

# Alternative MGB Heater Valves ...

## The Challenge

### MGB Owners Drive!

As MGB owner's we tend to drive our cars. MG's are rarely trailer queens and we push the edges of sane motoring from "Ancaster" to "Brass Monkey". As a Canadian car club we're fortunate to experience all the seasons... sometimes in one day. There have been a number of times when flakes of snow are in the air during a pre-dawn start, headed to a show in the other end of the city, and the trip back late afternoon is top down, t-shirt and shorts. This brings us to the topic at hand. Ideally, we really need to have all the heat our core is capable of **and** the ability to shut it completely off. Unfortunately, the design of the stock valve is an obstacle, creating a bottleneck even when fully open.

### Valve operation

The normal operation of the valve involves moving the lever at the top up the ramp, which in turn raises the poppet at the bottom of the spring. This allows the hot coolant to move up the vertical red path from the head and across the horizontal red path towards the heater core.

### Design Issue 1

The first design issue is that even when fully open, the poppet moves just over .3" and remains a restriction point. Less fluid makes it to your heater core which means less heat.

### Design Issue 2

The second design issue is that a rubber diaphragm sits above the poppet, keeping the hot water away from the lever mechanism. I'm told that original heater valves lived long healthy lives. Unfortunately this is no longer the case. Replacement valves are poorly constructed and, despite the availability of better rubber compounds, the rubber used in replacement valves is substandard. The diaphragm either ruptures or pulls away from the crimped side allowing fluid to pass.

### Design Issue 3

The heater valve sits directly above the distributor. When the diaphragm fails, coolant will spray down on the cap and wires causing misfires and eventually ignition will stop. At the last club meeting, one member let me know that he carries a disposable shower cap to drape over the distributor for just such an emergency. Great idea! (but unfortunate that we should have to resort to it).

### Design Issue 4

The heater valve is actuated with a control behind the dash in the cockpit. When you turn the knob, a toothed wheel is engaged and rotates, pulling and pushing a solid core wire in a sheath. That wire in turn pushes and pulls the valve open and closed. The valve needs to move just over 1.4" between fully open and fully closed and the control provides just about that amount of travel.



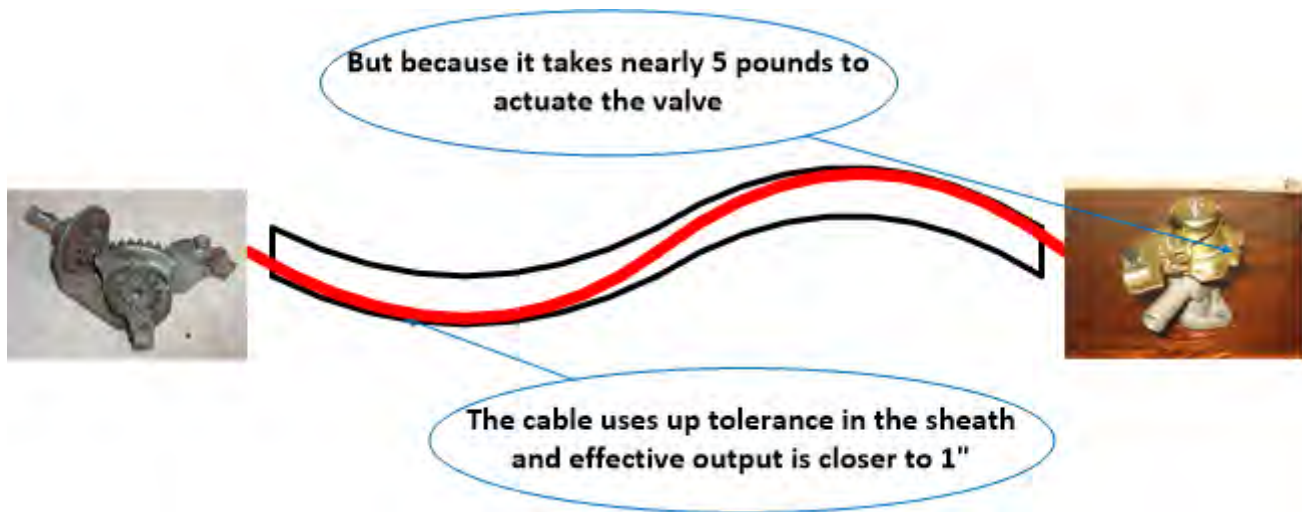
Valve requires 1.4" from stop to stop

Control provides 1.4" from stop to stop



The heater control system we use was originally designed in the early 1950's for the MGA. If you picture a right hand drive MGA, the control would be perhaps 18" away from the valve; a straight shot through the firewall. Fast forward to the North American 1968 – 1974 MGB and we have the worst possible evolution. The control now sits on the left side of

the left hand drive steering wheel. The cable must make at least two sharp curves in a long “S” as it travels over 44 inches from control to valve. Worse, as the quality of aftermarket valves has declined, the force required to operate them has increased. Samples I measured required nearly 5 pounds of force to operate.



The length, the curve and the force together mean that the cable no longer emerges at the valve end with the same distance that you move it at the control. Your 1.4" has become 1". Practically speaking this means that when you setup your heater valve, you must choose between having it fully open **or** fully closed. It is unlikely that you can have both. Freeze in the morning, or heat blowing on your feet when you're driving on a hot sunny day.

## A Range of Solutions

### Block it all off

This choice may be more attractive to our southern neighbours, but not really much of an option in our climate.

### Do nothing

Depending on your point of view, this may fall under the category of "If it aint broke, don't fix it". You should probably cross your fingers and touch wood and all those good things... (don't forget the shower cap)

### Buy the best

Do your research and ask around before buying valves and cables. Find out who is having good luck with which vendors. Make sure you get one that appears well constructed and if it seems hard to push open or closed fully – return it. (You should probably still cross your fingers)

### Home Depot Plumbing Isle

A full flowing, completely operational valve can be assembled using plumbing parts you can find at the hardware store. It's not going to be pretty and unless you fabricate something to hold the cable sheath you're probably going to have to open the bonnet to change the temperature. Plenty of examples can be found on the internet of ball valves, elbows, barb adapters and parts that fit the bill. Here's one example: *(Photo right)*



### Cable Driven Replacement

Use an alternative mechanical valve (such as one from a Ford Bronco) to replace the original. These cable driven valves require less force to operate and have a shorter throw yet retain a vintage look under the bonnet.

### Servo Driven Replacement

Use an alternative electronic valve to replace the original such as the Servo Heater Control Valve Kit available from Vintage Air.

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### The Bronco Valve

The valve I used in my '72 GT was originally used in early 1970's Ford Broncos. Truthfully, this valve was used in a wide variety of vehicles over many years, but for ease of sourcing, it's simplest to locate it and refer to it as a Bronco Valve. They used this valve for about 7 years in both V6 and V8 Broncos.



This valve is still era-appropriate with a zinc plating and simple mechanics. It doesn't look out of place under the hood and uses the stock control and cable. It comes with the sheath hold down and best of all it requires less than one pound of force to open and close in less than 1.3" of throw. This means that despite the cable length and turns, the valve fully operates.

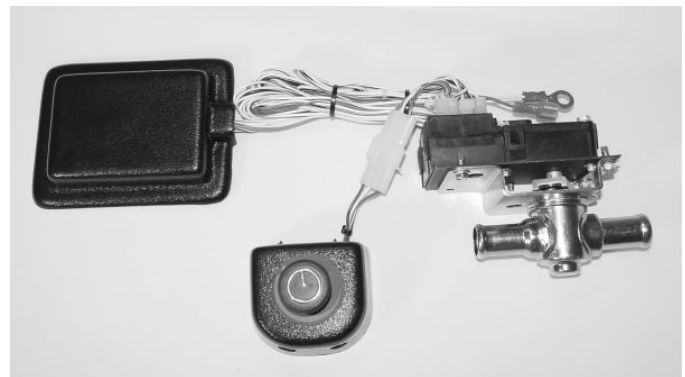
#### Assembly

*(A detailed list of supplies and sources follows the article.)* Any replacement valve will require many of the same elements. You first need to connect to the head. Most replacement assemblies make use of a discarded stock valve, sawing it off about  $\frac{3}{4}$ " from the base. The opening is then bored out to  $\frac{7}{16}$ " and tapped to  $\frac{1}{4}$ "NPT. In my first picture, you will see that I used a nice flange machined by "Pembroke Parts". A right angle fitting is needed to thread into your new base and to turn towards the heater. I found a nice brass one at Acklands Grainger. Nearly all replacement valves including this Bronco Valve require  $\frac{5}{8}$ " hose. You will need to step up to  $\frac{5}{8}$ " from the head and back down from  $\frac{5}{8}$ " to  $\frac{1}{2}$ " to go to the heater. Napa sells appropriate adapter hoses from Gates and I have located one that even rises slightly to account for the fact that the heater core inlet is above the head outlet. You'll also notice in the pictures that I use the thermoplastic Gates Power Grip hose clamps. These work like heat shrink tubing. A blast from the heat gun snugs them up tight. The downside is obviously that they are one use only. But I was trying to avoid the Frankenstein look of four steel hose clamps in a row.

### Electric Servo Valve

"But Greg", I hear you say... "If I'm going to rip out the original, why not go all the way?" Concours purists should probably stop reading now if they haven't already... This is what I did on my '70 roadster. After snapping the centers out of two brand new control knobs in a row, I decided I wanted the control to spin as easily as it does in my Civic. I found a heater control kit that's been used by the hot rod guys for some time now when they're doing custom builds.

Essentially this kit has a mechanical valve very similar to the Bronco valve at its core on the right. But driving that valve is a small servo motor mounted on top. The circuitry controlling the motor is in that flat box on the top left and a small control (potentiometer) turns left and right to open and close the valve.



#### Assembly

The installation of this servo driven valve is mechanically the same as the Bronco valve. You still need to get from the head, turn 90 degrees, step up to  $\frac{5}{8}$ " and step back down to  $\frac{1}{2}$ ". Additionally, you'll have to provide the circuit with 12 volts (switched). The green circuit is a good choice. This kit provides enough wire that you can hide the control box

anywhere (it requires no access) and mount the knob wherever you want. Admittedly, the servo box is a bit modern looking in a 1970 engine bay, but it doesn't attract too much attention. (photo - below left)



Inside the cockpit, you can just mount the potentiometer housing under the dash and ignore the original dial. I decided I wanted the control to be in the stock position and that I wanted to use a stock knob. The potentiometer supplied is too short to reach through the dash so I grafted on the shaft that I sawed off from a stock control. This let's me use the regular knob and keeps the dash looking normal. (photos - above right)

Closing

Both valves and controls have worked flawlessly since installation and I'm pleased with the results. I was asked at the last club meeting which solution I preferred. My first reaction is that the Bronco valve is the best solution. It's affordable, available, simple and functional. However, the servo valve, while admittedly overkill, is really nice and, only an MGB owner will understand this, without fail, every time I spin that control, I smile.

Sources

- ⦿ Heater Valve Ford Bronco 1966 to 1972 (About \$18.50)
  - Ford PN: C3UZ18495A
  - Motorcraft PN: YG133
  - Everco H1931
  - Four Seasons 74828 (note that Four Seasons replacements tend to be plastic. This may not suit you depending on taste)
  - Source:
    - ⦿ Napa, Part Source etc.
    - ⦿ <http://stores.ebay.ca/MR-FOMOCO-MOTORCRAFT? trksid=p2047675.l2563>
- ⦿ Vintage Air Servo Controlled Heater Valve 50507-VUA (\$100.00)
  - Summit Racing or [www.oldcarcenter.com](http://www.oldcarcenter.com) (Langley BC) or <http://www.horton.on.ca/> Horton Hot Rod parts Milton, ON.
- ⦿ Hoses:
  - Gates PN 18050 Napa 10050 straight 6" 1/2" step up to 5/8" \$9
  - Gates PN 18477Napa 10477 offset 4.5" 5/8" step down to 1/2" \$9
- ⦿ Elbow: (\$7.00)
  - 90 degree brass 1/4 NPT and 1/2" barb
  - Fairview PN FAR 139-8B
  - Source:
    - ⦿ Acklands Grainger <https://www.acklandsgrainger.com/>
- ⦿ Base:
  - Construct your own by cutting down base of existing heater valve to approx 3/4", boring to 7/16" and tap to 1/4 NPT.
  - Or purchase a fabricated base from [pembrokeparts@gmail.com](mailto:pembrokeparts@gmail.com) [http://www.britcot.com/page\\_four.htm](http://www.britcot.com/page_four.htm) (fyi... some have reported difficulty reaching this vendor)
- ⦿ Also need heater valve gasket Moss PN 697-360 and four hose clamps.