

S.U. Fuel Pumps 2

We're climbing a 10,000-foot pass outside Cody, Wyoming and the guys in the MG TD running in front of us are having fuel pump trouble. The car is hot, we're at altitude and the fuel is boiling faster than the pump can move it. The pleasant exhaust note is punctuated with random moments of silence as the car slowly loses speed. Ultimately a solution is found, the hood side panels are off anyway, so the passenger reaches around the side of the car and pours a cup of cold water on the fuel pump every few minutes. This procedure gets them up the hill.

On another occasion, one I was told about but didn't actually witness, a man resorted to an unusual solution when the old SU failed. He hooked a wire to the end of the diaphragm, looped it around something up front and ran it back through the firewall. When the car started to die, he yanked on the wire to operate the diaphragm and force fuel to the carbs. Crude perhaps, but I'd call it ingenious under the circumstances. Everyone has had to bang on the fuel pump to get home at least once in their lives.

There are as many stories about the difficulty of rebuilding an SU pump as there are about rebuilding SU carbs. What do we really know about the Skinner family anyway? Can anyone guarantee their loyalty to the Crown? Were they perhaps German agents who's job it was to make English components equal to or worse than their Italian counterparts? We'll never know the answers to these questions, but in the meantime we still need to make the stupid things work. As far as rebuilding SU carbs is concerned, we have an informative video tape on the subject, parts, manuals, or complete rebuilt carb sets if you're so inclined. We have new fuel pumps too, but some people are sentimentally attached to their old ones.

I've never been too sentimental about fuel pumps myself. However, I recently had to rebuild one because the particular style of pump can no longer be had. I started with three pumps in pieces and collected enough bits together to make one "vintage" pump. In my case, I was building a pre-war pump with a bronze base. The basics of fuel pump rebuilding can be applied to most any SU style pump, even the old Hartings. (Remember those, from the days when after market pumps were made out of metal and were disguised to look something like an SU?) However, this article deals specifically with the MG T-series type pumps. The only real trick I noticed in the process was getting the diaphragm adjusted properly, but more on that later.

All modern day SU fuel pumps operate on the same basic principle. A flexible diaphragm is used to vary the volume of a chamber. Flow in and out of the chamber is controlled by a pair of one-way valves. As the diaphragm is pulled up, the chamber increases in volume, fuel is drawn in from the tank through a filter screen and through a one-way valve. When the diaphragm returns, chamber volume is decreased and fuel is forced out to the carbs through the other one-way valve. The diaphragm is drawn up by an electro-magnet which we will refer to as the coil and is forced back down by a spring. The coil is energized through a set of points. As the magnet pulls the diaphragm up, contact is broken at the points thus allowing the spring to push the diaphragm back down. When the diaphragm reaches the bottom, the points come back into contact, the coil is re-energized and the process starts over. We'll look at the operation of the points in more detail later. For now, let's start taking the old pump apart.

Your fuel pump will divide into two basic assemblies if you remove the screws

around the base of the coil. We'll start with the base assembly because it is the easiest to deal with, so set the top portion aside for now.

Here is a list of the new parts you'll need for the whole job:

Diaphragm (Measure your old one and compare the length to our catalog description.

Fuel pump body gasket

Points (Buy the dual points unless you're an absolute nut for originality.)

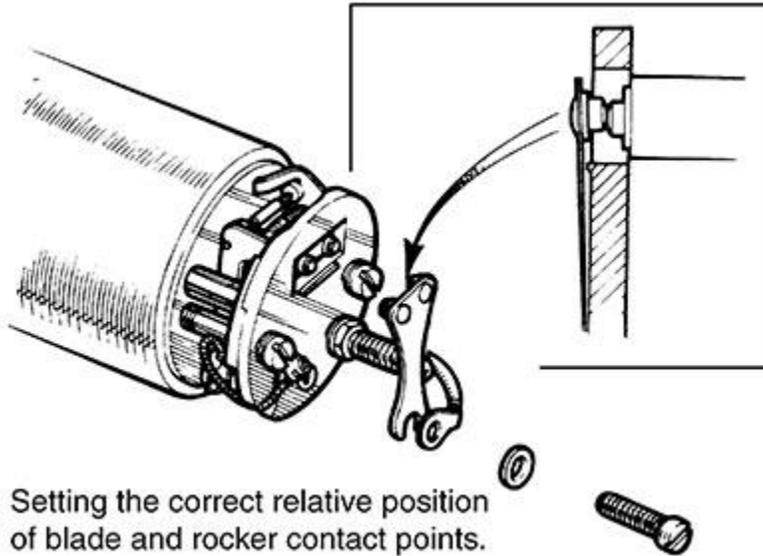
Condenser

Filter(If the old one is permanently clogged.)

Carefully separate the sandwich plate and main body casting. On very old pumps, the body is cast as a single piece. The body will probably have a good accumulation of rust and crud in it. Unscrew the filter and set it aside. All three fittings have fiber washers under them. Keep these with their respective fittings for now. Remove the inlet fitting and outlet fitting. Underneath the outlet you'll see a brass valve assembly. There is one fiber washer in front of and behind the valve assembly - pay close attention to their thicknesses. The outer one should be thicker and they will need to go back in the same orientation. Under the valve assembly is a round brass disk. This disk is the intake valve. It will most likely have a slightly ribbed side facing out and a smooth side which rests against the body and forms a seal. If either valve disk has a ridge worn in it, you may want to find a parts pump for spares. The disk in the outlet valve assembly can be removed for cleaning by squeezing the wire retainer and removing it. Put this guy right back together so you don't forget how it came apart.

Once all the parts have been removed from the base, clean the base and sandwich plate. Making certain the mating surfaces are clean, smooth, and flat. Clean or replace the filter and reassemble the base. If the fibre washers are in decent shape, they can be reused. Moss doesn't have specific listings for the fibre washers. When the base is all back together with the valves properly reinstalled, we're ready to start on the fun part.

Remove the top cap to expose the Bakelite pedestal and points. If you have a spare pump, use it as a sample of how the parts go back together. If not, take a picture, draw a map, or fire up your memory so you won't forget how things go together. Ultimately, everything should be removed from the pedestal so it can be cleaned. Watch the order that washers come off the pedestal mounting screws and terminal stud. You may want to keep them in order on the screws and stud so you know where they belong.

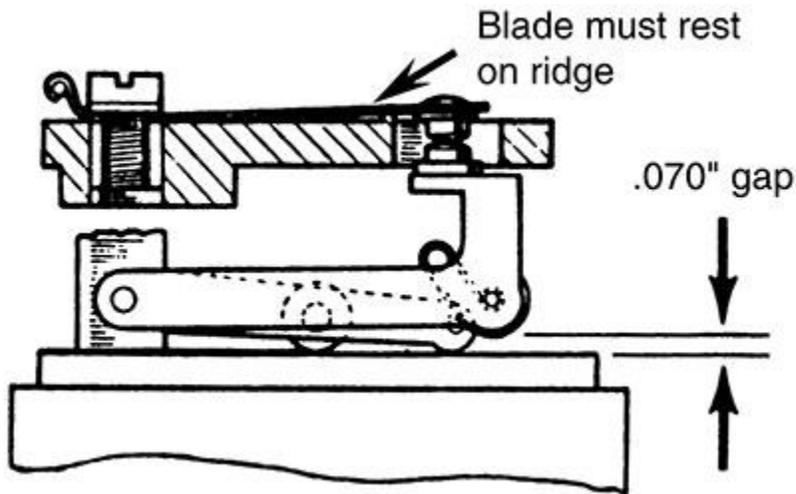


Setting the correct relative position of blade and rocker contact points.

Unscrew the diaphragm by holding it at its base and unscrewing it from the points. Remove the lower portion of the points by pulling the free floating pin out of the pedestal. The top portion of the points is, obviously, held in place by the small screw. Be careful of the two wires coming out of the electro-magnet body. I broke one of the lugs off mine and had to re-solder it. Unfortunately, there is just barely enough wire to reach up to the top of the pedestal.

Once everything is cleaned up, install the new point set on the pedestal making sure the "roll-over" spring on the lower portion of the points is installed in the same orientation as the old ones. Set the top portion of the points under the the wires from the condenser and coil. When the points are open, the top portion should just rest on the little raised lip at the base of the opening in the pedestal. Tighten down the pedestal mounting screws when everything is in place, but don't go crazy. The screws don't need as much torque as your cylinder head studs.

The next operation is to install the new diaphragm. Feed the diaphragm up through the coil housing into the threaded fitting on the points. First I'll quote the SU book on how to adjust the diaphragm:



- 1) Slacken the screw securing the contact blade (upper portion of points or upper contact arm) and swing the blade to one side, so that the points no longer make contact.
- 2) Holding the coil housing in the left hand, screw the diaphragm in generously with the thumb of the right hand, alternately pressing gently and turning until the rocker "throw-over" ceases.
- 3) Unscrew the diaphragm one sixth of a turn at a time in the same manner, slowly pressing and turning until the "throw-over" just operates.
- 4) At this point continue unscrewing until the nearest securing screw hole is just lined up, and then again four holes (two-thirds of a complete turn). The diaphragm is now correctly set.
- 5) The contact blade, previously swung to one side, should now be replaced in its correct position.

Try the book instructions first. If you don't get satisfactory results, try my ignorant method. I left the contacts alone and screwed in the diaphragm, pressing until I had a nice satisfactory "roll-over". In other words, I didn't have to ram the thing up or pull it down hard to get a good over center action.

The final operation, prior to testing, is to attach the two halves of the pump. A number of people have returned new diaphragms saying they don't look like their original ones and the new ones don't work. I suspect this has something to do with the book procedure on attaching the base. Many people say that their manuals recommend holding the diaphragm up while tightening the six screws. I disagree. Let the diaphragm hang down while tightening the base. This gives enough "slop" for the spring to push the diaphragm down and move fuel toward the carbs. If the book procedure is followed, the spring has to stretch the rubber ever so slightly to complete the output stroke. This slight extra effort may mean the difference between a working and non-working pump. Don't forget the plastic piece which rests between the rubber and the iron ring on the diaphragm base. Its job is to keep the diaphragm

centralized. I hardly see the point, but it must be there for a reason.

Now to test our rebuilt pump. Give the pump a ground and run Twelve volts to the terminal stud at the top. You should get a happy rapid ticking. If not, make sure the wires are hooked up properly and then try readjusting the points. Still no ticking? Something is obviously wrong. I'd say it's time to call in the local expert. Another good test before installing the pump is to place your thumb over the inlet and outlet while the pump is running. You should get a good vacuum on one side and pressure on the other. My pump worked, but not very well at first. I swapped the two washers on either side of the outlet valve in the base (remember, one is thicker than the other) and it worked much better. If all seems well, put the pump back on the car, connect everything, check for leaks, and go for a test ride.

There is a lot more to be said about different types and vintages of SU fuel pumps. There is also much to be said about trouble shooting, but I'm out of space, so it'll all have to wait for the next issue. In the mean time, good luck and whatever happens, don't let those *&\$%@#! things get you down.

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