Volume 14

V8 Workshop Notes

V8 Register - MG Car Club

Introducing The....

MG Car Club

Membership Includes.....

- Subcription to our award winning 100 page Club magazine
- Free Technical Help
- Disounts on Insurance
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Live Life. Drive

MGBGTV8 profile

MGBGTV8 - the MG with effortless performance

Launched in August 1973, the V8 powered MGB combined the popular fixed head coupe body style with a powerful three and half litre light alloy V8 engine. The Rover powerplant ran with a reduced compression ratio but an increased torque compared with the similar engines then used in the Rover saloons. The result transformed the MGB, creating a very nimble car with the luxury of multi-cylinder power which is both flexible and economical - features which continue to have a special appeal for V8 enthusiasts today!

On the road the MGBGTV8 has an effortless performance, accelerating rapidly in the higher gears with 125 mph available in both direct and overdrive top. Hills just melt away and the torque gives the car an unfussy manner. The 0 to 60 time of 7.7 seconds is still 30 years later, a time many of today's sports saloons cannot touch. Even when asked to work hard, the exhaust note retains its very pleasingly modest but purposeful burble in keeping with its understated manner.

The V8 engine, although from an old Buick design from the early fifties, contains hydraulic cam followers which give the MGBGTV8 a quietness that compliments the smooth power. Under the bonnet, the lightweight aluminium V8 engine seems much bigger than the original four cylinder steel engine but is only just a little heavier when the engine ancillaries are included. The lightweight benefits are good front to rear weight distribution and an appreciable increase in the power to weight ratio, even from the detuned 137bhp V8 power unit.

A surprising feature of the MGBGTV8 is the fuel economy. Even driven on the open road with a sense of fun the enthusiast can enjoy with V8 power, it is quite easy to achieve between 27 and 31 miles to the gallon. The overdrive unit gives the MGBGTV8 long legs with around 29 mph per 1,000 rpm or 3,000 rpm at 90 mph. The convenient overdrive facility is available on top gear at the flick of a stalk switch on the steering column and on many of the earlier chrome bumpered examples of the model it is available on third gear as well.

The MGBGTV8 is however not without its poor features - excessive wind noise at speed and a choppy ride at slow speeds from the stiffer rear springs which are needed to cope with the higher power output. The gearbox has to be treated with consideration when punching the additional power through to the road wheels.

At its launch in 1973, the MGBGTV8 was welcomed as a powerful example of the MG marque but generally regarded as arriving several years late in a popular but ageing bodyshell and suspension package, then over ten years old. The MGBGTV8 is very much an MG combining the famous marque's Safety Fast! features - speed and performance with predictable and forgiving handling characteristics. At the time of the launch, the specification of servo assisted brakes, tinted glass, distinctive light alloy wheels, fine cord covered adjustable seats, two speed wipers and an overdrive as standard made it a refined sports car for 1973 and good value at its launch price of £2,294.

In so many ways the MGBGTV8 is an undiscovered classic sportscar and prices have never been driven up by "chequebook investors". It remains a sports car that a small band of enthusiasts enjoy and see as very good value today in every sense.

MGBGTV8 facts

Produced: 1973 to 1976 with pre-development cars produced from late 1972.
Bodywork: Two door fixed coupe GT with rear hatch.
Engine: Rover aluminium alloy normally aspirated V8 3,528cc with 137bhp. Twin SU type HIF 6 carburettors.
0-60 mph: 7.7 seconds
Top speed: 125 mph
Fuel consumption: 25-30 mpg
OK for unleaded: Yes original heads are OK.
Production: Original Factory production figure is 2,591 with only a few early LHD cars and none exported to the USA, although total V8 production is believed to be 2,600. Just over two thirds of the production had chrome bumpers with the remainder fitted with rubber bumpers.
Specification: Servo assisted brakes (discs at the front and drums at the back), distinctive Dunlop composite light alloy/steel wheels, tinted glass, reclining seats covered in fine cord, two speed wipers and a heater as standard, with a four speed gearbox with overdrive fitted to all cars on fourth gear and on over 60% of the chrome bumpered cars overdrive was also available on third gear - change point around VIN 1200.
Number of cars still existing: Estimated at around 2,100 with many exported over the years to Australia and New Zealand over the years. So estimated UK stock is around 1,825 cars.
Spares availability: Very good, particularly from the specialist V8 spares providers.
Garage fit? L 13ft 3" (4.02m) x W 5ft (1.523m) x H 4ft 3" (1.292m).
Prices
See our six monthly market review and price guide online at: www.v8register.net/v8/profileprices.htm

So you want to buy an MGV8?

Our guide is one of the best sources of advice for an enthusiast wanting to get an MGBGTV8 or MG RV8. It is packed with tips on how to research the models, how to check a car offered for sale, negotiate a deal, make a safe payment and check you have the necessary documents. It's all in a useful 60 page book. See the link on the V8 website homepage at www.v8register.net

V8 Register

The V8 Register welcomes all enthusiasts for the V8 powered MG models covering the recent MG RV8 Roadster, the increasing numbers of MGBV8 Conversions, MGBV8 Costellos and of course the original factory produced MGBGTV8 model. The key strengths of the V8 Register are:

- **Workshop Notes** - two series of workshop notes, the original series for the MGBV8 now into Volume 12 and the recently launched series for the MG RV8 already into the Volume 8.

- **V8LIFELINE**, an enthusiastic band of V8 specialists and motor factors providing spares and maintenance services for the MGBV8 and MG RV8 models.

- **Gatherings of MGV8 enthusiasts and events** organised by the V8 Register each year. The V8 Register has always been a particularly sociable group with regular gatherings at MG Car Club meetings, particularly at the Club's annual International MG Meeting at Silverstone in June, V8 Tours of Scotland and elsewhere, and visits to the annual 24 hour sportscar endurance race at le Mans.

- **V8 Website**, launched in May 2002, packed with useful information, a V8 Bulletin Board and a copy of the Rolling V8 Calendar of events.

With these strengths and essential support, the V8 Register is certainly the specialist group any MGV8 enthusiast should join. From its formation in 1978, the V8 Register has attracted large numbers of MGV8 enthusiasts and continues to grow strongly today with over 2,500 members in the UK and overseas.

Joining the V8 Register

Joining the V8 Register is very straightforward – there is an easy to use online registration form at www.v8register.net or you can obtain a form from Club Office or the V8 Registrar and mail or fax it to:

Victor Smith
V8 Registrar
PO Box 888
London SW14 7YT
v8registrar@v8register.net
Tel: 0208 392 9434

MG Car Club

If you are an MG enthusiast then here is the MG Club for you. We welcome enthusiasts for all models of the famous marque – from machines like the current MGF and recent MG RV8 bearing the famous Octagon to modern BCV8 classics, Midgets, MGAs and back to the T-types and those pre-war models that created the legend that is MG!

The MG Car Club has a regular award winning monthly magazine called **Safety Fast!**, active Registers providing technical support and spares help for each MG model, spares specialists, insurance schemes for MGs and of course some of the best club motor sport and competition events – all within a wide and comprehensive social network in the UK, Mainland Europe and overseas, In all the MG Car Club has around 30,000 members Worldwide.

The MG Car Club, founded with factory support and encouragement in 1930, is run by enthusiasts for enthusiasts. We maintain our close association the old factory with our Club Office in Cemetery Road in Abingdon adjacent to Larkhill House, the former administrative building at the MG plant. The MG Car Club is run in the true spirit of a members' motor club and each member can participate in the activities and the running of the Club. It is company limited by guarantee.

Joining the MG Car Club

If you are not a member of the MG Car Club, full membership details and a new member pack can be obtained from the Club's office in Abingdon, the home of MG. Just contact:

MG Car Club
Kimber House
PO Box 251
Abingdon on Thames
Oxfordshire OX14 1FF
Tel: 01235 555552
mgcc@mgcc.co.uk
www.mgcc.co.uk

The Club Office team will be pleased to hear from you and welcome you as a member of the MG Car Club – the Marque of Friendship!

Why not join now!

Above: The advert at the launch of the model certainly did not understate the case for an MGBGTV8 in 1973!

V8 Workshop Notes series

Shortly after the formation of the V8 Register in 1978, the V8 Workshop Notes series was launched to help members maintain this limited production model and source spares. Victor Smith, the founder of the V8 Register, took on the role of editing the series and encouraging contributions from members of the V8 Register. Many individual notes were published in the V8 Register column in **Safety Fast!** - the award winning

monthly magazine of the **MG Car Club** - but as the number of notes grew rapidly, the series was published as individual volumes in a convenient A5 spiral bound layflat format.

The **first volume**, called First Fifty, was released in 1979. The popularity of the series and the support from members exceeded expectations and it was the clearest example of the interest and enthusiasm of V8 Register members. The aims of the series were quite simple and liberal – they are to amplify or clarify the Workshop Manual **AKD3259** and/or the V8 Supplement **AKD8468** and to give tips on the availability of spares and service. In less than five years the series grew to 175 workshop notes with the publication of Volume 4 in May 1984. The series has continued to thrive and is a popular source of information for fellow MGV8 enthusiasts.

Whole V8 Workshop Notes series is now available on a USB Twister memory stick

The distribution of the whole series in PDF format was changed to using a USB Twister memory stick in July 2014.
V8NOTES on a Twister memory stick

The common parts of the volumes are now published as a separate volume – the Contents & Index. This volume contains a review of the MGBGTV8, details of the V8 Register and the MG Car Club, a brief history of the V8 Register, a full Contents listing of the whole series, a chart of the Factory production colours, an Index to the whole series and a copy of the V8LIFELINE.
V8LIFELINE

Updated Contents Listing and Detailed Index

A copies of both the current Contents Listing and the Detailed **Index** for the whole series are available on the V8 Website. Those copies are regularly updated so members can download them at www.v8register.net to keep their copy of the V8 Workshop Notes up to date.
Contents Listing
Detailed Index

Caution and Disclaimer

The V8 Register of the MG Car Club has published the articles contained herein in good faith. However, neither the MG Car Club, the V8 Register or its officers, nor the respective authors can accept legal responsibility for the accuracy of any of the statements contained herein. These articles are intended to supplement the official workshop manual and any other publications produced and/or supplied by Rover and reference should be made to those publications. Accordingly the MG Car Club Limited, the V8 Register, the officers of the V8 Register and the authors of these articles hereby disclaim responsibility for any legal and/or technical liability whatsoever (as may by law be disclaimed) as might otherwise arise.

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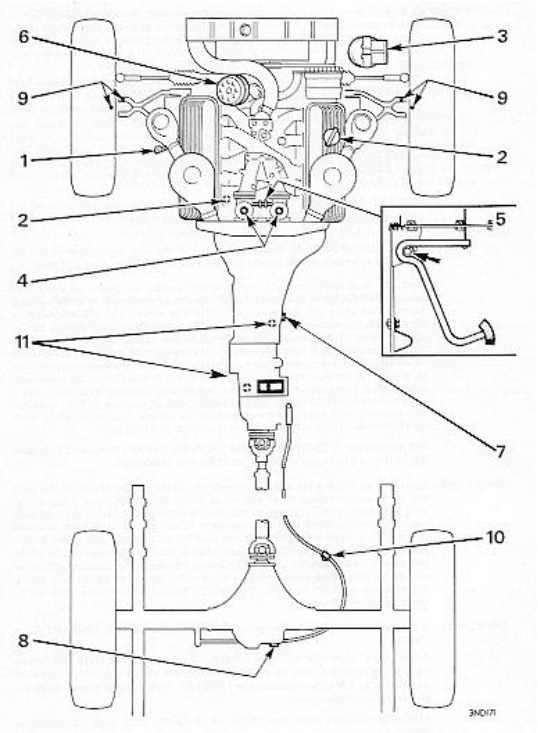
Maintenance Locations



Note – Ensure that the vehicle is standing on a level surface when checking the oil levels

Each week and before a long journey

(1) **Engine** - check the oil level with the dipstick and top up as necessary

Every 6,000 miles (10,000 kms) or 6 months

(2) **Engine** - drain the oil and refill with new oil
(3) **Engine oil filter** – remove disposable filter cartridge and fit new oil filter cartridge
(4) **Carburettors** – top up piston dampers
(5) **Accelerator** – lubricate control linkage
(6) **Distributor** – lubricate all parts, cam and felt pad, contact pivot, centrifugal weights and centre spindle felt pad
(7) **Gearbox & overdrive** – check oil level and top up if necessary
(8) **Rear axle** – check oil level and top up if necessary
(9) **Front suspension** – grease four nipples
(10) **Handbrake cable** – grease one nipple

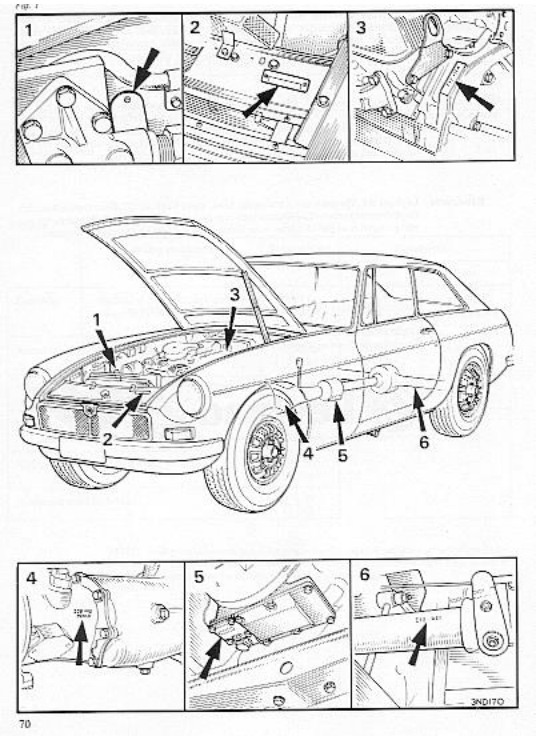
Every 24,000 miles (40,000 kms) or 24 months

(11) **Gearbox & overdrive** – drain oil, clean the overdrive filters and refill with new oil

Optional lubrication every 3,000 miles (5,000 kms) or 3 months

(12) **Engine** – check oil level with dipstick and top up as necessary

Car & engine numbers



Identification numbers and locations

(1) **Car number** – stamped on a plate secured to the right hand inner wing adjacent to the oil filter with the prefix GD2D1 (except for early LHD cars)
(2) **Commission number** – stamped on a plate secured to the bonnet locking platform
(3) **Engine number** – stamped on the right hand side of the cylinder block located directly behind the left hand cylinder head
(4) **Gearbox number** – stamped on the right hand side of the gearbox casing
(5) **Overdrive unit number** – stamped on a plate secured to the underside of the overdrive main casing
(6) **Rear axle number** – stamped on the left hand side of the rear axle tube near the spring seating

V8 Register records

At an early stage we found it necessary to give all non-factory MGBV8s an artificial Car Number to provide some rational structure for the V8 Register, and adopted the following arrangement

Car Number	Description
95 – 2903	Factory produced MGBGTV8s
3000 – 3999	MGBGTV8 conversions
4000 – 4999	MGBV8 Roadster conversions
5000 – 5999	Costello MGBGTV8s
6000 – 6999	Costello MGBV8 Roadsters

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Series continues in Volume 15 which will be expanded as contributions come in from V8 Register members and from useful tips posted on the V8 Bulletin Board on the V8 Website.

Detailed Index

A detailed **Index** is also available on the V8 Website and copies can be downloaded **free of charge** so you can keep your copy of the V8 Workshop Notes series up to date.

Insurance disclosure reminder

Members of the V8 Register and/or readers of these workshop notes are reminded that modifications to the original specification of their vehicle by way of changes of equipment, specification of equipment or components, design of equipment or components or the assembly of any components forming part of their vehicle may be deemed a "modification of the vehicle" by an insurer and require disclosure at the inception, during the term and

upon any renewal of motor insurance cover for your the vehicle.

The duty of disclosure is fundamental to contracts of insurance (insurances are contracts of the “utmost good faith”) and at all times the insured should make full and accurate disclosure to the insurer of any and all material matters having a bearing on the insurer’s assessment of the risk and decision as to the terms for covering such risk. When reading each of the workshop notes in this volume and the rest of the V8 Workshop Notes series, you should consider the content of the note in the light of your duty to disclose any modifications made to your vehicle to your insurer. Where necessary a full and accurate disclosure should be made. If you have any doubt with regard to the need for disclosure of any matter, you should consult your broker and/or insurer in order to clarify the position. The Caution and Disclaimer on page 4 of this volume shall also apply.

Report of the Don Hayter Talk 2002

Many V8 enthusiasts have mused over the years as to how the addition of V8 power transformed the MGB – but “how did they get it so right?”. Well the **talk on the development of the MGBGTV8 by Don Hayter** at Sandford-on-Thames at the end of February 2002 was a magical afternoon with many insights into the issues and concerns that faced the team designing and developing the V8 powered MGBGT.

The late Geoff Allen, the V8 Historian from the start of the V8 Register in 1978 and a member of the Rectifications Department at the MG Factory for over 27 years, provided his recollections of the V8 during Don’s talk. The question and answer session that followed was fascinating. A twenty page report on the event, with substantial transcribed sections and photos, has been produced by Victor Smith and a copy is included on the current V8NOTES memory stick.

MGBGTV8 Factory Colours

Chart showing the colours used during the production run of the MGBGTV8 model at Abingdon and the evolution of colours in the various production periods.

Up to 1973	1973 to 1975	1975 to 1976
Glacier White	Glacier White	Glacier White
Damask Red	Damask Red	Damask Red
Black	Black	Black
Flame Red	Blaze	Flamenco Red
Bronze Yellow	Bracken	Sandglow
Limeflower	Harvest Gold	
	Teal Blue	Tahiti Blue
	Citron	Chartreuse
Green Mallard	Tundra	Brooklands Green
Black Tulip	Aconite	
	Mirage	
Police White		Arun White (2902 only)
	Jubilee Colours (BRG with a gold flash)	

© **Geoff Allen** *(Teal Blue 2101)*
V8 Register Historian (1978 – 2006)
Sadly Geoff Allen died in June 2006

Useful MGBGTV8 references

Driver's Handbook (MGBGTV8) **AKD8423**

Workshop manual
Workshop Manual MGB **AKD3259**
MGBGTV8 Supplement **AKD8468**
(do make sure you have the **Issue 2 updates**)

Parts Catalogue **AKM0039**
(an invaluable friend)

Moss Europe also supply their parts catalogues for the MGB and a supplement for the MGBGTV8:
MGB/MGBGT parts catalogue **MGL003**
MGBGTV8 Parts Supplement **MGL001B**
They can be ordered from Moss by email on catalogues@moss-europe.co.uk or by telephone on 0800 281182.

Information on SU carburettors
Two A4 sized booklets were produced by SU.
Tuning SU HIF Carburettors **AUC 9940**
AKD 7521
Understanding how the HIF works **AUC 9939A**
AKD 7902

Engine, gearbox & overdrive
Technical notes issued to mechanics attending courses at the Factory prior to the launch of the MGBGTV8 in 1973. Copies of a BL Heritage approved reprint of these notes are available from the V8 Register.
Reconditioning specialists, see the V8 Website listing at www.v8register.net/subpages/v8gearbox.htm

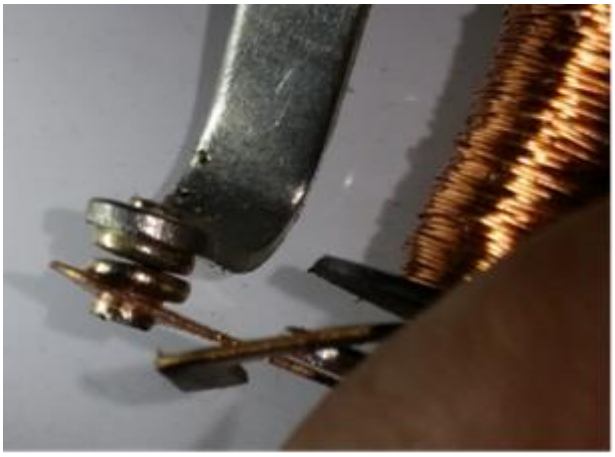
Students Technical Notes for the MGBGTV8 **AKD 5188**

Reunion with a Rover Motor
A useful article published in Car Mechanics in January 1980.

Alternator
Comprehensive Service Manual on AC Delco alternators (diode rectified AC generators) was published by AC Delco Europe (part number **071-200 12-74** which supersedes D462 10-73). This manual has good colour photographs and has fault finding flow charts.

Editor of the V8 Workshop Notes series

Victor Smith



500

Fault with the starter 6RA relay

The familiar bright alloy case of a 6RA relay on the offside inner wing of an MGBGTV8 greets you every time you go into the engine bay. The 6RA forward of the fuse box controls the twin cooling fans and the other on the bulkhead side controls the engagement of the starter motor. In both cases the 6RA relay is managing the switching on and off of a high current device with a signal from a switch on a low current circuit – so in effect the 6RA is **relaying the signal** from the low current circuit into an action on a high current circuit. (Feb 16)

Recently Steve Newton replaced the 6RA relay for the starter motor as part of the refurbishment of an MGBGTV8 owned by a longstanding V8 Register member, John Gay. Within a day or so a fault developed where having turned on the ignition key to engage the starter motor to fire up the engine, the starter would not stop turning once the engine was running. Usually once the engine fires up the starter motor automatically stops

and disengages, but with John's V8 even turning the ignition off left the starter motor turning! The only way to stop this was to tap the alloy case of the 6RA to free the contacts or to break the power supply to the starter motor from the batteries. With John's car he has a battery isolator switch so that was a readily available option.

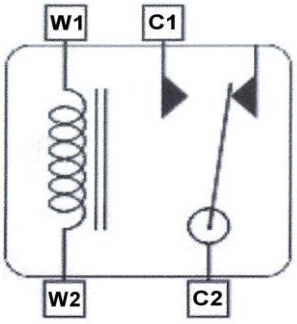
Steve replaced the 6RA but the problem was repeated a few days later. So he opened up both 6RA relays to investigate what was going on and causing this problem. What he found was sadly not unusual with many replacement parts in the classic car spares market today – poor quality parts often imported from Far Eastern suppliers and manufacturers.

On examining the faulty 6RA relay Steve found the contacts in the switch came together under the magnetic force of the coil in the relay but did so at an angle and not parallel to each other as they should, so there was a reduced area of surface contact between the contacts. With the large current drawn by the starter motor, the result was a fusing in one spot with the limited area of surface contact between the fixed and flexing contacts. This could only be broken by tapping the 6RA case to free the contacts. Steve also detected a lack of sufficient spring tension on the sprung blade (the lower of the two contacts in the photo above).

Where a 6RA relay is used in less demanding roles, for example with the twin cooling fans, the surface fusing problem above is far less likely to arise. So a serious operational fault will not develop although we have seen a case of a "burn out" with a 6RA relay used for the twin cooling fans.

How does a 6RA relay work?

A relay is just a remote control switch, but it can have many variants. The first is a single pole switch that, depending on which terminals are connected to which contacts, is Normally open or Normally closed when the electromagnet is not energised when no current is passing through the coil (W1 – W2, see the diagram below).



In the case of a 6RA relay **C2** and **C1** are Normally Open. When the coil in the relay (we will refer to the electromagnet as simply the coil for brevity) is energised by passing a current between terminals **W1** and **W2**, it produces a magnetic field which draws a sprung, iron armature towards the iron core (see below). In doing so a contact at the end of the armature (**C2** terminal) makes a connection with a fixed contact, the **C1** terminal. So then **C2** and **C1** which were open are now closed and, for example, the cooling fans will run.

Why were 6RA relays used?

As with many other cars of the period, MGBGTV8s used Lucas 6RA relays to control the power supply to various electrical ancillaries, specifically those that draw larger currents like the starter motor and twin cooling fans fitted to V8s. The benefit of using a relay, an electrically operated switch, is it allows a high current circuit (for example the circuit supplying power to the twin fans) to be controlled by an isolated, low current circuit (the circuit with the switch). This enables all the wiring handling the highest currents to be located within the engine bay but controlled by low current wiring routed from a switch. With the twin fans the switch is the Otter thermostat switch in the engine bay but in cases where the switch is near the dashboard, removing the high current wiring from the dashboard area reduces the potential fire hazard and also allows a lighter grade of wiring to be used.

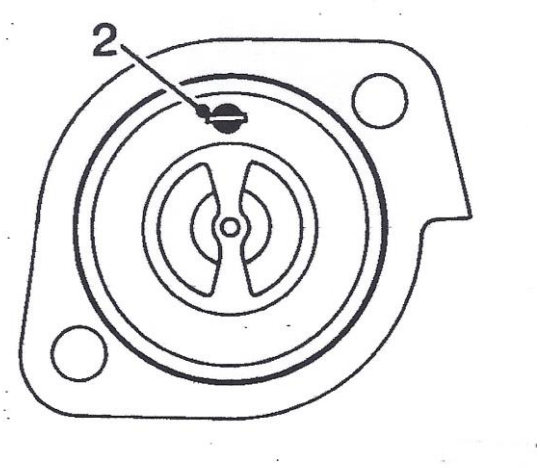
501

Checking your replacement thermostat has a vent

In a V8BB posting Dave Morris sought clarification on whether the thermostat is vented.

Dave Morris asked “does anyone know if the thermostat on an RV8 should be drilled or undrilled? I ask because I decided to replace mine while renewing the cooling system hoses using silicon hose kit from Clive Wheatley mg8parts which I am very happy with. I ordered a new GTS104 thermostat from one of the usual suppliers and found when it arrived it was undrilled. The old one (I don't know if it is original but doubt it) was the drilled type with the little bobble valve. I have tried to look at the spec for the GTS104 and can find both types so now I am not sure which is correct or best”.

Looking at the service repair section (Cooling system: Repair, page 3) of the RV8 Repair Manual AKM7153ENG the procedure for replacing the thermostat is set out. The illustration in the workshop manual shows the thermostat mounted horizontally and a note specifically says “fit the thermostat to the housing with the vent pin (2) in the 12 o’clock position – caution, failure to position the thermostat correctly can lead to air locks and overheating”.



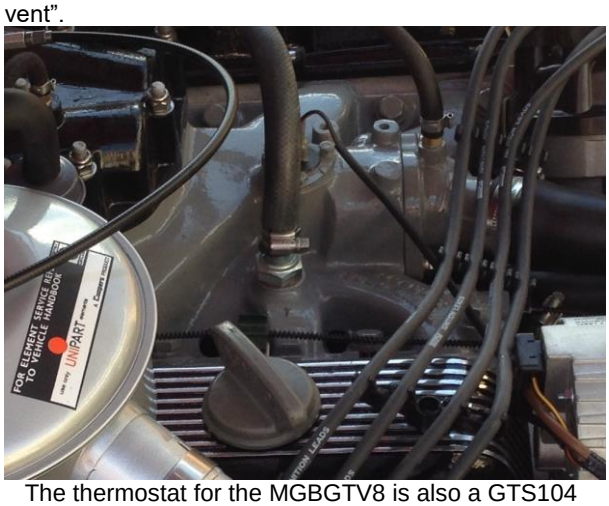
Dave Morris later added he had “spoken with Brown & Gammons and they said the thermostat does need to be drilled. So I will indeed drill it accordingly, but I wonder why the drilled type isn't specified as it was on my old XJR?”

So it is clear the thermostat originally fitted to the RV8 model had a vent pin (2) and it is important that it is located correctly in the thermostat housing.

Nic Houslip says “the Rover parts manual for the RV8 lists the thermostat as **GTS104**, so we are sure that is the correct part. I think that a caution for members is to check for the presence of the vent pin, bleed valve, bobble pin or whatever it is called, and to reject any thermostat supplied that does not have one. A quick survey of the leading parts suppliers shows four offer a GTS104 with no vent and three suppliers offer a GTS104 with a vent – they are B&G, Clive Wheatley mgv8parts and Moss Europe. There is also a very wide variation in price, from as little as £2.40 to over £6.00.

Dave Morris added “Yesterday I went to my local motor factor and looked at their stock of thermostats. What I found was that all of their 82C stats, including those listed as a GTS104 equivalent, were unvented. Conversely their 88C thermostats, listed for 3.9 Discoveries & Range Rovers, were vented. Not a very scientific survey I know but what I think it means is that we need to take care when buying replacements from non-specialist suppliers using the MG or Unipart part numbers”.

Nic Houslip added “the small drilled hole is a bleed hole, primarily to allow a small amount of heated water to go past the thermostat and ensure that the wax bulb gets heated and allow the thermostat to open, it also allows any air trapped [which may also prevent the bulb getting heated] The bobble valve allows a reverse flow of water during cooling down when the thermostat may be closed. You need to check carefully the replacement part has a vent”.



The thermostat for the MGBGTV8 is also a GTS104 with the vent in the 12 o’clock position.

502

How does a 6RA relay work?

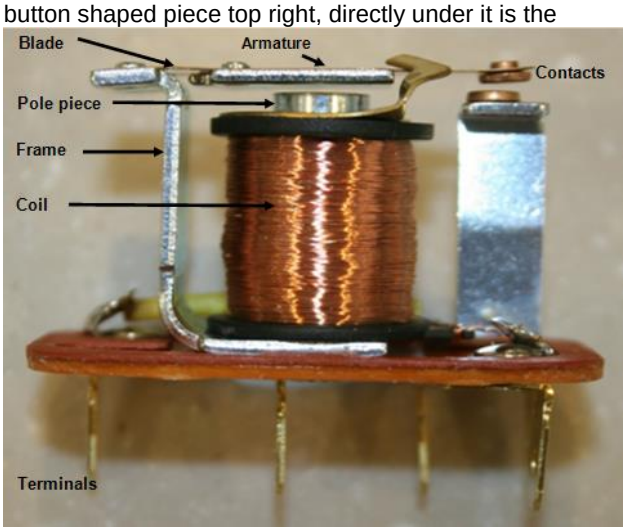
When reading workshop notes or V8 Bulletin Board threads mentioning technical terms or particular replacement parts, many members may welcome information on how various components work. The 6RA relay fitted to the MGBGTV8 model is an example and here **Nic Houslip** explains how a 6RA relay works.

The 6RA designation is a generic one and more properly it should include information on the number of contacts so that you get the right part. To start with, let’s use the one we often see on the MGBGTV8, the **6RA with 4 terminals**. The 6RA relay below is a new one so I scraped away the silicon sealant that was applied to keep the canister watertight and bent the crimps slightly to allow the internal workings to be exposed. Highlighting the markings stamped into the Bakelite base with a small marker pen ensures that the legend **C1**, **C2**, **W1** and **W2** is now clear. Older 6RA relays may not have the silicon sealant, certainly original equipment would not have had sealant. With replacement 6RAs the sealant

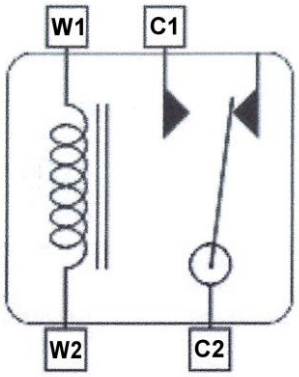
also obscures the terminal markings, so you may need good light and even a magnifying glass to see them.

Internal workings of a 6RA relay

If we now turn to the internal workings you can clearly see the **Coil** (or winding) in the centre of the photo. The coils are wound on an insulating former (the **Bobbin**) which is fitted over a soft iron **Pole piece**, the circular part protruding from the top of the Bobbin. Note too, the thick silver coloured iron frame that is fixed under the Coil and supports the **Armature** that is suspended above the Pole piece. The phosphor bronze spring that carries the armature, called the **Blade**, can be seen riveted to the frame and extends to the right to carry the **Contact**, the button shaped piece top right, directly under it is the

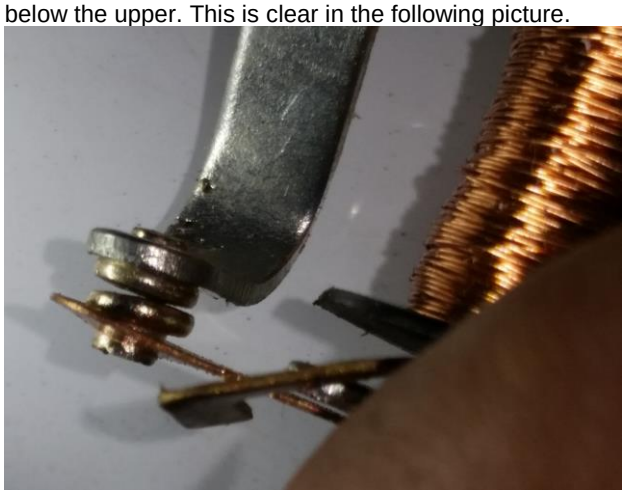


other Contact which is connected to Terminal C1 via the silver coloured metal strip.



The **Pole piece** is riveted through the base and is actually the connection for the Contact to Terminal **C2**. When current is passed through the **Coil** via Terminals **W1** and **W2**, a magnetic flux is set up in the Pole piece which flows through the air gap that you see just above the Pole piece and under the **Armature**, back to the Frame and thus back to the Pole. This flux causes a magnetic force that attracts the Armature, closing the air gap and moving the upper **Contact** downwards toward the **other Contact**, thus making the electrical circuit. Soft Iron is the material of choice as it has little remanence, or lack of residual magnetism, which means the magnetic field collapses quickly when the current through the Coil stops and the Armature is no longer attracted.

Now the circuit is made, current will flow from Terminal **C2** via the frame, the riveted spring Blade to the upper and then the lower Contact and out via Terminal **C1** which is riveted to the metal strip that supports the lower Contact. This metal strip has another function that isn't immediately obvious, during final test after assembly the strip, which you will notice has a kink, is tweaked by the test operator to position the lower contact immediately below the upper. This is clear in the following picture.



The Contacts might seem to the layman to be simply a couple of buttons made of a material that conducts electricity well, but most of the development effort in relays in the last 100 years has been in this area. The choice of metal used depends on the duty the relay is required to perform, there are myriad choices and the manufacturer will have taken into account the operating environment, vibrations, life time cycles and many other factors such as pressure and speed of operation. The Contacts are arranged so that they do not appear to align very well, but this is deliberate, because as they come together the springy Blade bends a little and the Contacts move axially allowing them to "wipe" against each other, giving a slight cleaning action. Too much wipe introduces wear, so this has to be carefully controlled. The spring also exerts a force on the Contacts that keeps them together. A certain pressure is necessary to ensure low contact resistance.

The **top view of the 6RA relay workings** reveals a curious piece of bent brass that protrudes over the top of the Armature. Despite its crude construction, this is a very critical part of the relay and should not be bent or moved at all. Its function is to limit the size of the air gap between the Armature and Pole piece so that when the Coil is energized the Armature is instantly attracted. If the gap is too large the Armature may not pull in, too small and the contact separation may be too little.

Contact separation is also important when switching an inductive load, such as a motor or a solenoid, there is a voltage generated in the windings of a motor that is in opposition to the normal and depending on the magnetic properties of the iron and the assembly may be many times higher than the humble 12 volts being switched. Too little separation can allow this voltage (or back emf as it is known) to cause arcing that pits the contacts and erodes them. In more serious cases it could actually cause arcing which may weld them together.

An important consideration too is the **vibration that the relay** will experience in its daily life. If the relay is subject to shock loads caused for example by pot holes in the road it isn't difficult to understand that the force on the Armature may be sufficient to cause the Contacts to momentarily separate. Usually the manufacturer will have determined the correct orientation for the relay mounting. With a 6RA, bolting it to the bulkhead is probably the best possible location, although under a heavy bump and rebound there may be a slight axial displacement of the Contacts and momentarily loss of electrical contact.

Substituting a modern relay
For this reason, it probably isn't a good idea to use substitute relays that are not designed for automotive use. They may work well in a stationary switchboard and handle huge currents, particularly AC, very well, but they will be unreliable when trying to switch the DC load of say, two cooling fans on a V8. They will also not be rated for the type and frequencies of vibration and temperature range experienced in automotive use.

The resistance between any two Contacts is usually measured in milliohms (thousandths of an ohm) which is not actually very easy to do without laboratory equipment, but a little thought and some simple arithmetic will show the effect of an increase in contact resistance. If the Contact was originally 10 milliohms (0.01 Ohms) the heat generated when a current of 20 amps was flowing would be 0.01 Ohms x 20 Amperes = **0.2 Watts**. This amount of heat is pretty easy to dissipate to the air around the contacts and is of little or no concern. Now imagine that the spring blade is getting old, the contact force is reduced and the contacts are misaligned and making contact only on a small contact area. The contact resistance may have increased to 100 milliohms (0.1 Ohm) then the calculation is very different; 0.1 Ohms x 20 amperes = **2 Watts**. This amount of heat isn't so easy to dissipate and will cause deterioration in the contact force and increase the resistance, leading to an early failure.

Corrosion is a source of 6RA failure

The 6RA relay is prone to another curious failure mode; the construction of the relay is riveted and depending on the skill of the operator and the set-up of the press to do it, there may be a small resistance between the various parts, particularly at the rivets to the Faston or Lucar blades. Over time the penetration of moisture can result in corrosion setting in – the environment in the engine bay is a very nasty place, so there must be airflow, but when it's raining cats and dogs on the M1 a lot of water gets in there. What happens here is unexpected, the increase in resistance causes the blades and rivet to heat up and after some cycles the material of the rivet will lose its clamping force and resistance will increase, causing further heating. This becomes self-destroying as eventually the terminals will get quite hot, the heat is transferred to the Faston connector and this too will lose its temper and contribute, by lessened holding force, to further heating and leading to eventual burning of the Bakelite base and a failure just when you need the fans most.

Burnt out C1 terminal on a 6RA

The best recommendation here is to replace the 6RA relay and at the same time replace the crimped on Faston connections on the wires if you have any doubt about their holding force. If they pull off and go back on easily they may have softened, so replacement is a must.

Finally, when assembling the whole thing a quick spray of WD40 on the contacts blades makes them much easier to reconnect and will keep moisture away from the contact interfaces leading to long life.

Fitting a modern relay in a 6RA case

Steve Newton and I have been investigating if it is possible to shoehorn a modern cube relay into the 6RA case, but this appears to be impossible as the shape of the modern relay is just too large to fit inside the 6RA case snugly. For owners of cars for whom originality is paramount we suggest that the fans should be controlled by a modern relay mounted in a hidden location (or at least out of sight) and the original 6RA relay left on the bulkhead with wiring intact, but disconnected. We will continue to investigate this modern relay upgrade idea and if and when more compact relays become available details of the conversion will be released.

Testing a 6RA relay

While searching in my garage for a cube relay to investigate the possibility of fitting it inside the 6RA case, I came across a small device that I bought from Maplin a year or so ago that may be interesting. It is called the Automotive Relay Tester and good value at only £9.99. The test it performs is quite simple, it switches a small load across the contacts ten times in succession and measures the contact resistance every time. Repeatability, i.e. if the tester reads a similar resistance on each of the 10 cycles, it will give an indication that the relay is healthy, if there are any failures [i.e. one or more cycles result in higher contact resistance] then it assumes the relay is faulty. This is a quick and easy way to decide if the relay is at fault or not, unfortunately it doesn't test under high load, but I am considering if it might be possible to modify it with some extension wires to test a 6RA relay.

503

Steering wheel centre colour

Timothy Southall posted a note on the V8 Bulletin Board seeking information on the colour of the horn push in the centre of the steering wheel on his MGBGTV8. The replies were useful. (Mar 16)


Horn push on an earlier MGBGTV8


Horn push on a Jubilee MGBGTV8

Timothy Southall said “I just wondered if anyone has a good photo of the steering wheel centre on a 75 MGBGTV8 showing the “gold” colour because the previous owner of my car re-painted it in a lovely shade of yellow. I am trying to find a photo which shows the original colour”. Timothy believes all V8s built in 1975 should have gold “V8” badges on the nearside wing and tailgate and a gold centre horn push in the steering wheel.

John van den Boorn responded saying “not all 75 built cars were “Jubilee” cars”.

Keith Belcher sent Timothy a photo of a Jubilee horn push so he could find a colour match. Timothy responded “the closest colour to the original I have found is Rover Primula Yellow and comparing the result with Keith’s photo it is almost identical”.

Judge for yourself as Timothy has sent in a photo of his freshly painted horn push - it seems to be a reasonably close match.

504

Wrapping or coating exhaust manifolds

A note on the V8 Bulletin Board from Barry West sought the views of fellow members on covering his RV8 manifolds with an insulating wrap as he wondered whether it was worthwhile. The thread provided a range of views some based on useful practical experience. (Mar 16)

Barry West understood “the main benefit of wrapping was reduced underbonnet temperatures coupled with faster exhaust gases and hence lower temperatures on the intake side with slightly increased performance. On the negative side, moisture retention in the wrap can cause cracking by generating differing rates of cooling where it’s thicker in some places than others, causing distortion and then cracking”. He was also concerned whether increased exhaust temperatures would cause difficulties for catalysts on RV8 models. With a number of products on the market Barry wondered if anyone could recommend any particular option.

Geoff King with a V8 Roadster mentioned he “wrapped his manifolds when he built his car some 15 years ago. The manifolds were supplied by MGBHive and manufactured by Guaranteed Exhaust Systems in Devon. They are 304 stainless steel and exit through the inner wings. He has never run the car without the wrap so does not know if it has made a difference or not. The wrap he used is intended for a gas turbine exhaust duct and seems to have stood up to the V8 heat without any difficulty. As far as he can tell the exhaust is still in good shape, but he is not going to unwrap it to check! If or when it starts to leak then he will buy another one – and wrap that too.

The only down side he could see is if, when the car has been parked in the rain, water soaks into the wrap and evaporates off as steam through the bonnet louvres when the engine is started but that is not something that would

bother him. On this point Geoff noted “my car gets used in sub-zero temperatures and above 40°C”.

Mike Haughton said “my RV8 manifolds are wrapped, as is the manifold on my MGC. The C definitely runs a little better, I think mainly because the carburettor bowls are right over the manifold so benefit from the reduced heat. The wrapping on my RV8 was done before I bought it so I cannot comment on that aspect”.

Another RV8 and MGC owner, **Peter Ferguson**, added “the C has a stainless steel manifold that I ceramic coated and a measure of its effectiveness is I can touch the manifold after a run but do not try this yourself for fear of burning your finger! I would be interested to know what the temperature of a wrapped manifold might be in the same situation on an MGC?”

Gavin Brown has had many years of experience in using ceramic coated parts. He has used the two main types available:

High temperature coating – used for turbo exhaust housings and turbo exhaust manifolds where the surface temperature can exceed 1300 degrees Celsius.

Exhaust system coatings – used for applications within the temperatures of -190°C to + 700°C. Both types of applications have a number of benefits:

1. Reduced under bonnet temperatures.
2. Improved gas velocity when the coating is applied inside of the pipe.
3. Prevents the metal from oxidisation and rust.
4. Is impervious to coolant, oil and brake fluid.

Gavin reports that he found a noticeable improvement in the coolant temperature reading of a forced induction car he once owned, and after 10 plus years of use on his RV8’s headers, he reports that the ceramic coating is lasting extremely well, has not flaked or chipped off and is holding its colour/appearance very well. Gavin added the use of an exhaust wrap is not recommended by any exhaust manufacturer and multiple web page searches shows that whilst it is a cheap option at reducing temperatures, it comes at a cost due to the damage it can inflict on the pipes. Further to this it is rather unsightly to look at, especially once it starts to get dirty.

In Australia Gavin recommends High Performance Coatings in Leongatha or Ceramic Coatings in Tasmania Gavin recommends “go ceramic, it’s the best and does make a noticeable difference”.

Barry West reported on a call he had made to Zircotec seeking information on their procedure for ceramic coating exhausts and the cost to coat manifolds as a cure for heat build-up under the bonnet. For ceramic coating an RV8 eight cylinder tubular manifold in their “Primary Black” range their estimated price is £479 excluding freight and VAT, so probably around £595. He was pleasantly surprised that current MG Car Club members would get a 20% reduction reducing the total to around £480.

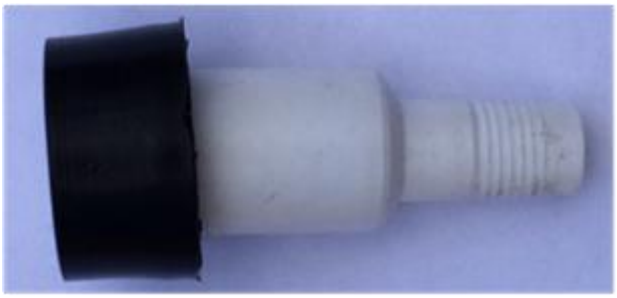
Alan Reeling posted a caution saying he felt “wrapping was not a good idea on cast manifolds (standard on Factory MGBGTV8s) as they are far less malleable than stainless steel, plus cast manifolds are not of a uniform thickness which can cause variable expansion and contraction rates and more internal stresses on the casting.

Philp Gent had his MGBGTV8 tubular manifolds ceramic coated by Zirotec and paid £355 including VAT with a discount.

505

Thread compatibility with replacement back axle breathers

Following Derek Squires highlighting a useful check worth making on RV8s to ensure the original plastic back axle breather has not broken or vanished, an alternative breather was identified by several members – a Land Rover part no. 515485 – and generally regarded as a far better quality replacement part. The key concern is whether the thread on the brass breather is compatible with the thread on the recess on the top of the back axle. This topic has a wider interest as plastic back axle breathers were fitted as original equipment on MGBs and MGBGTV8s. This note aims to clarify some of the compatibility concerns. (May 16)



Why is a breather needed on the back axle?

As the components within the back axle are in use and are subjected to the working loads as the vehicle is driven on roads, they together with the lubricants and air within the back axle heat up. In a sealed space that will generate pressure which needs to be released to avoid leakage around seals. The breather unit allows heated air to vent out with an outlet which impedes the ingress of water when the axles are on wet roads or in the case of

Land Rovers where they are off-road in conditions where the axles may be under water.

What thread does the breather have?
In his V8 Bulletin Board posting **Jonathan Buckley** mentioned how he had been "disappointed with the poor quality of the plastic replacement part **ZKC5726** and the "equivalent" MGB part **21H6060**" and was convinced that it would soon go the way of the previous breather tube fitted to his car so "he looked around for a better quality metal breather tube that would hopefully fit the same hole and thread". He found that the "Land Rover Defender and Range Rover use a similar rear axle breather (**515845**), but of better quality in brass and incorporating a ball-type non-return valve to exclude water and dirt. These breather valves are widely available from Land Rover dealers and on a well-known auction site generally for less than £5. Jonathan helpfully provided good quality photos of both the replacement plastic breather and the Land Rover brass unit.

In a subsequent posting on the V8BB **Stuart McGuigan** noted the "thread on the back axle breather is not 3/8UNF – at least as far as my RV8 is concerned" - and that the "the LR part **515485** readily available in the replacement parts market has a 1/8 BSP parallel thread. So they are not strictly compatible, however they will screw straight into the back axle thread and with a good sealant (Loctite HVV or Permatex 51D) on the threads, the seal should be adequate for the modest duty seen in this location. It should be tightened firmly but not over-tightened as the thread engagement is limited and the brass quite soft – though a good deal stronger than the horrible plastic original!"

Nic Houslip agrees that "the thread in the axle is definitely a threaded 1/8" BSP with 28 TPI and not 3/8 UNF. A 3/8" UNF thread is 24 TPI and a slightly smaller overall diameter". George Wilder and Chris Allan have confirmed with Rik Mooy that the axle supplied by GKN Salisbury for RV8s would have been threaded 1/8" BSP in line with British motor industry engineering practice of using BSP on all pipe-like connections. He adds "it's hard to check what the thread pitch is as the dimensions are so small; a 1/8" BSP thread would have a distance of 0.0358" between pitches and a 3/8 UNF would have a distance of 0.0417 between pitches. The difference being 0.0059" or a tad under 6 thousandths of an inch, which is difficult to see with the naked eye".

Looking at the replacement plastic breather in the photo above does suggest the thread is slightly tapered. **Stuart McGuigan** noted he had "measured the thread in the tube in the top of the back axle as best I could, having removed the remains of the nylon breather, and found it to be **1/8BSPT - the T meaning taper**. One would expect to find a taper thread in this location as there is no flange or spot face on the axle for the breather to seat onto, so the seal should be made at the taper thread - as it is on the axle drain and level plugs, for example."

The original plastic breather thread is not tapered due to the moulding process but is intended to be a taper thread to mate with the tapered thread in the hole in the top of the back axle and to obviate the need for a spot face on the axle and a seating flange on the breather. Thus, the **1/8 BSP parallel thread on the LR brass breather is not strictly compatible with the 1/8 BSPT taper thread in the axle**, but I feel it will be satisfactory in practice, if the breather is fitted with a suitable sealant". He added "I would not recommend using a fibre washer under the brass breather, as the surface of the axle tube is curved, so that the washer would only contact properly along the axis of the tube. Nor would I recommend using a copper anti-seize compound on the thread, as it may cause the thread to loosen".

Nic Houslip commented his personal choice would be "the brass part that Land Rover use although the plastic breather, whilst not so robust, does have the advantage of being non corrodible. If members want a brass one then the Land Rover part **515485** is a more solid part, but for the very few who might want authenticity then the **21H6060** is a very close match".

Can I fit a Land Rover brass breather without the need to modify the thread?
The simple answer is the readily available Land Rover part no **515485** can be fitted as a replacement back axle breather with **no modification**. The quality of several replacement plastic breathers has been reported by several members as "poor" and the likelihood of plastic breathers suffering damage or breaking off in service is high. With replacement brass breathers from £3.75 plus P&P the choice is clear.

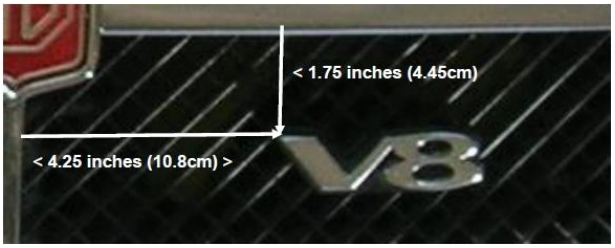
See also V8NOTE498.

506

Location of the V8 badge on the chrome bumper grille
Peter Spurrs posted a query on the V8 Bulletin Board seeking clarification of where the V8 badge is located on the plastic mesh forming the grille on the chrome bumper MGBGTV8. (May 16)

Peter Spurrs said "the V8 badge fell off the nearside of the car when I was washing it. V8NOTE253 shows exactly where it is supposed to go, so I re-sited it and its oblong companion. The tailgate badge is OK, but the grill badge is clearly in the wrong place being almost behind the overrider. Looking at the photos on various websites, there seems to be two choices: in the middle of the nearside panel and halfway between the MG badge and the overrider. Any ideas on how they came out of the Factory?

Victor Smith responded saying "the measurements on my grille are:
Horizontal measurement to the top edge of the "V" of the V8 badge measured from the nearside edge of the



vertical extension below the badge housing is **4.25 inches** (10.8cm)

Vertical measurement from the underside of the grille case to the top LH edge of the "V" of the V8 badge is **1.75 inches** (4.45cm).

I also attach a section of the front cover photo of Autocar on 16th August 1973 and a photo of the grille of an MGBGTV8 at that time".

507

Replacing the HIF6 floats

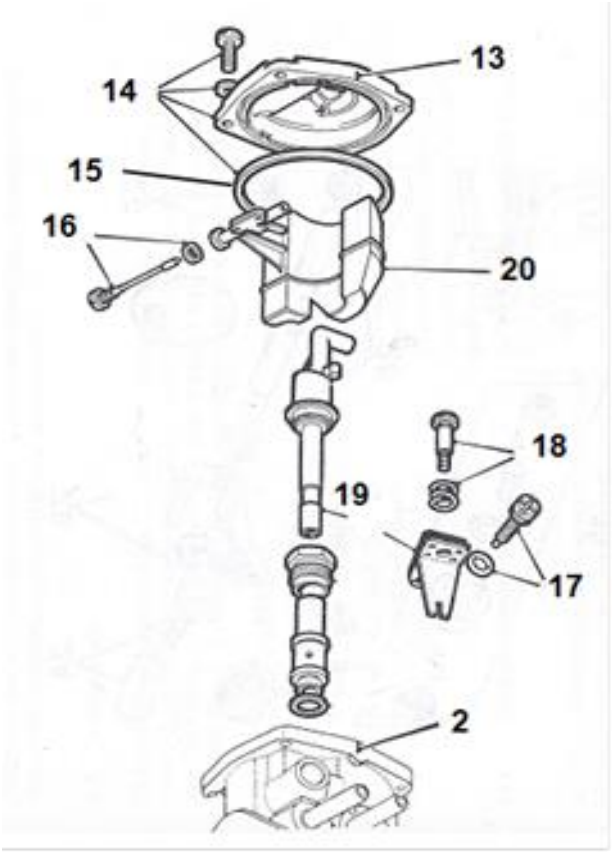
Victor Smith found on starting up his MGBGTV8 that petrol was running from the overflow hose which is routed to discharge below the car. It was traced to the float in the nearside HIF6 carburettor that had leaked so it was partially full of fuel. Here he describes replacing the floats with a new pair from Burlen. (May 16)

Two new floats were ordered from Burlen (who took over the SU business) and provide replacement parts for SU fuel systems and carburettor rebuild services. The float repair kit GSU206 for an HIF6 comes with replacement gaskets and a replacement seal (rubber ring) at the bottom of the carburettor - seal float GSU552.

Replacing the HIF6 floats was relatively straightforward

Remove the air cleaners (**1**), remove the overflow fuel hose from the side of each carburettor (**2**), remove the fuel supply hose from the nearside carburettor (**3**) which comes from the fuel supply filter nearby, remove the hose from both flame traps (**4**) on both sides of the engine which push on to connectors on each carburettor, remove the two bolts on the choke cable clamp on the front of the airbox (**5**) and the clip (**6**) on the offside of the airbox holding the choke cable, remove the two bolts (with grommets and spacers) at the back of the airbox (**7**), remove the two short bolts through the lower carburettor body (**8**) to the airbox (they have both a head you can get a spanner on and a groove for a screwdriver), then lift the airbox (**9**) away from the carburettors. As you lift the airbox the engine breather filter (**10**) will disconnect from the rubber hose below but remain in the clip.

Next remove the six nuts on the threads (**11**) clamping the adapter assembly (known at the MG Plant in Abingdon as the "pair of trousers" from its appearance) above the inlet manifold and then lift the adapter (**12**) clear of the studs.



At this point and before further progress, place a piece of kitchen paper or clean rag in each of the two large openings in the exposed face of the inlet manifold to avoid any unwanted material falling into the inlet manifold.

As the two carburettors are attached to the adapter assembly, you can turn the adapter over so the underside of each HIF6 is ready for the removal of the bottom cover plate (**13**). Mark the cover plate and body of the carburettor to ensure the correct reassembly. Unscrew the four retaining screws (**14**) on each cover plate and remove the cover plate with the rubber sealing ring (**15**). You will now see the float which is held in position by a float pivot spindle (**16**).

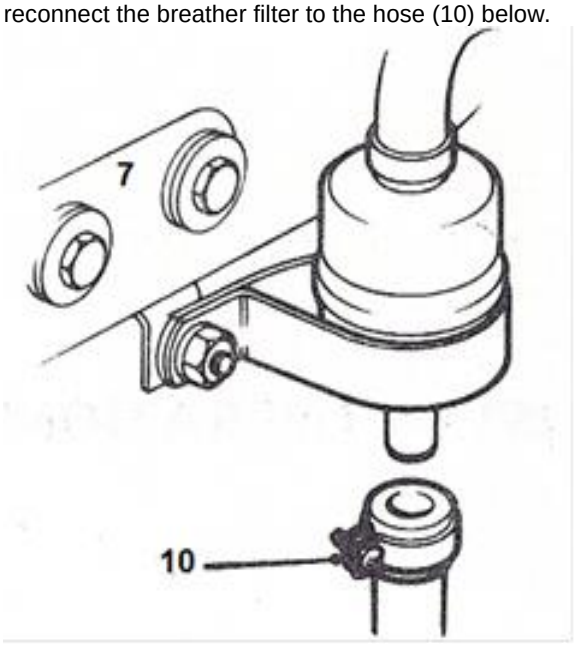
Remove the jet adjusting screw complete with the "O" ring (**17**) and then the jet adjusting lever retaining screw with spring (**18**). Withdraw the jet (**19**). Remove the float pivot spindle (**16**) and fibre washer and then lift out the float (**20**). Replace the float with the new float supplied by Burlen.

Reassembly is essentially the process above reversed with a few points to note

First you will see there is no gasket between the lower inlet manifold and the adapter assembly above, but there will be traces of sealant with a bluish colour. Nic Houslip suggests using a thin layer of Hylomar, a blue coloured sealant that never goes hard, between the surfaces on

reassembly. He adds “that when you buy it make sure you get the original one, not the silicone replacement - and get a tube, avoid the aerosol as it's inconvenient”. The MGBGTV8 Workshop Manual Supplement AKD8468 shows the induction manifold on Sheet 2 30.15.02 and on page 06-1 the torque setting on the induction manifold bolts as **28 lbf ft (1.80kgf m)**.

The second point is it is a tight squeeze reaching in between the back of the airbox and the heater box to reconnect the breather filter to the hose (10) below.



508

MG grille badge on a Factory MGBGTV8

A V8 Bulletin Board thread discussed the colour of the MG badge grille badge on a chrome bumper MGBGTV8 – was the Factory standard a read MG badge with a red background or a black MG badge with a red background? (May 16)

Following posting news of a black chrome bumper MGBGTV8 advertised for sale by a trader in Sussex on the Pricewatch webpage which included an observation that a “**non-standard MG grille badge fitted**”, Michael O’Leary contacted the V8 webmaster saying “I noted the comment about the non-standard MG grille badge at the end of the above advert featured in the Pricewatch item. From this advert and its previous private advert, the car has a red octagon on a black background. It is also a 1975 car which probably means it was actually manufactured in 1974. I’ve owned several 1974 Factory V8s, two of which were unrestored cars and both had this type of grille badge. I’m aware that this type of badge (MG octagon on a black background) is normally associated with a 60’s slat type grille and that V8 publicity photos suggest the badge should have a red background. Of course the grilles may have been changed but both seemed original and were quite pitted. Furthermore when I asked a previous owner about the grille badge he was adamant it had not been changed in his 38 year ownership. Therefore it’s possible this style of badge may have been used on 1974 cars”.

Robert Rose commented “interestingly when Quentin Willson drove HOH 920L on the Classic Car show it also displayed a black background to the red MG emblem? The car that Quentin drove was a former Press Car featuring in various magazines. I do not know if the badge background was black then? He promptly posted “apologies, although H0H 920L was a press car it was HOH 933L that appeared in some of the road test articles. This car clearly displays the standard background . . . . red”.

Victor Smith responded “I have noted that some of the pre-production Factory MGBGTV8s did have the "black MG grille badge" but once production was underway the "red MG badge" has been the one seen on most original cars. Michael O'Leary's note was interesting as his checks seem to suggest that at least one of his V8s did have a "black MG grille badge" from new. A check with the production records shows his car is car number 0965 was built in November 1973.

Martin Ashby noted “my 1974 MGBGTV8 – Bracken 1346 - is four cars before the black MGBGTV8 featured in the Pricewatch article. Mine has an original alloy grille with a red badge background”.

Victor Smith responded “the production records indicate **Bracken 1346** was built in February 1974 and mine, Harvest Gold 1089, in December 1973. The Black MGBGTV8 was originally **Citron 1350** with a respray in 1984”.

Michael O’Leary’s 1974 MGBGTV8 Bracken 0965 is the lower photo above.

Victor Smith did some research of the early pre-production press cars saying “I have just looked back at the clip of Quentin Willson driving the MGBGTV8 where

he exclaims at one point "ding dong", which I think is his way of saying the car was good. I have tracked down a couple of screengrabs from the episode that featured the MGBGTV8. It's clear from those photos that the MGBGTV8 in that film did have a "black MG grille badge" but it **was an early pre-production car**, HOH 920 L.

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V8 sump gaskets

A thread on the V8 Bulletin Board in May 2016 discussed the suitability of several sump gaskets for the RV8. One contributor, Tony Lake, mentioned how a problem with the pressed steel sump is the light steel section used. He noted “the V8 sump is one of the best candidates I’ve seen for leakage, along with the valley cover”. He then mentioned he had some sketches of the stiffening pieces he had made to overcome the problem and solve the leaks. (Jul 16)

Tony Lake’s contribution to the thread was “one of the problems with the pressed steel sump is the light steel section used to facilitate a relatively deep draw. Although the flange is rolled over it is not very stiff so clamping load midway between bolt holes drops pretty much to zero, so it is not surprising that leaks occur.

I built another 3.5 engine for my Factory MGBGTV8 five years ago. A local machinist made up some **longitudinal stiffening pieces to fit inside the sump flange**, just like the stiffening piece that fits at the rear of the sump. I used 0.25"x .56" mild steel strip. That allows 0.25" longer bolts to be fitted which provides more stretch for the same torque and gives a bit more margin to deal with the different rates of expansion of steel and aluminium.

I used the **fibre gasket**; the design with a hard insert is superior because it provides controlled compression on the gasket material around the bolt holes, but I fear that with the same weak flange leakage is still a risk. Now 20,000 miles on and the sump is still as dry as is the front oil seal but the rear seal is now leaking - woe is me.

Gasket designers don't usually specify sealant to make their products work. I'm **not sure they look at flange stiffness in sufficient detail to ensure leakage really is a thing of the past**. Fuji film is a pressure sensitive paper that visually displays load distribution on a flange between mounting bolt holes - quite clever. The result looks like a badly printed Banda copy; remember them? A poor design has good solid colour at the bolt holes fading to nothing at the mid-point. Fuji film fits at the stiffest surface under the gasket, in this case the block, and quickly confirms why joints leak.

The V8 sump is one of the best candidates I've seen for leakage, along with the valley cover. If anybody is interested I've got a sketch of the stiffening pieces I had made, all the dimensions are good old simple imperial fractions.

Copies of two sketches – a short stiffening piece and a long stiffening piece are available via the links below.

Peter Gorton added “may I suggest you obtain the rubber version of the sump gasket and try again. Reteach Direct in Henley can supply it, I think the part number is. RD2087A.

Geoff King noted “the supplier and part number for the rubber type of sump gasket Peter mentions is correct. See the Race Direct website. I hope the Jaguar service workshop (used by Peter Gorton in Germany) didn’t use sealant on a gasket; if they did the chances are sooner or later it will leak. As I mentioned when this was discussed on the V8BB last October 2015, all that is required is the smallest amount of an **anaerobic sealant**, such as Loctite 518, the mechanic can apply where the vertical front cover joins the horizontal sump and crankcase face.

Oil leaks from the sump leak are generally caused by distortion of the pressed steel sump and/or overtightening of the bolts. When a leak occurs the natural reaction is to tighten the bolts, this distorts the sump further and tends to increase the leak. The solution is to remove the sump and clean any sealant off and correct any distortion of the joint face before reassembly with a gasket or sealant – but not both. A Range Rover 3.5/3.9 gasket will fit the RV8; it’s the same engine of course.

See large copies of each sketch - short stiffening piece and a long stiffening piece and also a copy of this note as an article.

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Solving an alternator problem

Nic Houslip enjoys track days and sprints with his RV8 and V8 Roadster and here relates a tale of how a problem developed with his alternator on the RV8 at a sprint. Nick’s article provides useful information on solving the problem for fellow members. (Jul 16)

Whilst competing in a Sprint at Cur borough last Sunday I noticed after my first run that the ignition warning light remained on when the ignition was switched off. At first I thought it was a few errant rays of sunshine but shielding the lamp showed that it really was on. When I started the engine the light did not go out. Before we get into the detail, I should mention that the ignition warning light is actually a “not charging” warning light for the alternator. This light has a rather curious multifunction that it is worth understanding. Yes, it does show when you’ve switched the ignition on, but its proper function is to warn that the alternator is no longer charging, perhaps because of a fan belt breakage, but hidden behind that is a function little understood by most people, but very clear to electrical engineers.

Any electrical generating machine uses a combination of copper conductors moving in magnetic fields to generate electricity. To create a magnetic field one needs a current to flow in a coil, usually known as the **field coil** (in dynamo speak) or the **armature** (in alternator speak) The filament of the ignition warning light feeds a tiny current from the ignition switch into the alternator via the warning light terminal to “excite” it and make it start to generate electricity. When it is generating enough to charge the battery the voltage on this terminal rises to match the voltage at the ignition switch and the light goes out.

Now in my case I was interested to know why the light was on, and therefore draining the battery, when the ignition was off. When I returned from having my cup of tea and bacon sandwich, an important prerequisite of all motor sport events, I discovered that the battery voltage was rather low on the voltmeter when I came to start the engine for my second run. Aha, a clue, there must be

current draining into the alternator. As it was time to go on track I did not get a chance to check further.

But all was not to be as it should have been, undaunted I gave it some beans and was going really well until I spun out under heavy braking just before I got to the sharp right hander which popped the left rear tyre off the rim. Deciding that discretion was the better part of valour, I had another cup of tea, got the tyre back on and packed up to drive the RV8 home, followed by a friend in a car just in case.

On the way home the alternator started to charge, I could see the voltmeter steadily rising to its normal on charge reading of around 14V. How odd. So having got home early enough to watch the F1 men at Silverstone slipping and sliding all over the track at speeds I can only dream about, and with a nail-biting finish, eventually I got my RV8 wiring diagrams out and after some study decided that **the problem was most likely the failure of a diode in the diode pack** whose function is to change the alternating current that the alternator produces into direct current that the battery likes and needs. This failure probably caused the regulator to fail simultaneously.

So having removed the alternator, a few simple tests with a mustimeter confirmed this was the case. A quick web search showed me that there was a firm in Redditch near where I live who said they were able to repair alternators. This was interesting, their website actually says they are able to give you not just a replacement, but repair the original fitment. A little over 3 hours later I picked up my repaired alternator, cleaned and fitted with a brand new outboard end needle roller bearing - the drive end ball bearing was OK to re-use - a new electronic regulator and a new set of diodes. The charge was a reasonable £65.00 plus VAT, making a total of £78.00. Somewhat less than a replacement alternator.

When you get the alternator out it should look like this . .

. . . and the location it came from looks like this. The cradle bolts to the RH cylinder head and supports the alternator by two bolts.

Changing an alternator is well within the capability of a competent DIY mechanic. It is detailed in the RV8 workshop manual but if you don't have one here is how.

- **First remove the battery negative lead** or turn off the isolator switch if the car is fitted with one (as mine is) to avoid big sparks under the bonnet.
- **Remove the radiator cowl**. This is large plastic bit that directs air through the radiator rather than around it and which frequently cracks with age. You will note that mine has a line of Frankenstein stitches of stainless steel locking wire on the left side from the driver's seat and also a strip of aluminium pop riveted to the front edge for strength. I did this about six years ago, but I will eventually change it for a nice carbon fibre replacement from Clive Wheatley.
- **Remove the electrical connections**, noting which goes where, not too difficult as there should only be two and they are different sizes.
- **Now remove the bolt that secures the alternator** to the metal strip that allows you to adjust belt tension, remove the belt and then remove the two other fixings below the alternator that holds it to the cradle. Take care, the alternator is quite heavy and you can pinch your fingers if you let it drop from its mountings.

Please be very careful when removing the nuts bolts and washers, noting where they came from so that you can put them back in their right positions. This is IMPORTANT. If you do not put the washers back where they belong the belt pulleys might not be aligned correctly and lots of trouble will ensue that will cost, you a great deal of money to rectify.

Replacing the alternator is just a reverse of the removal, again the workshop manual is a great help and for only a small investment you get a document containing a wealth of useful knowledge and information about your car. See details of the **RV8 Repair Manual** **AKM7153ENG**.

The **parts that were replaced on the alternator** are shown in the picture alongside, the large aluminium ribbed part with three bolts is the regulator. This supplies a small current, proportional to the charge current required, to the armature and according to the battery voltage thus regulating the charge. The diodes are contained inside the body just under the two slots and the needle roller bearing is under the central circular cap.

Once everything is back in place, the belt tension adjusted correctly and the electrical connections made and tight, reconnect the battery and start the engine. The warning light should go out and the battery voltage should increase to around 14 volts indicating correct alternator function.

Warning, do not be tempted to start the engine before you refit the radiator shroud. It has an important, but not so obvious function - it locates the radiator in its correct position using the two large rubber grommets and the two pins on the radiator. If the shroud is not in place, the water pump spindle will rub on the radiator fan housing! If you happen to lose these rubber grommets, or they are perished they are available from your local Land Rover dealer. The RV8 radiator seems to be much like the Land Rover Defender radiator and the rubber grommets are identical!

One last bit of not very useful information. There is a **third terminal marked W**. Do not connect anything to this, it is marked W for winding and is an alternating voltage that was used in some cars particularly diesels to feed to the rev counter. As the alternator rotates, the alternating voltage it produces changes its frequency with the speed it rotates at, so it is possible to derive a reasonable accurate engine speed signal with the correct rev counter.

I must give a credit to the company that repaired my alternator. **Auto Electrics (Redditch) Ltd**, 241

Birmingham Road, Enfield, Redditch, B97 6EH. See their website.

Auto Electrics identified my alternator as a Magnetic Morelli A127-65 part which is as listed in the workshop manual. Magnetic Morelli is the Italian company who bought out the Lucas alternator factory some years back. Auto Electrics can repair almost all alternators and keep stocks of most parts so that work can be carried out quickly and economically.

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Advance or retard the spark?

Go forward or go back? That is an interesting question and when investigated it turns out that it isn't at all what you thought it might be. Nic Houslip, who prepares his RV8 and V8 Roadster for use in sprints and hill climbs, explains what's involved. (Jul 16)

Those of us old enough will remember that cars often had a manual advance and retard lever or control, often on the steering column, in the place now occupied by the airbag on modern cars. Starting of these old cars was by cranking the engine by hand and the lever were put to the retarded spark position to prevent the engine "kicking back" as you turned the crank handled. What occurred when it did if the spark was too early was that the spark occurred before the engine reached Top Dead Centre [TDC] and this pushed the piston back down the bore with some force and the crank handle would move violently back against the hand. This is one of the reasons why you should always crank with the thumb on the same side as the fingers. Retarding the spark ensured that if, and this wasn't always a given, the engine fired it, would occur after TDC and the piston was then pushed down the bore in the correct direction, usually with the result that the engine started and continued to run.

With the engine running it was prudent not to keep the lever in the retarded position as the engine was not only poorly performing but would also overheat very quickly, moving the lever to give a little advance would give more power. From this it will be obvious that some form of automatic control would be a good idea and the centrifugal advance mechanism, A.K.A. Bob Weights in the distributor came into our lives. As the engine speed increases the centrifugal force on the weights causes them to move outwards and via a system of levers and restraining springs, move the contact breaker cam in the direction of rotation of the distributor spindle making the spark occur a little earlier; leading to smoother running and better fuel economy. The condition of the bob weights, any slack in the pivots that retain them and the springs are critical to the smooth running of the engine. The spring rates are selected for the application, i.e. that particular engine and do age with time, heat and stress.

If you have driven an old car with manual advance and retard you will find that the engine can stand a little more advance when running lightly, as it would be on a level road, but as the road begins to slope upwards and the load increases the amount of advance needs to be reduced to, and especially as the engine speed starts to fall and the onset of the dreaded "pinking" occurs. Pinking, or pre-ignition, is not dissimilar to what happens when trying to start the engine with too much advance. The spark is occurring before TDC, but because the engine is heavily loaded, the mixture ignites and develops pressure, but the piston hasn't quite reached TDC and the resultant explosion of the mixture cannot push the piston down the wrong way. This is dangerous as it subjects the piston, connecting rod and bearings to shock loads they were not designed for and also creates very high temperatures in the combustion chamber that can, and often does, burn a hole through the piston crown.

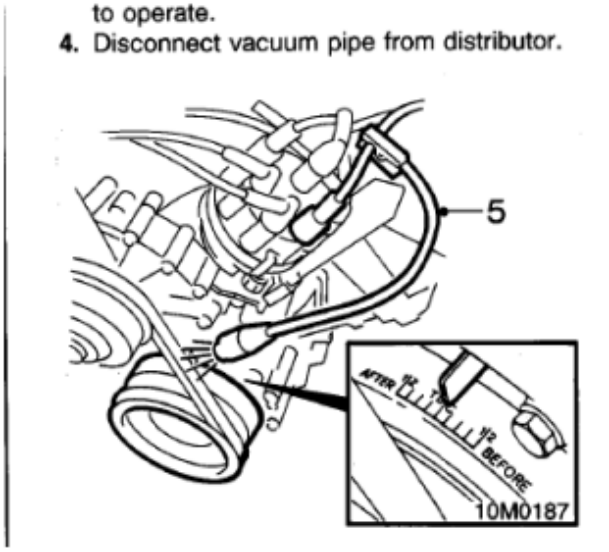
What is needed is a way of changing the advance in unison with the centrifugal method that is load sensitive. Fortunately, there is a **very good indicator of load in an engine, manifold pressure or lack of it**, dependent on engine speed and throttle position. If you imagine the throttle is almost closed, as in cruising on a level road, then the suction of the intake strokes mean that the manifold pressure is very much lower than atmospheric pressure and the diaphragm in the advance and retard device responds to this by moving the plate that the contact breaker points are fixed to in the opposite direction to the distributor spindle, thus advancing the spark. If the throttle is now opened, for example as the car begins to climb a hill, the manifold pressure rises towards atmospheric pressure and the diaphragm then moves the contact breaker plate in the same direction as the distributor spindle, thus reducing the amount of advance.

But let's think about why the engine needs the spark to advance as it speeds up. Is there is some mysterious process in the combustion chamber that requires this? Indeed, the correct amount of advance for any engine is usually determined empirically, that is by observation on a road test or better on a dynamometer, to determine which setting of the distributor, bob weight sizes, spring force and how much or little the diaphragm moves the contact breaker plate is correct. But don't worry, this is all taken care of during the development of the engine and as long as each engine of that design comes off the production line exactly the same, the makers can fit the distributor with all the variables already built in.

IGNITION TIMING

Check and Adjust

1. Connect stroboscopic light and tachometer, ensuring that stroboscopic lead is connected to No. 1 plug h.t. lead.
2. Clean timing marks on crankshaft pulley. Marks each side of TDC are ± 3° tolerance.
3. Start and run engine until normal temperature is achieved; cooling fan starts to operate.
4. Disconnect vacuum pipe from distributor.



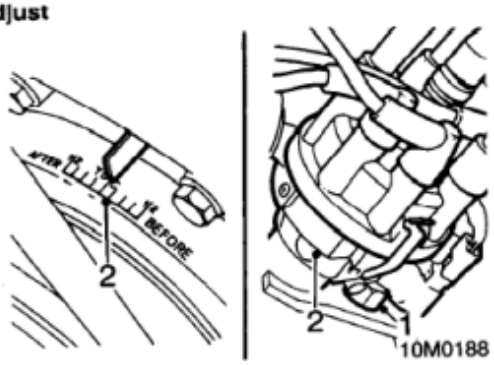
But why does it need to advance? If you think about the piston rising up on the compression stroke at a low

speed, let's say 500 RPM, a fairly typical idle speed, you can see that the piston will take a certain amount of time to move from when the spark occurs to the point where the flame propagation throughout the compressed mixture has completed and the gas pressure is exerted on the piston. Now imagine that he engine is running at 5000 RPM, or 10 times as fast. Then we can see that the piston will have moved from the spark position much further and the piston will be on its downward stroke before the flame propagation has completed. It turns out that the rate of flame propagation doesn't change much with engine speed; meaning that much of the explosive force is wasted as the piston is moving down as the gas pressure is rising. Advancing the spark's position ensures that the mixture begins to burn much earlier so by the time the flame propagation is complete the piston will be in the optimum position as the gas pressure rises to take advantage of it.

Checking the timing is best accomplished with a stroboscopic timing light. The timing of a distributor with a contact breaker can be set statically (engine off) by adjusting the distributor housing until the points just open. It is not possible to set or measure the timing dynamically (engine running) without the use of a strobe

5. Check timing using stroboscopic light: At 800 rev/min max. with vacuum disconnected = 5° ± 1° B.T.D.C.

Adjust



1. Slacken distributor clamp nut.
2. Carefully rotate distributor body to achieve correct timing. Rotate clockwise to advance or anti – clockwise to retard.
3. Tighten distributor clamp nut to correct torque and recheck timing.
4. Connect vacuum pipe.
5. Switch off engine, disconnect tachometer and stroboscopic light.

Alongside is the Ignition Timing maintenance routine from the RV8 Repair Manual AKM7153ENG

light. This handy device uses a flash tube rather like that in a camera flash that is triggered by the spark via an inductive pickup around the lead to the plug usually on number one cylinder. Aiming the strobe light at the fan belt pulley on the end of the crankshaft it should illuminate the timing mark. As the engine speed is increased you can see the mark move forward or backward around the pulley. Increasing the speed slowly you will see the mark advance as the bob weights do their work, and as the throttle is released the advance will increase as the vacuum in the manifold pulls the diaphragm in, but as engine speed falls the advance will back off.

Wandering advance, where the mark doesn't stay in the same place, is usually caused by wear in the distributor spindle, and with contact breaker distributors the dwell time (the amount of time the coil has to charge between sparks) may be affected thereby causing poor running.

On all Rover V8s the instructions for fitting the distributor are VERY precise and must be followed to the letter to ensure that correct timing occurs. It requires that you follow a correct procedure - if you do not you risk poor performance and ultimately damage to the engine. **If you need to rotate the distributor body or reassign the leads, there is something wrong!**

A last point is to check the condition of the ignition leads, their correct positioning and the use of the correct plastic clips and brackets to hold the leads apart from each other and prevent contact with metal parts. Old leads deteriorate and are often a source of hard to trace misfires, the insulation has to withstand in excess of 35,000 Volts and the spark will take the path of least resistance. If there is a pin hole or a worn lead the spark will leak away to earth and the plug may not fire.

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Timing the V8 engine on an RV8 or MGBGTV8

Timing the V8 engine in the RV8 and MGBGTV8
Nic Houslip explains how to set the timing on an MGV8.
(Aug 16)

I will start from the point where the engine has been rebuilt, or perhaps has just had the distributor removed for repair or replacement. If you have just rebuilt the engine, now is the time to use the special tool to engage with oil pump shaft and using an electric drill rotate the oil pump to prime the system with oil. You did remember to pack the oil pump with Vaseline, didn't you? This will ensure that on first start up the engine will not be starved of oil. If the engine has been standing for a long time it may be worth priming like this anyway, but of course omitting the Vaseline packing stage.

The instructions for fitting the distributor are detailed and must be followed exactly. It is slightly tricky but if you; as my science master used to say "read, learn and inwardly digest", it is within the capability of competent DIYers. First let's look at the position that the oil pump drive must be set to.

You must be sure that you have obtained the correct TDC for No 1 cylinder, on the compression stroke as directed, because as there are two revolutions of the crankshaft for every power stroke there are two TDCs. If you remember the sequence, Suck, Squeeze, Bang and Blow, you can visual that the correct TDC for the spark is with BOTH inlet and exhaust valves closed.

If you are on the wrong TDC, one or both of the valves for that cylinder will be slightly open because the piston has just completed the exhaust [piston rising with exhaust valve closing] and about to descend on the intake stroke [piston falling with inlet valve opening].
Because there is valve overlap in this position you can see both rockers moving if you remove the rocker cover. It might be possible to see through the oil filler cap, but I wouldn't rely on that.

Now back to the workshop manual and follow the instructions for positioning the distributor shaft.

At this point an explanation is necessary to help you understand what happens. The gear on the end of the distributor shaft is of the helical type and as it slides into engagement with the gear on the camshaft it has to rotate slightly, as it does so the shaft moves downwards and the slot in the oil pump shaft aligns with the key on the end of the distributor shaft and the two mate together.

As the distributor slides home [hence the instruction earlier to fit a new O ring and lubricate it] you will see the rotor arm shaft move slightly as it engages the gear on the camshaft. If the distributor doesn't seat down to the collar it may be misaligned with oil pump drive. If it doesn't, DO NOT force it. Take it out and recheck positions of the parts.

Once you have the distributor seated correctly then: (see a copy of an extract from the RV8 Repair Manual – available on the illustrated article that comes with these notes or via the link.)

The installation, position and condition of the HT leads are important and should be routed as shown below. The plastic clips should all be in place, holding the wires away from metal contact and contact with each other. If you are missing any of these clips they are available as spares. There are slight variances between the various cars that use the Rover V8 so be careful if offered Land Rover or Range Rover parts. The HT leads are under considerable electric stress, the spark produced is in the region of 35,000 Volts and because of the way it is produced is what engineers call spiky and is difficult to keep it inside the wires. Misfires can be caused by wires touching each other and if the plug in the cylinder concerned is hard to spark the energy may jump to the easier path through another plug or to earth. If in doubt, invest in a new set of leads. As you have had the plugs out make sure they are gapped property and that the ceramic insulator is clean before putting them back. The plug leads slide most of the way down the insulator, the part that isn't covered needs to be clean to prevent leakage of the spark under wet conditions.

Setting the timing accurately

Now the timing needs to be set accurately, the best way is as described in the workshop manual for the RV8. Note that the manual doesn't give any figures other than the timing at 800 RPM with the vacuum pipe disconnected. This is deliberate since the amount of advance is determined initially by the bob weight and springs inside the distributor and then by the vacuum advance device which sense manifold pressure and adjusts the amount accordingly. These are only adjustable by changing the bob weights and springs and the advance diaphragm canister and this should not be under taken unless you have a dynamometer available to check your results. If all the various parts are to the correct specification and in good order, the static timing of 3 degrees BTDC will usually give you the correct figure of 5 degrees plus or minus 1 degree. This means that anywhere between 4 or 6 degrees is satisfactory.

The only way that the correct advance figure can be determined is on a dynamometer, when the operator will adjust the advance for maximum power, but if you have any doubts about this, have your distributor serviced by a specialist like the Distributor Doctor near Taunton in Somerset. It will come back with the correct specification as long as you tell them the car model details. If set to the correct static timing it will produce the correct figures at all RPM.

Some points to finish on

1. If you are working on a V8 that was from an older car (prior to the MGBGTV8's introduction), be aware that the gender of the oil pump drive and distributor drive key was changed. I cannot find a date for this. The oil pump drive and distributor key must match and mesh correctly. Check the manual for the donor car. The Rover workshop manuals are particularly good.
2. The distributor installation instructions for the MGBGTV8 are similar, but the numbers vary slightly. Best that you check the workshop manual for the car you have.
3. If working on a car with a non-electronic distributor do not confuse the Dwell angle with the timing angle. Both are in degrees, Dwell angle is a measure of how long the points are closed between each spark and this materially affects how much energy is stored in the coil. Too short a dwell angle can lead to poor sparks.

And lastly

If you do remove the rocker cover(s) please don't try to save cost by reusing the gasket(s) unless they have only recently been renewed. You will get oil leaks that run down the back of the engine and make it look like the main shaft oil seal may have failed. Clean all the mating surfaces and use a thin film of Hylomar Universal compound to hold the gasket in place in the rocker cover prior to fitting it.

See the fully illustrated article, which comes with your set of notes, which includes extracts from the RV8 Repair Manual.

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How to connect up a battery conditioner to an MGV8

During a call from an enthusiast who had just bought an RV8, he enquired whether a battery conditioner like an Accumate could be connected to the power socket in an MGV8 as a simple and convenient way of maintaining the battery condition and charge when the car is parked in a garage for a while. Nic Houslip provides a clarification. (Aug 16)

With the MGBGTV8 model it is very convenient to connect an Accumate to the power socket in the lower part of the radio console because the socket is permanently live and is able to cope with the low charging rate of the conditioner.

Similarly with the RV8 the power socket is live at all times (through Fuse 8 – see a copy of the wiring diagram) but note if you have, or a previous owner has, fitted a battery isolator switch, the socket is

probably not live when the battery isolator has turned off the battery. However on page 22 of the Owner's Handbook AKM7144 there is a note alongside the sketch of the socket noting the cigar lighter only operates with the starter switch at position "I" or "II"" but Nic has checked on his early RV8 and says the socket is live.

Both Accumate and CTEK, another leading battery conditioner brand, offer special plug leads with the necessary plug for connecting their conditioners to a cigar lighter or power socket and Halfords offer a fused 5 amp cigarette lighter plug and lead if you wish to make up your own connecting lead.

A reassuring feature of having a lead set up to run from the conditioner to the power socket, by passing over the top of a side window, is it provides a very visible reminder the conditioner is connected to the car before you drive out of the garage!

Accumate offer a **special plug lead** for connecting their conditioner to a lighter/power socket for £12.99 including VAT – see their webpage. Halfords supply a **CTEK** Cigarette Plug Adapter for £7.99.

How does an Accumate work?

The Accumate information webpage says "the operation of Accumate is completely automatic. It uses a 1.2A constant current charge as the main stage, while monitoring the battery voltage. When this reaches a pre-set cut off point, it then switches to an intermediate constant voltage 'float charge'. Only when Accumate has detected that the battery is properly charged will it switch to the final stage for correct long-term battery maintenance and indicate a green LED on the face of the device. If at any time Accumate detects that the battery has discharged, it will automatically revert to the constant current stage. Do not be fooled by other similar compact chargers of the same price range, which do not have the complex circuitry to safely charge batteries over long term periods". They mention the key features: it's a **versatile four step automatic charger** of all modern and classic 6 and 12V lead acid batteries up to 75Ah – filler cap types, absorbed acid "MF" for motorcycles, valve regulated (VRLA) and gel-electrolyte types.

They add it's easy to use, simply select 6 or 12V output according to the battery type and then connect to the battery, it has comprehensive and intelligent LED indicators showing AC power on, the battery voltage selected, a wrong polarity connection, when it is charging and a green LED when it is in maintain mode (charge completed and monitoring). There is no risk of overcharging.

Victor Smith said he has had reports from many members they have used an Accumate for years with an MGV8 or other classic cars and it has worked well. "In my case, each time I pass through the garage I can see the green monitoring light on the Accumate is on and occasionally an orange light indicating it has detected a need for a top up charge".

See a copy of the illustrated note on the V8 website.

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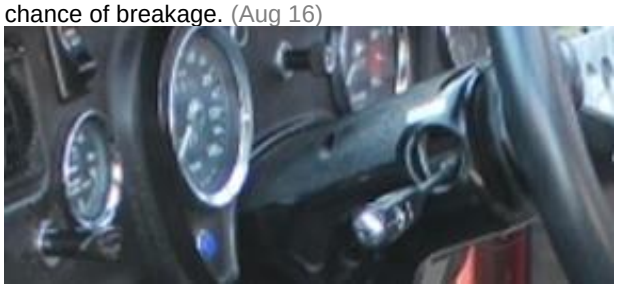
Stubborn stalks

The column mounted stalk controls on an MGB or a derivative are prone to stubborn and erratic smooth operation as they age. A tip Nic Houslip has found useful over the years is the application of WD-40 on a relatively infrequent basis (say twice annually) as it is beneficial to all switches in cars. As well as providing lubrication for moving parts it also displaces water from metallic surfaces and dries to a thin oily film that prevents corrosion from moisture in the air from condensation. Also the lubrication provided by WD-40 minimizes the forces involved in operating the stalk switch and any chance of breakage. (Aug 16)



515

How curved is the V8 tailgate badge?

The V8 badge fitted to the tailgate of both chrome and rubber bumpered MGBGTV8s is curved along the length of the badge - see overhead view alongside comparing the flat V8 badge fitted to the nearside wing to the slightly curved badge.

Flat V8 badge for the nearside wing (top) and slightly curved V8 badge for the tailgate (lower)

The badge is also very slightly curved from the top to bottom edge of the badge (not shown in the photos

alongside). This complex curving is necessary to fit the badge to the bottom lefthand side of the tailgate.
More photos

516

How to clean your V8 to almost concours standard

So you want to revive your V8's appearance from a dirty but sound car to somewhere nearer to a concours standard finish? Well it's not really that hard, honest, but it does take time and you will need to invest in the right cleaning/polishing/waxing products. You will need an initial outlay of around £160 although once you have them they will last the average V8 owner for many years. Howard Guiney explains. (Aug 16)

Below is my personal recommendations of what you'll need; they are all available at a discount from the Ultimate Finish company at
http://www.theultimatefinish.co.uk/
Meguiar's Hyper Wash - 3.78 Litres
UF Double-Sided Merino Wash Mitt
UF Ultra-Soft Microfibre Drying Towel
UF Microfibre Buffing Fleece (pack of ten)
Meguiar's Soft Foam Applicator Pad (two packs)
Bilt-Hamber Auto Clay – Soft
R222 Gloss Enhancing Paintwork Cleanser
R222 'Concours Look' Carnauba Wax
Meguiar's Perfect Clarity Glass Cleaner

A hose is a necessity and access to a pressure washer is helpful. The first time you "detail" your car will be the hardest and will take around two days to complete. Gather together everything you need and choose a day when it's dry maybe with a breeze but not too much sunshine. Start by removing your grille; when was the last time you cleaned behind it. It also helps to remove your mirrors, wiper arms and air intake grille.

The engine bay is probably the dirtiest part of your V8 so it's a good place to begin the cleaning process. With a cold engine cover your alternator and distributor with plastic bags and it's a good idea to remove the pedal box cover and water container to allow more access then using the Hyper wash diluted 25 to 1 spread it all over the engine bay and engine and around the oil cooler using a soft brush to work it into all the little crevices then rinse off with a hose, you may need to repeat some areas the first time around and just allow it to dry naturally whist you tackle the rest of the first stage cleaning.

If you have a pressure washer (if not use the hose) start by blasting inside the wheel arches and as much of the underside as possible not forgetting the cills, the hyper wash can always be used with the pressure washers soap dispenser. Then it's straight on to cleaning the bodywork using the hyper wash diluted 400 to 1; never use washing up liquid as it contains salt and always use a wash mitt not an old fashioned dirt trapping sponge. Always start at the top and work down rinsing with plenty of clean water before drying using a Microfibre Drying Towel, dry the wheels and engine bay last. Then let the car dry out overnight ready for the most satisfying part the next day!

The next morning use the tips of your fingers to run along the bodywork, it'll probably feel "gritty" like fine sand, if it does the you'll need to use the clay bar to remove all the contaminants, just follow the instructions and use lots of clean water, this really only needs doing every two years or so, on an MGB GT this should take around two hours to complete then you're ready to cleanse/polish using the R222, it essential to use a damp foam applicator and keep to straight strokes not circles and always do one panel at a time, concentrating on any tar or other marks, the cleanser will also remove most of the minor scratches and swirl marks, buff off with a Microfibre fleece. The R222 is very easy to use and leaves a lovely finish and should take less than an hour.

The final act is to use the R222 wax to protect the shine created by the polish; again only do one panel at a time and use a small amount of product; it really is shine on shine off...always use a clean Microfibre fleece and new foam pad (personally I always apply a 2nd coat of wax after a 24 hours) now stand back and admire your shiny car. . . well almost as you will need to decide if you are going to cleanse and wax the engine bay and around the oil cooler before replacing the grille etc.

After a well-earned cuppa it's on to the wheels. To do it properly they need to come off the car, especially for the normally unseen rear. Clean using the Hyper wash, dry and apply wax and you are done! Whilst the wheels are off you should always clean and check the wheel arch area and the suspension or if like me you'll even polish it all.

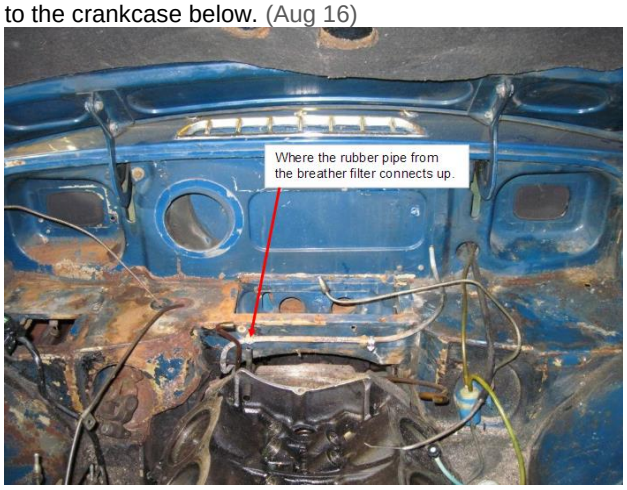
Don't forget to clean the glass and give the inside a good vacuum and if needed the seats should be cleaned using any quality shampoo or if leather then you can't beat Gliptone.

See a fully illustrated note online.

517

Breather filter connection to the crankcase

As a new V8 owner, Robert Rose sought help in clarifying where the lower section of the rubber pipe from the breather filter, located in that tight space between the back of the carburettor airbox and the bulkhead, connects to the crankcase below. (Aug 16)

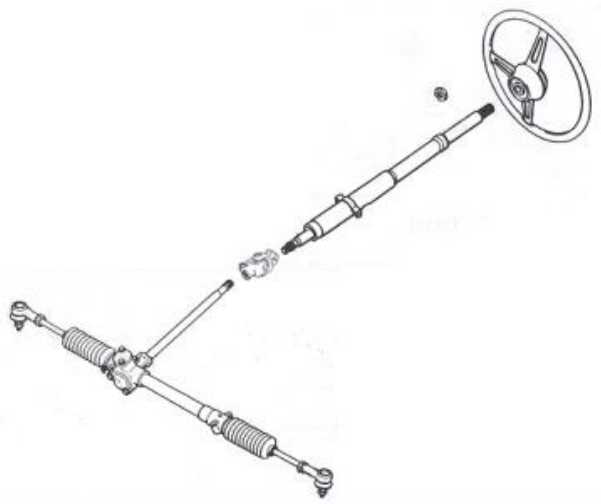


Mike Macartney provided a photo of a V8 during a rebuild which shows the location - it exits the crankcase valley at the back of the engine on the righthand side. It's highlighted in the photo alongside.

Alan Rennie clarified the part numbers of the filter too. See photos of the connection point indicated in the photo.

How does the crankcase ventilation system work on an MGBGTV8?
This topic came up earlier in a V8BB thread in September 2014 when **Geoff King** provided a concise explanation saying "the MGBGTV8 has a positive crankcase ventilation system; clean air is drawn into the rear of the crankcase through a small breather filter located behind the carburettor airbox and contaminated air in the crankcase is sucked out through the flame traps on each rocker cover and routed to the carburettors where it enters the engine and is burnt. Fumes should NOT be expelled from the rear of the crankcase especially at idle when (downstream of the throttle disc) the engine develops the greatest suction".
Breather and flame trap

Geoff King added "later versions of the Rover V8 engine, as fitted to the RV8 for instance, have a similar system. Clean air is drawn into the crankcase via a small filter at the rear of the left rocker cover; contaminated air is sucked out through a single flame trap at the front of the right rocker cover and is routed to the plenum chamber where it enters the engine to be burnt. Note this contaminated air enters the engine after the airflow meter so if the flow is too high the mixture will be weak because the electronics have already calculated how long the injectors are open based on the flow of air through the airflow meter. The flow of air is controlled by having a small hole in the rocker cover filter to restrict the flow".



518
Collapsible steering column
Mike Macartney has been rebuilding a rubber bumper V8 Roadster conversion and supplying a popular series of rebuild reports which have been released on the V8 website. In one of his reports he described the maintenance undertaken on the collapsible steering column. Here we expand on Mike's report with an illustrated note on the steering column and how the maintenance can be carried out. (Nov 16)

Collapsible steering columns
They were introduced to reduce the number of serious injuries caused by the impact of the steering column and steering wheel on the driver's body where their car was involved in a frontal impact collision. To improve driver safety innovative changes were made to steering columns so they collapse on frontal impact.

The collapsible steering column still has a long shaft connecting the steering wheel to the steering rack but the column has an inner and outer sleeve with a number of bearings contained between each sleeve. On impact, the sleeves will compress much like a telescope so the column will absorb the energy produced during impact by collapsing. On the MGBGTV8 and later MGB models a collapsible steering column was fitted as standard equipment during the construction of the car. Replacement parts catalogues list the parts for the MGBGTV8 as **BHH806** (chrome) and **BHH1596** (rubber). For the MGBGTV8 a universal joint (**AHH6000** – chrome and **575732** – rubber) was necessary. Below the universal joint is a solid section of the steering column which connects to the steering rack. This combination enables the steering column to pass the V8 engine and reach the steering rack.

Wear on the collapsible steering column
In his rebuild report, Mike Macartney says "it seems that all too often the collapsible steering column on MGBs wear out long before the rest of the car does, and when the rest of the car is refurbished or rebuilt, the steering column is ignored. Often it is because the Factory never offered any replacement parts, so when they wore out, you either had to find a replacement column or you just had to put up with the worn parts. The ball bearings used from the Factory on the lower bearing were cheaply made and of an odd size that is not readily available.

Another problem with these columns is the telescopic joint in the steering shaft. In order for the steering column to be able to collapse in the event of an accident, both the outer steering column housing and the inner shaft have to be able to collapse. The outer housing is perforated to provide for easy collapsing. The shaft is designed to telescope within itself upon a collision. The shaft itself is made of two pieces. One, the **outer tube** is basically a hollow tube with a modified socket to receive the inner shaft. The **inner shaft** is solid, and threaded and splined to attach the steering wheel at the top. At the lower end the inner shaft has two flats formed on the sides to match the outer tube. There are two recesses around the inner shaft in the area where it fits into the outer tube. At the Factory these recesses were filled with a **tough plastic** to act as friction material between the inner and outer shaft. Often, if someone disassembles the steering column, the plastic is broken into pieces and cannot be reinstalled.

The two parts of the inner collapsible steering that slide inside each other in the event of an accident with the broken bits of plastic that hold the column at the correct length. These I replaced with small screws to hold the two parts together.

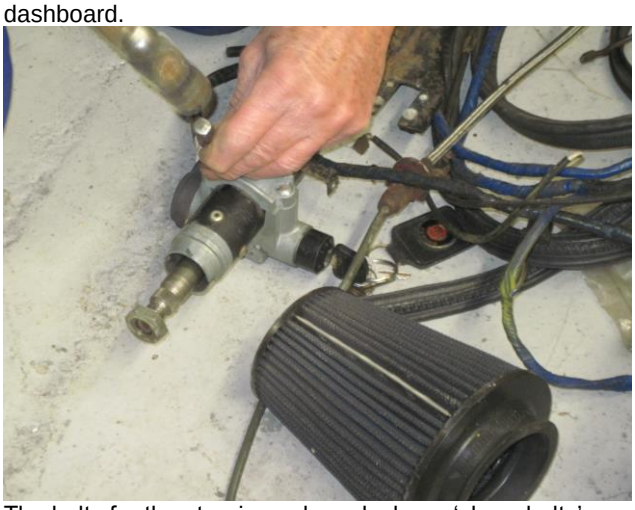
Examining a collapsible steering column

I was going to replace the bearings in the collapsible steering column. There is a ball race at top of the column and loose balls in a track at the bottom held in with a clip. A large spring and circlip hold the whole lot in place. There is also a circlip at the bottom of the top bearing to stop it moving. When I tried to purchase the bearings I found that you could only buy the late date rubber bumper MGB steering column complete, if there was any stock available! Undeterred, I decided to rebuild the steering column.

When I cleaned up and oiled the bearings they turned out to be useable with very little sign of wear. The main problem with the column was that the inside shaft was sliding up the outer shaft easily, which it shouldn't. It is meant to stay in place and only slide up when the crumple zone part of the outer steering column casing buckles up, in the case of a front end crash.

So some time ago I took the steering column apart to find out the problem.

This photo shows the crumple zone part of the steering column where my right hand is holding the column. The three aluminium 'bits' are the top bolts mountings for attaching the steering column to the bodyshell by the dashboard.



The bolts for the steering column lock are 'shear bolts'. When the steering column was fitted in the Factory, the spanner part of the bolt shears off, leaving no means to remove them. This is to slow down thieves. If you centre punch an indent in the dome that is left, then tap the centre punch anticlockwise you can usually manage to undo these two bolts. The column will then come apart and repairs can begin.

The part I am holding is the inner steering column that I need to repair.

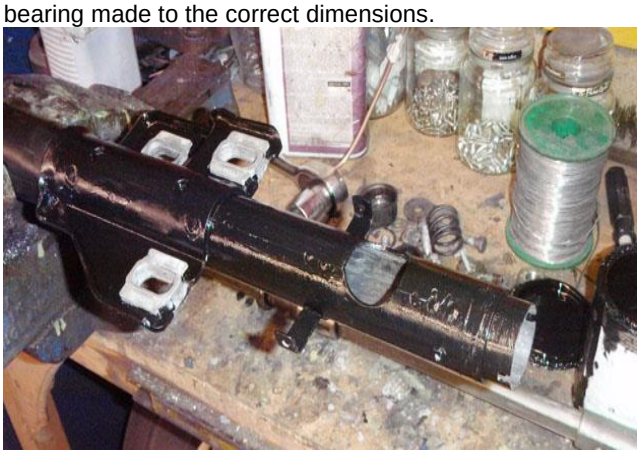
Unfortunately, I forgot to take photos before I repaired this part. Normally, there are some pins where I have installed the 4mm screws. They fit into some plastic inserts in the bit underneath the screws you can see in the photo. What I have done is tap the holes where the pins fitted and replaced them with screws. The column should then still collapse in an accident. The screws just press on the inner shaft and have stopped the inner shaft sliding about.

This is the bottom bearing with the balls inside the cage, held in with a clip. At the bottom of the outer part of the steering column is a rubber insulating pad, presumably to help stop vibration in the column?

This is the **spring that holds the centre steering column in place**. The circlip at the bottom looks as if I need to replace it. As it is not available from MG suppliers I will have to find a suitable circlip in my box of circlips of various sizes. Each side of the spring is a washer, or spacer.

The top bearing is held in place with another circlip. There seems to be two groves each side of the bearing. In the bits I took off, ages ago, there appears to be two circlips, but there is no way this second circlip will fit in the groove as the bearing covers it?

Over the bearing sits a rubber collar to take up the space, and make the bearing fit in the outer column. It looks like a bit of a British Leyland bodge to me, but I suppose it got them over the problem of having a special bearing made to the correct dimensions.



I don't know why, but I hand painted the outer steering column. My brush painting is not very good. At least with satin matt black the brush strokes don't show up as much as they do with gloss paint.

These are the parts that need to find a home back on the steering column.

Now the paint is dry on the outside of the steering column I can get to work trying to put it back together. Advice for others – It is much easier if you take bits apart and repair them there and then, rather taking them apart and leaving them for some period of time before you reassemble. In this photo above, you can see where the cut out is in the outer steering column and the slot in the inner shaft where the actual locking parts sits.

I wiped the bearing cover with Vaseline to help the bearing and its cover (spacer) to slide into its correct place inside the outer column.

Then appeared the first problem.

The inner shaft would not slide down the outer steering column. The M4 screws I had used had too larger heads on them.

Out came the grinder to grind off most of the head. This does not really matter as I was only using them to hold the inner shaft to the outer shaft. The problem will come if I didn't fix them in the correct place!

At last, I found out that you do need two circlips to hold the top bearing in place. The standard bearing that BL used was also not the correct size for the steering column shaft. You can see in this photo the 'O'-ring that they added to the shaft to stop the inner race of the ball race rotating on the shaft. Another BL bodge!

The bearing and spacer were pushed into the outer steering column at the top where the steering wheel goes and the circlip pushed down to sit in the second circlip groove.

The bearing, spring and circlip at the bottom of the steering column will hold the inner steering column shaft in its correct position.

Now came the next problem

How the hell am I going to push on this large spring and get the circlip to fit, all at the same time? Time for a cuppa and some thoughts. I think I will need some help with this.

This is a trick I have used in the past, wiring the spring in the fully compressed position. I put the spring in the vice to compress the spring and tied it up with wire. The problem was that the wire would not let the spring drop down over the inner shaft.

I got Jane to come and help me with the circlip. I held the spring back with a couple of screwdrivers whilst she tried to fit the clip in place. After about ten attempts I gave up that approach to the problem. The spring that BL used, back in the late 1970s, looks to me far stronger than it needed to be. Looking on the internet the other week I found a site in America saying that the problem with these steering columns is that the ball bearings at the bottom break up. This I think is probably due to the high pre load that the spring is imparting on the balls.

I went and had a look to see if I could find a weaker spring of the same diameter that I could use. No Joy, I had nothing like it. To decrease the load on the spring I decided to cut 1/8" off the bottom of the steering column with a Dremel cutting disc. I also put the spring on the linisher to make the end of the spring flatter so I could hold it in place better with the screwdrivers.

Then the bell rang. No, not seconds out, third and final round! It was Robert, of Saga Louts fame. He was an engineer so would prove useful in my hour of need.

The amount I had cut off the outer column was just enough for Robert to hold the spring in place, and for me to fit the circlip. Success at last.

Yes, I did fit the rubber and plate the wrong way round in my excitement of getting the column together at last. This was easily rectified without having to take the column apart again.

The next job was to bolt the steering lock back onto the other steering column. This photo shows clearly the 'shear bolt' holding the lock onto the steering column.

I have not tightened the steering lock fixing bolts to the shear point, just in case I need to take it apart again or the steering lock needs replacing in future.

It was easier fitting the steering column to the body with the shell upside down on the spit".

What is purpose of tough plastic as a friction material between the inner and outer shaft?

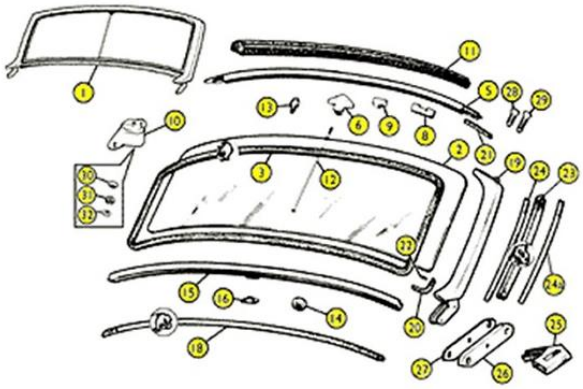
Nic Houslip notes that "when I dismantled the column in my 1978 shell V8 Roadster I faced the problems that Mike did and my repair followed the same route. I concluded that the **plastic filler** was probably injected under pressure into the spaces on assembly. Provided the pins or screws are thin enough I'm sure this will work satisfactorily, brass screws rather than steel would be a more suitable choice as they will shear more easily in the event of a crash. Nylon screws might be an even better solution if available as there is no axial load on the assembly in normal use.

Reason for the universal joint on the steering column

Because the pinion of the steering rack needs to be near enough to the centre of the car to allow the steering rack teeth to have sufficient movement to turn road wheels from lock to lock, but the designers ameliorated the problem by using a pinion with gear teeth cut at a slight angle rather than parallel to the axis of the steering column. The primary reason for the angled teeth is probably more connected with not needing it to pass through the engine block but also the life of the teeth as the sliding motion is spread over a larger tooth area, just one of those happy coincidences that make the compromises that are inevitable in design easy to work within. This however means that if you extrapolate the pinion shaft's path upwards it would probably enter the cabin and protrude through the instrument panel just to the right of the speedometer! Having the UJ enables the steering column to be mounted conveniently for the driver's seated position and to correct misalignment of the two shafts. It also provides a degree of protection since if the front of the car is extensively damaged and the cross member pushed back, the forces will not be transmitted directly up the steering column.

519
MGB Roadster windscreen quarterlight seal replacement

Mike Maude-Roxby explains.



The mystery screws that retain the seal are put in (or taken out) by making a small slit in the rubber seal. To put the new rubber in the channel - use washing up liquid or similar. There is a piece of aluminium - Part **24a** - that slides down inside the rubber and, as original, is secured by the two screws. Locate the holes with a pick or scribe and cut just a very small slit in the rubber and insert the screws. Not easy but it can be done - but first read on! I replaced mine and left the screws out. It hasn't moved in two years. The screws and retainer piece are intended to keep the seals from moving but I didn't want to cut or drill new seals.

Note: be careful when you cut your new seal to length as the bottom should seal onto the scuttle. I cut mine at a slight angle - and the top is more or less flush. It is easy to cut them too short so take your time! If any adjustment of the gap is required move the quarterlight to allow for a perfect fit. Mine needed no adjustment here. Parts **23** and **24** on the diagram alongside are relevant.

Link to Moss Motors helpful explanation.

520

Changing a speedometer when an RV8 is reimported from Japan

Japanese specification RV8s were exported to Japan with a speedometer incorporating an odometer, both calibrated in kilometres. Many RV8s have returned to the UK as reimports so what is the position with regard to the need for a speedometer change from kilometres to miles and retaining evidence of the mileage before that change so the owner of the vehicle can provide an indication of the total mileage when the car is subsequently offered for sale? Here Chris Hunt Cooke and Victor Smith set out what they believe are useful notes for RV8 enthusiasts together with information posted by fellow V8 Register members on a V8 Bulletin Board thread.

What is the legal position regarding speedometers in the UK?

Chris Hunt Cooke set out the requirements applying to a vehicle registered in the UK: the Road Vehicles (Construction and Use) Regulations 1986 LINK have the effect that an **RV8 must have a speedometer calibrated in both mph and kph**, so it is a legal requirement for a reimported Japanese spec car to have its speedo changed. “Having said that, it would not be an MOT failure and the chances of a kph speedometer ever coming to the attention of the police must be very slight. When I had my RV8 it never had the speedo changed and it never caused me any problem!

The straightforward way of dealing with the issue would be to **change the speedo head for one calibrated in both kph and mph**, but I think it would not be practical to keep the old speedo as both suppliers I have seen seem to deal only on an exchange basis. It is not much of a proof on mileage covered in any event”.

As a DIY solution, it would be possible I suppose for mph speeds to be neatly written on the glass of a kph speedo to comply with the law. It is an interesting question whether a satnav showing the road speed would meet the UK requirements, I am inclined to think that it would.

Those owners who would really like to keep everything in order could ‘clock’ the odometer of their replacement mph speedo forward to indicate in miles the distance recorded in kilometres on the original instrument calibrated in kilometres”.

Chris Hunt Cooke later added “Type approval regulations made in 1978, which would have applied to the RV8 when built in the early/mid 1990s, brought into force an EU commission directive LINK which specified dual marking in these terms:

4.2.2. In the case of a speedometer manufactured for sale in any Member State where imperial units of measurement are used, and where transitional arrangements in accordance with Article 5 are in force, the speedometer shall also be marked in mph (miles per hour); the graduations shall be of 1, 2, 5 or 10 mph. The values of the speed shall be indicated on the dial at intervals not exceeding 20 mph.

Who offer speedometer dial conversion services?

From postings on a V8BB thread, fellow members mentioned their experiences with various suppliers of replacement speedo dials or dial replacement services.

Prodash

While searching Chris Hunt Cooke did come across a very relevant item of interest - a **dial conversion kit for the RV8** LINK offered by Prodash in Somerset which might be an economic and convenient way of resolving the issue. That would leave the odometer reading in kilometres unless a re-calibration was done, but owners might be prepared to live with that and explain on selling the vehicle that it still had the original speedometer. An invoice for the conversion kit would provide some evidence.

Prodash offer two replacement speedo dial conversion services:

- **RV8 replacement kph/mph dial**

Their new speedometer dials are a direct replacement polycarbonate units as fitted by the manufacturer. The scaling and colours are very closely matched to ensure a factory look and the backlight is carefully managed for night illumination. Due to the complexity of a speedometer unit Prodash recommend they install dial conversion kits or that it is done by a trained technician to avoid damage to the delicate needle assembly.

Once the speedometer is damaged it usually means a replacement is necessary but they are able to repair some versions. The cost shown on the Prodash website for a replacement dial is £37.95 plus UK delivery of £2.45 plus VAT, indicating a total of **£48.48**.

Prodash confirmed they "do not provide fitting instructions and mentioned "the speedometer on the RV8 is not really designed to come apart, so in order to get into the speedometer unit you have to prise off the clamp ring. You also need to be very careful getting the needle off the shaft - we use special tools for these". However they do offer a dial conversion fitting service.

- **RV8 kph/mph speedo dial conversion fitting service**
  Prodash offer a kph/mph dial conversion service. If you send them your speedometer, they will then convert it for you and it send back ready for refitting to your car. Their price for that service is £145 plus VAT including return carriage, indicating a total **£174.00**.

See the Prodash website.

Lockwood International
This company was mentioned by Martin Cridford and appears to offer only a replacement dial supply service.

- **RV8 replacement kph/mph dial**
  On their website a replacement dial (Part No 8029) costs **£49.42** including UK delivery and VAT.

  Their link to a fitting guide says "throughout the world, many professionals in the automotive industry plus hundreds of thousands of ordinary car owners who have no technical training have fitted Lockwood replacement dials. They mention a step by step guide which they include with every dial kit they send out which they "feel sure you will find extremely helpful"!

  However Lockwood International's fitting guidelines include a caution: "No responsibility will be accepted by Lockwood International Ltd for any damage caused whilst, or as a result of, fitting these dials"!

- **RV8 kph/mph speedo dial conversion fitting service**
  A search of their website indicated a **dial fitting service was not offered by Lockwood International** despite their warning dial replacement was not an easy task.

See the Lockwood International website.

Speedy Cables
This long established firm has been involved in servicing speedometers for many years and has gathered a good reputation. Their website offers no replacement RV8 speedo dials but on enquiry they responded saying they **do not supply replacement speedo dials on their own but we are able to offer an RV8 speedo dial replacement and fitting service**. The cost for this service is £160 plus carriage (£12 to a UK address) and VAT so a total of **£206.40**. Both Dave Morris and Mike Howlett mentioned they had have had instruments rebuilt by Speedy Cables who provided a good service.

See the Speedy Cables website.

Speedograph Richfield
Peter Spurrs mentioned their website says they "carry out kph to mph conversions and vice versa and that they have a computer assisted dial production facility and can manufacture or reprint dials. You need to send them details of your speedometer to get a quote for their replacement dial supply and fitting service.

See the Speedograph Richfield website.

Clive Wheatley mgv8parts
He offers an RV8 speedometer (exchange only) at £150 including VAT". It's a speedometer with a mph dial with kph also shown and the odometer is changed to read miles and not kilometres. The speedos are sent off to a specialist Clive uses for the speedo dial change and recalibration of the odometer. The service can take up to three months particularly if you want your own speedo returned rather than an exchange unit. Website link

VDO Vision speedometer
Dave Morris mentioned that as original speedos are obsolete and very difficult to get hold of, a similar alternative is available from VDO.

How do you get evidence of total mileage should you wish to sell the car?

If you have a speedometer dial conversion or a replacement unit, what evidence can you have showing the total or aggregate mileage in Japan and later the UK? It is a key concern when you may later come to sell the car.

Looking at the options:

- **Fitting a kph/mph dial conversion kit**
  As the speedometer unit is the same instrument, the aggregate "mileage" will be as recorded except it will be recorded in kilometres on the odometer. But reading the UK regulations the requirement for calibration in both kph/mph applies to **recording the speed of the vehicle shown on the dial and not the total "mileage" recorded**, so a simple dial conversion would be sufficient to comply with the regulations. When subsequently an owner came to sell a reimported RV8 with a dial conversion, the aggregate "mileage" could be stated as indicated on the odometer in kilometres. The fact that it was the original instrument and not a replacement unit should provide sufficient reassurance for a buyer.

- **Using a kph/mph dial conversion service**
  The only addition is the speedometer will have been removed from the car, sent off for the professional conversion of the dial and then the same unit returned for reinstallation in the same car.

- **Replacing an original kph speedometer with another exchange unit calibrated in both kph/mph**
  In this case there would be two units - the original Japan spec speedo with an odometer recording the "mileage" in kilometres and the replacement exchange kph/mpg speedo with an odometer recording the "mileage" in miles. The owner of the vehicle would need acceptable evidence of the recorded "mileage" in kilometres on the original kph odometer sent off on an exchange basis so that the aggregate "mileage" could be checked later by a

buyer by their adding that kilometre "mileage" on the original odometer to that on the replacement odometer (presumably recording in miles following the conversion) at the time of the sale.

If the replacement odometer was purchased on an exchange basis then the physical evidence of "mileage" on the original odometer will have been lost, so the question is what would be acceptable evidence of the original mileage in kilometres? In that situation a sensible approach for the owner of that RV8 would be to take a good quality photo of the odometer showing the "mileage to date" in kilometres and then **get a copy of that photo certified by a responsible person** by their signing a declaration on the photo. That declaration could be something like "I hereby certify that this photo is of the odometer fitted to the RV8: VIN SARRAWWBMBMG002888 and VRN L888 MGR which shows the "mileage" recorded seen by me on that unit on this day." Signed and dated, possibly even witnessed too.

That should provide acceptable evidence for a buyer. The person certifying might wish to add "In certifying this photo I am not able to verify whether the “mileage” recorded in kilometres on that odometer is the full accumulated mileage covered by this car from new, simply what I have seen on this day".

What is involved in a DIY replacement RV8 speedometer dial installation?

Martin Cridford posted a note on the V8BB thread with his experience saying: “I have converted the speedometer on my RV8 from kph to mph myself using a new dial face supplied by Lockwood International. I believe Lockwood supply the dial faces to others. Fitting instructions were supplied and are also available on the internet.

The conversion is a challenge with the most difficult part being removal of the black outer rim that holds the glass into the casing. This took considerable time and effort and still resulted in some wrinkles to the outer rim as the rim is crimped back onto the casing. Fortunately these are not too visible once the speedo is fitted back in the dashboard. Even though I had some training in instrument mechanics (as a power station engineer apprentice back in the 1970s) I found changing the face a challenge in itself as the needle has to be removed from the spindle before the face can be changed. It’s all too easy to dislodge the spindle which requires further dismantling of the mechanism to get it all back together correctly.

Having successfully changed the dial I am not convinced that it has gone back together correctly with respect to the needle/spindle positioning as the speed indicated seems low to me! I think some form of calibration may be necessary. The odometer display stays in km too which confuses the MOT man and the numbers are not clear as the new dial face is a little foggy in the see through windows. Had I not been time limited with respect to getting it done for the car’s first MOT for registration, I would have gone back to Lockwood for their comments.

Overall a difficult job and far better left to the professionals! Unfortunately I have a penchant for 'having a go' based on the principle that if it was put together it can be taken apart.”

Dave Morris mentioned “Presto type hand lifters (made for clocks but work well on most instruments) are available on eBay”.

Conclusion

Many of the replacement dials for other cars do not need the removal of the needle of the speedometer but the replacement of the RV8 dial does. As a consequence the task is more difficult. Most RV8 owners, and quite probably many MG RV8 servicing specialists, would not wish to take on the task of fitting the replacement RV8 dial as the risk of damaging the instrument is high unless you have the necessary skills. So realistically most will wish to find a supplier who will provide a replacement dial fitting service. This may be on the basis of fitting the replacement dial to your existing speedometer or alternatively it might be on an exchange basis where you send your Japan spec speedometer and receive another RV8 speedometer which has had a replacement dial fitted showing both mph and kph speeds to conform with UK requirements.

The need and consequential expense of having the odometer recalibrated from kilometres to miles seems unnecessary.

Supplier	Supply RV8 replacement speedo dial incl VAT £	Supply & fit replacement speedo dial incl VAT £
Lockwood International	49.92	n/a
Clive Wheatley mgv8parts	n/a	159.30
Prodash	48.48	174.00
Speedograph Richfield	n/a	by quote
Speedy Cables	n/a	206.40
VDO new speedo (alternative)	n/a	251.52
Prices based on research in December 2016 & include UK delivery		

Which option will most RV8 enthusiasts reimporting a Japan spec RV8 opt for?

Most RV8 owners will not wish to carry out the dial replacement themselves because the task is recognised as being very difficult with a high risk of damaging the needle and/or the spindle. So the most sensible option for all but the most determined DIY owner is a RV8 kph/mph speedo dial conversion fitting service by one of the specialist firms offering that service mentioned above. The cost of the options reviewed in this article are summarised below.

The supply and fit a replacement mph dial service offered by **Clive Wheatley mgv8parts** on an exchange basis seems the most competitive at **£159** and it includes the recalibration of the odometer from kilometres to miles.

Prodash and Speedy Cables (a long established and well known vehicle instruments servicing specialist) offer a supply and fit service for a new mph speedo dial. Two fellow members mentioned in their posts on the V8BB thread that they had received a good service when using Speedy Cables.

Feedback welcome from fellow members who have had their reimported RV8 speedo dial changed.
Contact: v8registrar@v8register.net

Odometer is an instrument that indicates distance travelled by a vehicle.

Speedometer is an instrument that indicates the speed of a vehicle, usually combined with a device known as an odometer.

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Getting information on your car from DVLA

Getting information on your car from DVLA

After contacting the V8 Register for information about previous owners for his MGBGTV8, David Worthington made an application to DVLA under their V888 procedure. Here he describes how it works, what it costs and what information he received. (Month 16)

I made a request to the DVLA by completing their form and enclosing the £5 fee. I was delighted by their response – I received more than 30 A4 pages which set out a '**full keeper history details as requested according to our records'**. The pages I received are photocopies of the registration documents and any notifications of changes or registered keeper over the years. With that information it has enabled me to generate a complete history of the car with the dates of transfer of keepers. The DVLA is keen to stress that the registration document is not proof of ownership. I also have a couple of mileages recorded when the keeper changed. As you might expect, I have found it all very interesting. I was pleasantly surprised by their efficiency and the comprehensive nature of their reply. It also strikes me as good value for the fee of £5.

Getting information from DVLA on a vehicle

DVLA manages a vast amount of driver and vehicle data to help keep Britain's motorists moving safely and legally. In addition to providing information to the police and local authorities, the properly controlled release of DVLA data to third parties offers a host of practical benefits for the public. DVLA's vehicle register is maintained primarily to identify vehicles used on public roads, to assist law enforcement and the collection of taxes and to facilitate improved road safety. It holds information about each

motor vehicle including the vehicle registration number, the vehicle identification number or VIN, make and model, emissions classification and the vehicle's road tax status. It also includes the name and address of the registered keeper, dates of acquisition and disposal. While the law requires the DVLA to protect the privacy of individual motorists whose details they hold on both the driver and vehicle registers, there are a number of lawful circumstances in which data can be released from the registers

DVLA has two very thorough and useful documents setting out the information they can release from their vehicle records. First there is a 15 page guide to their release of information INF266 which sets out their responsibilities and the public benefits of data release and second there is a 30 page MIS546 with useful guidance on seeking vehicle data – for example if you are the current registered keeper and you need to know the history of your vehicle. Regulation 27 of the Road Vehicles (Registration and Licensing) Regulations 2002 provides for the release of information by the DVLA where a person shows reasonable cause to want it.

DVLA Form V888

This form has the title Request by an individual for information about a vehicle. As the DVLA holds personal data it has a duty under the Data Protection Act 1998 to protect that information. The DVLA therefore has to make careful checks before it will release information, so you will need to provide proof of your address with your application. If you do not provide a copy of one of the documents from the list set out on Form V888, DVLA will not be able to deal with your application and will return it to you. The documents DVLA requires to confirm your address are a gas, electricity, water or landline phone bill issued in the last three months, or a bank or building society statement issued in the last three months.

A necessary caution is set out on Form V888 that it is a criminal offence under Section 55 of the Data Protection Act 1998 to unlawfully procure or sell personal information. The maximum penalty is a £5,000 fine. DVLA adds they will carry out necessary checks on the information you provide.

Filling in Form V888

In filling in Form V888 you should choose either option A or B – you cannot choose both. But why are there two options? Well it depends on why you want the information which is part of the necessary and prudent checks DVLA has to make as a responsible personal data holder.

- **Option A**
  To obtain the name and address of the registered keeper of a vehicle at a specific date
  This option is used if the vehicle was involved in an incident where you need to trace the registered keeper of the vehicle if the incident involved damage and an insurance claim. You will need to provide details of any injury or damage, whether the police were informed and if so the incident number, the police officer and station together with details of any witness. Also details of your motor insurance cover have to be provided. Where your vehicle has been involved in an incident (Option A) you have to describe the situation that has led to you wanting the name and address of the registered keeper and how the vehicle was directly involved in the situation. The fee payable to DVLA with your V888 application is £2.50.
- **Option B**
  To obtain information about a vehicle that was previously registered, or is registered in your name
  This is the option if you are seeking information on previous registrations of a vehicle. The fee payable to DVLA with your V888 application is a modest £5.00.

In completing Form V888 there is a **serious and necessary declaration** as to how you will use the information you receive, that you are aware of the Data Protection Act requirements, that it is an offence to unlawfully procure or sell personal information and that you are aware of your legal obligations in handling information provided to you by the DVLA. So other sections on Form V888 require details from you of the vehicle you want information on, **what information you want and why** (section 4) and **how you are going to use the information** (section 5).

In many cases where a classic car owner is making a V888 application to learn more of the history of their car, the statements that might be suitable in sections 4 and 5 could be:

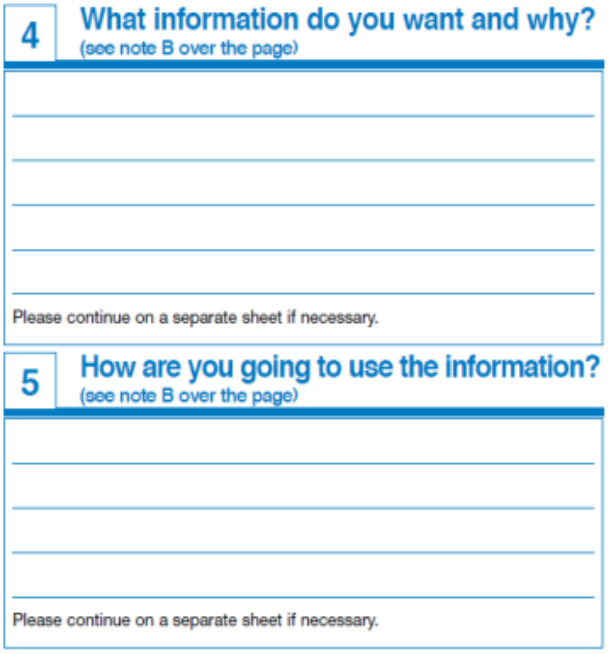
Section 4:

"Information including how many owners my car has had and the locations in which it has been based and any mileages on transfer of the vehicle."

To cover the **undertaking required in the declaration** (particularly with regard to the sale of data) it might be wise to include in section 5 a statement that it is the intention that the **history obtained should stay with the car** and in due course be **passed on to future owners**. There should be no objection to that since a future owner would be equally entitled to obtain the DVLA information themselves.

Section 5:

"To trace the full history of my vehicle for my own personal interest, including how many owners it has had and the locations in which it has been based. It is my intention that the history obtained should stay with the car and in due course be passed on to future owners, for their own interest."



When the time comes to sell the car, a documented history file will be of considerable interest to any prospective purchaser of the vehicle, but it should be borne in mind that personal data is concerned here. The suggested wording for section 5 of the form indicating **an intention that information obtained under the form V888 procedure should remain with the vehicle and be passed on to future owners**, should avoid any suggestion that such data is being illegally sold when the car is disposed of.

The completed form with the appropriate fee is then mailed to Vehicle Record Enquiries, DVLA, Swansea SA99 1AJ. You can download a copy of Form V888 via the GOV.UK website.

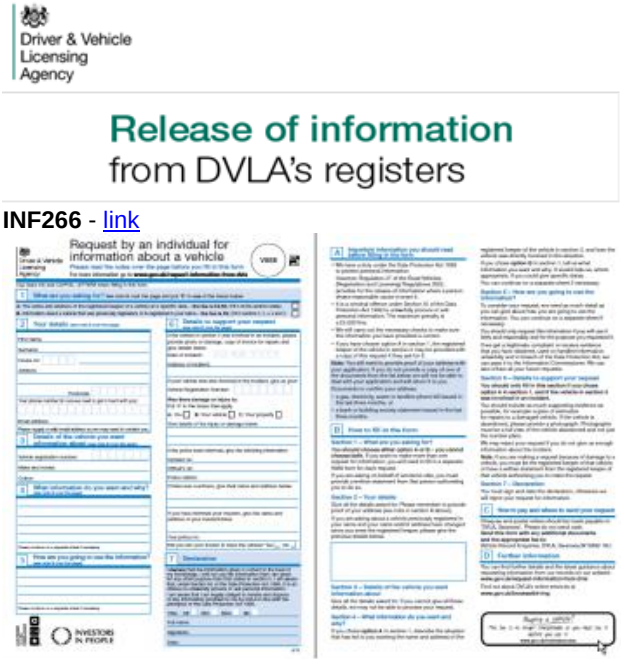
Interest in V888 data for future owners of your car

While anything about the history of the vehicle you are buying is interesting, I am not sure that a list of previous owners adds much reassurance about its maintenance. A history file with a well-documented trail of regular servicing and replacement parts invoices, even possibly a maintenance log, would be seen as more important. However I was pleased to know more of the history of my car.

What information did I receive from DVLA?

The thirty A4 pages I received from the DVLA were nearly all photocopies of the front pages of the original **Vehicle Registration Document** or the pages used for the **Notification of Changes**. These contained the names and addresses of the previous keepers and the dates of changes of details. All signatures had been erased.

The oldest document was the **Application for a Licence for a New Motor Vehicle and Declaration for Registration** giving details of the original dealer and also the 'selling' dealer. This explained a mystery to me of why the **British Motor Industry Heritage Trust – Certified Copy of a Factory Record** I had obtained gave the destination dealer when my V8 was despatched from the MG plant as Wadham-Stringer in Southampton but the vehicle registration number was issued in Worcestershire. The address of the selling dealer was in Stourbridge!



INF266 - link

I knew that I was the 14th keeper of the car and I had details of the previous three keepers but the DVLA information enabled me to compile a complete history of all previous keepers. It gave details of how long they had kept the car and in a couple of recent transfers, the 'present mileage' had also been filled in. Two of the keepers had been garages and this explained why there was a mystery garage sticker on the rear screen. It was not the selling dealer but keeper number seven.

One page was a summary of the last 5 keepers giving their date of acquisition; date of disposal and name and address. This looked to be a computer generated list, maybe from a database when the DVLA records were computerised.

Form V88 - link

This is a very helpful service from the DVLA and has answered many questions that would have been very difficult to work out by other routes. It was performed speedily by DVLA and in my opinion represents very good value for money.

Note: see V8NOTE532 in Volume 13 with an update as the V888 procedure has changed.

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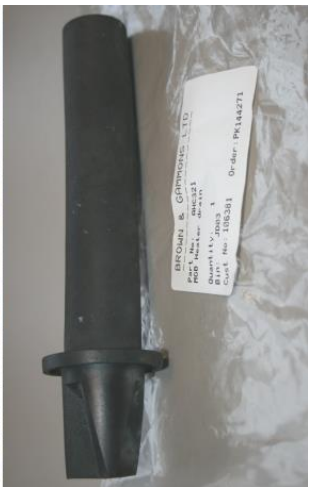
What's happened to "Ted's Knob"!

Nic Houslip has spotted a part has come back into stock at Brown & Gammons - "it's that strange shaped rubber tube device that dangles down from the underside of the air chamber for the heater box to below the transmission tunnel on MGBs and derivatives - it' was known at the MG Factory as Ted's Knob!". The late Geoff Allen, who worked there in Rectifications Department for 27 years, said that was the name of the part on the production line where a fellow with a reputation with ladies was very able at fitting it! (Feb 2017)



How does the drain outlet on the replacement part work?

Nic Houslip has sent the photo above of the drain outlet at the lower end of the part. Nic says "the "valve" is a form of Bunsen Valve but instead of the globe shape end of the original part (see alongside) the valve above is a 3 pointed star. This may be more effective".

But oh dear what has happened to the part! The thought of a replacement for this part sends a chill down your spine. The replacement has lost its former character ! Nic feels it will work just as well! I'm not sure Ted would have agreed! There must have been a recent EU Directive on the design of drain tubes!

Part AHC 321 drains water from the bottom of the fresh air intake chamber below the chromium grille in the bodywork just in front of the centre of the windscreen. This special valve can get blocked with leaves and other debris and if allowed to get plugged, water will collect and rust the bottom of the chamber. Many owners fit a mesh panel under that grille to protect the chamber.

See V8NOTE452 - cleaning out the drain tube. More

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Refitting Ted's Knob

Nic Houslip spotted this drain tube had come back into stock at Brown & Gammons - "it's that strange shaped rubber tube device that dangles down from the underside of the plenum chamber which supplies fresh air for the heater box on MGBs and derivatives. Our earlier articles mentioned it was known as "Ted's Knob" at the MG Factory!" as the late Geoff Allen, who worked there in Rectifications Department for 27 years, had said "that was the name of the part on the production line where a fellow with a reputation with ladies was very able at fitting it!" Geoff's advice was "avoid removing this part as it's a devil to put back!" Nic was recently working on his V8 Roadster and as he had full access to the plenum chamber he decided to fit the new type of drain tube. Here he describes the task saying "**to be honest this is a job that if I didn't have to do it, I would have put off having experienced doing it**". (Feb 2017)

What does the heater plenum chamber drain tube do?

The heater box in an MGB is a complex compartment that is below the chrome air intake grille between the bonnet and the windscreen and sits just ahead of the central console. It is divided into several compartments and this tube – **AHC321** - drains water from the plenum chamber where heated air outlets from the heater itself just inside the footwell air outlet on the righthand side of the car. Its function is to provide a drain for water to escape rather than running into the foot well. It exits just inside the transmission tunnel and the new replacement part has a curious duck bill shape. The end has a form of Bunsen valve that allows water and air to exit downwards, but prevents air and engine bay fumes from entering the heater.

Changing the drain tube

This is where it becomes a tricky job. The first step is to pull the old drain tube downwards out through the hole it's located in. The screw clip inside will remain in the plenum chamber, and by putting your finger in through the hole you should be able to feel it. Leave it where it is and proceed to the next step, for which you will need to remove the carpets and the centre console to get to a position in the following picture below.

Centre console removed - note the white plastic plug just to left of footwell heater outlet.

Oval Hole for access

For the next step a certain amount of manual dexterity is required, because by reaching in through the large oval hole in the plenum [see picture below] you should be able to retrieve the screw clip and after pushing the new tube up from below you can pull it far enough to fit the clip onto the end of the tube.

Tighten the screw clip

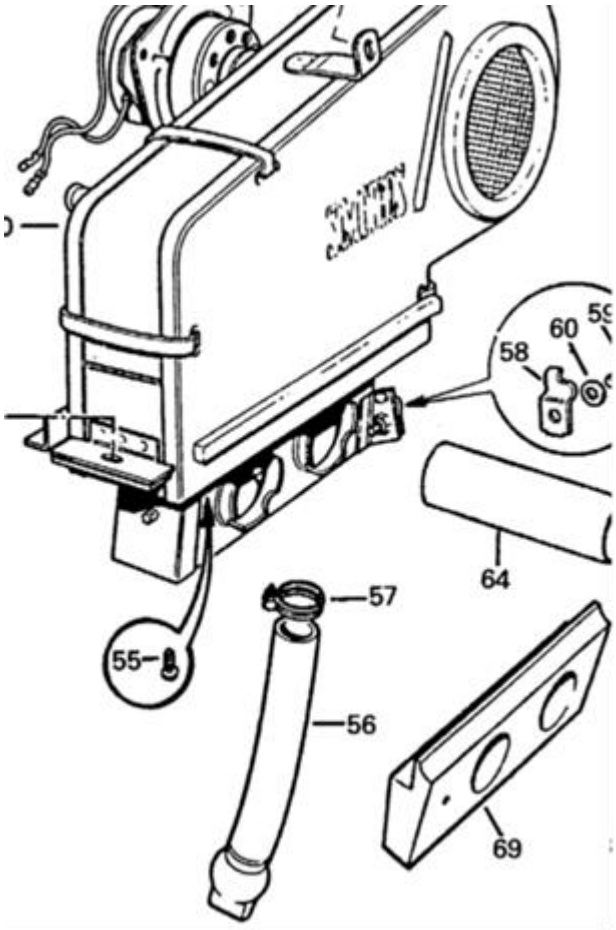
Now a warning; do not put the clip on the tube the way it is shown in the picture, but turn it over so that the screw head is facing the opposite side. Why will become clear in the next step. By putting your left hand onto the oval hole in the picture below you should be able to manoeuvre the tube down slightly and then slide it up onto the steel pipe that is just inside the chamber. Some exploration by your fingers is necessary and will enable you to understand the internal arrangements, as I wasn't able to take a picture of what is in there. The white plastic plug in picture below is where the screw head should be when the tube is slid right up on the steel tube.

The new drain tube in place - the brown tube is the petrol feed pipe.

Now, having removed the white plastic plug, the screw head is accessible through the hole. The reason it was necessary to turn the clip over is because with it the way I showed it first, the angle for the screw driver mans it is almost impossible to get the driver into the slot, but turned over the angle is more favourable. Tighten the screw and replace the plastic plug.

You will note that the new tube is shorter than the original part, also not curved and with triangular section valve, but this should not impair its operation. AHC 321 has been NLA for some time, but is now back in stock at Brown and Gammons in Baldock.

The following picture shows the location of the tube (**item 56** in the diagram alongside taken from the parts manual) and its proximity to the heater box. The heater box is shown viewed from the back of the heater, not the face you see from under the bonnet.



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Gas struts for an MGBGTV8 luggage platform

Gas struts for an MGBGTV8 luggage platform

Have you ever thought you needed three hands when delving into the boot of the MGBGTV8 or any MGBGT come to that? David Worthington decided that there must be a better solution than the wooden props he used so he did an internet search for gas struts and there he found the solution - two gas struts designed to support the liftable floor of all series of MGB GTs. These are not for the tailgate itself but for the carpet covered luggage floor panel that is above the spare wheel. (Feb 2017)

The two struts were supplied by Danbury-Hydraulics and are made specifically for the GT luggage platform panel. They fit to each side of the boot well and to the underneath of the floor panel. At £22.00 for the pair including free postage on eBay, they are good value and

do not take long to fit. They arrived with easy-to-follow instructions and some photographs to show the exact location of the fixing brackets. Apparently there are differences between the location of the floor panel hinges on the earlier BGTs (1967-69) and the later models from 1970 onwards, so there are two sets of photos and measurements to show the correct location of the brackets.

A few holes need to be drilled to attach the brackets to the stiffener rails on either side of the boot and a few more to attach the corresponding brackets to the floor panel. All the screws and fixings are supplied and the comprehensive instructions and photos make the process quick and easy. In my case, all was fitted and working within an hour and a half and that includes finding the tape measure and the drill.

The two struts ensure that the support to the floor is even both sides. Having raised the floor, it stays propped open. Removing the spare wheel and other items in the boot is a doddle. No more resting the floor panel on your head or hunting for the wooden prop! Intro text . . . . .

David has no association with Danbury-Hydraulics who are based in Essex at 'Glengarriff', Moor Hall Lane, Danbury, Essex, CM3 4ER. Tel: **07979 533173**. email: dhydraulics@btinternet.com .

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Black paint for Dunlop composite wheels

Robert Rose posted a note on the V8BB saying "my original MGBGTV8 wheels are in a relatively good condition in view of their age but there are areas around the slots where the black paint has gone leaving exposed uncoated alloy. In order tat least to maintain the current look, can someone please advise as to the original paint maker and paint code for these wheels and whether this would be suitable to use as a touch up the affected areas. I hope to have the black areas completely repainted in the next couple of years but I do not wish to leave the previously painted areas to deteriorate further, so any advice and guidance would be gratefully appreciated. (Feb 2017)

Victor Smith responded saying "I know from contacts with you that you are keen to maintain your MGBGTV8 in an original condition and there is one detailed feature of the original Dunlop composite wheels that needs care when it comes to refurbishing those wheels. A subtle feature of those original wheels was **very fine machinings on the face of the raised alloy features** around the centre of the wheel. In many cases where the wheels have been refurbished involving applying fresh black paint to the areas alongside those raised features and once dry, on close examination you can see the refurbisher had chosen to remove the paint that had crept over the edge of the side of those raised features and onto the flat face, by using the abrasive effect of emery paper. The result of that rubbing action, which seems a convenient way of removing the paint and leaving a neat edge to the paint on the flat face, is **those fine machinings can be lost**. Whilst a few express scorn over such detailed concerns for "originality" with a classic car like the MGBGTV8, for those unaware of how those original machinings can be lost but who value such detail, then this might be an alert to note. It's fair to say many Dunlop composite wheels have lost that detail through maintenance over the years".

Robert Rose replied with "I do not believe the wheels have been refurbished before. The first owner drove approximately 26,000 miles before selling on to the next owner who disliked both the colour of the car and also the wheels. Therefore he fitted aftermarket wheels which remained on the car until he sold it, by which time it had completed approximately 37,000 miles. The next owner refitted the original wheels and they remained with the car to this day - the car now having completed approximately 58,000 miles. I wish to retain the patina of the car, I am not trying to recreate a car fresh from the factory but do not wish the wheels to deteriorate". Therefore, subject to the information you have recently supplied, I will maintain those areas now devoid of paint with polish until such time I have them inspected further at the MGLive! meeting next year at which point I can garner all the information to determine the way forward".

Michael O'Leary added "although I don't know the paint code, originally the wheel centres were painted matt black. Attached is a photo of a Dunlop composite wheel still in the box for your reference".

Peter Spurrs added "I understand that MWS no longer refurbishes these wheels. Perhaps they will tell you what they used to use - it's not going to cost them any business. I found them to be a friendly group of folks".

Robert Rose returned with some useful news: "I took your advice and contacted MWS who as you intimated were very helpful. The wheels were "Wet Painted" Satin

Black with this work being outsourced to a company based near Thatcham in Berkshire called Professional Coatings (Procoat). On contacting Procoat they were equally very helpful - **the paint was a 2 Pack Adhesion manufactured by PPG under the trade name of "Selemix" with the colour code is RAL 9005 M 30%**. This is available from Automotive Paint Distributors".

Footnote: an A4 size copy of the photo is available on the V8 Website. New Dunlop composite wheel

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What colour is my MGBGTV8?

Thomas Hagemann posted a query on the V8 Register Facebook Group saying "I have been stripping the underneath of my MGB and discovered a beige tone. Would like to respray in a colour as close as possible to the original. Does anybody now the RAL or colour code please? (Mar 2017)

Simon Black responded by posting photos of two pages from a publication listing the colours - copies alongside. See also a larger copy

The **MGBGTV8 colours** are set out in a colour table on the V8 Website together with V8NOTE404 from Angus Munro on where you can get touch up paint.

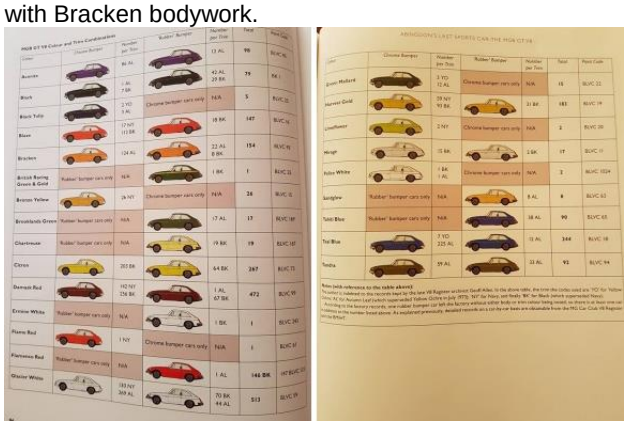
Thomas Hagemann responded "the car is Bracken at present. I am looking for the original beige yellowish tone colour code of the underneath floorplan.

Thomas Hagemann with his MGBGTV8

Underside of Thomas Hagemann's MGB

Barry West mentioned Bedouin as a possible colour but that colour (seen on a few MGBs) was much darker. It is fairly clear from Thomas Hagemann's photo (alongside) that the colour there is Harvest Gold although there was another similar colour called Limeflower. There were only two MGBGTV8s produced in Limeflower so it's much more likely the colour is Harvest Gold.

Victor Smith looked up Thomas Hagemann's registration of his MGBGTV8 (Bracken 0772) and then checked his copy of the production records for 0772 and found that car is recorded as produced at the MG Plant with Bracken bodywork.



MGB colour chart

Also see V8NOTE313 for a chart showing how many MGBGTV8s were made in various colours and the trim colour combinations. More

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Uprated alternator for an MGBGTV8

Colin Goodey has a 1975 MGBGT Jubilee which he converted to full Factory V8 specification about five years ago. Although it ran problem free as a rubber bumper car, Colin was always conscious of the under bonnet temperature when he was driving in heavy traffic. He found the original specification twin cooling .fans were almost permanently on during the summer months. Whilst the temperature gauge never got to a worryingly high level he wanted to see what could be done relieve the load on the fans and wiring without going down the normal route of an expensive hi-flow radiator and other upgrades. Here Colin explains what he did. (Mar 2017)

Uprated 75amp alternator

I decided to go for an uprated 75 amp alternator which delivers about 10% more power at tick over which in real terms meant that the cooling fans on my car were spinning at over 200 rpm higher than with the standard AC Delco (45 amp) fans. In real terms, on the road, I have noticed that the fans now cool the engine sufficiently well enough so as cycle rather than being permanently on, plus once on the road the increased output from higher engine speeds cooled the engine considerably quicker.

The unit I chose is brand new and looks very similar to the old Lucas 18ACR unit and to my mind is totally in keeping with the MGBGTV8s engine bay. It is also a perfect fit without any need for any alteration to the fixings and has the standard 3 pin euro plug as the AC Delco unit, so is totally plug and play. It even has an extra live feed take-off post for those who want to fit an extra fuse box.

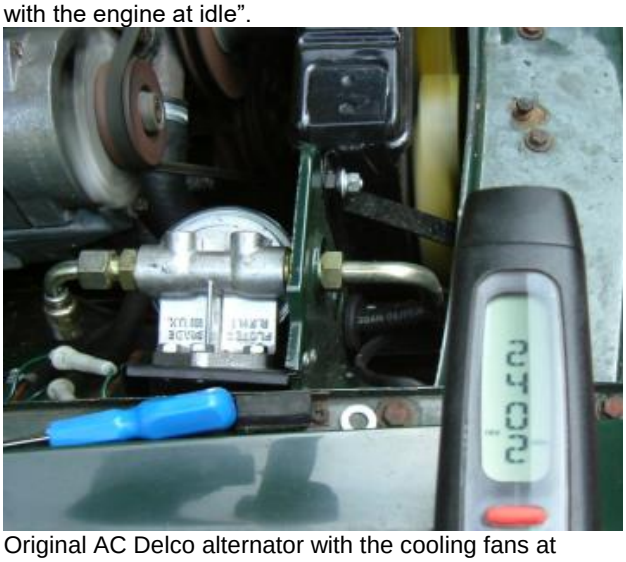
Where can you get one of these uprated alternators?

The unit is available as an outright sale, so you can keep hold of your valuable AC Delco unit, for just £80 including

VAT plus £10 UK carriage to all normal postcodes. The supplier, Just MGB, can also ship them overseas well. See Just MGB via their Facebook page at www.facebook.com/justmgb.co.uk The 75amp alternator unit will suit all cars with the overhung set-up illustrated in the photo alongside (top left).

Nic Houslip feels "the cooling fans are running faster simply because the battery is being charged to a higher voltage level than it was with the original AC Delco unit. The cooling fan has a series wound motor, its speed is dependent on voltage and load. This fan seed may have been due to either the original alternator being faulty by its regulator being off or perhaps a suspect battery with a partially dead cell that recovered when the new alternator was fitted. I don't think that fans will suffer from running faster, rather anno domini may be the major cause of fan failure. I think fitting the uprated alternator is a good plan".

Colin Goodey adds "add that the original AC Delco alternator was working perfectly and the battery was in a state of normal charge when the alternators were swapped without any other changes to the electrical system. The major benefit here is that the higher output alternator is able to produce over three quarters of the maximum output of the original AC Delco unit (45 amps) with the engine at idle".



Original AC Delco alternator with the cooling fans at **2,402rpm**.

Victor Smith noted "my standard MGBGTV8 has a 12v battery upgrade and when the fans kick in the engine speed drops a little and the lights dim. As most V8 cooling problems are when the car is moving slowly or at a halt in traffic, then engine speeds are low. Occasionally I lift the engine speed to 1,500 rpm when I am at a halt in traffic to let the fans run a little faster. So if your upgrade unit has such a significantly higher output at idle, that is a real benefit".

Uprated alternator with the cooling fans at **2,600rpm**.

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Why does a starter motor not turn over?

Turn the ignition key to start the engine and all you get is a "Clack" from the solenoid, or perhaps even a "clac-clac-clac-clac" sound. As you realize that the starter motor won't turn over you get that sinking feeling, wondering what is going on. The answer is not as easy to explain as to describe but here Nic Houslip explains the checks you can make and some of the background information you will need. (Aug 17)

First check the state of the battery

Of course, the first thing to do is to determine if the battery is discharged – flat or nearly so. You can check this by turning on all the lights, including the headlamps. If they appear reasonably bright then the battery is not flat but if all you get is an orange glow then all that should be needed is a battery charger. Note: it is of little use measuring the battery voltage with no load because without a load on it, a lead acid battery may well indicate 12V (or 2.0 Volts per Cell) but this gives no indication of its capability. If the battery appears to be reasonably well charged and when you try to start you get the clack sound, it is certain that the problem is corrosion on the battery terminals. Why is this?

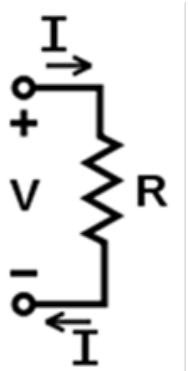

Diagram 1

Corrosion of the battery terminals

The phenomenon is curious and not well understood, but is common and has a sting in the tail, of which, more later. Before we get into the mechanics of this there are a couple of things I want to explain so that you can grasp

what is happening. Most of us will have heard of **Ohm's law**, (no relation to OHMS as James Bond was). Georg Simon Ohm was a German physicist who wrote the famous law that states that "the current through a conductor between two points is directly proportional to the voltage across those two points". In simple terms, if you apply a Voltage (in Volts, abbreviated as **V**) to a Resistor then the current in Amperes (symbol **I**) that flows will be proportional to the voltage applied. Resistors have a value of resistance measured in Ohms (abbreviated **R** or the Greek letter Omega Ω). Since I is proportional to V the law can be manipulated to determine any value that is unknown if the other two are known.

As an example, and using numbers that are easily calculated in one's head, if **V** = 12Volts and **I** = 1 Ampere, then using the formula **R = V divided by I** then we get 12 Ohms. Furthermore, we can rewrite the formula as **I = V divided by R** which equals 12/12 or 1 Ampere.

That should be enough of Ohms law for the explanation, but just remember that every conductor has some resistance. Sometimes very small and often a nuisance, at other times higher, intended to do something in a circuit to help its operation.

In a car starter motor circuit, the battery is connected to the starter motor terminal by a very thick wire, because thick wires tend to have very low resistance and **when the starter is operating it may have to carry currents as high as 300 Amperes**. Think of Ohm's law, if the resistance of the wire was 0.001 Ω (or 1 milli Ohm) and the current flowing was 300 Amperes we could calculate, by rewriting the formula to I x R the voltage across the ends of the cable if we had a meter with long enough leads. It would be 300 A x 0.001Ω or 0.3 Volts. Electrical engineers would refer to this as 300 mV (milli Volts).

OK I hear you say, what does this all mean?
Well, if you have only 12V from the battery to drive the starter motor the loss of voltage in the wire must be deducted from the voltage at the motor. In this example, the difference between 12V and 11.70V is very small; but if the figure for the wire's resistance were increased by a factor of 10, say from 0.001Ω to 0.01Ω the calculation is changed greatly. 300A x 0.01Ω then becomes 3.0 Volts lost in the cable, and deducting that from the 12V we started with means that we have only 9V left to turn the starter motor. This may only seem a small amount, but the power of the starter motor, which is calculated as P Watts, from formula **P=V x I** now becomes 12V x 300A = 3,600 Watts (about 4.8 HP) and at 9V x 300A = 2,700 Watts (3.6 HP) you can see that it will materially affect how well the starter turns the engine over as **that 3V difference accounts for about 1.2HP**. You may be wondering where does the energy in the cable go to? It is lost as heat from the cable, in this case, which is rather extreme, there is loss of 3,600 – 2,700 or 900 Watts.

Let's look at the electrical circuit from the RV8
The electrical circuits from the RV8 and MGBGTV8 are similar in principle but the RV8 wiring diagram is more complex as it is all on one page! The battery is the source of power and can **deliver a large current** to start the engine. This **current is so large that a normal switch isn't capable of handling it, so a "Solenoid" is used.**

A **solenoid is a heavy current switch** that is operated by an electromagnet (a coil of wire around an iron core) that attracts a movable armature carrying a contact piece that connects the battery to the starter motor. In the case of the RV8 and MGB and derivatives like the MGBGTV8 (but not MGAs), the solenoid also has another function. As the solenoid is moving the contact piece it, by means of a lever, also **moves the starter pinion into engagement with flywheel ring gear**. The battery feed is connected to the starter at **C114** (see diagram 2 above), the large copper stud and nut. The solenoid is fed in from **C113** which in turn is fed via **C63** from the starter relay.

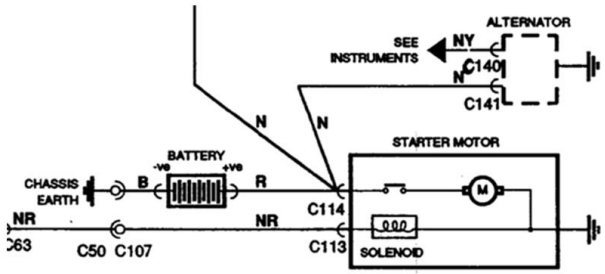

Diagram 2

Why does the solenoid "clack"?
Now let us get to the nub of the issue. Why does it go "clack" or "clac-clac-clac-clac"? If you look at a battery you will see that protruding out of the top of the battery case are two lugs or pillars. These are the connections to the internal workings of the battery and this is where the corrosion (or more correctly sulfation) occurs. Looking at the diagram above you will see the clamp type terminals **3** and **4**. Older cars such as the MGBGTV8 may have Lead cap shaped terminals with screw in the top. These are sadly more prone to corrosion than other types. The sulfation occurs because the battery uses a dilute solution of Sulfuric acid in distilled water as the electrolyte and this is always present near the terminals as it is almost impossible to seal the terminals into the plastic battery case.

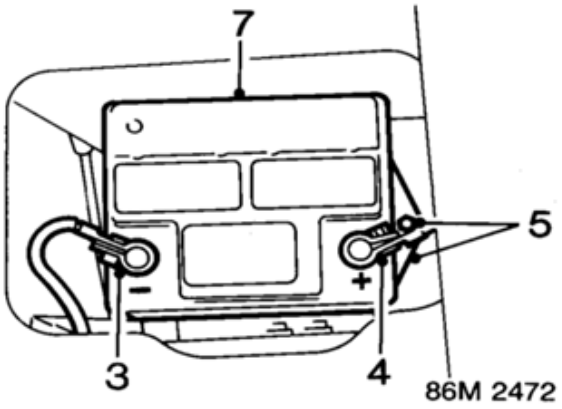

Diagram 3

If a layer of corrosion should build up between the clamp and the post it can interfere with the current flow, but just to make it more complicated, the sulfation doesn't follow Ohm's law! So, there can be a situation when you turn on the ignition, see the lights on the instruments come on because the sulfation can carry the few amperes need for that. The voltage "dropped" across the sulfation, like that lost in the starter motor cable may be only a fraction a volt. But when you try to start the engine, the solenoid itself draws a much larger current and because the sulfation doesn't obey Mr. Ohm's ruling, its resistance changes and the voltage dropped increases to the point where the solenoid can no longer pull in. If the sulfation isn't quite as bad, then the solenoid will pull in, but as the starter motor then draws a larger current, the sulfation will defeat it, and the solenoid will drop out and

the voltage rises until the solenoid connects the motor again and promptly drops out again giving the familiar “clac-clac-clac-clac” sound.

The sting in the tail is that the sulfation also plays a role when the battery is being charged by the alternator. You will note from Diagram 2 that the Alternator output is connected to the starter motor heavy terminal **C114**. The alternator has a clever device built into it, a voltage regulator that “senses” the battery voltage at the output terminal of the alternator at **C141** in Diagram 2. As the alternator forces current into the battery the voltage of the battery rises, indicating that it is fully charged, when the regulator reduces the charge current. The sneaky sulfation acting as a non-Ohm’s law resistor changes its resistance with current flowing through it, tricking the alternator regulator into thinking the battery is charged and reducing the charge current to what is essentially a trickle charge. The sulfation causes you to have an undercharged battery anyway and puts a barrier in the way of correct starting. If you do manage to get the engine started (perhaps by using jump leads) and run at night, all will work OK as the alternator will sense the load from the headlamps, radio, heater fan etc. which are connected to the starter terminal and adjust the alternator’s output to keep the lights at full brightness.

What’s the solution?

First clean up the battery and terminals. With the car outside, pour a jug or kettle of hot water, as hot as you can bear it, over the battery, terminals and if there is any corrosion on the battery carrier, pour it on that too. This will remove surface grime and the majority of the sulfation on the terminals and clamps. The advantage of hot water is that it evaporates and it is much easier to dry off with a cloth or paper towel. Now remove the terminals, Negative first (**Black or marked –**) followed by the Positive (**Red or marked +**). Doing it in this order avoids the possibility of shorting the battery should the spanner being used to loosen the Positive clamp bolt, accidentally touch the body of the car.

Now you must clean the mating surfaces of the clamps and the pillars or posts back to bright metal. A small wire brush is useful, sandpaper works too but you must clean off all the sand after using it. If the sulfation is hard, a sharp knife can be used carefully. If any of the bolts are bent or damaged it is worth replacing them with new, plated ones, as the old ones are often bent by overtightening.

Now you need something to **prevent further corrosion**. There used to be a product called **No Crode**, made by Holts, but it seems now to be NLA. Not to worry, take about a teaspoon of Vaseline in a small container and mix about ¼ teaspoon of bicarbonate of soda with it. Quantities are not critical, I find the handle end of the teaspoon picks up about ¼ teaspoon. Smear the terminal posts and the clamps liberally with this material before replacing the clamps (remember Positive + First!) and again after tightening the bolts. This should keep them from corroding for a long time.

While doing these jobs, **check the water level in the battery is correct**, add distilled water if needed. At the same time, it is a good idea **check on the condition and tightness of the alternator belt**. The belt must deliver a large amount of power to the alternator and as its pulley is a small diameter compared to the crankshaft pulley the belt must be flexible and have a toothed inner to allow it to bend to the radius of the pulley. Tighten as specified in your hand book or workshop manual.

Just for information, an alternator charging at 35 Amperes is delivering about 500 Watts to the battery. Allowing for frictional and other losses, the belt needs to deliver at least 1 Horsepower to the pulley from the crankshaft. The belt should look like diagram 4.

$$I = \frac{V}{R} \quad \text{or} \quad V = IR \quad \text{or} \quad R = \frac{V}{I}.$$

Calculate the unknown on the left of the = sign by following the appropriate formula.

Diagram 4 - the belt should look like this. If it doesn’t, Clive Wheatley has stock of the correct item.

Other stuff that might be helpful

Measuring very low resistance values (less than 1/10 of an Ohm) is difficult, but it is interesting to connect a volt meter across any junction and measure the voltage drop across it. You may be surprised! The object is to have the lowest voltage drop across any junction.

Ohm’s Law

There are 3 formulae in Ohm’s law that you can use – see below.

Power in a circuit

Power in Watts is given by multiplying the voltage **V** by the current **I**.

Different types of Resistors

All resistors, indeed all conductors, have a Temperature coefficient, which is an indication of a how much the resistor value (in Ohms) changes with temperature. Most are Positive (PTC) meaning the resistance increases with increasing temperature. The filament in a light bulb is a good example, if you measure the resistance of a Halogen lamp filament you will find that it is quite low, perhaps as little as 0.1 Ohm. If you calculate the resistance from the voltage applied and the current flowing through it you will find it is much higher.

Using Ohms law, we know both V & I, so R = voltage divided by current. 12V/5 = 2.4 Ohms

Negative Temperature coefficient (NTC) resistors are less common; their resistance decreases as they are heated. Many of the sensors used in RV8’s to sense temperature or incoming air, coolant or fuel are resistors with precise characteristics related to temperature. The change in resistance is measured by the Engine Control Unit 14 CUX and converted to a temperature.

See the full article online. More

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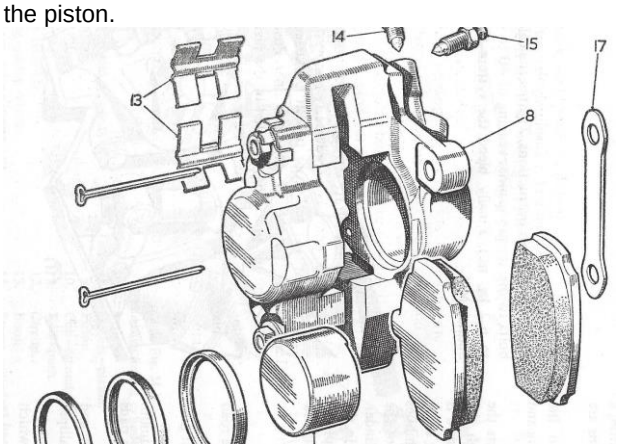
How can I stop my brakes squeal?

Angus Munro posted a query on the V8 Bulletin Board saying “the brakes on my MGBGTV8 squeal badly” and

that his internet searches had produced a variety of notes on how to solve the problem but often contradictory. Angus mentioned he was easy on his brakes. He welcomed fellow members' views or information.

Angus Munro subsequently mentioned that "when a highly competent chum looked at the problem of the squealing brakes he found that the complete front brake system was new, as it should be as my MGBGTV8 was a completely rebuilt car, but when he tried to chamfer the pads one of them was so hard that it would not be cut. He termed it a "rouge pad". The pads were then changed for a brand new set of Mintex but, the squeal was then even worse - really awful. Brake squeal seems to be a problem for everybody with an MGB or a BV8 if what I read on the internet is correct. As brake squeal didn't happen when the model was first launched – "I had a brand new MGB Roadster in 1966" - the only conclusion I could come to is that the pad compound has changed over the period. This is quite understandably as the original compound contained asbestos apparently". It was clearly very frustrating for Angus who added as there seemed to be "no real conclusions or answers yet but a fifty mile drive to the North Norfolk coast yesterday convinced me that a wonderful car and driving experience is being completely ruined by the brake squeal until I do something and preferably get it right first time. What to do? Desperate in Norfolk". (Aug 2017)

Tony Lake noted "my brake set up is dimpled and grooved discs with EBC Green Stuff pads which squeal occasionally when reversing. I believe my callipers are the original factory design. I am not a heavy braker. I have rebuilt them a couple of times in the last 17 years when fitting new disc rotors and have always managed to salvage the whole assembly and reuse all the parts with a service seal kit. The pistons are relieved for a small sector where they butt against the pad. This is counter intuitive, but it would seem like good practice to apply the hydraulic load through a full 360 degrees. The **squeal is caused by a very high frequency vibration** which I suspect is interrupted by the discontinuous perimeter of the piston.



I also recall that piston position in the calliper with respect to the relief is critical, but can't find a reference to it. I wonder if this is the key to the squeal problem, replacement parts book illustrations show pistons with a full 360 degree piston perimeter?" Tony added "I've just found the assembly instruction for the piston. Extract from AUSTIN MORRIS PRODUCT TRAINING, Service School Cowley, part of a publication dated 1972 which notes "the cut-away portion of the piston must be located at the inner edge of the calliper, ie, towards the hub." In that position the hydraulic load will likely lead to a "toe-in" attitude as the pad makes first contact with the disc. That method of adjustment is also favoured when setting up bicycle brake callipers to get rid of squeal".

Good news – squeal solved

Angus Munro later reported that on fitting alternative replacement brake parts the squeal no longer occurred saying "I am now able to report that the **squealing problem has been solved** and that, so far, I have completely quiet front brakes. This has been achieved by fitting new **standard EBC OE spec discs together with EBC Ultimax2 pads**. I purchased the discs and pads as a set directly from BMH at Witney for £146 which was cheaper than buying the discs and pads separately by about £20. I chose the Ultimax2 pads because they are the softest of the EBC range and appear to be free of metal within the pad material. I am hoping that the softer pad material will help to absorb any frequency vibration that may have contributed to the sound, the squeal. BMH kindly included a packet **containing thin sticky back 3M rubber strips** for adhering to the steel backing plate of the pad separating the calliper piston from the pad backing plate. Interaction between the slightly floating pad steel back and the piston may have contributed to the squealing sound. This may go some way to explaining why some people have had success with the use of Copperease between the two surfaces, the Copperease acting as a lubricant of course. By using the 3M strip we did not use any Copperease. Should the rubber eventually wear through it will be a simple job to replace it as the kit supplied was more than sufficient for several application over time.

Which way is the right way to fit the pads?

"Comparing the old, less than 200 mile old, pads with the new EBC pads both had the same oddity. The steel backing plates were symmetrical about a horizontal centre line and yet the pad material is displaced with its own centre line, a slot in fact, a little above the backing plate centre line. What this means is that there is a greater lip of backing plate exposed at one end of the pad than at the other. So. . . . which way is the right way up? We had to make a telephone call to BMH at Witney to ask the question as, astonishingly, there is no mention of this in the instructions and no marking on the backing plate. The answer is the **longer lip is at the bottom**.

The discs as supplied are coated with a black material which we were advised to leave in place. For the pads, I quote from the packaging, "**The surface of the brake pads for street pad materials is coated with a red material known as BRAKE-IN. This coating helps your brake pads to 'seat' or bed in quickly. However pads should be used gently for the first 100 miles**." Once the two coatings, disc and pad, have worn away and I return to the real world of bare pad to bare disc, I hope that even my gentle braking style will continue with silent brakes. As mentioned before, if it works for a ten year Golf using aftermarket pads.

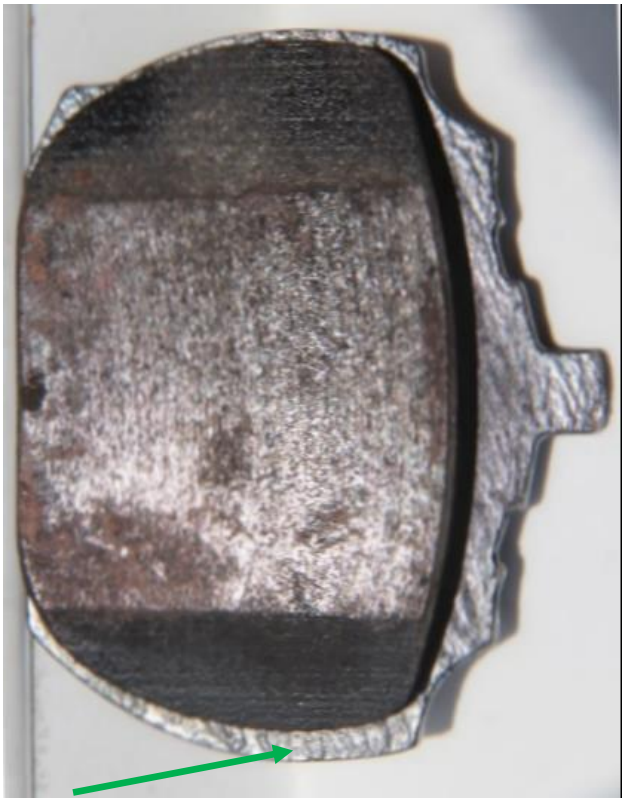
I should mention that all four pistons were correctly orientated with the slot facing the centre of the hub".

Angus Munro hopes this note will be useful and he thanked the various contributors and followers to the V8BB thread who have been with him along the way. He added "mostly though, many thanks to my super chum John Cumming who actually did the work for me yesterday. He just made it all look so very easy. Should anybody care to discuss any aspects of this work directly I am happy to be contacted by telephone. My contacts are on the Contacts webpage on the V8 Website".

Below is a photo of one of the old pads that will clarify what Angus meant regarding the pad material/pad backing steel relative positions. This will help fellow members fit the pads in the correct position.

Avoid over enthusiastic advice that high performance brake pads upgrades are worth having

Angus Munro feels that some suppliers recommend using high performance brake pad upgrades with racy product names that are, in reality, completely unsuitable for our general use. He found that installing that type of pad on his MGBGTV8 produced a very bad squeal but finally on using a relatively soft brake pad the squeal vanished.



Extended lip between the pad material and the metal pad holder needs to be located at the bottom of calliper

Make sure the brake pads are installed the right way up

The extended lip between the pad material and the steel backing plate needs to be located at the bottom of calliper. Angus adds, chamfering on the pad alongside should be ignored as it was an earlier “after market” attempt to cure the squeal problem”.

Contacts: http://www.v8register.net/contacts.htm
See a copy of the full article. More

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Weakest point in the Factory V8 drive train?

A member mentioned he had always wanted to drive his MGBGTV8 a little harder but was aware the half shafts and the gearbox are known weaknesses so he had always resisted full bore starts in the past. In a V8 Bulletin Board posting he asked “what component in the gearbox is the most likely to fail and would the gearbox be able to take repeated full bore starts in first gear?” He felt the answer would be either to have the gearbox internals uprated or to just bin the Factory gearbox completely and fit an uprated gearbox instead. He sought fellow members’ views. (Aug 17)

Mike Breedon, who has a subtly upgraded Factory MGBGTV8, felt the “gearbox will suffer from hard use so fitting an uprated gearbox will be essential. That would be best done before ruining a good standard Factory gearbox - they are too valuable to break with brutal use with repeated full bore starts in first gear. If you want to drive an MGBGTV8 as hard as suggested then I think the Factory gearbox will sooner or later give out. Rather than damage a good Factory box, possibly even the casing, I feel it would be best to think in terms of an uprated gearbox by replacing the Factory box with something stronger and selling the Factory box to a fellow V8 enthusiast who is in need of a good original gearbox”.

Victor Smith felt that if hard use is likely then it would be best to think in terms of an uprated gearbox by replacing the Factory box with something stronger. A good starting point for considering uprated gearboxes would be to read the first chapter of the late Roger Williams' excellent book "How to give your MGB V8 power". The chapter "What car, engine and gearbox?" takes you through what you should consider and options depending on your choice of engine power - moderate up to 220bhp, medium (200 to about 250bhp) and high over 250bhp. "What gearbox?" is on page 19 and Roger covers alternative choices and getting the box to fit.

One development since the last edition of the book was published has been the availability of a replacement Mazda gearbox for the MGBGTV8 from a company called Vitesse. They had invested in producing a bellhousing to fit the Mazda gearbox to the V8 engine together with extensive and tough testing of the replacement Mazda box on a 4.0 litre MGBGT. Details of the Vitesse Mazda gearbox were released on the V8 Website in 2017.

Mike Breedon, a longstanding V8 member who has been involved in racing MGBGTV8s for over 20 years, said “I quite agree that in general the V8 gearbox is the weakest link in the drive train of a Factory MGBGTV8. I have my own experience of stripping a tooth from third gear simply by hitting a pot hole as I let the clutch out at the same time as I changed up from 2nd to third even with “only” the power from the standard Factory built V8 engine. Later I did modifications to my 1973 Factory MGBGTV8 to match the BCV8 Championship Standard Class V8 race regulations so I could race in that championship from 1984 to 1997. With a limited amount of work allowed on the engine by the championship

regulations, I swapped the original Factory V8 for a Rover Vitesse 3.5 engine with a calmer cam and simply went to straight cut gears in the standard gearbox casing together with a rebuild of the overdrive unit with special settings and valves to suit racing conditions. In all races and road use, including 2,900 miles in 9 days on a MSA European Classic Rally, I never had a problem with the gearbox, overdrive or half shafts. That rally took in race circuits along the way that included Spa Francorchamps, the old Nuremburgring, foreign hill climb circuits, Saltzburgring, banked ovals and various very quick runs across country lanes.

If however the engine is taken to a much more powerful tune then this does introduce more power than the original drive train was ever designed to withstand and people have had various problems along the way depending on the power output being targeted. However, even the Club's BCV8 Championship Class D full race cars are known to run with the **Cosworth T5 gearbox** which has proved both reliable and cost effective. Half shafts are occasionally a problem with many seeking a heavier "beefed up" version, but in general until you hit a kerb or downshift at the wrong time they are very reliable".

Mike Breedon later noted "the **T5 gearbox is now getting harder to find** and by all accounts so is access to some spares for it, so that could also be a problem for anyone choosing a T5 upgrade. Having continued to use my MGBGTV8 with the same Rover 3.5 litre engine tuned to BCV8 standard class spec but now purely as a road car, I initially retained the straight cut gears simply because they are stronger than standard V8 gears and the condition of the roads around my rural village are appalling! However, due to the miles covered it eventually became necessary to have the gearbox overhauled in 2016 when Malcolm Beer recommended fitting a set of MGB gears which were considerably cheaper than replacement straight cut gears and much more accessible "off the shelf" so far with no problems in use.

The downside for some is that the **straight cut gears are now getting harder to come by**, they are expensive and they are obviously noisier in operation than standard gears. I am not sure if the "new" Mazda gearbox put up as a replacement option for a V8 would stand the aggressive starts in first gear. I have never tried one nor heard any reports about its "in life" operation when fitted to an MGBGTV8.

Regarding the half shafts failing, in all that I have done with my MGBGTV8 since April 1984 to date, I have never had a half shaft let go, however I was always advised that you should run a V8 to get it warm before being "aggressive" with either gear changes or fast full power starts. Maybe I have been too "engineering mindedly delicate" all these years to prevent any damage but I think I have still enjoyed flooring the throttle on a few occasions with no adverse effects!"

How to give your MGB V8 Power by Roger Williams, 221 pages and published by Veloce Publishing. See our review of this useful book. Book review

Replacement Mazda gearbox for the MGBGTV8, now available from Vitesse. See: News & Articles

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Where can I get touch up paint?

Picking up on the advice in a previous workshop note by Angus Munro - RV8NOTE300 - for supplies of paint for the odd touch up job, Barry Kelly says "I have previously bought Oxford Blue (BLVC1203) from Halfords and been happy with the blend match to the existing paintwork. Having recently obtained some more cans at the end of May earlier this year which I had used up, I went to Halfords again to get a couple of cans of Oxford Blue. On visiting them on 6th July I was told that all Halfords stores have stopped doing paint mixing in branch". Here Barry relates how he solved this problem. (Aug 17)

Well, every cloud has a silver lining and I was pointed in the direction of Bitec in Halesfield 2, Telford. That was handy as I live in Shropshire, although it's a big place! The service at Bitec was excellent and knowledgeable with the paint code immediately recognized on their system (unlike Halfords initially) and the cans are 400ml rather than 300ml at Halfords. As it is only a base coat, I got an additional two cans of the Pro HB 2k clear lacquer to go with three cans of Oxford Blue costing in total just over £60.

If you don't fancy a trip to Shropshire (and you'll be missing out!), the Bitec website can be found at https://www.bitec.co.uk where you can see that they also supply all manner of items and equipment for painting and detailing motor vehicles. Given that MG models are no longer "live", if you can't get there in person your best bet is to ring them up with your code. They'll know it is a Rover colour (in my case 1993 to 95) and the match is perfect. The various RV8 paint codes can be found at RV8NOTE300.htm

News of a range of spray and touch up paints from Moss

Moss Europe have sent out details of a range of spray and touch-up paints produced by Classic Car Colours for classic cars including MGBs and MGBGTV8s. If there is sufficient demand to 'reinstate' a colour, CCC say "we will do our utmost to include it in our range". They add "the colours are carefully blended to be an exact match to the original paint as used by the factory, but it is worth observing that your car may well have faded from its original colour. For this reason before you start, we recommend that you do a test spray of any aerosol on a piece of old metal or a carefully selected area of the car where a mismatch will not be noticed". Moss webpage

Moss Europe say "we can supply paint in either aerosol or brush-on format. The aerosols come in 300ml cans and brush-on paints are available in 125ml cans with a brush in the cap. Engine & chassis paints are supplied in 500ml tins". See colour range

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Changes to the availability of information on vehicles from DVLA

It's clear that the procedures for applying for information on a vehicle and current and former keepers under the DVLA V888 procedure have been changed since an article was released on the V8 Website in January 2017 and added to the RV8 Workshop Notes series as RV8NOTE433. The main change is redefining "reasonable cause" for seeking the information. Clearly the provisions and requirements of the UK Data Protection laws have been serious concerns in those changes and the focus on "reasonable cause". **So this workshop note replaces that earlier RV8NOTE433**.

The main change is DVLA now judge each V888 application strictly on its merits, particularly the statements you make as to why you want that previous information from DVLA's records.

DVLA clarification and focus on "reasonable cause"

DVLA has clarified how information on a vehicle and current and former keepers can be obtained by an applicant by redefining "reasonable cause" for accessing vehicle records held by DVLA. In an article in this week's issue of Classic Car Buyer they report "a spokesperson for the DVLA told us that the information on their website is all up to date and correct. You will need to have "reasonable cause" should you wish to apply for previous owner information on a car you don't or have never owned, but there are no specific rules when requesting information on your own vehicle or a vehicle you have previously owned. **These cases are all reviewed on a case-by-case basis**".

Applying for information on a vehicle you own
In order to apply for information on your own vehicle you will need to fill in a "V888 request by an individual for information about a vehicle" form and specify why you want that previous information from DVLA's records. The reasons for applying for information on your own vehicle may include you suspect the vehicle may have been involved in an accident at an earlier date or you would simply like to cover the history of your vehicle with a little more information on its history.

Driver & Vehicle Licensing Agency

Applying for information on a vehicle owned by someone else
Applying for information on a vehicle owned by someone else you will need to provide one of the following "reasonable causes":

- Finding out who was responsible for an accident.
- Tracing the registered keeper of an abandoned vehicle.
- Tracing the registered keeper of a vehicle parked on private land.
- Issuing parking tickets.
- Issuing trespass charge notices.
- Tracing people responsible for driving off without paying for goods or services.
- Tracing people suspected of insurance fraud.

Policy paper. Release of information from DVLA's registers - INF266
This covers how DVLA complies with legislation when releasing data from its driver and vehicle databases. Updated: 19th July 2017. More

How we give people information from our vehicle record
Guidance for people and companies about what information DVLA will release from our records. Updated: 20th September 2017. A link on that webpage goes to a DVLA document "Giving people information from our vehicle record - mis54 August 2017". This document sets out in detail the process and requirements for various types of applicant including debt collectors and solicitors as well as private individuals seeking information on their car or a car previously owned by them or a car owned by someone else. More

Request information about a vehicle or its registered keeper from DVLA
Fill in a form and apply by post. The form you need to use depends on who is making the request and why. Details of how to pay and where to send your application are on each form. There are three forms depending on who is making the request

- Form V888 - for an individual.
- Form V888/2 - for a company.
- Form V888/3 - for a company that issues parking or trespass charge notices.

Form V888: Request by an individual for information about a vehicle
Use this form if you want to apply for information about your vehicle, a vehicle previously registered to you, or the registered keeper of a vehicle which is registered to someone else If you want to request information about the registered keeper of a vehicle which is registered to someone else, you must show 'reasonable cause' for wanting this information and how it will be used.
Form V888

Form V888/2: Request by a company for information about a vehicle
Use this form for companies that want to apply for information from DVLA's vehicle records.
Form V888/2

Form V888/3: Request information if your company issues parking or trespass charge notices
Companies who issue parking or trespass charge notices and want to apply for information from DVLA's vehicle records must use the V888/3 form.
Form V888/3

533
Ever broken a stud removing parts from your engine?

It happens, particularly on studs that are exposed to the elements and to heat, as exhaust manifold studs invariably are. Here Nic Houslip recalls having the front most stud holding the exhaust manifold shear off just below the nut on a car that he was working on and was able to remove the residue with a stud remover. (Nov 17)

I was able to remove all the other fixings and the manifold leaving me with about ½" of 3/8" UNF stud protruding from the cylinder head. In cases where the stud breaks flush with or below the surface, you have no option but to drill down centrally and use a stud extractor, but this is really a "head off and take it to a machine shop" job. They will then have to drill accurately down into the stud, remove it if it will come free with a "screw in" extractor that has a coarse lefthand thread; or if that fails, to drill down with larger drills until the root thread diameter is reached and pick out the remaining bits of thread from the hole. This is a difficult and time consuming job and best avoided, or better still left to an expert.

In this instance there was just enough stud protruding to be able to do something about it, but a first attempt with a self-grip wrench failed because it wasn't possible to exert enough pressure to grip and turn the stud. Over the years I've bought various unusual tools at events and auto jumbles, mostly on the basis that "it'll come in handy if I never use it". One tool I have had for a long time but never tried was a stud remover that had a cam shaped wheel with a knurled surface inside a strong circular body that was supposed to grip the stud. Unfortunately it needed about a half turn to get a good grip, by which time the body of the tool was up against the timing chest.

Time for a search on the internet. Less than 15 minutes later I had located a device that looked like a big sturdy version of a drill chuck. This seemed to be the tool for the job so next morning I set off to the local Machine Mart to get one.

The photo alongside shows the device mounted onto the stud. It clamps on like a drill chuck, and is designed to be used with an impact wrench, although it could be used with a ½" square drive ratchet or breaker bar. Turning the black hexagon shaped part anticlockwise tightens the jaws, chuck fashion, onto the stud, the more it is turned the tighter the grip and the teeth inside the jaws bite into the stud. The teeth produce longitudinal marks that can be seen below, it is these that grip the stud tightly.

Setting it to run anticlockwise the impact wrench screwed the remainder of the stud out of its hole in about 15 seconds, the length of time showing how tightly it was held by the rust of the ages. It is possible to use a½" drive bar but this might not be as easy as using an impact wrench, unless you have a very long one and the space to manoeuvre it.

I can honestly recommend this tool as being something that works exceptionally well, it was made by Laser Tools www.lasertools.co.uk and is called the ½" D. It will remove studs from 6mm-12mm (1/4" – ½") diameter. It can also be used to remove rounded or rusted nuts with external dimensions similar to the stud diameter, such as those with hexagon heads from ¼" AF to ½" AF or 6mm to 12mm AF. I bought mine from the Machine Mart at Great Barr in Birmingham.
https://www.machinemart.co.uk/p/tool-connection-tc3986-impact-stud-extractor/

At £21.59 it was worth every penny.

534

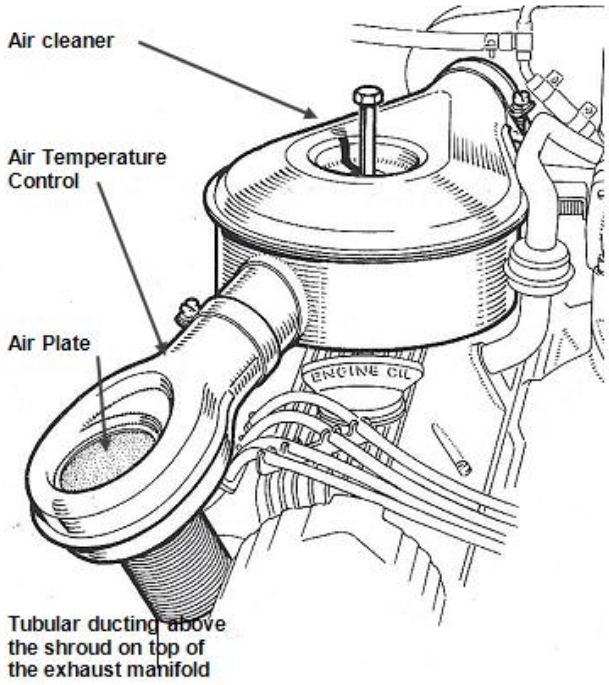
Replacement ducting above the hot air shrouds

Angus Munro purchased a good Condition 1 MGBGTV8 in 2017 and later, whilst working through various maintenance items, decided he would have to replace the ducting above the hot air shrouds on the "Lobster Claws" attached to the air cleaners. The shrouds are located just above the exhaust manifolds. In his post on the V8 Bulletin Board he mentioned that he had found that Brown & Gammons have them listed as BHH1297 (right) and BHH1298 (left) but marked as "No longer available". (Jan18)

Angus Munro added that "searching other websites had unfortunately produced similar result. As the shrouds are soft and vulnerable items close to the exhaust manifolds I would have thought there would be a market for them as a maintenance item. Has any member found a supplier?"

Tony Lake responded saying "I recall looking at the Revotec website some time ago when digging into cooling fans for the MGBGTV8 and see they have a flexible aluminium ducting listed on their website in 1m lengths at very nearly the right outside diameter – 51mm v 50mm – that I have measured on my old air cleaner parts on the shelf. Given the relatively fragile nature of the ducting, having a slip fit rather than a force fit might not be such a bad arrangement." The Revotec website is at: http://www.revotec.com

Angus Munro was delighted with that tip and promptly contacted Revotec and ordered a length of the ducting at £24.54 including VAT and Next Day delivery. He posted a brief note saying "I can confirm that it fits the Lobster Claw (Air Temperature Control Assembly) absolutely perfectly. It was an excellent tip which will also be a great help for other MGBGTV8 enthusiasts looking for the NLA part. Thank you, I am most grateful to you."



What does the Air Temperature Control Assembly do?

It has a bimetal plate in the circular opening in the top of the assembly, the Air Plate, which closes when the engine is cold thereby drawing air from over the exhaust manifold into the air cleaner and onwards to the carburettors. As the manifold warms up fairly rapidly, the air drawn into the assembly and onwards to the carburettors and combustion becomes warmer than the ambient air thereby assisting the engine reaching a smooth running state from a cold start. Once the engine bay reaches operational temperatures the bimetal plate moves to open the circular Air Plate allowing the air intake to be taken from the general underbonnet area.

Part numbers

In an earlier MGBGTV8 parts list from Moss Europe, the parts are described as follows:

BHH1163	Air Temperature Control Assembly	
BHH1255	Connector – shroud to air temperature control	

The Brown & Gammons website lists them as:

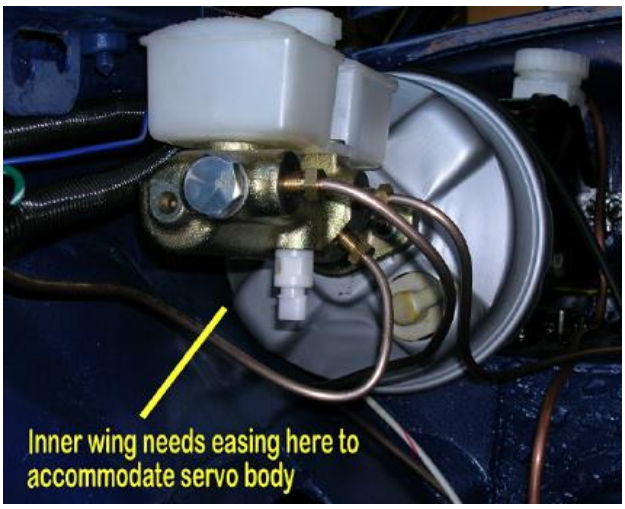
BHH1297	Hot air shroud (left)	Currently NLA
BHH1298	Hot air shroud (right)	Currently NLA

535

Fitting a dual circuit brake servo to an MGBGTV8 conversion

As part of the conversion of his MGBGT to V8 specification in 2008, Mike Howlett fitted dual circuit brakes to a1969 chrome bumper MGBGT using the In-line Master Cylinder and Servo. Here Mike describes the job. (Jan 18)

My car is a 1969 GT that I bought as a complete wreck five and a half years ago with the express intention of making my own MGBV8. The inspiration for the conversion was Geoff King's V8 Roadster which I rode in shortly after it was completed. Family and work commitments have meant that progress has been slow, but I retired in April 2008 and so work has speeded up, with all the bodywork completed and a Hoyle suspension upgrade fitted. The 3.9 litre engine is nearly rebuilt and I am currently stripping the LT77 gearbox.



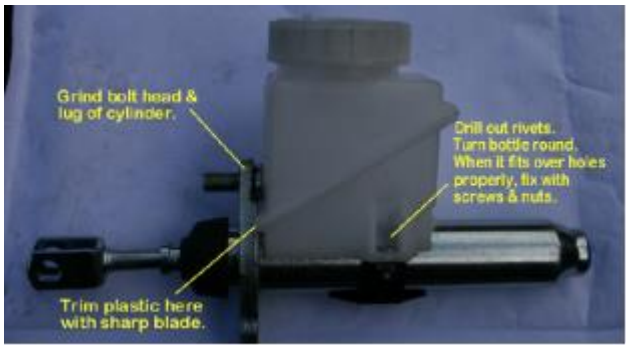
It has always been my intention to upgrade the car wherever possible, and one of the improvements that I decided on early in the planning was to use the late model twin circuit brake master cylinder with a direct acting servo. Accordingly I purchased from Andy Jennings a complete late model pedal box with cylinders, servo and pedals. This cost me £45 in 2006.

I stripped the assembly down, and cleaned and painted the parts. A new brake master cylinder was bought, but for the servo I simply dismantled it, painted the case and reassembled it using a servo repair kit. As the inline servo does not have brake fluid in it, the internal components were in excellent condition. There is an issue with the clutch master cylinder, but I'll come to that later.

Holding the new pedal box up to the car showed that the bolt holes are in the same places, so no extra drilling would be required for them. However, the brake pedal is hung in a slightly different way and fouls on the rear of the original square aperture. I extended the aperture rearwards by 30mm to give clearance (see photo).

Bolting the servo to the pedal box and offering it up showed that there was a small area of conflict with the servo body and the inner wing. A little dressing with a hammer soon gave sufficient clearance (see photo).

When I was finally ready to fit the pedal box I found that both pedals together will not go through the aperture from the top. On the bench I removed the clutch pedal, bolted the servo on the box and connected it to the brake pedal. I bolted the clutch master cylinder to the back of the box. Then I manoeuvred the brake pedal through the hole, fiddled the rubber gaskets in place under the box and bolted it down. This was a bit awkward as some of the bolts are in the narrow gap between the pedal box and the inner wing. Then I introduced the clutch pedal from beneath. You can either use an assistant to push it up, or haul it up on a piece of wire as I did. I bolted the clutch pedal in place and connected it to its master cylinder.



The brake master cylinder bolts on the front of the servo and fits under the bonnet line nicely. I found that on my car, the manual bonnet prop did not get in the way. If you have a telescopic prop, you might have to move it to the left side of the car as the factory did.

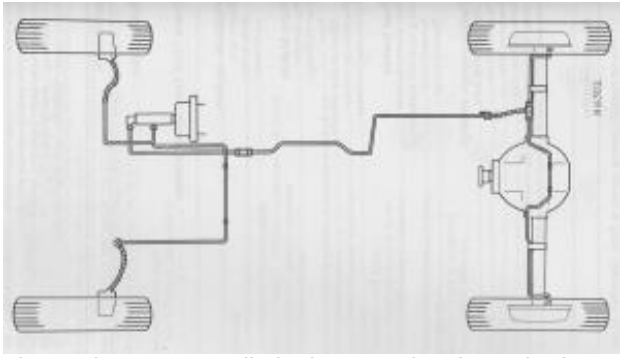
The cylinder has three outlets, two in the first stage and one in the second stage. I connected the two front brakes to the twinned outlets, and the rear brakes to the second stage outlet. This way if one circuit fails I should still have either front or rear brakes working (see photo).

There is a circuit failure switch incorporated in the master cylinder – it's the white object you can see beneath the cylinder. It is up to you whether you connect this up. Personally I reckon you would instantly know that a circuit had failed by the feel of the pedal, so I haven't bothered.

This pedal box also has a mechanical stop light switch actuated by the brake pedal. Again you can decide whether you want to use this or continue with the hydraulic item, if that is what your car has fitted as standard. The pedal switch needs to be adjusted to make sure it doesn't prevent the pedal from returning fully to its rest position. Details are in MGB workshop manuals.

Now the clutch master cylinder. If you have a serviceable cylinder with a metal reservoir, then use it. It will bolt straight in. If you go to any of the usual suppliers and buy a new V8 brake master cylinder, you will be sold part no. GMC1011. This has a plastic reservoir. If you bolt this onto the dual circuit pedal box, you will find that it is too tall to go inside the recess on the bulkhead (see photo). Metal reservoir cylinders are no longer available it seems and my supplier seemed non-plussed when I said it didn't fit. I assume it works on the earlier style pedal box.

Andrew Harrison gave me the idea for overcoming this problem. Basically you need to detach the reservoir from the cylinder by drilling out the rivets, rotate it through 180o and re-fix it using small nuts and bolts. It is necessary to cut away a little of the plastic moulding on the reservoir, and also to grind down the bolt head and the lug on the cylinder. Hopefully the picture describes the work. It shows the reservoir turned round and re-fixed after the mods have been done.



The tandem master cylinder has two chambers: the front chamber feeds the rear brakes with a single pipe. Rear chamber feeds the front brakes with two pipes, one to the right and the other to the left.

Having done that the reservoir will now sit in front of the recess. The hydraulic connections to the cylinder can be reached through the hole in the bulkhead that is normally filled with the large rubber grommet.

See also V8NOTE535 online.

536

Fitting replacement ducting to the hot air shrouds

As a sequel to V8NOTE534, Angus Munro has provided some photos of the replacement ducting which indicates the care needed when cutting the ducting. Here he explains. (Jan 18)

Initially he thought that the coils might contain thin wire that would make trimming difficult. In fact the 'threads' are simply formed shapes and are simply cut with scissors. Although neat it is impossible to get a perfect end finish but this does not matter as the duct when fitted looks very good anyway.

Cutting the ducting needs care. Angus Munro explains that his first cut of the ducting to the length he needed for a replacement which would fit neatly above the hot air shroud, he followed the valley of the spiral. But he found that he was four 'threads' out. He then found the trick is to

The photo above shows on the left how not to cut the ducting and on the right how to cut the ducting by following the line of masking tape.

The replacement duct looks very neat above the shroud.

Angus Munro purchased a one metre length of ducting but received a length that measured about 600mm. Presumably the idea is you have to stretch or expand the tube to reach the metre. He simply used what he had in the expanded form as he didn't want to allow any opportunity for the ducting to return to an unexpanded state, or length, leaving it loose between the air cleaner above and the hot air shroud below, wrap a length of masking tape around the ducting such that both ends meet, and then make the cut by following the edge of the tape. Surprisingly it makes a fairly neat end finish.

The most difficult part of the job was to refit the air filter – getting the centre bolt that goes through the air cleaner to the bracket below. Angus recalls that with the second one, "as I patiently struggled, my doctor chum popped along to see what I was doing "in overalls." After a moment of explanation he took over and entered the bolt almost right away!"

The **ducting was supplied by Revotec** Ltd, Unit 1 & 5, Henderson House, Hithercroft Road, Wallingford, Oxfordshire OX10 9DG. Tel **01491 824424**. Total net amount, was £24.45 including carriage net of £7.50 and VAT of £4.09. Price in January 2018.

537

Refurbishing the rocker covers

As the paint on the rocker box covers was flaking off and looked awful, Angus Munro decided to have them powder coated by a specialist company. Here he explains.

The specialist Angus Munro chose for the work was Maldon Powder Coating and Shot Blasting. “They did a superb job, flatting the fins to bright aluminium and clearing the threads within the castings. The finish that I chose is called Gritty Black and it has given the same rough finish that the original casting had. Each rocker box was returned in a sealed heavy duty plastic bag to prevent damage. The total price was £156. I would highly recommend this company.”

538

Tip for refitting the thermostat

Angus Munro has a little tip, which he modestly feels is not worthy of a workshop note, but perhaps useful for other members. (Feb 18)

Angus decided to fit a new high flow thermostat and as it sits vertically within a shallow recess at the front of the engine, he found that trying to keep the thermostat within the recess while keeping the gasket and housing together and controlling two CopperEase covered bolts and washers, was just too much for this mere mortal. The solution was to put two dots of Superglue on the thermostat flange, one at the top and one at the bottom. Then, a dot of the glue on the ears of the gasket to the housing, and the job of fitting became simple.

Angus says "a bonus here is that in years to come a future caretaker of the car will have something to talk about in the pub with his chums. You see how considerate I can be?"

Remember V8NOTE501: "fit the thermostat to the housing with the vent pin in the 12 o'clock position - caution, failure to position the thermostat correctly can lead to air locks and overheating".

539

Fitting instructions for Smiths Industries’ supplementary instruments

Keith Belcher was sorting through some stuff and came across a 2" Smiths clock he had bought in 1974/75, well over 40 years ago. Keith says "I have had it in several MGBs but I have refrained from adding it to my MGBGTV8 for originality reasons. With the clock is a set of Smiths Supplementary Instruments fitting instructions, which provide interesting reading, especially for those wanting to fit period instruments. As it might be a useful reference document for fellow MGV8 enthusiasts I attach a copy of the instructions". (Mar 18)

A copy of the instructions is in the “V8NOTES illustrated articles” folder and also available online on the V8 Website.

540

Changing the differential thrust washers

Dugald MacNeill went up to Norfolk recently to visit his old friend Mike Macartney and whilst he was there Mike very kindly offered to help Dugald change the differential thrust washers on his Factory MGBGTV8. The car had been comprehensively restored four years ago by Mike but there had been a back axle clonk for some time and Dugald had been working himself up to fixing it. Dugald took photos during the work and explains how the job was done.

Differential being reassembled

See a copy of Dugald's six page illustrated article available with your set of these notes in the "V8NOTES illustrated articles" folder or online on the V8 Website

A weary Mike Macartney at the end of the job

541

Clip on the damper in an HIF carburettor

Keith Belcher & Nic Houslip

Keith Belcher with MGBGTV8 (Damask 1949) posted a note on the V8BB saying "two different mechanics have told me recently that these retaining clips "are more trouble than they are worth." What do other owners think? (April 2018)

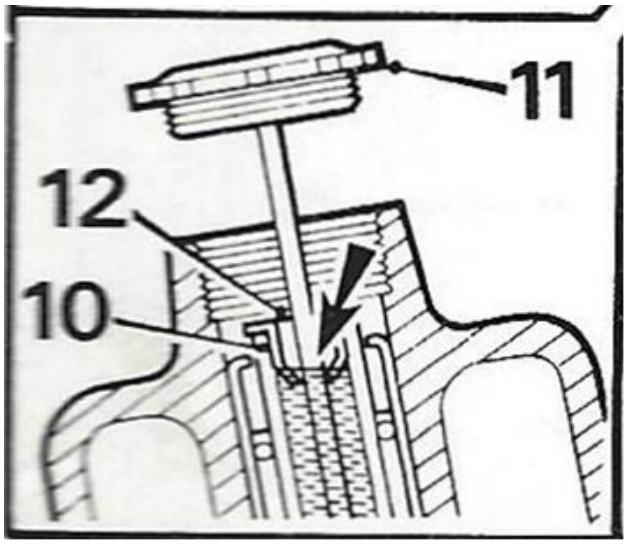
Victor Smith responded saying "I attach a diagram from page 46 of Tuning SU Carburettors 3rd Edition by Speedsport, Feb 1975. It's a useful 128-page A5 size book on tuning SUs I have had for years which provides detailed exploded diagrams of SUs and information on how to dismantle, service them and tune them. The book is mentioned on our "MGBGTV8 Manuals" webpage via the "Technical Support" link on the V8 Website homepage."

Keith Belcher was then in touch and sent **photos illustrating the clip on the damper** on his HIF carburettors which the V8 Webmaster referred to as a "**floral clip**". It seems this clip was fitted to the HIF carburettors fitted on the MGBGTV8 model.

Nic Houslip then contacted Burlen (who took over the SU carburettor activities) with the aim of getting some authoritative information on the "floral clip" so that is clear an illustrated V8NOTE could be produced to explain the matter with Burlen's information.

Keith Belcher later mentioned "quite why these clips are fitted is a mystery to me. My research shows that few rods were fitted with them. They are seen on some late Minis, possibly late Midgets and Austin/Morris 1300s. I have only once ever had a dash rod come loose, on a 1967 1275 Sprite, but I was fairly sure it hadn't been tightened properly. The only reasons I can think of as a reason for them on an MGBGTV8 could be that the closeness of the damper to the bonnet? Were they worried if one came loose it might get wedged causing the throttle to stick? Or perhaps that to lose one they might fall into the engine valley and be almost impossible to recover. I have a couple of washers and a new throttle spring there. Since being recommissioned in 2014, my car (Damask1949) has rarely had a constant tick-over. After a complete dismantle with required new bits the fitter could not get the emissions right and fuel consumption was heavy. However after a visit to Aldons in October 2016 this was rectified. Rest assured I have checked everything on the website. It has always been between 900 and 1200 rpm, rising when warm. I was resigned to put up with it as just an old cars foible.

However I have had a few instances when the throttle seems to stick on, or there is rough running with lumpy pick up, accompanied by a rise in engine temperature. It would go away after leaving it to cool for 15 minutes or so. When this happened at the Classic Car Weekly photoshoot I attended in July 2017, I noticed a clip had come dislodged. They are difficult to re insert. When this



Item 10 Damper retaining clip, 11 Damper cap and 12 Retaining recess. (Carburettor (HIF) damper topping up, page 58 & 59, MGBGTV8 Driver's Handbook AKD8423 4th Edition)

happened again a couple of weeks ago, on investigation both clips were loose and the rods showed signs of deep scratches. On thinking about it I surmised that one clip was wedging the rod to one side causing the piston to fail to return to the bottom, causing a rise in rpm and the

other carb to run weak, causing the temperature increase.

So I asked two “old school” mechanics and both said the clips were “more trouble than they are worth!” Hence the post on the V8BB. But with no useful replies I took the bull by the horns and snipped the clips off. Over the weekend and today I must have completed over 200 test miles. The tick-over has been a rock steady 900 rpm all the time, even on a long run when it was very warm. The tickover was steady even when throttle off free-wheeling at speed. It might be too early to say that I have sorted my problem, but I must say that initial findings are looking good. The clips were very easy to snip off,”

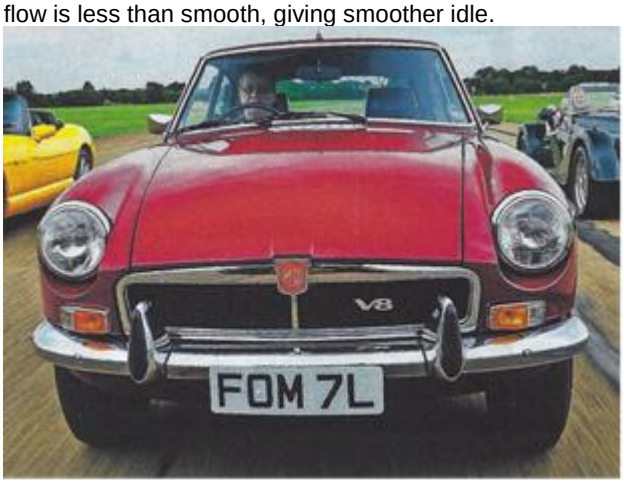
Burlen responded to Nic Houslip’s query saying “the clip was introduced to stop the damper being lost if the cap (11) became unscrewed. The later damper caps have quite short lengths of thread. It also stops the piston falling out of the suction chamber if that is removed”.

On receiving the clarification from Burlen, **Nic Houslip** said “I would think it quite safe to recommend that people remove them (the clips on the floral clip) if they want to. I do not recall ever seeing a damper coming loose, but I suppose it could. A useful caution for fellow members is “make sure they keep the damper caps tight”.

What does the damper do in the SU HIF carburettor?

Whether or not an MGBGTV8 is fitted with the “floral” clip on its HIFs depends on the age of your carburettors, because it seems the clip was introduced at an unspecified date to prevent loss of the damper rod if the cap should work loose by vibration, or perhaps from a failure to tighten it correctly. Before discussing the clip and its removal Nic Houslip feels it’s worth understanding what the damper does.

The piston in the SU HIF carburettor controls the size of the fuel orifice by raising and lowering the needle and the size of the air path over the jet where the fuel mixes with the incoming air. The height that the piston rises is controlled by the difference between the air pressures acting on the top of and below the piston. While idling the piston is in its lowest position and as the throttle butterfly is opened the pressure differential raises the piston, increasing fuel flow; but the fuel has greater inertia than the air, so the damper slows the piston’s movement to prevent a “stutter” as you move off from a standstill or low speed. It also “damps” the piston while idling when the air flow is less than smooth, giving smoother idle.



Above: Keith Belcher with his MGBGTV8 at a Classic Car Weekly photoshoot for an article on the Rover V8 engine. Five cars with V8 engines were selected to celebrate the engine’s 50th anniversary in 2017. Photo: CCW

The **floral clip is a friction fit inside the piston rod**. It was added to prevent the damper rod falling out if the cap worked loose, but otherwise contributes nothing to the carburetion, so it can be removed if you take precautions to prevent the damper caps from working loose. My suggestions are to check for tightness regularly, and if wished you can add some mechanical means of securing the cap, wire locking seems a bit OTT, but a strip of Duct Tape over the top and down the sides of the bell chamber, although not pretty will suffice.

Removing the floral clip is simple, a snip with a pair of side cutters will enable you to remove it quickly. If you can spend more time, taking the damper assembly out and removing the tiny circlip at the bottom will allow you to slide the brass damper off and then the clip. The only downside here is that the circlip is very small and may be damaged unless care is taken when removing and replacing it.

Keith Belcher reported at MGLive! 2018 that “the car has done over 1000 miles of testing and the rough running, fast idling and temperature symptoms have now all gone”.

542

Basic windscreen wiper maintenance

Nic Houslip says as "Summer is here, a useful tip is to check the condition of your wiper blades. After a winter long lay-up they can become distorted by the pressure that the arm applies to keep the blade on the screen. Lifting them off when laying up will prevent this. Eventually the blade is pushed down and bent to one side and produces that "screek" noise when you wipe the screen. If the blades are worn or the wiping edge and is not smooth they will not clear the water properly. (Jun 18)

Surprisingly the condition of wiper blades is as important in Summer as in Winter. An English Summer a shower may occur without warning and as your screen will already have a layer of grime and dust from driving on hot roads, when you need to wipe it away, the blades smear the grime across the screen.

Keeping your screen clean and the wiper blades in as near perfect condition is a great contribution to safety. They are not expensive and are easily replaced. Another tip I learned in Norway, where they get a lot of snow in the Winter, eventually the blades build up a greasy layer on them from salt and other road grime, then a quick wipe with a tissue wetted with a small amount of petrol cleans the blade perfectly.

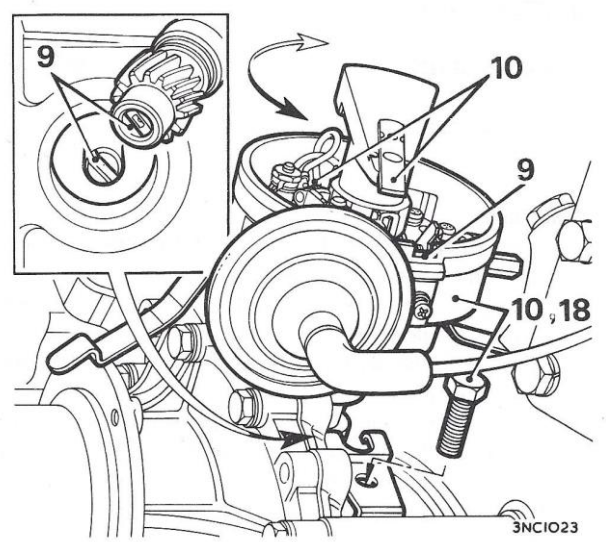
543

Ignition timing – why do we need to advance the spark?

Almost all distributors that we meet have a set of bob weights and springs as well as a vacuum operated advance mechanism, but it may not clear why it is needed. Nic Houslip admits it was somewhat of a mystery to me until he sat down one day and thought about it.

Everyone knows that as engine speed increases the spark must be advanced i.e. occur earlier in the combustion cycle but let’s just think about why. As the mixture is compressed by the rising piston it is ready to be ignited. A spark across the points of the plug will do this very nicely, but the flame that it starts takes a finite, although very small, amount of time to propagate throughout all the compressed mixture. To ensure that the maximum burning rate and gas production occurs, **it is necessary to fire the spark a short while before TDC** so that the resulting build-up of gas pressure can push the piston downwards and turn the crankshaft.

The flame propagation speed can be thought of as being nearly constant, but the engine speed can vary from under 1,000 RPM to, in the case of the V8, a maximum of 6,000 RPM. What this means is that at the lower speed the crank will make one



revolution in 60 milliseconds. For clarity that is 60/1000th of a Second, and later I will use the abbreviation mS to avoid repetition. Now if we speed the engine up to its maximum, that revolution will only take 1000/6000 = 1/6th of the time or only 10 mS

So, you can see that as engine speed increases the spark needs to occur earlier to allow maximum pressure to develop when the piston has just passed TDC. The bob weights are rotated on the distributor spindle and want to fly outwards but are restrained by the springs. As they move outwards they cause the contact breaker cam to move relative to the spindle so that the effect is to open the points slightly earlier. The bob weights and spring selection are critical to giving a correct advance curve, the amount of advance compared to engine speed when plotted on a graph. The springs, bob weights and their pivots must be in good condition. Do not stretch the springs.

If the spark occurs too early the maximum pressure will occur when the piston is approaching TDC and the result is a sudden attempt by the burning gas to slow the piston rising, which causes a knock sound we call “Pinking”. It really ought to be called Pinging, but it has stuck for almost a century now!

If the spark occurs after TDC the cylinder is losing some of the gas pressure that is built up as the piston is accelerated downwards by the crank. Both advanced and retarded sparks sap power from the engine, pinking can damage the piston, even making a hole in it if allowed to continue while retarded sparks cause increased exhaust gas temperature with the possibility of burned exhaust valves or seats.

Having got to the nub of the need for advance and how it changes with speed, let’s now think about the vacuum capsule. Imagine bowling along a nice straight level road at 2,500 RPM, throttle opening will be small and manifold vacuum relatively high, so the vacuum capsule will advance the spark to near maximum. Now you start to climb a hill, so to maintain speed, you increase the throttle opening because you need more power, remember the throttle pedal controls power, not speed, but as you open the throttle the manifold vacuum decreases and the vacuum capsule retards the spark a little. If you applied maximum throttle with the spark advanced the engine would Pink,

Because of the difference between engines the rate at which spark must advance with engine speed might be different, so the bob weights in the distributor and the springs that control them are selected for optimum advance over the speed range. That is clear, but here is an important fact; the bob weight, spring and the vacuum advance capsule are selected by the engine manufacturer to give optimum performance for that engine and in its intended application. A Distributor for a different make of engine will probably not perform as expected, and a distributor from an engine for a light car might not work as well if that same engine were installed in a heavy car.

From this we are aware that **ignition timing is a sensitive issue**, but there are further factors we must include. The fuel used today is very different to that available when the MGBGTV8 was introduced, so your spark timing may not be optimum with today’s fuel. If you changed anything affecting the **intake** (air filters) or **exhaust** (manifolds or silencers) it may again not be optimum. And last, but in no means least, if you changed to an electronic distributor, how do you know that the timing is optimal?

Normally ignition timing is set statically; the old way was with a piece of cigarette paper between the points, but an electronic distributor has no points! OK so you take stab in the dark and set the distributor roughly where you think it should be and with luck the engine will run. Now, by consulting the handbook you look up the data and find that it should be 8 degrees BTDC at 1,000 RPM, so you set it at that with a stroboscope.

But is that figure optimal? Given that there have been changes to the engine and it ancillaries it may not be. Unless you are prepared to spend a large part of the rest of your life with an assistant with a stop watch and time the car’s acceleration in various gears under various conditions which will enable you to adjust the timing by a small increment either way, the only solution is to get it on a rolling road dynamometer. The dynamometer is a device that absorbs the engine power and indicates on a dial or screen how much power the engine is producing. How it does that need not concern us here.

The dynamometer engineer will firstly set the carburetion correctly for optimum combustion, by measuring the exhaust gas constituents under working conditions, then do a maximum power run over the speed range, having noted the figure, adjust the ignition a little more advanced, run again, if power improved make further small adjustments same way to find the sweet spot, if not improved make an adjustment the other way, again to find the sweet spot. It is worth commenting here that if your carburettors have not been serviced or rebuilt for some years, it might be the right time to do this before investing in a dynamometer session.

Ignition timing is much more important in a time when we are concerned about emissions and fuel consumption. Getting it right also makes the car much nicer to drive. For those who are still using an original distributor with contact breaker points, the need for ignition advance doesn’t change, and the bob weighs, springs and vacuum capsule are still needed, you have the advantage of being able to set the timing statically, but because of the changes in fuel over the years and the improvement in air filters and manifolds, you may still need to get the timing checked on a dynamometer.

Contact breaker distributors have another adjustment that electronic distributors do not have, that is also critical, it is called setting the dwell angle or dwell time.

This adjusts the relative position of the contact breaker points and the cam that drives them to set the optimum closed time. Why? The way the coil and condenser work to produce a spark requires that the points are closed for long enough to allow current to flow through the coil to "charge" or build up a large magnetic field inside it. The collapse of this field when the current ceases as the points open allows the coil to discharge through the condenser. Simply put, if the coil does not have time to charge properly, it will not have enough energy to discharge into the condenser to produce a nice fat spark. Because there are 8 cylinders to fire every two revolutions setting the dwell angle is more important on a V8 than on a 4 cylinder, as it maximises the time to charge the coil. Some V8s have in the past used two four-cylinder distributors driven together to maximise the coil charging time.

Interesting thought
Diesel engines are noted for their much higher torque output than petrol engines and do so at lower RPM. Why do they exhibit this characteristic? The burning of petrol air mixture is more like an explosion, very rapid, but the burning of diesel fuel and air is much slower, and the combustion process is producing gas for much longer, maintaining pressure on the piston for longer. Diesels tend to be longer stoke engines to develop the higher compression ratios needed to ignite the fuel, which means the crank is also longer, and the leverage at the crank is greater. But as the combustion is slower diesels must develop their power at much lower RPM.

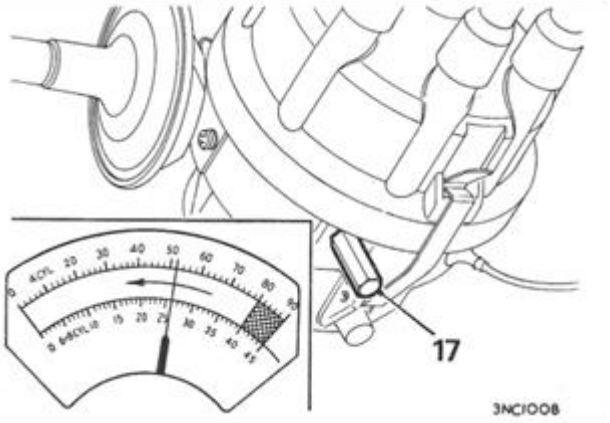


Diagram in the MGBGTV8 Supplement AKD8468 page "Sheet 2 86.35.20" showing the distributor and the convenient external dwell adjustment screw (**17**).

Adjusting the dwell angle
With the original distributor fitted to the Factory MGBGTV8 the dwell angle can be adjusted to 26 to 28 degrees whilst the engine is running using a dwell meter. On the side of the distributor there is a **convenient hexagon headed screw (17)** a on the distributor body – turn clockwise to reduce the dwell angle and anticlockwise to increase it. Simply clip the positive lead of the dwell meter to the negative connector at the base of the coil (that's the low tension lead from the coil to the distributor) and the earth lead of the meter to a suitable earth on the car. With the engine running, the meter will then read the pulses to calculate the dwell angle. The **dwell angle for the V8 engine is between 26 and 28 degrees**.

If you have a dwell meter for a four cylinder engine then you will need to set the dwell on the V8 engine with that meter to show a reading on the meter screen of between 52 and 56 degrees.

Footnotes
TDC or Top Dead Centre is the position of a piston in No 1 cylinder is at its highest point on the compression stroke.
A Millisecond (mS) is a thousandth of a second.
Dwell angle is the amount of time measured in degrees of rotation that contact breakers close in a distributor. For the V8 engine in an MGBGTV8 the **dwell angle is 26 to 28 degrees**. It can be measured with a dwell meter.
Distributor diagram – (**9**) oil pump spindle, (**10**) distributor body, (**18**) securing clamp and external dwell adjustment screw (**17**).

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What oil for the V8 gearbox?
David Halliday enquired "what oil is everyone using in the gearbox of their Factory V8? The manual recommends EP90 in the MGBGTV8 as opposed to the 20w/50 engine oil in 4 cylinder cars and MGCs. My overdrive is being replaced because of an issue with the overdrive clutch. Speaking to Overdrive Spares in Rugby and Overdrive Repair Services in Sheffield, they both recommend using 20w/50 engine oil in an MGBGTV8 gearbox! The suggestion is that the use of EP90 could be what caused my overdrive to give trouble. The late Geoff Allen, the V8 expert, always used EP90 in V8 gearboxes. I would be very interested to hear what others think. The suggestion from the overdrive specialists is that the EP90 can damage the clutch in the overdrive. Of course whatever oil you use, you need to steer well away from anything with friction modifiers in it". (Aug 18)

Peter Beadle responded saying "the BGTV8 overdrive had an uprated relief valve 37H8070 to cope with the EP90 oil (see AKM0039 parts book, page 108-C48.02 item 28).

Bob Owen added "I have always used EP80 or EP90 as recommended originally. As far as I can see nothing has changed to alter the original recommendation. The higher gear loads of the V8 are what presumably caused the change from standard 20/50 engine oil. Note that it should be gear oil not differential/axle oil as the additives are different". EP90 is for temperatures over -10C and EP80 for below -10C which are rarely experienced in the UK.

See a copy of AKM0039 parts book page 108-C48.02 item28 and a copy of the recommended lubricants table in the MGBGTV8 Driver's Handbook, AKD8423. A copies are in the "Manuals" folder with your set of V8NOTES on a Twister memory stick.

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Motorola radio fitting instructions
Peter Beadle found amongst his papers a four page document plus a two page supplement relating to Motorola radio fitting instructions for MGB and MGBGTV8. He says "I never knew I had them - they were left over from my days at University Motors in Epsom. The main document (Fitting instructions) is dated November 1975 and the supplement is dated Sep 1976 (after the end of MGBGTV8 production!). Interestingly the installations are for Mono not Stereo systems". (Nov 18)

A copy of these two Motorola documents is included with sets of V8NOTES – just go to the "Manuals" folder on your Twister memory stick.

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Replacement handbrake cable on an MGBGTV8

Ian Thomson fitted a replacement handbrake cable from one of the usual suppliers and found it was too long and it barely held the vehicle on maximum adjustment. He assumed he had the wrong one but could not find a part number for the correct one for his MGBGTV8 as he kept coming up against the need to know whether his car originally had disk or wire wheels. He sought information on the differences between these cables and whether it is purely the length that is different. (Nov 18)

Peter Beadle responded saying "your MGBGTV8 would have left the Factory with what is called a "Steel Wheel" tube type back axle. If it had Rubber Bumpers originally (from GD2D1-2101 and on) the Original Factory Part Number for the cable should be **BHH1470** or Unipart Part Number **GVC1016**. If it had Chrome Bumpers originally (before GD2D1-2101) the Original Factory Part Number for the cable should be **AHH8450** or Unipart Part Number **GVC1004**. If your car is a conversion then who knows what axle has been used? But if you have the old cable, all is not lost. In 2006 and modified again in August 2009, Michael Grant from Moss USA published a chart with "Supplemental information for handbrake cables" for Moss Europe & Moss USA. This chart should help you find the cable you need. Link

Mike Howlett added "there were only ever two types of rear axle fitted to all MGBs, including variants such as the V8 and the MGC. Early cars had what is known as the **Banjo axle** inherited from the MGA. This axle has the differential housing and axle tubes made in one piece. From the start of GT production in 1965, and fitted to Roadsters during the period up to July 1967, the **Salisbury axle** was used. This has separate tubes for the axle shafts. Since all Factory MGBGTV8s were made after 1972, and since all had bolt on wheels (none had wire wheels), the wider Salisbury tube axle was fitted to all of them, with a 3.07:1 differential".

Peter Beadle referred to the MGB Parts Catalogue AKM0039, pages 108-G42 & G44:

Part No	Hand brake assembly
AHC546	Used prior to BHH538
BHH538	GD2D1 101 to 2100
BHH1377	GD2D1 2100 to 2700
BHH1923	GD2D1 2701 on
	Hand brake cable
AHH8450	GD2D1 101 to 2100
BHH1470	GD2D1 2100 to 2700

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Replacement 5-speed Mazda gearbox in an MGBGTV8

Peter Berry relates his experience with Vitesse Global, the installation of their 5 speed Mazda gearbox, the after-sales service he received and his overall impressions with the new gearbox. After 118,000 miles the original gearbox in his early Factory V8 he has owned for 34 years of its 45 year life, the gearbox started making ominous sounds. All the gears would still engage without difficulty but a sound similar to a bunch of knitting needles rattling was clearly audible, coming up through the gear lever. Of course, nothing can be fully diagnosed without the removal of the gearbox and a partial dismantle. However, the experts around me drove the car and agreed that the end of the gearbox's life time was fast approaching.

So what to do?

The gearbox on the Factory MGBGTV8 is a notoriously weak link as it received very little upgrade from the standard 1800 unit at the time the V8 went into production. Briefly my thought process went along these lines: Do I want to remove the 'box, dismantle it, find the problem, rebuild it (with no guarantee of sourcing all necessary parts, as they become increasingly difficult to find), reinstall it (oh yes, why wouldn't you overhaul the overdrive unit too, while it's out?) and replace the whole lot again, just to reinstate the weak link once more? Yes, it would be faithfully original still, warts and all! Or should I throw caution to the wind and investigate the fitting of the highly acclaimed Vitesse Mazda 5 speed 'box, which is a direct replacement without any modifications, assuming you discount recalibration of the speedometer.

Contacting Vitesse

I called Vitesse and was immediately impressed with their attitude and willingness to explain everything in detail. It seems they really have thought of everything, as no stone has been left unturned in their research and development into making the Mazda 'box highly compatible with the MGB–both the 1800, or V8 powered models or even an MGA. They indicated they could do the job in two weeks' time so I booked it in. The 130 mile drive to Hinckley, near Leicester was completed without incident –but still with the knitting needle effect–and an AA Relay card in my pocket. Vitesse were very welcoming, serving up a coffee and taking me on a tour of their not inconsiderable facilities. They supply Caterham and Morgan with gearboxes at an industrial level. I was also offered a drive in their 4.0 litre MGBV8 demonstrator, and although I'd already committed to the conversion at this stage, their demonstrator only served to confirm what I already knew. I was convinced before I was into third gear! It really is that good.

What was the car like on collection?

Two weeks later the car was ready for collection. The outsourced speedo recalibration took the time, not the basic work of replacing the gearbox. So I collected the car and set off back down the M1 with the nicest gear change I had experienced in a long time. All went extremely well until the lower reaches of the M1 and the M25, when queues of traffic meant that progress was stop/start for several miles -typical M25 conditions. A knock was developing with the engine at idle. It sounded like part of the exhaust was fouling with the bodywork. I arrived home without incident, but still with the 'knock' when at rest and I called Vitesse the next day. They reassured me they would find the problem and fix it, so I sent them a short video with the bonnet up and the engine at idle. The noise was self-evident but not easily traceable, as all potential problem areas showed plenty of clearance between the exhaust and the bodywork.

Vitesse decided to send their engineer to my home to identify the cause and either fix it on the spot, or trailer the car back up to Hinckley, for further diagnosis. Now, many years ago, I fitted an engine stabiliser bar between the nearside inner wing and the engine. This was to prevent the common problem of the offside cast iron exhaust manifold knocking against the steering column under acceleration. This had been known to crack manifolds in some cases, so the fitting of the bar eliminated the problem. Some years later I fitted tubular manifolds for improved breathing, thus increasing the

clearance issue considerably but the stabiliser bar remained. Chris from Vitesse felt the problem was here and on removal of the bar, the knock was gone. The cause was friction between a small collar on the bar which passed through a hole on the inner wing. It was "squeaking" back and forth as the engine rocked slightly at idle. Amplification from the body panels resulted in the man with a thousand hammers! So problem solved and all was once again well. Vitesse even came along with a shorter gear leaver and fitted it as the original Mazda item was around 40mm too long. I cannot fault the after-sales service, it was exemplary.

So what is it like to drive?
I can only say it has transformed the car. The ratios are very similar to the original gearbox but with slightly improved spacing between second and third. The addition of a fifth gear (as opposed to overdrive on third and fourth, which is gone forever, which is a shame) is a joy and frankly, is far more intuitive with today's motoring. Some will decry this remark but personally I think it adds, rather than detracts to the character of the car.

The gear change is positive, without being clunky and the clutch feels very similar to the original item, so no change there. One nice touch is that the bleed nipple is at the end of a long hydraulic hose, which terminates in the engine bay, adjacent to the master cylinder. So no more grovelling under the car to bleed the clutch –not that I'm expecting to do that any time soon. Oil type is SAE 75W-90 and the capacity is 2.0L. The shift control case, which houses the gear lever and has its own separate oil bath, holds a further 290-330ml. And here's the best bit though; the service interval is 5 years or 62,500 miles (100,000 km) so it really is a case of fit and forget. Apart from the significant cost (the kit at £2,525 and installation at a reasonable £450, both plus VAT), the decision to fit this gearbox was a no-brainer. These cars are for driving and I've just future-proofed that experience by some margin.

Sold the original gearbox
I have since sold my old gearbox to a fellow V8 Register member for a nominal sum. He intends to rebuild it to replace the ailing box in his immaculate Factory V8. A further member is also in line to receive that old box to perform a similar operation on his car. How's that for sustainability! Further information and fitting instructions is on the Vitesse website at: https://www.vitesse-ltd.com/ .

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Radiator options for an MGBV8 Conversion

Chris Bound has been looking at his standard 1977 BGT radiator and wondering whether he can keep it once he has done his V8 conversion. He feels it seems to be much bigger than the ones fitted to the earlier models and not very different from the aftermarket items available for MGV8s. Apart from the hose outlets being at opposite ends and aligned differently, it's hard to see much difference. He says "I fully understand the need to uprate the early models, but would my late-model MGB radiator (with the addition of a pair of decent electric fans) have any chance of coping with the heat output from a 3.9 EFi V8? I'm not planning any track use, just normal on the road motoring.

Mike Howlett, with an MGBGTV8 Conversion with an EFi engine, responded saying "the simple answer is I don't know but what I do know is that the amount of heat from a 3.9 injected V8 is enormous. I started off with an aluminium radiator from Cambridge Motorsports, but I had so much trouble with radiator leaks that I gave up on them in the end. I now have one of Clive Wheatley's uprated V8 radiators and on hot days it barely copes. The fans run almost continuously below 40 mph and once when in France with shade temperatures about 36 C, the water temperature gauge went right round the scale and into the oil pressure zone. I think the primary problem is that there is no easy escape for the hot air from the engine bay. The V8 radiator is taller than the standard one and comes right down behind the vents in the valance. Is yours like that?"

Peter Beadle responded saying "I would "Bite the Bullet" and follow the Gordon Hesketh-Jones route of fitting a 4 core Radiator he described in his V8NOTE399. I believe GM Radiators could easily rework your top and bottom tanks to the V8 specification. If your cooling fan Otter switch is going to be mounted on the inlet manifold as on Factory MGBGTV8s you will need to block off the redundant MGB top tank hole. If you are planning to mount the switch in the top tank, I suggest you use a threaded switch and have a matching threaded collar/nut brazed into the side of the top tank.

Be careful of the aluminium radiators coming in from China as most do not have the three correct imperial (unf) captive nuts attached to both side mounting brackets. You will either find metric nuts or be just left as bare holes! Sometimes, the holes are even machined in the wrong place. Yet more problems to challenge your engineering skills".

Nic Houslip mentioned "**radiator would be better called a heat exchanger**, since it exchanges heat from the coolant to the passing air, more by conduction than by radiation. The determining factors are the conductivity of the metal from which the tubes are made and the surface area of the tube in contact with the coolant on the inside and the surface area presented to the passing air. Aluminium is a good conductor of heat but copper is twice as good as aluminium. The manufacture of the tubes and getting the fins (that increase the surface area presented to the air) fitted to the tubes has improved greatly over the last 40 years or so, fortunately a radiator specialist can replace the core of the radiator (the core is the assembly of tubes) with more modern ones. They do this by taking the whole radiator apart and then re-soldering the whole assembly. It comes out as good as a new one. Two Revotec fans would be great upgrade too. The old radiator might have a resale value to someone who was prepared to have it cleaned and re-cored".

Nic Houslip added "V8 cooling is a complex issue, but it is vital that everything on the engine is correct, ignition timing and mixture, as these can make a big difference to the heat produced. As a rough guide the heat produced is about twice the power output of the engine (in kWatts). A 190 BHP engine (~250 kW) therefore will produce about 500 KW when on full power. Of course it only produces a much smaller amount at low (typical driving) power levels. Check thermostat is opening fully-it only controls the warm up time, not the engine operating temperature. If you drop it in a pan of boiling water, it should open rapidly. If in doubt replace it. A standard radiator should be OK but if you have a doubt run down to local radiator man and have it re-cored with more modern and more efficient cores–the cost will be about £100 or so.

Peter Beadle provided some information from his visit to the NEC Classic Car Show on Friday 9th Nov 2018 when he came across Coolex Heat Transfer Ltd in Hall 4 Stand 433. See their website. They are Nottingham based at NG5 6HP. The salesman said they can easily take your old 1976-on MGB radiator case, including top & bottom tanks, rework them to V8 spec and add a new

uprated core for £220 plus VAT. Or they can supply a new English made imperial threaded Alloy V8 radiator outright for £300 plus VAT. They had an impressive display of product at the show which included samples of both types of radiator". David Terry added "I can vouch for Coolex as they did some work on my RV8 radiator last year and I was very impressed by their quality of work and their price".

Victor Smith has been in touch with Clive Wheatley mgv8parts who offer a high efficiency radiator for MGBGTV8s and MGBV8 Conversions produced by a skilled specialist in the West Midlands on an exchange basis (£279.50) or outright (£391.00)including VAT. The uprated radiators have the cores in diagonal vertical rows rather than with each core behind each other, which increases the surface area of the cores in contact with the airstream thereby contributing to at least a 25% improvement in cooling. They also supply similarly uprated radiators for the RV8.

Overheating and cooling concerns with MGBGTV8s and RV8s. They are a regular topic for MGV8 enthusiasts so there is plenty of information available. Note& Further information & radiator upgrade project and also slides from a presentation at the V8 Technical Day in 2013. Slides

Sourcing and fitting an upgraded aluminium radiator
An article contributed by Graham Cornford. Article

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How did a Factory MGBGTV8 cope with high ambient temperatures in Spain & Portugal?

When Andrew Collins first started making plans to join the Club's European Event of the Year in Portugal in 2019, his planned route added up to about 1,500 miles in Spain and Portugal in July and August. He thought about engine cooling, and decided that at the least he needed some way of accurately knowing the temperature of coolant leaving the engine. To provide this information he bought a small CD temperature monitor which attached to a remote sensor element. The sensor element is housed in a stainless tube, 4mm in diameter and about 15mm long. He drilled a 4mm hole in the V8 thermostat housing and fitted the sensor. The LCD monitor was fitted in the centre console inside the car.

Here he describes his preparations and the information the sensor provided on how his MGBGTV8 coped with the very hot conditions. (Aug 17)

What did the sensor show?
It was quickly established that the thermostat was opening at 82C, and the Otter switch was putting the fans on at 92C –in both cases the correct temperatures. So far, so much as per the vehicle specification. Having temperature readout in the car is an interesting diversion, but subsequently it became a source of reassurance.

Preparations before setting off
Before setting off for Spain and Portugal I removed the cylinder heads to check the coolant passages and of course new gaskets were fitted. The coolant passages were in excellent condition. The **coolant used is 50:50 ethylene glycol (blue) antifreeze and deionised water**. At 15psi above normal atmospheric pressure this has a boiling point of about 129C.

I decided that a coolant temperature in the eighties would be absolutely normal and no cause for concern. In the nineties I would also be content, but over 100 degrees would require monitoring and a prompt decision about how to get the temperature down. If the temperature ever exceeded 110 degrees I would be looking for some remedy immediately.

It may be stating the obvious, but the radiator loses heat because of the temperature difference between the coolant inside the radiator and the air outside it. All other things being equal, if the ambient temperature increases then the temperature of coolant inside the radiator must also increase to provide the same heat loss.

With all this in mind, coolant level and oil level were checked before driving off the ferry at Bilbao. Ahead was a motorway run

Features of the route
As is well known, much of central Spain is on a plateau at an altitude of 2000 feet or more. About 40 miles into our journey, the motorway started climbing and ahead it was clear that there was a long haul upward. Maintaining about 80mph required a fairly high power setting, and the coolant temperature began to increase. The ambient temperature at this point was about 35C –Spain and Portugal were experiencing a heatwave. The road climbed to about 3,000 feet altitude, and the coolant temperature passed 100C. There was a little more climbing to do and the coolant temperature peaked at 105C at the summit at 3,200 feet. Normal oil pressure was still maintained, and I continued to our destination for that day.

A week later in Portugal we were on a similar stretch of motorway –ambient temperature between 35C and 40C, a steady climb at more than 70 mph to a maximum altitude of 3,200feet. This time the coolant temperature reached 108C, again with normal oil pressure and no indication that the coolant temperature would climb any higher.

At 3,200 feet, standard atmospheric pressure is 13.1 psi, not the 14.7 psi at sea level. Thus a 15 psi radiator cap will vent at an absolute pressure of 28.1 psi at altitude, and at this pressure the boiling point of a 50:50coolant mixture will be about 128 degrees – not a huge difference from the sea-level boiling point. However, the reduced air density will reduce the rate at which heat is taken away from the radiator. On the other hand, the reduced air density will also reduce the available engine power output and thus the cooling demand.

I have **often heard the assertion that "the V8 cooling system is marginal". After the run in Spain and**

Portugal I don't agree. The cooling system on our car is totally standard, but in good order throughout. The radiator flows well, the coolant pump works properly, the pressure cap works, the fans work, the thermostat is correct, the coolant passages in the engine are clear and the coolant is a 50:50 mix. After the experience of a fortnight which included a good deal of 'hot and high' driving, I cannot see the need for holes in the bonnet, waterless coolant, baffles around the radiator etc.

My observations

At a road speed of 50 mph or more, I doubt that the fans contribute much to cooling the radiator and at these speeds whether the fans are running or not is probably irrelevant.

Water is a better coolant than water/ethylene glycol mixtures. Ethylene glycol has a lower specific heat than water, and at sensible concentrations (50% ethylene glycol or less) the ethylene glycol does not contribute much to raising the boiling point of the coolant. However, it is probably unwise to run on 100% water because the addition of antifreeze provides some anti-corrosion protection and also some lubrication for the coolant pump.

The temperature of coolant leaving the engine appeared to be the same whether or not the heater was on.

A key component in managing high temperatures is the pressure cap. Oil is also a part of the engine cooling equation. Make sure that the oil quantity is correct and that the chosen oil brand will still perform at elevated temperature

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Waterless coolant concerns

Chris Danner sought advice or information on replacing the standard antifreeze/water coolant in an MGBGTV8 with the waterless type? Here we have some useful information and views on waterless coolants in an MGV8.

Chris Danner said "since I keep my car inside for most of the winter months and especially out of the wet with only the occasional engine run or a drive out on the road if it's dry, I was considering relenting to the sales pitch from the various waterless coolant adverts-no corrosion and water pump damage!" He welcomed any insights or advice from fellow members.

Victor Smith responded saying "waterless coolants is a topic like Marmite -you either believe in it and the claimed benefits and accept the comparatively high price of waterless coolants or you are happy to stay with a less expensive and simpler water and glycol mix. I believe Evans is the sole supplier in the UK and their website sets out their case for its benefits and use.

As experienced qualified engineers, Nic Houslip and Tony Lake are able to provide their views and outline any benefits. If you type in "waterless coolant" in the search box on the V8 Website homepage very few links are there but one note – V8NOTE549 – with Andrew Collins providing his view that a waterless coolant is not necessary from his experience of driving to Portugal in his MGBGTV8".

Victor Smith adds that if you do decide to stay with a water and glycol mix then it will be worth reading a note linked to V8NOTE413.and note with concerns with antifreeze.

Tony Lake noted "it's not so much what a waterless coolant supplier might say as what is not said. The incontrovertible fact is that the coolant in any engine that changes to a waterless coolant will run hotter than compared with a 50/50 antifreeze/water mix and even hotter than with de-ionised water and a corrosion inhibitor. Raw water has the best heat transfer properties. The reasons are twofold; firstly, the specific heat of their mixture is about 0.58 Btu/lb/degF vs 0.865 Btu/lb/degF for a conventional mixture that contains water. Secondly their mixture is more viscous so there is some flow loss at the water pump as well. Those two factors combine to change the coolant operating temperatures across the engine. That only makes a V8enginerun hotter than it was originally designed to achieve. On a like for like day the heat rejection from the engine to the waterless coolant will not change but the "coolant out" temperature will increase and all the hot components will just get a bit hotter until a new equilibrium is reached. Typically a radiator will cool the coolant by 10 degF, give or take, that doesn't change because a waterless coolant is used, a higher coolant inlet temperature will be the result as equilibrium is reached. There is some recognition of this in one of the waterless coolant supplier's older blurb where they say that engine designers when provided with their technical specification often come back to say that a larger radiator is now required to achieve the correct operating temperatures. They rebut that by saying that it is an incorrect assumption that water based coolants actually behave as a fluid all the time, they argue that water vapour is present around hot spots, spark plug, exhaust valve, which does not occur with their waterless coolant because of its high boiling point, therefore no risk of pinking or detonation. Not a bad argument but my MGBGTV8 engine will pink at will on 95 octane. When I use 97 octane it is very smooth, the coolant temperatures are the same so I'm not convinced that the all alloy V8 is at any risk from coolant boiling .I expect many high performance iron engines are at risk and that is probably where a waterless coolant might score".

Victor Smith looked into the cost of a change to waterless coolant using the information available on the Moss Europe website in November 2018. With a coolant capacity on an MGBGTV8 of 9.1 litres (16 pints) the cost is around £170. You will need sufficient special "Prep fluid" (7 litres as they say you must have a minimum of 75% of the coolant volume) at £50 to help flush out the water based coolant and then two 5 litre containers of waterless coolant at £120 to refill the system".

Nic Houslip commented "it's really helpful to have Tony's in depth explanation too. I'm always surprised that people think that the design of the MGBGTV8 cooling system was lacking, yet I am quite certain that the engineers at MG/BL would have made the calculations based on facts similar to Tony's and then tested their design under all the climatic conditions that the car might encounter in the markets it was to be sold into. On that basis I think we can say if it is overheating-for example boiling over-then something is wrong, which must be investigated before investing in shiny aluminium radiator upgrades or indeed a waterless coolant.

An alloy radiator or EWC might mask the symptoms but the problem is still there. It is important to understand that humans are not good at "measuring" temperature, we are able to tell something is hot, but to discriminate between a large lump of metal at 99C or 120C is beyond our capabilities yet that is what we would need to be able to do to decide if a V8 was overheating. Because the V8 is rather a big lump in a small container, there will inevitably be heat dissipation problems.

To be honest the original V8 electric fans are pretty puny compared to the larger fans available today that are also much more efficient. If you are less concerned with originality and more with practicality, this might be a very easy modification. Keeping the old fans in a box in the

garage to hand to a new owner would also be a nice idea, especially if the new owner was an originality buff".

Other options to consider with cooling a V8
Victor Smith mentioned "there is another item worth checking, or even replacing on a preventative basis, and that is the **pressure cap on the expansion tank**. As that component ages, it can begin to fail to maintain the correct pressure on the water based coolant which will also contribute to overheating. A replacement cap is around a fiver so is not a life threatening investment. There are a couple of V8NOTES on this -just type "pressure cap" into the search box on the V8 website homepage.

The other modification I have had for some years is a **manual override switch** which enables me to turn the twin cooling fans on before the thermostat clicks in. It's a very easy modification to do. Just type in V8NOTE389. The switch is useful if you want to anticipate a heat build-up - for example coming off the M4 onto the elevated road leading to the Chiswick Roundabout in West London where often the traffic slows from 60mph to well below 40mph or lower if there is a queue".

Concerns with antifreeze
See our useful note on concerns with antifreeze for classic cars. More

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