



A Detergent is not spraying at an Arch Nozzle or not drawing any Detergent. Part 1 of 2

This article contains information on how the Tommy's Detergent and Maintenance Pods send detergents to the Arches and what each competent does. Troubleshooting will be in Part 2.

Issue: Many things can cause a detergent not to spray at an Arch Nozzle or not to draw any detergent like a clogged feed line, a stuck Hydra-flex, or a clogged nozzle.

The Detergent and Maintenance Pod uses the Venturi Effect to draw detergent from the detergent tote up to the VersaDials/Metering tip into the injector that is connected to the Hydra-Flex. In the Hydra-flex, water and the detergent are mixed and then sent out through the 1/2" poly and Stainless-Steel water lines to a Foam generator that is connected to an airline and then out to the Arch Nozzles, or a Rain/Manifold Bar where it is sprayed on to a Guest's vehicle in the Tunnel.

Not all Arch Nozzle will use a foam generator.

The Venturi effect is the reduction in fluid pressure that results when a fluid flows through a constricted section (or choke) of a pipe. This increases the velocity of the fluid.

A car wash detergent injector is a clever device that uses the Venturi effect to mix car wash soap, wax, or other detergents into the water stream without needing any moving parts or complicated systems.

Here's a short and sweet explanation:

1. **Water Speeds Up:** Water flows through a pipe in the car wash system. At one point, there's a narrower section in the pipe. As water flows into this narrower section, it speeds up because of the Venturi effect, just like water speeds up when you partially cover the end of a garden hose with your thumb.



2. **Pressure Drops:** When the water speeds up in that narrower section, the pressure in that part of the pipe drops. It's kind of like the water doesn't have time to push on the walls of the pipe because it's moving so fast.
3. **Detergent s Get Sucked In:** There's a tube that connects a container of car wash detergent s to this narrow part of the pipe. Because the pressure inside the narrow part of the pipe is low, the higher pressure from outside pushes the detergent into the pipe. This is because fluids like to move from high-pressure areas to low-pressure areas.
4. **Mixing Happens:** As the detergent enters the pipe, it mixes with the speeding water. This happens in a mixing chamber after the narrow section. The fast-moving water helps to thoroughly mix the detergent s with the water.
5. **Onto the Car:** This mixture of water and detergent s then flows out through the car wash nozzles onto your car, helping clean it effectively.

So basically, the detergent injector uses the natural behavior of fluids (the Venturi effect) to pull in and mix the car wash detergent s without needing any pumps or electricity to do it. It's simple and efficient.

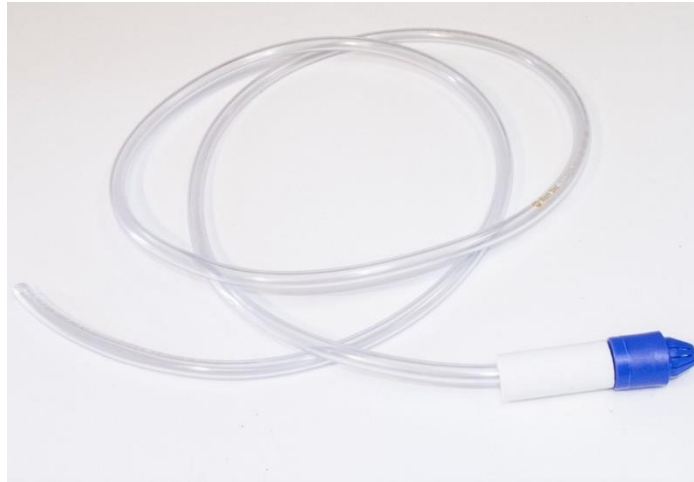
Note: This article does not cover the Wheel Blasters, Preblast, and Belt flush. These functions are supplied water from the Reclaim system through the ASCO Valves on the All-in-One Pump station in the Dry Back Room.

Components:

Foot Valves and Draw lines:

- The Foot Valves work as a check valve in the detergent tote and a filter to protect against foreign objects being drawn into the draw line and the rest of the system. A Stainless-steel weight is used to keep the Foot valve at the bottom of the detergent tote.

- The Draw line is a clear hose that makes it easy to check if the lines are full.



Metering Tips and VersaDial:

- Used to control the amount of Detergent that is mixed with water affecting the strength of the detergent that is being applied.
- VersaDial is an adjustable metering tip.
- The Correct Color for each Function can be found in the Franchise Pod Metering Tip/VersaDial Standards.





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Injector:

- Works with the Metering tip or VersaDial to allow for a more diverse spectrum of flow rates drawing into the Draw line.
- Color coded for Flow Ranges (Gallons per minute (G.P.M.))
- The Correct Color for each Function can be found in the Franchise Pod Metering Tip/VersaDial Standards.





Hydra-Flex

- Mixes Water and Detergent s to create the detergent that is used in the tunnel.
- Air is applied to open and close the Hydra-Flex.
- The Venturi Effect is created at the Hydra-Flex.
- The amount of Detergent used varies based on what size injector and Metering Tip is installed.
- The bigger the Metering Tip, the more detergent will flow.



SMC Valve and Air Solenoid:

- The Air solenoid valve is used to supply air to the Hydra-flex to open and close to send detergent and water to the arches.
- The Air Solenoid Valve is also used to send air to the Foam generators to create the foamy detergent that is sprayed onto a Guest's Vehicle.
- The SMC Valve is the brain of the Detergent and Maintenance Pod. It commands when the Air Solenoid Valves open and close.
- The SMC Valve receives digital signals from the PLC in the MCC.



Air Regulator:

- Used to adjust the air pressure coming out of the Air Compressors to match what is needed for the Wash function it is connected to.
- Can be adjusted manually.



Supply lines:

- 1/2" polyethylene and Stainless Steel lines are used to transport the detergent and water from the Pod to the Arches via the Ladder Rack.



Foam Generator:

- Adds pressurized air to the detergent to create foam to be sprayed on a guest's vehicle.





Rain Bar:

- Creates a vertical sheet of detergent.



Nozzles:

- Applies detergent and water to the Guest's Vehicle.
- There are multiple types of Nozzles in the Washes with each having its own spray pattern and use.



If the issue persists, please contact Equipment Support at 616-795-4892 or Support@TommyCarWash.com