

One Approach to RESTORING an AUSTIN-HEALEY

Installment 26: Refurbishing the Fuel Pump, Exhaust System, and Windshield

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This installment will cover refurbishment of three additional components of the big Healeys:

- Fuel pump
- Exhaust system
- Windshield

Fuel Pump Tips

Fuel pumps are notorious for failing, and the comments presented here are for those of you who wish to mitigate the problems while retaining the maximum degree of originality.

Fuel pump failures can be electrical (points, condenser), mechanical (non-sealing flapper valves), or diaphragm-related. There are places you can send a pump to have it rebuilt, or you can purchase look-alike new replacement pumps. These new ones are suitable for use with either positive or negative-ground electrical systems, and have original-thread fittings so no adaptation should be required when fitting them to your car.

It also is possible to purchase new just about every component of the many styles of pumps that were used on Healeys. This includes the stamped metal part number tags that were attached to the base of the coil. You just may have to spend a little time tracking down the sources.

Study the Service Parts list carefully, and talk to owners who have been tracking down details for their

cars, to identify any other bits you may need to make your pump exactly as it was when the car was new.

If you are rebuilding your original pump and it's one of the early ones with a flat cap, one upgrade that is worth considering is to add a capacitor to reduce burning of the points. (Later pumps had a telltale raised step on the cap to provide space for a small can-shape capacitor above the pedestal.)

There are Mylar capacitors available that are very thin, and these can be "floated" above the points and still fit under the flat cap of earlier-style pumps. They should be rated at 200 volts (or higher) and 0.047 microfarads (uf) capacitance. This type of capacitor is not polarity-sensitive, so it doesn't matter which end is connected to which terminal on the pump.

Exhaust System Tips

Mounting an exhaust system can be among the more frustrating of tasks, but if you get it "right" you will feel a great sense of triumph when you're done. Here are some tips that may not be obvious at the start.

Careful study of the Service Parts List is very important, since mounting hardware kits that you might purchase from a parts house don't always contain sufficient, or correct items. Time spent in preparation will be well-spent as you will be better prepared, mentally, when you encounter things that don't fit right, or find that some important bolt or clamp is missing.

Original exhaust pipes were formed



Photo 1: View of a 400v, 0.047uf capacitor "floating" above the points on an early type fuel pump. Note the washer/gasket on the terminal post to the left. Its purpose is to seal out air where the terminal passes through the bakelite cap. Capacitor connections are to the point's blade mounting screw (top) and pedestal mounting screw (right), which also serves as ground. The wires are sufficient to hold the capacitor in position.

using mandrels that prevented the tubing from collapsing (most notably on the inside radius of bends). If you look at original downpipes or tail pipes, you will see that the diameter of the pipe remains constant through each bend.

Prevalent tooling for shaping pipes uses a support in the inside radius, but typically as the pipe is bent this inside surface becomes pushed inwards a bit, leaving a noticeable step at each end of the bend. It can be quite difficult to find a shop equipped to form pipes in the way they were done originally, and if you did you would need an original set of pipes for them to copy. This would give you the most correct-looking results.

However, some original components might be salvageable, and this option is definitely worth considering. One particularly good candidate for this is the downpipe (two on all 6-cylinder Healeys), where it often is the case that the only damaged area is the flex pipe and short coupling at the muffler end. It might be necessary to replace original flex tubing, if you can't free it up to where it will allow flexing.

I believe the flexibility was intended so that the end could be properly positioned to connect with the muffler, as

some initial misalignment would be expected and you don't want there to be any stress on the rubber exhaust hangers other than that resulting from the weight of the muffler. As these flex sections are always extremely stiff after being on a car for only a short while, I can't see how they were ever expected to isolate engine vibrations from the rest of exhaust systems.

Another commonly-encountered problem with after-market exhaust systems is inaccurate bending of the pipes. Such issues may not be obvious until you are actually trying to install the system on a car. The moral might be to expect problems and save a lot of patience for working them out.

Windshield

There are a number of tricky details that you will encounter when restoring the windshield. The first group is associated with the frame, and the second with assembling the frame and glass into a complete unit.

I discussed pre-testing the windshield assembly fit to the body when I was going over checking the fit of various body parts during repair of chassis and body metal work. At that time it was not necessary that the windshield be restored.

Disassembling the Windshield – Windshield frames consist of four sections of chrome-plated brass channel, joined at the corners using very small screws (4BA thread on BN1s through 3000 MkII roadsters) that thread into brackets at each corner.

On four-cylinder and six-cylinder roadsters, corner joints are mitered, and have sharp, crisp edges so that the outer frame faces end up flush, without any perceptible step, across the joint interfaces. Because the corner bracket screws are countersunk into the frame sides, there is no adjustment to bracket positioning.

I have found that the location of tapped holes in the bracket arms often is not exactly uniform between the left and right brackets (at either the top or bottom corners). Thus, if the brackets are interchanged between sides (e.g. left to right, etc.) on re-assembly, or even flipped at a corner (for example, putting the leg that was originally screwed to a side frame piece now attaching to a top piece) the miter joint may not align up as originally, most commonly leaving an unsightly gap between the two frame sections.

Therefore, I strongly recommend that as you disassemble the frame you use a code to mark each corner bracket (use small punch marks or grooves filed into the bracket edges) so that you will know which bracket was from the right or left side, and which leg was attached to the side frame section.

Also, the lower corners of roadster windshields are very vulnerable to cracking, so be very careful when trying to free up glass from a frame where it may be firmly gripped by the rubber packing.

On roadsters be sure to check the threads on screws used to attach the side frames to the cast aluminum pillars, as these are not what you might think they are – on 100s the thread is 2BA (looks like, but is definitely different from, 10-32), while on 6-cylinder models (BN4/6/7 and BT7) the thread is 10-24.

Convertible frames (BJ7 and BJ8) do not have mitered joints, and there is only one screw into the corner bracket at each end of the top frame section (visible when the top has been lowered). Otherwise, the general frame construction is quite similar to that of the roadsters. The side pieces are each made up from two chrome-plated components.



Photo 2: A windshield frame top mitered corner on a 100. This is typical of the configuration found on all roadsters. The top corner screws are the only ones visible on the finished assembly.

The internal corner brackets on convertible windshields are attached to the frame channels using 10-32 screws.

Frame Restoration – Frame sections are formed out of brass, chrome-plated, and fairly vulnerable to deforming through twisting and bending, with the glass removed – especially the longer top and bottom sections. Therefore, treat your frame with care, being careful to avoid any changes to the curvatures. The top and bottom pieces should match the glass curvature, and this needs to be re-checked before, and after, having them replated.

When you look for a plating shop, ask questions, particularly about polishing, because with the channels made out of brass, it is very easy to round off sharp edges at the mitered joints, and this will easily stand out on the finished frame, after plating. It is important that the plating people are willing to work with you and oversee the process so that irreparable damage isn't done to your pieces. You will also be having very tiny screws re-plated, and extra care will be needed to avoid losing any. (You can purchase new BA thread screws from England, and it might be wise to do so and send them along for plating with your originals.)

The side frame pieces on BJ7s and BJ8s have a lower mounting bracket which is attached using solid rivets. This type of rivet is also used to attach the hook at the top corner which is engaged by the top latch. To properly plate these frame sections, they need to be disassembled. You will have to make up new rivets: I have done so by modifying the heads of commercially-available ones of the correct shank diameter and having them plated with the original finish. Thus it is important to save all removed rivet pieces for reference.

Glass Installation – In general terms, the assembly process is as follows: First, attach the four corner brackets to each side frame piece. Next fit the frame, starting at one side, adding the bottom and then the other side, and finishing with the top channel.

Windshield glass has a short relieved area on the edges at all four corners. This is to allow clearance so the installed windshield will not hit the corner angle brackets. To prevent the glass from becoming positioned too far towards any side, four heavy (5/16 inch wide by 1/8 inch thick) rubber packing pieces lay into



Photo 3: Chrome windshield frame sections overlap at corner joints on convertibles. There is only one visible screw at each corner in the upper frame section (with the convertible top lowered) This picture shows the convertible with the softtop frame in place but before the softtop has been attached.

the frame channels with their ends just short of the corner bracket legs.

The glass edge is wrapped with a thin rubber strip to provide packing and sealing to the frame channel. This rubber comes in a variety of thicknesses, and can be obtained from any windshield shop. Typically I find the 1/16 inch thickness to work fine. You don't want this packing to be too thick, or you won't be able to slide the glass into the frame.

On BJ7 and BJ8 Healeys there is a special molded rubber seal section that the glass nests in, and this can be purchased new.

These rubber packing strips need to be lubricated when the frame is fitted to the glass. Liquid soap or grease will work. However it also may be necessary to stretch the rubber along the side of the glass as the frame is pushed on. Elongating the rubber reduces its thickness – however it will relax back a bit after the frame is in place, so wait before fitting around the corners.

On roadster windshields I have found that the glass doesn't bury well into the lower corners. You may have to compromise on the fit, but make sure that at least a little of the glass is trapped all around by the frame.

After the four frame sections have been fitted and all screws tightened at the corner brackets, the last step is attaching the bottom rub-

Photo 4: On BJ7s and BJ8s, the hook which the top latch engages is attached to the upper end of each windshield side frame using solid rivets. Solid rivets are also used to attach mounting brackets to the lower end of these frame pieces.



Photo 5: On roadsters (BN1 - 3000 Mk II) the lower corner brackets have sharper bends than the upper brackets. 4BA screws are used to attach these to the frame channels. These brackets were custom fit when the windshields were assembled at the factory, and should be restored and re-used, marking how they were originally positioned at each corner.

ber strip that seals against the cowl. This has a "T" cross-section and is very difficult to fit into the mating channel on the bottom frame section. Lots of lubrication will be required, as well as a collection of tools with blunt edges that won't cut the rubber. This is one task where stretching the rubber to reduce the "T" cross-section will help greatly. The toughest part will be at the ends where the channel has been machined to clear the corner bracket screw heads.

On 6-cylinder roadster windshields, it is easier to install this strip before attaching the painted side pillars. On 100s and convertibles, the side posts will already be attached to the frame and you will find some interference with the bottom of the side pillars.

In all cars it is best to wait until the windshield is fitted to the car before trimming the ends of this seal. On convertibles, about 4 inches of seal should be allowed to extend past the pillars. However the material will have to be trimmed lengthwise, removing the molded "T" section part, from where it interferes with the side of the pillar, and leaving the exposed flat sealing flap. This flap will end up later tucking behind the windshield seal where it attaches to the rear lip of the front wing.

Finally, I have not found any windshield shops that I would trust with assembling a Healey windshield. Modern windshield installation technology is totally different. The small screws for attaching brackets are easy to lose and replacements are not locally available, so the likelihood of something getting lost and messed up through substitution of a similar U.S.-spec. screw is high. And, as should be clear from my notes above, a lot of attention to detail is needed to assure proper mating of the frame pieces at the corners.

Therefore, you need to find a shop that specializes on Healeys or has a track record of doing a proper job of installing these windshields. Otherwise, plan on getting help and doing this task yourself. It is also possible that other club members have been through the experience and are willing to assist you.



Photo 6: On BJ7s and BJ8s, the extra flap from the windshield-to-cowl seal will be tucked behind the windshield side pillar seal strip where it is attached to the rear of the front wing when the windshield and pillar seal are finally installed on the car.

The rest of the components

In the past several articles, I have selected specific components and sub-systems to discuss restoration options and tips, but there are still tens of boxes and hundreds of marked plastic bags on your shelves, containing the many other bits that were removed during disassembly. These may include such items as fuel and brake lines, heater and fresh air system components, gaskets, rubber grommets and plugs, clips and badges. Refurbishment of all those items is usually fairly straight forward – cleaning, replating or painting, and possibly replacing with good used or new.

However, there is one point I would like to reiterate: As you work your way through the collection of bits, make a point of rounding up all fastener pieces (screws, flat washers, lock washers, nuts, etc.) so that when it comes time to mount finished assemblies to the car you are fully prepared. Depending on how concerned you are about originality (or correct original appearance of a new replacement part) you can spend an inordinate amount of time chasing after sources, and/or matching paint colors (e.g. fan, horn, washer bottle bracket). To avoid delays later on, start these potentially time-consuming and difficult tasks early on – you'll be glad you did.

Next time

We have now reached the stage of putting the car back together. Previous installments have helped you create shelves of finished parts. Everything should be ready to go.

How you proceed will depend, in part, on the approach you chose for painting the exterior. You might have opted for painting the body exterior (as well as chassis) and thus have a fully finished body just waiting to be built up. This is how the cars were assembled originally at the factory. Alternatively, you may have just put finish color on the chassis and insides of the body panels, and completed all shaping up to the point of final block sanding, with your plan to bring the partially-assembled rolling car (with body panels attached) to the paint shop for exterior painting. In either case, it is time to put stuff together, and this is where real excitement builds, and the "doubters" become "believers."

Some tasks will still be challenging, made more so by concerns for not scratching all that shiny paint. It can be done, and with relative ease at that. But keeping your patience and not rushing through any task will be key to your being completely satisfied with the final result. I'll talk about all this as we move forward.

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