

Portable 55 Gallon Biodiesel Wash Tank Plans

Pictures may take a while to load - They're worth the wait

By Graydon Blair 4/13/2005

The original concept for this wash tank came from Sean Parks:

<http://www.veggieavenger.com/avengerboard/viewtopic.php?t=333>

Pictures of a completed tank with a cost breakdown can be found at:

<http://www.utahbiodiesel.org/photogallery/processors/20041127graydonswashtank/>

Shopping List:

Item	Quantity
55 Gallon Poly Barrel w/ bungs	1
¾ X 2 Steel Black Pipe Nipple	1
¾ X 18 Steel Black Pipe(threaded w/ 8 thread)	1
¾ X 12 Steel Black Pipe	2
¾ 90 Degree Black Steel Elbows	2
¾ X 12 Black Steel Pipe	2
¾ X ¾ Hose Barbs	2
¼ Brass T-Valve	1
¼ X 5 Plastic Tubing	1
¼ X 3 Copper Tubing	1
Piece of small metal to use as a knob on lid	1
Small Piano-Style Hinges with mounting screws	2
Fish Tank Air Pump Variable Flow- 20-60 Gallons	1
Fish Tank T-Valve	1
Fish Tank Heater rated at 20-60 Gallons	1
Arizona Mist Portable Misting Kit ¼ With 5 Misting Heads	1
Box of 3 Gold Screws	1
Bolts, Washers, & Nuts for the casters	16 of each
2 Rubber Caster Wheels w/ 4 mounting holes	4
2 X 4 X 92.5 Wood	4
Tube of Silicone Sealer (GE Brand Clear)	1

Tools Needed:

Drill with 1 Wood Bit and various size smaller bits

Permanent Marker

Jig Saw, Hack Saw, Circular Saw, Grinder (Dremel style preferred)

Measuring Tape, Teflon Tape

Utility Knife, Small Needle, Pair of Channel Locks (Pliers)

Screwdriver for screwing in hinges, Wrench for tightening wheels



Upper Wash Tank Assembly:

- 1- Turn barrel upside down so bungs are facing down
- 2- Using marker, mark an area for the lid cutout (it will need to be big enough to fit the bubbler through)
- 3- Use a drill with a small bit to cut a pilot hole at the back edge of the lid area marked
- 4- Use the jig saw to cut out the lid you marked
- 5- Use the marker to mark 5 evenly spaced holes about 2 in from the edge of the same side you cut the lid in (this is where the misters will be mounted).
- 6- Pull the misting kit open and find a drill bit that's just bigger than the diameter of one of the misting nozzles
- 7- Use the drill with this bit and drill out one of the marked holes.
- 8- Unscrew one of the misters, push the mister housing through the hole & screw the mister into the hole from inside the tank
- 9- If it won't fit, move up one drill bit size. The nozzle should fit fairly snug in the hole.
- 10- Once the right bit size is found, drill the other 4 holes. Test each hole for a snug fit with a mister nozzle
- 11- Pull the misting nozzles out of the tubing they're hooked to (I found using a screwdriver to push the white clamp away from the nozzle & then pry the nozzle & hose apart, be sure to save the white clamps for later use)
- 12- Mount all 5 nozzles into the holes drilled.
- 13- Using the utility knife, cut the tubing (the stuff you pulled off of the nozzles) from the kit to fit the nozzles. Make sure to oversize the tubing a bit so each length will fit with a little room to spare between each nozzle.
- 14- Place two clamps on each piece that you cut & then mount the tubing to the nozzles & push the white clamps back into place
- 15- Mount the hinges to the lid and then to the barrel (I pre-drilled tiny pilot holes for my screws -made it easier to screw in)
- 16- Mount the knob to the lid (I used a cheap conduit clamp) and test the lid

Lower Wash Tank Assembly:

- 1- Turn tank on its side & unscrew both bungs
- 2- Using the utility knife, CAREFULLY cut the bungs so that the $\frac{3}{4}$ pipe can screw THROUGH the bung
- 3- Screw the $\frac{3}{4}$ X 18 pipe w/ the 8 thread through one of the bungs (Thread it through the bung so that the long end of the pipe will be on the side of the bung that goes INTO the tank –you'll be cutting off the extra that you don't need later)
- 4- Screw the $\frac{3}{4}$ X 2 nipple through the other bung so that the nipple comes flush with the side of the bung that will go into the tank
- 5- Set both bungs side by side, both facing the same way
- 6- Screw on (loosely) the $\frac{3}{4}$ 90 degree elbow joints onto the pipes sticking through the bungs (screw it to the side that will be OUTSIDE of the tank)
- 7- Screw the bungs into the wash tank. Do not tighten, this is just a dry fit. Screw them so that both elbows point the same direction.
- 8- Screw on (loosely) the $\frac{3}{4}$ X 12 pipe onto the other end of the elbows
- 9- Screw on (loosely) the $\frac{3}{4}$ ball valves to the other ends of the 12 pipes
- 10- Screw on (loosely) the $\frac{3}{4}$ hose barbs to the other ends of the Ball Valves

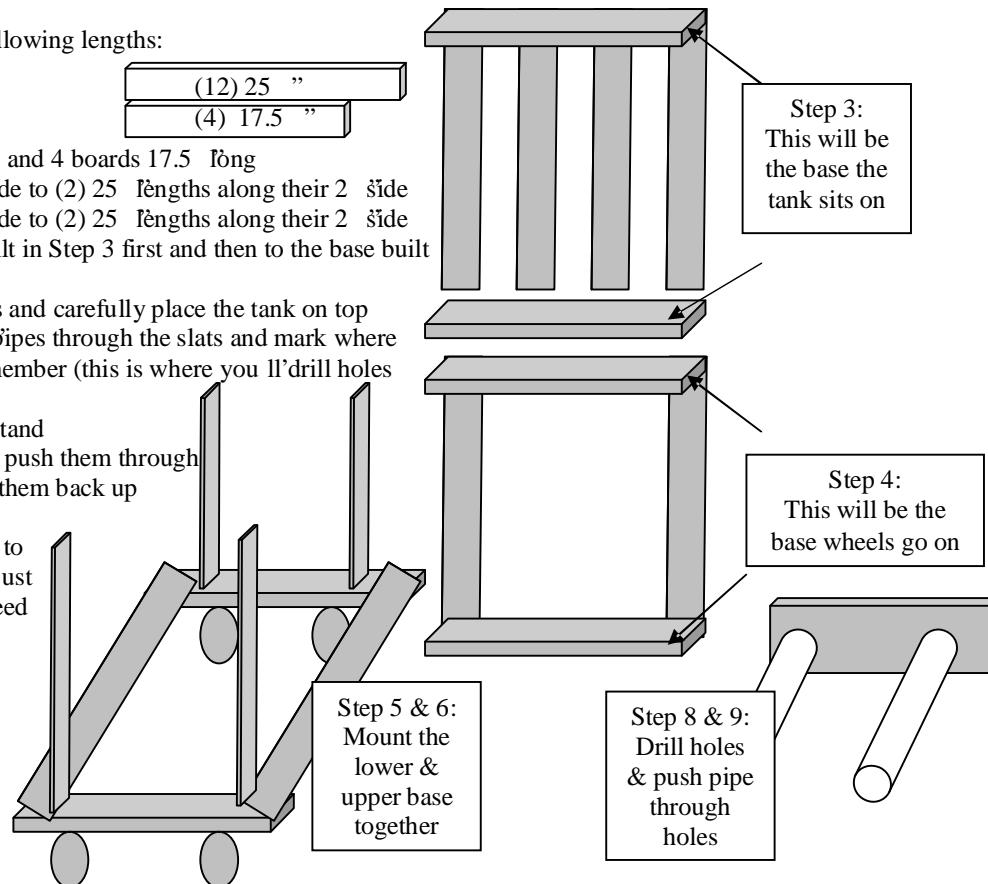
Bubble Ring Assembly:

- 1- Mark the 3 copper tubing in equal lengths every 2 With marker
- 2- Using grinder, grind down the copper until it's thin (don't grind THRU the copper, just grind it thin)
- 3- Using the pin, prick a small hole in the thin copper wall you just ground down (try to make the hole as small as possible)
- 4- Repeat this for each area ground down
- 5- Bend the copper tubing into a circle
- 6- Attach the $\frac{1}{4}$ T-Valve to both ends w/ the middle valve pointing up (same direction as all the holes you made)
- 7- Attach the 5 X $\frac{1}{4}$ plastic tubing to the middle valve
- 8- Cut two 2 lengths of the plastic tubing off of the 5 tubing from the end that's not hooked to the T Valve
- 9- Attach these lengths to the fish tank T-valve
- 10- Attach the other ends to the two air-outlets on the Fish Tank Pump
- 11- Attach the middle T-Valve to the 5 (now 4 8)piece of plastic tubing hooked to the bubble ring
- 12- Test the unit by putting it in a sink w/ water & turning the pump on
- 13- You should be getting very fine bubbles at low air volume & fairly large bubbles (or more small bubbles) at high air volume

Wash Tank Stand:

- 1- Measure & mark the 4 2X4 into the following lengths:
 - A. 3 lengths of 25 and leave the rest
 - B. Cut the boards
- 2- You now will have 12 boards 25 long and 4 boards 17.5 long
- 3- Screw (4) 25 lengths along their 4 side to (2) 25 lengths along their 2 side
- 4- Screw (2) 25 lengths along their 4 side to (2) 25 lengths along their 2 side
- 5- Screw (4) 17.5 lengths to the base built in Step 3 first and then to the base built in step 4
- 6- Unscrew the ball valves from the pipes and carefully place the tank on top of the wash tank stand. Align the 12 pipes through the slats and mark where they hit up against the wooden cross member (this is where you'll drill holes for the pipes to go through).
- 7- Using the 1 Bit, drill the holes in the stand
- 8- Unhook the 12 pipes from the tank & push them through the wooden frame. Then loosely hook them back up to the tank to make sure they align
- 9- Using the hardware, mount the wheels to the now completed base. Mount them just inside of the vertical 2 X 4's. You'll need

to mark & drill the holes with the drill
10- Tighten the wheels down w/ pliers





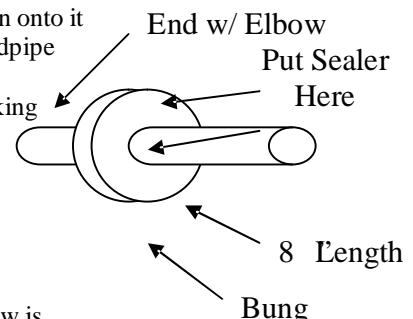
Pictures of the stand completed



Notice how the pipes come through the wooden frame

Assembling Tanks Onto Stand:

- 1- Take the tank and pipes back out of stand
- 2- On the standpipe bung, unscrew the bung from the tank
- 3- Measure the pipe w/ the elbow on it so that it has enough thread coming down for the elbow to align with the 12 pipes that will go into the front wooden panel
- 4- Place Teflon Tape on the end that will stick out of the tank and tighten the elbow down onto it
- 5- On the other side of the bung, measure the pipe to be 8 long from bung to top of standpipe
- 6- Using the hacksaw, cut the pipe to be 8 ”
- 7- Unscrew it from the bung, then coat the threads w/ Teflon tape & screw it back in making sure that the standpipe length is 8 long
- 8- Using Silicone Sealer, seal all the way around the pipe where it goes into the bung And around the threading on the bung itself
- 9- Thread the bung carefully into the tank, then put even more sealer around the edge of where it screws into the tank. Then screw the elbow to the assembly (use Teflon tape)
- 10- Screw it in so that the elbow is aligned properly (it should point outward)
- 11- Unscrew the other bung, place Teflon tape on it & screw back in making sure the elbow is aligned parallel to the other elbow from step 10
(it's easier to mount the nipple to the elbow (w/ Teflon tape) and then screw it into the bung)
- 12- Place sealer all around this second bung in the same manner
- 13- Allow the silicone to cure over night
- 14- Push 12 pipe through their holes in base & thread both ends w/ Teflon tape
- 15- Place tank on top of base and line up the elbows with the 12 pipes
- 16- Using Channel Locks, screw the 12 pipes into the elbows tightly
- 17- Screw the ball valves onto the 12 pipes (remember to use Teflon tape)
- 18- Place Teflon tape on the $\frac{3}{4}$ hose barbs & mount the hose barbs to the ball valves



Use:

- 1- Drain freshly processed Biodiesel into the tank via the ball-valve hooked to the non-standpipe pipe. Fill to about $\frac{3}{4}$ full.
- 2- Use Fish Tank Heater to heat Biodiesel to at least 90 degrees
- 3- Hook up the mister to a water hose & begin a light mist (Biodiesel needs to be warm)
- 4- Allow the mist to fill the tank to the standpipe & turn the mister off
- 5- Using the non-standpipe ball-valve, drain off the mist-water
- 6- Turn on the mister again, but this time with a more aggressive mist
- 7- When full, turn off mister & leave water in tank
- 8- Turn on bubble ring on low air volume & bubble for at least 8-10 hours
- 9- Let set for a couple of hours
- 10- Turn on bubble ring on high air volume & bubble for another 8-10 hours
- 11- Drain wash water using non-standpipe ball valve until water level is just below the standpipe
- 12- Drain off completely washed Biodiesel using Standpipe



Item	Store	Quantity	Item Cost	Total
Rolling Casters	Already Owned	4	0	0
5' 1/4" Plastic Tubing	Already Owned	1	0	0
3' 1/4" Copper Tubing	Already Owned	1	0	0
2 X 4 X 92.5"	Lowes	4	2.75	11
Tube of Silicone Sealer (GE Clear)	Home Depot	1	4.97	4.97
Hinges for Lid	Home Depot	1	2.89	2.89
3/4" X 12" Pipe	Lowes	2	3.12	6.24
3/4" X 18" Pipe	Home Depot	1	2.97	2.97
3/4" 90 Degree Elbow	Home Depot	2	0.66	1.32
3/4" Ball Valves	Lowes	2	5.94	11.88
55 Gallon Poly Drum	Smith & Edwards	1	15	15
Fish Tank Heater - 20-60 Gallon (Aqua)	Wal-Mart	1	22.76	22.76
Fish Tank Air Pump - 20-60 Gallon	Wal-Mart	1	9.97	9.97
Fish Tank T-Valve	Wal-Mart	1	0.97	0.97
Fish Tank Tubing - 25'	Wal-Mart	1	2.24	2.24
16 Bolts, Washers, Nuts for wheels	Lowes	1	5.9	5.9
3" Gold Screws	Lowes	1	4.32	4.32
1/4 " T-Valve	Durks Plumbing	1	2.71	2.71
1/4" Needle Valve	Durks Plumbing	1	2.92	2.92
Mini Tube Cutter (for cutting 1/4" tubing)	Durks Plumbing	1	4.46	4.46
Total				112.52