

CAMPERVAN, MOTORHOME CONVERSION

CODE LH11

SCOPE

This Code provides information on the minimum safety requirements for a vehicle being converted to a campervan/motorhome.

Code LH11 does not apply to ADR category L-group vehicles and motor cycles.

The requirements apply to those vehicles that have been previously registered and used in transport in Australia.

Note: Where any modification is intended to be carried out on a vehicle not previously registered and used in transport, such a vehicle would be subject to the Motor Vehicle Standards Act and requires certification and compliance with all applicable ADRs at the time of first registration or supply to the market (refer to Circular 0-4-12 (*Certification of Campervans and Motorhomes*) issued by the Department of Infrastructure and Transport (DIT) for additional information).

The importation of vehicles into Australia is also administered by DIT. Vehicles imported into Australia must possess an import approval issued by that Department. Registration Authorities will not register imported vehicles that do not have the necessary approvals. Therefore to avoid disappointment and unnecessary expenditure, persons wishing to convert unregistered imported vehicles should not do so without ensuring the vehicle/s in question have the necessary valid import approvals.

Further information about certification and importation of vehicles can be found in the DIT website located at:

www.infrastructure.gov.au

Note: Whilst VSB 14 is not intended to cover trailers, much of the information contained within this Code may be applied to the internal construction and fitting-out of caravans. The requirements for the construction of caravans of an Aggregate Trailer Mass (ATM) up to 4.5 tonnes is contained in Vehicle Standards Bulletin N° 1 *National Code of Practice for Building Small Trailers* which may be downloaded from the following website:

www.infrastructure.gov.au/roads/safety/bulletin/vsb1/index.aspx

DEFINITIONS

The term **motorhome** applies equally to both a *Campervan* and a *Motorhome*.

A **motorhome** is usually a motorised cab/chassis fitted with a body having accommodation facilities and designed for self-contained recreational travel.

A **campervan** is usually a motorised van (for example, a panel van or forward control passenger vehicle) fitted with accommodation facilities and designed for recreational travel (refer to Figure LH11-1 below).



Campervan



Motorhome



Motorhome



Bus Converted to Motorhome

Figure LH14 Examples of Typical Campervans and Motorhomes

The following definition therefore applies:

A **motorhome/campervan** is a motor vehicle manufactured to include accommodation space, which contains at least the following equipment:

- seats, and a table;
- sleeping accommodation, includes seats that may be converted to sleeping accommodation;
- cooking facilities; and
- storage facilities.

This equipment must be rigidly fixed - however, the table may be designed to be easily removable.

Gross Vehicle Mass (GVM) - is the maximum permissible laden mass of a vehicle as specified by the manufacturer. (This figure is normally shown on the vehicle identification plate (compliance plate) or in specifications published by the manufacturer of that vehicle).

Aggregate Trailer Mass (ATM) - the total mass of the laden trailer when carrying the maximum load recommended by the *manufacturer*. This will include any mass imposed on the drawing vehicle when the *combination vehicle* is resting on a horizontal supporting plane.

Tare Mass – mass of a vehicle, other than an L-group vehicle, ready for service, unoccupied and unladen, with all fluid reservoirs filled to nominal capacity, except for fuel, which must be 10 litres only, and with all standard equipment and any options fitted.

Load Capacity –is the difference between the GVM/ATM of the vehicle and its *Tare Mass*.

Gross Axle Load Rating (GALR) - the *manufacturer's* specified maximum *Axle Load* for each *Axle* for which compliance with applicable ADRs has been or can be established.

CONVERSIONS COVERED UNDER CODE LH10

Conversions that are covered under this Code include:

- Conversion of any light vehicle (up to and including 4.5 tonnes GVM) to a campervan or motorhome configuration.

CONVERSIONS NOT COVERED UNDER CODE LH10

Conversions that are not covered under this Code include:

- Building or modifying vehicles that were not previously registered;
- Conversion of a vehicle that does not have the necessary payload capacity to carry the designated number of persons and the equipment; and
- Conversion of a vehicle in excess of 4.5 tonnes GVM to a campervan or motorhome configuration.

COMPLIANCE WITH APPLICABLE VEHICLE STANDARDS

Modified vehicles must continue to comply with the ADRs to which they were originally constructed, except as allowed for in the AVSR. These modified vehicles must also comply with the applicable in-service requirements of the AVSR.

Modified pre-ADR vehicles must continue to comply with the AVSR.

Compliance with the AVSR also means compliance with the equivalent regulations of a State or Territory of Australia.

Outlined below in Table LH6 are areas of the vehicle that may be affected by the modifications and that may require re-certification, testing and/or data to show compliance for the modified vehicle. This is not an exhaustive list and other modifications may also affect ADR compliance.

Table LH6 Summary of items that if modified, may detrimentally affect compliance with applicable ADRs

DETAIL	REQUIREMENTS
Installation of Seats and Seat Anchorages	ADR 3x, 3/... VSB 5A, VSB 5B
Installation of Seatbelts and Seatbelt Anchorages	ADR 4x, 4/... ADR 5x, 5/... VSB 5A, VSB 5B
Child Restraint Anchorages	ADR 5/... ADR 34x, 34/... VSB 5A, VSB 5B
Replacement Windows	ADR 8, 8/...
General Safety Requirements	ADR 42/...
Vehicle Configuration and Dimensions	ADR 43/...
Specific Purpose Vehicle Requirements	ADR 44/...

To determine the ADRs that apply to the vehicle in question, refer to the applicability table in Section LO. Vehicles manufactured on or after 1 January 1969 and prior to 1 July 1988 need to comply with the Second Edition ADRs whilst vehicles manufactured after this date need to comply with the Third Edition ADRs. Section LO has separate applicability tables for each edition.

Alternatively, ADR applicability tables for individual vehicle categories may be referenced on the Department of Infrastructure and Transport *RVCS* website at the following address and under the section titled *ADR Applicability Tables*:

<http://rvcs.dotars.gov.au/>

The ADRs apply according to the vehicle's category and date of manufacture. It is the responsibility of the modifier and the Signatory to refer to the appropriate ADR applicable to the vehicle.

Where a campervan/motorhome conversion results in a change of vehicle category, the modified vehicle must comply with the ADRs applicable to the new vehicle category and the date of manufacture of the original base vehicle.

SPECIFIC REQUIREMENTS

The following are specific requirements that apply to Motorhome Conversions certified under Code LH11.

The conversions must also comply with the general guidelines contained in sub-section 2 *General Requirements*.

1 VEHICLE SUITABILITY

A motorhome must be of a type that is suitable for conversion to the required configuration. Aspects that need to be considered are:

- Is the vehicle's general mechanical and structural condition sound?
- Is there enough space available for seating, bunks, stove, sink, refrigerator and general living requirements?
- Is the payload capacity of the vehicle sufficient to accommodate the additional weight of equipment, accessories, passengers and luggage? and
- What category of driver's licence will be required to drive the vehicle after the conversion?

1.1 Motorhome Gross Vehicle Mass

The motorhome must have a GVM appropriate for its purpose, and must include the following allowances within its laden mass, regardless of the determined Vehicle Category:

- A *Maximum Loaded Vehicle Mass* (of a passenger vehicle) as per the ADR definitions, where reference to a *seating position* means a *designated seating position*;
- The mass of all supplied equipment such as toilets, refrigerators, showers, gas-bottles etc. including the mass of full tanks containing fluids or gas. Where waste (grey and black) water tank/s are provided, their mass may be reduced by the mass of the water stored in any fresh water tank/s; and
- A *Personal Effects Allowance*, to cover cooking utensils, bedding, luggage and other such items, of 60 kg for each of the first two sleeping berths, and 20 kg for each sleeping berth more than two. This must be in addition to that included within the *Maximum Loaded Vehicle Mass* (of a passenger vehicle) above; and

Note: This *laden mass* allowance should be distributed as appropriate to the build of the motorhome as determined by the motorhome manufacturer/modifier, but with the *Personal Effects Allowance* distributed equally per *axle group* for the purpose of determining certified *GALR*.

2 DIMENSIONS

The following dimensions must not be exceeded:

- Maximum length: 12.5 metres;
- Maximum width: 2.5 metres;
- Maximum height: 4.3 metres; and
- Rear overhang: the lesser of 60% of the wheelbase or 3.7 metres.

Items or equipment mounted on the rear of the vehicle (for example toolboxes or a rack to carry a motor cycle or gas bottles) are included in the measurement of rear overhang and overall length.

3 BODY COMPONENTS

Properly fabricated body components, including body panels, must be used for all new, additional or replacement panels.

Equivalent panels and brackets to that utilised on high volume manufactured motorhomes may be used, provided that the panels are at least equivalent material in thickness and strength and attached in accordance with good engineering practice.

Where sharp edges exist, they should be capped with fully welded steel covers or pinch weld or equivalent (refer Figure LH7, Code LH1).

Where panels are intermittently welded, they must be fully sealed to prevent the ingress of exhaust gases into the cabin.

4 MECHANICAL COMPONENTS

If any additional or replacement mechanical components, for example axle(s), suspension or modified braking system are utilised in the conversion, these modifications must be certified under the appropriate Sections of VSB 14.

5 GENERAL SAFETY REQUIREMENTS

Motorhomes must continue to comply with all the applicable standards and ADRs, including the requirements in ADR 42/... and ADR 44/... that apply to these types of vehicles.

The vehicle must not be modified or fitted with any object, fitting or appliance that is likely to cause the risk of bodily injury to any person.

Interior fittings are to be designed and located so as to prevent injury to any occupant. All chairs, tables and equipment should be secured in such a way that they are not likely to become dislodged in normal operating conditions. Sufficient cupboard space should be provided to store all items such as cooking utensils, cutlery and crockery, while travelling. The cupboard doors should be fitted with latches and hinges of sufficient strength to hold the doors closed in normal driving conditions.

Equipment such as stoves, refrigerators, water, fuel and waste tanks should be installed in positions so that:

- the load is evenly distributed;
- no axle or wheel is overloaded; and
- the vehicle remains level.

Motorhome converters should also establish with their relevant State and Territory Registration Authorities whether any additional requirements exist for items such as electrical power systems, remote connections, smoke detectors, fire control etc..

5.1 Lighting

The vehicle must be fitted with lamps that comply with the applicable standards as required in the AVSR.

All mandatory lamps must not be obscured by any equipment or fittings.

Note: As a condition of approval, all converted vehicles must be fitted with direction indicator lamps regardless of the date of manufacture.

5.2 Driver's View

The driver of the vehicle must have a full and uninterrupted view of the road and any traffic ahead and to each side of the vehicle, and by use of rear vision mirrors, a clear reflected view of any following or overtaking vehicle.

5.3 Seating Positions

Note: Refer to Section LK *Seating and Occupant Protection* for more detailed information about the installation of additional seats.

Motorhomes may be configured to provide a number of designated seating positions in addition to the driver and front passenger seats. *Designated seating positions* in this context mean *seating positions* that are equipped to be used whilst travelling. These seats may double in use as seats for dining or recreation and may convert to sleeping-berths. They may also be capable of swivelling to better suit their intended multiple use function.

A motorhome must be fitted with an adequate number of designated seating positions, designed for use while travelling.

The number of designated seating positions must be equal to, or greater than the number of sleeping-berths provided in the motorhome. For example, a motorhome which has four sleeping berths must have at least four seating positions designed for use while travelling.

As far as possible, all the designated seating positions should be forward facing and are those that would most likely be occupied when travelling, such as seats immediately behind the front row of seats, rather than those at the rear of the vehicle.

Swivel seats, if intended to be used as seating positions when travelling, must be capable of being locked against rotation in the position in which they will be occupied when the vehicle is in motion.

If a swivel seat is used in a designated seating position, it must be easily lockable without the use of tools in position(s) as intended for use in transport and ADR compliance must be determined for those locked position(s).

If a swivel seat is able to be locked in a position other than as certified as a *designated seating position*, then a durable and permanent label must be provided in a visible location adjacent to the seat warning prospective users that the seat can only be safely used in certain positions. The label must have lettering that is at least 6mm in height and must display a message similar to that shown in Figure LH15.

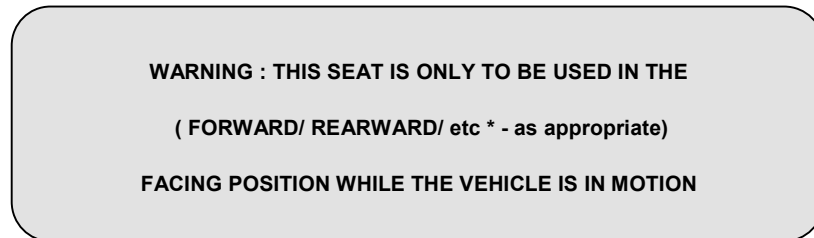


Figure LH15 Warning Label for Swivel Seats

Seats which are additional to the minimum number of seating positions intended for use when travelling, need not comply with seat strength and seatbelt requirements specified. However if these seats are not certified and no seatbelts are fitted, these seats must not be occupied while the vehicle is in motion on public roads.

To warn prospective users of the status of the seats fitted to a motorhome, it is recommended that a durable and permanent label or plaque be fixed in a conspicuous position inside the motorhome. The label must have lettering that is at least 6mm in height and must display a message similar to that shown in Figure LH16. The label should also include a seating plan that identifies with an X, the seats that must not be used when the vehicle is being used on public roads.

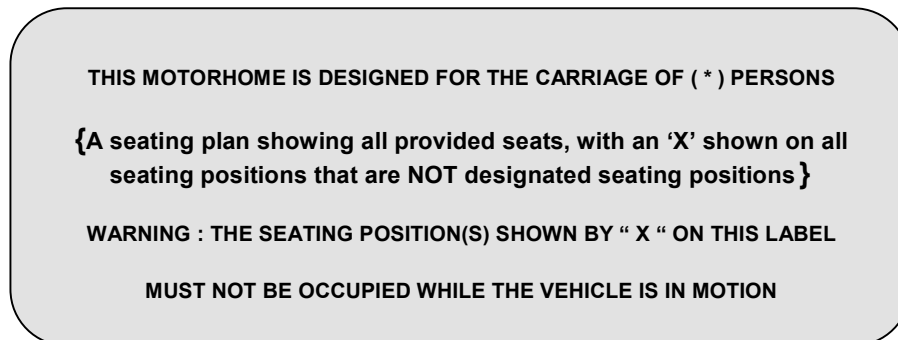


Figure LH16 Warning Label Including Seating Plan (for seats that must not be occupied when the vehicle is being used on public roads)

5.4 Seatbelts

Note: Refer to Section LK *Seating and Occupant Protection* for more detailed information about the installation of Seatbelts and Seatbelt Anchorages.

To determine the vehicle category after conversion, the following calculations must be performed:

- Multiply the number of designated seating positions by 68 kg;
- If the calculated mass is less than 50% of the difference between the GVM and the Unladen Mass then the vehicle is classified as a goods vehicle (provided there is an area available for goods to be carried). The requirements for an NA, NB or NC ADR category vehicle will apply as appropriate; or
- If the calculated mass is more than 50% of the difference between the GVM and the Unladen Mass, then the vehicle is classified as a passenger vehicle. The requirements for a MA, MB, MC or MD ADR category vehicle will apply as appropriate.

The seatbelt fitting requirements depend on the vehicle's ADR category. In most cases, vehicles converted to a motorhome will be in either the MB or MC passenger vehicle categories or in the NA or NB goods vehicle categories.

Seatbelts must be fitted to all designated seating positions. ADR 5/... specifies the type of belt anchorages required depending on the category and age of the vehicle.

The structural integrity of existing seatbelt anchorages must be maintained by ensuring that all original mounting and reinforcing sections are retained.

General requirements for seatbelts are as follows:

- Forward facing seating positions which are within 200mm of the internal sidewall of the vehicle must be provided with lap sash seatbelts;
- Side facing seats must only be fitted with lap type seatbelts; and
- The seatbelts fitted must comply with Australian Standard (AS) 2596.

Seats, in addition to designated seating positions, are not required to be ADR compliant, and do not need to be provided with seatbelts, child-restraint anchorages or any other equipment that may imply they are suitable for use in transport.

Note: Under no circumstances should seatbelts or child restraints be attached to non-complying seats.

5.5 Child Restraint Anchorages

Note: Refer to Section LK *Seating and Occupant Protection* for more detailed information about the installation of Child Restraint Anchorages.

Child restraint anchorages must be fitted if specified for that category of vehicle. If the vehicle has more than one row of seats, a child restraint anchorage is required for each forward facing seat, excluding the front row, up to a total of three.

Where the seat back is divided into two or more sections which may be folded independently of each other and the division lies close to the centre of a seating position, then a child restraint

anchorage must not be fitted for that position.

5.6 Safety Glazing Material and Applied Window Tinting

Requirements for safety glazing materials for windscreens, windows and internal partitions, together with information on window tinting by means of applied surface films are contained in Section LZ *Appendices Appendix G Safety Glazing Material and Applied Window Tinting*.

5.7 Access and Ventilation

Suitable access must be provided to both the travelling and living areas of the motorhome. The motorhome must have outward opening or sliding doors. At least one of these doors must be located on the left hand side or at the rear of the vehicle.

Sufficient ventilation must be provided for all vehicle occupants, both when travelling and stationary. Unless other satisfactory means of ventilation are provided, at least 50% of the windows must be able to be opened.

Adequate permanent ventilation must be provided for all gas appliances.

5.8 Liquefied Petroleum Gas (LP Gas) Installations

The ADRs specify certification requirements for LP Gas used both as a fuel for motor vehicles and also for installed equipment, such as stoves and refrigerators.

Gas operated appliances and gas containers must comply with the requirements of Australian Standard AS 5601 - *Gas Installations*, current at the time of installation.

In addition, any specific installation requirements specified by the appliance manufacturer, such as ventilation, and minimum clearance requirements, must be complied with.

Note: State and Territory jurisdictions responsible for gas installations and/or safety may have specific requirements under their own legislation. Manufacturers/modifiers must abide with these requirements.

5.9 Electrical Installations

Electrical installations must comply with AS/NZS 3001 - *Electrical Installations – Transportable structures and vehicles including their site supplies*, current at the time of conversion.

Note: State and Territory jurisdictions responsible for electrical installations and/or safety may have specific requirements under their own legislation. Manufacturers/modifiers must abide with these requirements.

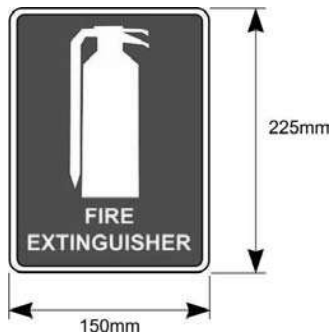
5.10 Fire Extinguisher

At least one fully charged and maintained fire extinguisher equipped with a hose must be installed in each vehicle in accordance with the latest version of AS 2444 *Portable fire extinguishers and fire blankets - Selection and location*, current at the time of motorhome/campervan conversion, in a position so as to be readily available for use in an emergency (refer to Figure LH17).

Each fire extinguisher must have an AS/NZS 1850 *Portable fire extinguishers – Classification, rating and performance* approval mark, showing it has a fire test rating of at least 5B.

The fire extinguisher mounting bracket(s) must be designed and fitted so that the extinguisher is not likely to become dislodged during normal vehicle operation.

If a fire extinguisher is fitted inside a cupboard, locker or bin the following sign must be affixed in a location adjacent to that enclosure so as to be clearly visible:



The sign must show a white fire extinguisher on a red background with a 5mm white border showing the words *Fire Extinguisher* in letters at least 16mm high.

Detailed requirements for this sign are specified in Australian Standard AS 2444.

Figure LH17 Fire Extinguisher Sign (Illustration Only)

Note: vehicles with multiple living compartments must have a complying fire extinguisher installed in each compartment in a position so as to be readily available for use in an emergency.

5.11 Television and Visual Display Units

Any television receiver or visual display unit and associated equipment must be securely mounted in a position which:

- does not obscure the driver's vision;
- does not impede driver or passenger movement in the vehicle;
- is unlikely to increase the risk of occupant injury; and
- unless it is a driver's aid, has no part of the image on the screen visible to the driver, directly or by reflection, when viewed from the normal driving position.

5.12 Toilets Sinks and Showers

Any toilet, sink or shower fitted to the vehicle must comply with the following:

- The contents of the toilet pan or urinal must not discharge directly onto the road but must empty into an externally vented tank which is securely attached to the vehicle;
- The contents of any basin, sink or shower must not drain into any toilet pan, urinal or into any other tank into which a toilet pan or urinal empties; and
- The toilet, urinal and tank must vent directly to the atmosphere.

6 ROOF MODIFICATIONS

Many campervans have roof modifications to allow occupants to stand upright whilst in the rear of the vehicle. The most popular conversions include *pop-tops* and *high-top* conversions which are known by a variety of commercial names.

These modifications may involve the complete or partial removal of the roof, roof support beams or cant rails. These modifications have the potential to reduce the strength and thus the safety of the vehicle. High-top conversions also have the potential to increase the centre of gravity of

the vehicle if careful attention is not paid to the final design. Designers of this type of modification must ensure that:

- the strength of the roof is maintained with adequate perimeter bracing and roof support beams wherever necessary;
- there are no sharp edges or protrusions as a result of the modifications which may cause injury to occupants of the vehicle;
- the centre of gravity of the vehicle is not increased to the point where handling, and thus the safety of the vehicle, is compromised; and
- removable bunks and mattresses intended for use in the *hi-top* or *pop-top* area can be safely stored or locked down whilst the vehicle is in motion.

7 INSPECTION

An inspection must be carried out on the structurally completed vehicle prior to painting and trimming of all modified areas.

Previously modified vehicles that are being assessed must have all trim etc. removed to allow a thorough inspection of all modified areas.

A final inspection is to be carried out on the converted vehicle when it is in a condition suitable for registration.

8 RECORDS

The signatory must hold a copy of all drawings, specifications, test results and any other data necessary to fully describe the vehicle modifications. Further details of record keeping requirements are specified by the Registration Authorities under their business rules and/or administrative procedures.

CHECKLIST LH11
CAMPERVAN, MOTORHOME CONVERSION
CODE LH11

(N/A=Not Applicable, Y=Yes, N=No)

1.	DESIGN			
1.1	Is the vehicle's general mechanical and structural condition sound?		Y	N
1.2	Is there enough space available for seating, bunks, stove, sink, refrigerator and general living requirements?		Y	N
1.3	Is the payload capacity of the vehicle sufficient to accommodate the additional weight of equipment, accessories, passengers and luggage?		Y	N
1.4	Are all dimensions within regulatory limits?		Y	N
1.5	Are all body components properly fabricated?		Y	N
1.6	Are any additional or replacement mechanical components certified (where necessary) under the appropriate codes of VSB 6?	N/A	Y	N
2.	COMPLIANCE WITH ADRS			
2.1	Does the vehicle continue to comply with all the applicable standards and ADRs, including the requirements in ADR 42/... and ADR 44/... that apply to this vehicle?		Y	N
3.	GENERAL SAFETY REQUIREMENTS			
3.1	Have all relevant requirements of Clause 6 <i>General Safety Requirements</i> of this code been complied with?		Y	N
4.	WORKMANSHIP			
4.1	Is all work, including welding, of satisfactory quality and has all work been performed in accordance with recognised engineering standards?		Y	N

(Continued overleaf)

4.2	Do all fasteners comply with the applicable requirements of Section LZ <i>Appendices - Appendix A Fasteners</i> ?	N/A	Y	N
4.3	Does the quality of welding comply with the applicable requirements of Section LZ <i>Appendices, Appendix C Heating and Welding of Steering Components</i> ?	N/A	Y	N
4.4	Are all panels (where relevant) fully sealed to prevent ingress of exhaust gases?	N/A	Y	N
4.5	Are all sharp edges capped or covered?	N/A	Y	N
5	ROOF MODIFICATIONS			
5.1	Have all issues to do with the fabrication of the roof conversion been adequately addressed?	N/A	Y	N
6.	RECORDS			
6.1	Have complete records of vehicle details and conversion/construction been retained in a manner suitable for auditing?		Y	N

Note: If the answer to any question is **N (No)**, the modification cannot be certified under Code LH11.

CERTIFICATION DETAILS															
Make						Model						Year of Manufacture			
VIN															
Chassis Number (If applicable)															
Brief Description of Modification/s															
Vehicle Modified By															
Certificate Number (If applicable)															
Vehicle Certified By (<i>Print</i>)															
Signatory's Employer (If applicable)															
Signatory's Signature												Date			