirements given in the NB Vehicle Class Analysis Section in Appendix A of this document. (Front and Side Direction Indicators are not required under ADR 13/00 for trailers.)					
ADR	A-6.6.	Hazard Warning Signal (#)	Refer Requirements given in the NB Vehicle Class Analysis Section in Appendix A of this document.					
ADR	A-6.7.	Stop Lamp (#)	Refer Requirements given in the NB Vehicle Class Analysis Section in Appendix A of this document.					
ADR	A-6.8.	Rear Registration Plate Lamp (#)	Refer Requirements given in the NB Vehicle Class Analysis Section in Appendix A of this document.					
ADR	A-6.9.	Front Position Lamp (#)	Refer Requirements given in the NB Vehicle Class Analysis Section in Appendix A of this document.					
ADR	A-6.10.	Rear Position Lamp (#)	Refer Requirements given in the NB Vehicle Class Analysis Section in Appendix A of this document.					
ADR	A-6.11	Rear Fog Lamp (+)	Refer Requirements given in the NB Vehicle Class Analysis Section in Appendix A of this document.					
ADR	A-6.12.	Parking Lamp (+)	1 or 4	1500	350	n/a	<400	R: Fpos & Rpos
FMVSS	n/a		n/a	n/a	n/a	n/a	n/a	n/a
ADR	A-6.12.	Parking Lamp (+)	/	<2100 (where 1500 not possible)	n/a	n/a	n/a	n/a
FMVSS	n/a		n/a	n/a	n/a	n/a	n/a	n/a
ADR	A-6.13.	End-Outline Marker Lamp (#)	Refer Requirements given in the NB Vehicle Class Analysis Section in Appendix A of this document.					
ADR	A-6.14.	Rear Retro Reflector (+)	Refer Requirements given in the NB Vehicle Class Analysis Section in Appendix A of this document.					
ADR	A-6.15.	Rear Retro Reflector, triangular (+)	2	900	250	>600	<400	n/a
FMVSS	n/a		n/a	n/a	n/a	n/a	n/a	n/a
ADR	A-6.15.4.1	Rear Retro Reflector, triangular (+)	/	n/a	n/a	>400 (vehicles <1300 wide)	n/a	n/a
FMVSS	n/a		n/a	n/a	n/a	n/a	n/a	n/a
ADR	A-6.15.4.2	Rear Retro Reflector, triangular (+)	/	1500(where 900 not possible)	n/a	n/a	n/a	n/a
FMVSS	n/a		n/a	n/a	n/a	n/a	n/a	n/a
ADR	A-6.16.	Front Retro-Reflector (#)	Refer Requirements given in the NB Vehicle Class Analysis Section in Appendix A of this document.					
ADR	A-6.17.	Side Retro-Reflector (#)	Refer Requirements given in the NB Vehicle Class Analysis Section in Appendix A of this document.					

Reg	Clause	Feature	No off	Height*		Apart**	Edge***	G/ C/ R****
				Max	Min			
ADR	7.2	Side-marker Lamp (+)	Refer Requirements given in the NB Vehicle Class Analysis Section in Appendix A of this document.					
# = Mandatory component + = Optional component * = To highest (Max) and lowest (Min) points on illuminating surface. ** = Distance between innermost edges of illuminating surface. *** = Maximum distance from outer edge of vehicle to illuminating surface. **** = Specific lamps, which may be grouped (G), combined (C), or reciprocally incorporated (R): % = Permitted with any other lamps. →				... Continued: %f = Permitted with any other front lamp. %r = Permitted with any other rear lamp. Dip = Permitted with Dipped Beam. Main = Permitted with Main Beam Fpos = Permitted with Front Position Lamps. C/Part = May have common parts with a lamp. Park = Permitted with Park Lamps SMar = Permitted with Side Marker Lamps. Rpos = Permitted with Rear Position Lamps. Reg = Permitted with Rear Registration Plate Lamp. Indic = Permitted with Indicator Lamps.				

ADR	38/03	Trailer Braking Systems		
FMVSS	121	Air brake systems		
FMCSR	393.43	Breakaway and emergency braking		
Equivalence Comments:				
<ul style="list-style-type: none"> As stated in Clause 4.5 of ADR 38/03, performance testing is not required for trailers that fall within the TB class 				
ADR Clause	Requirements	ADR Spec.	FMVSS / FMCSR Spec.	FMVSS/ FMCSR Clause
4.1	Each trailer must be equipped with a service brake system such that the braking force can be progressively increased and decreased by means of a control signal from the towing vehicle (except for a trailer utilising an over-run braking system)	yes	n/a*	/
4.2	For a trailer with a gross trailer mass exceeding 2 tonne, the braking system must operate on all wheels	yes	yes	S5.2.2 (121)
4.4	Every trailer with a gross trailer mass exceeding 2 tonne must have an emergency brake system that will operate automatically in the event of the trailer becoming disconnected from the drawing vehicle	yes	yes	S5.8.1 (121) (d)(393.43)

Additional Notes:

- * FMVSS 121 does not explicitly state that the braking force can be progressively increased and decreased by means of the control signal from the towing vehicle

ADR	42/04	General Safety Requirements		
FMVSS	106	Brake Hoses		
	119	New pneumatic tires for vehicles other than passenger cars		
FMCSR	393	Parts and accessories necessary for safe operation		
Equivalence Comments:				
<ul style="list-style-type: none"> All clauses of ADR 42/04 pertaining to TB category vehicles have been compared to the FMVSS/FMCSR in the table below 				
ADR Clause	Requirements	ADR Spec.	FMVSS/ FMCSR Spec.	FMVSS / FMCSR Clause
9.2.2	Every trailer must be equipped with an electrical conductor independent of the trailer coupling that provides a return path between the electrical circuits of the trailer and that of the drawing vehicle	yes	n/a	/
11	Refer Requirements given in the NB Vehicle Class Analysis Section in Appendix A of this document.			
14	Refer Requirements given in the NB Vehicle Class Analysis Section in Appendix A of this document.			
15	Refer Requirements given in the NB Vehicle Class Analysis Section in Appendix A of this document.			
25.2.2	Retreaded tyres fitted to T-group vehicles must comply with AS 1973-1993 "Pneumatic Tyres – Passenger Car, Light Trucks and Trucks/Bus – Retreading and Repair Process"	yes	n/a*	/
25.4	Vehicle must be fitted with a tyre placard	yes	n/a**	/

Additional Notes:

- * FMVSS 117 details the appropriate requirements for retreaded tyres for passenger cars only
- ** Tyre placards are required under other FMVSS standards (such as 110 and 120), but these standards are not applicable to trailer tyres

ADR	43/04	Vehicle Configuration Dimensions		
FMVSS	658	Size and Weight, Route Designations — Length, Width and Weight Limitations		
Equivalence Comments:				
<ul style="list-style-type: none"> Apart from Clause 6.2.3 of ADR 43/04 (replaced with Clause 6.2.1 in the table below) and Clause 7.2 of ADR 43/04 (replaced with Clause 7.4.2 in the table below), the analysis is the same as that given in the section NB Class type vehicles in Appendix A of this document. The relevant definitions and diagrams relating to Rear Overhang are given in ADR – Definitions and Vehicle Categories 				
ADR Clause	Requirements	ADR Spec.	FMVSS Spec.	FMVSS Clause
6.2.1	Maximum Rear Overhang	*	n/a	/
7.4.2	A trailer supported with 2 axle groups must have all wheels on the front axle connected to the steering mechanism for that part of the vehicle	yes	n/a	/

Additional Notes:

- * The Rear Overhang is the lesser of 3.7m or the length of the load space forward of the line at the rear of the vehicle from which the Rear Overhang is measured

ADR	45/01	Lighting & Light-Signalling Devices not covered by ECE Regulations
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
Equivalence Comments: <ul style="list-style-type: none"> Refer to the analysis undertaken in the section NB Class type vehicles in Appendix A of this document. 		

ADR	47/00	Retroreflectors
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
Equivalence Comments: <ul style="list-style-type: none"> Refer to the analysis undertaken in the section NB Class type vehicles in Appendix A of this document. 		

ADR	48/00	Devices for Illumination of Rear Registrations Plates
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
Equivalence Comments: <ul style="list-style-type: none"> Refer to the analysis undertaken in the section NB Class type vehicles in Appendix A of this document. 		

ADR	49/00	Front and Rear Position (Side) Lamps, Stop Lamps and End-outline Marker Lamps
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
Equivalence Comments: <ul style="list-style-type: none"> Refer to the analysis undertaken in the section NB Class type vehicles in Appendix A of this document. 		

ADR	51/00	Filament Lamps
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
Equivalence Comments: <ul style="list-style-type: none"> Refer to the analysis undertaken in the section NB Class type vehicles in Appendix A of this document. 		

ADR	61/02	Vehicle Markings
FMCSR	565	Vehicle Identification Number Requirement
FMCSR	567	Certification

- Equivalence Comments:**
- ADR 61/02 calls FMVSS 115 as a technically equivalent standard. Since the release of ADR 61/02 FMVSS 115 has been withdrawn and the information relocated to FMCSR 565.
 - The attachment of registration plates in the USA is governed by the individual states and hence no FMCSR or FMVSS requirements exist.

ADR Clause	Requirements	ADR Spec.	FMCSR Spec.	FMVSS Clause
5.1.	Vehicle Identification Number	Yes	Yes	565.13(a)
6.1.	Compliance Plate	Yes	Yes	567.4(g)
8.1.	Vehicle Plate	Yes	n/a	/
9.1.	Registration Plate Holders	Yes	n/a	/
9.1.1.1.	Max Registration Front	1300	n/a	/
9.1.1.2.	Plate Height Rear	1300	n/a	/

ADR	62/02	Mechanical Connections Between Vehicles
FMVSS	n/a	/
FMCSR	393.70	Coupling devices and towing methods, except for driveaway-towaway operations.
SAE	J849	Connection and Accessory Locations for Towing Multiple Trailers, Nov 1985
<p>Equivalence Comments:</p> <ul style="list-style-type: none"> Refer to the analysis undertaken in the section NB Class type vehicles in Appendix A of this document. 		

A.3 Australian Design Rules: Compliance of TC Class Trailers

ADR	01/00	Reversing Lamps
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
Equivalence Comments:		
<ul style="list-style-type: none"> Refer to the analysis undertaken in the section TB Class type trailers in Appendix A of this document. 		

ADR	06/00	Direction Indicators
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
Equivalence Comments:		
<ul style="list-style-type: none"> Refer to the analysis undertaken in the section TB Class type trailers in Appendix A of this document. 		

ADR	13/00	Installation of Lighting and Light-Signalling Devices on other than L-Group Vehicles
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
FMCSR	393.11	Lamps and reflective devices.
FMCSR	393.22	Combination of lighting devices and reflectors.
Equivalence Comments:		
<ul style="list-style-type: none"> Refer to the analysis undertaken in the section TB Class type trailers in Appendix A of this document. 		

ADR	38/03	Trailer Braking Systems
FMVSS	121	Air brake systems
FMCSR	393.43	Breakaway and emergency braking
Equivalence Comments:		
<ul style="list-style-type: none"> For TC class trailers with a gross trailer mass less than 4.5 tonne, refer to the analysis undertaken in the section TB Class type trailers in Appendix A of this document. Requirements for Antilock Systems are listed in Appendix A of ADR 38/03 (Special Provisions for TC category trailers over 4.5 tonnes ATM incorporating an Antilock System). Clauses listed in the table below starting with "A" refer to clauses in the appendix not the main text of the ADR. All performance requirements of ADR 38/03 (except for Clauses 6.3 and 8.6) are not specified in any FMVSS/FMCSR 		

ADR Clause	Requirements	ADR Spec.	FMVSS / FMCSR Spec.	FMVSS / FMCSR Clause
4.1	Each trailer must be equipped with a service brake system such that the braking force can be progressively increased and decreased by means of a control signal from the towing vehicle (except for a trailer utilising an over-run braking system)	yes	n/a*	/
4.4	Every trailer with a gross trailer mass exceeding 2 tonne must have an emergency brake system that will operate automatically in the event of the trailer becoming disconnected from the drawing vehicle	yes	yes	S5.8.1 (121) (d)(393.43)

ADR Clause	Requirements	ADR Spec.	FMVSS / FMCSR Spec.	FMVSS / FMCSR Clause
5.1	A service brake system must be fitted to all trailer wheels	yes	yes	S5.2.2 (121)
5.3	A parking brake system must be fitted	yes	yes	S5.6 (a) (121)
5.5	For a brake system which utilises stored energy to actuate the service brake system, the conditions specified in Clauses 5.5.1 – 5.5.2 must be met when energy in the supply line is reduced at a rate not less than 100 kPa/sec	yes	not specified	/
5.6	No failure in the brake system (other than of the supply line) shall cause the brake to apply without a control signal	yes	not specified	/
5.7	Automatic devices that normally remain passive and whose function cannot be readily checked during trailer operation shall not be employed to isolate faulty devices or brake circuits	yes	not specified	/
5.8	Where a trailer is fitted with an auxiliary park brake release device, it must be such that the brake system is restored to normal no later than on the resumption of the supply of stored energy to the trailer from the towing vehicle	yes	not specified	/
5.9	All components in the brake system must meet or exceed at least one of the following standards: SA, SAE, BS, JIS, DIN, ISO or ECE	yes	not specified	/
5.10	Brake line couplings must not be interchangeable and must comply with AS 4495-2000 or ISO 1728:2006	yes	not specified	/
5.11	Each air reservoir must be fitted with either a manual or automatic condensate drain valve fitted at the lowest point	yes	not specified**	S5.1.2.4 (121)
5.12	The service brake system must incorporate devices which compensates for any increased movements of its components due to wear	yes	yes	S5.1.8 (121)
5.13	Each brake system must produce a resultant braking force along the longitudinal centreline of the vehicle***	yes	not specified	/
5.14	The brake power units are to be preferentially charged until the supply line reaches an energy level of not less than 450 kPa****	yes	not specified	/
5.15	Any demand for stored energy (other than the brake system) must be disconnected if the stored energy falls below 450 kPa	yes	not specified	/
5.16	Where separate methods of actuation are provided different functions of the brake system, the actuation of one function must not cause operation of another function	yes	not specified	/
5.17	Stored energy devices must be safeguarded to prevent energy depletion through failure of the supplying system	yes	not specified	/
5.18	A pressure test connection complying with Clause 4 of ISO Standard 3583-1984, must be fitted either at the inlet or in the body of the slowest reacting brake chamber in each axle group	yes	not specified	/

ADR Clause	Requirements	ADR Spec.	FMVSS / FMCSR Spec.	FMVSS / FMCSR Clause
6.1	The service brake system must be designed so that the braking force can be progressively increased and decreased by means of a control signal from the towing vehicle	yes	not specified	/
6.2	The combined total energy of all energy storage devices in the service brake system must not be less than 8 times the combined maximum energy capacity of the service brakes actuating devices.	yes	yes	S5.2.1.1 (121)
6.3	The maximum time allowable for energy in the energy storage devices to drop from 650 kPa to 420 kPa upon application of the service brake control*****	0.4 sec	0.5 sec	S5.3.3.1 (a) (121)
6.8	For trailers fitted with a variable proportioning brake system, it must have markings in a visible position in indelible form containing the information in Clauses 6.8.1 – 6.8.3 of ADR 38/03	yes	not specified	/
7.2	The emergency brake system may utilise parts of the service brake system provided failure of the service brake system does not prevent the emergency brake meeting its performance requirement	yes	not specified	/
7.4	An auxiliary release device must be provided for emergency brake systems that employ stored fluid energy to hold them in the release position	yes	not specified	/
8.1	The parking brake system must be independent of the service brake system (except for the brakes and any mechanical components attached directly to the brakes)	yes	not specified	/
8.2	The parking brake must be applied by means of a control which is held in the applied position by purely mechanical means	yes	not specified	/
8.3	It must not be possible to release the parking brake unless a means of immediately reapplying it is available	yes	not specified	/
8.4	The parking brake must operate when the supply line energy level falls below 155 kPa	yes	not specified	/
8.5	Additional parking brake facilities are permitted provided they comply with Clauses 8.2 – 8.4 of ADR 38/03	yes	not specified	/
8.6	Required gradient for parking brake tests	18%	20%	S5.6.2 (121)
A-1.2	At speeds exceeding 15 km/h, the wheels on the axles where an antilock system if fitted must remain unlocked from an initial speed of 40 km/h^ and at least 80 km/h	yes^^	not specified	/
A-2.1	An antilock system must be fitted to each single axle, and at least one axle in any tandem axle group	yes	yes	S5.2.3 (b) (121)
A-3.1	The antilock system must be powered by a connector conforming to DIN Standard 72570 configured for 12 volt operation or ISO/DIN Standard 7638:1996 configured for 12 or 24 volt operation	yes	not specified	/
A-3.1	If the connector is configured for 24 volt operation, this must be marked on the plug	yes	not specified	/

ADR Clause	Requirements	ADR Spec.	FMVSS / FMCSR Spec.	FMVSS / FMCSR Clause
A-3.2	The connector must conform to Clause A-3.2.1 of ADR 38/03 for 12 volt operation and Clause A-3.2.2 of ADR 38/03 for 24 volt operation	yes	not specified	/
A-3.3	Any electrical failure of the antilock system must be signalled to the towing vehicle by connecting Pin 5 on the electrical connector to negative	yes	not specified ^^^	/
A-3.4	The warning device must light up when the Antilock system is energised, and must go off after not less than 2 seconds or at the latest when the trailer reaches a speed of 15 km/h	yes	not specified	/

Additional Notes:

- * FMVSS 121 does not explicitly state that the braking force can be progressively increased and decreased by means of the control signal from the towing vehicle
- ** Clause S5.1.2.4 of FMVSS 121 specifies a manual condensate drain must be fitted, but does not specify it must be at the lowest point
- *** This clause does not apply to vehicles capable of producing asymmetric braking in responsive to tractive conditions
- **** Clause 5.14.1 or 5.14.2 of ADR 38/03 can apply in preference to Clause 5.14 of ADR 38/03. Neither of these clauses are mentioned in any FMVSS
- ***** FMVSS 121 states a pressure drop of 100 psi (689 kPa) to 60 psi (414 kPa)
 - ^ 40 km/h with a tolerance of +5 km/h to -1 km/h
 - ^^ The testing must comply with Clauses A-1.2.1 – A-1.2.3 of ADR 38/03
 - ^^^ Clause S5.2.3.2 of FMVSS 121 states the trailer shall be equipped with an electrical circuit capable of signalling a malfunction to the towing vehicle, but it does not contain the specific requirements of the ADR clause

ADR	42/04	General Safety Requirements
FMVSS	106	Brake Hoses
	119	New pneumatic tires for vehicles other than passenger cars
FMCSR	393	Parts and accessories necessary for safe operation
Equivalence Comments: <ul style="list-style-type: none"> Refer to the analysis undertaken in the section TB Class type trailers in Appendix A of this document (except for Clause 25.4 of ADR 42/04 which is not applicable to a TC category vehicle). 		

ADR	43/04	Vehicle Configuration Dimensions
FMCSR	658	Size and Weight, Route Designations — Length, Width and Weight Limitations
Equivalence Comments: <ul style="list-style-type: none"> Refer to the analysis undertaken in the section TB Class type trailers in Appendix A of this document. 		

ADR	45/01	Lighting & Light-Signalling Devices not covered by ECE Regulations
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
Equivalence Comments: <ul style="list-style-type: none"> Refer to the analysis undertaken in the section NB Class type vehicles in Appendix A of this document. 		

ADR	47/00	Retroreflectors
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
Equivalence Comments: <ul style="list-style-type: none"> Refer to the analysis undertaken in the section NB Class type vehicles in Appendix A of this document. 		

ADR	48/00	Devices for Illumination of Rear Registrations Plates
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
Equivalence Comments: <ul style="list-style-type: none"> Refer to the analysis undertaken in the section NB Class type vehicles in Appendix A of this document. 		

ADR	49/00	Front and Rear Position (Side) Lamps, Stop Lamps and End-outline Marker Lamps
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
Equivalence Comments: <ul style="list-style-type: none"> Refer to the analysis undertaken in the section NB Class type vehicles in Appendix A of this document. 		

ADR	51/00	Filament Lamps
FMVSS	108	Lamps, Reflective Devices, and Associated Equipment
Equivalence Comments:		
<ul style="list-style-type: none"> Refer to the analysis undertaken in the section NB Class type vehicles in Appendix A of this document. 		

ADR	61/02	Vehicle Markings		
FMCSR	565	Vehicle Identification Number Requirement		
FMCSR	567	Certification		
Equivalence Comments:				
<ul style="list-style-type: none"> ADR 61/02 calls FMVSS 115 as a technically equivalent standard. Since the release of ADR 61/02 FMVSS 115 has been withdrawn and the information relocated to FMCSR 565. The attachment of registration plates in the USA is governed by the individual states and hence no FMCSR or FMVSS requirements exist. 				
ADR Clause	Requirements	ADR Spec.	FMCSR Spec.	FMCSR Clause
5.1.	Vehicle Identification Number	Yes	Yes	565.13(a)
6.1.	Compliance Plate	Yes	Yes	567.4 (g)
8.1.	Vehicle Plate	Yes	n/a	/
9.1.	Registration Plate Holders	Yes	n/a	/
9.1.1.1.	Max Registration Front	1300	n/a	/
9.1.1.2.	Plate Height Rear	1300	n/a	/

ADR	62/02	Mechanical Connections Between Vehicles
FMVSS	n/a	/
FMCSR	393.70	Coupling devices and towing methods, except for driveaway-towaway operations.
SAE	J849	Connection and Accessory Locations for Towing Multiple Trailers, Nov 1985
Equivalence Comments:		
<ul style="list-style-type: none"> Refer to the analysis undertaken in the section NB Class type vehicles in Appendix A of this document. 		

Appendix B Required Standards

The table below shows a comparison of the ADRs, their equivalent FMVSS, FMCSR and SAE Standards. It is further stated if the appropriate US standards are part of the JLTV Purchase Description and their technical equivalence for each ADR vehicle type class.

ADR	US Standards	R*	Vehicle Class Technical Equivalency**		
			NB***	TB	TC
01/00	FMVSS 108	Yes	f	n	n
02/01	FMVSS 206	No	f	n/a	n/a
03/03	FMVSS 207	No	p	n/a	n/a
04/04	FMVSS 209	Yes	f	n/a	n/a
05/05	FMVSS 210	Yes	f	n/a	n/a
06/00	FMVSS 108	Yes	n	n	n
06/00	FMVSS 108	Yes	n	n	n
	SAE J914	No			
08/01	FMVSS 205	No	f	n/a	n/a
13/00	FMVSS 108	Yes	n	n	n
	FMCSR 393.11	No			
	FMCSR 393.22	No			
	SAE J1319	No			
14/02	FMVSS 111	Yes	p	n/a	n/a
	FMCSR 393.80	No			
18/03	FMVSS 101	No	n	n/a	n/a
	FMCSR 393.82	No			
30/01	USCFR 86.098-11	No	f	n/a	n/a
35/03	FMVSS 105	No	p	n/a	n/a
	FMVSS 121	Yes			
	FMCSR 393.43	Yes			
38/03	FMVSS 121	Yes	n/a	p	p
	FMCSR 393.43	Yes			
42/04	FMVSS 102	Yes	p	n	n
	FMVSS 103	No			
	FMVSS 104	Yes			
	FMVSS 106	No			
	FMVSS 113	No			
	FMVSS 118	No			
	FMVSS 119	Yes			
	FMCSR 393.81	No			
	FMCSR 393.88	No			
	SAE J1292	Yes			
43/04	FMCSR 658	No	n	n	n
45/01	FMVSS 108	Yes	n	n	n

ADR	US Standards	R*	Vehicle Class Technical Equivalency**		
			NB***	TB	TC
46/00	FMVSS 108	Yes	n	n/a	n/a
47/00	FMVSS 108	Yes	n	n	n
48/00	FMVSS 108	Yes	f	f	f
49/00	FMVSS 108	Yes	n	n	n
50/00	FMVSS 108 FMCSR 393.22	Yes No	n	n/a	n/a
51/00	FMVSS 108	Yes	f	f	f
52/00	FMVSS 108 FMCSR 393.22	Yes No	n	n/a	n/a
61/02	FMCSR 565 FMCSR 567	No No	p	p	p
62/02	FMCSR 393.70 SAE J849	Yes Yes	n	n	n
75/00	n/a	/	n/a	n/a	n/a
76/00	FMVSS 108	Yes	n	n/a	n/a
80/02	USCFR 86.004-11	No	f	n/a	n/a
80/03	USCFR 86.007-11	No	f	n/a	n/a
83/00	FMCSR 325	No	n	n/a	n/a

* = US Standard Referenced in JLTV Purchase Description

** = Compliance for Vehicles in the NB Type Class: f = technically fully equivalent; p = partially technically equivalent; n = not technically equivalent, n/a = not applicable to type of vehicle

*** = Type classes of vehicles: NB = Medium Goods Vehicle; TB = Light Trailer; TC = Medium Trailer.