NZMCA Technical Guide – Updated Sections

Sec/page	Description of change
Page 9	Update to #5 Observed Inspections
Page 11	Update to #93 Conflict of Interest
A2 Page 21	Update to Portable Freshwater tank storage in tow vehicles
B1 Page 30 Page 31	Added new toilet model images Added resource links for new toilet models
B3 Page 33 Page 33 Page 37	Update to toilet fixing information for brackets/mounts Added resource links for toilet fixings Added examples of portable toilet fixings
C1 Page 44	Update to Portable wastewater tank storage in tow vehicles
C6 Page 49	Waste Tank Capping Update
D2 Page 52 Page 52 Page 55	Amended Performance Measure and Technical Explanation Amended Practical Inspection Tips Added Poppet Valve Information
	Amended Vehicle Inspector to Self-Containment Inspector and VI to SCI throughout the document

Observed inspection - #5 – Page 9

Question 5 records the identification number of either the trainee or the observing Self-Containment Inspector. This information will be documented in the database when the inspection is processed.

The observation process is a key component of the NZMCA self-containment programme. It not only allows National Office to keep track of trainee self-containment inspector progress but is also a way to keep track of peer observations completed throughout the year. This process aligns with Regulation 6(d) and (e) and allows National Office to accurately document this information on the inspection form in order to maintain the NZMCA training and observation records in a comprehensive manner.

The inspection form utilised by the NZMCA serves to document the training progress of Self-Containment Inspectors. As part of their training, Trainee Self-Containment Inspectors are required to observe a minimum of 15 inspections conducted by a qualified Self-Containment Inspector.

The observer section will also be utilised in the peer observation process conducted by the Self-Containment Inspector. A secondary self-containment inspector from NZMCA will supervise a vehicle inspection as part of the routine audit process.

Furthermore, both the trainee and/or observer are required to sign off on the inspection on page 4 of the form.

Possible conflict of interest – #93

NZMCA as a certifying authority is required by law to manage any substantial conflicts of interest, and we look at these on a case-by-case basis. The Regulations require any personal interest or obligation a self-containment inspector may have in the vehicle to be recorded. Conflicts of interest include, but are not limited to, being the vehicle owner, an employee of the vehicle owner or an outside influence that could affect the self-containment inspector's judgement.

Certain conflicts of interest should be avoided unless there is no alternative option.

Examples of possible conflicts of interest:

- Your own vehicle
- A relative's vehicle
- A close personal friends' vehicle
- An Employee/Contractor of an NZMCA Preferred Commercial Operator

If a conflict of interest is apparent, another self-containment inspector MUST carry out the inspection to maintain impartiality. An exception to this would be if the vehicle owner were in a remote area and did not have reasonable access to another self-containment inspector.

If you are unable to avoid a conflict of interest, the following steps MUST be taken to ensure the conflict of interest has been declared:

Step 1 – SCI to declare possible conflict of interest by ticking #93 of the inspection form

Step 2 – SCI to explain in comments section the nature of the possible conflict

Step 3 – Programme Lead (Self Containment) to assess submitted inspection form in light of declaration and, if necessary, contact the SCI to discuss.

Step 4 – Programme Lead will either (a) approve inspection form to be processed or (b) request vehicle to be re-inspected by another SCI.

A2 Water tanks' volume

Relevant inspection sheet questions 20 and 100

Purpose of these questions?

The volume of storage of freshwater helps determine the number of occupants a camping vehicle can accommodate. This volume measurement is reported on the self-containment certificate. Question 100 requires the Self-Containment Inspector to make a judgement on how many people the vehicle can accommodate for a minimum period of three days. This number is a function of the volume of freshwater stored in the vehicle as shown in the 'NZMCA Standards' table on page 4 of the Vehicle Inspection Form.

Performance measure

The Regulations require a vehicle's freshwater storage to be of sufficient size, volume, and durability to be able to operate for a minimum of 3 days for the maximum number of occupants for which the vehicle is certified. This volume measure is provided in the 'NZMCA Standards' table on page 4 of the Vehicle Inspection Form and can be applied to individual vehicles to at least 95% of these figures.

Technical explanation

Freshwater can be stored in fitted onboard tanks or portable tanks. These tanks must be suitably supported (see **Guidance A3**) and capped (see **Guidance A5**). The volume of stored freshwater is the sum of all tanks in or on the vehicle which are dedicated solely to contain freshwater. This volume is recorded as an answer to Question 20.

Practical inspection tips

Freshwater is commonly stored either in tanks fitted to the vehicle (beneath the floor or in a cupboard) or in portable tanks which are stored outside the vehicle when it is being used for camping. Some vehicles have a combination of both options.

The volume of onboard tanks may be recorded on a name plate in the vehicle or on the tank (US and Canadian vehicles have this). This volume may be reported in gallons. Examples of converting gallons to litres are provided below.

The volume of onboard tanks may also have been recorded in certificates issued under NZS 5465:2001. Self-Containment Inspectors should check that the tanks have not been changed since this previous inspection. A new volume measure should be done if there is some doubt. Here is a worked example of a volume measure

Worked example of volume measurement

Length = 0.56m, Width = 0.43m, Depth = 0.21m

Multiply 0.56 x 0.43 x 0.21 = 0.5057 x 1000 = 50.57 litres round down to 50 litres.

(There are 1000 litres in 1 cubic metre)

Portable freshwater tanks commonly come with wheels and vary in size from 20 litres to 50 litres. The volumes may be recorded on the tanks or can be determined by searching the tank model on the manufacturer's website. Examples of these tanks are provided here and links to some manufacturers' sites are provided below.

Portable freshwater tanks

Aqua Roll Fresh Water Tank – 40 litres

Fiamma Fresh Water Roll Tank – 40 litres

Freshwater tanks stored in/on tow vehicles are not counted in the inspected vehicle's tank volume. This is because there is no guarantee the tanks will be available when the camping vehicle is occupied, or if the tow vehicle is not with the camping vehicle.

Portable freshwater tanks that are transported in tow vehicles can still be counted in the vehicles tank volumes, as long as they are set up with the motorhome/caravan at the time of inspection. A note should be added to the pass comments reflecting this to ensure the owner is aware the tow vehicle must be with the caravan in order to remain certified.

Conversions from gallons to litres

Tank volumes may be reported in UK or US gallons rather than litres. The conversions are as follows:

UK gallons to litres - multiply by 4.55 | 8 (UK) gallons x 4.55 = 36.4 litres – round down to 36 litres.

US gallons to litres - multiply by 3.79 | 10 (US) gallons x 3.79 = 37.9 litres – round up to 38 litres.

Links to useful resources

None at this stage.

B1 Toilet type, make and model

Relevant inspection sheet questions 34, 35, 36 and 45.

Purpose of this question?

Details of a vehicle's toilet are required to be recorded on the self-containment certificate. Although the required information is straightforward these details are critical to whether a vehicle can be certified under the government's self-containment programme, or the NZMCA's internal scheme.

Technical explanation

Vehicle toilets can either be fixed or portable. Fixed toilets can either be fitted to a holding tank (known as a blackwater tank) or have a built-in but removable cassette for containing toilet wastes. All portable toilets have removable cassettes. Some toilets are said to be waterless which include composting, organic and incinerating toilets. Waterless toilets are dealt with in more details in **Guidance B7.**

Fixed with a blackwater tank – this type of toilet is most often referred to as a marine toilet where the human waste is flushed into a tank fitted beneath the floor. Water is sometimes drawn from the vehicle's freshwater supply for flushing (e.g. Thetford Aqua Magic – marine toilets) and these should be fitted with a backflow prevention device.

Fixed with cassette – this type of toilet is designed to be fixed to the floor of the vehicle and has a removable cassette above floor level. Common models are the Thetford C range. See **Guidance B3** for details of compliant toilet fixing.

Fixed and waterless toilets may be referred to as compositing, organic or incinerating type toilets. Most toilets in this range have a removable cassette or container above floor level although one brand (Clivus) has a composting chamber beneath the floor. The performance and level of compliance of waterless toilets are discussed in **Guidance B7**.

Portable toilets do not meet the Regulations and vehicles reliant on them cannot be certified with a green warrant card. These vehicles can still be certified under NZMCA's yellow warrant card system.

Practical inspection tips

Toilet type – the type of toilet is easily identified and will be one of the four categories listed in the tick box for Question 34. There may be a question over whether a cassette type toilet is fixed or portable. Some vehicle owners may have done a DIY alteration to a portable toilet or porta-pottie to meet the Regulation's requirements for a fixed toilet. This question is dealt with in **Guidance B3**. If a portable toilet is not fixed in accordance with the requirements in Guidance B3 it cannot be defined as a fixed cassette toilet. Examples of toilet types are provided below.

Toilet make – most of the toilets in vehicles are either Thetford or Dometic makes. Numerous unbranded models started to appear following the Christchurch earthquakes and most likely have been manufactured in China. Other off-shelf brands available in New Zealand include TMC, Clivus, Sunmar, Cinderella, Seperatt. Burnsco have a range of self-branded portable toilets. If the toilet-make is recorded as "Other" on the inspection form remember to record the make in the comments section on page 4.

Toilet models – virtually all toilet brands have a model number or identifier. Identifying the model of the toilet may be important for confirming its specifications and from this the volume of its cassette/container and the extent to which it meets the Regulation's requirements. If the toilet model is not easy to identify ask the owner to remove the cassette as the model number may be on the cassette or cassette cavity – see illustration below

Examples of common types of toilets found in camping vehicles

Fixed blackwater toilets

Jabsco Manual Toilet

Jabsco Compact Electric Toilet 12V

Fixed cassette toilets

Thetford 402 Cassette Toilet

Dometic Cassette Swiveling Toilet

Portable cassette toilets

Thetford 165 Qube portable toilet

Burnsco 10 litre portable cassette toilet

Waterless toilets

Nature's Head Weekender composting toilet

Cinderella Comfort incinerating toilet

New toilet models

Black Moa Cassette

Laveo Dry Flush Toilet

Boxio Composting Toilet

Joolca Gotta Go Toilet

- Joolca – this toilet can be either a cassette or a composting toilet – these are reviewed on a case-by-case basis. Because they have the option of being a cassette or composting toilet, only the model viewed at the time of inspection can be counted.
- Laveo Dry Flush – this toilet is waterless and uses a bag system to contain the waste. The bags come in various sized cartridges which can accommodate different usage amounts. The size of the cartridge and any refills carried on board will determine the number of occupants that this toilet can accommodate. To comply with the regulations this toilet will need to be fixed in place with the Laveo Dry Flush floor mounting kit. It should be installed with locking nuts, to prevent the toilet from being removed from the vehicle.

Identifying a toilet's model number on a Thetford C256/260 series cassette toilet

Links to useful resources

Thetford's range of toilets - https://www.thetford.com.au/shop/product-category/toilets/

Burnsco's range of toilets - https://www.burnsco.co.nz/boating/plumbing/toilets-sanitation

Black Moa Toilet - https://www.mystenterprise.com/shop/nzcompliant-fixed-cassette-toilet-12l-330#attribute_values=74,12,60,27

Laveo Dry Flush - https://dryflush.co.nz/products/laveo-dryflush-electric-toilet

Boxio - https://myboxio.com/

Joolca - https://www.joolca.co.nz/products/gottago

Composting toilets - OGO and Natures Head - https://goodloos.co.nz/?_gl=1%2Aeurdsq%2A_up%2AMQ..%2A_gs%2AMQ..&gclid=CjwKCAiAtsa9BhAKEiwAUZAszSsm4mGg7om7qxHwC0HCu_9bvjapMqPSD6ctA6-XeurmQhQxNv9dZBoCPZkQAvD_BwE

B3 Toilet fixing

Relevant inspection sheet questions 38, 42, 43 and 44

Purpose of this question?

The Regulations require toilets to be 'rigidly mounted in position' and 'not require removal in order to empty human waste' (Reg 17(1)(b). Assessing compliance with this requirement requires Self-Containment Inspectors to make judgements calls on the permanence of any fixing and the way in which any cassette is removed from the toilet.

Technical explanation

To comply with Regulation 17(1)(b) a vehicle's toilet can be fixed in one of four ways:

Secured directly to the floor with screws or bolts attaching the body of the toilet to the vehicle – most types of fixed toilet fall into this category.

Secured to a plate which itself is fixed to the floor – some waterless toilets are fixed in this way, but portable cassette toilets attached in this way do not comply with the Regulations.

Moulded into or fixed to the walls as a type of integrated toilet / shower cubicle. This arrangement is often found in hire/ex-hire vehicles which have been purposely fitted out with this feature.

Secured to sliding arms which are either attached to the floor or the sides of a storage cupboard or drawer. This approach is common in customised small van campers (e.g. Toyota HiAce) and some camping trailers (e.g. Avan and Jayco).

Secured to a purpose built bracket that has been designed to permanently fix a portable toilet to a motorhome or caravan. The toilet **MUST** be fixed to the bracket only allowing the waste tank to be removed from the vehicle. Brackets are still under review by the PGDB so assumptions should not be made that they will all be compliant. The PGDB may revise their position on the suitability of brackets at any time.

Practical inspection tips

Fixing of portable toilets – there are various purpose-built brackets or mounting kits available that permanently fix a portable toilet to the body of a vehicle. To comply with the regulations, only the cassette/waste container can physically be removed from the vehicle. Some examples of these brackets/mounting kits can be found below. If inspecting a vehicle with a retrospectively fixed portable toilet, images will be required to confirm compliance. Images have been requested by the PGDB to show that at the time of inspection, the self-containment facilities within the vehicle complied with Section 87U(3) of the Plumbers, Gasfitters and Drainlayers Act 2006.

Yellow Warrant Cards – if an NZMCA member requests a yellow warrant card and their vehicle has a portable toilet, the toilet must be usable within the vehicle, including sufficient head and elbow room whenever required, even with the bed made up. The toilet must also be adequately restrained and secured when the vehicle is in motion. The portable toilet can be used externally if it can first be used internally.

Demountable plates fixing a toilet to the floor of a vehicle but require most of the toilet to be detached from the plate for the purpose of emptying and cleaning out the toilet, do not comply with the Regulations.

Toilets in cupboards and drawers which are mounted on heavy duty rails with drawer runners comply with the requirement that a toilet must be rigidly mounted in the vehicle. These toilets can be either

fixed cassette toilets or portable toilets that have been permanently fixed using a fit-for-purpose bracket or mounting kit.

Usability – regardless of how a toilet is mounted it must be in a position which is comfortable and convenient to use at any time – including when the beds are in use – see **Guidance B5**.

Removing Cassettes - cassettes can be removed either externally or internally from the vehicle

Links to useful resources

Fix-A-Potty - https://fixapotty.co.nz/

Laveo Dry Flush - https://dryflush.co.nz/collections/setup/products/floor-mounting-kit-self-containment

Fix'N'Rail - https://www.mystenterprise.com/shop/fix-n-railtm-356?srsltid=AfmBOorAYW4tQ3Oq_jp2eTnb_V4mAFoiGZFVtZabxmtGG1BFyliySbh_#attribute_values=89,91,92,93,94,96

Examples of Portable Toilet Fixings

Fix-A-Potty

Fix-N-Rail

Laveo Dry Flush Mounting Kit

Portable toilets that have been fixed in place with a mounting kit or bracket may comply with the requirements of the regulations. If a vehicle has a portable toilet installed permanently, images are required by the administration team for compliance purposes. The PGDB released guidance on taking photo evidence to support self-containment inspections, allowing certification authorities to show the self-containment facilities within the vehicle complied with Section 87U(3) of the Plumbers, Gasfitters and Drainlayers Act 2006.

The following images are what will be requested, however if you can include these with the inspection form, it will help the team process the certification more efficiently:

1. *Clearly showing how the toilet is permanently fixed and a birds eye view (photo of fittings).*
2. *Clearly showing the cassette removed while the toilet remains permanently fixed in place.*
3. *A wide-angle photo clearly showing the placement of the toilet in relation to the rest of the interior of the vehicle. (photo/s of the interior of the vehicle set up as a whole and where the toilet is situated)*
4. *Any additional photos you feel support this request.*

C1 Volume of wastewater tanks

Relevant inspection sheet questions 47

Purpose of this question?

The volume of storage of wastewater helps to determine the number of occupants a camping vehicle can accommodate. This volume measurement is reported on the self-containment certificate.

Technical explanation

Wastewater can be stored in fitted onboard or portable tanks. These tanks must be suitably vented (see **Guidance D2**) and capped (see **Guidance C6**). Wastewater may be stored separately as greywater and blackwater or combined as blackwater. For the sake of recording a vehicle's wastewater storage, the capacity of toilet cassettes or containers in the case of waterless toilets is not included. The volume of separate blackwater tanks recorded in Question 37 (see **Guidance B2**) should also be included in the reported wastewater tank volumes in Question 47.

The Regulations require a vehicle's wastewater storage to be of sufficient size, volume, and durability to be able to operate for a minimum of 3 days for the maximum number of occupants for which the vehicle is certified. This volume measure is provided in the 'NZMCA Standards' table on page 4 of the Vehicle Inspection Form and can be applied to individual vehicles to at least 95% of these figures.

The PGDB recommends the wastewater tank(s) should:

- have a capacity of not less than the capacity of the water supply tank(s) i.e. a minimum of 12 litres per person
- be durable enough to be able to withstand wear from normal use of the tank(s).

Greywater tank capacity needs to be sufficient to handle the flow of water (it could overflow with a small tank). Note: a monitor, gauge (or eyeglass) can be fitted to the greywater tank to monitor and prevent overflow into the vehicle.

Practical inspection tips

Wastewater is commonly stored either in tanks attached to the vehicle beneath the floor or in portable tanks which are stored outside the vehicle when it is being used for camping. Some vehicles have a combination of these.

The volume of onboard tanks may be recorded on a name plate in the vehicle or on the tank. This volume may be reported in gallons. Examples of converting gallons to litres are provided below.

The volume of onboard tanks may also have been recorded in pervious inspection sheets. Self-Containment Inspectors should check that the tanks have not been changed since this previous inspection and a new volume measure should be undertaken if there is some doubt. Here is a worked example of a volume measure.

Worked example of volume measurement

Length = 1.20m, Width = 0.55, Depth = 0.15m

Multiply 1.20 x 0.55 x 0.15 = 0.99 x 1000 = 99 litres.

Portable wastewater tanks usually come with wheels and may vary in capacity from 23 to 75 litres. The volumes may be recorded on the tanks or can be determined by searching the tank model on the manufacturer's website. Examples of these tanks are provided here and links to some manufacturers' sites are provided below.

Portable wastewater storage tanks

75 litres Roll Tank with monitor

Fiamma Waste Water Roll Tank 40 litres

Wastemaster 38 litres rollaway tank

Thetford SmartTote portable waste holding tank – 54 litres

Wastewater tanks stored in tow vehicles are not counted in the inspected vehicle's tank volume. This is because there is no guarantee that they will be available when the camping vehicle is occupied.

Portable wastewater tanks that are transported in tow vehicles can still be counted in the vehicles tank volumes, as long as they are set up with the motorhome/caravan at the time of inspection. A note should be added to the pass comments reflecting this to ensure the owner is aware the tow vehicle must be with the caravan in order to remain certified.

Conversions from gallons to litres

Tank volumes may be reported in UK or US gallons rather than litres. The conversions are as follows:

UK gallons to litres - multiply by 4.55 | 20 (UK) gallons x 4.55 = 91 litres

US gallons to litres - multiply by 3.79 | 25 (US) gallons x 3.79 = 94.75 litres – round down to 94 litres

C6 Wastewater tanks' capping

Relevant inspection sheet question 56

Purpose of this question?

This is an assessment question which requires the Self-Containment Inspector to determine whether the vehicle's wastewater storage tanks are adequately capped.

Performance measure

All tanks should be adequately capped to avoid leaks from water movement when the vehicle is moving

Technical explanation

The necessity for a cap is straightforward.

Removable wastewater tanks are required to have a cap installed – this is to avoid spillage. As per PGDB vehicle inspection guidance section 3.3, Removable wastewater tanks can be used provided the waste pipe that feeds the tank has an isolating valve and cap (the tank itself requires a cap but no isolating valve).

Practical inspection tips

An appropriate cap should have a bayonet or screw fitting and a rubber seal at the top

Ensure all holes – inlets and outlets, in portable tanks have sturdy secure caps fitted

Examples of tank caps

Screw cap

Bayonet type cap fitted to isolating valve

Male and female fittings with bayonet type cap

Links to useful resources

None at this stage.

D2 Vent pipes

Relevant inspection sheet questions 67, 68, 72, 73, 74, 75 and 97

Purpose of these questions?

Questions 67 and 68 describe the height and location of vent pipes where the location response is recorded on the Self-containment certificate Questions 72 to 75 are assessment questions which require a Self-Containment Inspector to make a judgement that the various parts of the vehicle's ventilation system are sufficient, reliable, and soundly installed. This judgement is also relevant to responses to Question 97

Performance measure

For an installed vent pipe to meet the requirements of the Self-containment Regulations, as per regulation 20(c), it must:

- terminate outside the vehicle and away from its doors, windows or vents,
- be installed at a height that safely prevents wastewater leakage
- be protected against entry by birds or vermin.

Technical explanation

Self-Containment inspectors are required to measure the height of the vent pipe and record this on the Vehicle Inspection Form. How this height is determined is described in inspection tips below. The accuracy of any measurement is expected to be ±50mm. The PGDB guidance section 4.3 states the vent pipe should extend about the flood level of the lowest sanitary fitting.

Every wastewater storage tank in a vehicle should be separately vented to the outside. This includes portable wastewater tanks such as 'rollaways'. The location of the vent pipe should be noted as a Rollaway external vent.

Venting requirements also apply to the waste containers found in waterless toilets – the Regulations define wastewater as blackwater, greywater and 'solid waste material from a waterless toilet'.

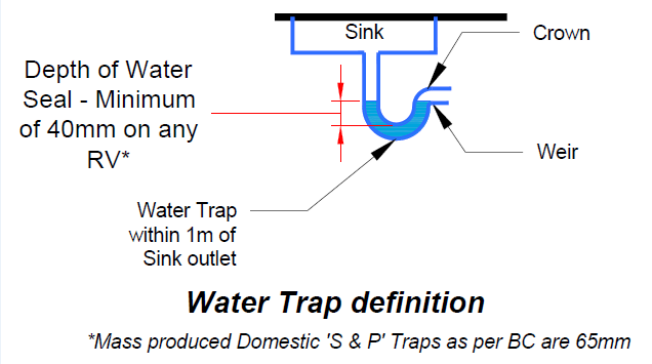
The vent outlet diameter is recommended to be a minimum of 12mm and should be suitable for the fixtures attached to it.

Practical inspection tips

Possible scenarios likely to arise in inspecting wastewater vent pipes:

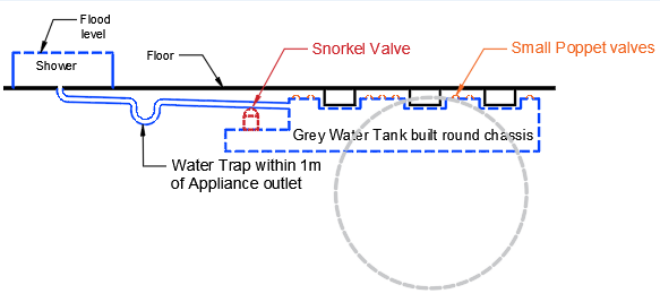
- the vent pipe(s) go through the roof,
- the pipe is an inverted U which terminates under the vehicle's floor,
- the pipe comes out through the wall of the vehicle
- some tanks have poppet valves instead of a vent pipe
- some cassette toilets have an in-built carbon filter which is vented by a short pipe through the vehicle's wall (see photos below as an example),
- a retractable stand pipe attached to a portable/rollaway tank when it is being used outside the vehicle.

Apart from in-built carbon filters, vent pipes should be higher than the flood level of the highest sanitary fitting. The flood level is the level of the water held in a water trap and is generally the invert of the outlet pipe from the trap – see diagram below.



Defining and measuring the height of the vent pipe under these scenarios is complicated somewhat if a vehicle has a waterless trap such as Hepvo Valve. These do not rely on a water trap to block odours coming back through a waste pipe so have no water level to measure a height against. These guidelines offered below address this complication as well.

Poppet Valves



While the PGDB guidance recommends that waste tank vents should be positioned above the vehicle's floodline, this is not a mandatory requirement. Waste tanks with correctly installed and properly functioning poppet valves can still comply with the requirements set out under Regulation 20(1)(c). They are deemed fit for purpose if they are installed and remain functional for at least the period of certification.

If these valves are operating correctly, there should be no visible signs of seepage or leaks on the tank, indicating that they effectively meet the regulatory requirements.

If you encounter a tank equipped with poppet valves and pass the inspection, follow these next steps:

1. Advise the vehicle owner to regularly service their waste tanks to ensure the poppet valves function correctly, otherwise any waste discharge to ground may compromise their vehicle's certification and/or result in significant fines under the Freedom Camping Act 2011.
2. Make a comment on the inspection form that you have provided this advice to the vehicle owner. This will be kept on record for future reference, if required.
3. Select "Other" for question 66 regarding the type of wastewater ventilation system, and please note your observations in the comments section on page 4 of the inspection form. For question 67, which pertains to the height of the vent pipe above the wastewater tank, it is likely that the answer will be 0 (zero).

If there are signs of leakage from the valves, you can fail the inspection and advise the owner that the waste tank needs servicing. If the valves are no longer functioning as they should be and servicing is not going to help, an alternative solution, though more expensive, would be to block off the failing valves, and have an inverted U vent pipe installed onto the tank.

Example of a carbon filter vent on a cassette toilet

Links to useful resources

None at this stage.