



Coolant flow in an MGBGT V8 engine

1. Coolant from Radiator to Water Pump Inlet (cooled water)
2. Flow from Pump Outlet (in Front Cover) to Cylinder Block (both banks)
3. Flow from rear of Cylinder Block to Cylinder Head (both banks)
4. Flow from front of Cylinder Head to Inlet Manifold (both banks)
5. Flow from Inlet Manifold to Radiator via Thermostat and Outlet Elbow

Note that the coolant flow is from front to rear in the Cylinder Block and from rear to front in the Cylinder Head.

Why did the temperature gauge go near the red and lead to a breakdown recovery?

Victor Smith describes how his MGBGT V8 had an overheating problem which resulted in a breakdown recovery. An investigation revealed a coolant leak and on discussing the tale with Tony Lake later he commented that if the leak was even modest then the cooling system was being asked to deal with the same heat rejection but with a lower volume of coolant. Then the operating temperature increases which is what the gauge confirmed. He added "once coolant loss occurs then it is unlikely that the system pressure becomes high enough to help increase the boiling point of the coolant; so the loss through boiling only makes the temperature higher. But the fact that you still have coolant to boil protects the vital parts in the cylinder".

What happened on the day of the breakdown?

It was a hot day and as I was negotiating the streets in Richmond to get on to the main A316 which goes out to the M3. I had my cooling fans' override switch on to ensure the radiator was being cooled as early as possible but I spotted my temperature gauge was moving up passing the 4 o'clock position, then 3 o'clock on the dial and then it approached the red zone just before I was able to pull off into a side road and cut the engine. I then turned the ignition on so with the override switch still on the cooling fans could run.

After about five minutes I briefly fired up the engine. Normally with the coolant slightly cooled with the fans running, the needle on the gauge would fall back but it remained very close to the red zone.

I checked the top and bottom hoses - the top was very hot and the bottom less so. I felt the coolant might not be circulating.

When the AA arrived he saw it was an MGB V8 and mentioned he was a classic car enthusiast with a Triumph Stag and said he thought the likely cause was a seized thermostat in the closed position rather than a failed water pump. He recovered the car to my home and then I made arrangements for the car to be taken to Baldock by Brown & Gammons on the back of a truck for an investigation and repair.

What was the cause of the problem?

A week later I went up to Baldock to collect the car and heard that they had found coolant had been leaking into the "Vee" under the inlet manifold. Searching for the cause of the leak they found the **Heater Feed Pipe 90611532** between the water pump and heater, which is an internal pipe that is screwed into the intake manifold, was in good condition and was not leaking and causing the problem. The original pipe can corrode quite badly but mine was a replacement composite stainless steel pipe with a "copper like" look to it and was in good condition.



Heater Feed Pipe – water pump to heater 90611532 with a swaging near the end for the hose to grip to.

The **Bypass Pipe Heater Outlet 603049** attached to the underside of the intake manifold was also in good condition.



Stainless steel replacement Bypass Pipe Heater Outlet 603049 attached to the underside of the intake manifold (Ralph Hardwick)

They then found the **Gasket for the Inlet Manifold GEG665** was the source of the coolant leak, so the manifold had to be removed.

Removing steel bolts in aluminium can be a devil to extract and in this case one of the bolts sheared and had to be drilled out and replaced. The manifold was then put back with a new gasket and a precautionary coating of thread sealant on the bolts to help protect them from the inter-metal effects that often lead later to a difficult experience extracting them.

The thermostat housing was removed relatively easily and they found it had not seized but as a precaution a new replacement **thermostat GTS104** and a new **Otter switch BHA5252** were fitted, plus new gaskets of course. During the work they also found the sump was leaking slightly so the sump was removed and put back with a new gasket. The **replacement coolant** was [SilverHook](#) blue summer coolant and antifreeze AFB5 is an ethylene glycol based product. The capacity of the V8 cooling system with the heater is 9.08 litres.

Return home from Baldock

The return trip home via the A1 and M25 went well but at 70mph the needle on the temperature gauge moved just right of the 6 o'clock position to near 5 o'clock so I eased back to a steady 60mph and using my manual override switch set the cooling fans running whereupon the gauge returned to 6 o'clock. It was a fairly warm afternoon in August. So I feel the problem has been cured but I will check the coolant level in the expansion tank and remove the brass radiator plug to check the radiator coolant level too.

How can you spot a problem like this as it is developing and avoid a breakdown?

Upon reflection I did notice on the morning I took the MG out of the garage that the carpet tiles under the sump area were slightly soiled with a little oil marking. The B&G service manager felt that a little of the leaked coolant must have run down the side of the engine and over the side of the sump and on to the mat. So there is an early warning as a future early warning. On studying the carpet tile later the soiling is noticeably less than you would get with an oil leak from the sump nut or from the sump gasket.

Spotting a coolant leak accumulating in the Vee under the inlet manifold is difficult to see. Regular checking of the expansion tank (coolant level should be around a third full) and removing the brass plug on top of the radiator to check it is full is well worth doing. Also replacing the coolant **Pressure Cap GRC110** on the expansion tank is a modest cost to ensure the pressure holding capability of the cap does not fall and compromise the cooling system.

Check the condition of your radiator

Another issue with an effect on cooling is the external condition of the radiator. Tony Lake says "you would be amazed at how much rubbish accumulates at the front of the radiator - dead insects, residue of leaves, general road dirt and any amount of rubbish, all of which doesn't help cooling. A high pressure jet flush from the back of the radiator will dislodge the bulk of it and also an occasional flush of the radiator to remove sediment that has accumulated over time".

Another case described by Ralph Hardwick

"I have been through this process and know it too well. I purchased my Factory MGBGT V8 in November 2019 and as it had only covered around 1,000 miles in the previous 10 years I decided to trailer it from Heswall to B&G for a full fluid change. The first problem was the back axle which required a full rebuild due to a blocked breather.

On my way home down the A1 and on the M25 and M11 to London there were three occasions when the temperature gauge

needle swung towards 4 o'clock and ejected coolant through the expansion tank. I managed to limp home after replenishing the lost coolant and using the fan override switch. I decided to replace as much of the cooling system as I could - radiator, hoses, water pump and thermostat.



Severely corroded internal **Heater Feed Pipe 90611532**. (Ralph Hardwick)

We then entered Covid lockdown so I decided to venture further. I removed the intake manifold and removed the internal **Heater Feed Pipe 90611532** (see above) which was severely corroded. A replacement was sourced from Rimmers. In the process I had the pair of trousers and intake manifold powder coated in black and grey as it had left the factory. I cleaned up the 'Otter' switch and cleared the steam pipe. The Heater Feed Pipe 90611532, is screwed into the inlet manifold, should not be confused with the bypass pipe that runs under the manifold and is attached to it by two screws.

Still in lockdown I decided that I would remove the cylinder heads to ensure that the passageways were clear. A decision was made to fit some later cylinder heads that I had bought secondhand and I had them refurbished at Powers Performance. When I had removed the heads I discovered that one of the liners was slightly lower than the block deck height. A slipped liner.



Removing the heads discovered that one of the liners was slightly lower than the block deck height - a slipped liner (Ralph Hardwick)

The clean piston crowns also indicate that they had been steam cleaned! I removed the engine and gearbox and had Powers Performance fit new 'top hat' liners and rebuild the engine with new HC pistons sourced from Turner Engineering.

During the time when the engine was being rebuilt I replaced the heater matrix, replaced the heater valve and also fitted a new replacement stainless bridging pipe from the intake manifold.

Another case - overheating on the way to Brooklands

Peter Berry described an overheating experience he had with his MGBGT V8 in April 2014 on his way from Bromley in Kent to an MG meeting at Brooklands. He said "being a cold morning (2 degrees in Bromley at 8am) I turned up the heater and set off towards the M25. About six miles into the journey I noticed the temperature gauge was dangerously high, with the needle at around the 4 o'clock position. I pulled over, lifted the bonnet and found nothing amiss. A stretch of dual carriageway lay ahead so I figured that if the needle dropped on that part of the journey it would be fine to turn onto the M25, where the temperature would surely drop. Luckily the

temperature did reduce so I joined the M25, where the needle came to rest at a more normal seven o'clock position. However as soon as I left the motorway again the needle began to climb quickly once more. I made it to my destination at Brooklands near Weybridge without further drama and switched the engine off immediately.

I thought about what had happened over a coffee and came to the conclusion that my journey that day had one big difference. At the outset, I turned the heater on. As I rarely drive the car in cold weather these days, usually the heater valve remains closed for the vast majority of time. When the engine was out recently the coolant was obviously replaced. The heater valve stayed closed throughout and hence the heater was not refilled when the coolant was replaced. Opening the valve simply drained the coolant from the engine into the heater matrix! When the temperature settled, I removed the radiator plug and found room for an additional three litres of water in the radiator! Needless to say, the remainder of the day's driving saw the needle at 7 o'clock with very little fluctuation. Relief the problem was solved and a comfortable journey home.