

INSTALLATION INSTRUCTIONS FOR THE TRUCK MOUNTED VIPER ADDITIVE INJECTION SYSTEM GTP-8776C

This additive injection system was designed to be used with five gallon jug of additive. The system is supplied assembled to a mounting bracket. This system includes a five gallon jug holder, an additive injection pump, a sight flow indicator with a three-way test, off and inject valve and a combination air pressure regulator and lubricator. Installation is simple all that is required is a compressed air supply capable of at least 2 scfm, a 1/4" n.p.t. port in your piping after the filter for our exclusive injector nozzle and replacement of your old Veeder Root register once we modify it with an air pulser valve. We include all of the compression fittings and tubing that are needed for installation.

Installation

1. Install the mounting bracket in a convenient location on the fueling side of the truck where it can be seen while fueling.
2. Install your modified register on your meter.
3. Install the injection nozzle into a 1/4" n.p.t. port in your piping, after the filter.
4. Using the Gammon supplied 3/8" stainless steel tubing and 3/8" stainless steel compression fittings, connect from the injection nozzle to the top of the sight flow indicator. Refer to the attached flow diagram.
5. Install a 5 gallon jug of additive into the mounting bracket. Secure it in place with the bungee cords.
6. Using the 3/4" n.p.t. port, install the 5 gallon jug suction tube and vent, into the 5 gallon jug. Adjust the height of the suction tube so that is at the bottom of the 5 gallon jug.
7. Using the Gammon supplied 3/8" Teflon tubing, compression fittings and quick disconnects, connect the suction tube quick disconnect assembly to the inlet of the additive pump. Refer to the enclosed flow diagram.
8. Connect your compressed air supply to the inlet of the air regulator. We supply 3/8" Synflex tubing and brass compression fittings for the connection. Refer to the air system diagram attached.
9. Using the 1/4" Synflex tubing, connect the inlet port on the Gammon modified register to the 1/4" tube port at the air regulator outlet. The

housing on the modified register is stamped inlet.

10. Using the 1/4" Synflex tubing and the brass compression fittings, connect the outlet port of the modified register to the air signal port on the additive pumps four-way pilot valve. Refer to the air system diagram attached.
11. Fill the lubricator with SAE 5 or 10 weight non detergent oil up to the full mark on the plastic bowl.
12. Set the lubricator to the minimum setting.

Testing: We recommend that neoprene gloves and an eye shield be used.

NOTE: This pump is supplied with neoprene seals. These seals are not compatible with jet fuels. This pump should be tested and calibrated with anti icing additive only.

1. Close the three-way selector valve.
2. Open your compressed air supply valve.
3. Open the valve at the inlet of the air regulator.
4. Set the air pressure equal to your pumps outlet pressure using the air regulator.
5. Open the valve on the additive pump inlet.
6. Place a calibrated container under the tubing on the test port of the three-way selector valve.
7. Turn the handle on the three-way selector valve to test.
8. Start the flow of fuel and allow the system to prime. Each time the pump cycles there will be a noticeable thump. This will be the adjusting wheels hitting their bumpers and is normal.
9. If the system has a problem priming, stop the flow of fuel and close the air valve. Remove the two 1/8" npt plugs on the outlet of the pump and fill the pump with additive. Replace the plugs using Teflon tape to seal the threads. Turn your air supply valve on and start the flow of fuel.
10. Once all of the air has been forced from the system, stop the flow of fuel.
11. Reset the meter and then restart the fuel flow to check the calibration of the system. The system has been adjusted to deliver 1000ppm. That is equivalent to 380ml of additive per 100 gallons of fuel pumped. This pump can be calibrated up to a rate of 1800 ppm. To change or adjust the flow rate of the system, refer to the section on calibration.

Final adjustment: This adjustment causes the Viper to operate smoothly, injecting additive continuously for perfect blending. Since our pump is double-acting, it is capable of excellent blending.

1. Once calibrated correctly, adjust the test stand (nozzle downstream restriction) to cause the fuel system to operate at the maximum normal pressure.
2. Reduce the air pressure until the systems stops injecting correctly.
3. Slowly increase the air pressure until the Viper just injects correctly. Raise the air pressure about 5 psi higher.

Calibration:

Adjust the stroke of the Viper piston.

1. Close your air supply valve.
2. Remove the two socket head screws from the guard to expose the calibrating wheels. Located below the four-way pilot valve.
3. To increase the flow of additive, first loosen the two set screws on both of the calibration wheels C and D, refer to the diagram attached for identification. Next turn each wheel away from each other. This will increase the stroke of the piston. Each 360 degrees of rotation will equal .005 gallons or 19 ml of additive pumped.
4. To decrease the flow of additive, first loosen the two set screws on both of the calibration wheels. Next turn each wheel toward each other. This will decrease the stroke of the piston.
5. Once adjusted, tighten the set screws and replace the guard.
6. Retest and re-calibrate as needed.

Troubleshooting

PROBLEM	CAUSE	SOLUTION
Pump will not cycle	<p>1. Low or no air pressure</p> <p>2. No power</p> <p>3. Outlet ball valve is closed</p> <p>4. Pulse counter is not counting</p> <p>5. Pulse counter presets set too high or not entered</p> <p>6. Presets in pulse counter were changed and counter was not reset</p> <p>7. Four way air valve or solenoid bad</p>	<p>Turn on air supply Increase air pressure to 50psi</p> <p>Turn on the power Check the wiring and correct as required</p> <p>Open outlet ball valve</p> <p>Check the wiring and correct as required. Check the pulse counter program reprogram as required. Check pulse transmitter, repair as needed.</p> <p>Replace pulse counter Check the presets adjust as needed</p> <p>Reset pulse counter</p> <p>Repair or replace as needed</p>

PROBLEM	CAUSE	SOLUTION
Pump cycles but does not pump	<ol style="list-style-type: none"> 1. Inlet ball valve closed 2. Additive fluid level is low 3. Pump was not primed 4. Air leak in the suction line 5. Pump strainer clogged 6. Additive tank not vented 7. Worn or dirty check valve o-rings in the pump 	<p>Open the inlet ball valve</p> <p>Refill additive tank</p> <p>Remove the prime port plugs and prime the pump</p> <p>Check suction line for loose fittings and repair as required</p> <p>Remove strainer and clean</p> <p>Vent the tank</p> <p>Check the check valve o-rings for wear or debris replace or clean as required</p>

<p>Pump injects the incorrect amount of additive</p>	<ol style="list-style-type: none"> 1. Calibration wheels not set correctly. 2. Three way test inject valve is oriented incorrectly. 3. Worn or dirty check valve o-rings in the pump 4. Air pressure set to low 5. Pump was not primed 6. Air leak in the suction line 	<p>Check and adjust calibration wheels as required. Refer to calibration section of manual</p> <p>Verify the three way valve is oriented as per the installation instructions</p> <p>Check the check valve o-rings for wear or debris replace or clean as required</p> <p>Increase air pressure to 90 psi</p> <p>Remove the prime port plugs and prime the pump</p> <p>Check suction line for loose fittings and repair as required</p>
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VIPER PUMP COMPLETE REBUILD

Drawing required: GTP-8757-4

Tools required for complete rebuild: 1-3/8" wrench or large adjustable wrench

5/8" wrench
11/16" wrench
15/16" wrench
1/4" wrench
3/4" wrench
7/16" wrench
1/2" wrench
7/8" wrench
9/16" wrench
Set of Allen wrenches
Flat blade screwdriver
Needle nose pliers

Materials required: Teflon tape
Petroleum jelly
Loctite 242

CHECK VALVE AND STRAINER REPAIR PROCEDURE

1. Remove the Viper pump assembly from its mounting location. Be sure to shut off and vent the air supply, disconnect the power and close all inlet and outlet ball valves.
1. Remove the four valve port plugs, GTP-8689-3. Be careful not to lose the inlet and outlet check valve springs. Remove and replace the valve port plug o-rings, GTP-2200-914C. Lightly coat these o-rings with petroleum jelly.
2. Remove the four check valve poppets, GTP-8689-4. There are two styles of check valve poppets. One style has a 3/8"-16 female thread in the center, use a 3/8"-16 bolt to remove this type. The other style has a 5/16" counterbore in the center, use an internal snap ring pliers to remove this type. Remove and replace the four poppet o-rings, GTP-2200-206C. Lightly coat these o-rings with petroleum jelly.
3. Reinstall the four poppets.
4. Inspect the inlet poppet springs and replace as required. Install the inlet springs, GTP-8720-7. These are the lighter of the two springs.
5. Install the two inlet valve port plugs. Tighten securely.

6. Inspect the outlet poppet springs and replace as required. Install the two outlet springs, GTP-8720-8.
7. Install the two outlet valve port plugs. Tighten securely.
8. Remove the strainer port plug. Remove and replace the o-ring, GTP-2200-017C.
2. Lightly coat the o-ring with petroleum jelly.
9. Remove the strainer, GTP-8689-14. Remove and replace the o-ring, GTP-2200-014C. Lightly coat the o-ring with petroleum jelly.
10. Reinstall the strainer assembly. Be sure the strainer snaps into place below the level of the inlet port.
11. Install the strainer port plug. Tighten securely.

PISTON SEAL AND GLAND BODY REPAIR PROCEDURE

1. Remove the copper tubing from between the four way pilot valve, GTP-8695, and the air cylinder, GTP-8689-16.
2. Unthread the cylinder joint, GTP-8689-17, from the pump drive rod, GTP-8689-6.
3. Remove the four 5/16"-24 bolts that secure the cylinder support assembly, GTP-8689-10, to the pump body.
4. Remove the cylinder support assembly.
5. Remove the screws that secure the gland body to the pump body. There are two style gland bodies. One type has four screws to secure it to the pump body and the second type has three screws to secure it to the pump body.
6. Remove the gland body, pump drive rod and piston assembly from the pump body.
7. Remove the cotter pin from the pump drive rod.
8. Remove the 1/4"-28 castle nut and washer from the pump drive rod.
9. Unthread the piston, GTP-8689-5, from the pump drive rod.
10. Pull the pump drive rod from the gland body assembly.
11. Remove the three Allen head screws that secure the seal carrier to the gland body.
12. Remove the seal carrier.
13. Remove the pump drive rod seal, GTP-8776-26, from the gland body.
14. Remove and replace the gland body o-rings, GTP-2200-110C and either GTP-2200-129C for the four screw gland body or GTP-2200-126C for the three screw gland body. Lightly coat these o-rings with petroleum jelly.
15. Install the new pump drive rod seal into the gland body. This is a special seal and must be handled and installed with extreme care. To

install this seal; Coat the inside of the gland body with petroleum jelly.

1. Insert one of the cupped halves into the gland body cupped end into the gland body. Be sure the seal half bottoms in the counter-bore.
 2. Install the spring over the seal half. The spring should rest in the groove in the seal.
 3. Carefully insert the second seal half into the gland body, cupped end facing out. The cupped end will protrude from the gland body.
16. Install the seal carrier on the gland body. Align the three hole in the seal carrier with the three holes in the gland body. Place a drop of Loctite 242 on the threads of each socket head screw. Thread the three screws into the gland body. Do not tighten. The seal carrier should just touch the pump drive rod seal without compressing it.
 17. Install the gland body cover on the gland body.
 18. Coat the pump drive rod end and the inside of the pump drive rod seal with petroleum jelly.
 19. Insert the pump drive rod thru the gland body cover gland body and rotate the pump drive rod to push it thru the pump drive rod seal.
 20. Now tighten the three socket head screws into the gland body.
 21. Install the piston half with the machined recess on the pump drive rod. The recess should face toward the threaded end of the pump drive rod.
 22. Install the new piston seal on the installed piston half. The cupped end of one half against the piston then the spring and then the other half over the spring.
 23. Thread the second half of the piston on the pump drive rod. Tighten securely by hand.
 24. Install the flat washer, castle nut, tightened securely, and the cotter pin on the pump drive rod.
 25. Lightly coat the piston seal with petroleum jelly.
 26. Install the gland body into the pump body. Be sure to align the holes in gland body with the holes in the pump body.
 27. Install the gland body screws. Tighten securely.
 28. Position the cylinder support assembly on the pump body. The air cylinder compression fittings should face out toward the valve port plugs.
 29. Install the four 5/16" flat washers and 5/16"-24 bolts to secure the cylinder support assemble to the pump body.
 30. Thread the pump drive rod into the cylinder joint. Tighten securely.
 31. Install the brass tubing into the compression fittings on the air

cylinder and four way air valve. Tighten snug.

AIR CYLINDER REPAIR PROCEDURES

1. Remove the copper tubing from between the four way pilot valve, GTP-8695, and the air cylinder, GTP-8689-16.
2. Unthread the cylinder joint, GTP-8689-17, from the pump drive rod, GTP-8689-6.
3. Remove the four 5/16"-24 bolts that secure the cylinder support assembly, GTP-8689-10, to the pump body.
4. Remove the cylinder support assembly.
5. Remove the plastic enclosure, GTP-9124, from the solenoid on the four way air valve.
6. Remove the three socket head screws that secure the four way air valve to the cylinder support assembly.
7. Remove the four way air valve. Remove and replace the two air stones, GTP-5855.
8. Remove the guard assembly, GTP-8689-11A and assembly brackets, GTP-8689-11B, from the cylinder support.
9. Loosen the two set screws on the adjusting collar, GTP-8689-8 closest to the air cylinder.
10. Thread the adjusting collar that is closest to the air cylinder toward the air cylinder.
11. Unthread the adjusting rod, GTP-8689-7, from the air cylinder, GTP-8689-16.
12. Remove the eight truss head screws that secure the air cylinder to the support bracket.
13. Remove the air cylinder from the air cylinder support bracket.
14. Remove the two compression elbows from the air cylinder. Clean any remaining
15. Teflon tape from the threads of the compression fittings. Remove the cylinder joint from the air cylinder shaft.
16. Install Teflon tape on the N.P.T. threads of the compression fittings. Coat the threads with petroleum jelly.
17. Reinstall the compression fittings into the new air cylinder. The ends of the compression fittings should face toward each end of the air cylinder. Do not over tighten. Install the cylinder joint on the air cylinder shaft.
18. Reinstall the air cylinder into the air cylinder support assembly.
19. Thread the adjustment rod into the air cylinder. Tighten securely.
20. Install the guard brackets on the cylinder support bracket.
21. Thread the adjusting collar away from the air cylinder until it is in approximately the same location it was before moving. Be sure to align the set screws with the flats machined on the adjustment rod. Tighten the set screws.
22. Install the four way air valve on the air cylinder support assembly. Tighten the three screws securely.
23. Install the copper tubing into the compression fittings and tighten the compression nuts snug.
24. Install the plastic enclosure on the four way air valve.
25. Install the guard on the air cylinder support assembly.

FOUR WAY AIR VALVE REPAIR PROCEDURES

1. Remove the copper tubing from between the four way pilot valve, GTP-8695, and the air cylinder, GTP-8689-16.
2. Remove the three socket head screws that secure the four way air valve to the cylinder support assembly.
3. Remove the four way air valve.
4. Remove the all of the compression fittings from the air valve Clean any remaining
5. Teflon tape from the threads of the compression fitting.
6. Install Teflon tape on the N.P.T. threads of the compression fittings. Coat the threads with petroleum jelly.
7. Install the compression fittings into the new air valve.
8. Install the air stones, GTP-5855, in the new air valve.
9. Install the air valve on the air cylinder support assembly. Tighten three socket head screws securely.
10. Install the copper tubing into the compression fittings and tighten the compression nuts snug.