

Office of Gas Safety



***Guide to Gas
Installations in
Caravans &
Mobile Homes***

CONTENTS

GAS INSTALLATIONS IN CARAVANS AND MOBILE HOMES

	Page
Introduction	2
Cylinder requirements	2
Cylinder installation	2
Cylinder compartment	3
Cylinder regulator	4
Consumer piping	4
Appliance installation	6
Air supply to appliances	8
Required consumer instruction labels	8
Clearances around a cooking appliance	9
Protection of a combustible surface near cooker	9
Commercial catering equipment	9
Prohibited locations – instantaneous waters heaters	9
Location of flue terminal	9
Safe hot water storage & delivery	9

IMPORTANT!

If a vehicle engine is fuelled by Autogas (automotive LPG), the gas installation must operate on commercial propane from a separate storage system.

Introduction

This document provides guidance to the requirements of AS 5601 for gas installations in caravans and mobile homes. AS 5601 should be consulted for the full requirements.

Compliance Notices

As set out in Building Act 1993, a Compliance Certificate is required by the Plumbing Industry Commission from a licensed plumber for the installation, relocation or replacement of any gas-using appliance; and the installation, modification, or relocation of consumer gas piping carried out in the State of Victoria.

A Gasfitting Notice is required by the Office of Gas Safety from a licensed plumber for work involving–

- Permanent on-site caravans which are connected to a common LPG tank system or billing meter.
- Mobile Catering Vehicles, vans, trailers, transportable catering sheds

A caravan is defined in AS 5601 as being –
A structure that is or was designed or adapted to be moved from one place to another, whether towed or transported, which is intended for human habitation or use as a workshop, and includes a self-propelled recreational vehicle.

NOTE: A large structure assembled in a factory and transported to a permanent location is not considered a caravan, eg portable school classrooms or transportable homes.

The definition includes, but is not limited to

- Caravans
- Mobile homes
- Camper trailers
- Fold-up trailers with fixed gas installation
- Transportable or mobile food vans

In this guide –

OGS advice is provided in boxed print.

Cylinder requirements

A cylinder shall comply with AS 5601 Clause J1.

NOTE: A cylinder must not be installed or used unless its surface or protective coating is suitable for the conditions of use (AS 1596).

Required clearances around a cylinder

Clearances around a cylinder shall comply with AS 5601 Appendix J.

NOTE: Figures J2(b) & J3(b) depict a building, however the clearances are relevant to caravans.

Restriction on location of a cylinder

A cylinder shall not be installed inside a caravan unless it is in a compartment that meets the requirements of AS 5601.

Minimum clearance above the ground

Where a gas installation is designed such that the cylinder is to remain connected to the consumer piping while the caravan is moving, the minimum clearance between a cylinder or the cylinder support and ground shall be 200 mm.

NOTE: In the case of a caravan used for commercial application, the cylinder is to be installed with as much ground clearance as possible. However, the clearance is never to be less than the minimum road clearance of the caravan under maximum spring deflection

Location of a cylinder

Where a gas installation is designed such that the cylinder is to remain connected to the consumer piping while the caravan is moving, the cylinder shall be installed using one of the following methods:

- (a) Mounted externally on the draw bar of the caravan or in a similarly secured location on the caravan wall which would normally face the towing vehicle.
- (b) In a cylinder compartment within the profile of the caravan or on the draw bar of the caravan.
- (c) In a fully open recess within the profile of the caravan and which is vapour-proof to the inside of the caravan.

Cylinders to be upright

A cylinder shall be installed upright with the valve uppermost.

NOTE: This is to ensure the inlet to the safety valve always remains in the vapour space clear of the liquid content of the cylinder.

This applies to all cylinders, full or empty.

Securing of cylinder

Where a gas installation is designed such that the cylinder is to remain connected to the consumer piping while caravan is moving, the following shall apply:

- (a) The cylinder or cylinder carrier is to be rigidly secured so that its fastenings are capable of withstanding a steadily applied load equal to four-times the weight of the filled cylinder; and
- (b) The cylinder mounting method is to be capable of withstanding this applied load from any direction.

Identification of cylinder compartment

A durable label as shown below shall be attached in a prominent position adjacent to the cylinder compartment.

The label is to be of Retroflective red to AS 1743, Appendix C, Class 2.
Lettering and symbol to be white.
All lettering 15 mm high minimum.
Label 150 mm by 50 mm minimum.

**Requirements for cylinder compartment**

A cylinder compartment shall comply with the following as appropriate

- (a) Be designed to —
 - (i) House cylinder(s) and their associated equipment only;

A cylinder installed in the boot of van is to be partitioned off from the general storage section. The partition is to extend to lid of boot.

- (ii) Allow the cylinder(s) to be positioned in the compartment without obstructing the drain in (g); and
 - (iii) Not have access from the inside of a caravan to a cylinder installed in a compartment
 - (iv) Permit easy removal of the cylinder(s) and the operation of the cylinder valve(s)

NOTE: Consideration should be given to the location of the associated equipment when determining the compartment size to enable requirement (iii) to be satisfied.

- (b) Be constructed of material that is water and corrosion resistant.
- (c) Be capable of securing the filled cylinder(s).
- (d) Be sealed to prevent gas vapour from entering caravan.
- (e) The access door or opening shall be openable without the use of tools.
Note: A key is not regarded as a tool.
- (f) Have a drain in the base which has a minimum diameter of 25 mm and terminate at a point which faces away from the forward direction of travel of the caravan and is directed away from and-

- (i) at least 1 m from any opening into the caravan, unless the opening is at least 150mm above the drain outlet.
 - (ii) at least 1.5 m from any source of ignition unless the ignition

source is at least 500 mm above the drain outlet.

- (g) Not contain any electrical equipment other than a non-sparking shut-off device.

The shut-off device is usually a gas detection system solenoid valve
No lights or electrical equipment are permitted in a cylinder compartment.

Cylinder regulator

AS 5601 requires the regulator to have over-pressure protection

Connection of cylinder regulator to the cylinder

A cylinder regulator shall be rigidly fixed to the caravan or other rigid mounting, positioned with the diaphragm vertical and the vent pointing vertically downwards and be protected against the weather. It shall be connected to the cylinder by-

- (a) A hose assembly with a minimum length of 300 mm with an excess flow valve fitted immediately upstream of the hose assembly; or
(b) Acceptable tubing which is formed into a loop.

The hose assembly shall be to AS 1869 Type C – and be appropriately marked.

Maximum outlet pressure

The cylinder regulator shall be adjusted to ensure the maximum outlet pressure does not exceed 3 kPa with all connected appliances operating

Consumer piping

Piping not to be subject to physical damage

Consumer piping shall not be located where physical damage to the pipe is likely to occur, unless adequate protection is provided.

NOTE: This would preclude the fitting of pipe to the underside of the chassis or below the chassis unless the piping is adequately protected.

Usually pipe under a van will have a protective coating, but must still be installed where it cannot be damaged.

Restriction on joints in consumer piping

There shall be no joints in consumer piping-

- (a) in locations which are not readily accessible.
(b) between the branch point and manual shut-off valve; or
(c) where the pipe passes through a sleeping accommodation area or through an engine compartment.

The engine compartment could be in a commercial food van or mobile home.

Restriction on use of a hose assembly as consumer piping

The use of a hose assembly as consumer piping is restricted as follows:

- (a) The installation is to have one appliance only.
(b) The hose assembly is to be in one continuous length from the outlet of the cylinder regulator to the inlet of the appliance.
(c) The hose assembly is to be supported

The hose assembly shall be to AS 1869 Type C and be appropriately marked.

Pipe and fittings

Pipe and fittings shall be free from defects and comply with the following table.

MATERIALS FOR CONSUMER PIPING SYSTEMS IN A CARAVAN

Section of piping system	Materials	
	Pipe	Fittings
Between cylinder and regulator	Copper tube to AS 1572 having an alloy designation 122 to AS 2738 Part 2, with a minimum wall thickness of 1.22mm and nominal size of 6mm	Copper alloy flared compression fitting to Fig. 8.1 of AS 3688 Copper or copper alloy capillary fitting to Fig. 5.2 of AS 3688 (Note 3)
	Non-metallic hose assembly to AS 1869 Type C with an excess flow valve immediately upstream of the hose assembly	POL fitting and tail piece
From outlet of regulator to appliance	Non-metallic hose assembly to AS 1869 Type C	End couplings threaded to AS 1722 Part 1
	Copper tube to AS 1432 Type B	Copper alloy flared compression fitting to Fig. 8.1 of AS 3688 Copper alloy flared compression fitting to Fig. 8.1 of AS 3688 Copper or copper alloy capillary fitting to Fig. 5.2 of AS 3688 (Note 3) Junction formed in hard drawn tube using an appropriate mechanical branch forming tool Socket formed using an appropriate tube expanding tool

NOTES

1. Clause J2.8 restricts the length of this connection to 1 m
2. The excess flow valve may be an integral part of the POL fitting
3. For joining methods and material refer to AS 5601 Table 3.1

Main run of consumer piping to be located outside the caravan

Where more than one appliance is to be installed, the main run of the consumer piping system shall be located outside the caravan.

Consumer piping design

Where more than one appliance is to be installed, the design of the consumer piping system shall be that -

- (a) each appliance is connected separately to the main run; and
- (b) the branch pipe enters the interior of the caravan adjacent to each appliance.

Protection of piping where penetrating a partition, floor or structural member

Where consumer piping penetrates a partition, floor or structural member, the pipe shall be protected against abrasion.

NOTE: A rubber grommet, or the like, fitted to the piping, will satisfy this requirement.

Flexibility of consumer piping system

To avoid the loosening of any component within a consumer piping system, the system shall be designed with allowances for -

- (a) thermal expansion and contraction.
- (b) movement between sections of the structure; and
- (c) vibration of the structure.

NOTE: See Clause 4.2.5 .for methods of providing flexibility within the piping system

Hose assembly for connecting an appliance to consumer piping

A hose assembly used to connect rigid consumer piping to an appliance shall -

- (a) not exceed 1.2 metres; and
- (b) be of adequate diameter for the maximum gas consumption of the appliance.

The hose assembly shall be to AS 1869 Type C – and be appropriately marked.

Pipe support – Requirements and spacing

Consumer piping shall be secured to the structure by suitable non-ferrous metal clips which are compatible with the pipe material. The spacing of the clips shall not exceed those detailed below.

SPACING OF PIPE SUPPORTS

Pipe type	Maximum spacing of pipe supports		
	Vertical run mm	Horizontal run mm	At change of direction or junction
Metal	1250	600	To be between 100mm and 150mm of each side of a change of direction or junction
Hose	750	300	

Appliance installation

Prohibited appliances

The following appliances shall not be installed in a caravan:

- (a) A flueless water heater.
- (b) Unless specifically approved by the Authority, an appliance which is designed to operate at a pressure exceeding 2.75 kPa.
- (c) A space heater, other than a room-sealed type.

NOTES:

1. An appliance that is permanently fixed in place or an appliance that is fitted in a location where it is intended to be used or likely to be used is deemed to be installed
2. There are other requirements for the installation of a flueless space heater in a transportable home. See AS 5601.

Required clearance between appliance and fuel filler cap or vent

Except for caravans fuelled by diesel, the minimum clearance between a fuel filler cap or fuel tank vent and an appliance flue or combustion air intake shall be 1 m.

Manual shut-off valve required

A manual shut-off valve shall be provided on the inlet connection of every appliance. The valve shall be accessible for operation.

Appliance to be secured

An appliance shall be suitably secured to minimise movement or vibration of the appliance and to minimise strain being imparted onto the appliance connection.

Appliance flueing

An appliance designed to be connected to a flue shall be fitted with a flue which -

- (a) Meets the requirements of AS 5601; and
- (b) has a minimum clearance of 50 mm between the lowest opening of the flue cowl and the outer surface of the caravan.

Normally the requirement is for a flue cowl to be above a roof line. For a caravan, the flue cowl need only comply with (b) above.

Installation of a refrigerator

A refrigerator shall be installed to comply with one of the following;

- (a) Be installed with means to exhaust the combustion products to outside atmosphere and terminate at a point not less than 100 mm from an opening into the caravan; or
- (b) Be installed within a sealed recess which complies with the requirements of AS 5601.

Piping must be installed sufficient to allow for future disconnection and re-connection.

Connection of a wall-mounted gas light

The final connection of a wall-mounted gas light shall be of adequate length to enable the connection to be examined and leak tested without disconnection.

Air supply to appliances

An area in a caravan where an appliance, other than a room-sealed type, is installed shall have two openings. The openings shall-

- (a) provide permanent and unrestricted ventilation;

NOTE: In the case of a pop-up type recreation caravan, ie. one where only the roof extends, the requirements of (a) needs to be satisfied whether the top is up or down. However, in the case of a camper-trailer, ie. one which folds to a trailer profile, the requirement need only be satisfied when the camper-trailer is fully erected

High and low level ventilation applies to fold out trailer vans when consumer piping is installed. It is the installers responsibility to ensure ventilation for caravans and mobile vans complies with the requirements.

- (b) be located at opposite sides or ends of the area except in the case of pop-up type recreational caravan when the top is down;
- (c) subject to (d) comply with the following Table; and
- (d) each have a minimum free ventilation area calculated using the following formula, but in no case shall the total area of the ventilation openings be less than that given in the table below.

$A = 3 \times T$ where

$A =$ minimum free ventilation area (cm²)

$T =$ total gas consumption of all appliances in the area (MJ/h)

REQUIRED AIR SUPPLY TO FLUED APPLIANCES INSTALLED IN A CARAVAN

Internal length of caravan (m)	Minimum total free ventilation area (cm ²)	Minimum number of openings at each level	Minimum amount of ventilation to be provided at each level	Location of opening	
				Upper level	Lower level (See note)
Up to 4	240	1	50%	To be within 300mm of the highest part of the ceiling or roof	To be within 150mm of the floor
Over 4 and up to 5	300				
Over 5 and up to 6	360				
Over 6	420				

Note: Where the lower ventilation is fitted in the floor the opening is to be located where it cannot be covered.

Required consumer instruction labels

Warning label to be fixed near cooking appliances and gas lights

A permanent durable instruction label shall be fixed in a prominent position adjacent to cooking appliances and gas lights.

The label shall have the following wording
 “WHEN OPERATING THIS APPLIANCE,
 COMBUSTIBLE MATERIALS SHALL BE
 RESTRAINED IN THEIR INTENDED POSITION
 AND POP-UP ROOFS ELEVATED.”

Consumer instructions to be displayed near cylinders

A durable permanent label containing the following instructions shall be fixed in a prominent position adjacent to the cylinder

1. Close appliance valves before opening cylinder valves.
2. Check connection at the appliances, regulators and cylinders periodically for leaks with soapy water or its equivalent. This should be done annually
3. Never use a match or flame when checking leaks
4. Close cylinder valves when appliances are not in use.
5. All appliances must be turned off and cylinder valve closed when not in use or whilst refuelling is in progress.

Consumer instructions to be displayed near an appliance

A printed instruction sheet shall be located in a prominent position near an appliance. The sheet shall be suitably protected from damage and contain the following instructions

1. Close appliance valves before opening cylinder valves.
2. Check connection at the appliances, regulators and cylinders periodically for leaks with soapy water or its equivalent. This should be done annually
3. Never use a match or flame when checking leaks
4. Close cylinder valve when appliances are not in use
5. All appliances must be turned off and cylinder valve closed when not in use or whilst refuelling is in progress
6. In the event of an accidental gas leak, close cylinder valve and ventilate the caravan until air is clear
7. Never use cooking appliances for comfort heating
8. In the event of fire, immediately close cylinder valve

9. Close valve and fit sealing plug to all spare cylinders not connected, whether full or empty.
10. All additions or alterations to the LP Gas system shall be performed by an authorised person. (consult your LP Gas supplier).
11. Appliances shall not be altered without the approval of the Authority.
12. Persons should familiarise themselves with the odour of unburnt LP Gas to assist in the early detection of leaks.
13. All permanent ventilators, flues and vents should be checked regularly to ensure that they are clear.

Clearances around a cooking appliance

The minimum clearances and means of protecting combustible surfaces around a gas cooker are given in AS 5601.

The Office of Gas Safety has granted a blanket exemption to allow the clearance to a range hood to be lowered to 400 mm, as follows -

Rangehoods and exhaust fans shall be installed in accordance with the manufacturer's instructions. However, in no case shall the clearance between the highest part of the hob of the cooking appliance and a rangehood be less than 400 mm or, for an exhaust fan, 750 mm

Protection of a combustible surface near a cooking appliance

The protection required by AS 5601 shall ensure the surface temperature of a nearby combustible surface does not exceed 65°C above ambient.

Slide-in cooking appliances

Slide-in cooking appliances shall have means to prevent gas flow when in the stored position.

Commercial catering equipment

The installation of commercial catering equipment shall comply with the general requirements given in AS 5601 and the manufacturer's installation instructions.

Prohibited locations for water heaters

An instantaneous water heater, other than a room sealed type, shall not be installed in a-

- (a) bedroom;
- (b) bathroom
- (c) toilet; or
- (d) combined living/sleeping room

Location of a flue terminal of a balanced flue appliance, room sealed appliance or an outdoor appliance

The location of the flue terminal of a balanced flue appliance, room sealed appliance or an outdoor appliance shall comply with AS 5601, Figure 5.3

This clause includes water heaters approved for caravans. Flue terminal to be at least 500 mm below or to side of any opening into caravan.

Safe hot water delivery and storage**Hot water delivery**

Where hot water is provided to fixtures and appliances used primarily for personal hygiene, such as a shower in a caravan it shall be delivered at a temperature not exceeding 50° Celsius to avoid the likelihood of scalding.

Hot water storage

Hot water shall be stored at a minimum of 60° Celsius so as to inhibit the growth of legionella bacteria.

Authorised by:



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