Grey Water Tote

Article 2

The following is an explanation of the tote construction, the parts used and images of the finished product.

A gallery of images are also provided on the CMCA website. It would be advisable to look at the image gallery first to get an overall understanding of the tote design. (insert link)

This is written and put together by a non-technical person. There is no claim that it is the best design, but one that has been tried and tested, received much favourable comment, is easily constructed from readily available parts and most importantly affordable. Many thanks to all those who have contributed to this project.

A copy of the parts list from an irrigation/water specialist is also attached as a guide.

It should be noted that the tote drum used here is a 10 litre container and is for illustration purposes only. The tote size will be limited by the height from the shut off valve to the ground level. That is why many of the commercially manufactured units have a low profile.

The other consideration is where to store the unit within the confines of the vehicle whilst traveling so users need to be mindful of unit size when setting up. There are many variations of containers available so the user will need to establish the most suitable to fit under the vehicle. Remember that a 40 litre container will weigh 40 kgs when full and hence heavy to transport unless it is on sturdy wheels or a trolley is used.

The finer details:

- The camlock (Figure 2 Part a) is connected via thread to the shut off valve (Figure 1)

Figure 1

Figure 2 Part a

Figure 3 Part b

- The second part of the camlock (Figure 3 Part b) fits into the coupler attached to the shut off valve and locked into place by the folding wings.
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Figure 4

Figure 5

- In a new version the connection of the camlocks has been reversed. This would need a threaded pipe nipple (Figure 4) to attach the shut off valve to the camlock. This allows a camlock dustcover (Figure 5) to be put in place whilst travelling to prevent dirt etc. clogging the valve.

- The drainage hose used in this instance is a PVC Marine Flex Hose PP2707 Black – 19mm @ $4.64 /mtr (Figure 6). This is an ideal hose because it has a metal core and does not kink readily if at all. The drainage hose is connected to the camlock (Figure 3 Part b) via a 19mm Tail x 20mm BSP Male Director (Figure 7). A S/Steel clamp 16mm-27mm clamp has been used with silicon to achieve a watertight seal.

Figure 6

Figure 7

Figure 8

- The other end of the drainage hose is connected to a common Hose Connector Flo-Thru 18mm click on fitting (Figure 8).Once again a suitable glue or silicon product is needed to achieve a watertight seal on the marine flex hose.
  To improve the setup even further a hose connector with a stop flow valve is used. The benefit of this modification is that when the hose is disconnected there is no leakage/spillage from a full hose.
- The drainage hose is then connected via an 18mm click on tap adaptor (Figure 9). The hose could be connected directly to the cap/container top but the click on adaptor fittings have made the design far easier to use and transport.

Figure 10

Figure 9

Figure 10

The click on hose fitting is attached to a Poly Elbow (Male & Female) 20mm (Figure 10).

A Poly Nipple 20mm (Figure 4) is threaded into the Poly Elbow (Figure 10) and the cap of the container. Some caps have a thread in the cap but either way it is not a difficult process. If there is no thread in the cap a locking nut may be required with suitable sealant to prevent leaks.

The Poly Elbow is not essential – the click on tap adaptor (Figure 9) can be screwed directly onto the Poly Nipple (Figure 4) – user preference.

- For any design to work efficiently there must be a breather in the top of the unit. As liquid enters the container, air is displaced. The 13mm in-line barbed tap (Figure 11) is plugged into the container with a rubber grommet to act as a breather. (this grommet was obtained from Clark Rubber - < 50 cents)

Figure 11

Figure 11

15 litre container

Obviously, it's a benefit to have a container that is somewhat transparent to monitor the grey water level.

To empty, it's a simple matter of disconnecting the hose connector and screwing the elbow connector from the container.

To transport in a van it's also worthwhile to have a spare cap(s) (available at pool shops) so that the hose can be cleaned and stored away.

Points of note:

The invoice attached does not include the:

1. The cost of a container – very much dependent on individual needs, and not overly expensive. This is a 15 litre container ($15.95) that is being used for a new version as well. A squat design that sits under most vehicle types.
2. Shut off valve - $7.00 - $25.00 depending on type and quality.
3. PVC marine flex hose Black – 19mm x MTR $5.00.

The next instalment will look at how a caravan owner has retrofitted a tote tank with success. This can involve a bit more work as a large number of vans have two outlet pipes which need to be diverted into a single outlet.

We trust this guide has been helpful and informative.