University of Delaware

Vehicle Undercarriage Wash System Building Guide

The University of Delaware with support from USDA APHIS has helped design a low-cost open source vehicle undercarriage wash system for use on farms for increased biosecurity. This system is designed to fit most passenger cars and light duty truck, depending on the desired installation the system can handle feed and hauling tractors and trailers. The current design does not provide freeze protection, since it is designed as a portable model. Freeze protection may be achievable depending on the installation location. A disinfectant/water reservoir is needed and not calculated into the overall cost of less than $500.00 as this factor depends on the end user’s needs. Certain water systems are powerful enough for this which can avoid the need for a water tank. With that option a disinfectant dosing device will be needed. It is currently recommended to use VirkonS at 1% for the vehicle disinfectant to achieve the broadest range of protection with the understanding that regular vehicle care and rinsing will be required of extended uses. New batches of disinfectant should be prepared according to the manufacturer’s instructions and all unused disinfectant solution should be disposed of properly.

This system will help clean and disinfect the outside of the vehicle. The floorboards and pedals of the vehicle need to be disinfected in addition to the exterior. Disposable boots should be worn and shoes should be sprayed with disinfectant prior to entering the vehicle. If the windows or doors of the vehicle have been left open, a spray insecticide should be used inside the vehicle and allowed time to work prior to entry.

This image below is to show the basic design schematic to achieve coverage of the undercarriage of a variety of vehicles.

[Diagram of vehicle undercarriage wash system]

Water Source
Supplies: All PVC pieces are Schedule 40:

PVC Glue and Primer

30 Feet- ¾ Inch PVC pipe

2- ¾ inch PVC Cross Slip fittings

1- ¾ inch Tee Slip fittings

4- ¾ inch Tee x ½ inch FNP SXSFNP

8- ¾ inch 45-degree angle

2- ¾ inch 90-degree angles

2- ¾ inch Slip x ½ inch FNP 90-degree angles

2- ¾ inch male threaded connectors (Male TA)

3- ¾ inch female threaded connectors

4- ¾ inch x ½ FNP reducers

1- ¾ Brass MNHXMNP fitting

8- 1/2x ¼ brass reducers

10- ¼ NPT Spray Nozzle: 1gpm @20psi, 120-degree angle McMaster-Carr: 3404K14

2- traffic cones

3- cord protectors (unless being installed in the ground) - BestEquip 3 Pack Extreme Rubber Cable Protectors 2 Channel Cable Protector Ramp 11000lbs Capacity Rubber Speed Bump Rubber Traffic Speed Bumps Channel Cable Protector

1-Powerfit AP31076 Sediment Filter Attachment for Garden Hoses and Pressure Washers

1-1.6 HP Submersible Clean Water Pump for Pool Pond Flood Utility Pump Water Transfer (1.6HP - Blue) or WAYNE PC4 1/2 HP Cast Iron Multi-Purpose Pump with Suction Strainer ( or greater than - 10gpm at 20psi)
Build instructions:
Cut ¾ inch PVC pipe into pieces and prime each end.
6- 4 inch
4- 10 inch
4-12 inch
1- 24 inch
2- 56 ½ inch
2- 19 inch
2- 13 inch

Two sets of the piece below:
See Diagrams below image to assemble:

Diagram A:

Continued Operation Instructions on Reverse Side.
Developed by the University of Delaware
For questions please contact: Dan Hougentogler, (302)494-1673 or Dhoug@udel.edu
Diagram B:

Two 4 inch sections with female TA’s to attached arms

10 inch attached to a cross and ¾ x1/2 FNP tee

2-10 inch attached to a cross and ¾ x1/2 FNP tee and a ¾ tee

2- 4 inch sections to 2-45 degree fittings

12 inch section with 45 degree fitting, reducers and spray nozzles angled 90 degrees from flat

12 inch section with 45 degree fitting, reducers and spray nozzles angled 90 degrees from flat
24 inch section with adapters to hose fitting.

12 inch section with 45 degree fitting, reducers and spray nozzles angled 90 degrees from flat.

PVC cross with 24 inch, two 4 inch with flat 45 degree fittings, and a 10 inch fitting connecting to the ¾ x1/2 tee from diagram A.

12 inch section with 45 degree fitting, reducers and spray nozzles angled 90 degrees from flat.

10 inch attached to a cross and ¾ x1/2 FNP tee.
Picture of nozzle assembly:
Continued Operation Instructions on Reverse Side.
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