Fuel Tank Sealing

By Steve Jekogian

Does your back end smell. Now that I got your attention what am I talking about? It's a nice Saturday and you just opened the trunk to turn on the battery switch and you got a whiff of something. Is it gas? You can keep telling yourself you filled the tank to high, but did you?

Austin-Healeys are very prone to the gas tank rusting, and/or developing small pinholes and leaking. Just think about it, the tank is located inside the trunk, an area that collects water, gets a lot of condensation from temperature changes, and has a battery that gives off acid and occasionally leaks. The Healey gas tanks often develop leaks around the side edges near the battery, and on the bottom, especially toward the drain plug where it sits on a foam rubber gasket. Not only does the tank rust from the outside, but water from condensation in the tank also contributes to the problem, as it can rust from the inside out.

What can you do? Well, buy a new tank for about $350 or repair and seal your tank for around $50.00. Even if your tank is not leaking, draining, sealing and painting it is probably a good idea and it could save you from having problems later. The gas tank repair job is a relatively easy task. First order the gas tank sealing products (Moss part # 220-620, 220-630, and 220-450, new gas sending unit cork seal 293-415 and sealing rubber for under the tank or Eastwood gas tank sealer kit 10165Z 1-800- 345-1178. Most kits have a three stage process: a metal wash, an etching wash, and a sealer.

Remove the tank by draining the gas out through the bottom drain plug or siphon it out. Be careful. Unscrew the two straps that hold the tank in, the fuel line, the inlet pipe and the gas sending unit. Once the tank is out look for signs of leakage or stained areas and sand down or wire brush rusty sections, but do not paint it yet. If you uncovered any leaking areas determine how extensive they are. A few small pinholes can be covered with epoxy compounds made for the purpose, and larger areas can be covered with fiberglass cloth and resin. I covered leaks in my tank with fiberglass and sealed it in 1976 and it has not leaked yet!

Follow the sealing kit instructions which usually indicate using the metal wash to dissolve dirt and varnish, then an etching product to prepare the metal inside the tank. Suggestion: have some plastic milk bottles or laundry detergent bottles to pour the waste into. When adding the sealer be careful of the fuel pick up line. It can not be removed and the steel tube inside the tank has a strainer on the end that you do not want to get it plugged up. As you turn the tank to coat the inside with the sealer blow air through the pick up line occasionally to keep it unclogged. I did not do that and after a week I checked and it was plugged, so I poured some acetone in the line and it opened right up.

While the sealer dries, paint the outside of the tank, the straps that hold the tank in and the gas filler pipe black, clean up the trunk floor and paint that if necessary. Replace the tank and away you go, knowing your tank is free of rust sediment and protected from rusting again.

This entry was posted in Fuel System on June 10, 2014 [http://www.austin-healey-stc.org/tech-articles/fuel-system] by rick.

FUEL DELIVERY PRESSURE

Chris Dimmock
Sydney, Australia

Both SU and Weber carburetters are very prone to leaking if your delivery pressure (totally different issue from *volume*) is excessive, irrespective of how good or new the float valve is. Most modern, non-SU fuel pumps operate at too high a pressure.

Why is this important? Because too much pressure can push the valve off its seat and cause an excessively rich air-fuel mixture, or worse, flooding. With too little pressure (or volume), the air-fuel mix is too lean.

If you don't have the equipment yourself, most workshops that have a dyno setup and they would be capable of measuring the:

1. Fuel delivery pressure. Basically, to measure fuel delivery pressure, disconnect the fuel line from the carbs, connect a low pressure gauge (something that accurately reads 0 -10 lbs.) securely to the line, start the pump, and look at the gauge. Delivery pressure for either SU or Weber carburetters should be the 3.5 preferred - 4 max lbs. per square inch range, unless you have made major mods to the carbs themselves (e.g., a large ball bearing inside a Weber instead of a standard valve).

2. Fuel delivery volume. Basically, to measure fuel delivery volume, disconnect the fuel line from the carbs, start the pump, and use a stop watch to ascertain how much fuel is delivered into a measured container over a measured amount of time. Most modern pumps deliver enough fuel. Your fuel volume requirement is based on the state of tune of your engine, and how you drive it.

If the volume is OK, but the pressure is too high, you have 2 options: you can get a lower pressure pump or fit a regulator. If you fit a regulator, my suggestion is the old fashioned Malpassi "filter king" combined fuel filter and pressure regulator. They were fitted to Italian high performance cars such as Maseratis, and they are very "period" in appearance. (They occasionally come up on eBay around $US50. Try searching for "filter king" on eBay.) Most speed shops sell just plain modern regulators. The flat-type regulators — usually annodised red or blue with a dial on top — seem to fail after about 12 months based upon my experience.

Once you have the regulator, fit it near the carbs and then go back to the dyno man with the pressure gauge and adjust it to deliver 3.5 lbs. per square inch pressure. Then recheck the delivery volume. The dyno man should be able to tell you what volume you need for your engine, which depends on its state of tune.

Fuel Pumps,

Tips on Maintenance and Repair

By Roger Moment

Part 2 of 2

SU fuel pumps are known to quit on occasion, usually at most inconvenient times and locations. The expedient thing to do when this happens is replace the pump with a spare (that hopefully you carry in your car when out on drives). This is not always easy and can become quite messy, with issues compounded by spillage of fuel from disconnected fuel lines. If you don't have the proper tools (including a jack for raising the car so you can remove a rear wheel to gain access to the pump) or experience in performing a pump swap, it is best that you have your car towed to a place where someone with adequate capabilities can do it for you.

Eventually you will need to decide what to do with the failed pump. If it is a genuine SU one it is worth saving – to rebuild and keep as a spare or even just for spare parts. If you aren't in the mode of saving old bits, there may be others in the club who would like to have an old pump, so ask around, as someone would be quite happy to get it.

If, or when, you tackle rebuilding, there are some tips I've found that help assure everything works properly, or even better than when it was new.

Pump Filters

It is best to think of fuel pumps as consisting of two components: 1) the pump body containing a fine filter and inlet and outlet valving; and 2) the electrical part consisting of the coil, points, and diaphragm that flexes to draw fuel into the pump chamber and scoot it on to the carburetors.

In the pump body the filter is made from a very fine screen that has a mesh similar to that of a silk stocking. On AUA 36 and AUA 56 pumps (these are BMC/SU part numbers; see Fuel Pumps, Part 1 in the May-June Austin-Healey Magazine for detailed descriptions of all the fuel pumps used in Big Healeys) this screen is accessible on the bottom side of the pump body, using a 3/8 W/ 7/16 BSF wrench, without having to disconnect fuel lines or remove the pump from the car. Be careful not to lose the fiber gasket/washer.

On LCS box-style fuel pumps found on later 100-Sixes and 3000s into the early Phase II BJ8s (SU part numbers AUA 72, AUA 172, and AUA 173) the filter is accessed by removing the bottom rectangular cap. However this really requires removing the pump from the car, and limited information on doing this can be obtained from Service Manuals.

On the AUF 301 pump used in later BJ8s, the filter is a coarser screen disk covering the inlet valve and requires major disassembly of the pump body, a task best attempted on a work bench.

Why Do Pumps Quit?

Pumps can stop pumping fuel for a number of reasons, and the easiest to check is clogging of the internal filter. Second on my list would be failure of the points. Third would be stiffening and/ or cracking of the diaphragm. Interaction of fuel with the rubber can result in a diaphragm that is hard for the coil to flex, and this can result in points not properly opening or closing at the end of diaphragm strokes. And fourth could be the valve disks not sealing properly against their seats. This can be caused by dirt particles that were not filtered out, but also by wear in the flat valve disk surfaces resulting from motion against their valve seats.

Working on pumps to replace or repair various parts requires the pump to be out of the car. Few special tools are required, but you do need to have a good aptitude for working on mechanical things, and a bit of patience.

Some maintenance operations on pumps are described (to a limited degree) in Healey Workshop Manuals. To compound repair challenges, I have also often found over the years that previous mechanics have re-assembled pumps incorrectly or even left out some parts that didn't seem important. In my experience, SU had a reason for each piece that is part of the pump design, and it is easy to overlook some of these bits, especially if they are missing, when reassembling a pump. To achieve the best results, pay close attention to all the parts shown in pump diagrams, and plan on rounding up any that appear to be missing from your pump.

Therefore, I have included a numbers of photos that illustrate some of those details that might not be fully understood or appreciated, or can be tricky to set up correctly.

Pump Body Valve Issues

Sometimes I have found valve seats to have imperfections on the sealing surface, and these can be repaired by patient lapping using a disk of carbide paper, glued to the flat end of a wood dowel with water used for lubrication.

A more a common problem is finding valve disks with a shallow, circular groove from wear of the disk against the valve seat. Even new valve disks are not perfectly flat, but rather have a very slight domed curvature to them, particularly as you approach their edges. To assure the best sealing, these disks can be made perfectly flat by lapping with carbide paper (I start with 600 grit, followed by 1200 and 1500 or 2000 grit and use WD-40 as a lubricant). I use a flat cast iron saw table as a backing surface for the carbide paper and plenty of lubricant to flush away grit.

Photo 1 – The intake flapper valve seat in a square-body LCS-type pump. On predecessor AUA 36 and AUA 56 pumps this seat is not brass but a ridge cast into the pump body. Note the damage to the sealing surface on the right side. This can be corrected by lapping, using the method described.

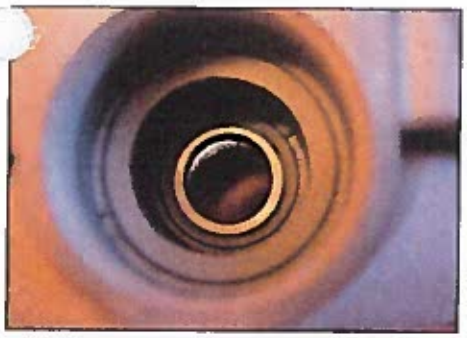


Photo 2 – The seat shown in Photo 1, after lapping. Output valve seat in both AUA 36/56 and LCS pumps are part of brass cage inserts, and if their seats are damaged these can be repaired in a similar manner

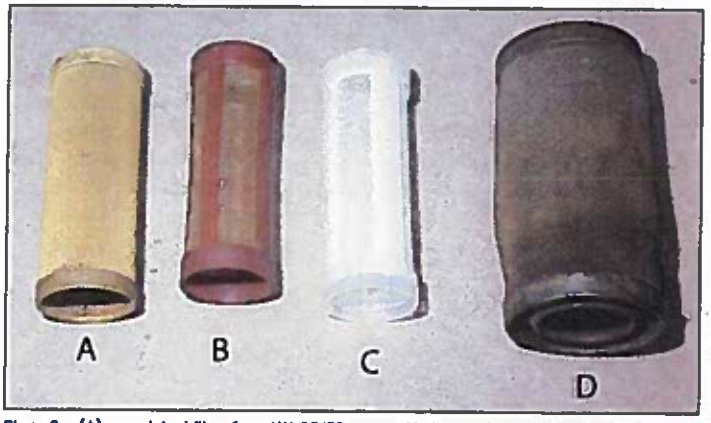


Photo 3 – (A); an original filter from AUA 36/56 pumps. Modern replacements are molded plastic (B & C). Original filters on box-style/LCS pumps (D).have an even finer mesh.

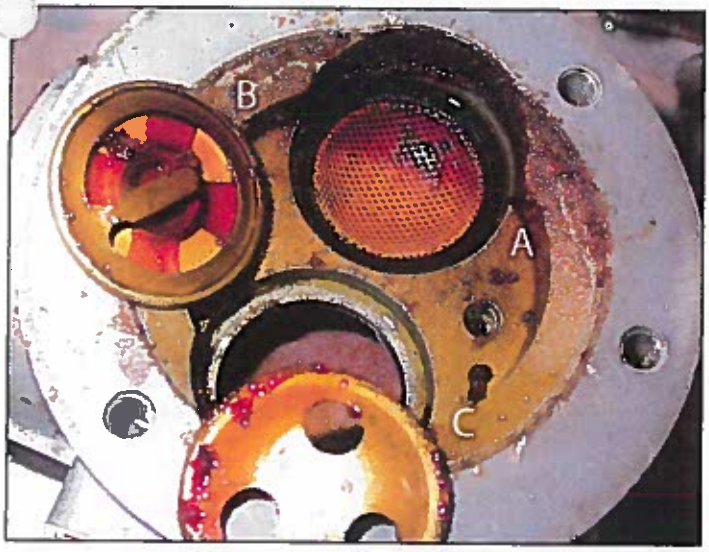


Photo 4 – AUF 301 pumps use a domed screen filter (A) adjacent to the inlet valve (B). It is coarser than filters in previous style pumps. A retaining cap (C) holds these bits in a pump body cavity (behind C). A second cap retains the outlet valve. A retainer piece clamps the covers to the pump body, holding both inlet and outlet valve assembly "stacks" in place.

Electrical Controls

There were two coils used on Healey fuel pumps. A 3-inch tall one was used on AUA 36/56 and the LCS box-style pumps up to March 1961. At this point a 2 3/8-inch tall coil replaced it on the LCS pumps and was continued as well on later AUF 301 BJ8 pumps.

On earlier original coils the center hole in the top of the coil housing is smaller than those shown in Photo 5. This will bind on new diaphragm stems, so you need to drill out the phenolic insert so that the hole is opend to the size of that in the steel coil body. This is the way later coils were made, so you are not destroying anything of importance (diaphragm stems on earlier pumps were also smaller in diameter).

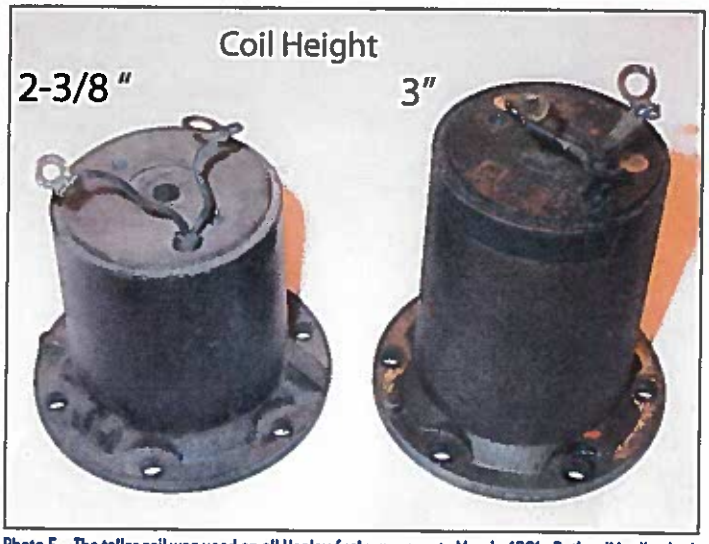


Photo 5 – The taller coil was used on all Healey fuel pumps up to March, 1961. Both coil bodies had a tapped hole in the flange for attaching a grounding wire. The eyelet with the larger hole attaches to the pump terminal, while the one with the smaller hole attaches to the points blade.

Another significant visual difference between pumps was the shape of their cap. All pumps up to introduction of the AUF 301 pump on Phase II BJ8s (August, 1964) had flat-top caps. A capacitor was added at this point that would not fit inside, so the cap was modified with a raised step.

A nice advantage of the small Mylar capacitors and the suppressor are that they are thin enough to "float" just above the points blade and thus fit within the flat caps on earlier pumps, allowing protection of the points against arcing while preserving the original look of these pumps.

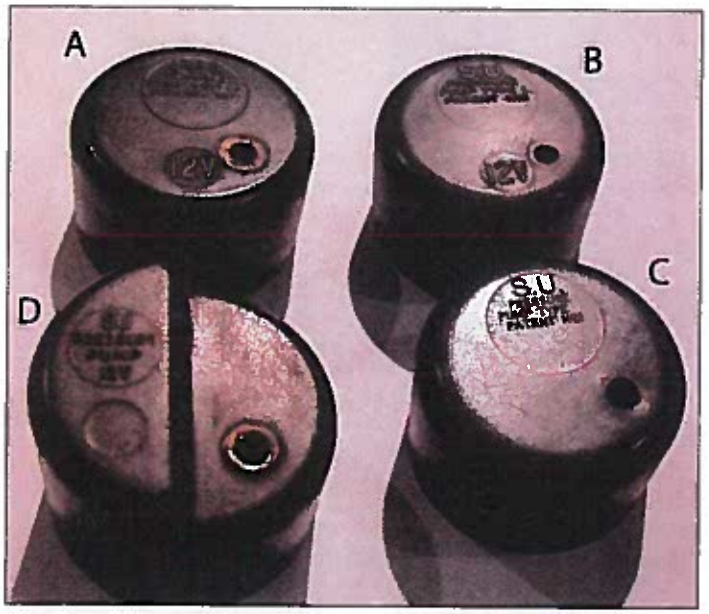


Photo 6 – Cap (A) is an original flat style found on Healey pumps. (B), without the brass grommet, may be from older replacement pumps. (C) is a new cap, available today from parts suppliers. The lower part of cap (D) is the same height as the top of caps A, B, and C. The raised portion accommodated a metal can style capacitor.

Tech Tips - Maintaining Your Fuel Pump

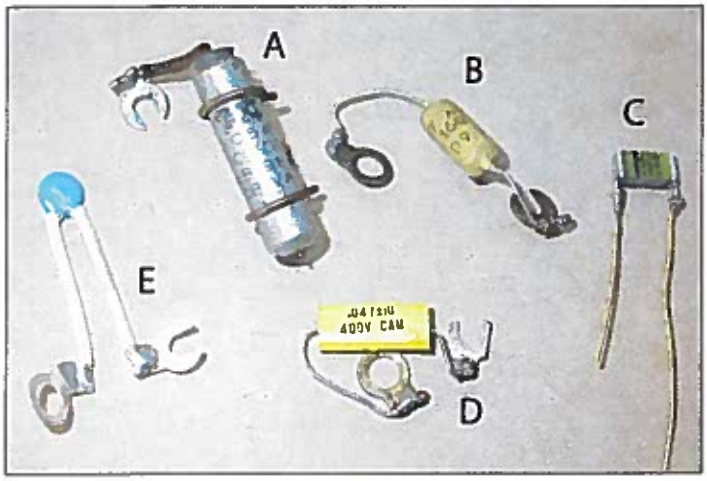


Photo 7 – The metal can capacitor, (A) is original in BJ8 Healeys after August 1964, and replacement pumps from the same time period. Capacitor style (B) has been found on SU replacement pumps, likely manufactured in the 1980s or later. I am not sure of its construction. Styles (C) and (D) are Mylar capacitors available today. A suppressor (E) is sold by Burlen Fuel Systems (a source for SU fuel system parts in England). Capacitor (A) must be used with cars wired with positive ground. Mylar capacitors and the suppressor can be used in cars with either positive or negative ground. All capacitors are marked 0.047 μf (microfarads). (A) and (B) were supplied in new SU pumps and are rated at 200v and160v. The Mylar capacitors (C) and (D) are rated at 250v and 400v, respectively. The suppressor (E) has no markings on it.

Photo 8a – The mylar capacitor is attached between the screw that mounts the points blade and the screw that holds the ground wire from the points rocker assembly. The two larger slotted screws mount the pedestal to the coil body.

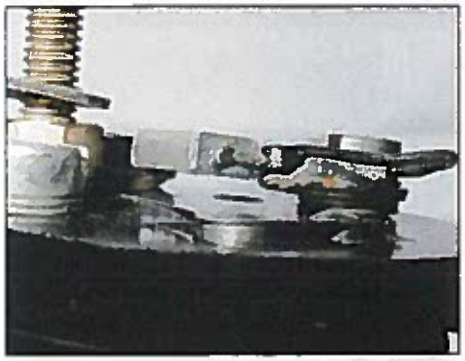


Photo 8b – The capacitor needs to be positioned no higher than the brass terminal nut, but also far enough above the points blade to clear it during operation.

Photo 8c – The suppressor (arrow) mounts in the same

Assembling the Pedestal to the Coil Body

There are a number of bits involved when assembling the terminal to the pedestal. Note that a 2-turn spring washer is placed at the bottom of the stack (the Brits call these Thackery washers), that pushes the eyelet up against the lead (Pb) washer and retaining nut (see photos 9 & 10). Three of these Thackery washers should be used in mounting the pedestal; one, as shown on the terminal; a second under the head of the mounting screw adjacent to the terminal; and the third under the wire eyelets that are attached by the other pedestal mounting screw. This style of spring washer helps prevent cracking the pedestal from too much pressure when tightening the mounting screws. On most original pumps I have found the spring washer under one of the pedestal mounting screws to be missing, but I feel using them under both is better in order to avoid excessive pressure from over-tightning the pedestal screws.

The coil wire with the larger eyelet must be slipped onto the terminal screw before placing the pedestal against the coil top, as this wire is too short to reach over the terminal otherwise. I recommend loosely building up the stack of Thackery washer, coil wire eyelet, lead washer and special brass nut (concave side down) before locating the pedestal against the coil body.

To mount the pedestal, first install the mounting screw adjacent to the terminal post, but only run it in a couple of turns, leaving the pedestal free to be lifted a bit above the coil surface. You need this extra clearance when you inst the points rocker assembly (this trick also allows you to replace the points without having to disassemble the terminal from the pedestal).

Next install the points and the second pedestal mounting screw, placing the Thackery washer against the Bakelite and stacking the points rocker assembly ground wire and capacitor/suppressor eyelets over it so it will press them up against the screw head.

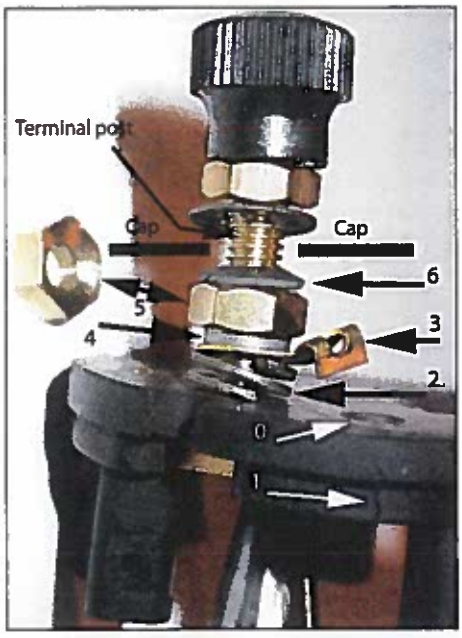


Photo 9 – The stack of components on the terminal post: 0 – a hole in the pedestal for one of the two mounting screws. 1 – the pedestal "deck" will crack if the mounting screws are overtightened. New pedestals are redesigned with stronger support posts to help keep this from happening. 2 – two-turn Thackery spring washer. 3 – the eyelet that will be soldered to one of the coil wires. 4 – lead washer. 5 – br nut with cavity on the b tom face. 6 – rubber washer/ sealing gasket. The dark line represents where the top of the cap lies when it is installed later. Holding the cap in place is the

You can now tighten the two mounting screws, followed by installing the points blade along with the other capacitor/suppressor lead. Be sure to accurately align the blade contacts with those on the rocker assembly. The blade should be pushed up slightly off of the pedestal with the rocker assembly in its "up" position. Also, the bottom stop on the rocker assembly should have a 0.030" gap to the top of the coil body when the rocker is raised just half way towards where its points just contacts those on the blade.

Finally tighten the brass nut holding the coil wire to the terminal post. Make sure that the square post head is fully nested into its pocket on the underside of the pedestal, and tighten the nut until it is really firm. This will cause the lead washer to deform, locking the assembly tightly together (see photo 10).

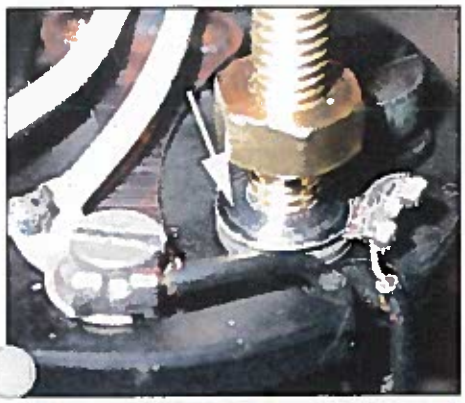


Photo 10 – In this photo the brass nut has been backed off to show how the lead washer is crushed when the nut is tightened, creating a locking of the assembly. This is how the things will appear when disassembling a factory-built pump. The lead washer must be cut with a sharp blade in order to free the terminal post and remove the pedestal from the coil.

Photo 11 – This photo shows the second pedestal mounting screw, which also is used to attach the rocker assembly ground (braided copper wire) and one lead of the capacitor/suppressor. Note that the Thackery washer is located at the bottom of the stack so that it presses both eyelets upwards against the screw head.

Installing the Diaphragm

The diaphragm return spring fits over the stem before inserting this into the coil body. There were three sizes of springs used in the various Healey fuel pumps. Only the shortest spring will fit into the short coil, while either of the longer ones will work in the tall coil. However, the tallest spring was only used on AUA 36 high-pressure pumps found on Healey 100s.

With taller springs, pumps cycle slower but deliver fuel at higher pressure. With the shorter springs, pumps cycle more quickly, and the fuel pressure is less. Either pump operation delivers adequate fuel to the carburetors. New replacements for either the short or middle size springs are available, but not the taller, HP pump spring.

To install the diaphragm, slip the spring over the post, making sure that the small end nests properly against the steel plate, centered by the molded-in ridge. Push the diaphram all the way up, compressing the spring, so that the stem tip can engauge the receiving threads in the rocker assembly. Rotate the diaphram an additional 2-3 turns.

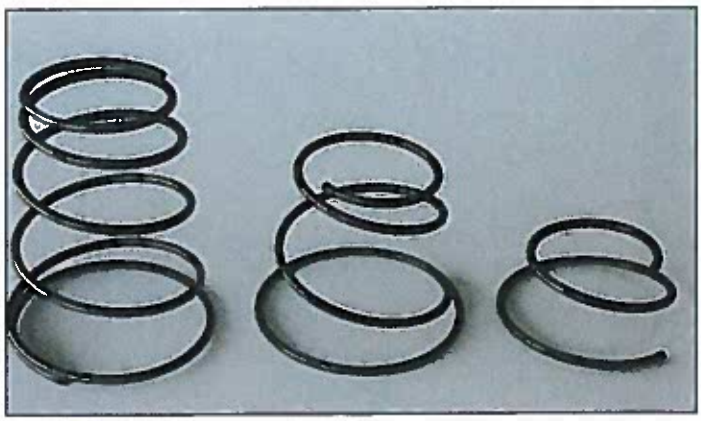


Photo 12 – The tall diaphragm spring on the left is used in HP pumps, found on Healey 100s. The middle spring was used on tall coil pumps in 100-Six and 3000 Healeys up to introduction of the short coil. The short spring on the right was only used with short coil pumps.

Before adjusting operation of the points, you will need to have the spacers installed so that the diaphragm is perfectly centered within the coil housing. Three styles of spacers have been used. If you use the 4-part molded spacer, it will need to be installed before the diaphragm is inserted into the coil. All other multi-piece spacers are installed after the diaphragm stem has been partially threaded into the rocker assembly.

Photo 13 – Three styles of spacers used to center diaphragms in pump coil bodies. Original on all pumps (Healey BN1 – BJ8) is a set of 11 thick brass washers (bottom). The molded 4-part plastic spacer appeared on some replacements pumps in the 1980s and 1990s. This style works very well and is easy to install. The set of five figure 8 spacers is being supplied with pump rebuild kits today, and some of these spacers are too wide and will bind diaphragm operation. The brass rollers are tricky to install, but provide extremely dependable operation.

Invert the coil (particularly so that the roller spacers can't fall out if you're using them) and insert the 11 brass rollers. Make sure that all seat properly into the diaphragm plate groove and that you use all eleven disks – the odd number assures that they won't bind.

Still holding the coil upside down, screw the diaphragm post further into the rocker assembly until it won't throw over when you push the diaphragm fully into the coil housing. Then back off the diaphragm to line up its outer holes with those in the coil flange and continue unscrewing until the rocker assembly will trip when the diaphragm is pushed in. Finally, and most importantly, continue unscrewing an additional five hole positions. The diaphragm is now properly adjusted for points operation.

Assembling the Pump

The last step is to assemble the coil to the pump. Gaskets are used between the diaphragm and pump body (and also between the two body pieces on AUA 36 and AUA 56 pumps). These can be assembled dry as fuel will cause them to swell and seal.

Photo 14 – Inserting the eleven rollers is tricky. You need to 1) make sure they seat properly into the metal diaphragm plate, 2) keep from falling out, and 3) insure that the diaphragm rotational alignment is not changed.

Correct rotational orientation of the coil relative to the pump body is illustrated in Service Parts Lists. Continuing to hold the coil upside down, insert two screws through the coil flange, diaphragm, and gasket and place the pump body and gasket(s) against it so you can start the screws.

Photo 15 – The two holes in the main body of AUA 36/56 pumps needs to line up with the oblong slot in the intermediary plate.

Photo 16 – A special gasket seals between this plate and the main pump body in AUA 36/56 pumps, and a second one against the pump diaphragm.

(On AUA 36 and AUA 56 pumps make sure that the two pump body pieces are aligned properly.) Run these two screws in fully to draw the pump body and coil up snugly all around the flange. If a gap remains, it is probably due to a roller slipping out of place, and you will need to go back and sort this out. All components should draw up easily, so don't force things if something doesn't feel right. Finish by inserting the remaining four screws and tighten everything up.

Testing

A word of caution: before connecting electricity to the pump to test it, be sure to install the cap. If you don't, the wire shaft that the rocker assembly pivots on can (and likely will) "walk" out of its mounting holes in the pedestal during operation. The cap provides a stop to prevent this from happening. Note that a rubber washer/gasket should be positioned on the terminal post to seal the gap where it passes through the cap (see Photo 9).

Connect clear plastic tubing to fittings that attach to the inlet and outlet ports and first run the pump dry to make sure it is working. Applying your finger over the inlet tube should cause the pump to slow a bit, but may not when placed over the outlet.

Next insert the tubes into a container filled with mineral spirits/solvent (same petroleum family as gasoline, but far less dangerous) and check that the pump will self-prime. Important: The pump must be held in the same orientation that it will be in when installed into the car so that the internal valves will seal properly. Check all joints for tightness by putting a finger first over the inlet tube end and then the outlet tube. When the tubes are filled with solvent, both tests should cause the pump to stop.

If the pump appears to be working properly, after disconnecting the wires and removing the tubes, tilt the pump to remove most of the solvent (you can also blow compressed air through the pump's inlet fitting). Finish by wrapping the cap-coil body joint with a strip of electrical tape (to help seal out air), and cover with the appropriate rubber boot or band.

A Final Note on Installation

Pumps may not readily self-prime when installed in the car because of back pressure from fuel in the line to the carburetors. The solution is to start the engine -- as it draws fuel from the lines the pump should readily prime. Check again for fuel leaks around the pump body and at all fuel line connections. When the engine is shut down, and the ignition turned back on (but with the engine off) the pump should be silent or revert to very slow clicking (perhaps one click every 10 seconds, or longer), as the old pump did before it developed problems. Note: on BJ8s, the key should be in the "run" position – not turned to operate the starter.

Acknowledgement

I would like to thank John Hodgman for critically reviewing this article and providing many valuable suggestions.

Fuel Pumps for the Big Healeys, 1953-1967

Originally published in CHATTER, *June/July 1994*

By Roger Moment
Rocky Mountain AHC

For most people, a fuel pump is just another part of the car, one which "ticks" in Austin-Healeys, is hard to get to, usually forgotten and best left alone. That is until your car stops dead for lack of gas or sputters and misses on occasion, usually going uphill under full throttle. Then it is usually your "friendly" mechanic who gets to set things right. But in fixing or replacing fuel pumps there are many choices that can be made. Do you go for an after market pump, that gets the job done, but is definitely not original; do you replace the original pump (assuming it is still in the car) with another Healey pump, even if it is not exactly the same; or do you try to restore the pump to its condition of yore. I believe that a properly rebuilt original pump, with added capacitor (as described below) can provide reliable service for a long time. Mine have been operating for 15-20 years.

For all my involvement with Concours over the years, I really hadn't given much thought to fuel pumps, until lately. Being a bit of an "originality nut," I was curious as to which pumps used the 3" long shaft diaphragm (not available from MOSS, but from other sources), and which used the short 2 3/8" shaft (this one is commonly available). In researching this question, using parts books from BN1 through BJ8, I started to sort out differences between the various pumps. Some of this information will be of interest to anyone who would undertake to fix a pump themselves, and some will only be useful to those wanting to get "right" even this little esoteric detail of their restoration.

There were three different fuel pump styles used from the BN1 through the BJ8, as described in the table and shown in photo 1. Those used on "early" BN4s are for cars built in Longbridge -- the change over in pump style seems to coincide with moving production to Abingdon.

It appears that the shorter coils were introduced at chassis #13831, but this is based on interpretation of listed part number change points. The change-over to the step cap came at BJ8 28225, and reflects inclusion of a capacitor to reduce point "wear" from arcing. It is possible to use "later" pumps on earlier cars, at least from the stand point of fuel delivery, and I suspect that the shorter coil assemblies were used on replacement pumps sold after about 1962, since they all fit interchangeable on the different cast aluminum pump bodies. This may be why most pumps found on cars today may have the correct pump body, but are fitted with short coils and stepped caps. (The points on all pumps are also interchangeable.)

Fuel Pumps Used on Big Healeys

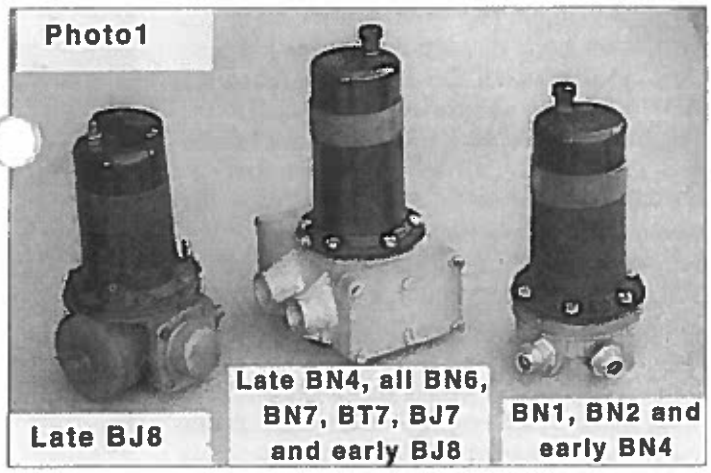
FEATURE	BN1/2, early BN4		BN4/6, BN7/BT7, BJ7 and early BJ8		Later BJ8
Type	"L"	"HP"	"LCS"		AUF301
Flow gal/hr	8	10	12.5		15
Pump body	round		box-like		round (not like BN1)
Coil Body	3" (tall)		3"	2 3/8"	2 3/8"
Cap	flat top		flat top		step cap

Fixing Pumps

There are three main reasons why pumps fail: 1) clogged internal filters, 2) cracked diaphragms and 3) burned out points. In many old pumps that I have examined, particularly those that had capacitors, the points were really not all that bad and cleaned up nicely with 400 grit carbide paper, followed by polishing with 1200 grit ultra-fine.

If you have pump problems, it really is best to totally disassemble the coil from the pump body. This is the safest way to remove the points and avoid damage and also protect on the sixes because of risk to damaging the rectangular gasket. These filters will most likely become clogged from particles sucked up from the gas tank. If this happens often, unscrew the drain plug at the bottom of the tank and flush it out. I run the tank down to about 1-2 gallons, and recycle this amount through a fine strainer until it runs out clean. Shake the car a bit to slosh it around for maximum pick-up of particles distributed across the tank bottom.

Remember, there really is no reason to throw out a pump that is not working. Many parts are no longer available, so it would be a shame to throw pieces away that could be salvaged to restore other pumps. Besides, you could probably have your old pump rebuilt as a spare to carry in your car.



vides an opportunity to check the diaphragm conditions. When separating the coil and diaphragm from the pump body, watch out that you don't lose any of the 11 brass washer-like spacers. You need every one of them to assure proper alignment of the diaphragm on reassembly. (Some rebuilt pumps may have a plastic spacer, which works fine and is easier to install). Diaphragms in original pumps are comprised of two rubber layers, and this material will deteriorate and crack or become stiff over time from contact with fuel. This is why checking the condition is so important. More recent diaphragms from SU have an additional mylar membrane on the fuel side, which I suppose was added to provide protection from fuel attack and prevent this problem. It is important to install an additional gasket (Victoria British part #3-2012) between this membrane and the pump body, when using this type of diaphragm, as these materials will not form a properly tight seal by themselves.

To remove the points I recommend following the shop manual instructions and unscrew the diaphragm after separating the coil from the pump body. You will avoid 1) having to disassemble the pedestal assembly, and 2) risking damage to the fragile insulation on the two wires as they poke through the coil body. If you are adventurous enough to take everything apart, it is possible to miss some fine points. First, special two-turn helical spring washers were used under the various screws as lock washers. These are placed against the bakelite, with connector eyelets positioned above and *between* them and the screw heads or nut. Second, a lead washer (Victoria British part #12-5040) was added under the brass nut on the terminal post to assure good electrical contact. The proper order of assembly on the terminal post is shown in Figure 1, taken from the SU service manual. It is a good idea to refer to a parts book drawing to check the order of all washers, as they could be missing or incorrectly installed during pervious servicing. The 100-6 or 3000 parts books have proper drawings (the 100-4 parts book has no illustration), and the electrical pedestal parts (except for the capacitor) are the same for all pumps.

Warning: Insulation on coil wires gets brittle with age -- handle them very carefully. Electrical resistance on 3" tall coils is 3 ½-4 ohms, and on the shorter 2 /3/8" coils 2½-3 ohms. Resistance should be infinite between the wires and coil cases. Frayed leads can be resleeved – don't throw those old coils away!

Modern technology has come up with capacitors that are flat enough to easily fit under the flat cap of earlier pumps, thereby giving electrical protection to the points while preserving the pump's original appearance. Photo 2 shows a mylar 0.047 uf capacitor, rated at 400 volts (the originals were pencil shape and rated at 200 volts) attached across the points (One end to the blade retaining screw and the other to the screw to which the flexible copper point lead goes). It sits no higher than the top of the adjacent screw, clears the points by an ample margin, and almost totally cuts out arcing. Cost is a whopping 35 cents. To further extend point life, be sure that the joint between the cap and coil base is sealed to shut out air. Once the oxygen under the cap is depleted (after a few minutes of operation) arcing cannot be sustained. This is part of the reason why rubber bands and sleeves were originally used on new pumps, and tape is applied to rebuilt ones.

Caution: When reassembling components and the pedestal to the coil body, do not over tighten the screws, as you could crack the bakelite.

Adjustment of the diaphragm is quite easy, and is explained in the 100-six and 3000 shop manual (but not the 100-4 manual!) Be sure to install the coil spring and the plastic spacer ring (if that is the type you are using) before inserting the shaft up through the windings. By pressing in fully while turning, it is possible to engage the first thread into the rocker assembly. Continue to screw the diaphragm shaft until the rocker just "throws over" when the diaphragm is pushed fully upwards. Then back off ⅔ of a turn (count four holes on the edge). If you are using the 11 brass spacer rollers, they are best inserted after completing the rocker adjustment by lifting up an edge of the diaphragm to drop them into place. It is emphasized in the shop manual that the screws holding the coil to the pump body should NOT be tightened with the diaphragm in the "relaxed" position. You can make a simple tool, illustrated in Figure 2, to reach in and hold the top of the spindle in its uppermost position, thereby stretching the diaphragm, while tightening the six body screws.

Finally, remove and clean the filter from the bottom of the pump body. This can be easily done with the pump in place on 100-4s, but is a bit trickier with the box-type

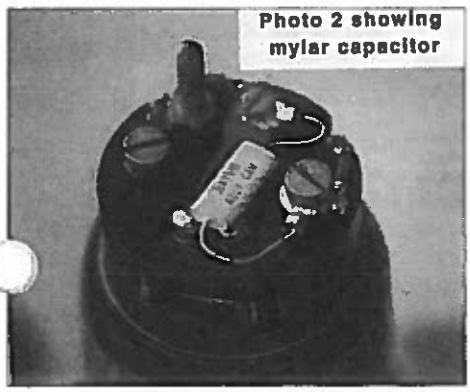
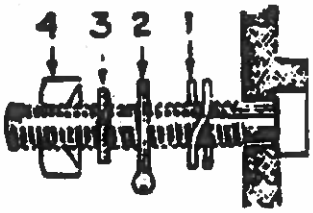
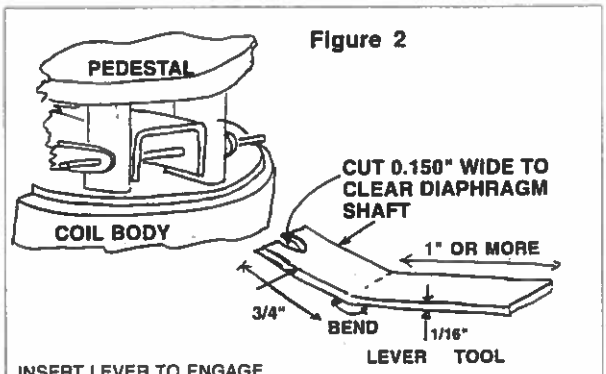


Figure 1



1. Helical spring washer
2. Wire connector eyelet
3. Lead washer
4. Brass nut – note concave on side against lead washer

Figure 2



INSERT LEVER TO ENGAGE UNDER POINT MECHANISM. PRESSING DOWN ON HANDLE WILL RAISE DIAPHRAGM SHAFT FOR TIGHTENING SIX SCREWS HOLDING COIL TO PUMP.

GOING DOWN THE TUBE

...or, What you never wanted to know about your fuel tank

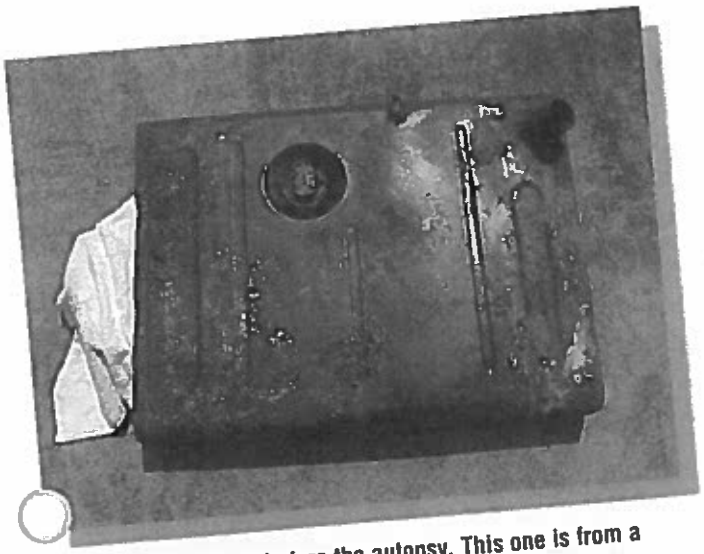
Perry Small
Kailua, Hawaii

Have you ever wondered what lurks inside your fuel tank? Do you just pump that unleaded into the filler tube without the slightest thought about what's happening inside? Well, you might be surprised at what's lurking in there. Please read on.

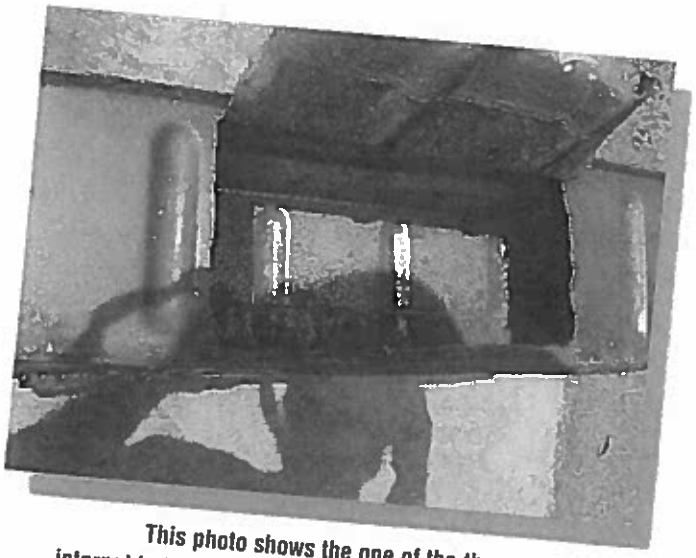
A couple years ago a friend asked me to undertake a partial restoration of his BN2. The intent was to produce a "decent driver" after more than 10 years of non-use. He had dismantled the car years earlier, and left the rolling chassis and boxes and boxes of car parts under his house, hoping someday to put his pride and joy back together. Never happened!

This scenario seems to be repeated around the world with many Austin-Healey owners. Some are successful in resurrecting their cars to "good drivers" or better, and some remain dismantled until the tin worm and time machine overtake it all and there's not much left to work with. Others just give up (or are pushed by their better half) and peddle the "pile of stuff out behind the garage" to the first person with some green stuff in their hand.

Anyway, for this project some specific rules were established prior to starting work on this particular car. Several of the components on the chassis were



The fuel tank before the autopsy. This one is from a six-cylinder big Healey, with the rust damage from battery acid visible along the right edge near the filler neck.



This photo shows the one of the three internal baffles (walls) that run fore and aft in the tank. The baffles prevent the fuel from sloshing from side to side too much, possibly causing fuel starvation.

to be used as-is, such as the front suspension, the engine, the transmission and the gas tank. But why would someone not want the tank looked at, replaced or at least cleaned after a long hiatus? "It worked before I quit driving it, and besides, it was treated with one of those modern gas tank sealers," was the reply. Therefore, since I had to fix the gas tank straps anyway, I took the occasion of having the tank out of the car to rinse the tank with $3 worth of 89 octane, didn't notice any weeping at the normal locations, and put it back in the car. Little did I know what was waiting, literally down the road.

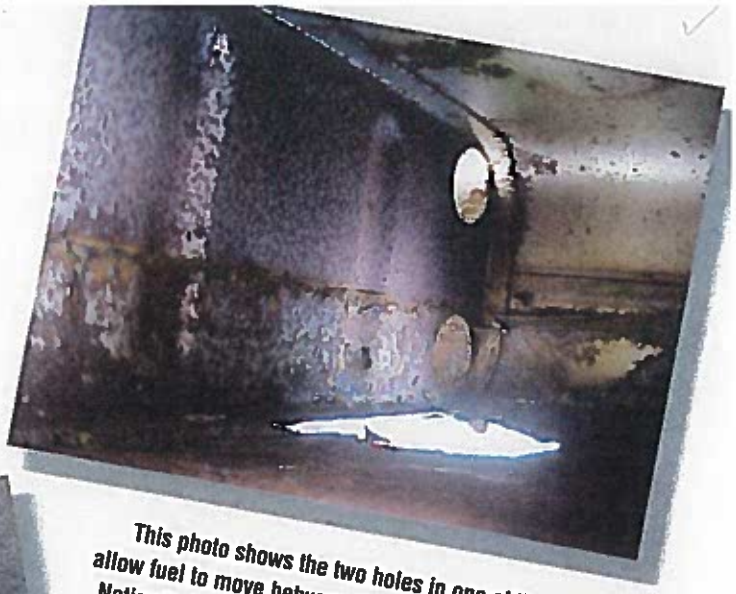
To make a long story short, the car ran fine for me while I had it. Following that, it still ran fine for the first couple weeks that the owner drove the car. Then it started to get the slight stumble on acceleration, followed by sporadic missing, and finally came a call to me at work to inform me that the car was on the side of the road somewhere between here and nowhere, and would not run.

Once the car was back at my garage, the fuel system was checked from front to back. Everything was as it should be. The inline fuel filter had kept any debris from getting to the pump or carbs, and the fuel lines seemed to be clear except

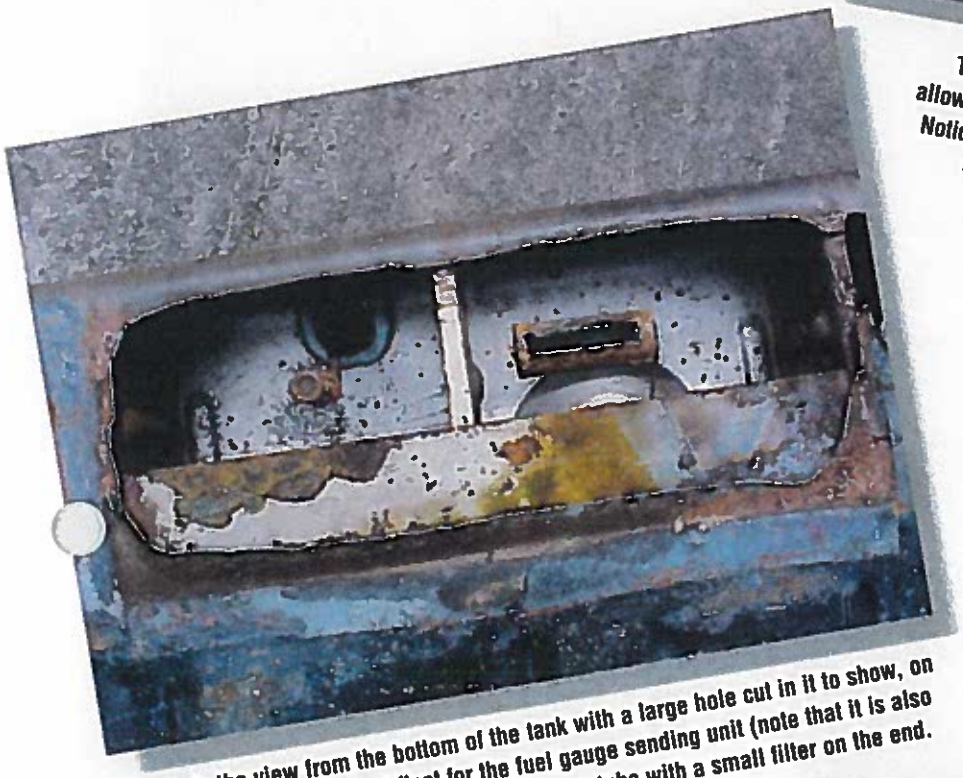
when I tried to force air into the fuel tank from the pump ne. I got a lot of resistance and couldn't hear bubbles in the tank with the cap off. Ah yes, the dreaded clogged fuel tank pick-up tube.

Now are you beginning wonder what might be in your tank?

Fuel systems have been the same on most cars and trucks for a long time, but some manufactures anticipate component failures better than others. I have heard it said more than once at Healey gatherings that "these cars weren't expected to last a long time." If you consider the method of assembling and painting the cars, rust was an inevitable event and the foregone conclusion may have been that *Continued on page 27*



This photo shows the two holes in one of the baffles that allow fuel to move between the four internal compartments. Notice the horizontal line of varnish that indicates the level of the last load of fuel before the tank started leaking. Amazingly, the upper parts of the tank, where there was only air, were not rusted that badly. However, the gas in the tank will float on accumulated water or moisture, and in this tank the bottom of the tank was like Swiss cheese.



This is the view from the bottom of the tank with a large hole cut in it to show, on the right, the cylindrical float for the fuel gauge sending unit (note that it is also rusted through) and, on the left, the pick-up tube with a small filter on the end.

a small filter on the end of the pick-up tube. Imagine using an internal do-it-yourself tank coating and having it come in contact with this small, fine-screen filter. Perhaps injecting compressed air down the pick-up tube immediately after coating the tank would force most of the coating off the filter surface, but do you want to take that chance?

This close-up of the end of the pick-up line filter shows the name of the vendor supplying Austin way back when.

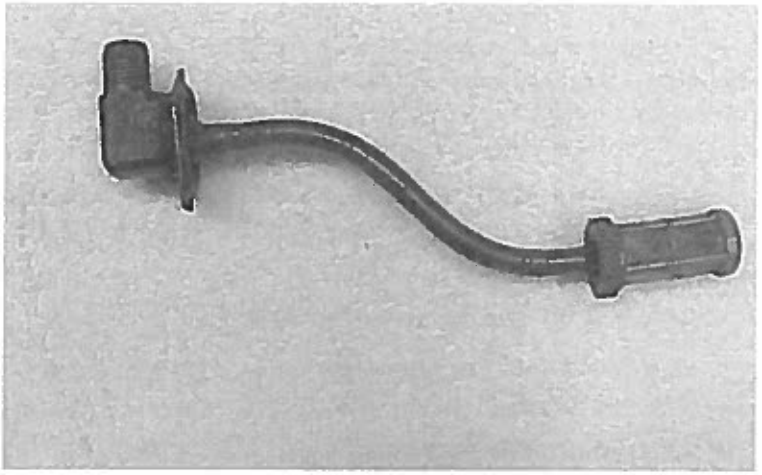
GOING DOWN THE TUBE

Continued from page 23

many cars may meet their demise in that mode of failure. Certain parts were expected to last just "long enough," and never to be replaced before the car finally gave up the ghost. The fuel tank is one on those parts. Early tanks had sections of the tank soldered together, more like a radiator, and seem to last a long time. However, later tanks were welded and made of basically unprotected steel.

Did you know that there is a small filter at the end of the pick-up tube inside your fuel tank? Since the tanks tend to rust if left empty (or if left full for that matter; it doesn't seem to matter too much) the corrosion debris and stuff that may be introduced by the tank-filling operation must be kept out of the pick-up tube. The filter design changed over the years, but it is still in there. The important thing here is the design of the tank does not allow changing that filter. The temporary cure is to poke through the clogged filter and restore the free flow of fuel to the pump, but a better and more permanent cure is a tank replacement.

Anyway, the BN2 in question is now back on the road and all is well in Healeyland. In light of that problem, I had an old fuel tank from a six-cylinder big Healey awaiting the next trip to the metal recycler, and I decided to open it up and take some photos for fun. This tank had been in a Healey that had been parked for about 12 years, and it was perforated both from within and without. Battery acid is tough on thin, unprotected steel. Hopefully these photos will give you a good idea of what's inside your fuel tank.



The pick-up tube removed from the fuel tank. The filter on the end of the pick-up tube cannot be changed since the pick-up tube cannot be removed except by cutting it out, damaging the fuel tank.

So next time you fill 'er up, you'll know what's down the filler neck besides that unleaded fuel. Be careful what you put in there!

Solid State Fuel Pump

By Fred Vercruysse
Atlanta AHC

Purolator makes a solid state fuel pump which has 3 leads: red+, black- , and a chassis ground wire all of which allow it to be connected in either a positive or negative ground vehicle.

Advanced Auto Parts normally carries this pump – priced under $30. There are two versions; 1-4 PSI and 4-7 PSI. Caution – the SU carburetor must use the 1-4 PSI version; while some, if not all Stromberg's use the 4-7 PSI version. Also, it does "tick" for those of you who like the reassurance of hearing the pump run. I installed one on my Austin-Healey in 1995 and it still works great. I liked it enough to buy another one as a spare – just in case.

You might have to work a little at getting the proper fuel line connections. You may need to get a short length of $^5/_{16}$ fuel line hose and various fittings to adapt the pump to your car. It's also a great time to connect an in-line fuel filter between the tank and the pump. Be advised that the Big Healey uses the steel fuel line as a ground return for the fuel gauge. I don't know if other LBCs also use this unfortunate grounding system or not.

Installing a length of rubber fuel hose will remove that ground if 40+ years of crap, crud and corrosion haven't already accomplished that solution – attach a ground wire from the fuel tank sending unit to a nearby frame/chassis screw. If you are just interested in a spare pump and have several cars – some of which use the higher pressure pump – keep in mind that the 1-4 PSI version should at least get you home on either type car.

TECHNICAL SERVICE BULLETIN

Fuel Pumps - A Major Cause of Breakdowns

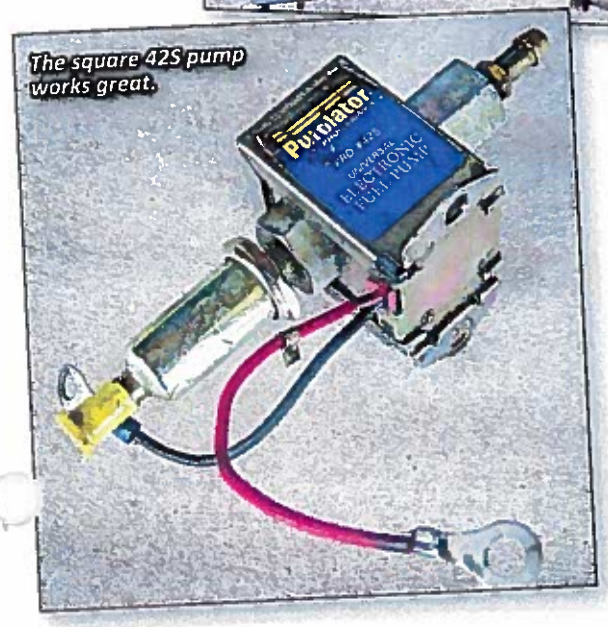
Mike McPhail, Dripping Springs, Texas, Gulf Coast Healey Club

Whew... that three-month long brake job was a bit much! Let's do something a little less ambitious this time. How about a new fuel pump? Of course, you don't just replace the pump for the hell of it. The obvious scenario is that the darn thing won't pee a drop, so you swap it for a new one and bada-bing, it's a done deal. Sadly, that is not usually the way things go.

What really happens is that at the least opportune time, the car sputters and dies for no apparent reason, then mysteriously runs again, making you wonder what the heck is going on! Not to worry, you don't really have to guess about the condition of that old pump. Don't try disconnecting the fuel line from the carbs to see how far the gas will shoot when you crank the engine. Instead, on your next trip to Harbor Freight, purchase a combination vacuum and fuel pump tester. Now not only can you check the manifold vacuum, but you can test the fuel pump for proper operation. A ...ally clever ...llow would test the pressure on all his Healeys just to get an idea of what to expect.


Fuel pump graveyard.

Connect the gauge to the output of the pump with the input still connected to the tank. Crank the engine for five seconds on the stock Bugeye or for most everybody else with an electric pump. Turn on the ignition for a few seconds, and listen for the pump to reach full pressure. On original SU pumps the unit will stop clicking when the pressure has built up, while on most aftermarket electric pumps, the sound and frequency will just diminish. Shut everything off and look at the gauge. It should read between 1 1/2 and 3 1/2 PSI, and more importantly, the pressure should hold indefinitely. Too much pressure can cause the float bowl to overflow, causing the engine to flood and gasoline to drip all over that hot exhaust manifold. Harbor Freight also sells fire extinguishers!



The square 42S pump works great.

The round E8016S pump also makes a nice spare.

Watch the gas tank crud accumulate in this filter.


You can't see inside these filters.

Truth is, many fuel delivery problems are not the fault of the pump at all. Replacing all of the lines is a sure fire (there's

that word again) way to ensure that all the walking you do is with Fido. Crud in the gas tank often accumulates in the fuel line, especially on cheap cars like Triumphs with fuel lines coming from the bottom of the tank. Usually, the SU pump has a screen in it, or the lines at the carbs have thimble-like sieves. If you were to look into the bottom of your float bowls, you would see that the OE (Original Equipment) filters don't keep all the dirt out of the carbs. If junk gets past these filters, the check valve in the float bowl will malfunction, causing the car to die or, even worse, cause the bowl to overflow. To prevent this situation, a clear disposable fuel filter (Fram G2) should be installed as close to the tank as possible. Installing a filter under the bonnet right before the carbs is convenient, but not entirely effective. Soon after adding the new filter, you will almost certainly notice a build up of silt in the filter. This stuff has been running through your fuel lines for years!

On Austin-Healeys the line comes from the top of the tank, greatly reducing the amount of silt getting into the system. Unfortunately, sometimes there is an inaccessible screen in the tank that can become clogged, resulting in a total lack of fuel delivery, especially if a tank sealer product has been used. You should be able to blow into the fuel line where it leaves the tank (with the gas cap off) without getting red-faced. A

plugged up vent can cause lots of trouble; a vacuum will be created and eventually the pump will be unable to suck any gas. On modern cars you expect to hear the rush of air when removing the gas cap, but never on a vintage vehicle. Healeys have vented gas caps, which are renowned for dumping ethanol-laden fuel all over your new paint job, stripping it quickly to bare metal – just ask my friend Mike Johnson! If your LBC is not stinking up the garage with fumes, the vent may not be working! The Healey Hundred gas cap is in the boot and does an admirable job of fumigating your luggage. I sealed the cap on mine and ran a vent line so as to dump the fumes onto the hot exhaust... clever, what?

The SU electric fuel pump is in fact the Achilles Heal-ey of our cars. I would say that it is the major cause of breakdowns that we have to worry about. Those leaky old OE pumps had contact breaker points like in a distributor that eventually require a sharp rap with a hammer to get going. The latest reproductions replace this with an electronic device. For my money, a modern universal electric fuel pump makes an economical and reliable alternative. Most auto parts stores sell a low-pressure solid-state fuel pump for about $40. The little square one usually carries the part number 42S; or for the round one, E8016S. Keep an extra on hand so as to play the hero when Terry's pump packs it in on the way to the Texas Healey Roundup. I have had a "Facet 42S" on my 100M for a very long time and am most pleased with it! HM

Fuel Pumps,

Evolution of Configurations and Mounting on Big Healeys

By Roger Moment

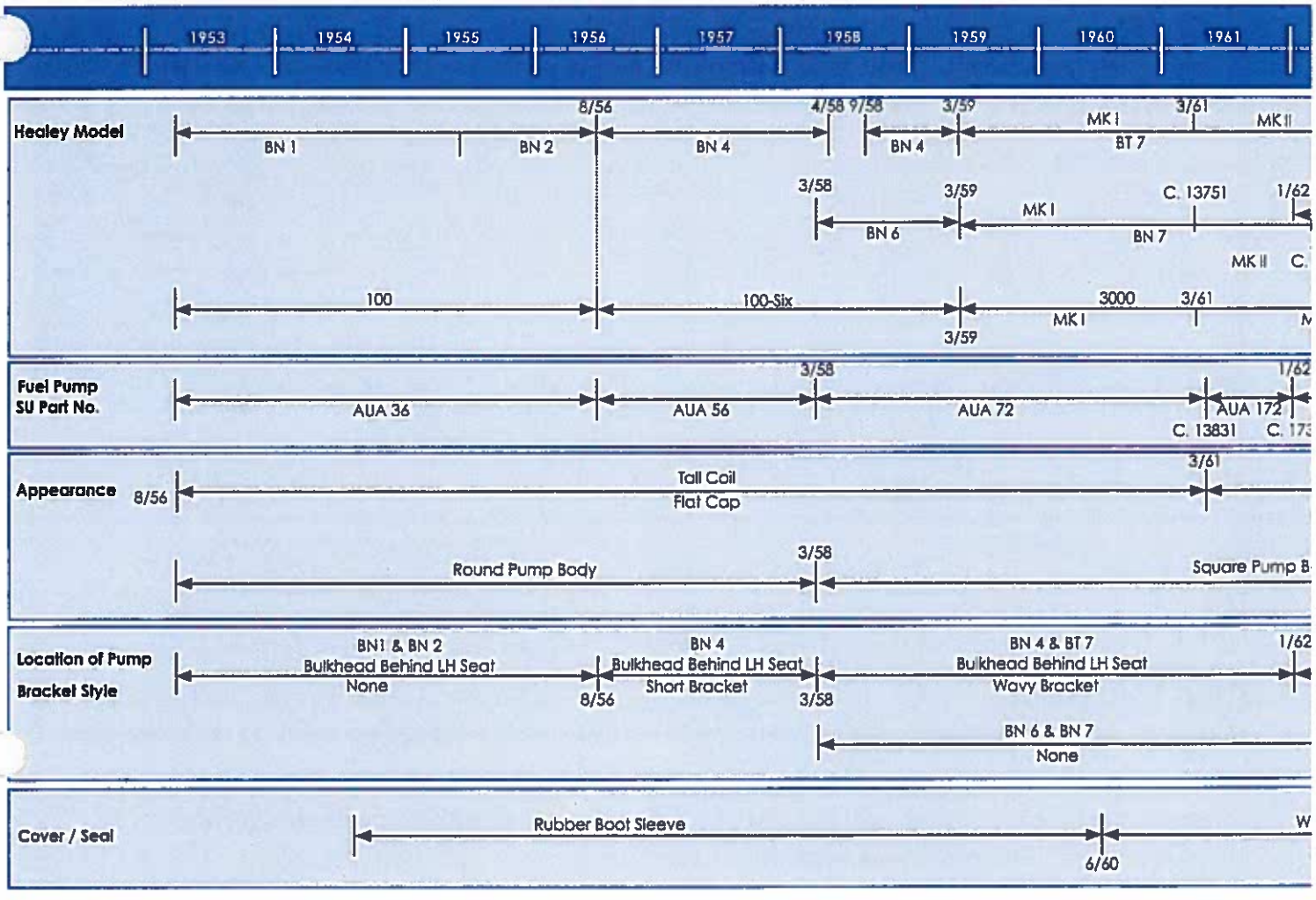
Part 1 of 2

It all started innocently enough with an e-mail requesting information on what the fuel pump mounting bracket on 3000 BT7 roadsters looks like. So I embarked on one of my research sorties and quickly became sidetracked into also identifying: 1) what was the fuel pump mounting configuration on each of the big Healeys, and 2) what were the differences between the various fuel pumps used and their change points. The result of this many-week long adventure is presented here as Part 1 of a two-part series. Part 2 will cover some details of pump construction and tips on performing maintenance operations.

Not is all as you expect

Did you know that there were six different fuel pump numbers listed from the BN1 through the last BJ8? The first pumps used on Healey 100s and early 100-Six BN4s had round bodies and tall coils. Next on later BN4s, BN6s, and 3000 Mk Is came box-shaped pump bodies, still with the tall coil, followed by a version with short coils very early on during Mk II production. This pump was continued on BJ7s and into BJ8s, when the pump body changed again to a round shape, and a capacitor was added to help protect the points against damage from arcing.

Service Parts Lists often do not necessarily contain illustrations of all pump components, and thus make it challenging to sort out answers to some rather simple questions, such as what did the various mounting brackets look like. While we like to think of Parts Books as accurate sources for identifying what bits were attached to each Healey model, there have been a number of instances found (other than related to fuel pumps) where they are in error. Sometimes part numbers are wrong, and just as often parts are not included that we know were on the cars. Furthermore, change points cannot be trusted, as the cars were not built in numerical order. Such problems appear to be the case in two instances related to the fuel pumps – 1) The wavy bracket (AHB 5378) used to mount pumps on the right side of BT7s, for which there is a part number (but no drawing) in later BN4 parts lists (AKD 1423, 5th & 6th editions) and absolutely no mention of this bracket in any 3000 BT7 parts list; and 2) the ¾ inch wide rubber sealing band that



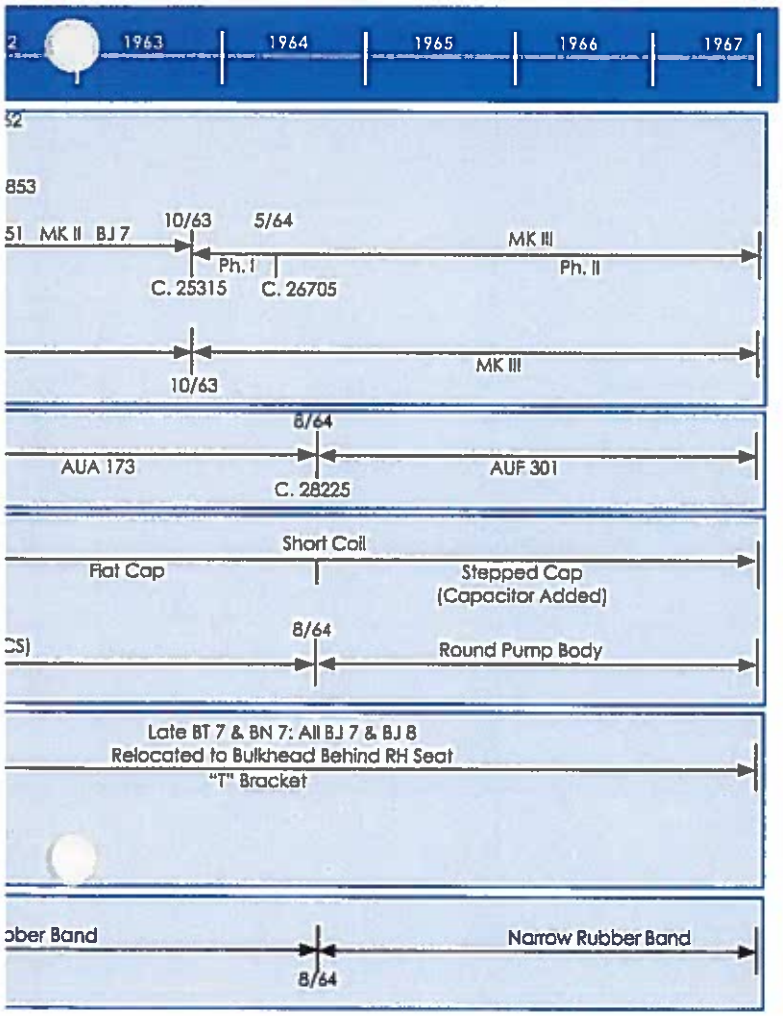
replaced boots on pump coils starting in June, 1960.

Among the surprising things I learned was the extensive range of application for the box-style pump bodies, ranging from 100-Six Healeys well into the early Phase 2 BJ8s. Also, the stepped cap that is often seen on old pumps was not introduced on Healey pumps until August, 1964, with the new AUF 301 pumps, when the capacitor was added to help prevent excessive point burning. Most of the old-looking pumps we see on Healeys that have stepped caps on them are replacements, which incorporated the latest design changes that SU had put into their pumps at the time these were purchased.

In this article I would like to focus on visual differences between the various pumps and how they were mounted in the cars. There also were some internal changes, but these will be discussed in Part 2.

Gaining Perspective

I have prepared the accompanying chart to show the evolution (including overlaps) of Healey model production. The lower part ties pumps (the BMC Service Parts List uses SU part numbers for the pumps and their components), appearance features, and mounting location to the Healey models. Note: dates listed were taken from The Original Austin Healey by Anders Clausager. Chassis numbers are from Service Parts Lists as well as Clausager's book – remember that cars were not completed in numerical sequence, so build dates serve as a better bench mark as to whether the earlier or later configuration of an item, from the listed change point, might have been original to a particular car.



Fuel pumps were one of the common items to fail on Healeys (and probably equally on all British cars), and many found on cars today could have been installed as far back as the late 1960s. So even the oldest and grimiest examples are not necessarily original, and are likely different from pumps on the car when it was new. However, here still are a few Healeys around that contain their original fuel pump, or owners who saved such when replacements were installed, and these are the sources for valuable information.

Finally, it is useful to think of fuel pumps as consisting of two elements – 1) the actual pump body through which the fuel flows, and 2) the electric part that controls operation of the diaphragm that draws fuel into the pump an sends in on to the carburetors.

Chronology of Changes

I will describe fuel pump configuration changes in chronological order, starting with the 100 BN1s and BN2s, and ending with the BJ8s.

Mostly visible differences will be shown, though I will discuss some associated important internal changes as well.

***NOTE*: C. = Car or Chassis Number**

Healey 100 Models

BN1 ... C.1380311 June 1953

First production Healey 100 – BN1 – Fuel pump AUA 36; Round body; Tall (3") coil; Flat cap; Rt. Angle fitting on output; HP (high pressure) pump with long diaphragm spring; Pump mounted to left heel board using ¼ BSF x ½ inch hex screws: Rubber boot covering coil and joint with cap added at C. 160315, 8/54 *(See Photos: 1,2, 3, 4)*.

BN2 ... C.228047 August 1955

First BN2 – Fuel pump unchanged from BN1. *(See Photos: 1,2, 3, 4)*

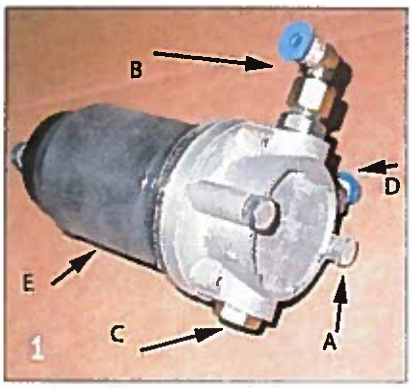


Photo 1 – The AUA 36 pump was mounted to the heel board behind the left seat using two ¼ BSF x ½ inch long hex screws (A). The outlet uses a right angle fitting (B) attached to a union. An internal fuel filter can be accessed through a plug (C) at the bottom without removing the pump from the car. The inlet port (D) uses a union fitting. A rubber boot (E) was added in 8/54 for "protection against weather".

Photo 2 – The AUA 36 pump continued -- A screw (F) is available for attaching a grounding wire, though I've never seen this wire on original 100 pump installations. The boot (G) has writing molded into it. Note the molded writing on the flat cap. Original caps have a 12V molded in next to the terminal, as seen here. Flat caps were used on all pumps up to the last pump version (AUF 301) introduced in August, 1964 during early Phase 2 BJ8 production.

Evolution of Healey Models and Fuel Pumps

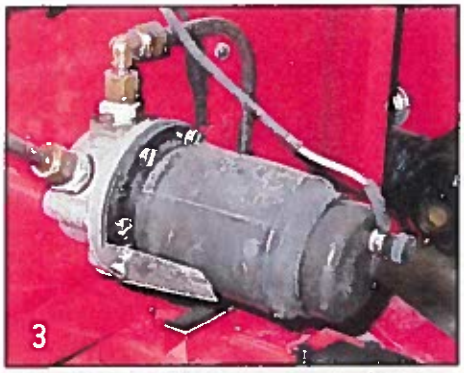


Photo 3 – Installation of the AUA 36 pump on a 1955 BN1.

Photo 4 – A pressed steel tag (also seen in Photo 3) has been found on some AUA 36 pumps, though it is not known whether these were used on many 100s. It identifies them as HP pumps.

100-Six Models

BN4 August 1956

First production BN4 – Fuel pump AUA 56; Visual appearance unchanged from AUA 36; however, not an HP type pump – a slightly shorter diaphragm spring resulted in less pressure and faster pump operation; Pump mounted to shallow bracket that was attached to left heel board using four ¼ UNF x ½ inch hex screws (into nuts welded to cockpit side of heel board). *(See Photos: 5, 6)*

Photo 5 – The AUA 56 pump was mounted to a shallow bracket using ¼ BSF x ½ inch long hex screws. This bracket mounts to the rear axle side of the heel board behind the left seat.

Photo 6– The fuel line segments in this photo have been cut from orignal lines but show the approximate orientation when attached to the pump. The final installation will have a ground wire from the coil flange screw (arrow) to one of the hex screws mounting the bracket to the heel board.

BN4 C.60413 (approx.) March 1958
BN6 (new model introduced)

New fuel pump model – AUA 72 – Box shape pump body with two union fittings on inlet and outlet; Same coil, diaphragm, spring, rubber boot and flat cap as on AUA 56 pumps; On BN4s, pump mounted to a wavy bracket that was attached to left heel board using four ¼ UNF x ½ inch hex screws as before *(See Photos: 7, 8)*. On BN6s pump mounted directly to heel board with nuts and spring washers on the cockpit side (no separate mounting bracket, *see photo 9)*. Removal and installation of the pump requires peeling back the bulkhead carpet to gain access to the nuts.

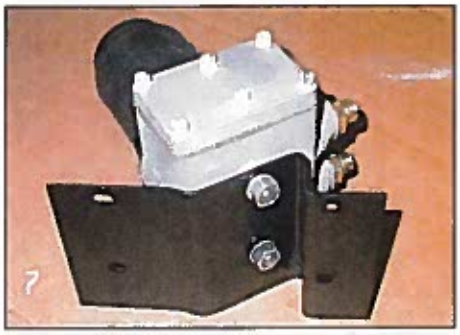


Photo 7 – The AUA 72 pump was mounted to a wavy bracket on BN4s (and later BT7 2+2 seat roadsters). These pumps had two one inch long studs with 5/16 BSF threads into the pump body, and 5/16 UNF threads for mounting to the bracket (BN4s) or directly to the heel board (BN6s).

Photo 8 – Inlet and outlet fuel lines were attached union fittings (brass in this photo). Use of the rubber boot/sleeve was continued from the earlier AUA 36 and AUA 56 pumps.

BN6 C.4425 January 1959

Right angle fitting introduced on BN6 pump outlet (not used on BN4 pumps). *(See Photo 10)*

Photo 9 – AUA 72 pump mounted to an early BN6. Note the "doubler" plate welded against heel board.

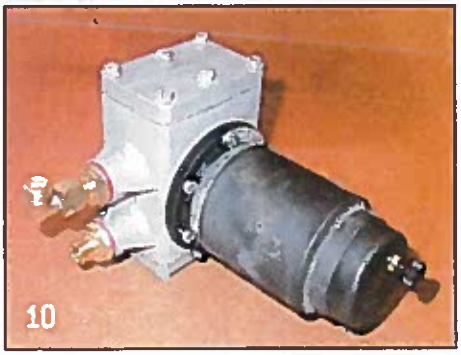


Photo 10 – AUA 72 pumps fitted to later BN6s had a right angle fitting added to the outlet union from C. 4425. They also had the same mounting studs as on pumps fitted BN4s. The rubber boot was dropped during 3000 Mk I production (BN7 C.10842 build date in June 1960) and replaced with a rubber band.

3000 Models

3000 Mk I BT7 & BN7 **March 1959**
Same AUA 72 pump and mounting continued from 100-Six BN4 and BN6 models.

BT7 C.10876 **June 1960**
BN7 C.10842
Rubber boot over coil replaced with a ¾ inch wide rubber band over joint between cap and coil. The Service Parts List AKD1151 for 3000 roadsters and BJ7s does not mention a replacement for the boot. However, a later list, AKD 3523 (for BJ7 & BJ8) shows a ¾ inch wide rubber band for sealing the cap-coil joint. I suspect this band may have been introduced when the boot was discontinued in 1960 and just inadvertently omitted from the earlier parts lists. (See Photos 11 – 14 for how this band looks).

BT7 C.13751 **March 1961**
First 3000 MK II (tricarb) model built – fuel pumps and mounting unchanged form 3000 Mk I.

BT7 C.13831 **March 1961**
Fuel pump changed to AUA 172 – Same box style body and union fuel line attachment fittings for both BT7s and BN7s; Shorter (2-3/8 inch tall) coil; New diaphragm with shorter stem; Short diaphragm spring; Same pump mountings as before – wavy bracket used on BT7s; No bracket for mounting on BN7s.

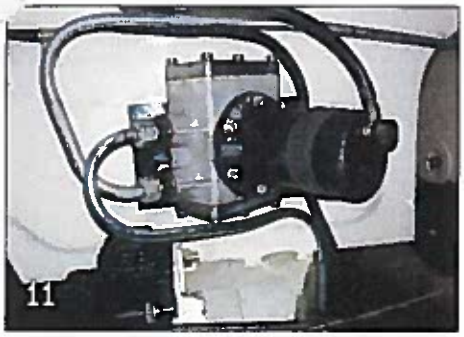


Photo 11– The AUA 172 pump installed in a Mk II BT7. This pump has the short coil and ¾ inch band that seals the cap-coil housing joint, replacing the rubber boot starting after BT7 C.10876 (Jun. '60).

Photo 12 – AUA 172 pump as configured for Mk II BN7s starting at C. 17547 (Jan. '62). It uses the same right angle output fitting as on BN6 pumps. Rubber band replaced the boot cover at Mk I BN7 C.10842 (Jun. '60).

BT7 C.17352 **January 1962**
New fuel pump model AUA 173 – Pump mounting was moved to right heel board; Mounting bracket changed to a "T" type; Fuel line fittings changed from unions to banjo fittings with a threaded nipple to accept fuel line connections. The short pump coil, flat cap, and rubber seal band short seal between coil and cap all remained the same as on AUA 172 pumps. This pump configuration continued through all BJ7s, BJ8 Phase 1s, and into BJ8 Phase 2 models. *(See Photos: 13, 14)*

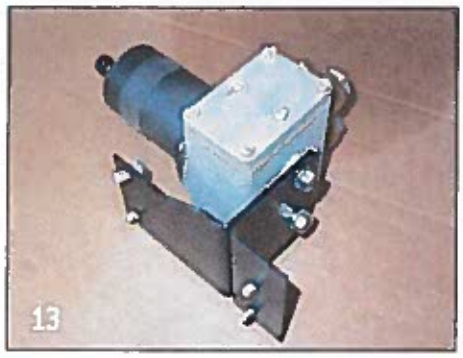


Photo 13 – AUA 173 pump. Its "T" shaped bracket was mounted to the right heel board using ¼ UNF x ½" long hex screws (nuts welded to cockpit side).

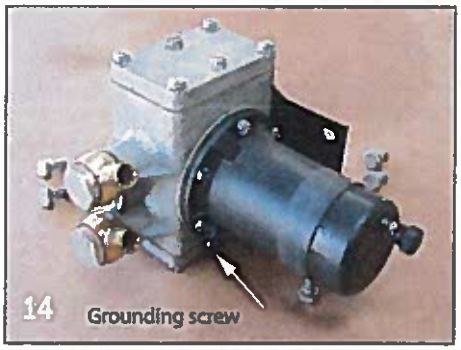


Photo 14 – The AUA 173 pump differs from the preceding AUA 172 only in the banjo inlet and outlet fittings with threaded nipples, which replaced unions. Note the grounding screw.

BN7 C.17547
Pump location also moved to right heel board, but mounting as before on BN7s with no bracket; Fuel line fittings on pump changed to banjos as on BT7s (right angle fitting on outlet no longer used).

Photo 15 – "Doubler" Mounting plate (same as on BN6s) where AUA 173 pumps mount on late 3000 Mk II BN7s. The owner of this car installed an additional in-line fuel filter, so the fuel line shown is not as-original.

BJ7 C.17551 **January 1962**
BJ7 convertible introduced – Same AUA 173 pump and mounting configuration as on Mk II BT7 s.

BJ8 C. 25325 **October 1963**
BJ8 model replaced BJ7 – AUA 173 fuel pump and mounting bracket continued unchanged. *(See Photo16)*

Photo 16 – An AUA 173 pump mounted on a Phase I BJ8. Note the ID tag (seen on the coil flange behind the outlet fuel line) and black ground wire (arrow) connected to the coil flange with a grounding screw. These ground wires have been found with pumps that mount to cars using brackets (BN4, BT7, BJ7, and BJ8; NOT on BN6s or BN7s). It is believed that their use was to assure a good ground, as the fuel lines provide the ground for the fuel tank sending unit.

Evolution of Healey Models and Fuel Pumps

BJ8 C.26705 May 1964
Phase 2 BJ8 introduced.

BJ8 C.28225 August 1964
New fuel pump model AUF 301 – New "round" body; Same short coil, diaphragm and diaphragm spring; Capacitor added to help protect against contact point damage from arcing; Stepped cap to accommodate capacitor; Vent added to cap; Rubber band sealing cap-coil joint changed form ¾ inch to 3/8 inch wide; Spade push-on electrical connectors attached to terminal post and grounding screw on base flange of coil. This pump and configuration continued through the end of 3000 BJ8 production. *(See Photos: 17, 18, 19)*

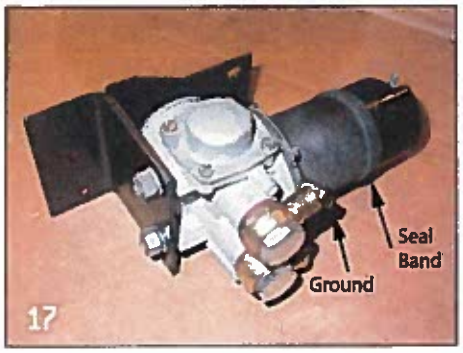


Photo 17 – AUF 301 pump fitted to Phase 2 BJBs from C.28225 (Aug. '64) to the end of production. It uses the same mounting bracket and banjo fuel line fittings as with the AUA 173 pump. A spade terminal for the ground wire was mounted by a screw into the side of the coil base flange (see also Photo 18).

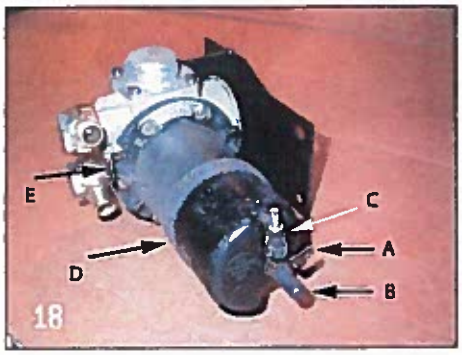


Photo 18 – The AUF 301 pump had a "round" body with new valving and internal construction. The spade terminal (A) for electrical connection was mounted with the brass nut that retains the stepped cap. An insulating sleeve (B) covered the exposed end of the terminal. There was a "breather" fitting (C) on the cap. A capacitor was mounted under the raised part of the cap to mitigate arcing across the points. The sealing band (D) was now rather narrow – only about 3/8 inch wide. Arrow (E) points to the ground spade terminal.

Photo 19 – An AUF 301 pump fitted to a late BJ8. Note the ground wire (arrow) from the coil flange to the bracket mounting screw. These pumps used push-on (Lucar) electrical connectors.

Coils

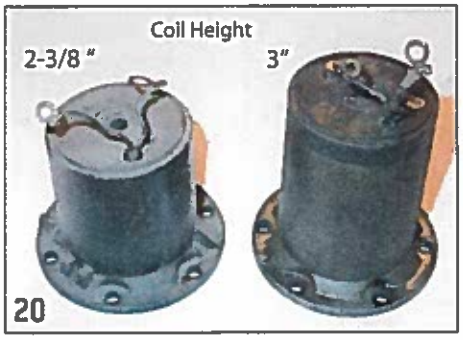


Photo 20 – The short coil was introduced about 80 cars into 3000 Mk II production (Mar. '61), and its use continued through the last BJ8. All replacement pumps sold after the change point (and to this day) have this coil. Unless seen next to the tall one, the short coil can be difficult to identify.

Summary

The evolution of fuel pumps throughout Healy production can be broken down into a three categories: mounting, pump bodies, and coils.

Mounting

• On 100s (BN1 & BN2) and 2-seat 6-cylinder roadsters (100-Six BN6s & 3000 Mk I and Mk II BN7s) pumps were mounted directly to the cockpit heel board in the rear axle area– on the left side up to January 1962 and subsequently on the right side. No ground wire was used from the coil flange to the body.

On all the following mountings a ground wire was used from the coil flange to the body.

• On BN4s up to March, 1958, pumps were mounted to the left heel board using a shallow bracket.

• On later BN4s and 3000 Mk I and Mk II BT7s, up to C.17352 (Jan. '62) pumps were mounted on a wavy bracket and attached to the left heel board.

• From 3000 BT7 Mk II C.17352 through the end of production (including all BJ7s and BJ8s) pumps were mounted on a "T" shaped bracket that was attached to the right heel board in the rear axle area (no bracket used on BN7s, as noted above).

Pump bodies and coils

• The pump used on BN1 & BN2s (AUA 36) was a high pressure type with a round pump body, 3" (tall) coil, and flat cap. A long rubber boot covered the coil body and joint to the cap starting 8/54.

• BN4s, up to March 1958, used an identical-looking pump, AUA 56, which was not the high pressure type (it had a slightly shorter diaphragm spring. It used the same coil, cap and rubber boot as on the AUA 36 pump.

• Starting in March, 1958, the pump body was changed to a box shape which continued through remaining 100-Six production (BN6 & BN4), all 3000 roadsters (BT7 & BN7), BJ7s, BJ8 Phase 1s, and to BJ8 Phase 2 chassis 28225 (Aug. 1964). Fuel line attachment fittings changed a bit, but these all were interchangeable with the same pump body. The tall (3 inch) coil with flat cap was continued into early 3000 Mk II production (BT7 C.13831 – Mar. '61), followed by a shorter 2 3/8 inch tall coil through the end of BJ8 production. The rubber coil boot used on pumps from the first BN1 well into 3000 Mk Is was discontinued in June, '60 (at BT7 C. 10876 and BN7 C. 10842), and is believed to have been replaced with a ¾ inch rubber band seal around the coil-cap joint from that time on.

• In August, 1964 a new AUF 301 pump with" round" body was introduced during BJ8 Phase 2 production. This pump had a stepped cap to accommodate addition of a capacitor for mitigating arcing across the contact points. The sealing rubber band was also replaced with a narrower 3/8" wide one, and electrical connections were changed to the push-on type.

Replacement pumps supplied throughout Healey production reflected the latest version currently available. Thus, after around March

1961 they would all have had short coils, and after August 1964 they could also have had capacitors and stepped caps, regardless of the pump body style. Replacement pumps also had an adhesive tape sealing the cap-coil joint (instead of rubber bands). On SU rebuilt pumps this tape had blue and yellow SU graphics. Many pumps have been found with just black electrical tape, and it is likely that these are pumps that had their points and/or diaphragm replaced by a shop.

Since pump failure was rather common, it is rare to find a Healey with its original pump installed (it was easier to just put in a new replacement), and even if so, there could be various omissions or changes, such as ID tags or caps, that occurred during servicing that prevent knowing what the pump really looked like when the car was new.

Fuel Pumps

Based on the number of friends I knew in the Austin-Healey club who have had fuel pump problems on the road, I initially planned to carry a spare until it occurred to me that it would be even better if I had a backup pump already installed and wired. Two SU electronic fuel pumps were mounted on the vertical bulkhead behind the passenger seat near the original location. The pumps are plumbed in parallel so that either one can operate independently. The pumps include built-in check valves so the fuel cannot flow backwards through the inoperative pump.

Electrically the pumps are also wired in parallel through two toggle switches located on the dash so that each can operate independently. I switch between the "main" pump and the "auxiliary" pump periodically to make sure they are both in good working conditioning and to even out the wear on them.