totally t type 2

ISSUE 43 - AUGUST 2017

The bimonthly magazine of the MG 'T' SOCIETY LIMITED

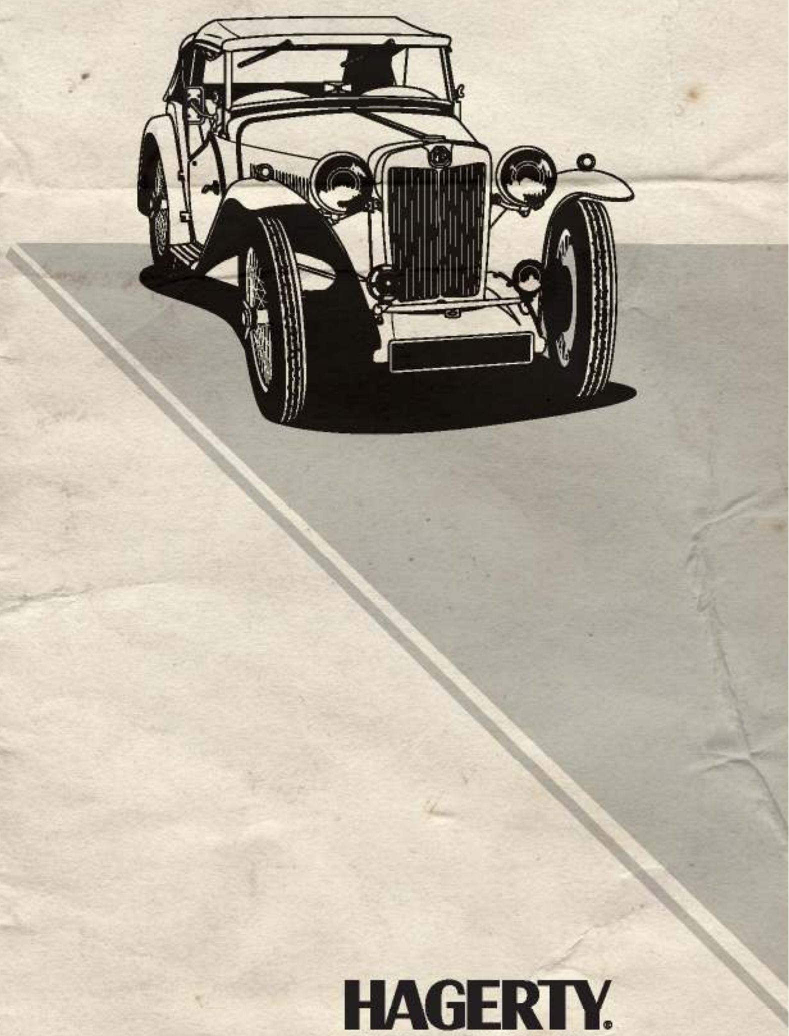
CLASSIC CAR INSURANCE?

THE HARD WAY

- [ ] Ring an insurance broker that's not Hagerty. Spend half an hour explaining why your classic isn't just "an old banger".
- [ ] Politely decline home, pet and travel insurance. Patiently explain that you only need agreed value classic car insurance. To get off the phone, promise to get a quote for your home "in the near future".
- [ ] Go out to the garage, pull off your car's cover, snap several photographs. Email photos but hear back that "the photos are too dark" or "we need six and you only sent five".
- [ ] Cough up a £15-50 "certification" fee, on top of your policy premium.
- [ ] Wait on hold half an hour while their staff reviews the information. Lose the connection. Ring back, get transferred to three wrong departments. Get put on hold again.
- [ ] The Agreed Value certification finally arrives. You begin looking forward to repeating the entire tedious, maddening process, fee included, if you want to increase your value again.

THE EASY WAY

- [ ] **Call Hagerty. 0333 323 1383.**
- [ ] Go for a relaxing drive.



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THE EDITOR John James

Welcome to Issue 43, August 2017!

“Volvo calls time on combustion engine with pledge to electrify all cars by 2019.” was the headline in a recent *Financial Times* (Business section) issue. Coming as it does on the back of the editorial in the June TTT 2, it’s all getting a bit scary. There seems to be a headlong rush to switch (sorry, couldn’t think of another word!) to electric vehicles and none of the manufacturers appear to want to be left behind.

Volvo is owned by Geely, the Chinese carmaker, so it is not hard to see where the impetus is coming from as China is already the world leader in pure-electric vehicles with a reported 265,000 sold in its home market last year. It has been suggested that the Volvo agenda may put pressure on Tesla, the US electric start-up, whose market capitalisation has soared recently.

Predictably, there’s always a whiff of sensationalism about newspaper headlines, for when you read the above article, it states that after 2019 there will still be Volvo cars made with a small petrol engine …… with a large battery. But change is definitely coming with Jaguar saying that its all-electric five-seater sports car, the I-Pace, is to go on sale next year and Audi and Mercedes-Benz vowing to begin selling electrics from 2019.

Is it too much to hope that the price of petrol will plummet as the world will be awash with the stuff? I hardly think so!

The arrangements for the 5th Totally T-Type 2 Tour (Tour of West Sussex and East Hampshire) which is being held from the 18th to 20th August are bang on schedule with the rally plates now prepared, courtesy of the combined efforts of Peter Cole in his ‘Bognor Regis design studio’ and Brian Rainbow in his ‘Harbury workshop’.

It looks as though we are going to have a record entry of around 50 cars with guests from Australia and France joining us.

The copy for the road books is shortly being sent to Hagerty International Classic Car Insurance and I must thank this company and NTG Motor Services, who have sponsored the road books and the rally plates for this tour and for the last four. We really do value their support.

Looking ahead to 2018, the MG Octagon Car Club ‘Founders Weekend’ is being held over the weekend of the 11th to 13th May in the Peak District of Derbyshire. Full details are given in the July *Bulletin*.

The sixth Totally T-Type 2 Tour is being held over the weekend of the 17th to 19th August in the Cotswolds. Full details will be given in the editorial of the next issue. Additionally, for those attending this year’s tour, I have obtained 50 copies of the hotel brochure which I will distribute, along with an aide-memoire detailing the booking arrangements.

In the ‘Suck, Squeeze, Bang and Blow’ article, published in the last issue, the term “Micro Pinking” was incorrectly attributed to John Saunders. It should have been attributed to Chris Morgans. Apologies are due to John.

Back in May I met up with Steve Poteet from South Carolina and his son, James. Through the good offices of Pete Neal, the MGCC Archivist, we spent the best part of a day in Abingdon, including lunch at the Boundary House.

Steve’s 1953 TD (TD27602) is on the front cover and he also sent me this picture.

Steve purchased the car from Ed Seagrave in 2000. Steve was working with Ed on a complete restoration of the TD and one day he asked what Ed’s plans were for the finished car. Ed said that he would probably sell it, so Steve bought it. Unfortunately, a year after Steve and Ed had completed the car Ed passed away. So, the car is very important to Steve.

He also has a TC under restoration.

Interleaf Pads on TD/TF (and Y) Rear Springs

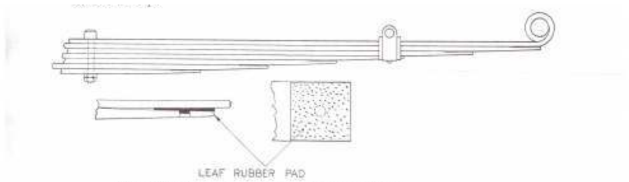
The Service Parts List for the TF Midget lists these as:

Rubber pad – interleaf ACG5232

Twenty four (24) are required.

As far as I know, this part number is common to the TD and Y-type.

As can be seen from the illustration in the YB Workshop Manual (the TD/TF manual has the same illustration) the pads were originally square, but the caption to the illustration pointed out that on some models the leaf rubber pad is circular and not square in shape as shown.



The picture below shows the 4th leaf down (the one with the clip) from an original TF spring and you can see that the pad is part circular but with squared off ends.

The following picture shows (a) how the rubber pads can wear and distort and (b) shows the holes drilled in each leaf to accept the pads (the second and third leafs are missing their pads).

At the suggestion of Barrie Jones, MGCC T Register Technical Specialist for the TD and TF models, I have had some of these interleaf pads made from Nylatron.

Nylatron is said to have high mechanical strength, stiffness, hardness and toughness, good fatigue resistance, high mechanical damping ability, good sliding properties and excellent wear resistance. The cost is £2.07 per pad, which is less expensive than commercially available rubber pads and they should last a lot longer!

Although the Parts List specifies the quantity as 24, some people only order 20 because, as can be seen from the picture of the 4th leaf down, the hole in this leaf cannot be drilled right through, otherwise it wouldn't be possible to attach the clip.

I don't know what was done originally (I suspect nothing) but there should be enough of a recess to fit an interleaf pad which has had its 'nipple' shortened.

I am aware that these pads are also fitted to the rear springs of MG ZA/ZB and no doubt the Wolseley 4/44.

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DISCLAIMER BY THE EDITOR

SUPPLY OF T-TYPE ASH FRAMES (INCLUDING TIMBER PARTS)

If you want a complete ash frame, or just a few timbers if you are keeping your original frame and you need to replace some rotted sections of it, there is plenty of choice of suppliers.

MOSS, NTG, Andy King (who has bought the stock and machinery from Rique Llinares – now retired), the Hutson Motor Company, Steve Gilbert (for a panelled body), will all be pleased to supply you.

I have recently received the following from Andy Denton, who served a five-year apprenticeship as a pattern maker.

“I started making Ash frames and parts in 1988 when I became an apprentice at Holroyd & Hall Pattern Makers in Clayton, Bradford, under the tuition of Mr Philip Robinson. He had taught my father pattern making when he went there 33 years previous. However, I didn't go to work for my father as he wanted me to be taught by Mr Robinson, who would ensure that I would learn the trade correctly. Philip didn't retire until I had completed my apprenticeship.

Holroyd & Hall supplied ash parts to Moss, Naylor Bros and Hutson Motor Company. Sadly, when Naylor Brothers got into difficulties over the Naylor TF1700 it affected Holroyd & Hall. Hutsons bought Naylor Cars but soon realised that the brains of the operation were at Holroyd & Hall, so Philip Robinson was bought out and we became part of the Hutson Motor Co.

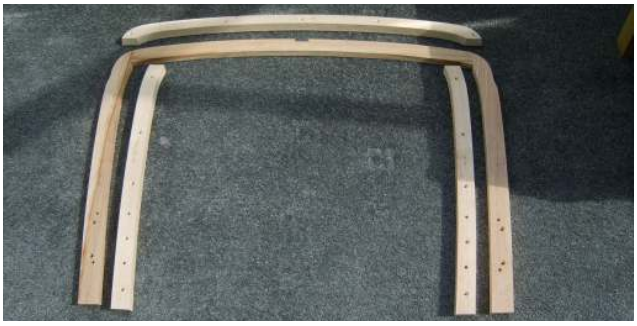
At 22 I left Hutsons for a change of career but I kept my hand in at pattern making by doing jobs at my father’s pattern shop. Philip Robinson went there for a short time, to bring the standard of pattern making back up to how it should be.

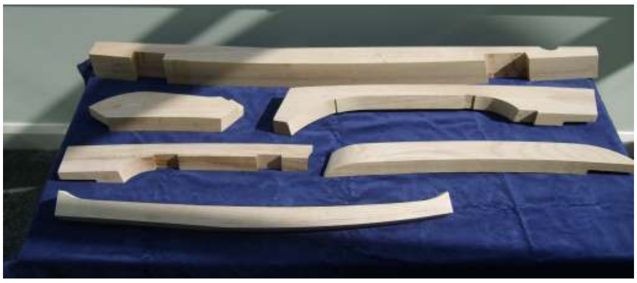
In 2001 my father retired and Airedale Pattern Co shut down. I would still see Philip Robinson regularly as he had started building a 1955 TF from scratch; new chassis, bulkhead, everything made brand new.

I spoke with Philip a couple of years ago about starting with the T-Types again, but at 85 he said he was too old. However, he said that he would help me in whatever way he could. So, over the last 18 months I have set up a full working Pattern Shop; we have re-done all the drawings, templates, all the jigs and tooling has been made and from next month the adverts will be in the MG Owners Club magazine.

I intend to make replacement chassis and bulkheads in the future, all the tooling has been done for the 54/55 TF - just the other models to tool up for.”

Andy sent me the following examples of his work:





Andy’s address is:

57 Main Road,
Drax,
SELBY
NorthYorkshire,
YO8 8NT
Tel: 01757 617455

Classic & Sports Cars *Essex*

SPECIALISTS IN THOROUGHBRED AND CLASSIC CARS

Tel: 01376 569335

Mention was made in the last issue of a rebuilt TF gearbox by Classic & Sports Cars Essex.

This family run business has been established for many years, and over that time has built up an excellent reputation for high quality service.

The technicians are headed by father and son team, Michael and Jason Waller, who have a wealth of experience in the motor industry.

Before opening their premises in Essex, they ran a historic Formula One team and regularly took part in the Cam-Am championships….winning a few along the way.

As will be seen from their website, this company has experience on a wide selection of marques and focusses on servicing, restoration and bespoke finishing work. Customers are welcome to visit the workshop to view progress throughout all stages of their project.

Jason Waller sent me a selection of photographs of work done on T-Types and I've reproduced some of these for readers of TTT 2.

Not untypical of how some arrive.

Horrible mess!

That's better!

That's even better!

All ship-shape and Bristol fashion!

Pictures below show T-Types in various stages of construction (TC, TD {frame}, TD & TF1500).

Pictures below show carb side of XPAG engine, TC9935, TF8576 and TC3984.

XPAG COOLING

Eric Worpe delivered another of his superb technical presentations to the attendees at the MGCC T Register's 'Rebuild' seminar back in the Spring. I'm most grateful to Eric for taking time to write up his presentation and for taking photographs of those wonderfully explicit drawings of his which help to make the subject matter 'live'.

It's probably as well that we choose not to agonise about the lack of efficiency of an internal combustion engine as we strive to improve the performance of our T-Types. The realisation that some 75% of the fuel's energy is wasted as lost heat would be quite dispiriting.

By way of an example, even running the engine at its greatest efficiency (coinciding with its peak torque output at around 2,800 rpm) which gives a useful power output of about 34 BHP, the equivalent of 100 BHP is generated as heat; some 50 BHP through the exhaust and 50 BHP through cooling. That's sufficient energy to enable one to make a cup of tea every second.

Internal combustion engines burn fuel at temperatures that can melt cast iron, which rather focuses the mind on finding ways to dissipate waste heat. Removing high levels of heat from a concentrated source would need massive cooling fins radiating out from the cylinder head if direct air cooling were to be used, plus a generous flow of cool air. Not a problem with a propeller stuck in front of an aircraft engine.

The alternative is to use a high specific heat capacity liquid to remove heat from the confined source and then dump the heat in an efficiently designed device for dissipating heat into an air stream. Water, which is usually used as the liquid medium, boils only slightly higher than the optimum temperature for engines to run at. This leaves little head room for overheating before steam is produced.

However, although generating steam absorbs considerable heat energy for a very small rise in temperature, the steam once generated is unable to absorb much heat, causing a rapid rise in the temperature of the engine block. Any sudden rise in the temperature of the block may not initially be apparent as the steam condenses when in contact with the coolant in the radiator's header tank and escapes as water vapour through the overflow pipe under the car.

Fortunately, the XPAG's cooling system was designed with a generous cooling capacity, able to cope with most situations. The design of the cooling system should prioritise the inlet ports and valves; these need to be as cool as possible as heat expands the incoming air and thus reduces the density of air available for combustion. Driving on cold mornings usually generates a much broader grin, not so much from clenched teeth due to the cold, but from the enhanced performance of the engine. At the same time, heat from the exhaust ports and valves also needs to be removed, so most of the coolant flow is directed through the cylinder head.

Engines can be subject to external temperatures ranging from -10 to +40 degrees centigrade and have to cope with widely varying engine loads from idling to full power. Trying to maintain a suitably stable engine temperature, despite such diverse operating conditions, has resulted in some ingenious ideas from temperature controlled radiator grill slats to the ubiquitous thermostat.

The skirted thermostat in the XPAG is quite sophisticated, compared with everything else, Figure, 1.

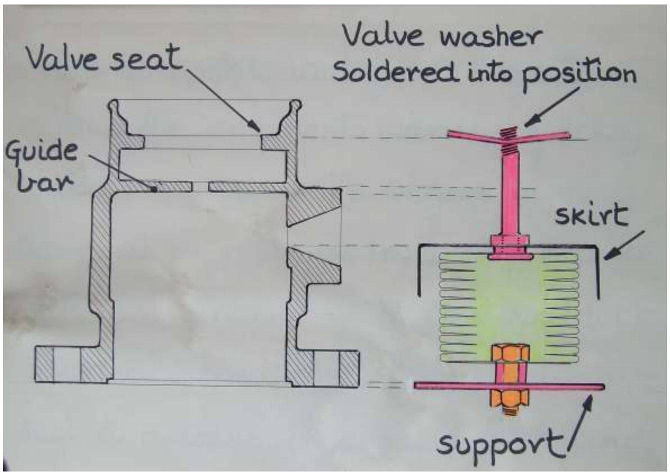


Figure 1 – Original skirted thermostat.

When the engine is cold and the thermostat's valve closed, all the coolant is directed through the by-pass loop. This maintains sufficient flow to scavenge out any hot-spots in the cylinder head and helps even out any temperature variations within the engine block. Differential temperatures and hence expansion effects, stress the cast iron block which is weak in tension and thus prone to cracking.

As the by-pass loop coolant flowing through the head reaches the operating temperature of the thermostat, the valve starts to open and at the same time, an attached skirt begins to shut down the by-pass loop. Ultimately when the engine is generating sufficient heat, the thermostat valve will be fully open and the by-pass loop closed off so that all the coolant is pumped through the radiator. However, before reaching this stage, the thermostat apportions what coolant flows through the radiator and what portion flows through the by-pass loop so as to maintain a constant engine temperature whilst achieving the maximum flow rate. This is a feature not provided by substituting "modern" thermostats for the skirted type. Figure 2.

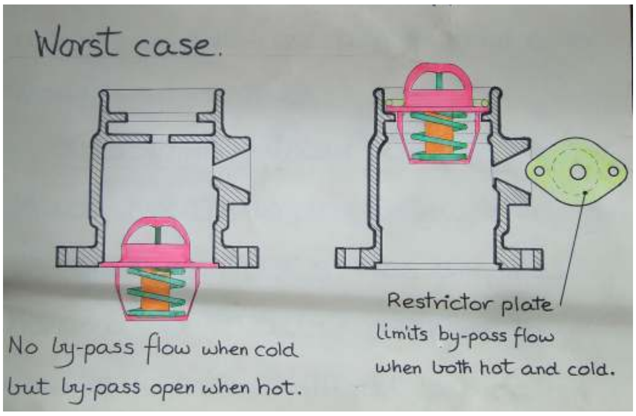


Figure 2 - Modern thermostats in original housing.

The need for skirted thermostats in modern engines is obviated by the use of Nodular cast iron in the engine blocks. Nodular iron differs from grey cast iron in that the free graphite is present as compact, isolated nodules rather than as flakes dispersed throughout the cast iron. This reduced potential cracks propagating along the fault lines created by the alignment of graphite flakes.

This improvement in casting during the mid-1950s was due to the addition of Magnesium and special heat treatment of the cast iron. Consequently, full flow through a by-pass loop was no longer essential due to the increased strength and ductility of Nodular cast iron.

The thermostat isn't just there to allow the engine to warm up quickly, but to stabilize the engine running temperature at an optimum level and thus reduce stresses within the cast iron block.

Original skirted type thermostats are now available, but I've discovered that their assembly lacks the correct adjustment that synchronises the opening of the valve with the closing of the by-pass loop. Looking through the by-pass port should reveal the skirt's top sitting level with the opening. However, the skirt on some appears to sit some 4mm below the opening, which ultimately prevents it completely closing off the by-pass port at the correct operating temperature. The actual thermostat bellows may soon be available as a separate item for self-assembly in existing housings.

Coolant Flow Paths

Much credit is due to Claude Bailey, designer of the X-Series engines. He paid particular attention to having full flow filtered lubrication and a pumped cooling system that prioritised the cylinder head, whilst also cooling the area of the bores swept by the piston rings.

Coolant flow is "assisted" by the water pump's impeller to flow along a duct under the manifold to the rear of the block, where it rises up to the back of the cylinder head through an elongated hole in the gasket, if fitted correctly. Some coolant is also directed through two narrow vertical slits behind the pump, to cool the front of the cylinder walls. This area would otherwise be exposed to the accumulated heat picked up by the coolant as it flows forwards through the head and on to the thermostat.

The heat generated within the block is carried away by a thermo-syphon action in such a way that both head and the upper block end up running at a similar temperature, leading to reduced differential expansion and thus less stress within the whole head and block, enabling it to be made lighter.

This may seem over-protective, but experience gained with early air- cooled aero engines, showed that rapid cooling of just part of the engine during a non-powered dive, could lead to fractures in the cylinder head.

Figure 3 shows a schematic of the coolant flow. The temperature differences are exaggerated to indicate the problems due to low flow rates.

An absence of turbulence in the coolant flow could encourage wide temperature differences within the engine, so a high flow rate is desirable, confirming the need for an effective by-pass loop during warming up when the thermostat valve is closed.

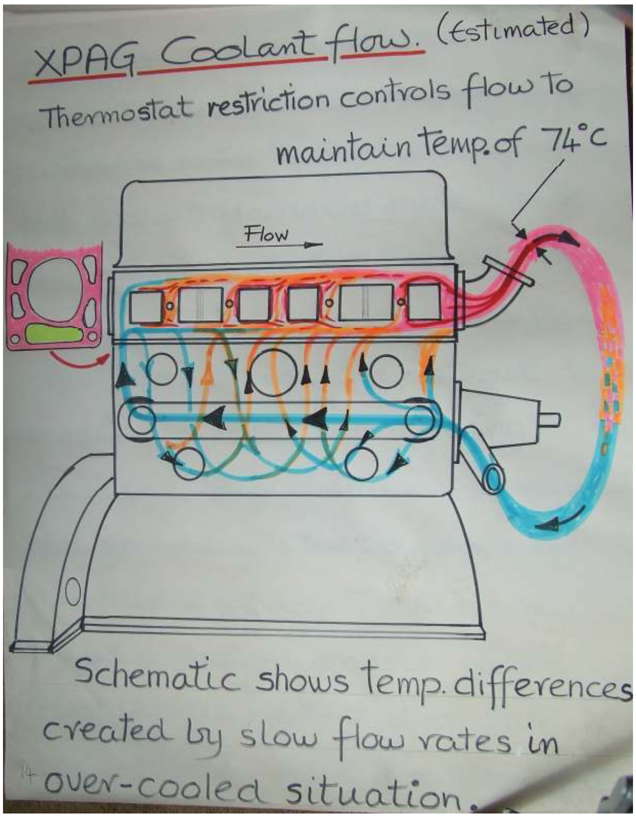


Figure 3 – XPAG coolant flow.

Pumped Flow Rates

It's at this point that I admit to indulging in some home spun theory concerning coolant flow rates. Consider the radiator in a near maximum heat generating situation, powering uphill on a hot day.

The thermostat would be almost fully open at around 74 deg. C. A fast coolant flow would result in a reduced temperature difference across both engine and radiator. What heat the coolant absorbed whilst flowing quickly through the block would have little chance to cool down during its brief period in the radiator. The whole radiator would sit at an elevated average temperature, with its maximum temperature of 74 deg. C. being defined by the thermostat.

Such a situation actually enhances the cooling ability of the radiator as Newton's law of cooling states that the degree of cooling depends on the temperature excess.

A slow flow rate would result in any specific volume of coolant absorbing more heat in the engine and conversely would also allow the radiator to dissipate more heat from the same specific volume, resulting in a greater temperature differential. As mentioned, large temperature differentials within the engine increase expansion stress levels.

Fig. 4 illustrates the benefits of high flow rates when the engine is working hard (thermostat fully open). It seems six bladed impellers could offer improvements in cooling.

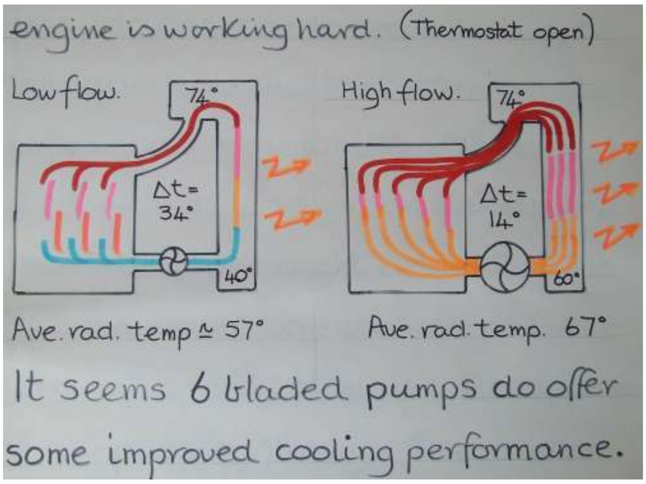


Figure 4 – Low and High flow rates in XPAG.

The Radiator

A bit of a misnomer as most of the heat is lost by convection as air is forced through, due to the car's forward speed and rotating fan blades. The original unbalanced metal fan blades can be replaced by the 7-bladed plastic fan from the MGB to increase air flow when stationary and reduce loading on the water pump bearings. Some might argue that the MGB fan would consume more power, which is true when stationary. However, when moving forward the velocity of air forced through the radiator becomes similar to the velocity of the displaced air of the fan blades. A back of an envelope calculation showed that at 50 mph and some 3,000 rpm, the air flow through the radiator could be around 4,000 ft/min (*) whilst the average air displacement of the fan would be about 5,300 ft/min. In effect, the fan is only displacing air at around 1,300 ft/min.

(*) The air velocity through the radiator is an unknown, any air flowing through the radiator fins expands due to the absorbed heat, resulting in an increased velocity of the air leaving the radiator. An added bonus is the forward thrust generated which can, with careful design, equal the drag of the radiator. This is known as the Meredith Effect. Somehow, I doubt if Morris Radiators would have considered such an issue in their design.

Over Heating

1. ***Loss of coolant:*** leakage or evaporation due to open vented system.
2. ***Furred-up radiator:*** Is this due to calcium or rust deposits in the narrow brass tubes? For a thorough de-scale, the radiator would need to be removed and a pumped re-circulating flushing loop set up.
   For rust deposits, mix Phosphoric or Oxalic acid (available as powder) with hot water.
   For calcium deposits, mix Citric acid (available as a powder) with hot water. An alternative is Muriatic acid or Spirits of Salt, which is a dilute form of hydrochloric acid and therefore hazardous.

   After flushing with acids, use a neutraliser flushing solution with Baking Soda and then follow up with several plain water flushes. The final fill should be with de-mineralised water from a dehumidifier with blue anti-freeze added.
3. ***Engine sludge:*** resides in the bottom of the water jacket and is best removed mechanically. The engine probably needs to come out, core plugs removed, "off with its head", and the water ways assaulted with say, a screwdriver blade. Any debris can then be blasted away with a jet washer. Further de-rusting with Phosphoric or hot Oxalic acid solutions, followed by neutralising and flushing may be needed. Alternatively, some engine machinists offer a "hot tank" or steam cleaning service for dismantled engines. You may need to check that the white metal front camshaft bearing will not be affected.
4. ***Head gasket the wrong way around:*** reduces coolant flow to the head.
5. ***Radiator shell's slats:*** obstructing air flow too much.
6. ***Damaged radiator fins:*** blocked air gaps between fins.
7. ***Faulty thermostat:*** housing full of corrosion detritus.

8. ***Slipping fan belt:*** loose impeller on water pump shaft.
9. ***Reduced engine efficiency:*** poor compression, worn down camshaft lobes, incorrect timing set up.
10. ***Poor tuning:*** engine has to work harder for a given performance.
    A retarded ignition delays complete fuel combustion, resulting in a delayed peak pressure point (normally around 15 deg. after TDC). The consequential loss of engine efficiency reduces performance.
    A lean mixture can increase combustion temperatures due to a slowed down "burn time" to the extent that fuel could still be burning as the exhaust valve opens. Maximum power is delivered from a controlled explosion at the optimum "burn rate".
11. ***Faulty gauge:*** calibrate by placing sensor bulb in hot water.
12. ***"Blown" head gasket:*** combustion gases escape into coolant.
13. **Obstructed exhaust system:** misplaced absorber material in silencer.

Water Pump

There have been several variations in the type of carbon/graphite seal, how the bearings are located and the type of spindle. Pumps recently available have proved less reliable due to short cuts in manufacturing.

Of greatest significance is the absence of a suitable surface for the carbon/graphite seal to rub against. Carbon seals work best when thrust up against a hard and polished surface, usually ceramic, or in the case of the original pumps, a phosphor bronze washer.

New pumps have a slightly modified seal thrust up against the machined surface of the cast iron impeller. The reduced contact surface area of new carbon seals, rubbing against a cast iron surface, reduces the life of the seal. Coolant then leaks into what used to be an intermediate drainage chamber.

This used to be isolated from the bearings by a secondary seal consisting of two rotating steel washers, one of which is keyed to the shaft. The two steel washers sandwich a felt washer which makes contact with the chamber walls. Not the most effective of seals, but it guided any leaked coolant to drain away through a large hole in the bottom of the chamber.

This facility is absent from the latest pumps and combined with a too small hole which corrodes up and becomes blocked, allows coolant to contaminate the nearest ball bearing; hence a short life expectancy. Any slight rocking of the fan blades is a warning sign.

Fig. 5 illustrates the earliest pump which used a pin driven, spring loaded graphite cup thrust up against a fixed graphite seal. This design suffered from a poor seal between the graphite cup and the shaft.

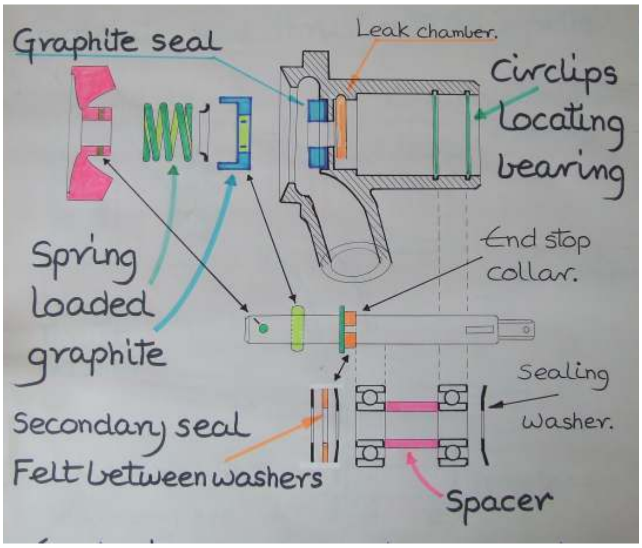


Figure 5: Early water pump.

Fig.6 illustrates the later improved pump with a rubber bellows enclosing a spring-loaded graphite seal thrust onto a bronze thrust washer, silver soldered onto the impeller. This version is the best available and worth rebuilding.

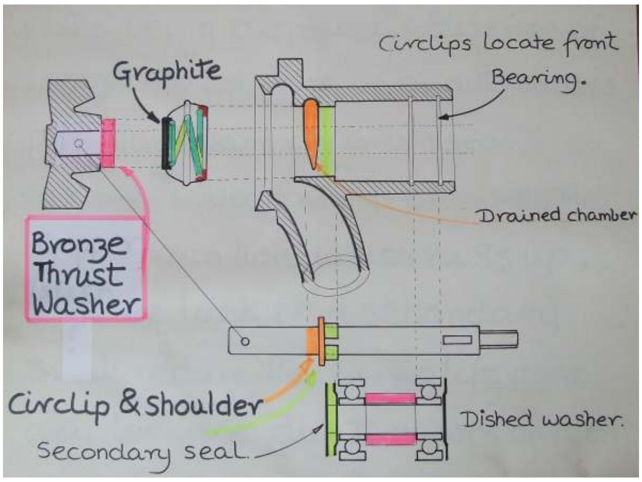


Figure 6: Later improved pump.

Modern versions omit the locating shoulder on the shaft and only have a circlip to locate the bearings. If the pulley nut is tightened robustly, the circlip risks being displaced and the shaft consequently dislodges which then increases the pressure of the graphite seal on the already inadequate thrust surface of the impeller. The fan pulley also risks becoming loose.

However, modern pumps can be modified by attaching a collar to the spindle, replacing the circlip. An improvised secondary seal, made from a thick plastic washer, makes an interference fit in the drain chamber adjacent to the rear bearing and steers any leakage through an enlarged drain hole. The impeller can be counter bored to take a flanged bronze bush with a polished thrust face. New seals are available from Jonathan Welch, who has identified a similar seal to the original; the cast iron seat for the seal might need machining to allow an effective fit. Sealed ball bearings are now available, type 6301-2RSH.

Fig. 7 shows the suggested modifications. One tricky issue is the plug welding of a collar to the old shaft, two plug welds on opposite sides should minimise any distortion.

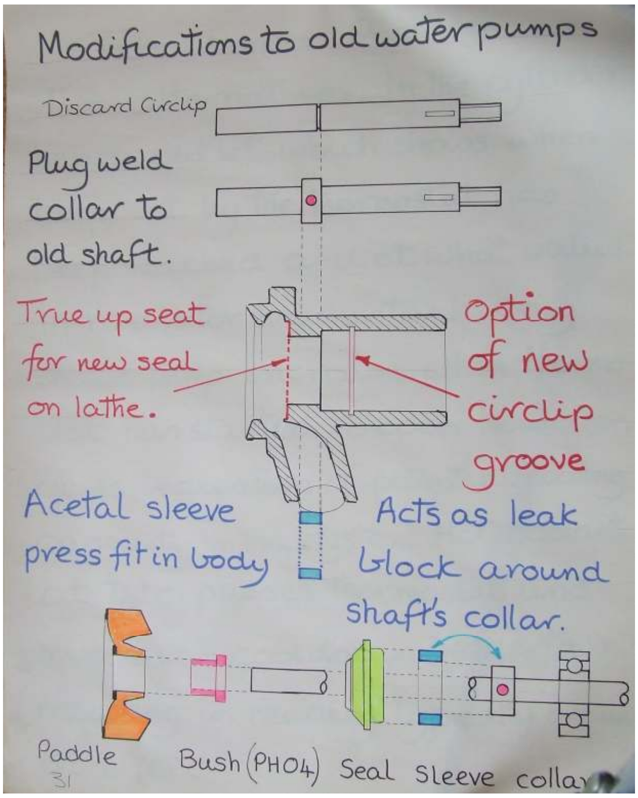


Figure 7: Modifications to modern pump.

Temperature Sensor Position

Two alternative positions exist:

(A) In the cylinder head outlet which shows when the temperature set by the thermostat has been reached and then any over-temperature.

(B) In the radiator header tank. This only shows a temperature increase when the thermostat has started to open. However, it does give an indication of the potential cooling capacity left in the system. Some of the hot coolant at 74 deg. flows through the thermostat and mixes with coolant in the header tank resulting in a reading of typically 65 to 70 degrees C.

If the coolant temperature increases, less coolant will be directed through the by-pass and the increased flow through the thermostat raises the indicated temperature in the header tank, revealing the reduced cooling headroom left in the system. Eventually, the indicated temperature might exceed the 74 deg. C of the thermostat as the engine overheats and the gauge reading will then follow the level of over-heating as in (A).

Position (B) seems to give more information on the cooling system, with the possible added bonus of indicating whether the coolant level in the header tank has fallen, exposing the sensor bulb. This should produce an unexpected drop in the gauge temperature reading.

Heater Take Off Points

Hottest coolant is from the feed to the thermostat. XPAGs in saloon cars had the "take off" from the elbow connecting the cylinder head to the thermostat housing. The return point could be placed at the back of the cylinder head, using a "take-off" connected to the cover plate.

Ed's note: You now have all the information you will ever need about how the XPAG cooling system works. Eric has been at pains to describe it in relatively simple terms so that even 'plugs and points men' like me can understand it.

If you need your water pump rebuilt you won't go far wrong in entrusting it to E.P. Services in Wolverhampton.

I always feel re-assured when using a company that has been in business for over four decades and they did a superb job on my XPAG pump.

Recently, TC owner, David Lewis has been in touch to report excellent service from this company.

E.P. Services http://www.ep-services.co.uk

If you want a new pump which gives approximately twice the volume and pressure of the original Factory fitted item, Racemettle in Gainsborough, is the place to go http://www.racemettleltd.co.uk

A word of caution is called for here – these pumps will certainly work better than your old one, which, if it is on its last legs, might be good for stirring tea, but not for effectively circulating the coolant. If you have (to use Eric's term) corrosion detritus in your system these pumps will find it and I know that E.P. Services recommend dealing with it before fitting their rebuilt pumps (for which they offer a lifetime quality guarantee).

Finally, mention was made of Jonathan Welch. Jonathan is a TC and PA owner and runs a company specialising in seals for classic vehicles. http://www.oilsealuk.co.uk (He stocks thousands!).

John Twist – University Motors Ltd.

John will be in the UK in October to present one day seminars on the 14th and 15th at the MGOC Workshop, Swavesey and on the 20th, 21st and 22nd at Wroxall Abbey, near Coventry.

The event of particular interest to us a 'T-Typers' is being held on Sunday 22nd.

John is a 'larger than life' character and if you've watched any of his videos you'll probably identify with this description.

I promised in the last issue to write some notes about him, so here goes……

He first became 'hooked' on 'square rigger' MGs in 1965 when he saw a TD tucked away in the back of a repair shop. He resolved to buy the car, but didn't have the money.

A few years later and with financial assistance from his father, who was persuaded to loan the purchase price of a TD which John had described in glowing terms, he bought the car and drove it home. On seeing the car his father said "this isn't the car you wrote me about" – John's reply was "Dad, it's a diamond in the rough".

Following the completion of a tour of duty in Vietnam, John came home with $800 in his pocket and spent it at Moss Motors on parts he felt he needed to restore the TD. He then completely dismantled the car and it didn't go back together for the best part of four years.

In the meantime, and with his car still in pieces, he took on the job of restoring another man's TD with the help of a friend. With little experience, but much enthusiasm and armed with the workshop manual and a set of tools they did the job. This was John's first paid assignment (he thinks the final bill came to $265) and he considers it as his entry into the profession.

John's ambition was to open his own MG dealership with excellent customer service as the unique selling proposition. After being turned down for a job at the MG dealership in Grand Rapids, Michigan (where he might have hoped to get a grounding in sales, parts and service) he vowed to set himself apart by moving to England and gain experience with University Motors of London, the largest MG dealership in the world.

John worked for UML for a year and on returning to the US he was employed by the dealer in Grand Rapids until he got fired! Then he worked for an independent who went bust and then for a VW dealer in parts. But the magnet was energised and he was drawn back to MGs, which led to the purchase of a 3,500 sq.ft. building in Grand Rapids.

The business, which he named after the English dealership, began in earnest in 1975 and during the next three decades grew from a one-man operation to 16 with his wife, Caroline, handling the accounts. In 1993 the business moved to a larger facility in Ada, Michigan.

Always keen to share his passion, John wrote a number of technical articles for various magazines. His first was for *MG Magazine* in 1979. He also wrote for *Sport & GT Market* and *Abingdon Classics.* He has hosted group tech seminars for the best part of 40 years, both on his own premises and at various venues in the US and more recently, in the UK. He's even held a telephone tech hour between 1.00 and 2.00pm Eastern.

Yet it is for his You-Tube videos that he is probably best known, with around 300 being produced with 6 million viewings over the years. The most popular of these is easily the MGB Gearbox video.

By the latter half of the year 2000 decade the Michigan economy took a downturn, due in no small part to the shedding of jobs in the automotive industry. John's sales were drying up and additionally he was living in the knowledge that his wife had been diagnosed with lung cancer.

He came to the conclusion that given the circumstances, he could not carry on as previously and therefore decided to run the business down in an orderly fashion. Cards were sent to customers that the business had reached the end of the road and a closing date of July 2009 was set.

John paid all of his employees severance pay and an auction of equipment and memorabilia was held in the November with most of it snapped up. “Being a sucker for reunions” as John put it, he organized one for all of his former employees and 50 of them came along.

Following the death of his wife, John needed to finalize winding the business down. There were still outstanding jobs to be completed and he was being assisted by one of his old employees who had not found a job elsewhere. Another ex-employee came along and asked to come back and before he knew it, John was up and running again and moving to a building in Kentwood. In his words “I’m ready to embark on University Motors 3.0.”

The business carried on successfully until the final closure was announced on 7th November 2016 with the final farewell party on Saturday 21st January 2017. After the best part of 42 years in business at three different locations with University Motors John quipped “I am not so much ‘re-tiring’ as re-treading.”

John Twist Seminars

October 2017

John Twist Seminars will be over two weekends and at two UK venues

One-day seminars at the **MGOC Workshop, Swavesey:**

Saturday 14th October – The Complete MGB Tune-Up
Sunday 15th October – The Complete MG Lubrication

At **Wroxall Abbey near Coventry:**

Three distinct one-day Tune Up seminars

Friday 20th October – MGB
Saturday 21st October – MGA/Magnette
Sunday 22nd October – T-series MGs

In association with the MG Octagon Car Club & the MG ‘T’ Society

The cost of attending a one-day seminar at either location will be £90 which includes a light lunch and refreshments.

At Wroxall Abbey there will be the option of an evening dinner at additional cost, on Saturday 21st and John will be a guest speaker.

Wroxall Abbey can also offer accommodation, full details and booking forms for the seminar will appear on the MGOC website.

Numbers will be limited to 30 attendees per day so be sure to book early to avoid disappointment.

He has retained the name of University Motors, but no longer operates as a ‘bricks and mortar’ automotive repair facility. He is continuing to write technical articles, offering technical seminars and workshops, with the production of videos and has entered the lecture circuit.

Ed’s note:

I’ve adapted this from the Internet and run it past John to check that he is happy with it, which he is.

John tells me that he will be accompanied by his friend, Mary James, who is a language arts teacher. Mary kindly proof read my text and pointed out an incorrect apostrophe.

You can book for any of these seminars on the MG Owners Club website:

http://www.mgownersclub.co.uk/news/john-twist-technical-seminars-2017

or phone (01954) 231125 for further information.

I’ll be attending the Wroxall Abbey event on Sunday 22nd October with Brian Rainbow.

We hope that some of you can make it.

Some detective work gets a result!

The story starts when the editor was contacted by Colin Harris (aka 'Tweed') at the end of April to see if I could help in tracing the present owner of a TC.

'Tweed' had been asked by the daughter-in-law of Colin Hutchinson, if he could help with tracing Colin's old TC (TC1366, registration mark KPH 439). *Pic of Colin below with his TC in the 1950s.*

He noticed that TC1366 is shown on the T-Database as a very presentable TC that is on the road and wondered if I could help with the owner's details. Unfortunately, I said I couldn't because we don't keep owners' details. However, the registration mark KPH 439 'rang a bell' with me as belonging to Richard Mascari.

I contacted Richard, who told me that he sold TC1366 to Andy King a couple of years ago. Andy sold it on to somebody in North Yorkshire, who rebuilt the car in 2 1/2 years from a box of bits.

Richard gave me some useful history of the car. It used to belong to Mark Sellick's father and Richard purchased it in chassis form with a V5C in 2005/2006 from Barry Foster's Montlhery Garage in Butleigh, South Somerset (Barry was garaging the chassis for Mark).

The chassis was not in a good state so that went up to Russell Truman for repairs in 2006/7 along with the bent front axle and damaged rear axle casing (which were spares that came with Richard's very first TC that he bought with the help of his dad back in 1967 for the princely sum of £117.00 - Richard was only sixteen at the time).

The bulkhead and foot ramp were purchased from Peter Cole. The body tub, which was an early Naylor Bros. tub, came from Mark Deacon, a friend of the late Terry Andrews, who was building a TC special at the time and was stored in Terry's 'lockup'. Smaller items were purchased from the late Ben Hyams in Kent and also Digby Elliot. Other smaller items were purchased through small member's ads in the club magazines etc.

Richard fully intended restoring the car but having completed one restoration (TC9622) he wasn't sure if he could go through with another, so he sold the bits to Andy King.

The identity of 'somebody in North Yorkshire' was established with the help of the MG Octagon Car Club and contact was made with Chris Edwards, who was very pleased to learn some more of the history of his car.

Chris has managed to trace owners back to 1964 as follows:

Jan 64 William Martin Craven, Cleethorpes

April 65 Henry Robert Buchanan, Stourbridge, Worcestershire

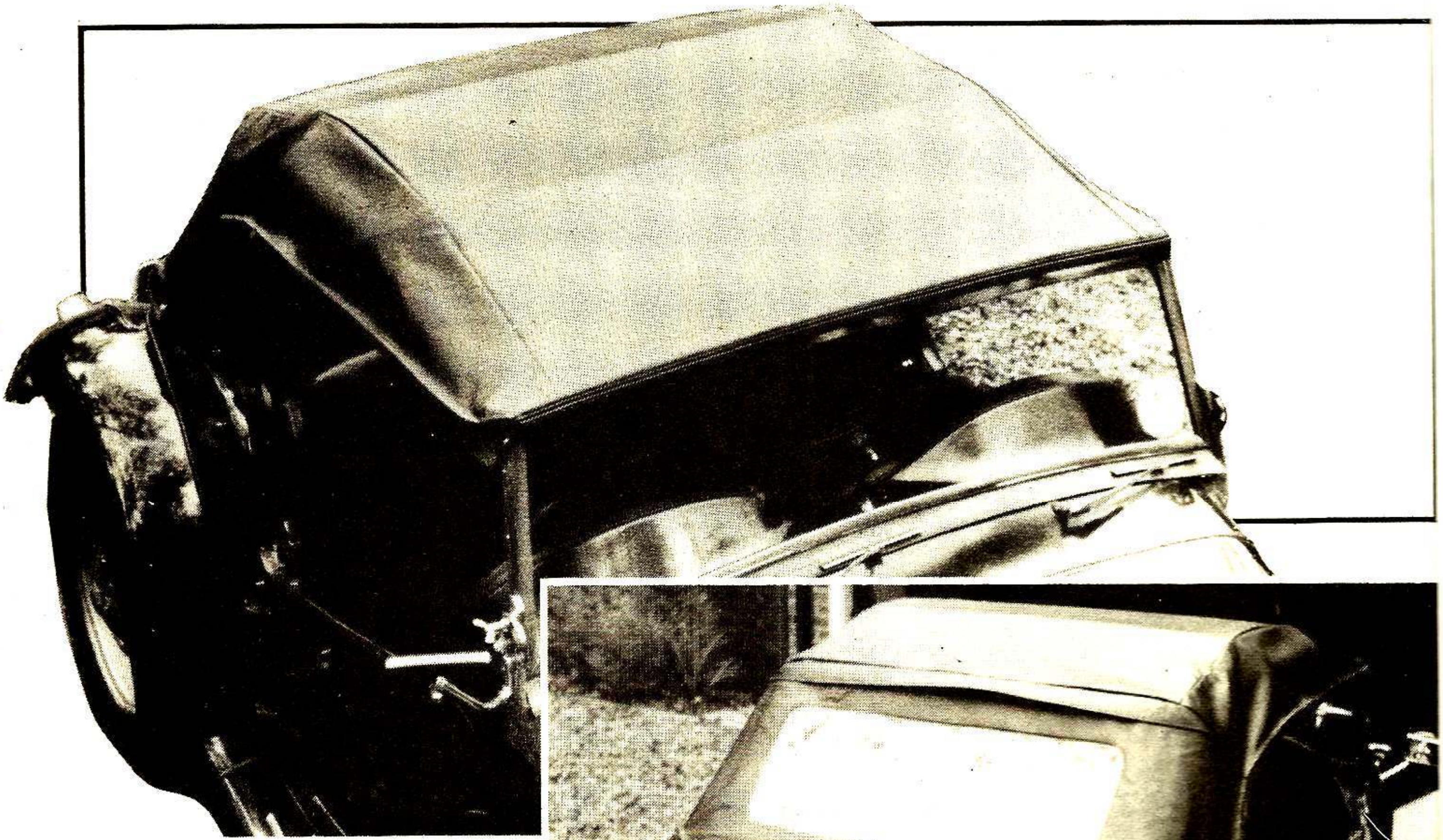
Oct 65 S/Lt John Alexander Wilson, Plymouth (Royal naval Eng. College)

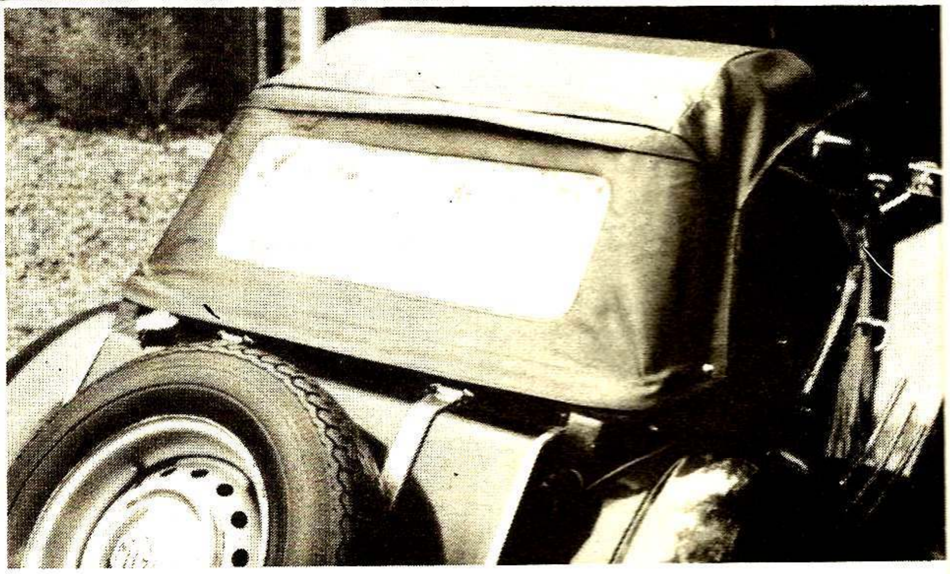
Dec 65 S/Lt Henry Peter Lansdown, Morpeth

Oct 76 Andrew Sellick, Taunton

Here's a pic of KPH 439 Taken just after the finished restoration:

Some of this information was not received in time to pass on to Colin Hutchinson, but he received a surprise birthday present when 'Tweed' took his TC (TC0632 – JTT 423) to his house in Wisbech. Pictured below is Colin with TC0632. I've promised to send him a copy of this issue of TTT 2 so he'll see his old TC, after all these years.





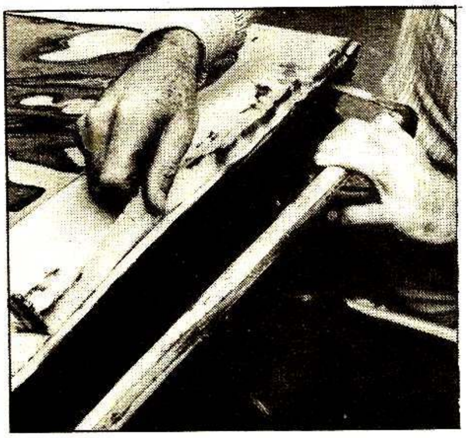
The easy way costs money – that's buying the whole assembly from the car manufacturer and just dropping it on.

Cheaper by far is to buy the ready made cover, and do the rest yourself. Which you've got to do anyway if you can't get a complete unit.

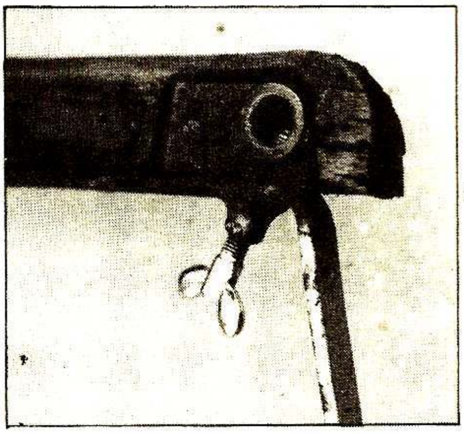
Barry Jones, who's recently done both his T-type and an MGB, shows what's involved.

FIT YOUR

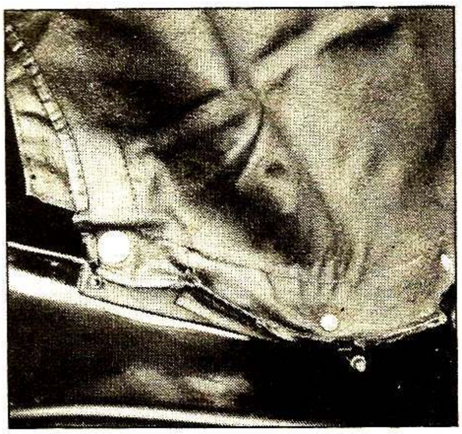
PROBLEMS



My MGB hood had come completely away from the frame.

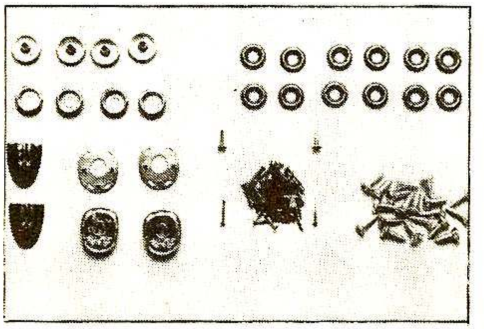


On my TF, the top rail was splitting apart, as you see, and is beyond repair.



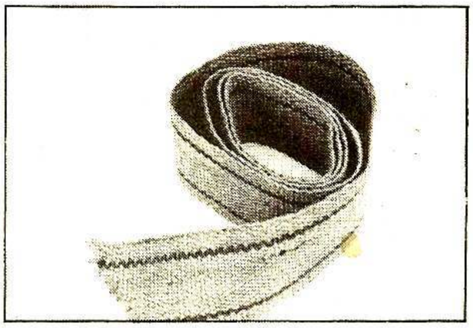
As is so often the case, the Vinyl has become dry and brittle.

MATERIALS



Make sure that you've got a good supply of fixings and fastenings.

For frame renovation you'll need fast-drying paint, brush – and don't forget some adhesive.



Very often the webbing needs replacing. Play safe and do it!

Hoods don't last forever, and even if you look after them, there comes a time when they are uneconomical to repair.

My TF hood was fraying at the edges, the back window was yellow and cloudy, the stitching was breaking, and the overall effect spoilt the look of the car. My neighbour's MGB was in a similar state, and the rear hoop had ripped out of the material securing it to the hooding, so we agreed to buy two new hoods and help one another to fit them.

Before ordering, I uncovered the front rail on the TF (where the hood clamps to the top of the windscreen) and found that the wood was too rotten to re-use. The MGB top rail was made of two strips of metal, joined together by pop-rivets hidden under the rubber sealing strip, and this was suitable for re-use.

Materials

When new, the TF was fitted with a 'double duck' hood which consisted of two sheets of canvas bonded together by a thick layer of rubber Modern sports cars tend to have vinyl hoods which are easier to keep clean, longer lasting, more waterproof and can be folded whilst still wet. (Please dry them when you get home). Finally, they are cheaper than double duck.

For a little extra you can get double-sided vinyl, which is easier to keep clean, but stiffer and heavier.

In the luxury class, you can get mohair hoods, and these are fitted as standard on Jaguars, BMWs and more expensive sports cars. They need to be looked after with care, and the price is approaching the cost of a hard top, so a vinyl replacement may be better value for money.

Repairs

Vinyl hoods in particular are easy to repair. When new they are soft and supple, and small tears can be repaired by stitching and welding-in new pieces. If all you need is a new window, then these can often be cut out and replaced at a fraction of the cost of a new hood. However, as time goes by the vinyl gets brittle, and can neither be stitched nor welded. The stitching sometimes rots, especially if the hood is put away before it is thoroughly dry, and in this case it should be re-stitiched by hand, using a heavy waxed thread and following the original needle holes. Machine stitching results in two sets of holes, and this provides a weak spot which will soon 'tear along the dotted line'. The best hand stitch is a simple over-and-under stitch in one direction, followed by an under-and-over stitch the other way.

Prices

We priced various covers for an MGB and came up with the following prices, including VAT:

Vinyl tonneau cover £19.50
Vinyl hod (single sided) £52.00
Canvas hood (double duck) £66.00
Mohair hood £139.50
Hardtop £184.00
Targa hardtop £299.00
Fastback hardtop £316.25

Extras

When buying a new hood, check what you are getting for your money. The following may or may not be included:

Colours (other than black)
Fittings and fasteners
Double-backed edges
Draught valances around the windows
Material to recover the top rail
Zip-out rear window
Rooftop window

I bought a TF hood from Toulmin Motors, and was pleased to find that it came complete with a new cover for the top rail, a length of Hydem binding to conceal the fixing tacks, and a complete selection of fittings and fasteners.

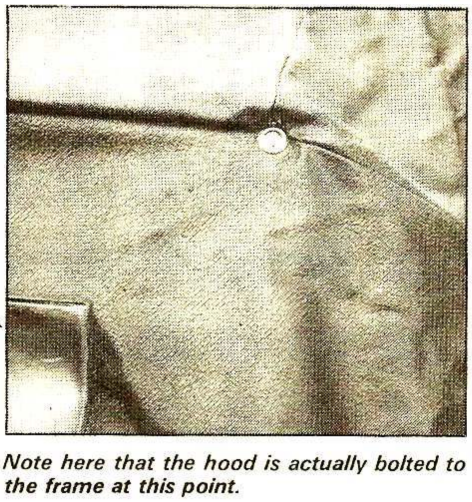
The TF top rail came from M C Griffiths, and it was a perfect fit.

The MGB hood came from Prestige Hoods, and we deliberately bought their cheapest model. Nevertheless, it came with a full set of instructions and the press-studs were already fitted, so all we had to

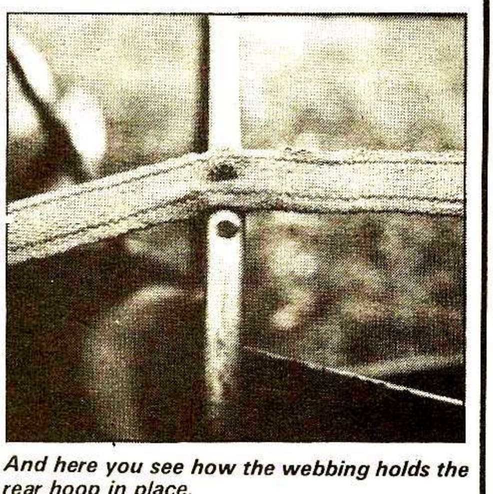
OWN RAG-TOP

REMOVAL

The MGB top rail is held together by these hidden pop-rivets.

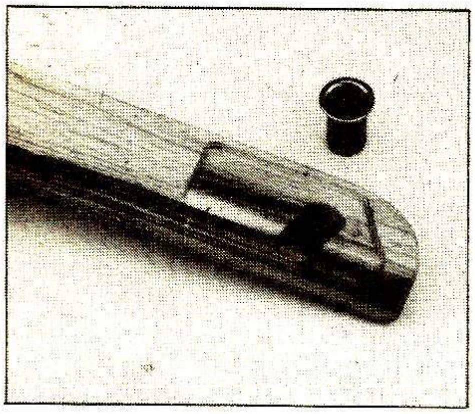


Note here that the hood is actually bolted to the frame at this point.

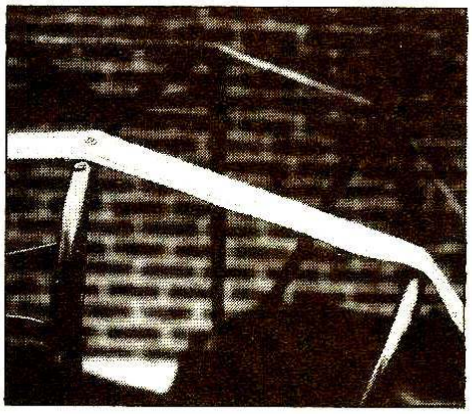


And here you see how the webbing holds the rear hoop in place.

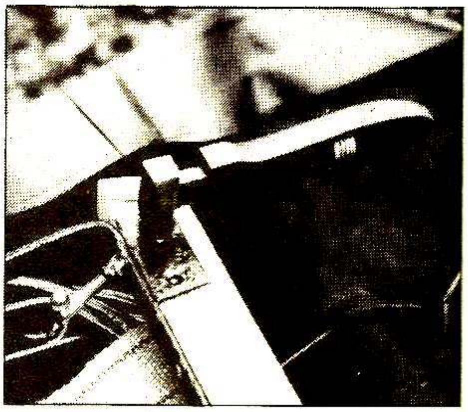
FITTING



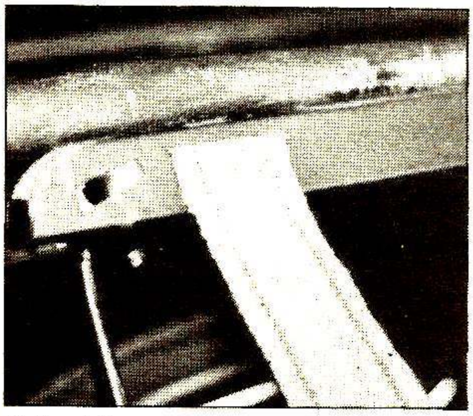
When I did mine I had to obtain a new top rail and ferrules.



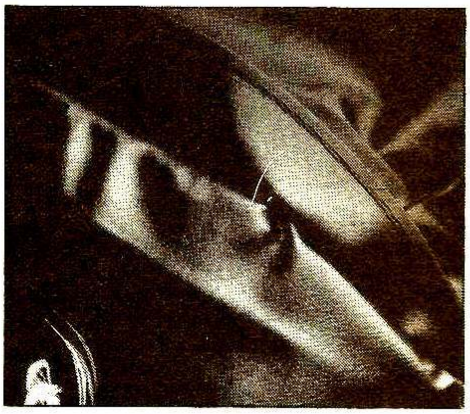
When you've cleaned the frame, paint it and attach and webbing.



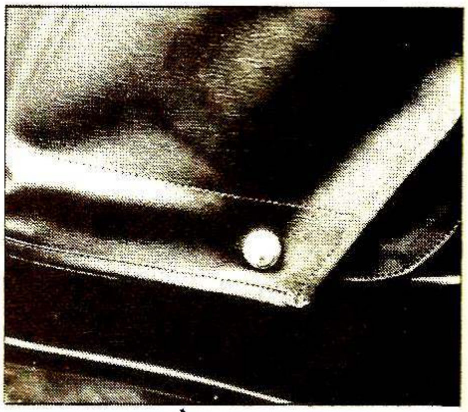
Use a suitable clamp when drilling and screwing the top rail.



Nail webbing to the top rail, and glue the new cover over the webbing.



Erect the hood, stretch it tight, and pierce from inside. Alignment at this stage is critical!



Now that that's done, fasten it from the rear and along the side.

FIT YOUR OWN RAG-TOP

do was to hook it on at the rear, fasten the press-studs, stretch it over the one half of the top rail, and clamp it in place with the other half. The rail is then riveted together with 1/8 pop rivets, and the heads are hidden by replacing the rubber weather strip.

Sundries

Adhesive. The best adhesive for vinyl is Dunlop S758. Do not use Bostik clear or Evostik, since these attack vinyl.

Webbing. This is available as upholstery webbing, and is usually 2 inches wide.

Ferrules. With older cars, where the hood is located on top of the windscreen by two pins, the top rail contains two metal ferrules. These are available from a plumbers merchant for about 22p each, and are normally used to reinforce plastic tubing where it terminates in a compression joint.

Hinges. One of the hinges had rusted solid, and when the hood frame was opened, it sheared in half. A mild steel rivet made a perfect replacement for 10p.

Ordering

Always quote the year and chassis number of the vehicle, and specify whether the hood is removable or folds away. Some manufacturers changed specification in mid-year, and others had standard and 'de-luxe' hoods.

If you intend to fit a roll-over bar, make sure it will fit under the hood.

We found some manufacturers who would not supply a hood, but insisted on tailoring and fitting them for us. This is understandable with older vehicles which were hand made, but not for later cars such as the TR4, MGB, Spridget or Spitfire.

Hardtop

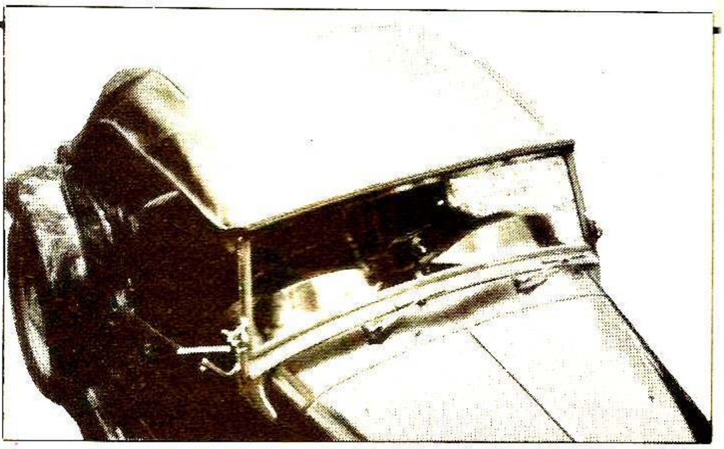
There are many styles of hardtop available on the market today, suitable for the majority of mass-produced sports cars. Styles vary from the simple hood replacement, the targa top with one or more removable roof panels, to the fastback hardtop which replaces both the hood and boot lid, turning the car into a GT coupe. The finish of hardtops varies enormously:

Exterior

Some are only available in standard colours such as black or white. Some are sprayed with paint, others are self coloured, which means that a pigment is added to the glass fibre resin during manufacture. Some are covered in vinyl, and I have seen one fitted with a sunshine roof. With older cars, avoid colour matching, since new paint will fade and may not be such a good match next year.

Windows

By law, car windows must not be made with ordinary glass. Some hardtops use perspex, but the better ones use toughened or even laminated glass, which is far superior. Tinting is a desirable extra.



Finally, attach the front of the hood, and the job is done.

Interior

It is a long time since I have seen a single skin fibreglass hardtop with the matting visible on the inside. Nevertheless, the interior finish varies from flock spraying to velvet lining. Look for a professional finish.

Edges

Where the hardtop meets the bodywork there should be a rubber seal. Similarly, at the window reveals, there should be a closure strip just like a saloon car. These should be firmly attached.

Fitting

Most hardtops are a straight replacement for the hood and frame.

Usually they clip on in place of the hood and use the mounting points at the rear where the hood frame was bolted to the bodywork. With modern mass-produced car bodies there is no excuse for a hardtop which does not fit — perfectly.

Tonneau covers

I have driven sports cars for 17 years, and I would hate to own one without a tonneau cover. They protect the car from sudden showers, are much easier to erect than a hood, and keep the warmth in when driving in winter.

As with hoods, look for quality, such as:

* a good fit
* strong zips
* double-backed edges
* box-pleated corners

Don't forget to specify such extras as pockets for head restraints, small extra zips for seat belts and cut-outs to clear a roll-over bar. Finally, a tonneau bar helps to prevent sagging in the middle, and if you do not have one, then you should think of making one. A sagging tonneau will collect water, and it can drain through the centre zip and onto the carpets inside the car. This leads to wet floors and a rusting floor pan ●

CHASING VINTAGE POWER

This article by Bill Hyatt has already appeared in the April issue of *The Sacred Octagon.* Bill sent me his copy back in February, but it has only been possible to publish it in TTT 2 now.

“It is very easy to get discombobulated when chasing power, it is best to start from basics.

When chasing greater performance for safer touring in modern traffic, 25% greater torque will be immediately noticed, whereas 25% greater HP will barely be noticed when staying out of the redline area. Since very little time is spent at WOT (wide open throttle), more grunt for passing, climbing hills is advantageous w/o shifting down. HP via greater rpm means a narrow max performance RPM range which would indicate need for 5-6 speed tranny.

The methodology to achieve greater **vintage power** is based on the premise that one has to understand basic concepts involved in achieving the end game, before selecting from the proper of many false trails available. Missing building elements based on First Principles can lead one down a wide selection of erroneous paths, not conducive to the best results sought. Hence the **trilogy** of discussion put together so far**.** ***Thoughts on Torque & Tightening Critical fasteners*** Thoughts on Torque & Tightening for Critical Fasteners***,*** ***Valve Train Dynamics*** http://ttypes.org/ttt2/pdf/TTT2-Issue35.pdf **, & finally *Chasing Vintage Power.***

For performance, the primary design parameter is obviously to achieve the **best power to weight ratio**, tempered by various outside constraints such as the capabilities of the chassis, tranny, diff., brakes, etc. and these components being able to accommodate any extra loads from the added power and the adverse effect they have on the service life of the engine.

To achieve more power there must be more fuel. To burn more fuel, there must be more air (O_2). More air is difficult to achieve with NA (naturally aspirated) engines, but abundant air (O_2) is available with FI (forced induction) engines via classic supercharging, turbo charging, or adding oxygenators such as nitro methane, or on demand nitrous oxide. The down side is that the larger the explosive combustion event generated, while maximizing BMEP & torque, also generates extra thermal spikes that can exceed the temperature limits of stock, non-specialized engine components, resulting in burned valves & pistons etc. (Bronze alloy valve guides and seats are becoming common, acting as heat sinks, drawing heat away from valves, also copper bnz. alloy top piston rings are being tested as heat sinks to better transfer excess piston crown heat to cylinder walls). Also, there are the extra induced mechanical stress loads that may affect the rotating assemblies and engine structure, possibly making them incapable of sustaining additional loads long term. As high horsepower requires high RPM, the stability of the valve train assembly becomes a weak point.

It is bad form to be passed by a Trabant https://en.wikipedia.org/wiki/Trabant **a Yugo** http://content.time.com/time/specials/2007/article/0,28804,1658545_1658533_1658529,00.html , **a Gogomobile** https://en.wikipedia.org/wiki/Goggomobil, **a Crosley or a Cyclops** http://sbiii.com/cyclops/cyclops.html#stanorig **as long time readers of Road & Track may recall. One has to be able to say ta-ta, and show them who is real boss.**

- **Torque & RPM** are measurable quantities of engine output.
- **Power (HP)**, rate of doing work, is calculated and dependent on torque & RPM.
- **HP** = Torque x RPM/5252: E.g. 50 (lb-ft) torque x 4K rpm = 38 HP, therefore 50 lb-ft. of torque x 7K rpm = 66 HP and so on.
- **Torque** = HP x 5252/RPM.
- **BMEP** (PSI) = 150.8 x torque (lb-ft)/ displacement in c.i. (cubic inch)

  Max HP: This occurs at **max available engine intake airflow and max fuel burn**, so there is no leftover residual unburned air/fuel mix remaining after the combustion event. This is the Stoichiometric ratio, in lay terms, where X amount of a reactant (fuel, gasoline, e.g.) completely burns or reacts with another reactant (air) so that there is no leftover residual unburned potential air fuel mixture remaining after the combustion event. i.e. complete combustion.

  Max Torque: This occurs in NA (Naturally Aspirated) engines when there are max units of air (O_2) charge to fill the cylinder(s), i.e. the **best valve timing that induces the max unit of air charge** to optimally mix with the fuel units available in the cylinder at the combustion event. Bigger combustion explosion = greater BMEP = greater torque & HP. Under fixed atmospheric pressure it is hard to get air introduced into the cylinder(s) to maximize the combustion event, whereas extra fuel can be easily introduced and maximized with bigger jets to match the available air for the best air: fuel ratio.

Without fitting at least a temporary O_2 sensor, the problem is getting the ideal average (Stoichiometric) 14.7:1 air: fuel ratio to be spot on for complete combustion and max “bang”. Therefore, it is easy to see that maximizing torque (via more O_2) is a very productive means of generating power w/o going crazy chasing HP via possibly undesirable uber RPM in vintage engines. **For non racers seeking more power**, **chase torque, not HP.** A little richer air:fuel mix, say 14:1 gives more power, and a little leaner, say 16:1 gives better fuel mileage. Today's wideband lambda O_2 sensors provide a digital readout allowing one to optimize air:fuel tuning ratios throughout the RPM range with vintage carbs by testing different needle and jet combinations. Gas engines will putter along nicely at air:fuel ratios ranging from 10:1 to 20:1 compared to the more ideal 14.7:1 Stoichiometric ratio that results in the greatest BMEP.

HP via higher RPM destabilizes vintage valve train dynamics, stresses vintage engines, etc., *See link above.*

BMEP: (Brake Mean Effective Pressure), is the more important figure. In lay terms, it is the average *pressure imposed uniformly on the piston from top to bottom of the power stroke, producing a measurable (brake) output amount,* i.e. how big the explosive event is on combustion. The bigger the bang slamming the piston down, the more torque is induced into the crankshaft producing power. BMEP is a derived theoretical figure, **not** associated with cylinder pressures. It is just a comparative measurement of the efficiency of any given engine to produce torque for a particular displacement size. The more available air (O_2) inhaled to mix with fuel during the intake charge cycle, the greater the explosive event = greater BMEP = greater Power. Spinning the engine to greater RPM = greater HP for any given torque, **BUT GREATER RPM WILL IMPACT SERVICE LIFE OF VINTAGE ENGINES. Solution is to chase torque, aiming at maximizing a high, flat torque curve to the desired red line. Getting more air (O_2) mixed with the most fuel to achieve the ideal Stoichiometric mix is the goal**. All kinds of engine mods can increase engine efficiency which can be measured by greater BMEP, e.g. larger cylinder displacement will allow more fuel: air mix to be ingested for greater bang on ignition. **Higher compression ratio is the simplest means of greater BMEP via bigger explosion at combustion.**

With NA (Naturally Aspirated) engines, greater HP means chasing RPM, **not necessarily a good thing in a vintage engine**, as a way to increase BMEP. It is better to chase torque by maximizing available air (O_2) to grow explosive combustion event. However, it is easy to maximize BMEP with FI (Forced Induction) via blower or turbo charging (introducing more air O_2). Nitro methane or other on demand O_2 enhancers such as nitrous oxide can be added into the cylinder on the fuel side of the equation. These all make an enhanced explosive charge by mixing with more O_2 at the combustion event. With FI "x" greater amounts of combustible air/fuel mix will be introduced into the cylinder to create a bigger bang (maximizing BMEP) and forcing the piston down with more power thus increasing the torque loads introduced into the crank. While the FI path will easily generate 1.5-2 times or more HP, it really generates lb-ft torque via more air/O_2, (the real goal) to the point of closing in on HP; thus there is no need for excessive RPM in vintage engines that would be necessary on a NA engine. Of course, the downside of FI, as with a NA engine looking for HP via greater RPM, is that the bottom end, pistons, valve train, etc in the engine need to be bullet proof due to increased, loads, stresses, dated engineering, & thermal issues.

I doubt if the service life of a FI engine would be adversely affected by its extra power, compared to a new OEM XPAG engine. It may be possible to get 30-50K miles between rebuilds for the FI engine compared to semi-annual or annual rebuilds for a NA engine with similar HP. A few engine mods and technology such as thermal coatings, anti-wear coatings, modern metallurgy, tolerances, etc, could greatly increase engine reliability and valve train service life to the current daily driver levels of 100K + miles as compared to 30-40K miles back in the 40s, 50s, & even 60s.

Just adding a cam w/o a lot of other work to improve air/fuel intake efficiency is unlikely to add significant performance. An engine with FI would require different cam/valves than one for a NA engine. Higher comp. ratio is the simplest means of greater BMEP via a bigger explosion at combustion.

Enlarging ports to XL size may actually decrease HP as there is not enough velocity to transit atmospheric air/fuel mix to fill the combustion chamber during the intake charge phase of the cycle.

Principles of Wave Form theory: Air/fuel mixes in and out of a 4-stroke engine are a very complicated transient, resonant pressure wave study (but not as complicated as on a NA 2-cycle engine). The end game with either 2 or 4 cycle IC (internal combustion) is to maximize the air/fuel charge into the cylinder to combust the charge with greatest efficiency to achieve the biggest explosive bang resulting in the greatest BMEP.

As an aside: See Walter Kaaden, who eventually achieved 200 HP/Cu. Inch out of a NA 2-cycle engine some 55-60 years ago, a figure unmatched in 4-cycle NA engines until recently.
https://en.wikipedia.org/wiki/Expansion_chamber
Kaaden's research into pulse jet resonate pressure wave concepts, incorporated in powering the notorious WWII German V1 Buzz Bombs, led to his later 2 cycle pulse gas expansion experiments. These experiments were aimed at using exhaust gas pulses to help evacuate combustion cycle gasses,

while further scavenging intake gas flow during intake cycle, to maximize O_2 available beyond what is available via atmospheric pressure alone. Vintage readers may recall the bulbous expansion chambers incorporated in 2-cycle exhaust systems. Without FI, (forced induction) the objective was to enable the 2-cycle engines of the same displacement to compete against 4-cycle engines, by ingesting greater volumes of air/fuel mix than theoretically possible in N.A. 4-cycle engines; these being limited to 100% max gas/air fill of swept volume of cylinders i.e. 100% efficiency, (almost never possible, except possibly with modern direct fuel injection into the cylinder.) In a 2-cycle engine, anything above 100% efficiency is money in the bank, maximizing torque via greater BMEP.

Airflows are not steady state, but rather RPM related gas pulses (one pulse per rpm in 4-cycle, engines and two in 2-cycle engines.) stopping, starting, echoing back and forth, and overlapping each other. Air momentum, velocity, valve timing, and valve overlap all have to complement each other to maximize pulse units of atmospheric air charge available throughout or at desired RPM range. **(This is not unlike sea waves hitting a restriction like a seawall or beach and refracting back as undertow or as reverse/negative wave forms enhancing the next incoming positive wave form.)**

By using **Wave Form theory,** Kaaden was able to increase air (O_2)/fuel mix into the cylinder(s) beyond the theoretical 100% efficiency of atmospheric pressure fill alone. This functionally provided a supercharging effect in a naturally aspirated 2-cycle engine. Ultimately, he was able to achieve a volumetric efficiency equivalency of 140% compared to a 4-cycle NA engine with the theoretical potential of 100% fill efficiency. This resulted in a much greater BMEP using 2 stroke technology, than with 4 stroke engines of the same displacement, (essentially putting 4-cycle Moto GP at all levels out of business for a time). That is, until Honda & other 4-cycle stalwarts succeeded in getting 2-cycle bike engines banned on environmental emissions grounds. Today, with emissions issues being resolved, 2-cycle engines are making a comeback. At least one major mfgr of 4-cycle outboard engines is dropping its entire line of 4-cycle engines and is returning to building 2-cycle engines.

The trick was a succession of various evolutionary experiments in bulbous expansion chamber design shapes, to refract/echo the expanding high pressure exhaust gas pulses back into the combustion chamber. The next positive pressure wave(s), maximized the exhaust gas suction, backflow pulses at the end of the exhaust cycle. As the intake cycle starts, these suction pulses provide a scavenging effect, accelerating the intake air/fuel inflow charge **to exceed the potential** of atmospheric pressure to fill the cylinder with air fuel charge, sort of a ping pong or yoyo effect.

Smaller ports can generate higher airflow velocity and more momentum to respond to pulses sucking the air/fuel mix into and out of the combustion chamber during each intake/exhaust cycle at low rpm. Large area port passageways can diminish air pulse velocity, therefore the airflow has less momentum to optimally fill or evacuate any given cylinder displacement, unless very high RPMs are needed to generate HP, as opposed to torque at low RPM. Then there is the issue of optimizing and coalescing the fuel air swirl/tumble mixture in the combustion event to enhance the air/fuel mix. Ideally there should be no isolated, non-atomized fuel concentrations in the combustion chamber, igniting or auto-igniting isolated flame fronts. These contribute to knock and **extended** combustion, thus diminishing one cohesive bang on the ignition event, and not maximizing the BMEP punch. Less fuel/air mix entering the combustion chamber = less BMEP explosive punch to generate torque.

The last thing to contemplate is the trade-off between added performance vs. the service life of the engine. The service life will be reduced as the performance of the engine is increased. 'Tis a delicate balance on a vintage engine!

Greater service life with uber performance as a goal would lead one down the path to an engine swap, as there are plenty of modern, tiny light engines with 150 hp+ that offer a service life of over 100K+ miles with virtually no maintenance. The question is, will the chassis handle new power? Beware of O. P. (Originality Police) though!"

For Further information see:
Re Kaaden: see Mat Oxley, *Stealing speed*; Jan Leek, *MZ The Racers: The Birth of The Modern Two-Stroke.* (An out of print collector's item.)
Re. Valve Train/Cam dynamics: see Blair, G.P. et al, Valve Train Design.

WSH TC 4926 02-23-17.

LOST AND FOUND

TC0777 – EWD 36

Brad Purvis in the US has recently bought TC0777. It was advertised on the following website: http://bringatrailer.com/listing/1946-mg-tc/

The car was restored in the UK in the 1980s and exported to the US, possibly by a dealer.

Brad is keen to learn of the car's history (it was originally registered in Warwickshire).

To this end, I wrote to DVLA as follows:

"This car was exported to the USA sometime back.

You may not be aware of this because it still comes up with a vehicle enquiry.

The current owner in the USA is keen to learn of the car's history (previous owners). If I forward his e-mail address to you, are you willing to release information to him?

Alternatively, if he sends me an e-mail authorising me to ask you to provide the information to me, are you willing to release the information, please?"

I received the following reply:

"Thank you for your email.

Perhaps I should first explain that the register held at DVLA is not a public record. Whilst Regulation 27 of the Road Vehicles (Registration and Licensing) Regulations 2002, permits the release of certain information, the DVLA may only do so in a limited range of circumstances. In addition, DVLA is registered under the Data Protection Act 1998 and has a duty to protect the privacy of individuals when releasing personal data.

Currently, we cannot release data outside of the UK as we are unable to obtain the necessary assurances as to the identity of the requester and that the enquiries are genuine.

Also, I must advise that we do not release to UK address if we have knowledge that you intend to pass the information to the USA.

I can understand your reasons for wanting the information but under the circumstances you describe I am unable to provide it.

I regret that you may be disappointed with this reply, however I am unable to be of any further assistance on this occasion."

I really do despair at the attitude of the DVLA in these circumstances. Brad tells me that he is a frequent traveller (he was in Dublin when the car was delivered) and is minded to present himself in person at Swansea to gather the information.

For the benefit of DVLA here is a picture of Brad, sitting in his new purchase. I certify this is not a cardboard cut-out and that Brad is a real person.

Please contact the Editor jj@ttypes.org with any leads you may have.

TA3076 – DTF 654

DTF 654 is shown on the DVLA website as "Tax due 1st December 1988".

Martin Endsor martin.endsor(at)gmail.com {Please substitute @ for (at)} is hoping that his old TA is still alive and well and that somebody out there might be able to help him track down the car.

Martin paid £5 (yes, that's correct, £5!) back in 1964, or thereabouts. The radiator needed re-coring and the bill - 4 pounds10 shillings) was almost as much as the car. The TA ran for a time on its original engine, but it was very worn. A Wolseley 4/44 engine was obtained and fitted and the gearbox, propshaft and mountings were fitted from a local TC that had been 'T-boned' and was at that time beyond economic repair.

Martin cleaned up the head, re-profiled the support pillars, had the cam shaft re-profiled and increased the compression ratio. The car performed very well but tickover was lumpy, (back then he had not discovered the need to alter the timing). All this was done when he was 19 or 20.

Martin last saw the car near Redditch where he was then living and the pictures shown were taken around 1985. Soon after, he relocated to Cornwall (near Falmouth) where he still is.

The then owner had had the TA restored. He sold it on, not being happy with the wandering steering. Sometime later, he was killed while out riding his push bike. Martin made contact with one of his sons through a Redditch company of which his father had been a director. Unfortunately, neither he or his mother have any records or recollection of where the car went. Pictures of the car, taken around 1985 show that it was untaxed.

TA???? – DKJ 233

Nick Manton has e-mailed to enquire if this TA is still around. It is recorded as not known on the DVLA website.

Nick spotted a photo of the car in Bob Ogley's book *Kent: A Chronicle of the Century Vol.2: 1925-1949.*

I'm unable to share the photo due to copyright, but the caption is interesting. It records the ending of a 3-week bus strike over pay and conditions in the county of Kent with a return to work by thousands of busmen on 14th May 1937. It goes on to say that a few bus drivers who crossed the picket line and went to work needed a police escort. To illustrate this, there is a photo of the TA with two policemen aboard following the only bus in the Rochester, Chatham and Gillingham district as it went through Chatham on 22nd April.

When (if!) I have a bit more time I'll see if I can get permission to print the photo. In the meantime, if anybody has any past knowledge of DKJ 233 I'd be grateful if they would contact the editor.

TD4194 – LXK 284

Towards the end of April, I received an e-mail from Karen Harrison on behalf of her mother Sheila. Sheila, now an octogenarian, has been trying to locate the whereabouts of this TD (and what has become of it) since her husband's death. Her late husband, Denis, was a motor mechanic at Appleyards in Leeds. Appleyards were MG main dealers since the 1930s and most have sold and serviced hundreds, if not thousands, of MGs. They are even on record as having serviced the socialite, Lady Docker's gold-plated Daimler!

Denis and Sheila owned the TD for about 5 years but Denis reluctantly had to sell his pride and joy in order to raise the deposit for his and Sheila's first home.

Sheila's daughter tracked down LXK 284 through the Internet, which led them to Issue 19 of *Totally T-Type,* which I edited in a previous life.

With help from Graham Parnell, I put them in touch with Tony Short, the current owner, who was both amazed and delighted that someone who owned his car 60 years ago should contact him.

Tony told Sheila that he bought LXK 284 in 1978 and tried without success to contact some of the previous owners. He has the 2nd original buff log book which goes from 1979 (owner no 8) until 1964 (owner no 13). No. 8 was Audrey Redman who may have bought the car from Denis and Sheila. All the owners lived in Leeds but didn't keep the car long; on average one year each.

The car was in a sorry state, mainly in pieces, when Tony bought it from a Pontefract night club owner. He restored it over a 9-year period in his spare time and put it back on the road in 1987. It's still going strong and is regularly used to go to the local MGCC 'natter'.

LXK 284 – then and now.

A happy ending indeed to 'LOST AND FOUND!'