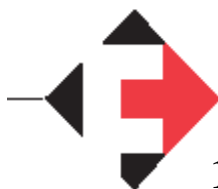


# **CAMERAWASH**

U.S. Patents 6,554,210 & 6,199,773

## **Installation Guide**

### **MSF1128-12A**



**M. S. Foster & Associates, Inc.**

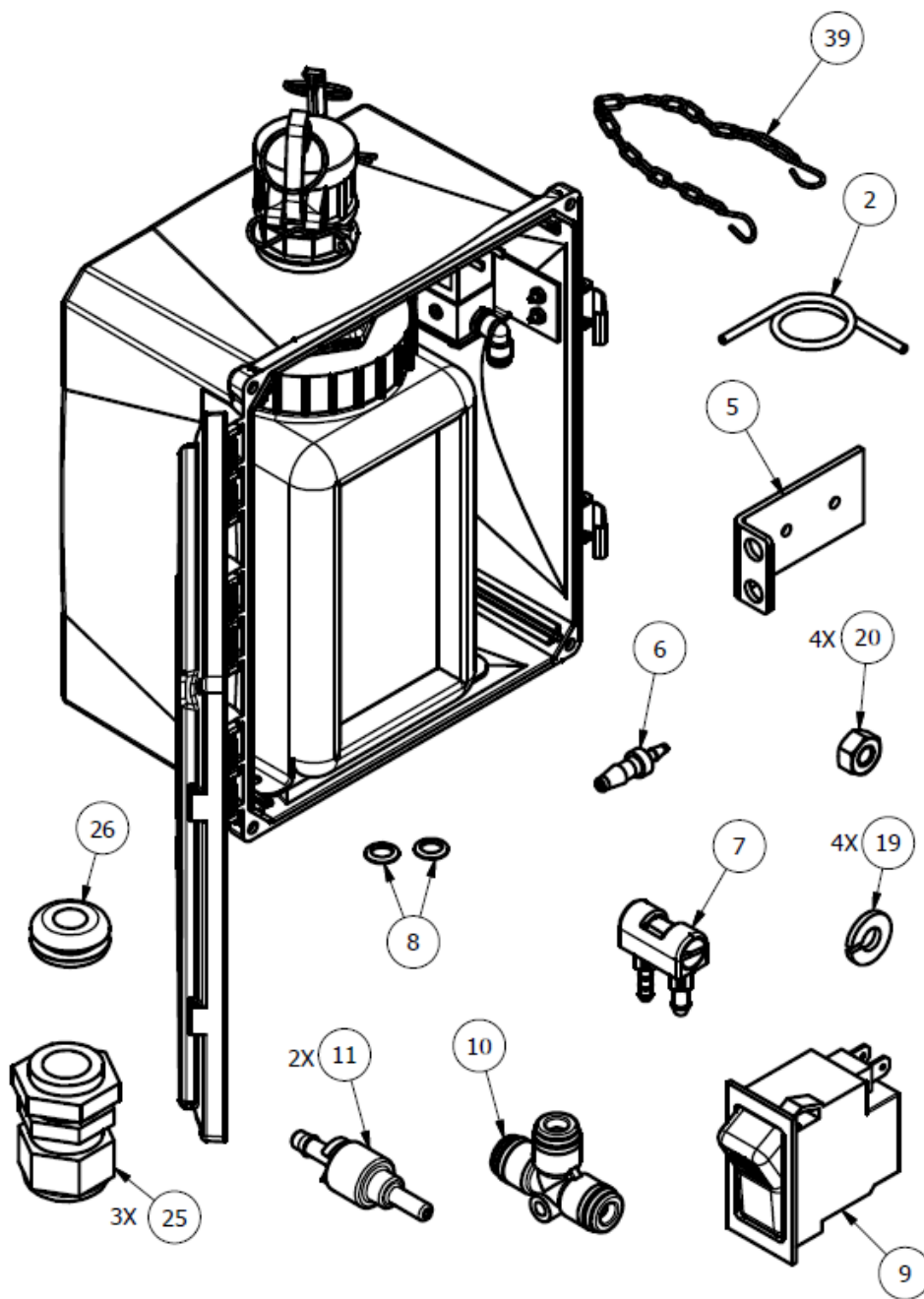
---

**1040 Indiana Highway 212, Michigan City, IN 46360**

**Phone 219-879-9225 / Toll Free 888-452-4053**

**Fax 219-879-9313 / Email: [sales@msfoster.com](mailto:sales@msfoster.com)**

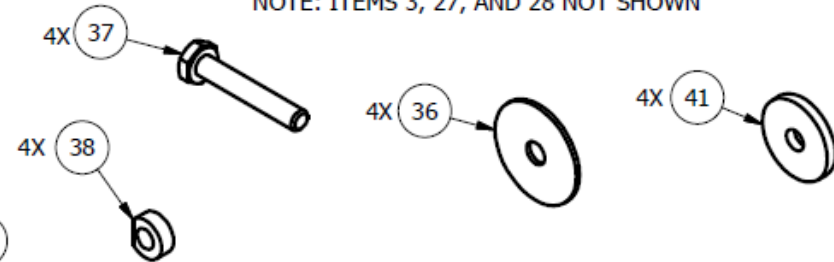
**[www.msfoster.com](http://www.msfoster.com)**

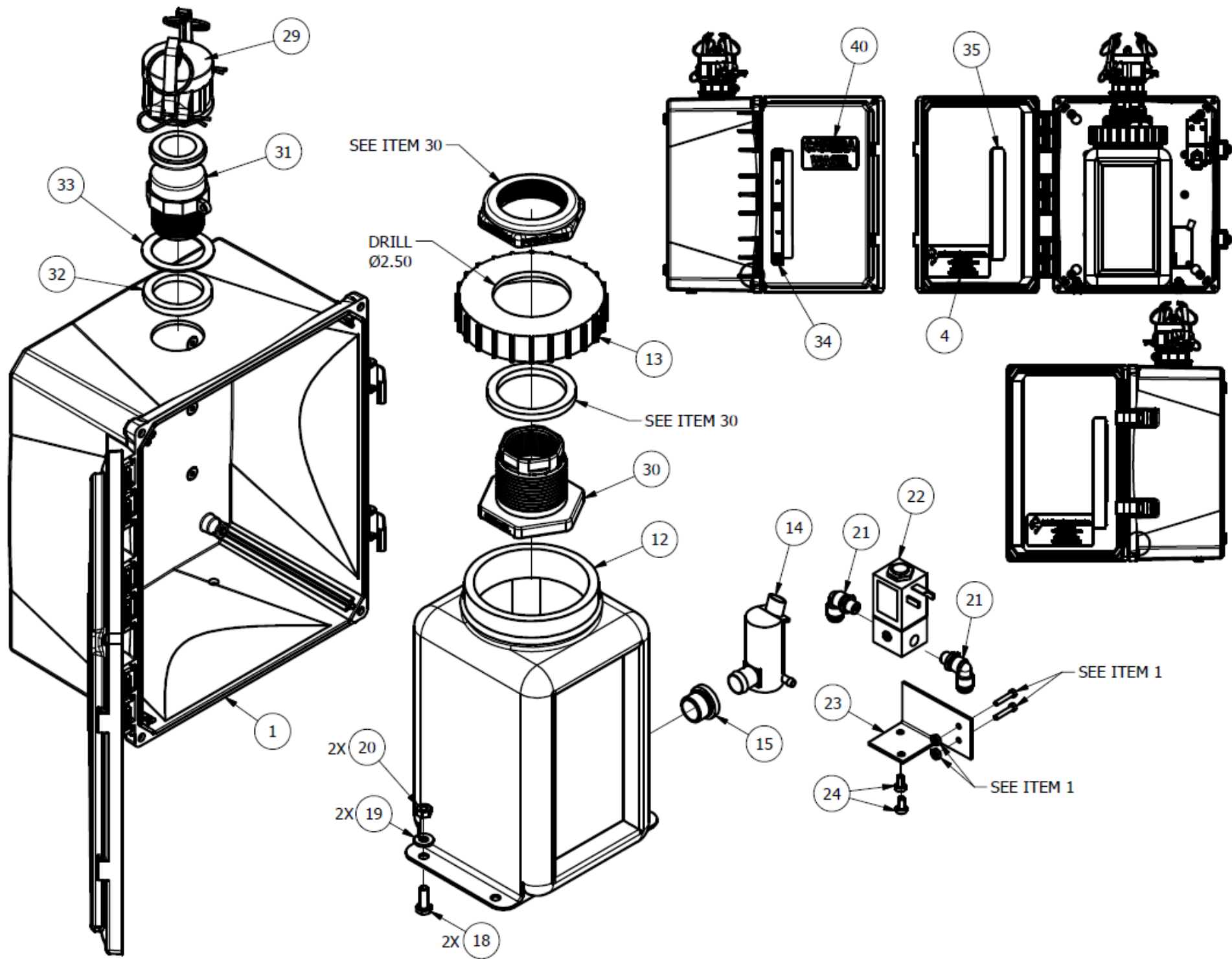


PARTS LIST

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	MSFH12106HLL-BLK-DRILL5	INTEGRA ENCLOSURE
2	1	MSF9776T2	3/32" TUBING X 18" LG.
3	1	MSF5010A	30 FT. TUBING KIT
4	1	MSF LOGO LABEL	MSF LOGO LABEL
5	1	MSF5174	NOZZLE MOUNTING BRACKET
6	1	MSFW-538	REDUCER FITTING
7	1	MSF847-0026-000	ADJUSTABLE NOZZLE
8	2	MSF027-0003-003	RETAINING RING
9	1	MSF832-0044-000	ROCKER SWITCH
10	1	MSFKV2T07-00	PUSH-TO-CONNECT 'T' FITTING
11	2	MSFW-534	CHECK VALVE
12	1	MSFW-411	RESERVOIR
13	1	MSFW-393-3	RESERVOIR COVER
14	1	MSF24010738	12V PUMP
15	1	MSF22110984	GROMMET
18	2	MSF92240A540	1/4-20 X 3/4" HHMS
19	6	MSF92146A029	S.S. 1/4" SPLIT WASHER
20	6	MSF91845A029	S.S. 1/4-20 HEX NUT
21	2	MSFKV2L07-34S	PUSH-TO-CONNECT ELBOW FITTING
22	1	MSF142-0007-000	SOLENOID VALVE
23	1	MSF5176	SOLENOID MOUNTING PLATE
24	2	MSF91772A194	S.S. #8-32 X 1/2" PPHMS
25	3	MSF69915K54	CORD GRIP FITTING
26	1	MSF9600K47	GROMMET, WIRE HARNESS
27	1	MSFCBL3349-30	CAMERAWASH MAIN HARNESS 30FT
28	1	MSFCBL3287-00	CAMERAWASH SWITCH HARNESS
29	1	MSFDC125125PP	PP CAM-LOCK DUST CAP
30	1	MSFTF125	PP THRUWALL FITTING, 1-1/4" NPT
31	1	MSFF125125PP	PP HEX NIPPLE, 1-1/4" NPT
32	1	MSF150EP	SEALING GROMMET FOR 1-1/4" PIPE
33	1	MSF5023	FLAT WASHER
34	1	MSF_FILL_SCALE_LABEL	LABEL, FILL SCALE
35	1	MSF1130	VIEWING WINDOW
36	4	MSF90313A108	.250" OVERSIZED WASHER
37	4	MSF92240A549	1/4-20 x 1-7/8" HHMS
38	4	MSF5019	'D' SPACER
39	1	MSFCH-600SS	6" STAINLESS STEEL CHAIN
40	1	MSF CW LABEL	CAMERAWASH LABEL
41	4	MSF90131A305	1" OD CUSHION WASHER

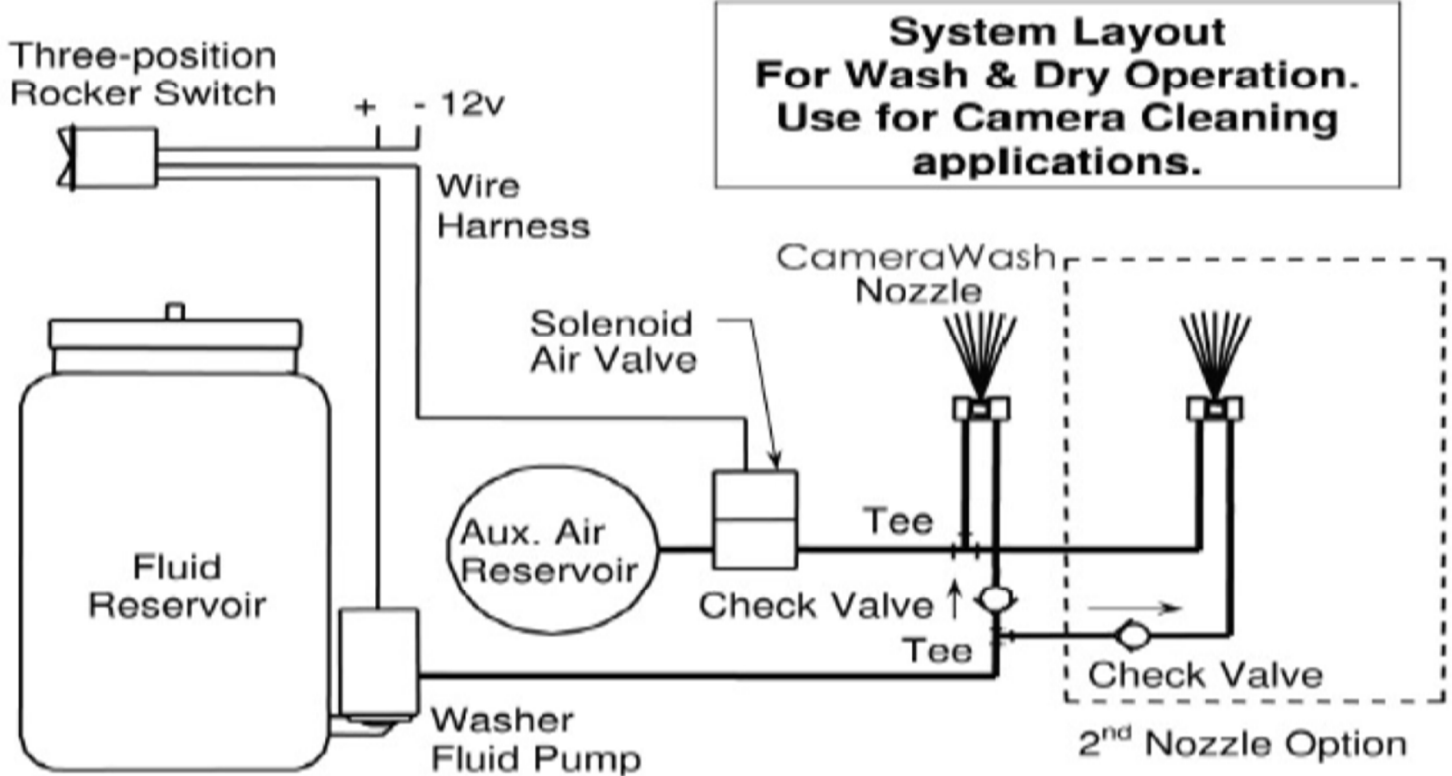
NOTE: ITEMS 3, 27, AND 28 NOT SHOWN





# Installation Instructions

## CAMERAWASH™



These instructions describe the installation of an independent fluid and air cleaning system for vehicle-mounted cameras.

### Required Tools

- 8 mm of 5/16" hex deep socket (only for installing retainer washers)
- Tubing cutters (or sharp utility knife)
- Phillips head screw driver
- Flat screw driver, 5/16" wide (for nozzle adjustment)
- Portable with assortment of bits
- Center punch
- Socket and drive set
- Wire terminal crimp tool

# Installation Instructions

## Camera Wash

Step 1. **NEMA Box:** Locate an area where you can mount the NEMA box. It should be mounted in an area that is easily accessible for refilling, away from direct impact of tire debris, such as rocks, etc., and away from high heat sources such as engine exhaust. If possible, mount it near the cab to keep electrical wiring within reach of the harness that is supplied.

**NOTE:** Make sure that the necessary clearance is available above the reservoir for filling.

Step 2. Once you have determined your mounting location, Use the provided template to mark the hole locations.

Step 3. Drill four (4) mounting holes with a 9/32" drill. It may be necessary to drill a small (3/32") pilot hole first. Use of cutting oil is recommended.

**NOTE:** *Be sure to check behind the mounting surface for wiring, hydraulic lines, or tubing before drilling. You may need to pull tubing or wiring to allow clearance for drilling.*

Step 4. **Mounting:** After drilling the mounting holes hold the NEMA box up and insert the for 1 1/2" stainless steel bolts, with the D-shape washer on, insert it through the back

*Continued...*

# Installation Instructions

## Camera Wash

...mounting holes, which are drilled out. **The 1" OD cushion washers need to be secured in between the skin of the vehicle and the Nema Box to prevent damage to the Nema Box.** Then use the four fender washers and nuts provided to secure the box.

- Step 5. After mounting the box, drill four (4) holes (location is your preference). One hole should be big enough for the rubber grommet provided. The other three holes should be big enough for the cable grommets provided. The fluid out should go through the rubber grommet. Air in, air out, and electrical should all be fed through the through-wall grommets.
- Step 6. Route the 1/4" nylon air line from solenoid (be sure to follow the arrow on solenoid) to an existing 1/4" line. Insert the tubing into the push to connect. See following for tubing handling.

**Nylon Tubing Handling:** Prior to installation, the tubing end **MUST** be clean and free to contamination, with no nicks or burrs for the first 1/2". The air tubing is supplied in this condition. When length adjustments need to be made, the tubing should be cut-off clean and square to the length, using tubing cutters or a sharp utility knife. **Do Not Use Pliers.**

**To install the tubing:** push the tubing into the fitting approximately 5/8" and "bottom out".

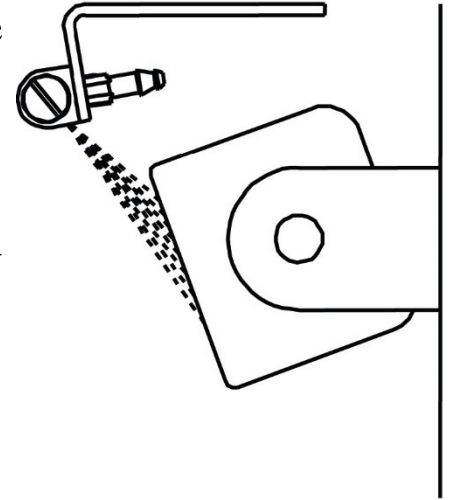
**To remove the tubing:** With air supply off, hold the plastic push-to-release button tight against valve, and while holding in, pull the tubing out.

# Installation Instructions

## Camera Wash

Step 7. Route the air and fluid delivery lines from the Reservoir and Solenoid to the nozzle location. Avoid sharp edges and kinks. Route so as to avoid tubing damage during normal use.

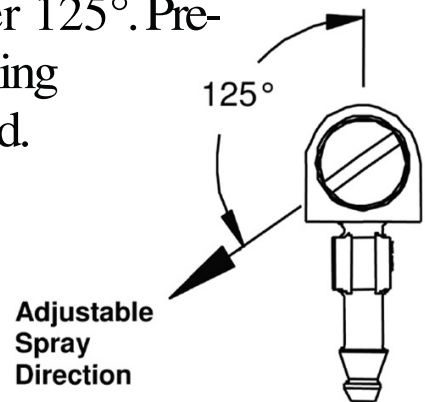
Step 8. **Nozzle Location:** The nozzle can be aimed up, down, or sideways. The nozzle must be within 4" of the lens, and 1" to 2" ahead of it. The spray should be aimed near the center of the camera lens, avoiding directly impacting microphone or speaker openings.



Step 9. **Nozzle Adjustments:** The nozzle spray direction is adjustable over 125°. Pre-adjust the nozzle before installing to spray in the direction needed.

Always use a 5/16" wide, flat head screw driver (in good condition) to adjust the nozzle.

Hold the nozzle securely, against a slid surface and turn slowly, applying generous downward force to prevent the big from slipping out of the slot.



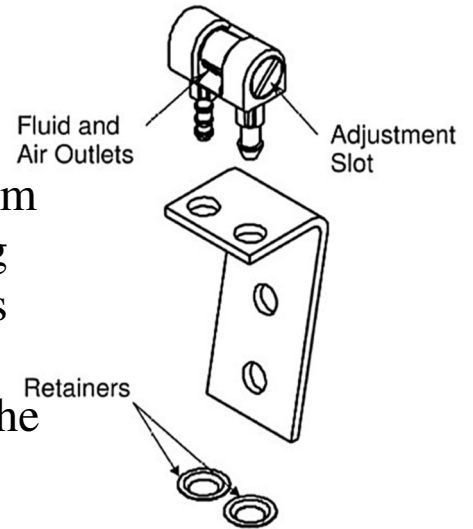
# Installation Instructions

## Camera Wash

Step 10. Insert the nozzle into the nozzle bracket. Position the nozzles so that the fluid and air outlets are facing the camera. You may need to access the adjustment slot later, so make sure it is easily accessible.

**Once the retainers are installed, they cannot be reused**

To install them, use a 5/16" or 8 mm hex deep socket; push the retaining washers onto the nozzle hose bars until the nozzle fits snug onto the bracket. Attach the bracket to the vehicle.



**Nozzle Attachment**

Up to four (4) nozzles may be operated from one pump and solenoid pair. If additional nozzles are needed, contact M.S. Foster & associates, Inc.

Step 11. Install the 18" piece of 3/323" ID rubber tubing to the nozzle fluid fitting (the fluid fitting has three barbs). Attach the nylon tubing to the nozzle air fitting. The air fitting is shorter, has one single barb, and is labeled "AIR". Check to make sure that the air and fluid tubing are connected to the correct barbs. Install the check valve in the larger rubber tubing from the pump. Make sure the arrow is pointing away from the pump. Install one check valve nearest to the nozzle and install the other nearest to the reservoir.

# Installation Instruction

## Camera Wash

**NOTE:** If more tubing is needed, use .156 (5/32") I.D. windshield washer tubing for the rubber tubing and use 1/4" O.D. SAE J844 nylon tubing for the air lines.

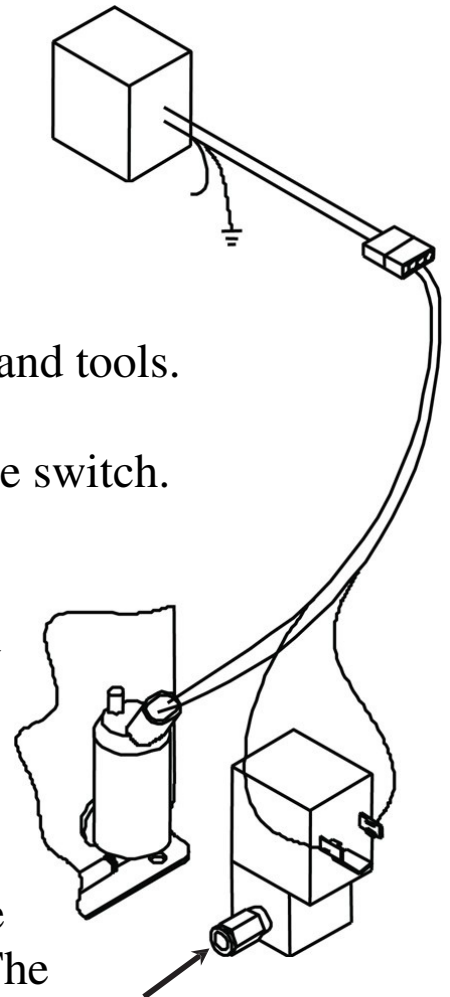
Step 12. **Switch:** Install the switch into the dash. The hole size for the switch is 1.732" x 0.866" (44mm x 22mm). Panel thickness must be 0.04" x 0.10"

Step 13. **Switch Wire Harness:**  
Connect the loose red (+) Wire to a fused circuit (8 to 10 amp). Attach the Loose black (-) Wire to a clean ground attachment point. Use the appropriate crimp terminals and tools.

Step 14. Attach the wire harness to the switch.

Step 15. Route the pump harness From the pump and solenoid to the cab. Feed the pin terminal ends through a grommet (not supplied). insert the pins into the connector housing (using the switch harness as a guide). The

*Continued...*



# Installation Instructions

## CameraWash

...green wire goes in socket #1, the black in socket #2, and the gray in socket #3. Connect the two harnesses.

Step 16. Connect the harness to the pump and solenoid (inside the NEMA box). At the solenoid valve attach the red and black connectors to the two terminals that are “C” shaped (see picture). It does not matter which wire color goes on which terminal.

### **System Check**

Step 1. The system is now ready to check.

Step 2. Make sure the washer bottle is filled with washer fluid.

**A** **w**ARNING: SOME WASHER FLUIDS CONTAIN POTENTIALLY HAZARDOUS SUBSTANCES. FOLLOW SUPPLIER'S INSTRUCTIONS.

- Wear safety glasses or goggles at all times when observing Washer Nozzle spray patterns.
- Operate Washer only in a well-ventilated area outdoors.

Step 3. Check to make sure that the vehicle has sufficient air pressure (90 psi or greater).

Step 4. Start the engine and operate the CameraWash Wash switch in the wash direction. It will take 10 to 20 seconds to prime the system. When the system has...

...primed itself, fluid and air spray will come out the nozzles.

- Step 5. Operate the switch in the opposite direction to apply an air blast that removes most of the fluid off of the lens for clearer vision.
- Step 6. Adjust the Nozzle if necessary. It will be necessary to have someone activate the system from inside the cab while the Nozzle spray pattern is observed.
- Step 7. To adjust the Nozzle, a 5/16" wide flat head screwdriver (in new condition) to raise and lower the pattern. On some installations it may be necessary to use an angled screwdriver.
- Step 8 Tie wrap (or tape) the tubing and wire Harnesses so that they are secure and clear of moving parts, including the hinge points of the hood. Make sure that they do not come in contact with hot or moving engine components. It is recommended to fasten the Tubing Harnesses to existing harnesses where possible.

# Installation Instruction

## Camera Wash

### Trouble shooting

Step 1. Check to see that the solenoid valve and check valves are plumbed correctly.

Step 2. If there is no fluid at nozzle:

- Be sure there is fluid in the reservoir. Run the washer pump for 15 seconds to prime the system with fluid.

- Examine the check valves to see that the arrow on it is pointing toward the nozzle.

Operate it again, If there is no fluid:

- Check for kinked or pinched tubing
- Check that fluid is flowing when the pump is running. If not, the pump may be wired wrong reverse wires and try again.
- Make sure that all connections are properly engaged and sealed.

- Check the nozzles for debris. To clear debris, remove the fluid tubing below the nozzle, and blow compressed air back through the small nozzle opening to clear it.

*Continued...*

# Installation Instructions

## Camera Wash

Step 3. If the nozzles spray fluid:

- Check the air inlet connection to the solenoid valve, to make sure that the valve is pressurized and plumbed with air supply to port 2/A.
- Make sure all air fittings are securely connected
- Check for kinked or pinched tubing.

