

## Windshield Washer Repair Tips

The following are cut and pastes from NCRS Tech Forum threads.

The way it works is when the button for washer is pushed it applies ground to the blue wire which should no longer be powered. The solenoid will then be a magnetic field and pull the paddle inward and the rotating cam will operate the pump. Make sure to check connections at wiper switch and try adding an external ground to washer housing if all else fails. Most corvette electrical problems arise from a bad ground situation.

1. All I had to do was remove the distributor shielding and then I could get enough access to the washer motor housing to remove it from the wiper motor housing. It was definitely cramped for hands and wrenches but it can be done. There are four screws to remove (roughly in the four corners) so that the entire housing can be detached from the wiper motor.
2. The screw in the bottom left corner facing the firewall has a ground plug attached to it that will need to be unplugged. Make sure you don't drop the metal plug bar when you remove the screw. Interestingly, this ground is for the wiper motor. So, when it is disconnected the wiper motor will not work and you can't test the washer unit until you reconnect it.
3. When doing steps 1 & 2 be sure you DON'T remove the two screws holding the washer motor to the plate that then attaches to the wiper motor. Those screws are mounted through the plate with locking washers and nuts. They are located more in the middle of the washer motor unit as you might expect (and yes I removed one them and almost the second before I realized my mistake). Once removed, the washers and nuts are free to disappear into the void of the engine compartment as you remove the plate, so be careful if you accidentally do this.
2. Detach the line in and two lines out from the driver's side of the washer motor unit.
3. Detach the plastic double plug from the leads on the wiper motor.
4. Now you can weasel the washer motor unit and plate out of the engine compartment, and sit down and begin work on the unit outside of the car.
5. Take the nozzle plate (where the hoses attached) off by removing the four screws. This frees up the plastic piece with the three diaphragms for removal and reveals the rubber bellows. In my case, everything just needed a good cleaning, but if either of the parts are damaged (cracked belows etc.), you can replace them now. Don't lose the three ring seal around the diaphragms - it tends to easily fall out. I could not free up the bellows easily when I tried and since I didn't replace it, I'm not sure what the secret is there.
6. Looking through the back of the mounting face reveals a four-pronged white plastic wheel on the washer motor. At one point on this wheel is a rectangular seat that needs to re-connect to a projection on the wiper gear. This requires a bit of fidgeting when remounting the unit, but after three or four tries, I could tell that the nipple on the wiper wheel had seated. And of course they don't easily line up.
7. Here's what I figured out. The wiper motor runs that wheel continuously and you can hand-crank it counterclockwise to test the functionality of the unit. Movement of the four prong unit makes a metal piece slide back-and-forth over the washer bellows gear (white plastic with curved teeth). However, in the

"neutral" position the metal bar can NOT engage the teeth until a larger but similar in style bar (shaped like an oblong "O") is moved out of the way.

8. Now for the magic. Press the washer button and a small wound magnet just above both metal pieces pulls the larger metal "O" up permitting the smaller metal "O" to now engage the teeth of the diaphragm wheel. The larger metal piece pops into a thin metal catch at the top when it flips up thereby keeping it in place and out of the way until the washer cycle finishes.

9. Now the wiper motor is spinning the four pronged piece which is now engaging the bellows wheel causing the bellows to pop out (if the plastic nozzle plates have been removed). Continued movement of the wheel causes the bellows to pump in and out creating the suction necessary to move the washer fluid.

10. As the wheel turns a given number of times a missing section of the outer edge slowly progresses around counterclockwise until the metal retainer for the larger "O" bar that the magnet caught is now permitted to move out of the way. A couple more turns and BOOM down comes the large metal "O" disengaging the smaller "O" from contacting the gear teeth and OFF goes the washer fluid.

11. At this point, I cleaned and greased all the parts and determined that everything seemed to be working correctly. You can plug the washer motor back in while it's outside the car, just MAKE SURE and REATTACH THE WIPER GROUND. Now, hit the washer button and watch everything work. It's pretty cool. Also, there are a lot of wires just above the wiper motor, which at this point is running uncovered. S, BE CAREFUL that none of the wires are in the way before hitting the button.

12. I next got a glass of water, filled up my mouth and blew water through both of the washer nozzle hoses to check and make sure the nozzles were clear and fluid could flow. I then primed fluid through the feeder hose from the reservoir and no washer fluid does not taste good.

13. At this point I reattached the plastic pieces over the bellows. First, seat the three diaphragm piece over the bellows. Make sure the single in diaphragm is up and the lower two exit diaphragms are down. Now place the plastic nozzle unit over this piece while holding it in place. My diaphragm unit had two small plastic nipples at the top making the orientation only fit one way. But simply put, the in line in the middle should line up with the single upper diaphragm and the two outlines with the lower two diaphragms. Now, hold the pieces in place and attach the four screws.

13. At this point, the unit can be re-attached to the wiper motor housing MAKING SURE to RE-ENGAGE THAT NIPPLE TO THE PLASTIC RECESS ON THE WASHER GEAR. Just engage the two pieces off center from attaching the unit and then slide the unit to the left until the holes line up for re-attachment. That way you can feel the springiness (word?) of the four-pronged wheel when it's engaged. It takes a bit of handiwork at this point to get the screws in place without letting the two pieces disengage. Make sure you have the screws handy before starting the re-attachment process.

14. Tighten up the screws, reattach the hoses, and reattach the electrical plugs. There is a correct front to back orientation for the washer magnet double-plug as it only works one way. You can determine this while you're testing it as the magnet part of the action will not work in one orientation. AT THIS POINT, I REALIZED THERE REALLY IS NO SEPARATE WASHER MOTOR, SINCE THE WASHER BUTTON SIMPLY ACTIVATES THE MAGNET PERMITTING THE WIPER MOTOR WHICH HAS BEEN TURNING THE WASHER MOTOR THE ENTIRE TIME TO ENGAGE THE BELLOW'S GEAR. Go figure, I guess that saved GM a motor?

15. Press the washer button and step back - ok, you might have to press it several times before water squirts freely, but when it does watch out because it can give you an eyeful if you're standing next to the

vent window having just pushed the button - duh!

16 Nozzles can be adjusted by just turning them in/out from the center of the windshield.

As Replacement Motor AFTER REPAIRS and to Pumpreturn to correct position. i.e..... To Align the Washer pump Rectangular Slot correctly to the Metal Rotating Peg on the Wiper Motor it can be helpful to leave Wiper in On slow position (Reattach The Lone Wiper Ground Wire and Lug a bit at Lower left corner hole) and Turn Battery disconnect while wiper arms turning and cut power at disconnect when it's at around 9 o'clock. Remove Ground Wire and then take off Washer Cover plate Screws so you can LOOK in and line up the peg and pump Slot. Fit Washer to Peg and tighten it up with 4 Screws and THEN reattach Washer Cover plate. After you verify pump is in correct spot. Also, replace Ground Wire and Washer 2 plug wire terminal and retest

**To remove (or replace) the bellows, stick your thumb in the bellows, push against the spring, and turn the bellows 90 degrees.**

There may be a possibility that the discs were installed in the plastic holder wrong if they don't match the photos

Single rubber disc toward wiper motor

Dual rubber discs toward hoses



Here's my troubleshooting in order:

First thing to do is to try priming the washers from the reservoir end. (I use a catherer syringe). When you prime with a pump force (just blowing fluid from the reservoir intake) you should see fluid coming out of the nozzles.

Next listen for the click, when you push the washer switch. If no click, it may be something electrical with the switch to the pump.

If it clicks and no spray after priming, check the washer pump valve, the little three circle rubber gasket and the rubber check valves. Replace the valve assembly, if it won't hold suction from the reservoir end of the hose.

Sometimes just putting some silicone grease (Sly-Glyde) on the check valves will do the trick.

Last thing is the bellows in the pump. It can be removed by putting your thumb in it and turning it a 90 degree turn.

Take a look at the photos in the above thread.

Hopefully just priming it will do the trick.