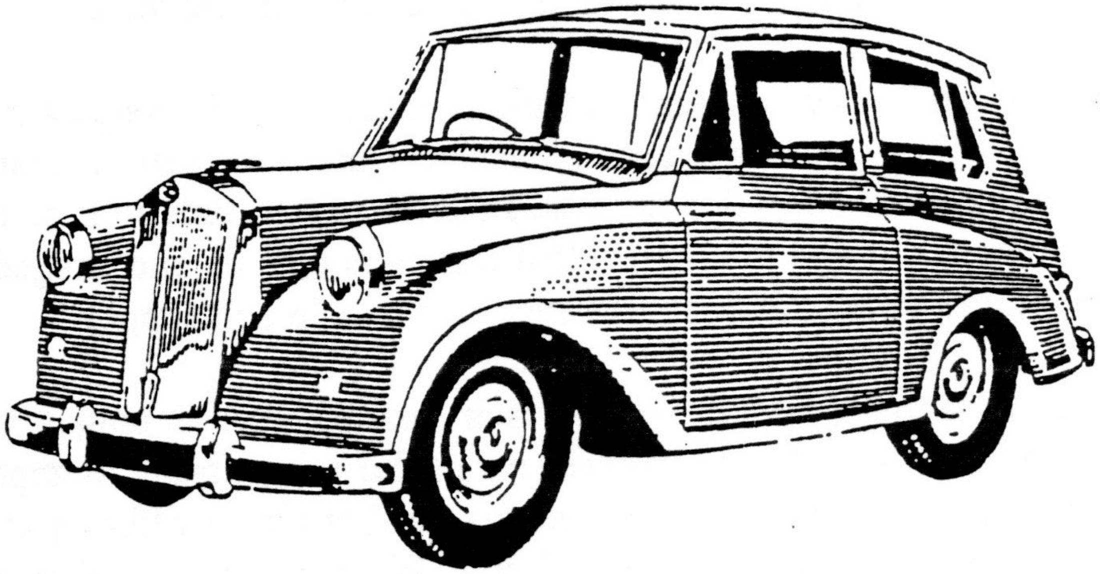


THE TRIUMPH MAYFLOWER CLUB

TECHNICALITIES: ENGINE, GEARBOX & CLUTCH

February 2019 | Paul Burgess

CONTENTS

Engine Transplants – Flowerman, Flower Power, Summer 2005

Just about all and any engine has been fitted to a Mayflower from a Stanley Steamer to a American V8 so Just about anything is possible. In America again we have a member with a Nissan engine fitted and another with full electric power run by batteries.

These are all extreme and require some form of expert engineering feats but the easiest way of engine transplanting by far is to fit a four cylinder Triumph engine from the Herald or Spitfire or even the Toledo, all are much the same.

If we take the 12/50 Triumph engine or 1200 cc/50 bhp engine that will immediately give a 25 per cent power increase, a 13/60 will give a 50 per cent increase over the 38 bhp of the original engine and give a better mpg.

All the above engines can be coupled to the Mayflower gearbox without any serious engineering, although some will inevitably be necessary to change the exhaust pipe over to the other side which in terms of engine transplant is more of a fiddle than a career.

The gearbox I would agree is somewhat lacking but I am assured by people with the above engines they work well together and maintain some of the originality by using three on the tree (three gears on a column shift) as against four on the floor where again some chopping will be required to get the box in and remanufacture yourself a tunnel cover.

I have heard of plans for a Spitflower, Spitfire 1300 engine and box with overdrive, which will make It go but disc brakes will also be fitted to make it stop. This again will need some engineering to accommodate the overdrive, to enlarge the tunnel, change the gearbox mounting point etc, etc.

Whatever you decide about engines it will all enhance the straight line speed but please, please remember you will not be able to produce the cornering ability very easily on this car.

So with the Vitesse engine, my opinion Is it is overkill, it may be quick, It will be thirsty, It will certainly be very, very heavy on the steering and although you may get to where you are going faster I think you will spend a lot of time replacing all those steering joints.

Fitting a Herald 13/60 Engine in a Mayflower – Norman Ward, Flower Power, Winter 2002

I chose the Herald 13/60 engine which requires more work to fit than the 1200/1250 range but the latter would not provide sufficient power so fuel consumption would surely suffer. It is possible to fit the 1500 cc engine but it is rather a harsh unit and crankshafts can be troublesome. So as the 13/60 seemed the obvious choice I duly purchased one from my local breakers yard for £35, which when thoroughly checked proved to be okay.

I then proceeded as follows: remove the Mayflower engine and gearbox, separate and remove the clutch, flywheel, front and rear engine plates. Remove the clutch, flywheel and rear engine plate on the 13/60. Position rear engine plate of Mayflower on the 13/60 plate, making certain that it remains central for crankshaft line and drill holes for mounting to 13/60 block using old plate as template.

Cut original front engine mounts off 13/60 front plate, measure position exactly from Mayflower front plate before cutting off mounts so as to correctly weld or bolt these on the 13/60 front plate.

The starting handle dog, when removed from the Mayflower front pulley, will fit the 13/60 engine but needs to be turned down on a lathe sufficient to clear cross member. A ½" spacer will then need to be made which will fit rear end of crankshaft, which must be dowelled to crankshaft and flywheel, the flywheel being a Mk I Triumph 2000 type. This needs to be drilled and tapped to accommodate the Mayflower's seven inch clutch. Also the holes for mounting the flywheel will need reducing in diameter (I did this by making collars which were a tight fit) and using longer bolts (because of the spacer) for mounting. The 13/60 flywheel cannot be used because of the starter motor alignment and clutch measurements.

Next a longer bronze bush for the spigot bearing is required. Unfortunately I cannot remember the length but a measurement can be made from the gearbox bell housing and rear engine plate without difficulty. Next remove and discard the clutch release plate from the clutch cover and assemble cover and clutch plate to the flywheel. Fit a Mk I Triumph 2000 release bearing and carrier into the bell housing. (If carrier snout protrudes forward of first motion shaft splines, it may be necessary to remove and cut off ¾" and refit.)

The gearbox can now be mounted to engine (2 or 3 bolts near the top cannot be fitted due to the holes that do not correspond and these can be ignored). The next step is to obtain a Mk I Triumph 2000 front exhaust pipe, the 13/60 manifold is then cut off just above the front pipe flange, angled and re-welded to take the 2000 front pipe, this is essential to bypass the starter motor. Next remove and discard the original exhaust system, remove petrol pipe clips from underside of the car and reposition pipe to nearside and clip firmly. Remove the starter switch and spot welded bracket and mount inline near heater box. Extend dynamo and low tension cables etc to left hand side of car. The water heated manifold pipes will have to be repositioned to clear gear change and steering tie rods.

The engine and gearbox can now be installed. Connect up all fittings and mount ignition coil on nearside inner wing, make up remainder of exhaust system with a suitable silencer and tailpipe, which should now be mounted along the offside of the car. A suitable adaptor for temperature gauge capillary tubing should be fitted and also a longer choke cable. Convert throttle fittings to carburettor as necessary.

The air filter I found difficult, as there is insufficient room for fitting. I overcame this problem by making a welded slim box for extending to a suitable position. The radiator needs to be lowered as far as possible for a safe clearance between the bottom hose and the fan blades, the hoses being cut down from a suitable equivalent. There are probably a few more small details that I may have forgotten but none that should provide any difficulties.

Mine on test did just reach 80mph on a motorway but driven at a steady 40-50 mph on open roads produced 39 mpg. A well worthwhile conversion with no more blown head gaskets or fear of climbing hills holding up traffic and your Mayflower will be transformed to a miniature Renown!

Conversion To Run On A Herald Engine And Gearbox - David Miller, Flower Power, Summer 2000

Remove old engine, gearbox, prop shaft, etc, after, of course, removing the bonnet, radiator, grille, etc.

Hang Herald engine and gearbox in the appropriate position (with gear lever removed) and connect the Mayflower propshaft after changing the front flange to a Herald one to get the position of the engine correct. The engine can be aligned by using a bar through the starting handle aperture. Set the engine to the correct height, taking care not to damage the track rod.

You will now need to undertake the awful task of cutting the floor to allow the gearbox up. Fit a 'U' shaped cradle across the chassis utilising the existing captive bolts/ holes. For this I used ¼" stainless steel four inches wide. Using a combination of Mayflower and Herald engine mountings, set so the bottom of the mounting is flat, position the cradle so that it is touching the engine mountings, mark, drill and bolt.

Gearbox mounts can be made to suit. I used the existing cradle and made brackets as required. As the Herald requires a hydraulic clutch I fitted a Herald clutch master cylinder directly onto the bottom of the clutch pedal, facing backwards, bolted onto the chassis. This makes topping up difficult but I have now fitted a remote reservoir.

As the exhaust manifold exits on the right side a length of flexible exhaust pipe was used to connect the original Mayflower exhaust system. The existing bottom hose was shortened slightly and I used it as the top hose. The bottom hose is presently in four sections and I'm currently looking for a suitable replacement. I fitted the Herald starter and all the other ancillaries.

The Mayflower is now much more driveable and not such a hindrance in today's traffic. I have no idea of the top speed because although the Mayflower speedo cable fits the Herald gearbox it reads about 8 mph slow. Cruising at about 60 mph is a nice speed.

No special tools were needed for this transplant except the hire of an engine hoist.

Engine Breather - Malcolm Tidball, Flower Power June 1977

The Flower was gradually losing power and becoming progressively more difficult to start. On carrying out a compression test, a leakage rate of 84% was recorded on two cylinders so I thought "Aha, the head gasket has blown". But surprise, surprise two exhaust valves were very badly burnt out, the head gasket being perfect. As it was obviously necessary to hold an inquest, I investigated very thoroughly every avenue but could not account for the cause. I proceeded to make the repairs, checking all details as I went. Then suddenly Lo and behold I found it! The engine breather pipe was blocked solid with sludge. This had allowed oil mist to accumulate in the crankcase and eventually find its way up past the valve guides and onto the valves themselves, thus causing them to burn out.

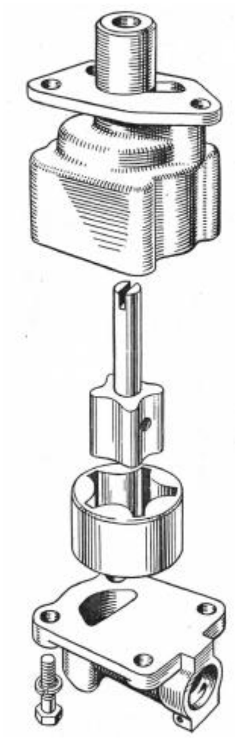
So be warned, do not get caught out as I was. Periodically check that the breather is clear. Being horizontal, it is prone to blockage. It is advisable at the same time to check the little valve located on the inlet manifold connected to the end of the tappet cover breather, as the blockage of this valve is the cause of lots of sludge being pushed through the main breather pipe.

Finding Top Dead Centre - Classic Motor Monthly, May 2016

A simple device for finding top dead centre on a side valve engine: Take an old spark plug, snap off the side electrode and knock out the central metal core. Then tape a small balloon to the now hollow insulator. In use remove all the plugs and turn the engine by hand until it's on the compression stroke on number one cylinder. Now fit the modified plug to that cylinder and continue turning the engine. When the balloon is expanded to its largest volume, the piston will be at t.d.c.

The Hobourn-Eaton Oil Pump – Facts Behind Design, Standard Car Review, August 1951

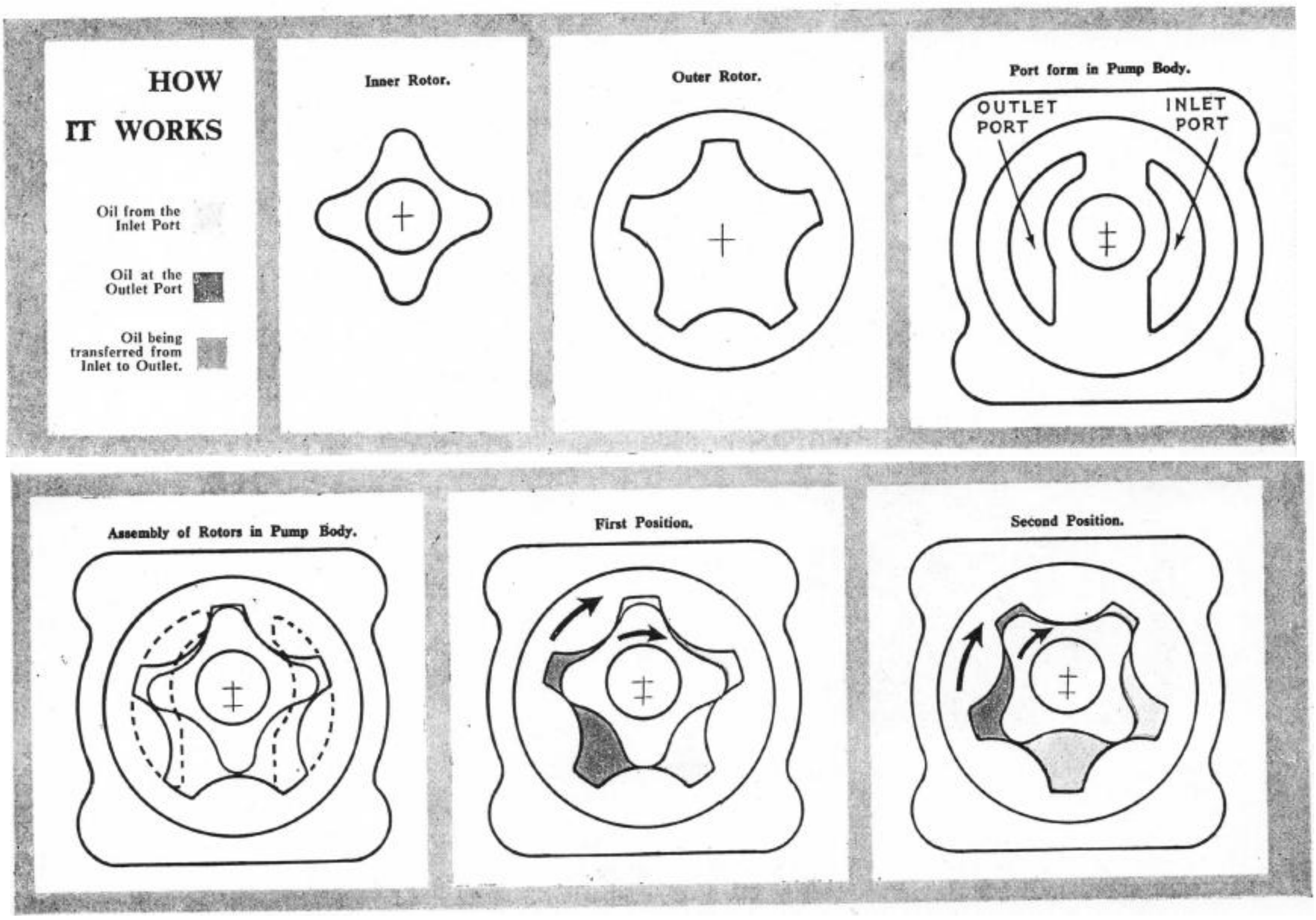
INTERESTING DATA CONCERNING THE DESIGN, FUNCTION AND TESTING OF THE HIGH CAPACITY DOUBLE ROTOR UNIT FITTED TO ALL CURRENT STANDARD AND TRIUMPH CARS AND THE FERGUSON TRACTOR.



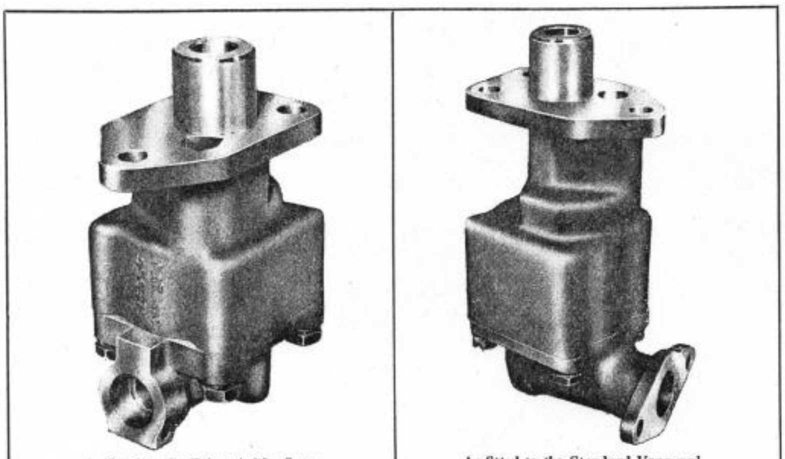
AS the internal combustion engine has been developed over the years to give more power for a given size, so the load on the various bearings, and the heat to be dissipated has increased. Thirty years ago the main bearings of the crankshaft of a touring car engine were lubricated by oil under comparatively low pressure, but the connecting rod bearings, cylinder walls and valve gear were probably lubricated by splash and oil mist only. Invariably today, main and big end bearings are lubricated and cooled by oil under pressure. In addition valve gear and auxiliary drives are positively lubricated. This entails the use of a comparatively large quantity of oil at any one time.

DESIGN CONSIDERATIONS

The oil carried in the sump is constantly being circulated through the engine. It is drawn from the sump and delivered under pressure to the main oil gallery in the crankcase by the oil pump. It is desirable for the oil to be filtered before being delivered to the bearings and this is often carried out in two stages. Firstly, before entering the pump and, secondly, under pressure between the pump and the bearings. On the Standard Vanguard engine primary filtration is carried out by a filter on the inlet side of the pump which is situated just below the oil level in the sump, floating in the case of the Mayflower. This ensures that any sludge which may form at the bottom of the sump will not be drawn into the engine. Having passed through the pump the oil is delivered under pressure to the main bearings, big ends, valve gear, etc. Part of this oil is diverted through a by-pass oil cleaner which filters the oil to a very fine degree.



From the above it will be realised that the performance and type of oil pump for any engine must be considered in relation to the characteristics of that engine. For example, it is necessary for an oil pump to deliver enough lubricant at idling speeds even when clearances both in the pump and the engine have been considerably



As fitted to the Triumph Mayflower. As fitted to the Standard Vanguard.

increased by wear. Conversely, when the engine is new and clearances are small the amount of oil delivered at high speed will be such that attention has to be paid to pipe size and relief valve design to ensure that oil pressure does not become unduly high. Two types of pump are being fitted to British cars today. One is the gear pump and the other the Hobourn-Eaton pump. The latter is fitted to all Standard and Triumph cars and the Ferguson tractor. It is hydraulically more efficient than the gear pump, is extremely simple. and runs for a very long period with no attention and little decrease in efficiency,

OPERATION

The principle of the pump is apparent from the illustrations on these pages. Referring to the part section drawing, it will be seen that the pump consists of five main parts—the body, the driving spindle with the inner rotor pinned to it, the outer rotor, and the cover, which is secured to the body by four set screws. The inner rotor has one lobe less than the number of internal segments in the outer rotor. The spindle centre is eccentric to that of the bore in which the outer rotor is located. Thus the inner rotor is able to rotate within the outer and causes the outer rotor to revolve. The positions of the inlet and discharge ports are as shown.

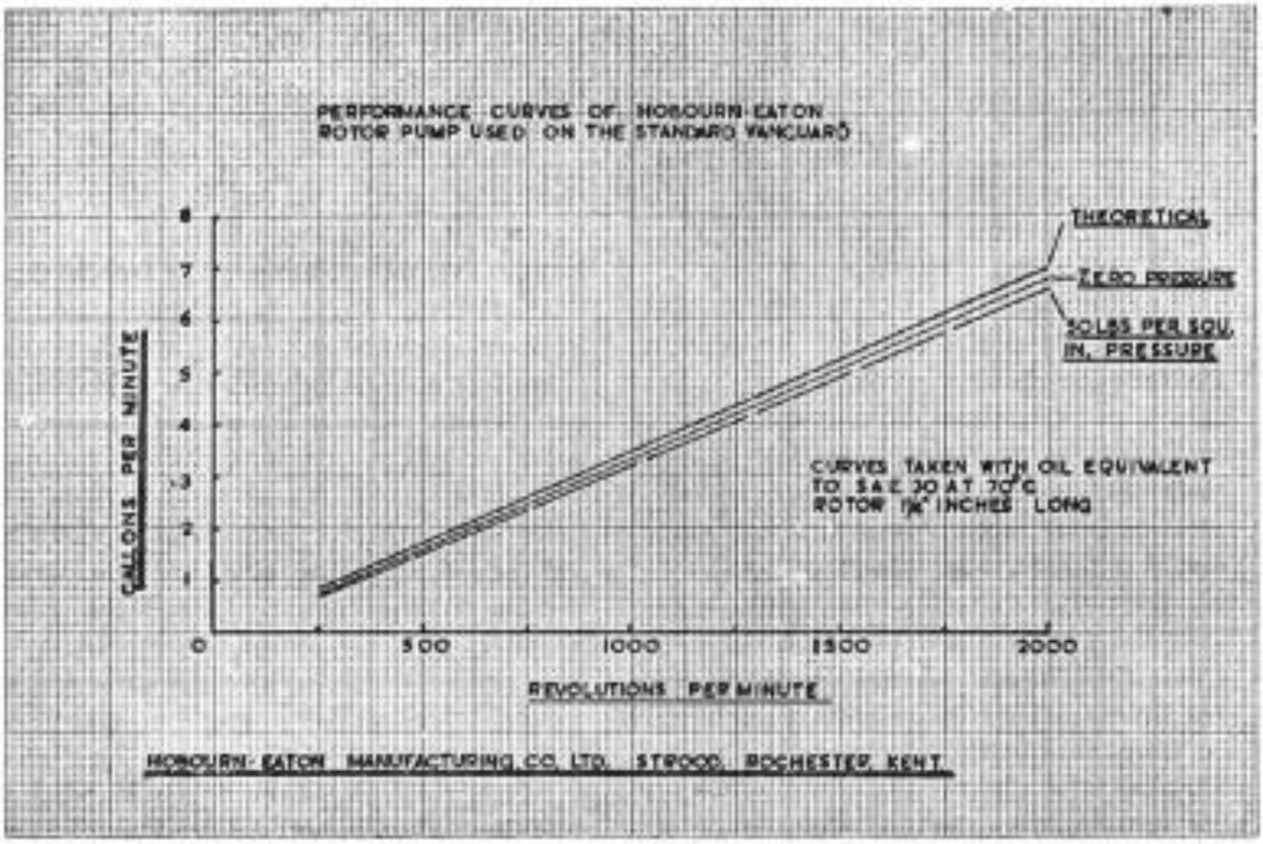
Now let us consider the oil flow in the first position, that is with the lobes of the inner rotor lying along the line of eccentricity. In this position oil is free to flow from the inlet port into the space coloured light red between the rotors, and that oil in the space coloured dark red may flow into the delivery port. In the second position the inner and outer rotors have rotated and caused the oil that was flowing from the inlet port into the space between them to be cut off from the port and transferred to the enclosed space between the ports (shown grey in diagram). Similarly, the space which enclosed oil free to flow to the delivery port in the first position has decreased in size in the second position, and thus caused the oil to flow into the delivery port. The action of the pump then is a continuous repetition of the above; oil flowing into the space between the rotors from the inlet port under atmospheric pressure and being discharged into the delivery port by reason of the space in which it is contained decreasing in size as it passes over the port.

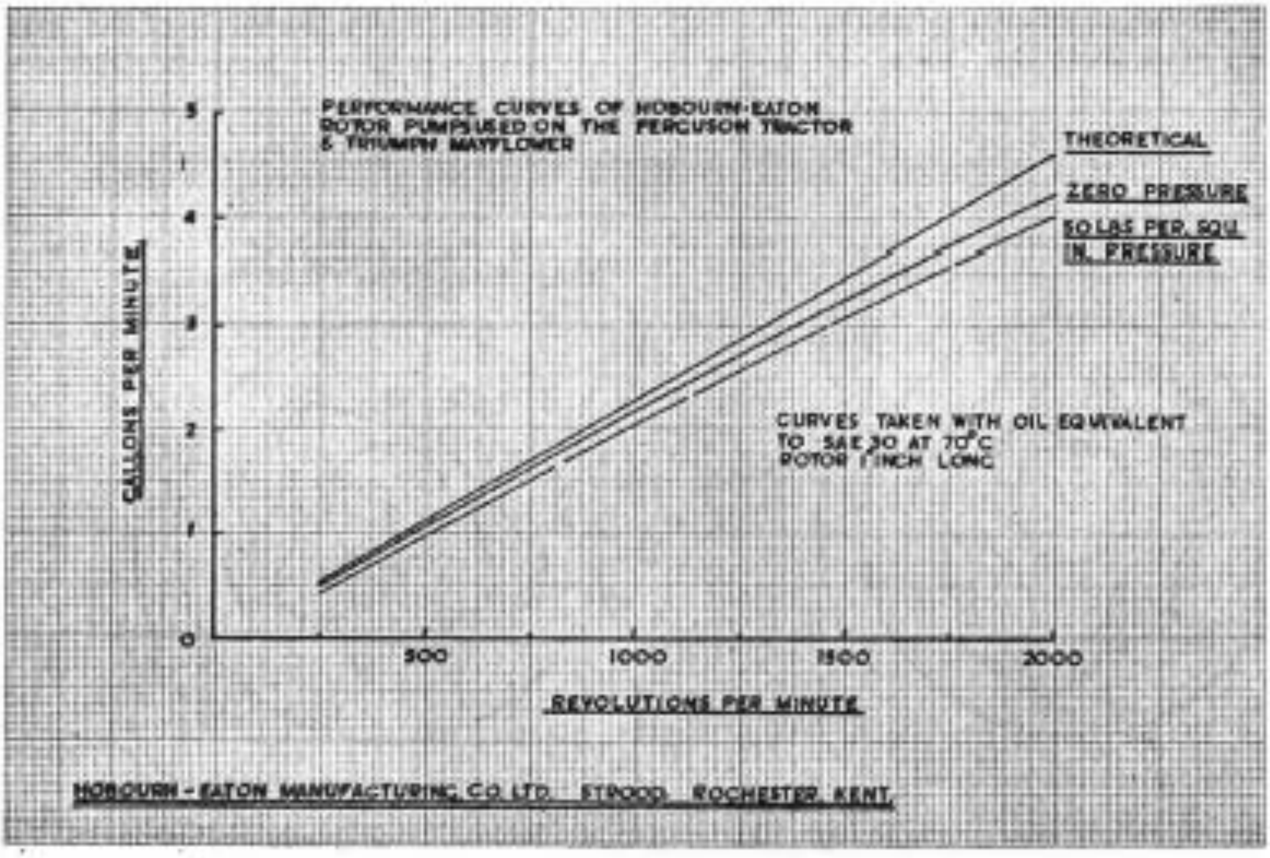
From this it will be realised that the amount of oil delivered from a pump of any given rotor section, that is shape between rotors, is dependent on the length of rotors. It is interesting to note that all Standard, Triumph and Ferguson vehicles utilise the same rotor section, in fact, the one illustrated, but the pump designed for the Vanguard engine has rotors 1 ½ ins. long, that for the Ferguson tractor has rotors 1 inch long. Therefore the delivery of the Vanguard pump is approximately fifty per cent greater than that of the tractor pump, the pump speeds being the same. This is necessary on account of the higher power output of the car engine. Referring again to the illustrations, it will be seen that the ports are at opposite ends of the rotors. Since the oil has to be raised from the sump to the main oil gallery in the crankcase it is convenient to have the delivery in the flange of the pump which is bolted to the crankcase. This arrangement obviates the necessity of any external pipe to the pump and is perfectly satisfactory so far as the working of the pump is concerned.

FACTORY TESTS

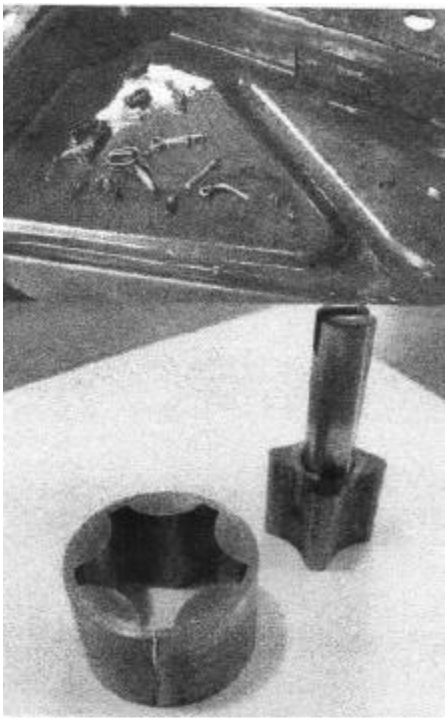
The graphs show typical performance curves of Hobourn-Eaton pumps. In all cases actual delivery is not less than eighty per cent of the theoretical. Also, it will be seen that increased delivery pressure has little effect on output. To ensure that this standard of performance is maintained, every Hobourn-Eaton pump is tested before it leaves the works. During test the pump delivers a mixture of paraffin and oil, having a viscosity equivalent to engine oil at normal working temperature. Initially the pump is run at 1,800 to 2,000 r.p.m. to bed down the working surfaces and wash the interior. Then it is caused to deliver through a known jet and the r.p.m. required to give 40 lbs. per square inch read from the tachometer. If the speed is above a certain figure the pump is rejected.

It will be of interest to owners to know that the Hobourn-Eaton pump requires no maintenance between major engine overhauls. At these times it should be inspected and if any part is worn, it, or the complete pump, can easily be replaced. Spare parts are readily available, and their cost is low since all parts are interchangeable and produced in large quantities. In fact, the pump has been designed not only for high efficiency but also for ease of production and maintenance.





Alternative Oil Pump – John Leslie, Flower Power



A COUPLE of years ago I bought my second Mayflower and, on the 150 mile drive home, I was pleased to note that it had excellent oil pressure. However, about a year ago, I was returning home from a short trip and, as I entered my driveway, noticed that the oil pressure had dropped away to virtually nothing. As the engine was just on idle, I didn't worry too much about it but on subsequent (short) trips I again noticed that the oil pressure was unusually low.

Finally I decided to investigate by dropping the sump where, to my surprise, I found that every single one of the big-end split pins had broken off and were lying in the bottom of the sump. Actually this isn't quite the whole truth. One piece, at least, had been sucked into the oil pump where it cracked the female rotor hence the loss of oil pressure. Bugger!!

To cut a very long story short enquired of our spares secretary as to where I could get a new oil pump, no luck. I did however have a couple of used spares and so fitted one of these - and new bearing shells, etc, etc. This gave me back some useable oil pressure (about 35 psi when hot and cruising) and I have been running like that for several months now. Incidentally, whilst lying under the car doing all this work I noticed a drip of green water coming down a cylinder into my eyes every five minutes or so but that is another story!

A few months ago I was relaying this oil pump issue to a very knowledgeable friend of mine who told me that a Massey Ferguson tractor had the same (Standard) engine as a Mayflower and was sure that an agricultural supplier could probably get hold of a new oil pump for me.

Unlikely as it seems, this is true (at least partially). The tractor engines are a larger bore and probably have several other differences too. The good news however is that they do have the same oil pump and that they are readily available. Actually this isn't quite the whole story, the oil pump male and female rotors are identical to the Mayflowers but the drive shaft, although the same diameter, is a bit longer.

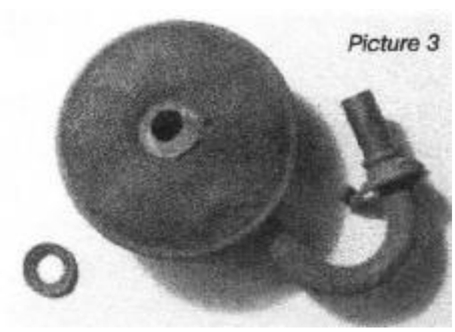
Nevertheless I bought one, cut off the drive shaft, and had a new drive slot milled in the end. (If you decide to go down this route, but remove the rotor from the shaft rather than milling a new slot, DO NOT use a roll pin to reattach the rotor. You will lose oil pressure straight from the discharge side of the rotor to the suction side. You must use a solid pin).

This has now been fitted to the Mayflower and all is well.

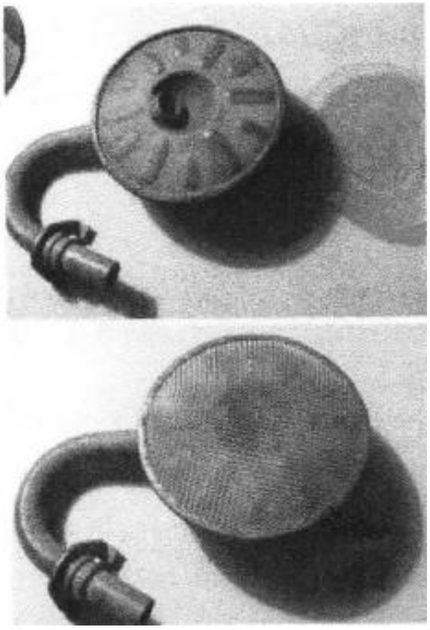
This leaves two questions:- Why did the split pins all fail and. How come a broken piece was able to get through the gauze filter.

Prior to me buying the car, its engine had been reconditioned at a 'recognised' garage. (I have all the receipts.) Maybe they fitted old split pins? Probably unlikely but not impossible. I did notice however that the split pins which failed were all a bit smaller in diameter than the holes in the big end bolts. My suspicion is that, because they were loose in the holes, they were hammering up and down thousands of times a minute so eventually suffered from metal fatigue and broke off.

For some reason that escapes me, the gauze filter is designed with a 'large' hole in it, see Picture 3, which show a spare, dirty, one, not the one fitted to the car. This hole is formed by a copper ring, crimped onto the centre of the gauze. In use, it is supposed to bear against the underside of the cruciform 'spider' and so prevent the ingress of solids. On my car the gauze had been deformed at some time, probably by a finger (?) and hence the pump was no longer properly protected.


Picture 3

The only reason I can think of for this design (other than a demented designer!) is that, if the oil at start-up is very cold and clogging the gauze, the gauze itself could be sucked back by the pump and this would allow oil to flow through the hole and thus feed the bearings. As the engine warmed, and the oil thinned, the gauze would return to its correct position just because of its springiness.



Irrespective of the reason, I don't want my gauze to have a large hole in it! I therefore replaced it with stainless steel gauze from a flour sieve (or is it Flower sieve!?) which I stole from my wife's kitchen cupboard!!

All now seems well, and I look forward to our (Southern Hemisphere) summer and a (hopefully uneventful) trip to a large rally being held about 750 miles away in Wanganui, New Zealand.

For the benefit of others, the tractor in question is a Massey Ferguson TE 20 and the part number of the rotor pair is 827 501 M91.

(There was a brief mention of this tractor in Flower Power No 128).

Incidentally, while buying this rotor pair, it appeared from the computer display at the tractor 'shop' that several other tractors had a similar pump but again the drive shafts were different from the Mayflowers. Just to confuse the issue, when I look at the box my new rotor pair came in it bears the identification: Bare - Co, 0S0607AN, Batch B2257, Rotor oil pump=MF petrol.

Replacements For Duff Engine Mounts - M. Hudd, Flower Power Summer 1985

The condition of my front engine mounts together with the difficulty I experienced when trying to fit my starting handle prompted my search for replacements. After visiting various car shops I discovered that Morris Minor (Series II) gearbox mounts are ideal for the job.

The mount consist s of a piece of rubber I" thick with metal plates fixed to both sides. On each plate is welded a 3/8" fixing bolt. All that is required is to remove the car's mounting brackets and strip off the old rubber. The new mounts are then bolted to the brackets which have been drilled in the middle with a 3/8" clearance hole.

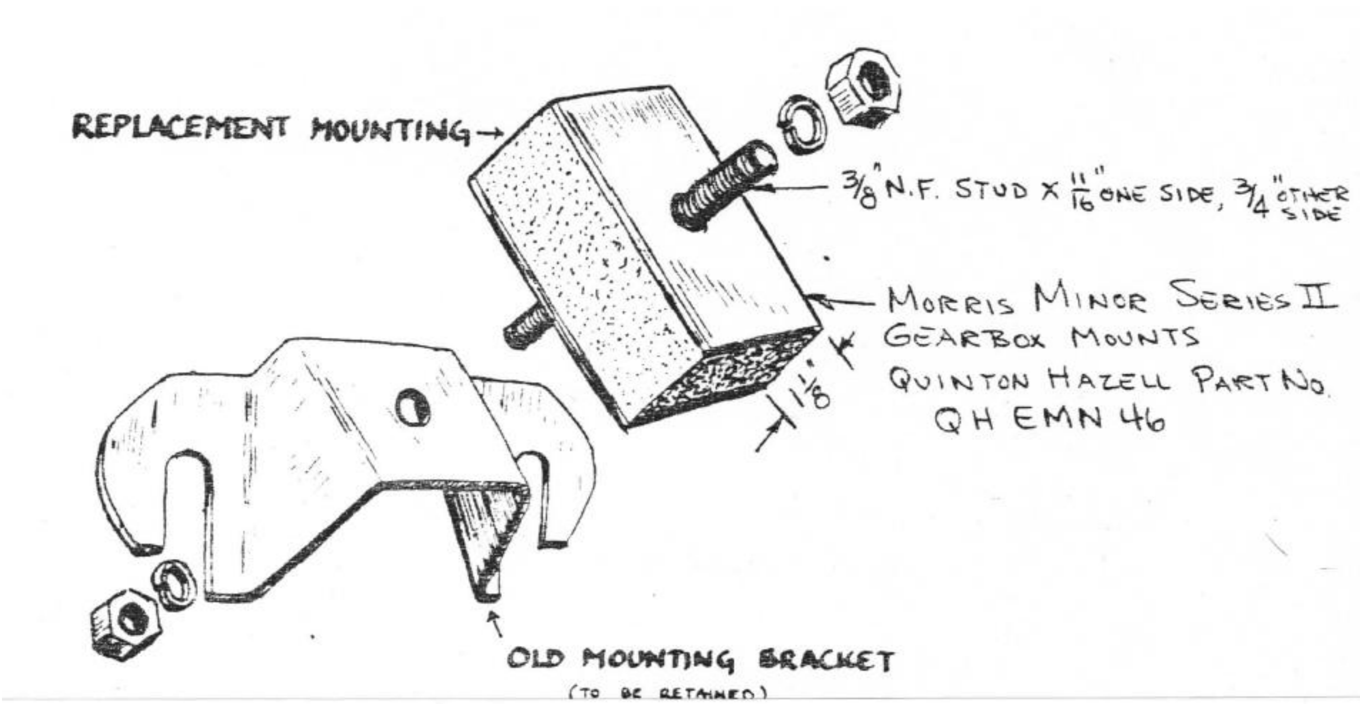
First drain water and then disconnect the top radiator hose. Place jack under sump and raise the engine little by little. Undo the four bolts which hold the brackets. When the engine is raised clear of the chassis the old mounts may be unbolted from the engine. Note they are right and left handed. Fit the Morris mounts as described above and then refit to engine and reassemble car.

Having tried this method on my own Flower I can attest to its simplicity and that the new mounts will restore engine stability with no vibration of the car. Once done it should last for many years without further attention.

Fitting Morris Minor Series II Gearbox Mounts As Replacement Engine Mounts

NOTE: These mountings (Quinten Hazell QH EMN46) are the nearest to the original we can obtain, and in their fitting the following procedure is recommended.

1. Drain the water from the radiator and disconnect the radiator hoses.
2. Place a jack -under the sump and (taking care not t o damage the sump) raise the jack until it is taking the weight of the engine.
3. Loosen the nuts securing the old engine mounting bracket to the chassis.
4. Raise the engine clear of the chassis.
5. Unfasten the old engine mounting from the side of the engine block.
   Note that the brackets of the old mountings are right and left handed; to avoid confusion it is best to deal with the replacement of the mountings one at a time.
6. It is necessary to re-use the old bracket by which the mounting was attached to the chassis, so strip the old rubber from it and clean the surface.
7. Drill in the centre of the old bracket a $\frac{3}{8}$" hole (see diagram below).
8. The new mounting is fitted to the old bracket through this hole, and the complete assembly can now be attached to the engine.
9. When both sides have been repaired in this manner, lower the engine and refix it to the chassis; re-connect the radiator hose and refill with water.



Cylinder Head Removal – Roy Grove, Flower Power, Winter 2002

You mention on your website the difficulties removing the cylinder head. When I did this it took me a week to get the head off. I broke two small jacks, tried soaking around the studs with penetrating oil for a couple of days, nothing seemed to work and local garages were no help. They talked of having the car suspended in chains for days, one even said that he had to strip the bottom end and knock the head off with baulks of timber.

Finally in desperation I levelled off the pistons, filled the bores with penetrating oil, replaced the plugs and had a tow letting in the clutch. Amazingly this worked without wrecking the engine. I discovered later that there was a tubular saw available to remove the 'welding' from around the studs. You then left this overnight with penetrating oil around the studs then the head can be removed by replacing the plugs and using the starting handle to pop the head.

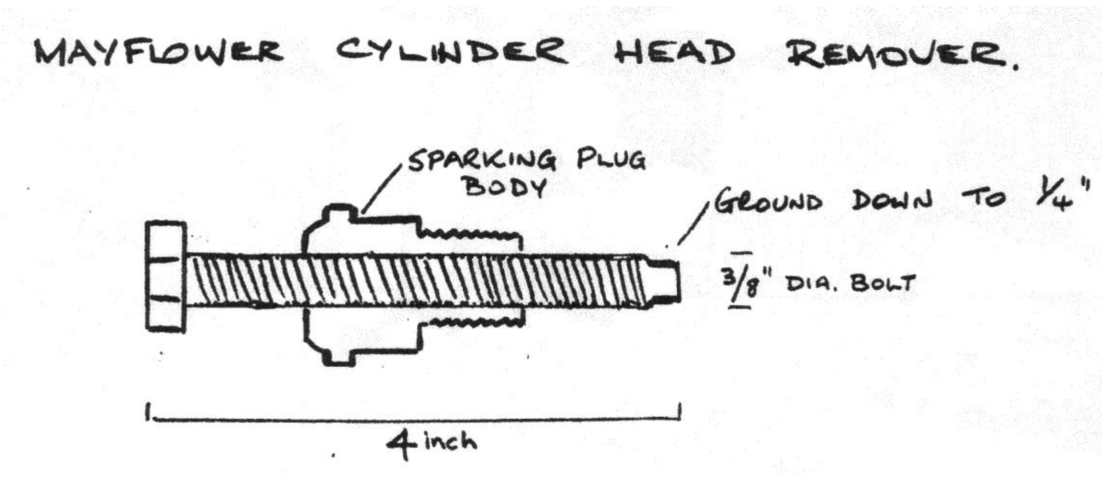
Cylinder Head Removal Tool – S Parnell, Flower Power, Summer 1985

I f you have struggled to remove the cylinder head from the corroded studs on your 'flower, a very simple and highly effective tool will greatly ease the problem.

Knock out the ceramic core of four old spark plugs, drill and tap the metal body to accept a 4" bolt 3/8" diameter A/F thread if possible but metric will do. The end of the bolt must be ground down slightly to fit in between the valve heads.

By screwing in the plug bodies and gradually winding down the bolts on to the crankcase, the head is lifted without resorting to old screwdrivers, hammers or pick-axe.

This method worked effortlessly on an engine that had stood unprotected for over 15 years.



Engine Will Not Idle – P Smith, Flower Power Autumn 1989

A couple of things to check here, first if you have had the manifold off make sure that the little restrictor valve fitted in the drilling for the ventilation pipe has not been lost , without this the engine will not idle correctly.

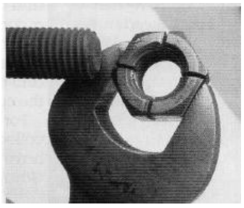
It's also worth checking that carbon has not formed between the stainless steel trembler pin and the washer which forms the valve as this is prone to blockage, and can cause excessive crankcase pressure which results in oil leakage, especially from the rear main bearing.

A sure indication of no crankcase ventilation will be the formation of rust inside the oil filler cap and in the ventilation pipe, between the filler and the air cleaner. If the hole requires cleaning use a No. 6O drill. (0.040 dia.)

Gasket Revitaliser – Flowerman, Flower Power, Winter 2004

You can use masking tape as a gasket revitaliser. If you have had the occasion to remove your sump for instance and you are waiting for your new gasket to arrive from the Spares Secretary, wrap or lay masking tape on your gasket on each side re-punching the holes for the bolts as you go and you will find you do not even need compound to seal your renewed gasket.

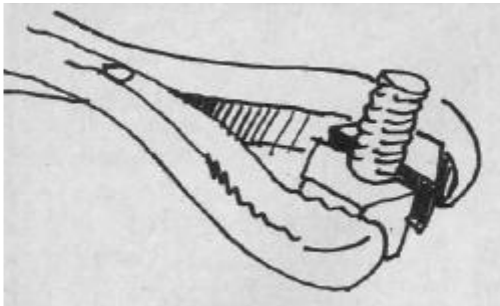
Thread Cleaner 1– Brian Cox, Practical Classics April 2007



NEED TO CLEAN up a corroded or damaged bolt thread or rusty stud? If you don't have a suitable die nut you can make a cheap substitute. All you need is a steel nut with a suitable thread. Hacksaw a cross about a third of the way down the thread, then run the nut down the bolt or stud, backing off regularly to clear the thread.

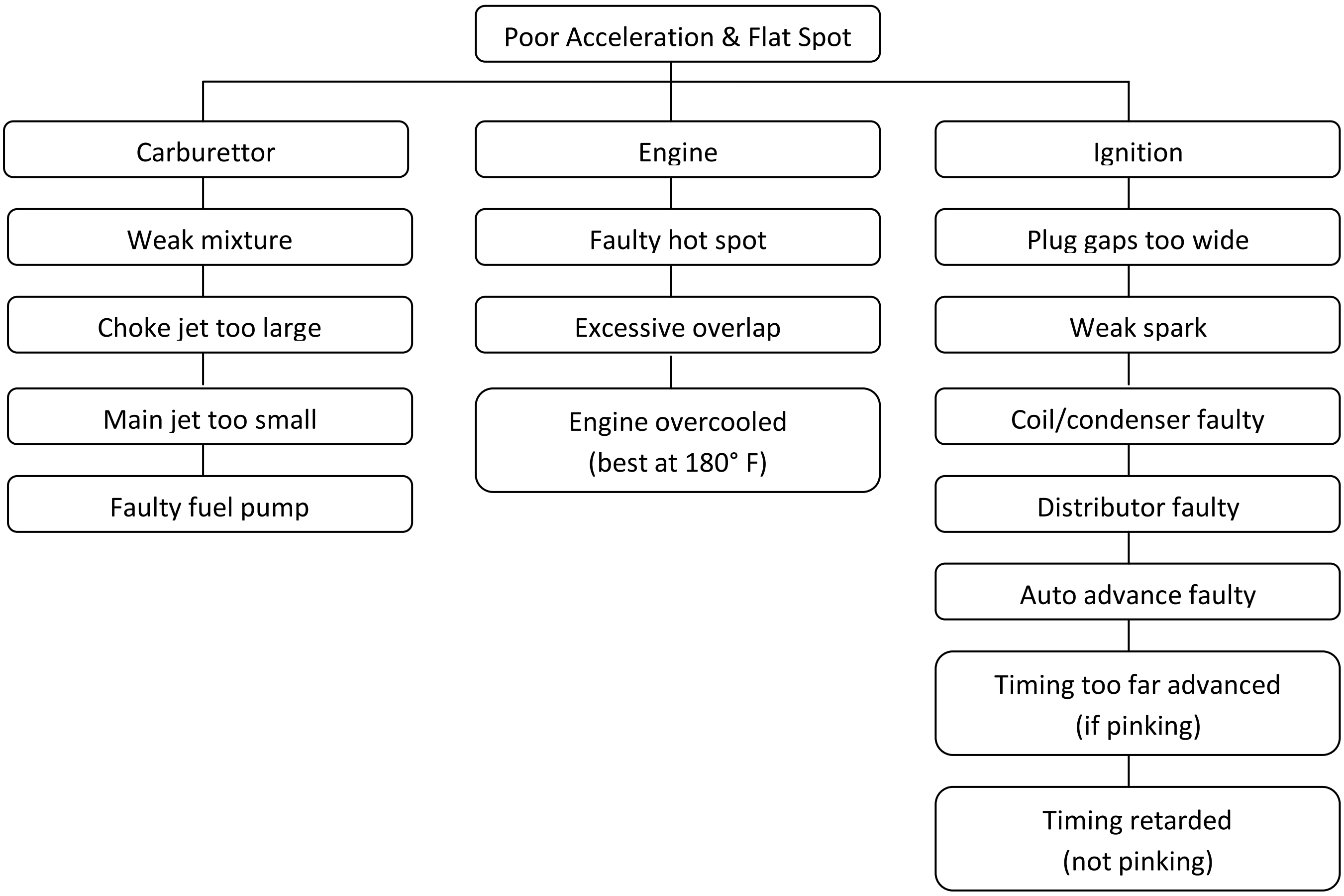
Nut threads can be cleaned up in a similar way by sawing a cross into a suitable bolt. Use plenty of oil.

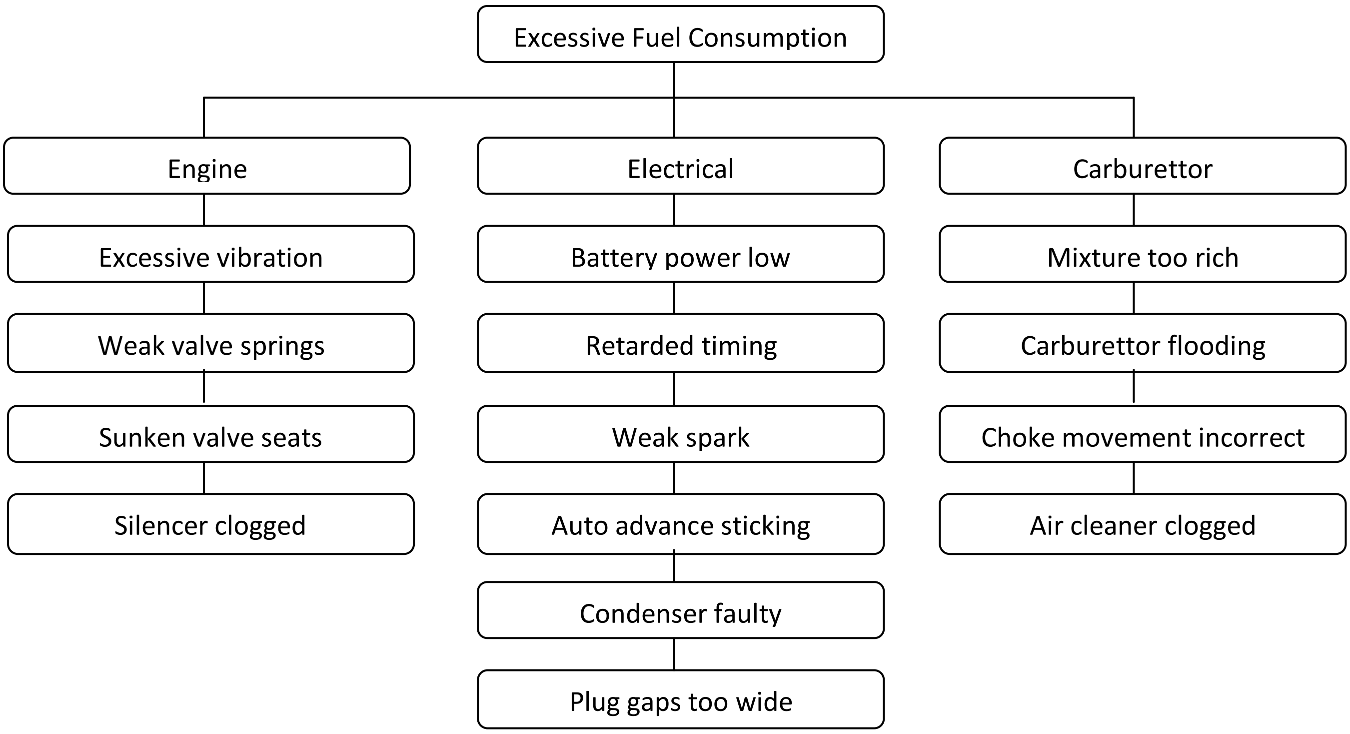
Thread Cleaner 2– Terry's Tips, Practical Classics August 1983

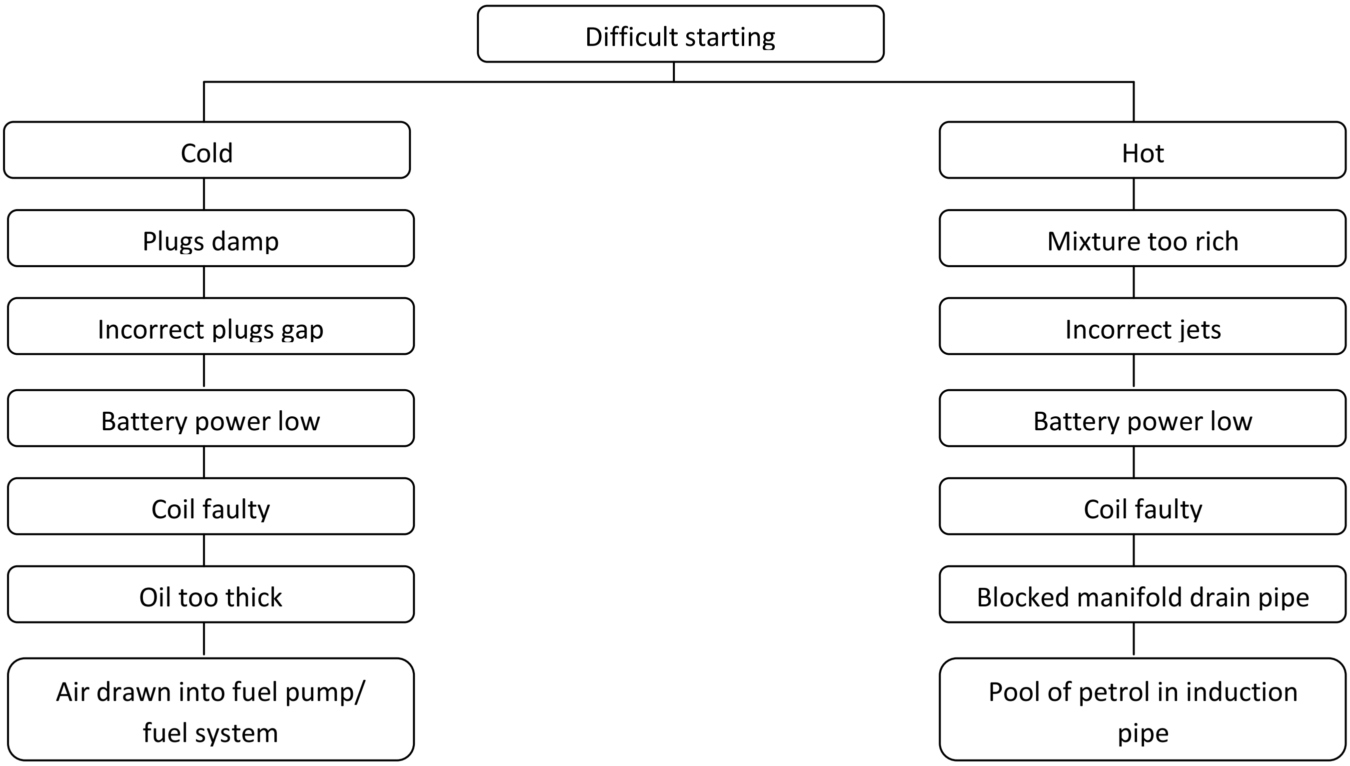


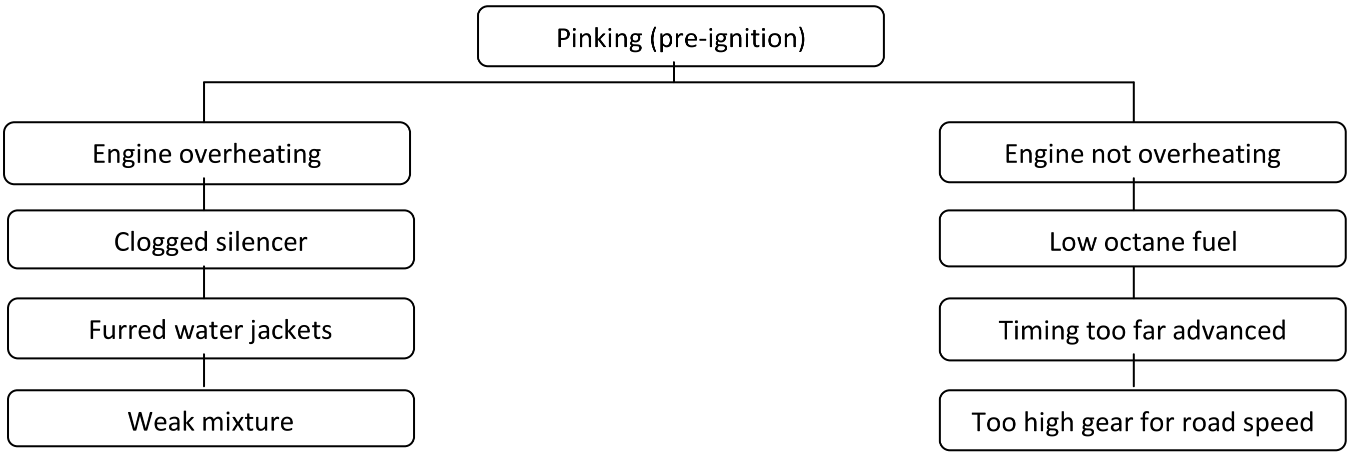
Another tip on a topic mentioned last month — how to clean up threads when you haven't the right equipment to hand. This one is for 'reconditioning' studs or bolts; what you do is saw in half a nut which fitted the stud, then clamp the two halves around the stud using Molegrips. Revolving the assembly will clean up any damaged threads, thanks to the sharp edges of the halved nut.

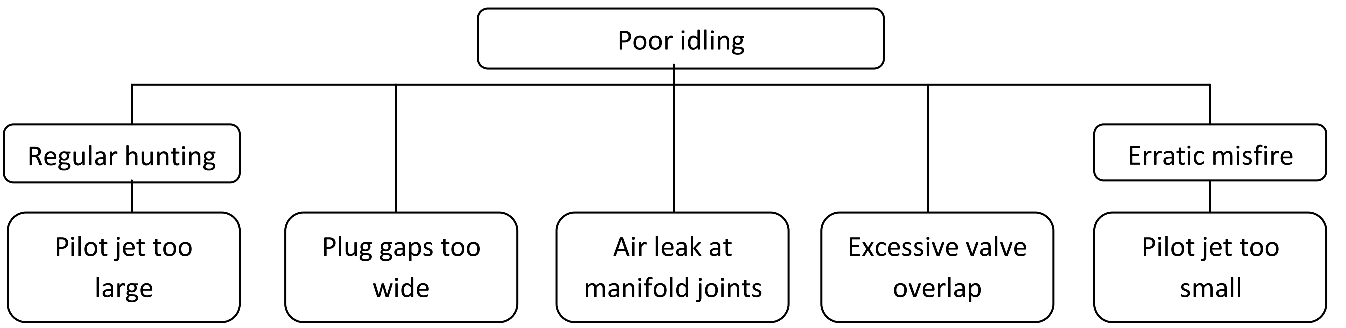
Fault Diagnosis Flow Charts For Engine & Carburettor – Flower Power Summer 1990

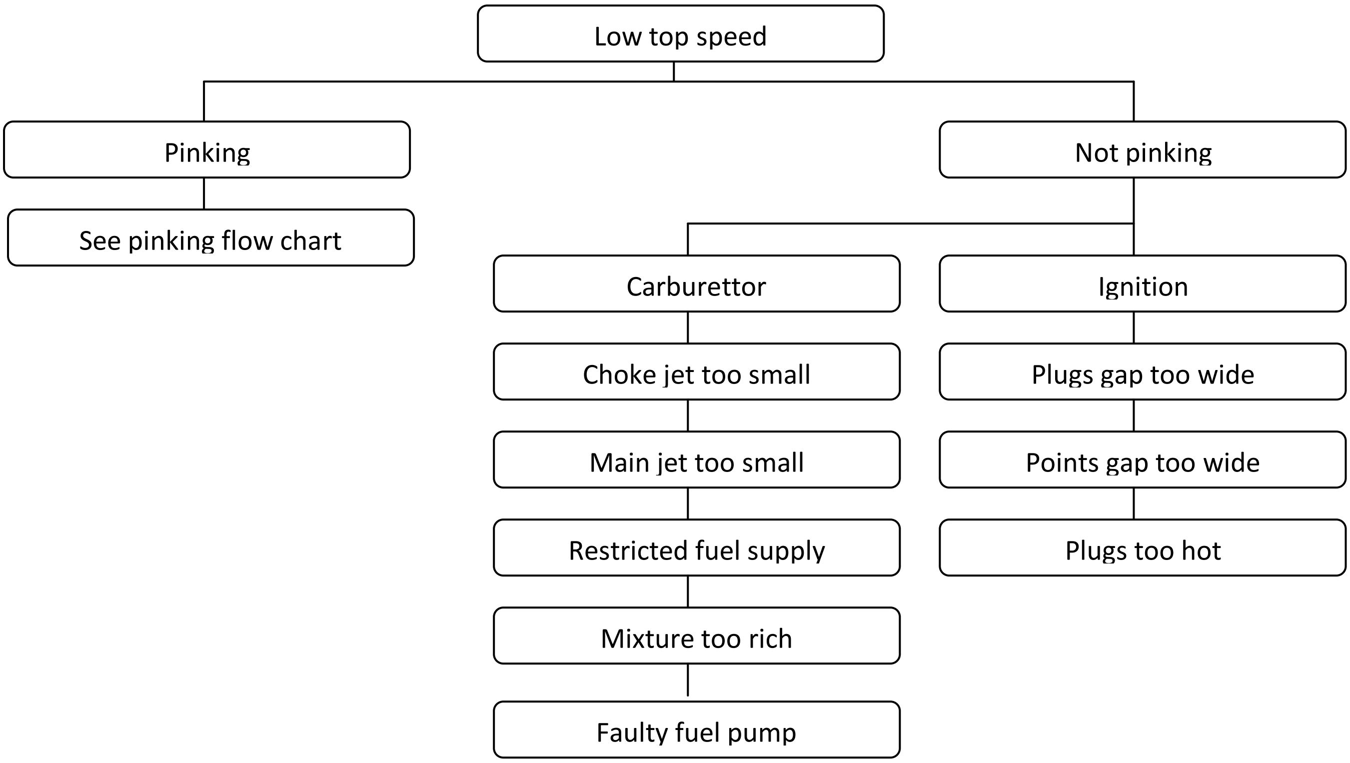





Difficult starting
Cold
Plugs damp
Incorrect plugs gap
Battery power low
Coil faulty
Oil too thick
Air drawn into fuel pump/ fuel system
Hot
Mixture too rich
Incorrect jets
Battery power low
Coil faulty
Blocked manifold drain pipe
Pool of petrol in induction pipe


Pinking (pre-ignition)
Engine overheating
Clogged silencer
Furred water jackets
Weak mixture
Engine not overheating
Low octane fuel
Timing too far advanced
Too high gear for road speed

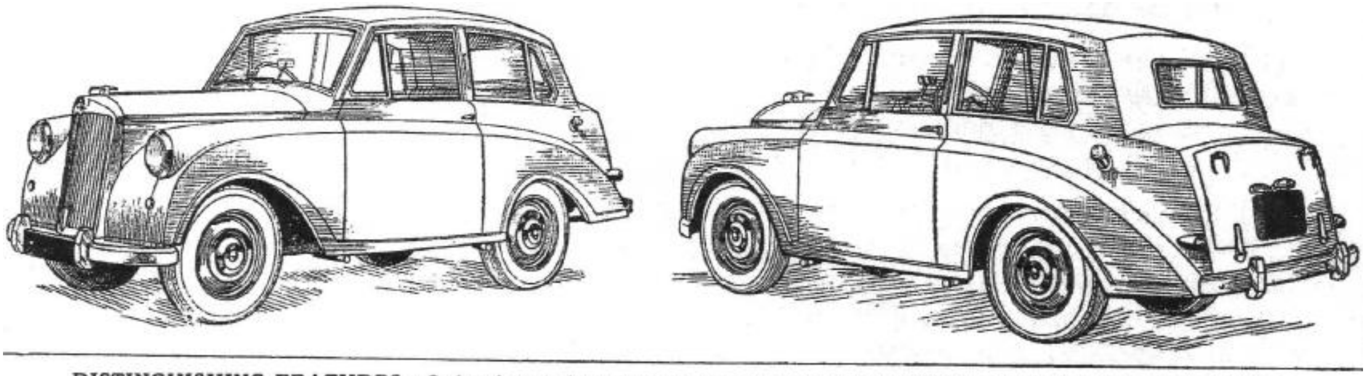

Poor idling
Regular hunting
Pilot jet too large
Plug gaps too wide
Air leak at manifold joints
Excessive valve overlap
Erratic misfire
Pilot jet too small



Trader Service Data No 180 – Motor Trader 1951, Flower Power Spring 1988

Triumph Mayflower Type 1200T 1950 - 51

Manufacturers: Standard Motor Co., Ltd., Banner Lane {Regd. Offices), Coventry.
Sales and Service: Fletchamstead Highway, Coventry.



DISTINGUISHING FEATURES—Only change in outward appearance has been fitting of block lenses to headlamps

Introduced at the 1949 Earls Court Motor Show, the Mayflower came into production in May, 1950. Original in styling, the car has an integral chassis and body. Independent front suspension with coil springs, a side-valve engine based on that of the pre-war Standard Ten, and a transmission on the same lines as the Standard Vanguard. Engineering changes introduced since the car was first produced are listed here.

Commission numbers (car serial numbers) starting at 1, prefixed TT and suffixed D L , indicating body type, are stamped on a plate on the near side of the scuttle under the bonnet. Engine serial numbers, also starting at 1, prefixed TT and suffixed E, are stamped on a boss at the offside rear of the engine below the oil filler. Engine and car numbers do not necessarily correspond.

SPECIAL TOOLS	
ENGINE	**Tool No.**
Tappet spanners (D/E). Set of three comprising ½in A/F straight × $\frac{7}{16}$in A/F cranked; $\frac{7}{16}$in A/F straight × ½in A/F cranked; $\frac{13}{32}$in A/F straight × $\frac{13}{32}$in A/F cranked	M 854 A, B, C
GEARBOX	
Mainshaft spring ring remover ...	20SM 69
Mainshaft spring ring installer... ...	20SM 46
Mainshaft assembling tool	20SM 65
Layshaft needle bearing retainer ...	20SM 77
Drawer with adapters for primary shaft, mainshaft and axle half-shaft bearings	20SM 4615
REAR AXLE	
Bevel pinion shaft bearing inner race drawer with adapters	20SM 85
Bevel pinion shaft bearing outer race installer	M 70
Bevel pinion bearing gauge (for meshing shims)	M 84
Final drive housing spreader	20SM 4220

Prefix 20SM indicates suitability (with or without adapters) for Mayflower and Vanguard.

Special tools have been designed to speed up certain operations, and officially approved by the Standard Motor Co. They are available from V. L. Churchill & Co., Ltd., 27-34 Walnut Tree Walk, Kennington, London, S. E. 11. Those considered most important are listed here.

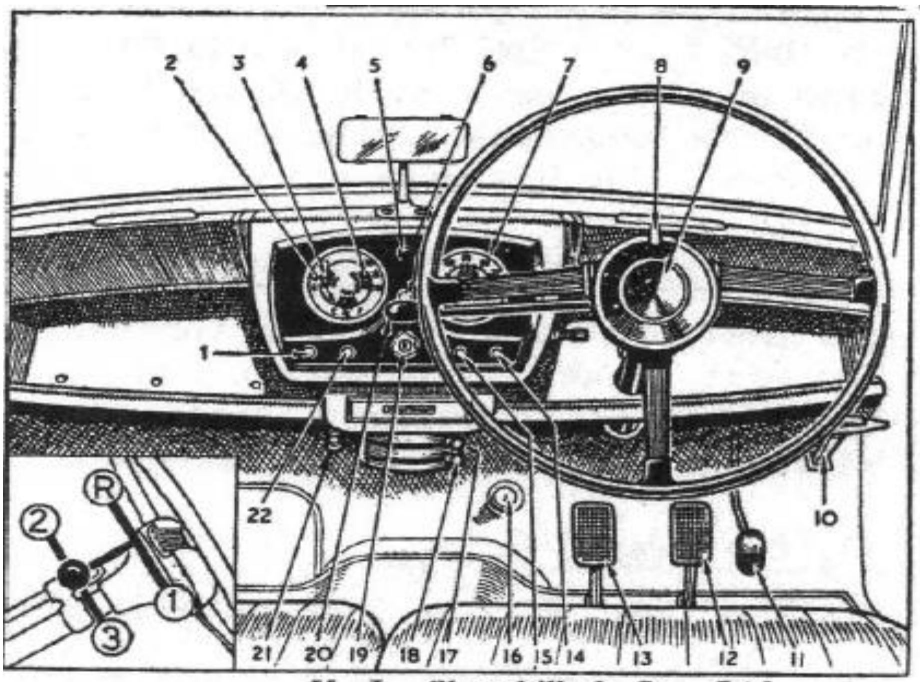
American S. A. E. threads and hexagons are used throughout, except on some proprietary components.

ENGINEERING CHANGES	Comm. No. (Prefix TT)
Longer rear springs fitted, with new spring plates and longer stroke shock absorbers	451
Rear springs stiffened (thicker leaf substituted)	928
Oil relief valve changed, ball to plunger. New plug	1356 E
Camshaft, and distributor drive gear, changed from casting to forging. Must be replaced together	1408 E
Rear spring changed, ten leaves to eight thicker leaves	3071
Oil bleed holes in con rod big ends deleted	3215 E
Headlamps changed to double dip, with block lenses and 42/36 watt bulbs ...	3264
Fuel pump with hand primer introduced	3407 E
Wheels with larger offset (1.125in instead of .63in) introduced. Track increased	5535*
Engine front mounting to frame, bolts changed to studs. Slotted mountings introduced (interchangeable) ...	6010 E
Fan and pulley changed, integral to separate. *New assembly must be used with new dynamo*	6109 E†
New (higher output) dynamo and new control box introduced. *New control box must not be used with old dynamo, but new dynamo can be used with old control box*	6155 E‡
Oil level in rear axle raised to bottom of filler threads. Dipstick deleted ...	6813
Manifold clamps strengthened. Longer studs	Pending
Differential gear and pinion thrust washers introduced	Pending
Screenwiper, more powerful motor introduced. *New drive (steel pinions) must be fitted with new motor*	Pending

* Except comm. Nos. 5547-5552.
† At comm No. 6131 (chassis).
‡ At comm No. 6134 (chassis).

Instruments and Controls:

1. Choke
2. Petrol gauge
3. Oil pressure gauge
4. Water temperature gauge
5. Ignition warning light
6. Heater motor switch
7. Speedometer
8. Trafficator switch
9. Horn push
10. Handbrake
11. Accelerator
12. Brake pedal
13. Clutch pedal
14. Starter switch
15. Screenwiper switch
16. Dipper switch
17. Heater air control
18. Demister control
19. Lighting and ignition switch
20. Gear lever
21. Scuttle ventilator control
22. Panel and roof lamp switch



ENGINE

MOUNTING

At front bonded rubber blocks bolted to chassis and to lugs on front engine plate. On early cars mounting plates were drilled and attached to chassis with bolts. Later mountings are slotted, and rest on studs on chassis. At rear similar bonded rubber block bolted to bottom of gearbox rear cover and to detachable cradle.

ENGINE DATA	
No. of cylinders	4
Bore × stroke : mm	63 × 100
in	2.48 × 3.94
Capacity : c.c.	1247
cu. in	76.1
R.A.C. rated h.p.	9.84
Max b.h.p. at r.p.m.	38 at 4200
Max torque (lb/in) at r.p.m....	695 at 2200
Compression ratio	6.8: 1

REMOVAL

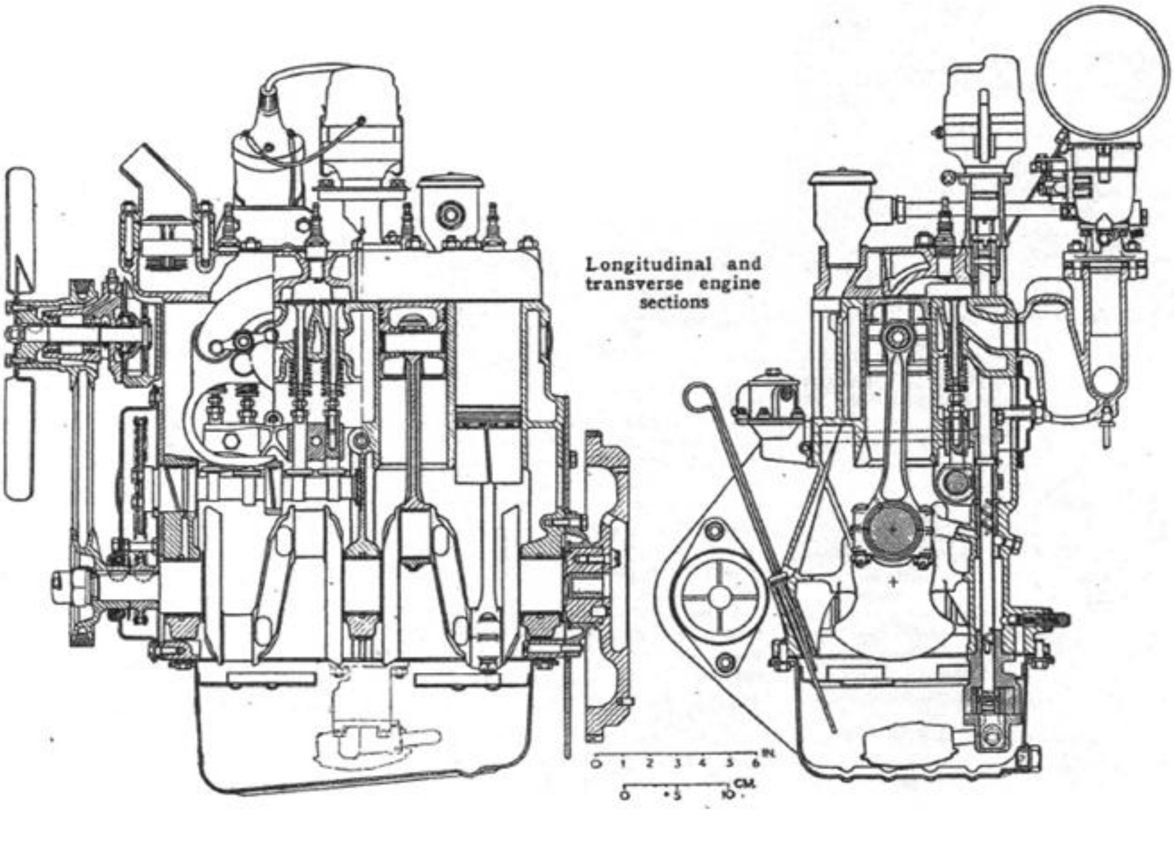
Engine can be removed with gearbox and all accessories. Detach bonnet, with hinges, from scuttle. Raise rear of car on axle stands under jacking pads, and drain gearbox. Disconnect rear end of propeller shaft, and slide front end out of gearbox (engine must be tilted at about 45 deg to car to remove. If oil is not drained from gearbox it will pour out when propeller shaft is removed). Remove radiator core (three setscrews each side) giving access to grille bolts. Detach grille. Disconnect all pipes, wires and controls (including thermometer bulb in cylinder head). Disconnect gear change cross shafts from coupling spiders on gearbox, and both clutch links (pull rod and compensating link) at front end. Detach clutch linkage bracket from rear mounting cradle on right-hand-drive cars. Support gearbox on jack, and detach cradle from rear mounting and body floor. Take weight of engine on slings behind crankshaft pulley and between sump and rear engine plate. Detach front mountings from chassis (if studs, slacken nuts only, as blocks are slotted and will rest on studs). Engine unit can then be tilted sharply to clear front cross-member, and lifted out.

CRANKSHAFT

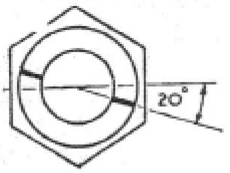
Three main bearings. Thin wall, steel-backed, white metal-lined shells located by tabs. End float controlled by half thrust washers recessed in either side of rear bearing cap. Replacement washers available .005in oversize on thickness. No hand fitting permissible. Worn shafts must be ground to standard under sizes. Main bearings and thrust washers can be changed, in emergency, without removal of shaft.

Flywheel, with integral starter ring gear, spigoted on rear of

CRANKSHAFT and CONNECTING ROD DATA	Main Bearings			Crank-pins
	No. 1	No. 2	No. 3	
Diameter	2in	2in	2in	$1\frac{7}{8}$in
Length	$1\frac{21}{32}$in	$1\frac{7}{16}$in	$1\frac{19}{32}$in	$1\frac{1}{8}$in
Running clearance : main bearings	.0015–.0025in			
big ends	.001 –.002in			
End float : main bearings ...	.004 –.006in			
big ends ...	.008 –.010in			
Undersizes	.020, .030, .040in			
No. of teeth on starter ring gear/pinion	117/9			
Con rod centres	7.25 ± .002in			



Longitudinal and transverse engine sections crankshaft, retained b y four setscrews and located by one dowel. Flywheel has two dowel holes at 90 deg. And shaft has two holes at 180 deg., so that flywheel can be fitted in any one of four positions. Clutch spigot bearing bush (self-lubricating) floating fit in end of shaft.



Timing sprocket (long boss to rear) and pulley keyed on front end of shaft by separate Woodruff keys, with oil thrower ring between. Shims (.004in and 006in) behind sprocket for chain alignment. Smaller shims behind starter dog nut for handle position (see sketch). Pulley hub passes through lipped oil seal in timing cover.

Sump flange continued over front and rear bearing gaps by bridge-pieces, with cork seals at ends, screwed to crankcase. Oil return thread on rear of shaft runs in oil collector housing bolted to rear of crankcase, and to bridge-piece by two long setscrews inserted from front, heads wired together. Clearance between housing and shaft must be at least .005in.

CONNECTING RODS

Big ends thin wall, steel-backed, white metal-lined shells located by tabs. No hand fitting permissible. Small ends bronze bushed for floating gudgeon pins. Big ends are offset, Nos. 1 and 3 with larger boss to rear, Nos. 2 and 4 to front. Big ends will not pass through, cylinders, but pistons will pass crank webs. Remove and assemble through bottom. Early rods not interchangeable must have bleed hole to off side. Later rods, without bleed hole, all interchangeable.

PISTONS

Aluminium alloy, split skirt. Gudgeon pins located by spring rings. Fit with split in skirt to near side.

Original pistons graded in three sizes, in .0004in steps, F (smallest), G and H. Grade letters stamped on crown in circle. Weight must not vary more than 4 drams per set.

Top compression ring chromium plated. Second ring taper faced. Fit with side stamped "T" towards crown (earlier rings stamped "B" on bottom).

PISTON DATA

Clearance (skirt) ...	.001–.0015in	
Oversizes	.020, .030, .040in	
Weight with rings and pin	.684 lb (10 oz 13 dr ± 3 dr)	
Gudgeon pin :		
diameter	¾in	
service oversize ...	.005in	
fit in piston	Light push hot	
fit in rod	.0002in at 68° F.	
Compression height ...	1½in	
	Compression	Oil Control
No. of rings	2	1
Gap	.006–.010in	.006–.010in
Side clearance in grooves	.001–.003in	.001–.003in
Width of rings	5/64in	5/32in

CAMSHAFT

Single roller endless chain drive, with flat spring tensioner in timing cover. Camshaft sprocket spigoted on central boss and bolted to end of shaft by two setscrews. Sprocket has four bolt holes, symmetrical but offset in relation to teeth, so that sprocket can be fitted in alternative positions or back to front, to give J-tooth variations of timing.

Camshaft runs in four bearings in crankcase. End float controlled by horseshoe thrust plate bolted to crankcase and running in groove in shaft.

Camshaft can be removed with engine in place. No need to remove cylinder head or sump. Remove radiator core and grille, timing cover, chain, sprocket and thrust plate. Remove distributor and withdraw drive shaft (see "ignition"). Remove tappets and draw out camshaft.

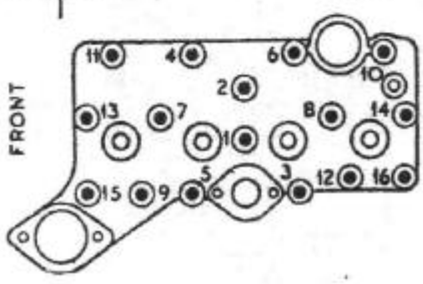
Timing marks are lines scribed on face of each sprocket in line with centres, and dot punch on camshaft sprocket opposite cutaway on end of camshaft (visible through one of unoccupied holes).

VALVES

Side-by-side. Not interchangeable, inlet larger than exhaust. Single springs retained by "figure eight" slotted collars locating on tapered registers. To remove spring, hold valve, push collar up clear of taper and move sideways. End of stem passes through larger part of hole.

Valve guides plain, no shoulder, interchangeable. Press in until top of guide is .07in below top face of cylinder block.

Left : Valve timing diagram. Below : Diagram showing order of tightening of cylinder head nuts



VALVE DATA

	Inlet	Exhaust
Head diameter	1 3/16in	1in
Stem diameter	5/16in	5/16in
Face angle	45 deg	45 deg
Tappet clearance (cold) ...	.015in	.015in
Spring length : free	1 21/32in	
fitted	1 9/32in	
at load... ...	22 lb	

TAPPETS

Mushroom tappets working in two detachable blocks bolted up with bridge-piece for distributor drive gear thrust collar. ***Note that each guide block fits with oil groove to cylinder block, and has one long and one short setscrew, long setscrew holding bridge piece as well. If long screw is accidentally screwed in without bridge piece it will penetrate into cylinder and damage piston.***

Tappet blocks can be removed without disturbing valves.

LUBRICATION

Hobourn-Eaton eccentric rotor pump in sump, spigoted and flange bolted to bottom face of crankcase, and driven by tongue on vertical shaft engaging slot in short pump shaft in side body. Pump can be removed without disturbing drive.

To dismantle pump, detach bottom cover with floating intake strainer, and tip out rotor and driving member, pinned to driving shaft. When refitting rotor make sure that chamfered edge is inwards.

Floating gauze intake strainer on pump cover. Oil delivered through drive shaft tunnel to gallery on near side with drillings to main and camshaft bearings. No filter on pressure side.

Adjustable spring-loaded relief valve was ball on early engines, later plunger (not interchangeable), located low down on near side. Normal oil pressure 40-60lb at 30mph.

TRANSMISSION

CLUTCH

Borg & Beck single dry plate. Graphite thrust release bearing. Only external adjustment is on pull rod by nuts and locknuts to give 1/2in free movement at pedal pad.

Access to clutch for service after removal of gearbox. Clutch assembly is balanced, and must be refitted so that numbers stamped on cover and flywheel correspond.

GEARBOX

Three-speed, all synchromesh, all helical gears except reverse. Steering column control with separate links for 1st/reverse and top/2nd selectors. Gearbox is "handed" according to position of steering wheel and control linkage.

Gearbox is same as on Standard Vanguard except that primary shaft has smaller splines, main shaft is shorter, clutch fork is smaller and clutch cross-shaft has lever welded on instead of located by setscrew.

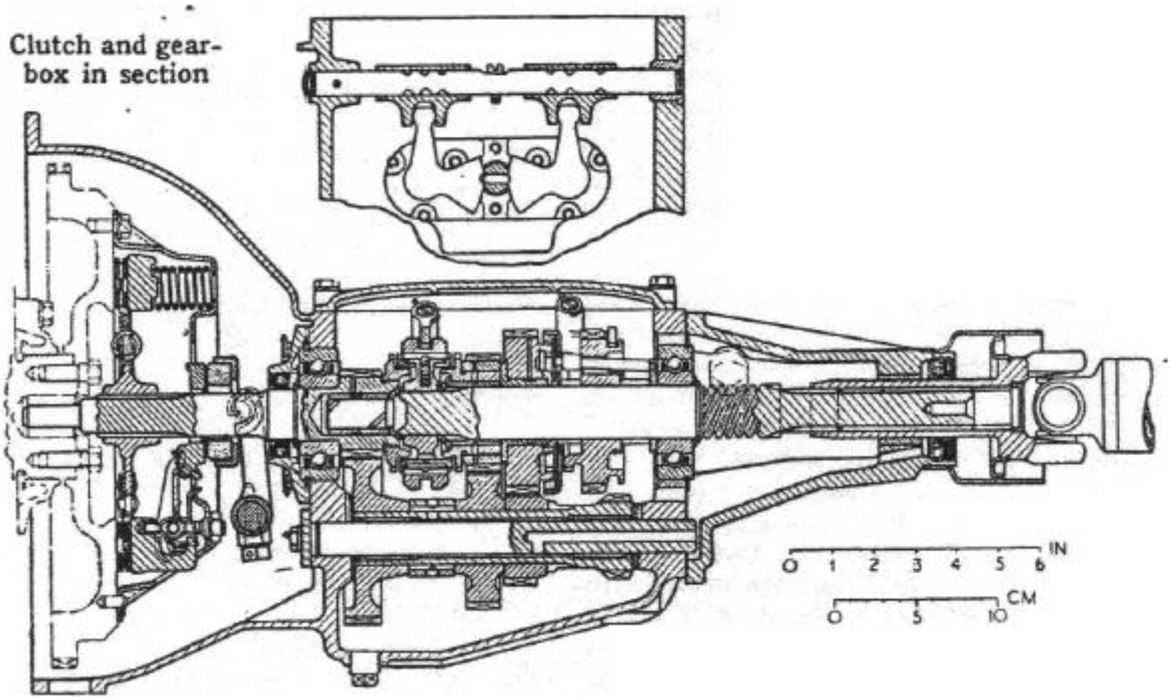
To remove gearbox jack up rear of car as high as possible, drain oil from gearbox, disconnect rear end of propeller shaft and draw shaft out of gearbox. Disconnect exhaust pipe from manifold, and disconnect brake and clutch linkage, (on right-hand-drive cars detach clutch linkage bracket from rear mounting cradle). Support engine and detach cradle from rear mountings and body floor. Lower engine as far as possible and remove twelve 5/16in nuts and two 3/8in fitted bolts round bell-housing flange. Draw gearbox back and lower to floor.

When offering up gearbox to engine on reassembly, use propeller shaft or spare sliding joint yoke to turn shaft to engage with clutch plate. Gearbox main shaft does not project far enough for turning by hand.

To dismantle gearbox detach top cover and extract clutch cross-shaft (shaft and fork located by setscrews). Slacken locknut and take out taper setscrew locating selector rod. Draw off rear extension cover with oil seal and bush in which propeller shaft sleeve rotates and slides. Extract locating springs and plungers from selector forks, take out stop screw and push selector rod out to rear. Take out long taper setscrew locating lay shaft and reverse spindles, and detach lay shaft front cover. Using special tool or a piece of tubing 3/4in O/D, 5¾in long, tap out lay shaft spindle to rear. Tubing will keep rollers in place.

Detach front bearing cover and draw out primary shaft with ball bearing and floating spigot bush. Extract spring ring and washer, and press ball bearing off primary shaft. Tap or draw main shaft to rear and slide off top/2nd gear synchro unit. Extract spring ring, draw off ball bearing and lift main shaft assembly out through top.

Clutch and gear-box in section



If puller is not available, main shaft can be dismantled before removal. Extract spring ring from front end of shaft, and draw off 2nd gear and bush, 1st gear and bush, recessed thrust washer, 1st gear female cone, reverse gear with three baulk pins and retaining spring. Lift lay shaft cluster from bottom of box. Reverse gear pinion integral with lay shaft, other gears pressed on splines, with distance-piece between 2nd and constant mesh gears.

To reassemble gearbox fit reverse idler gear with thrust washers, selector interlock, levers and shafts in box. Insert needle roller locating rings in bore of lay shaft cluster. Stick 24 needle rollers in place in each end with thick grease, followed by outer locating rings. Insert dummy lay shaft, and place thrust washers on ends with tabs outwards (larger washer at front). Lower assembly into box and test for end float, which should be .006 - .010in. If end float is less, dismantle cluster and rub down distance piece. If more, renew thrust washers.

Assemble main shaft by sliding on triangular baulk pin washer from rear, and holding in place with special retaining sleeve tool. Fit three baulk pins in reverse gear with retaining spring, slide gear on to shaft from front and locate baulk pins in washer, slide on 1st gear female cone and locate baulk pins in holes in cone. Slide on thrust washer so that small lugs engage splines not occupied by cone. Test end float of 1st and 2nd gears on bushes (.004-.005in) by measuring stand-out of bushes with feeler. Then slide on both gears with flanges of bushes to front, and retain assembly with new spring ring. Test clearance between 1st gear and female cone, which should be .065 - .070in.

Insert main shaft assembly into box and assemble top/2nd synchro unit with large boss to front. Before assembly, synchro unit should be tested with spring balance for axial load necessary to shift sleeve, which should be 19-21lb. Load can be corrected by shims under ball springs (about seven under each spring).

Slide off baulk pin washer retaining tool and slide on main shaft ball bearing, pulling it into place with special puller. If this is not available, bearing should be pressed on to shaft beforehand and main shaft gears assembled in box.

Assemble primary shaft and bearing in box with spigot bush (countersunk end towards main shaft). Fit front cover with oil seal (lip inwards), using pilot to guide it over splines. Slot in front cover should be horizontal to off side. Seal setscrews with lead wire.

Before assembling selector forks and rod in box, test forks for axial load (22-26lb, measured by spring balance). Normally grub screws should be flush with top of forks. Assemble forks and thread in rod from rear so that setscrew hole lines up.

Using taper-ended pilot, pick up lay shaft cluster, and follow through with lay shaft spindle, ejecting dummy spindle and pilot. Fit locating setscrew and front cover, using lead wire to seal setscrews. Assemble oil seal in rear extension cover and fit housing. Do not fill gearbox with oil until it has been refitted on car, and propeller shaft inserted.

Nutcracker – Terry's Tips, Practical Classics August 1983

Ever despaired of trying to shift a crank shaft pulley nut and had to resort to pipe wrenches and large hammers? Then try this way instead: place a normal spanner over the nut and wedge the other end against a suitable part of the chassis frame. Disconnect the coil (to prevent the engine firing) and press the starter button for an instant. Hey presto — one loose pulley nut!

Testing the Springs- Eddie Copson, Flower Power, Summer 2007

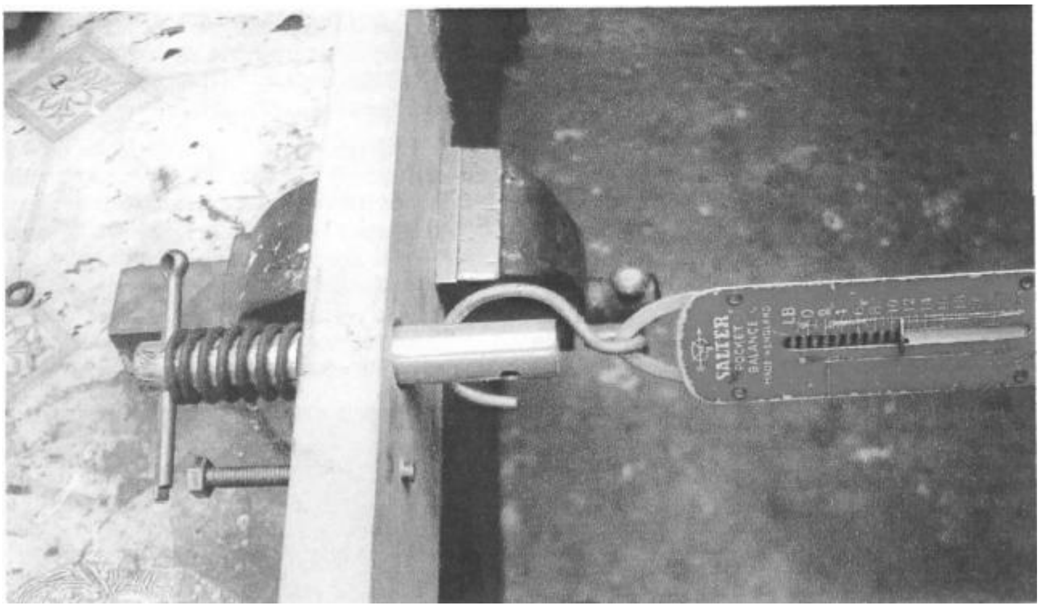
WE ALL FEEL a bit sluggish in the morning but my little Flower was worse than most. No problem starting up but number one plug would oil up until the engine warmed up a little. I set about to try and sort out this annoying problem and finally ended up removing the valves to see if the problem was there.

Not wishing to spend my hard earned pension on new valve springs I decided to try and fathom out a way to test them to see if the problem lay with them. I consulted the manual to see if there was information on the springs, to my surprise there was.

It says load at fitted length should be 22 lbs at 1. 9/32 inches (1.281"). So thinking the simplest ideas are usually the best, I made myself a testing device shown below to test for a weak valve spring. The screw head is set at 1.281". The split pin should touch the head at 22 lbs.

Conclusion: three out of the eight springs recorded 18 lbs (very weak). Springs replaced, problem solved.

Probably a better idea would be to just buy a set of valve springs from the club but this was more fun.



Oil Pressure Pipe Repair- Harry Mulcahy, Flower Power, Summer 2015

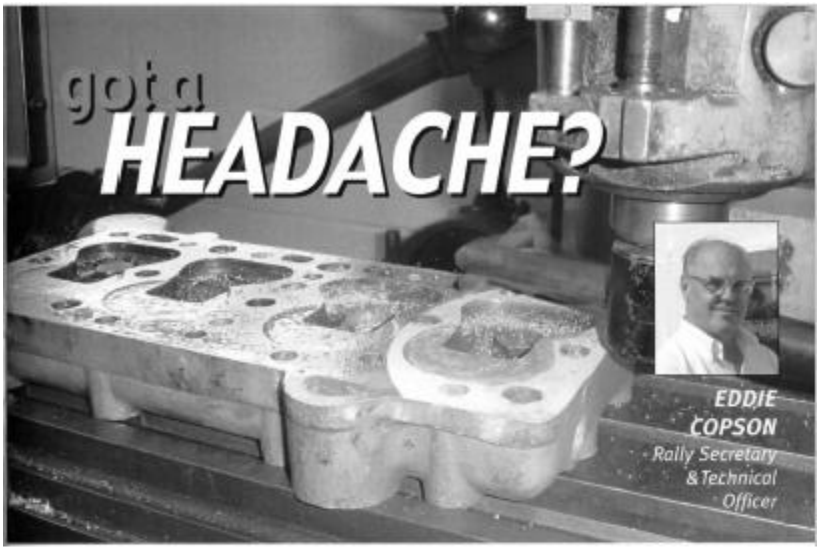
Last year I discovered my oil pressure pipe was leaking. Yes, it was listed on the club 2005 parts book but that was 2005 and this is 2015 so not available. I had look at Rimmer Bros TR2 parts, one pipe might do but it might be like playing poker, you have to pay to see.

I took myself off to my local commercial stores and asked my senior consultant if he had anything like my pipe. No but he took my pipe to his bench. He reappeared a few minutes later shoving a piece of hydraulic hose on to the pipe. "This has a burst pressure of 60 bar," he said, "it might just do on your Mayflower."

He squeezed a clip on to one end and gave me worm drive clip for the end that fits on to the engine.

I was so surprised at how easy he made it seem, it only cost 5 Euros. So if you're stuck for a pressure pipe any place that repairs excavators trucks should be able to make up a pipe or if you have a bench grinder and get a piece of hydraulic pipe you could do it yourself. The letters R,MEGOHMM are on the pipe.

Got a Headache? – Eddie Copson, Flower Power, Spring 2006



Well if you own a Mayflower you are sure to experienced one or two headaches in your time. However the sort of head I am talking about is the aluminium one that corrodes on top of your engine block.

Over the short time I have owned my Mayflower I have accumulated three or four cylinder heads all with some sort of problem that stops me using them so I decided to investigate how I could sort out from these, one good head as a spare. This of course took me down several different roads of engineering expertise and experience so I thought maybe if I penned an article for the club magazine it may just help some of our members.

USUAL PROBLEMS ENCOUNTERED WITH SECOND HAND HEADS

1. Head needs skimming.
2. Head has been skimmed to maximum.
3. Spark plug threads stripped.
4. Thread in head where capillary tube is attached damaged.
5. Badly corroded water chambers.

I have to admit to being fortunate here with the equipment I used and it of course would not be available to most people. The reason I gained access to it was through past employment at a technical college and still knowing one of the lecturers.

SKIMMING THE HEAD

The aluminium heads are usually skimmed using a vertical milling machine and a tool called a fly cutter. The fly cutter is a single point cutting tool that generates the flat surface using paraffin as a lubricant.

It is better to lightly skim the top of the head first to ensure a flat, bump free surface to clamp down on when skimming the face.

The procedure is as follows:

1. Clamp flat to the vertical milling machine table bolting through the spark plug holes.
2. Wet the surface with paraffin.
3. Lightly skim the top of the head.
4. Turn head over and skim the combustion side of the head.

The Bridgeport Machine used.


Skimming the top of the head.


Sk'mming the base of the head.


Milling the combustion chamber showing the rotary table.

HEAD HAS BEEN SKIMMED TO MAXIMUM

If the head has been skimmed to the maximum so as the combustion chambers are hardly showing then the chambers can be machined back in. This is a much more difficult operation again requiring a vertical milling machine with a head that can be extended a fair distance over the table to ensure the head can be revolved beneath the tool. I used a Bridgeport milling machine together with a revolving table.

The procedure is as follows:

1. As in the above lightly skim the top of the head.
2. Centre a slot drill over centre of the revolving table. (Slot drill diameter about 25mm)
3. Clamp the head under the slot drill so the slot drill is in the centre of the combustion chamber.
4. Move the machine table off centre about 10mm.

5. Plunge the slot drill in about 0.5mm and revolve the rotary table. The depth and offset will be determined by trial and error.

There are two less complicated ways of doing the above, as follows:

1. Clamp the head directly to the machine table and carefully guide the slot drill around the combustion chamber. This will not give such a nice clean curve but can be done with good 'steering skills'.
2. You would need a very large slot drill for this method of approx 2.25 inches diameter (not easily available and expensive). It is simply a case of centring the slot drill over the chamber and sinking in about 0.5mm.

SPARK PLUG THREAD STRIPPED

There is little to say about this except inserting a new thread requires a tool call a Heli Coil inserting tool, which is very expensive. So pop into your local engineering company and they will usually have this facility. I had two Heli Coils inserted for £20.00.

However if it is just a case of cleaning up old threads then the thread size is 14mm x 1.25pitch. A spark plug thread cleaner CHT261 order code 040210261 can be purchased from Machine Mart for just £4.69.

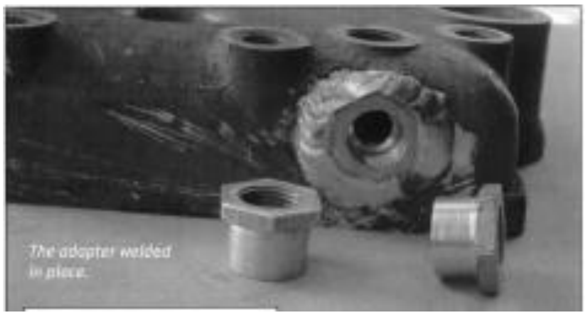
THREAD IN HEAD WHERE CAPILLARY TUBE IS ATTACHED DAMAGED

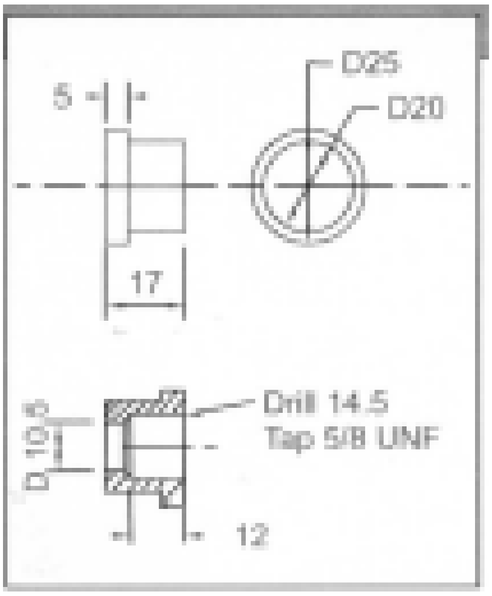
It is most annoying when you have a perfectly good head but the capillary tube thread is damaged but not all is lost. For this you will need a lathe and some turning skills and turn the adapter shown.

The procedure is as follows:

1. Clamp 25mm dia aluminium bar in chuck.
2. Turn 12x20 dimension.
3. Cut off from bar.
4. Face off to 17mm length.
5. Centre drill, drill through 10.5.
6. Drill 14.5 and tap 5/8 UNF 12 deep.

The damaged thread in the head will have to be drilled out to dia 20 mm.





BADLY CORRODED WATER CHAMBERS

Water chambers can be welded. To do this the welder will need all the corrosion removed to ensure a good weld. This I did not have to do so I have no photos but I was quoted £30.00 for several holes to be welded. If welding is required I would suggest skimming the top of the head first so a there is a flat surface to clamp to.

"My Engine Uses A Lot Of Oil!" – J.C. Jeffs Standard Car Review, October 1951

Several cases have occurred recently where " excessive oil consumption" has, upon qualified investigation, been proved purely illusionary. The main factors that have given a false impression of the amount of oil needed are discussed below, and it will be apparent that they must be considered if a true consumption figure is to be arrived at and unnecessary expense obviated.

There are several reasons for *apparently* high oil consumption, and the object here is to outline a definite procedure of verification.

The spread of oil on the various surfaces and galleries throughout the engine immediately after it has been running is quite considerable and naturally reduces the sump level. Consequently, if the oil is checked for level during a brief halt, *i.e.,* when obtaining petrol, the reading on the dipstick will not represent the total oil content of the engine, and you may possibly add oil when it is quite unnecessary.

A dipstick with a maximum and minimum mark is provided, and no advantage can be derived from "squeezing" in that extra pint. In fact, unless the level has fallen at least ¾ inch below the maximum level mark on the dipstick, "topping up" is really only a waste. It is more economical to change the oil completely at 2,000 miles than to add fresh oil at odd intervals. The expenditure on the complete change, although more frequent, will be amply repaid in greater efficiency and reduced wear of fast moving parts.

Although excessive "topping up" should be avoided it is nevertheless a wise precaution to check the oil level every 200 miles (as recommended in Instruction Book), thus any abnormal drop in oil level can be detected before the engine has operated for very long in such a condition. This check should be carried out on level ground, preferably the same location each time and when the engine is cold. The oil level, as stated elsewhere, need not be topped up unless it has dropped ¾ inch below the top mark on the dipstick.

Should you be in doubt concerning the oil consumption of your car, the following procedure is recommended:

Contact the Standard Dealer in your area and have the engine inspected for external leaks. If, after check and correction of any external leaks, there is no improvement, arrange for a consumption test over not less than 1,000 miles, as follows:

Check oil levels only when the engine is cold and car on level ground. Do not add oil until the level is ¾ inch below the maximum mark on the dipstick. Remember that no advantage is derived from overfilling.

Good, bad and indifferent advice will probably be given to you by people with or without the necessary qualifications. Be guided only by your Standard or Triumph Dealer who has a real interest in your car.

ON LEVEL GROUND.
An accurate reading on the dipstick can only be obtained if the car is standing on level ground. It is a good plan to test the oil level with the car on the same piece of ground every time—in your garage for example (if the floor is level !) or on the concrete or tarmac approach to your house or garage.

WHEN COOL.

Unless the engine has been stationary for some considerable time oil will still remain in the various pipelines and ducts, thus reducing the sump level. For this reason caution should be exercised when a reading is taken during a brief halt for petrol, it may result in over filling. In any case it is always wise to verify the reading yourself and also to ensure the car is level. The car in this photograph seems level—yet there was sufficient camber to produce an incorrect reading on the dipstick.

CHECK OFTEN.

While it is unnecessary to add oil unless the level has dropped ¾ inch below the top mark (see dipstick on left) it is a wise policy to check the level every 200 miles in order that any drastic drop in level is soon detected and investigated. Under no circumstances should the level be allowed to drop below the lower mark. The reading shown on the right dipstick represents the *absolute minimum* oil level at which the engine can safely operate.

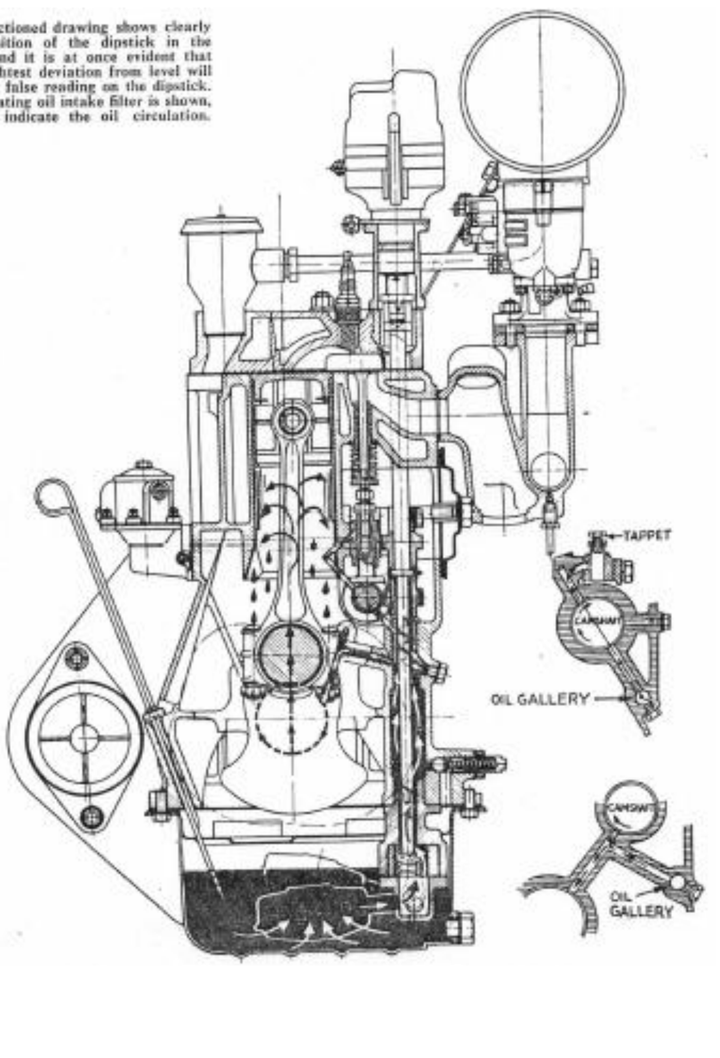
AVOID ROAD CAMBER . . . .

Although when illustrated as above it seems a very obvious thing to guard against, road camber is, nevertheless, often ignored when oil level readings are taken and a false impression of the engine oil content gained resulting in overfilling or oil starvation. The camber need not be anything like as steep as the one depicted (which incidentally is not unusually steep) for an incorrect reading to be obtained.

. . . . AND INCLINES.

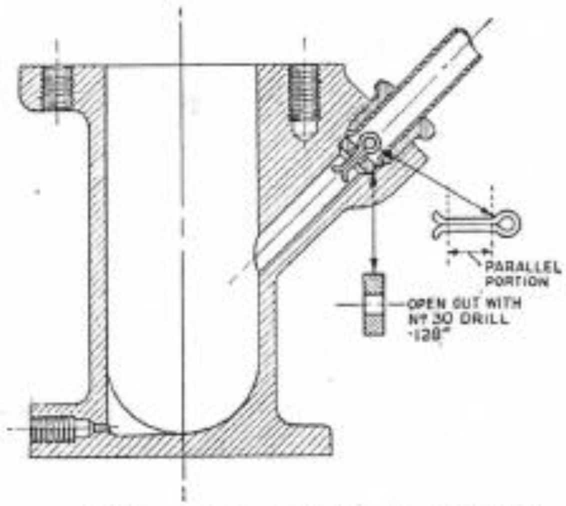
The fore and aft level of the car can also affect the dipstick reading. Many garages have an inclined approach and this should be avoided when a reading is taken. The reading is affected not only by the angle of the slope, but also by the position of dipstick (which varies with different models), in sump ; if, for example, the dipstick is located towards front of sump, when car is facing downhill, the reading will appear higher than actual level, but if dipstick is nearer rear of sump, level will appear lower than it actually is!

This sectioned drawing shows clearly the position of the dipstick in the sump and it is at once evident that the slightest deviation from level will cause a false reading on the dipstick. The floating oil intake filter is shown, arrows indicate the oil circulation.



A POSSIBLE CAUSE OF EXCESSIVE OIL CONSUMPTION

RESTRICTED CRANKCASE VENTILATION VALVE



If after taking the precautions and carrying out the checks outlined in this article, excessive oil consumption is still apparent it may simply be due to a restricted vent valve in the crankcase ventilation system, and if such is the case can be readily cured.

The stainless steel pin in the valve should be able to move quite freely in its orifice. To decrease the possibility of a restricted valve it is permissible to open out the orifice from .116 inch to .128 inch (a No. 30 drill should be used).

It is particularly important to the proper performance of this valve, that the two ends of the stainless steel pin should be spread, as shown in the illustration, so as to provide a parallel portion on this pin for free movement in the orifice.

If oil consumption is really heavy, in excess of half gallon per 1,000 miles, then it will have to be decided whether to have new cylinder sleeves and pistons, or the engine rebored and new pistons and rings fitted, or whether the Standard Dealer is asked to obtain a replacement engine. The latter is usually the more economical procedure.

Replacement Gearbox Mounting – Carl Stevenson

A Standard Vanguard Phase 3 and Vignale gearbox mounting is the same dimensions as the Mayflower but the studs and holes are 7/16" not 3/8". I drilled out the cross member holes 2mm larger but welded 3/8" washers over the new mounting holes rather than drill out the gearbox holes. There is plenty of 'meat' around the gearbox holes to do that.

Clutch Judder – Malcolm Barnsley, Flower Power, Autumn 2002

Does your Mayflower suffer from clutch judder? I recently changed the clutch in my Mayflower. On removing the gearbox, I found the rear gearbox mounting was left behind on the jack. Over the years the oil and rubber deterioration breaks the bond holding the rubbers to the mounting. It is well worth checking and a new mounting fitted will make all the difference in eliminating the problem.

Flywheel Teeth – Flower Power Spring 1990

If you are replacing the starter motor or flywheel in the course of re-building your engine, it is particularly important that you check that the starter motor pinion and flywheel ring gear are matched.

- 92 tooth flywheel with a Lucas starter motor type V-15 the pinion has 10 teeth and both have a pitch of 8/10.
- 117 tooth flywheel with a Lucas starter motor type L.3 the pinion has 9 teeth and both have a pitch of 10/12.

Left or Right Gear Change Lever – Standard Car Review 1951, Flower Power Winter 1990, Spring 2000

THE Standard Vanguard, Triumph Renown and Triumph Mayflower are all fitted with steering column gear change levers. During the past two years the position of these levers has been standardised with the lever pointing towards the centre of the car, whether the driving position is right- or left-handed. This coincides with most other makes of cars whether English or American.

We are frequently asked by owners if it is possible to alter the gear lever position to operate from the opposite side, usually because of some disability of the left hand. It is not unduly difficult to change the lever from one side to the other, and anyone of a reasonably mechanical turn of mind should be able to make the alteration.

We illustrate the two slightly different types of gear levers; Fig. 1 is the earlier type and Fig. 2 shows the slight modifications which were introduced in later models. Their construction can be clearly seen and with the aid of the following description we hope those who wish to change their control will be able to carry out the work without undue difficulty.

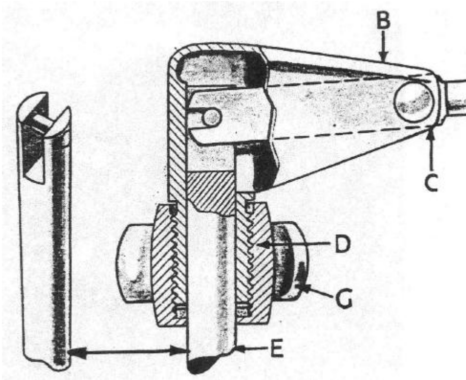


FIG. 1

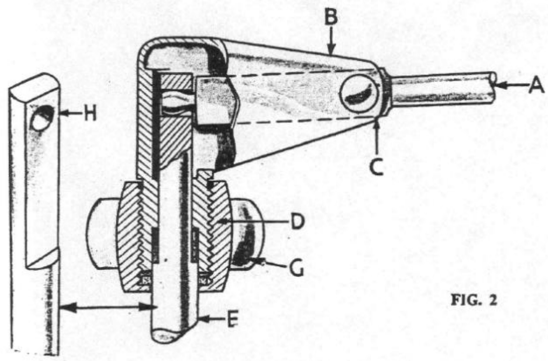


FIG. 2

The only difference between the two types is that in type 1 (Fig. 1) the end of the lever is forked and fits into the forked end of the gear control shaft, the fork on the lever fitting over a small pin. In type 2 (Fig. 2) the end of the gear lever is rounded and this fits into a hole, *H*, in the gear control shaft, the top of which has two flats to locate the lever cap and inner sleeve assembly, otherwise the movement and operations are identical. The following brief description and instructions for removal and replacement in the reverse positions apply whether on right- or left-hand driven cars:

The gear control lever consists of the following parts—*A,* gear lever and knob assembly. *B,* lever cap and inner sleeve assembly which is screw threaded and screws into the bush *D*; this is fitted in *C,* the gear lever clamp; which secures the assembly to the steering column. These two parts, *B* and *D,* are not screwed together completely, consequently *B* is free to rotate in either direction in *D.* The control shaft *E* passes freely through *D* and *B.* Gear lever *A* engages *E* near top of shaft, secured by fulcrum pin *C.* It will, therefore, be seen that up and down movement of gear lever *A* lifts control shaft *E* up or down, whilst horizontal movement of lever *A* rotates gear control shaft *E,* the two movements necessary to change gear.

To dismantle and reverse.

(1) Remove gear lever *A* by withdrawing fulcrum pin *C* (after removing circlip, see Fig. 3).

(2) Rotate cap and inner sleeve *B* through 180 degrees to the opposite side of the steering column.

(3) Re-insert gear lever *A* and fulcrum pin C. Unfortunately the change is not quite so simple as it sounds, as in most cases!!, especially with the later type lever, it will be necessary to remove the steering wheel in order to give room for the cap to be lifted off its flats and rotated to the opposite side.

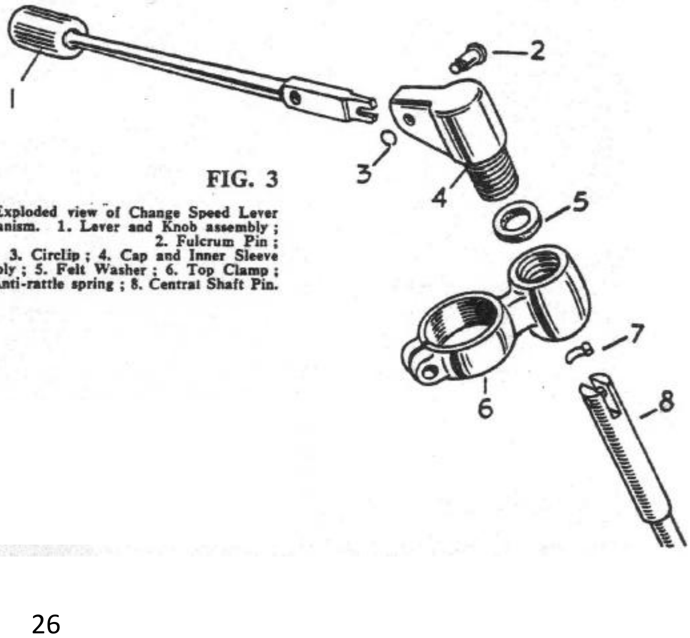


FIG. 3

Exploded view of Change Speed Lever mechanism. 1. Lever and Knob assembly; 2. Fulcrum Pin; 3. Circlip; 4. Cap and Inner Sleeve assembly; 5. Felt Washer; 6. Top Clamp; 7. Anti-rattle spring; 8. Central Shaft Pin.

Removing Steering Wheel.

To remove steering wheel we refer to sketches 4, 5 and 6. First remove the three screws indicated in steering wheel hub, and gland nut at bottom of steering box. The complete centre control for horn and trafficator switches can then be withdrawn after the connections for the horn and trafficator wires, which pass through the centre of the stator tube, have been detached at the lower end. Within the steering wheel hub will be found a large nut which must be removed. The wheel is then free to be withdrawn from its taper and splines. A proper extractor should be used for this as tapping on the wheel hub may easily damage the hub, unless great care is taken.

FIG. 4

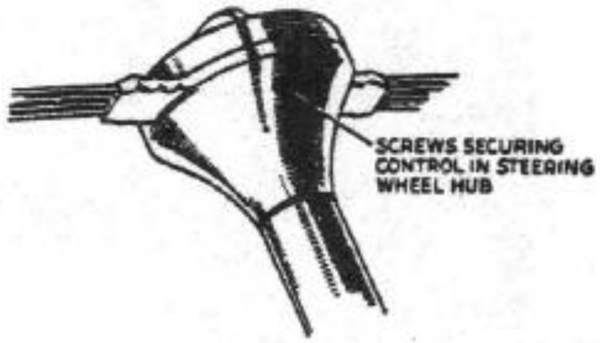


FIG. 5

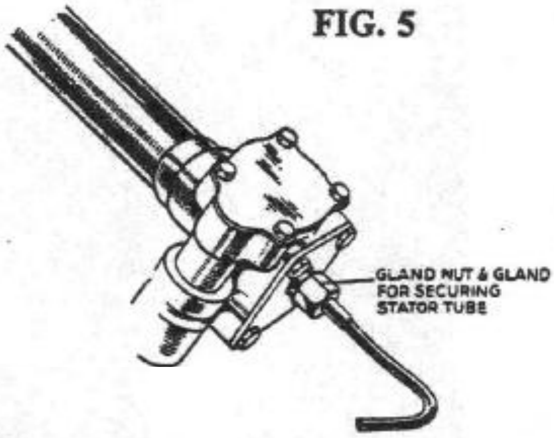
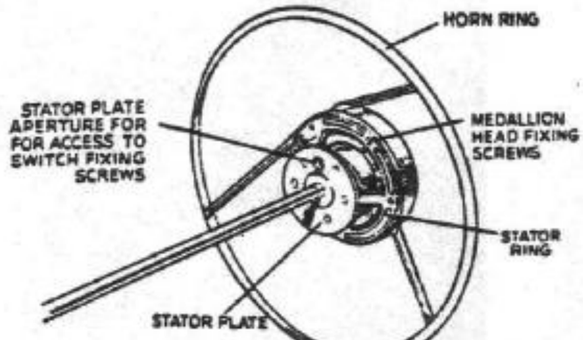


FIG 6.



With the steering wheel removed and securing clamp C slackened (Figs. 1 and 2), the whole unit can be lifted, *B* turned to desired position and all parts then replaced. If difficulty is found in threading the electrical wires through the stator tube a wire may first be threaded through, the wires attached to this and pulled through like a cleaner in a rifle barrel.

It will, of course, be appreciated that when the gear lever has been reversed the position of the various gears will also be changed. The following table will make this point clear.

Gear positions—lever pointing towards centre of car. Right- or left-hand steering.	Gear positions—when lever reversed.
Top—Down and back.	Top—Down and forward.
2nd—Down and forward.	2nd—Down and back.
1st—Up and back.	1st—Up and forward.
Reverse—Up and forward.	Reverse—Up and back.

Service Chart – Flower Power Summer 1995

DAILY

Check engine oil level.

A. EVERY 1000 MILES

A1 to A4. Lubricate with grease gun (3 or 4 strokes).
A1. Steering swivel joints (4 nipples).
A2. Lower suspension arm outer shackle pins (4 nipples).
A3. Steering linkage joints (6 nipples).
A4. Steering idler pivot (1 nipple).

B. EVERY 2500 MILES

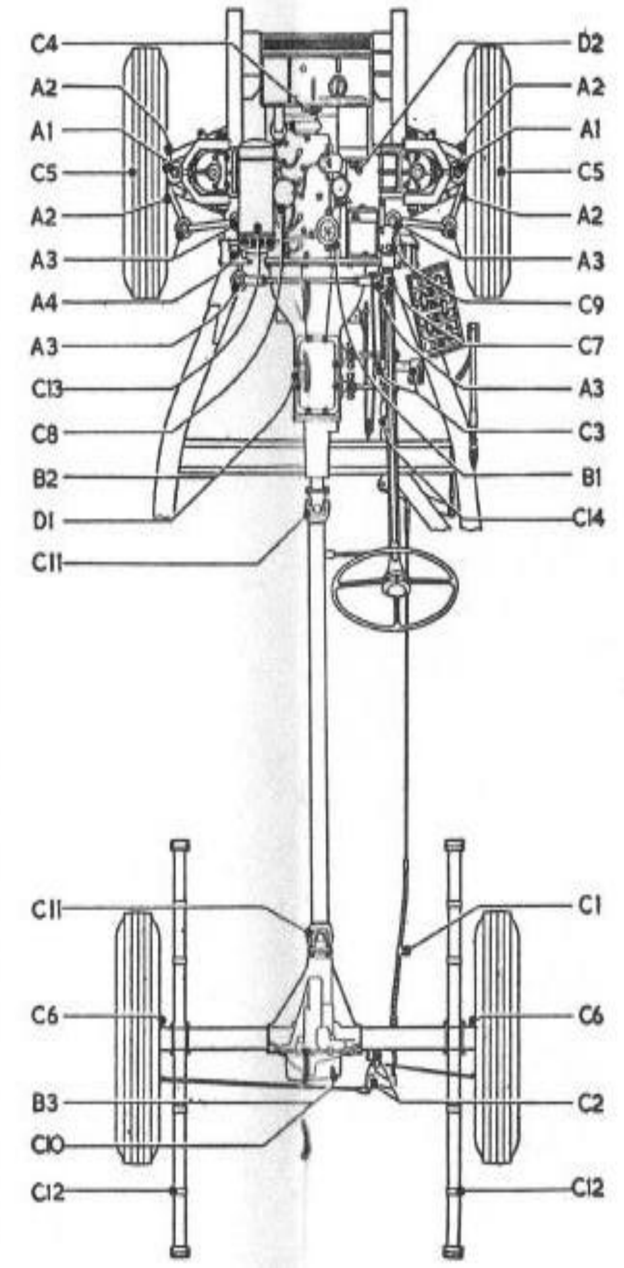
B1. Engine sump, drain and refill.
B2. Gearbox, check oil level, top up if necessary.
B3. Rear axle/Differential, check oil level, top up if necessary.

C. EVERY 5000 MILES

C1 to C7. Lubricate with grease gun.
C1. Parking brake cable (1 nipple, 3 or 4 strokes).
C2. Parking brake compensator (2 nipples, 3 or 4 strokes).
C3. Pedal bearings (2 nipples, 3 or 4 strokes).
C4. Water pump and fan (1 nipple, 5 strokes)
C5. Front wheel hubs (2 nipples, 5 strokes).
C6. Rear wheel hubs (2 nipples, 5 strokes).
C7. Gear shift mechanism selector box (1 nipple, 5 strokes).
C8. Ignition distributor : remove rotor and apply a few drops of engine oil on screw thus exposed, one drop on breaker arm pivot and a few drops on automatic advance mechanism through gap round cam spindle. Lightly smear cam profile with grease or oil.
C9. Steering box, check oil level, top up if necessary.
C10. Rear axle/Differential, drain and refill.
C11. Propeller shaft universal joints, lubricate with oil gun (2 nipples, 3 or 4 strokes).
C12. Rear road springs, clean and oil.
C13. Air cleaner, clean and re-oil element. Refill with fresh engine oil if oil bath air cleaner is fitted.
C14. Brake master cylinder reservoir, check fluid level, top up with brake fluid if necessary.
Lubricate with engine oil : gear shift mechanism frame bearings, accelerator and parking brake lever, clutch shaft bearings, clutch controls, door locks and hinges, bonnet catches and other moving points and controls.

D. EVERY 10000 MILES

D1. Gearbox, drain and refill.
D2. Dynamo rear bearing, unscrew lubricator cap (if fitted) and repack with BP Energrease L2.
Trafficators, lubricate sparingly with engine oil.



LUBRICANTS

Engine	BP ENERGOL 'VISCO-STATIC'* OR BP ENERGOL SAE 20W
Gearbox, Rear Axle/Differential and Steering Box	BP ENERGOL SAE 90 EP
Universal Joints	BP ENERGOL SAE 140 EP OR BP ENERGREASE L2
Grease Nipples	BP ENERGREASE L2

CAPACITIES

Engine	6 pints
Cooling System, without heater	12 pints
with heater	13 pints
Gear Box	1½ pints
Rear Axle/Differential	1½ pints
Fuel Capacity	10 gallons

TYRE PRESSURES

cold

	lbs./sq. in.
Front	20
Rear, normal	23
fully loaded	25

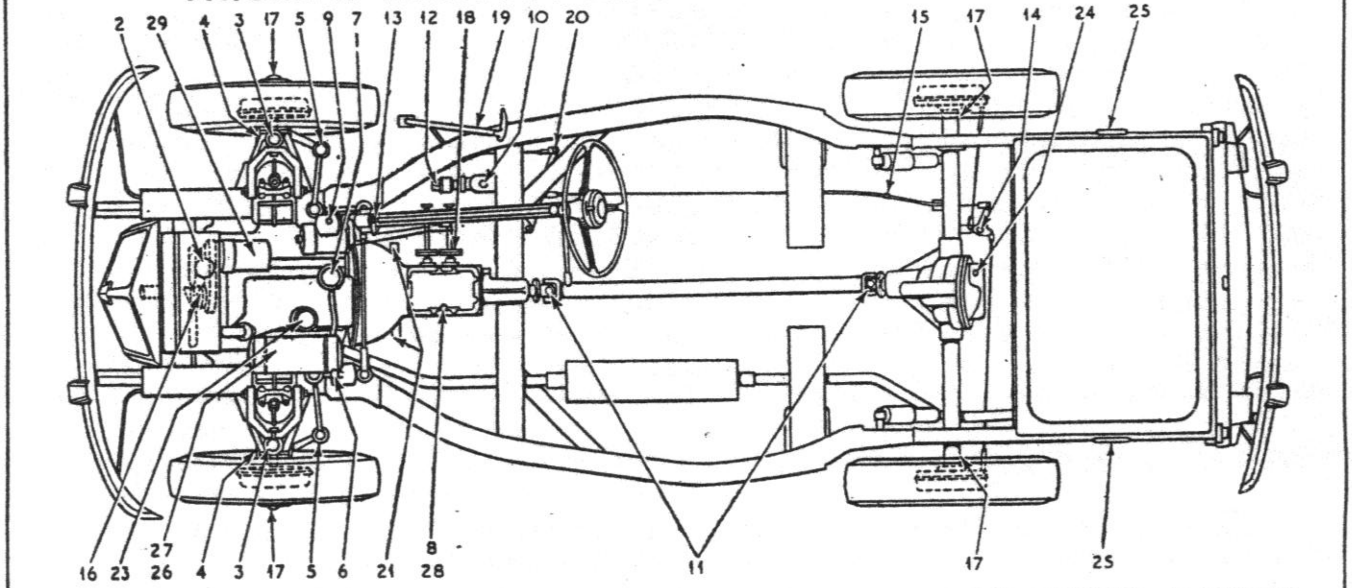
BRIEF ADJUSTMENT DATA

Valve clearance (engine cold), inlet	.015"
exhaust	.015"
Firing order	1-3-4-2
Contact Breaker points gap	.015"
Sparking plug electrode gap	.032"

* *'Visco-static' is a trade-mark of the British Petroleum Company Limited.*

Maintenance Diagram – Motor Trader 1951, Flower Power Spring 1980

TRIUMPH MAYFLOWER MAINTENANCE DIAGRAM



KEY TO MAINTENANCE DIAGRAM

EVERY 200 MILES
1. Engine sump } Top up
2. Radiator }

EVERY 1,000 MILES
3. King pin bearings (4) } Grease gun
4. Front suspension outer pivots(4) }
5. Steering ball joints (6) }
6. Steering relay arm pivot (1) }

EVERY 2,500 MILES
7. Engine sump—Drain and refill
8. Gearbox—Top up

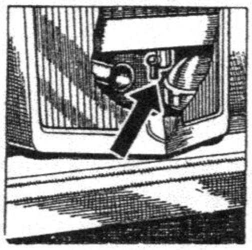
EVERY 5,000 MILES
9. Steering box } Top up
10. Brake fluid reservoir }
11. Propeller shaft universal joints (2) } Grease gun (chassis grease)
12. Pedal pivots (2) }
13. Gear change selector (base of column) (1) }
14. Handbrake compensator (2) }
15. Handbrake cable—Grease gun (cable grease)
16. Water pump bearings (1) } Grease gun (bearing grease)
17. Wheel hubs (4) }
18. Gear change linkage } Oil can
19. Handbrake lever }
20. Control linkage }
21. Clutch cross-shaft }
22. Door locks, hinges, bonnet catches }
23. Distributor—Oil shaft bearing, auto advance and contact breaker pivot. Grease cam
24. Rear axle—Drain and refill
25. Rear springs—Clean and oil
26. Air cleaner (oil-wet)—Clean in petrol and re-oil
27. Air cleaner (oil-bath)—Clean and refill with engine oil

EVERY 10,000 MILES
28. Gearbox—Drain and refill
29. Dynamo—Refill lubricator with H.M.P. grease
30. Trafficators—Oil can

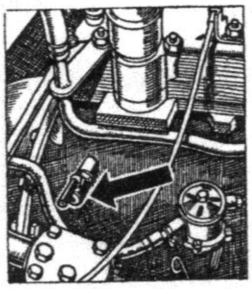
FILL-UP DATA

		Litres
Engine sump	6 pints	3.4
Gearbox	1¼ pints	.7
Rear axle	1½ pints	.8
Cooling system	12 pints	6.8
extra for heater... ...	1 pint	.6
Fuel tank	9 gallons	41
Tyre pressures : front ...	20 lb	
rear ...	25 lb	

DRAINING POINTS



Radiator drain tap on near side



Cylinder block drain tap on offside rear of block. To drain heater put control to "hot"

RECOMMENDED LUBRICANTS (HOME)

		Price's	Shell	Esso	Duckham's	Vacuum	Wakefield
Engine	Summer	Energol S.A.E. 30	Double Shell	Essolube 30	NP Thirty	Mobiloil A	Castrol XL
	Winter	Energol S.A.E. 20	Single Shell	Essolube 20	NP Twenty	Mobiloil Arctic	Castrolite
Gearbox		Energol S.A.E. 30	Double Shell	Essolube 30	NP Thirty	Mobiloil A	Castrol XL
Rear axle		Energol EP S.A.E. 90	Spirax 90 EP	Esso Expee Compound 90	Hypoid 90	Mobilube GX 90	Castrol Hypoy
Steering box, Propeller shaft		Energol EP S.A.E. 140	Spirax 140 EP	Esso Expee Compound 140	XS-Press 140	Mobilube GX 140	Castrol Hipress
Wheel hubs, Water pump...		Belmoline C	Retinax RB	Esso Grease	HBB Grease	Mobil Hub Grease	Castrolease Heavy
Chassis nipples		Belmoline C	Retinax C	Esso Grease	Laminoid Soft	Mobilgrease No. 4	Castrolease CL
Rear springs		Penetrating Oil	Donax P	Penetrating Oil	Laminoid Liquid	Mobil Spring Oil	Castrol Pen. Oil
Brake cables		Belmoline CG	Retinax C	Graphite Grease	Keenol KG 16	Mobil Graphited Grease	Castrolease Brake Cable Grease
Upper cylinder lubricant		Energol U.C.L.	Donax U	Essomix	Adcoids	Mobil Upperlube	Castrollo
Brake fluid reservoir ...		Lockheed Orange Brake Fluid					