Decals

Images from Leacy except where stated.

Roadster hood header rail

Speedo - could be black, red or green. However on my 73 and 75 the knob points downwards behind the dash so 'clockwise' is a matter of interpretation, and doesn't need to be pushed, just turned. It seems that some North American (at least) types do have to be pushed up then turned to have the desired effect. It seems that their late-model speedos (79-80?) had a push-button reset on the face.

Air filter cans up to 1969

Air filter cans 1970 to 1976

Air filter cans 1977-on (Minipernalia)

Heater case, facing forwards, between ports

Heater motor, top

Rocker cover - carb side, black screen-printed plate to 65, sticker as here 66 to 72
Rocker cover - plug side, plate up to 66, sticker 67 to 72 (Moss Europe)

Rocker cover - 18V engines to 1979

Container for replaceable oil filter element

Round washer bottle

SU fuel pump

Bonnet slam-panel, Mk2 on chrome bumper?

1970 on chrome bumper?

Rubber bumper replacing the previous two?
Clausager shows this label on the battery cover of a 1980 roadster. Apparently a UK car, I could expect it on a North American model with factory electronic ignition, less so an RHD model with points. (British Wiring)

There are very many more for North American spec, mainly concerned with their emissions and car ID requirements.

**Heater Valve**

Ring-spanner modified by grinding away part of the ring to be able to fit the bolt heads with replacement valves.

Door handle spindle (7mm or 8mm will suit) with 1/4" drive 7/16" socket.
Bent to shape.

Filed to size and cut to length.
Fitted to socket.

Just the job.
Marks showing the fully open (from a maximum flow point of view) and fully closed points of Michael Beswick's new valve.

Cut-away of the overall valve
If you look at Bob's drawings he depicts his pin as straight and fairly close-fitting through the centre of his cup, whereas the picture below shows my pin is tapered, and the hole in the centre of my cup (yellow and partly cut away in the inset) is much bigger. No circlip was fitted to my pin, it may have corroded away, certainly the cup and its seat were quite heavily corroded. It doesn't seem to need a circlip, the spring is a push-fit onto the diaphragm and into the cup and so lifts the cup off its seat as the valve is opened more than half-way. The pressure of coolant flow from the water pump will also tend to open the coarse-control valve as spring pressure is relaxed.

The first stage is the rubber diaphragm (blue in the picture below) which presses down on the end of the 'pipe' the cup sits in, to completely prevent any flow - the shut-off. As well as this the cup is sitting on its seat (coarse control) and the widest part of the pin is in the hole in the cup (fine control).
As the valve begins to open the blue diaphragm lifts off its seat opening the shut-off, but the cup remains on its seat so the coarse-control valve is still closed. As the pin, attached to the diaphragm, rises through the cup the taper narrows giving a very gradual increase in flow through the valve. This image shows the valve about half open (operating lever about mid-way in its travel) with the fine control fully open but the coarse control still closed.

The third stage is where the valve opens sufficiently to lift the cup off its seat and coolant begins to flow past it giving a rapid increase in flow - the coarse control. The fine-control valve is still fully open and the diaphragm valve is now fully open and the maximum flow is passing through the valve.
If you imagine that that coolant only flows past the raised cup and not through its middle then you would be right in thinking that the first half of valve travel, whilst opening the shut-off valve, does not allow any coolant flow and so is wasted movement, plus the valve won't open as far as it could. Adding washers will cause the pin to start lifting the cup valve off its seat almost as soon as the diaphragm starts moving and so give earlier flow as well as a greater maximum flow, but the washers will block the fine-control valve altogether which will result in there being very little control movement between OFF and HOT i.e. no WARM. Someone else has also opined that if the corroding away of the circlip is not uncommon you wouldn't want a bunch of washers circulating round your engine.

A 'push-off' spring on the cable between the outer and inner clamps. This is nearly fully compressed when the valve is closed ...

... and taking up about 4/5ths of the space when the valve is open. If the spring were stretched out to have a longer free length then it may well push the valve open even more. Some people get hot under the collar (boom boom) about getting the valve fully open, but on both my cars you have to close the heat control beyond WARM i.e. more than half-way before getting any noticeable reduction in heat output so I really don't think it is necessary.
The correct gasket laid over the flange on the heater valve. The hole in the gasket is about the same size as that in the head, with that in the heater flange being very much smaller. This greatly reduces the available area to clamp the gasket and form a good seal. It also allows corrosion to develop on the face of the heater flange which can 'burrow' under through what clamping area there is to cause a leak.

Heater ports in 'early' (left) and later (right) heads, from Sean Brown's Flowspeed.com. Sean dates the change to the 12H-2923 head introduced in 1972. British Automotive agrees and says they were fitted to 18V584/585/672/673 engines, although Clausager dates those engines to August 1971 i.e. the start of the 1972 model year. Both the above web sites refer to North American engines only, although the Non-NA 18V581/582/583 engines were brought in at the same time, Clausager lumps all the 18V58n engines together so one can assume UK engines are the same. My 1973-model 18V582 is like that, although it is a Gold Seal replacement engine (albeit the correct equivalent) so could have a later head anyway. Sean Brown attributes the change to making it easier to remove casting sand. As far as I know only the 'later' gasket with the large hole (12H3868) is available, indeed that is the only one listed in the Parts Catalogue.
April 2011: Small tear in one of the folds of the diaphragm in the nine year-old valve. What this shows is that with the valve fully closed the diaphragm will still leak coolant from the flow pipe to the heater matrix. But if you remove that hose from the valve and block it off with, say, a spare spark plug and the clip then you should be leak free.

The new (left) and 'nine year' valve showing slight corrosion on the face of the flange ...
... and also the seat the rubber diaphragm closes onto to fully cut-off flow (arrowed).

Wire spring-clip on the new valve ...
... and circlip on the old

New valve with the lever fouling the rivet
Heater Unit

The heater unit. This is a 77 and later version with the two-speed resistor fitted inside the heater unit. The earlier single-speed is much the same but without the resistor wiring and just two wires connecting to the main harness with bullets instead of a 3-pin plug and socket. (Image from Paul Depper)

Resistor unit inside the casing of 2-speed heaters. (Photo from Ashley Hinton)
Back of the heater unit, pre-77 with just two bullets connecting the motor to the main harness. This is a very early unit, later units had a mesh screen over the cold air inlet to prevent leaves entering from the air-box and clogging the heater unit. The circular seal prevents fumes from the engine compartment being drawn into the passenger compartment, and gets the maximum benefit from the ram effect while moving. (Image from Leyland Parts Catalogue)

Clausager has this very useful photo of the Gaydon cut-away engine on page 62 which shows the heater tucked away in the corner of the picture. I've labelled it with its main components and the body structure around it, plus the separately operated cold-air flap. Unfortunately the air direction flap appears to be missing from the heater unit.
The next three pictures show how the air flap controls direction. In this position both demister and footwell vents are closed off.

In the central position of the dash control the flap is straight up and down. On the face of it this appears to direct air to both demister and footwell. However the longer, narrower and more tortuous past to the demister means relatively little air escapes this way (it can be felt), the majority does flow to the footwell. The demister deflectors are only positioned immediately in front of the outlets, so either side of those air is going to go straight down anyway.
Flap turned to the other extremity closing off the footwell vent, all air being directed to the demisters. This begs the question of why the demister deflectors are there at all, as the flap in this position makes them redundant. You could say that they found some air to the demisters all the time was beneficial in keeping them clear, and the deflectors were needed to make sure some got through. But that is surely asking a lot for BL/Smiths in the 60s!

The passenger side in the V8. The flap is shown in the Interior position i.e. more or less straight up and down. You can also see some felt strips which are beginning to come adrift.
Mk1 roadster showing the screen demister outlets on the heater unit, air direction cable to the right, support plate for straight pipes and flexible hoses removed (image from Dave O'Neil). This ‘egg-shaped’ hole for the right-hand demister tube and direction cable makes it very difficult to fit the heater with the cable already attached to the heater unit.

Unlike this later arrangement with the separate tall slot, possibly from 1970 or 71 when changes were made to the heater ducts. This also clearly shows the recess for the rubber block that surrounds the demister tubes and cables ...
... compare with the earlier flat surface here. Cutting a slot up from the side of the earlier egg-shaped hole to where the top of the later separate slot is, to allow the heater unit to be refitted with the cable already attached. (*Chicagoland MG Club*; scroll down to 'P.P.S. - Oct 09, 2003')

The off-side footwell and the cable for the air flap - earlier arrangement with the adjustable footwell vents. Just about possible to reattach the cable with the heater in position.
The later arrangement with the fixed footwell cowl and rubber block. It can only be shown in two separate pictures on an RHD as the pedals get in the way. Note the rubber block, the clamp for outer is covered by it, making undoing or fastening without cutting into the block impossible.

The inner fastening to the flap lever, shown in the Off position. This looks to be more accessible but I can only just get a finger-tip to it, although access would be better with the cowl removed. You would still need to manipulate the end of the cable with a pair of very long nosed pliers, and the trunnion with a nut driver on an extension, you wouldn't be able to see the hole in the trunnion, and the pedals on an RHD prevent you looking straight into the space! All in all a difficult proposition even if you were only replacing the inner. This seems to be a stranded inner, but logic dictates that it should be solid as it has to push the flap closed as well as pull it open, and there is no spring to aid closing. I must be fortunate in that this flap is very easy to move. Interestingly my mate Terry with a 73/74 reports that his also seems to be stranded as is my 73 roadster, whereas his replacement from the MGOC (original chopped off both ends when the heater was removed by a PO) is solid. I've come to the conclusion that a stranded cable is fitted as these are much more flexible, as the cable has to cross from one side to the other behind the dash to get from the heater unit to the dash control.
Vee's footwell channel, with the felt strips loose and partly blocking air-flow. I removed six, which seems overkill, in one position there was one on the movable flap and another on the side of the channel it moved against.

The section that contains the air-direction flap is screwed to the bottom of the main case, so can be removed making cleaning and replacing the felt easier. I used 3mm felt from a hobby-shop and felt (ho ho) that four pieces stuck to both sides of the channel top (arrowed) and bottom was thick enough to form a seal with the moveable flap at either of its extremities of movement, with minimal restriction.
The foam seal that goes between the back of the heater casing and the bulkhead to seal the air inlet. *Photo from Ashley Hinton.* However this is low-density, the original is either rubber or high-density foam and more robust, so when refurbishing Vee's heater I left it in place.

The seal around the matrix. Seals the ends as well as the sides, so air can only pass through the heater by going through the matrix core.
The grommets (7H1993) round the matrix ports
The dreaded rubber block that goes between the lower back of the heater box and the inner bulkhead (Watford Classic Cars).

At first I though Vee's would be reusable, saving me some grief. But on trying to remove it carefully to clean the case it was crumbling. Note the strip seal just above the rubber block, which together with three other pieces under the flanges that screw to the bulkhead shelf prevent engine bay fumes getting into the cabin. Certainly the one on the back is rubber or high-density foam, if I found anything under the flanges it just crumbled away as I scraped it. Replacements for these are also low-density foam, but I have some sticky-backed high-density strip which is more robust. Looking at the whole shebang I don't think the rubber block does anything more than wedge the heater unit into the bulkhead cavity to stop it rattling, and to seal the demister pipes. It can't seal against engine bay fumes as it doesn't go the whole width of the heater, let alone the cavity, it's the four strip seals that do that.
Engine compartment side, on Vee (1975), corrugated tubing visible behind the panel. These just push into the rubber block which fits into a recess in the bulkhead.

The block gets thicker towards the top, so has to be compressed more and more to fit into the recess. At point 'B' it is being compressed by half to the thickness at 'C'.
'A' is the thinner part of the block that is above the recess. There may be some scope for thinning the block at the shaded areas, so there is less to compress.

New block trimmed with a craft knife, leaving the full thickness of the material around the vent holes. As suspected the bottom of the heater was 1/4" forwards of where it needed to be to be pushed down into the cavity. But daubing both the face of the block and the back of the cavity with Swarfega as a lubricant, as well as reducing the thickness over most of the upper edge, allowed me to wedge the left-hand corner in. After that pressing down and wiggling got the rest of the bottom of the heater into the cavity, then pushing straight down was relatively easy - especially with no engine!
After that pressing down and wiggling got the rest of the bottom of the heater into the cavity, then pushing straight down was relatively easy - especially with no engine!

Heater box drain

Showing a rod inserted in the drain hole in relation to the grill apertures - 1973 model.
Showing the rod going through the drain hole at the bottom of the heater box (false colour as a result of the flash being very close to the painted body and chrome grill).

Earlier cars had a sort of 'leaf-trap' as seen here on The British Motor Museum Gaydon MGB cut-away. This restricts access to the drain hole somewhat ...
... but it's still just possible. There is an after-market mesh screen that goes under the grille to prevent debris entering in the first place, although since I've only had to do Bee's once in 26 years soon after purchase, and Vee's not at all, I haven't bothered. The grille has to be removed to fit it.

Showing the original spire clip (arrowed) pushed onto the peg of the grille to retain it. These can be tricky to remove except by levering the grille up, which makes them ping into the bottom of the box, although on Vee I was able to lever them down with a small screwdriver through the holes in the grille and capture them on a finger-tip. These have been replaced with plastic sockets which push into the holes from above, then the grille pegs push down into them. Similar sockets are used for badges on the boot lid. Much easier to deal with, but unfortunately it does need a bigger hole as it has to accommodate the socket plus the pin, a bit of a beggar on a freshly repainted body if you didn't open them out before painting. It does also mean that the grille can be removed relatively easily - good if you are doing it, not so much if a tea-leaf is doing it.
The British Motor Museum Gaydon MGB cut-away showing the metal spigot for the drain tube, the double-skin over the transmission tunnel, and the hole in the lower skin the drain tube exits through. If the metal spigot rots away water will tend to lie in the double-skin and eventually rot through to the cabin. If that happens probably the easiest solution is to drill a drain hole at the lowest point, although that will require engine and gearbox removal. It may be possible to repair the bottom of the air-box and the drain tube by removing the demister tube and trim panels behind the console.

The clip attaching "Tom's Knob" (AHC321) to the drain tube at the bottom of the air-box, clearly visible on cars with the adjustable footwell vents (up to August 1970), as well as the air direction cable attached to the air flap (Dave O'Neil):
Showing the plastic blanking plug that gives access to the clip securing the drain hose to the bottom of the air-box on cars with the fixed footwell vents (August 1970-on). In either case you need to be very careful leaning on the Jubilee clip when loosening or tightening. If the bottom of the air-box has been weakened by corrosion you could push the metal tube over and have a much bigger job on your hands as the bottom of the airbox is pretty-well completely inaccessible from below. If water leaks from above the hose it lies in the box section between tunnel and air-box and from there gets into the cabin.

'Tom's knob' (arrowed) as seen from below, the hole just above the arrow is for the gearbox dipstick rubber bung (image 'borrowed' from www.vord.net).
Vee's 'knob', the first clear view I've had now the engine is out. Obviously missing the restrictor at the bottom, and cut short, in fact it looks more like a standard piece of hose as the one above seems to be tapered.

Unavailable for many years, Brown and Gammons are showing a modified version available (left), albeit on 'stock alert' i.e. not currently available. Although as one person has said: "If I'd known how much trouble it would be to fit it, if I hadn't had to replace it I wouldn't have bothered!". The original hose is shown on the right, maybe explaining how it gained its colloquial name.
My first attempt to compare the curvatures was to lay a straight-edge with its centre of balance over the last square hole in the grill at one end, then measure the distance between the end of the grill and the straight-edge at the other. Several millimetres less, difficult to photograph with a rule, but you can see the difference between Vee's problem grille at the top, Bee's good grill in the middle, and Vee's original grill at the bottom.

Then as I was using a spirit-level I hit on the idea of comparing the bubble positions when positioned over the end square hole on each grille. Vee's here with the bubbles barely off-centre:
And Bee's here with the bubbles right at the ends of the glass tube:

Then I had the idea of going back to method 1 but using drill shanks to gauge the gap rather than measure directly. With the straight-edge pressed down over the last square hole one end, I inserted drills between the straight-edge and the last bar at the other end. With Bee a 15/16” drill shank was fractionally too big and a 7/16” too small so about 11.4mm, whereas on Vee I could only get a 5.5mm drill shank in, so half the curvature.

Dash Controls

The wonderful illogicality of the chrome bumper controls - the heat control has to be turned clockwise to turn it on whereas the direction control is turned anti-clockwise, which is the more natural direction for turning a rotary control on, I suggest. This is because both dash controls pull the cable when turned anti-clockwise, and push it when turned clockwise. However the air flap at the heater unit shuts off air flow when the cable is pushed, but at the tap on the cylinder head pushing the lever opens it for heat, and that is where the illogicality comes from. The operation of the dash control for heat was reversed on rubber bumper cars and V8s so that turning it anti-clockwise pushes the cable instead of pulling it, so then each control is turned anti-clockwise to get heat or air, and turned clockwise to shut them off.

Showing the holes in the metal dash-mounted heat-control knobs, direction control knobs are similar. Press down the sprung pin at the bottom of this hole to release the knob. If the control shaft has rusted badly the corrosion could have expanded to jam the knob onto the shaft.
Showing the pin that retains the knob, with the spring that presses it outwards. In this example the spring has lost some of its tension, normally it would be pressing on the back of the pin. The pin has a flange to retain it in the shaft with the knob removed.

The end of the spring is turned up at the pin end (arrowed in the above), so a spike can be inserted and that end of the spring levered up to remove. There is a small projection on the curved end of the spring, that locates in a hole in the shaft (both arrowed), when refitting the spring. The hole in the spring is larger than the flange on the pin, so the pin can be refitted before the spring.
With the knob removed you can get at the nut which when undone allows the control to be withdrawn from the rear of the dash. You can also see the pegs and location holes to correctly orientate the control in the dash so the control knob legends are correctly aligned with the datum pin (A). Chrome bumper heat control location pips (B) are at 2 o'clock and 8 o'clock, and when set fully anti-clockwise (off) the knob location pin (C) is at 7 o'clock.

Rubber bumper dashboard heat control location pips are at 10 o'clock and 4 o'clock, and set fully anti-clockwise (hot) the knob location pin is at 9 o'clock.
The dashboard air direction control location pips are the same for both chrome and rubber bumper at 12 o’clock and 6 o’clock.

On UK cars there should be enough cable to bring the control below the dash to access the cable clamps or for lubrication. Out of interest the multiple holes shown in the moving lever (and there are more in the fixed bracket underneath) allow a set of components to be assembled in various ways to suit many orientation and operation direction requirements. This is a 1980 heat (I think!) control.

The controls of my 73 roadster, 3/366 for heat and 3/347 for air ...
... and 75 V8, 3/533 for heat and again 3/347 for air.

Not easy to see here but the V8 has a different sheath on the heat control (left). This has a nylon core with four steel wires running length-wise in slots, inside a plastic sheath, as opposed to the wound steel outer of the roadster. This overcomes the problem of the wound steel outer expanding like a spring when pushing the inner to open the heat control, but has the opposite problem of pulling the outer through the clamps when pulling on the inner to close it, because the clamp can't grip the plastic and nylon outer as well as it can the wound steel. Both cars have wound steel outers on the air direction control, with have stranded inners. This seems strange given that the inner has to push the air direction flap closed as well as pull it open, rather than pulling against a spring to open and the spring pushing it shut, but it works well enough.
The heater controls on the LHD cut-away at Gaydon. This shows both controls having the same orientation i.e. turning anti-clockwise pushes the cable. It also nicely shows why the controls have different part numbers and are orientated differently on the dash - the upper control has to come down past where a radio would go, whereas the lower control has to go across to fit above the turned-under part of the dash. Similarly the angle the sheath makes to the spindle varies - the upper control sheath has to pass over the cross-brace, whereas the lower one has to pass in front of it. It's pretty clever, really, that the designer came up with a method of achieving so many different orientations and angles using the same basic parts just assembled differently.
Footwell Vents

Early (up to August 1970) left-hand footwell vent shown in the open position. This picture and the next courtesy of Rick Lindsay.

Early right-hand vent shown in the closed position.

The right-hand vent when removed gives better access to the air-direction cable (slightly) and Tom's Knob hose clamp than does the later fixed hood and bung. (DK McNeill)
Later (August 1970 on) fixed vent hood in the right-hand footwell of my 75 V8 (this also nicely shows the access plug for the heater drain tube clamp).
The air-flap cable attachments can only be shown in two separate pictures on an RHD as the pedals get in the way. Note the rubber block, the clamp for outer is covered by it, making undoing or fastening without cutting into the block impossible.

The inner fastening to the flap lever, shown in the Off position. This looks to be more accessible but I can only just get a finger-tip to it, although access would be better with the cowl removed. You would still need to manipulate the end of the cable with a pair of very long nosed pliers, and the trunnion with a nut driver on an extension, you wouldn't be able to see the hole in the trunnion, and the pedals on an RHD prevent you looking straight into the space! All in all a difficult proposition even if you were only replacing the inner. This seems to be a stranded inner, but logic dictates that it should be solid as it has to push the flap closed as well as pull it open, and there is no spring to aid closing. I must be fortunate in that this flap is very easy to move. Interestingly my mate Terry with a 73/74 reports that his also seems to be stranded as is my 73 roadster, whereas his replacement from the MGOC (original chopped off both ends when the heater was removed by a PO) is solid. I've come to the conclusion that a stranded cable is fitted as these are much more flexible, as the cable has to cross from one side to the other behind the dash to get from the heater unit to the dash control.
Control for the cold-air flap in the left-hand footwell, in the closed position. This is the later lever, longer and angled downwards giving more leverage.

The early lever just pointed sideways making it much harder to move as well as being more hidden under the dash. They also had black knobs (this is the Gaydon cut-away hence the flap itself being white instead of the usual black).
... and to the 2nd, you can see the flap open directly above the handle, between the rear edge of the centre console and the demister ducting.

The British Motor Museum Gaydon 'cut-away' MGB clearly showing the **four** notches in the control quadrant, giving one closed and **three** open positions. The third notch seems to be deeper than the others, which will mean it takes more of a pull to get it from that to the fourth, which is maybe why many (well, everyone else as far as I have found) thinks there are only three notches and hence only two open positions.
Herb Adler's mod with a coil spring (arrowed) between the head of the bolt and the detent. This allows the arm with the roller to move downwards slightly when moving the cold air flap, rather than having to spring the arm itself, making the flap easier to open and close. A longer bolt may be required, secured with threadlock or possibly a lock-nut. This also shows one of the vanes that are attached to the back of the flap (nearest the camera, concealing the roller) which direct air sideways into the footwells when the flap is open.
The back of the cold air flap showing the vanes that direct air into the footwells.

What's that kink in the heater return pipe for?

To give clearance for the kick-down cable on automatics:

HS Carb Hose Support

Someone was asking where to get these HS carb hose clips and sleeves, not listed in the Leyland Parts Catalogue or on any of the usual suppliers MGB web pages. I eventually found the clips listed on an eBay ad for hoses and stainless clips complete as 12H1001SS. Several of the usual suppliers list those, but not on their MGB pages i.e. 'in context', only for other models such as Midget and Sprite, or under general hardware. Then I found PCR811 yellow passivated versions which are a lot cheaper, and again shown for other models but not MGB. Oddly the BL Catalogue lists quite a few components with a PCR prefix but not that one:
Support clip PCR811. Incidentally some suppliers show the same clip used for the early heater return pipe, the later pipe has them already attached: (Leacy)

Again the sleeves or 'ferrules' only appear against Sprite/Midget and even then only a couple of suppliers (Moss Europe (item 84) and MS&C (item 9)) as HMP215007. My front one tends to slip out as they are a loose fit in the clips. Glue would probably hold it:
Console Heater Controls

John Maguire in Australia found the original positioning and routing of the console-mounted heater controls and cables led to them being stiff, and has re-positioned the controls and rerouted the cables by cutting additional holes as follows:

Slot the firewall cable hole, and increase the size of the large hole in the inner firewall, until straight line access to the demister/interior direction lever on the heater box is achieved.

Add a cable clearance hole to the panel between the console and bulkhead.
Swap the heater/demister controls left to right and rotate through 90 degrees such that the Off positions are horizontal. Demister assembly should now be horizontal. Heater assembly vertical. Both cables now make a smooth transition from the firewall to the controls.

Attach the heat cable to its console switch on the bench while swapping the controls left to right to permit access to the cable clamp and trunion tightening bolts.

Demister/interior cable can be attached to console switch assembly with access through either the radio aperture (or from above before the I/P is fitted) to secure the cable clamp and trunion.

Fit the console to the car while passing the heater cable forward into the engine bay for connection to the heater tap later on.

Finished result.
Note 1: It needs to be understood that the heater/demister cable length must be finalized early on. Fit and refit cable as required to align and establish inner and outer lengths. Initially attach a longer heater/demister cable to the heater box flap lever. The outer cable can then be removed and re-fitted as often as is required to establish cable length by guiding it in and back out along the inner cable.

Note 2: The demister tubes are my own improvisation, originally from an old vacuum cleaner!

Fresh-air Vents

The fresh-air vents in the 73 and later UK dash. To remove them (one at a time, they are individual) carefully lift up the tabs (arrowed) at the inner corners - the point of a knife blade is best - one at a time whilst easing either the bottom (if you are lifting the lower tab) of the vent forwards, then lift and ease forwards the other tab and upper edge. It's probably easiest on RHD cars to remove the left-hand vent first as you can reach up behind the dash on the passenger side to grasp the body of the vent to do the easing forward bit while you are lifting the tabs. Once that one is out you can reach the right-hand vent through the resultant gap.

To replace, do the right-hand one first as you will need to position the rectangular end of the heater outlet tube inside the open end of the dash vent, and this is easiest done with the other one out of the way. To refit the left-hand vent reach up behind the dash as before, but this time to position the heater output tube in the vent.
In case you are wondering about the three 'foreign' switches, a PO had rather butchered the dash to fit a couple of switches that were neither the same as the originals or each other. I was fortunate to get three illuminated switches of the same type but different colours/logos to tidy it up a bit. The left-hand one with the fan logo is connected to the cooling fan relay, so not only can I override the thermostatic switch if I want to but it also shows when the thermostatic switch has closed to operate the relay and fans. The middle switch has red illumination and is used to operate the rear fog lights. The right-hand switch has green illumination and is used to operate the front fog lights.

The cowled inlets in the intake

November 2016: The section from the manual, with the parts about the packing boxed in red by Ray:

Section R.35

FACE-LEVEL VENTS

Removing

1. Disconnect the air duct hoses from the back of the face level vents.
2. Ease up the bottom locating tag of one vent and slightly withdraw the vent until the locating tag rests on the lip of the fascia aperture.
3. Ease down the top locating tag and remove the vent and the anti-rattle packing.
4. Repeat 2 and 3 for the remaining face-level vent.

MGB. Issue 3. 89961

One of Vee's vents with thin strips of card glued to the back of the flanges - arrowed. There is a third one on the other long side:
The factory packing would have to be thick enough to cater for both flanges (A), but if wide enough and too thick it will press on the pivot and limit stop (B) and could prevent the adjustment that directs air up or down.

Screen Vents

Pre-1972:

Showing the rigid tubes (white) between the heater unit and the elbows, and the flat bulkhead:
The demister outlets viewed through the cut-out in the cabin-side bulkhead. (Dave O'Neil)

The elbows in the mounting plate that covers the above cut-out. (Chris Wilson)
1972-on:

Flexible tubes turning to face the heater i.e. no elbows. Black trim panel goes under the tubes, with this removed you have better access to push the tubes into the rubber block.

The tubes pass through the large aperture in the cabin-side bulkhead, and the smaller holes in the engine compartment-side bulkhead, direct to the rubber block seal.
Note that at some point the air-direction cable got a dedicated slot for the cable (compare with the earlier arrangement), which made it much easier to fit the cable to the heater unit before fitting the heater to the car. Before that the cable had to be fitted afterwards - bad enough with the large pre-1970 footwell vent, difficult with the later fixed vent and especially with the rubber block arrangement. The cable had to be attached in-situ originally as before the dedicated slot it was impossible to get the heater into the body with the cable already attached without severely kinking the cable. Haynes indicates and Chicagoland MG Club claims it wasn't until 1977 that this dedicated slot for the cable was provided, but you can just see it in the image above of my 1973 roadster, slightly clearer (arrowed) in this image with the rubber block behind it.

Even clearer is this image on a chrome bumper shell that could be as early as 1971. (Graham Barker)
Engine compartment side, on Vee (1975), corrugated tubing visible behind the panel. These just push into the rubber block which fits into a recess in the bulkhead.

The block gets thicker towards the top, so has to be compressed more and more to fit into the recess. At point 'B' it is being compressed by half to the thickness at 'C'.
'A' is the thinner part of the block that is above the recess. There may be some scope for thinning the block at the shaded areas, so there is less to compress.

New block (BHH389) trimmed with a craft knife, leaving the full thickness of the material around the vent holes. As suspected the bottom of the heater was 1/4" forwards of where it needed to be to be pushed down into the cavity. But daubing both the face of the block and the back of the cavity with Swarfega as a lubricant, as well as reducing the thickness over most of the upper edge, allowed me to wedge the left-hand corner in.
After that pressing down and wiggling got the rest of the bottom of the heater into the cavity, then pushing straight down was relatively easy - especially with no engine!

However Brian Wall of Exeter MG Owners Club opted to stick it to the bulkhead rather than the heater, and once lubricated the heater went in (and came back out) easily. It also struck me that without the heater it would be easier to fully seat the demister tubes in the block, doing it purely from the cabin was quite a fiddle. But then again, there are protrusions around the demister outlets on the heater that would have to be pushed down the face of the rubber block, but more importantly the clamp for the cable outer is inside the large slot in the rubber block. Given that I can't see how - with the heater I have - it could be installed with the rubber block glued to the bulkhead.

Heater Matrix

Most cars:
Note that when installed the coolant inlet port is at the lower centre of the heater unit and the outlet is at top right, when looking into the engine compartment from the front. Seal wrapped around matrix as indicated by arrows.

Vee's heater (removed as part of a restoration) cover removed, manky foam on top of the matrix ...

... and no foam at all on the other side, allowing a significant amount of cold air to bypass the matrix.
New seal fitted, seals the ends as well as the sides, so air can only pass through the heater unit by flowing through the matrix itself.

There is a flange at the bottom of the cover, which tucks under the main part of the case, that prevents the cover being removed with the heater in-situ. However, even if that flange were not there the cover would still have to levered forwards to clear the matrix ports as the lower part of the cover is a good inch down into the bulkhead cavity. It's been said a number of times that cutting the lower part of the cover off at about the position of the mounting flange that sits on top of the shelf (red arrows) would enable one to remove the cover easily and access the matrix. It does, but you still can't remove the matrix, as it's lower corner (yellow rectangle) goes right down to the bottom of the original cover, and hence is also a good inch down into the bulkhead cavity. The matrix slots into guides which means it can only be removed with a straight pull, it cannot be tilted so as to get the top corner out, then lifted to get the bottom corner out, without further modifications to the case. The only thing the cover mod allows you to do is fit an uprated impeller to the motor, which is said to be bigger than the hole in the cover, unlike the standard impeller.
Seal for the matrix ports where they pass through the cover. A grommet, so fitted to the cover before it is fitted over the ports.

Hover over a wire to confirm the colour

Single-speed before 77  Two-speed 1977-on

Single-speed heater fan (before 1977)
Note 1: Up to 1970 the heater fan was powered from the green circuit in the fusebox. From 1971 for the remainder of chrome bumper production and all V8s the heater fan (and wipers and electric washers) were powered from the accessories position of the ignition switch via a white/green to an in-line fuse under the fusebox, and then via a green/pink to the fan switch. Rubber bumper cars up to the 1977 model year were powered from the green circuit in the fusebox again.

Note 2: Before 1970 the wire from the switch to the motor was Green with a Brown tracer. From 1970 it was Green with a Yellow tracer.

Note 3: Up to October 64 the wires going into the fan motor may both have been black. Because of the 2-way bullet connectors these can be connected either way round. With the later fan motor with the differently coloured wires from the motor the fan gives a vastly superior performance one way round compared to the other, try both ways. With the earlier motor it should make no difference.

Note 4: The single-speed fans on my 73 and 75 take about 3 amps.

Two-speed heater fan (1977 on)

Note 1: On 1977 models the heater fan is powered from the green circuit in the fusebox, but when the ignition relay circuit on RHD cars was modified sometime in 1978 and a second in-line fuse between brown/white and green wires was added under the fusebox, the heater fan was powered from one of these - the one with the thinner wires, the other with thick wires being for the cooling fan. For more information see the ignition schematics.

Note 2: If installing an uprated or aftermarket dual-speed motor that has three terminals to give the two speeds, care must be taken with the switching that power is not applied to both live motor terminals at the same time, or the motor will be damaged. This does not occur with the original two-speed system that used a single-speed motor and additional dropper resistor as shown above.

I didn't know the actual resistance and wattage values of the dropper resistor, but did some tests to see what sort of values they might be. I put a standard 3 ohm coil in series with the motor and it seemed to drop the speed by about half which would be about right. I then measured the voltage across it with the motor running at this speed and got about 5v, which at a system voltage of 12v (engine not running) is about half voltage which tends to confirm what I'd heard. This represents about 1.7 amps (voltage across the resistor divided by its resistance). Subsequently the manufacturer of the heater systems for the MGB and many other makes and models, Ashley Hinton, told me that they were 2.5 ohms so not a bad guess. Based on my test the motor has an equivalent ‘resistance’ of about 4 ohms, so with a 2.5 ohm resistor you would get about 2.2 amps, so about 5.5v across the resistor. Wattage is calculated by squaring the voltage and dividing by the resistance i.e. 5.5x5.5/2.53 which gives 12 watts. If you want to convert a single-speed system to a 2-speed the resistor would need to be greater than 12w to avoid burning it out, and probably screwed to a metal mass to aid cooling, making this type the best bet.

If you have a 2-speed you can measure the resistance by putting an ohmmeter between the green/yellow and green/brown wires with the fan switched off, and measure the voltage across the resistor by putting a voltmeter between those two wires with the ignition on and the fan switched to slow.

You can only calculate watts by measuring the actual resistance of and voltage across the resistor in this way as motor current varies with rotational speed, a stalled motor taking a lot more current than a freely running one. You can't measure the resistance of a stationary motor and use that in any calculations, except to see what the stalled current would be.
**Heater Fan Motor**

All photos from Clausager.

1962. On the face of it no white wires, but close inspection indicates the wires are wrapped in black tape, and there are traces of white at each end (arrowed), entering the motor near the top.

1964. Definitely two white wires entering the motor at one point, near the bottom.

1969, still two white wires, although one has sleeve on it, possibly indicating polarity! This wire does seem to be going to the coloured harness wire, with the other one going to the black.

1972. Now one coloured and one black wire, although it isn't clear where the two wires are going on the motor. Compare the depth of the motor bodies in the following pictures with those above.
1975, definitely one coloured and one black wire going to opposite sides of the motor. A clear difference in the shape and size of the flange on the motor body compared to the earlier one.

1980. Probably the same size motor (externally at any rate). Three wires coming from a 3-pin plug, two of them going into the heater casing plus the black earth wire going direct to the motor, and a third coloured wire coming out of the casing and going to the other side of the motor.
1968 MGC. This seems to have the early longer motor and the two white wires, ...

... but this 1969 MGC seems to have the later coloured wires and the shorter motor, even though it is still three years before the introduction of the V8. However this, and any of the photos, could be sporting a replacement heater unit or motor.

Dropper resistor for 77 and later 2-speed heater fan (circled) inside case (Photo by Andy Charman)
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Hood Fittings

Relative dimensions of the pegs, press-stud, and hook plate. However Kelvin Dodd of Moss America has written to say: "In reality, the rear snaps moved around quite a lot when the V8/rubber bumper shell was built. I’ve done some research on this and have found that the stud location on the cars up to 1974.5 is pretty standard. From then on the snaps vary even from side to side. To allow the later tops to fit these later cars accurately the snaps and even the cut of the top from some manufacturers is slightly different."
The positioning of the press-stud is dependant on what tonneau or hood cover you are using. I've had two full tonneau covers and both fitted my stud in this position, but I have seen others with a smaller spacing i.e. a bigger gap to the front socket.

The pegs are secured with washers and nuts that are a fiddle to get to, this picture is of the off-side. The rear one (A) is accessed through the arrowed hole which is awkward enough, but also to one side which is why you can only feel it and can't see it without a mirror. The next one moving forwards (B) is easier to access, and the other two further forward still are accessed by removing the trim panel aft of the doors. 'C' is the carpeted wheel arch, 'D' the cockpit rail, 'E' the straps that go round the folded hood, and 'F' the rear bulkhead trim panel. 'G' is a gash bolt I have screwed up from below to block off the hole that was used for the static belt quick-release fitting, to prevent water running down.
An 8mm or 5/16" socket is a snug fit on the nuts, or a 2BA spanner. However whilst I can get my miniature 1/4" drive ratchet and socket on ‘B’ above there isn't enough room for ‘A’. Initially I used a 6mm Allen key which can be wiggled into the 1/4" square drive of the socket, and that will just fit on that nut. Subsequently I expanded on this idea to use square bar in a 1/4" drive socket for the heater valve nuts, and that bar can be used with the 5/16" socket as well. Also note that you don’t really need to turn the nut, just hold it in position, while you carefully screw the peg down into it. Stuff the socket so the washer and nut sit just below the top otherwise the stud won’t pick them up. Do that before putting the stud in the hole which will allow you to align them with the hole as well as give you more space. Use a soft washer of some kind between stud and body to protect the paint, I used offcuts of vinyl used to recover the cockpit rail or dash.
The two 'teardrops' for the rear of the hood and tonneau cover are accessed from the boot, via a hole near the lid hinge.

Rear retaining bar, little vinyl boots glued on the ends, a shade under 35.5" long
The main bar curved as well as chamfers on one side of each end.

Crankcase Breathing

See also Engine Side Covers.

Non-positive system used until February 1964. This uses a hose from the rocker cover to the front air-cleaner (outside the filter) and a non-ventilated oil filler cap. (Photo: Clausager, Original MGB)
There is also a hose on the front tappet chest cover clipped to a stud or blanking-plate screw where the mechanical fuel pump is on other models, just hanging down with an open end. (Image: Auto-Part.com)

In February 1964 a positive ventilation system was implemented. Until October 1968 it consisted of a PCV valve mounted on the inlet manifold, plumbed to a port on the front tappet chest cover. The oil filler cap is now ventilated with a restriction and a filter. (Photo: Clausager, Original MGB)
In October 1968 the PCV valve was replaced by carb ventilation, with ports on both carbs connected together and taken
down to the front tappet chest cover. The oil filler cap is ventilated as before. This system was used on UK cars until the end
of production.
Cover with external filter and separator 12H3684 used with carburettor ventilation until the 18V779/780 engines for the 74 model year. However the Parts Catalogue states that rebuilt engines used the cover below, as is the case on Bee's Gold Seal engine. *Image from William Revit in Tasmania via the MG Enthusiasts forum.*
Cover 12H4395 (below) again with internal filtering and oil separation, used with original 18V797 and later engines, and for all rebuilt 18GG and later engines. (Chris Howells)

North American spec from October 1969 with the charcoal canister. Originally with twin SUs connected to the front tappet chest cover as before, but with a non-vented oil-filler cap. This version shows the later single Zenith/Stromberg carb and anti-runon valve. (Photo: Clausager, Original MGB)
V8 with individual hoses and oil/flame traps from carbs to rocker covers.

Rear of the V8 air-cleaner box showing the breather intake filter with mounting clip and hoses.