THE MAGAZINE OF THE LAGONDA CLUB

Number 219 Winter 2008/2009

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Printed by Pennine Printing Services, Ripponden, West Yorkshire Tel: 01422 825333 Part of The Jarvis Print Group, Manchester

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FRONT COVER:
Our Competition Secretary Tim Wadsworth at the BDC Silverstone Meeting.
Photo: Nick Hine.

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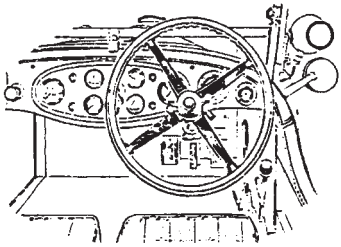
From the Driving Seat



Ken Painter

THERE IS NEVER a dull moment in the life of your Editor and one of the many pleasures is the regular stream of letters, telephone calls and emails from our members. Old friendships forged many years ago are kept alive in this way and new ones formed. Quite apart from the very welcome articles sent in by our more active members, there is a selection of requests for more – or less – on specific topics, a wide cross section of comments, some favourable, some critical and some correcting points made in earlier articles. All of these are welcomed and valued, after all, if we don't know what you want to see in the magazine we could get things very wrong!

Equally important are the requests for help or information made through the Editorial Chair, some of which can be answered immediately while others need to be referred to other members of the Club with greater specialist knowledge on the topic in question. The week before this was written is fairly typical. Way back in 1969, when I was serving with the RAF in Singapore, I sold my 16/80 to Mike Truter. Since then Mike has sold and subsequently re-purchased the car and now lives in Australia, but we keep in touch and Mike is able to access spares and services in this country through me as necessary. Living in a fairly remote part of Australia means that suppliers of the specialised items we need can be difficult, or even impossible, hence the request for help.

"Ken, what is the oil capacity of the 16/80 pre-selector gearbox? I want to change the oil, but have to send away for oil in bulk, so I need to make sure I order enough." Now both of my 16/80s were fitted with pre-selectors, but I never changed the gearbox oil, I needed to find "the man who knew". Brian Savill's and John Breen's 16/80s have Z type boxes, so they were unable to help and I turned to Arnold. "I have the data somewhere, but it might take a while to find it." he replied. Obviously his filing system is better than mine because he quickly came back with the answer. The preselector box takes nine pints of oil!

Whilst waiting for Arnold to do his customary magic, I searched the web and found that Penrite stock a specially blended oil for pre-selectors, Castrol recommend XXL 40 or XL 30.

Mike also wanted some rather special rubber strips for his running boards, when the car was restored in Singapore the material we buy from specialist suppliers in the UK was not available there, so a similar, but slightly different design was sourced locally. Back to the web and two suppliers were found, one in Denmark, the other in Australia! Now all Mike has to do is to persuade the Australian supplier to send him a sample so that he can ensure that it is the correct size and profile. We just don't realise just how lucky we are here in the UK!

Last date for copy for the Spring magazine is . . . Saturday 28th March 2009 . . .

Setting up the 2 litre CWP

Brian Savill makes it look simple

THE FOLLOWING is a reply made to Douglas Fox, our Malaysian ex pat member, who requested advise on how to fit his, purchased from club stock, new Crown Wheel and pinion.

The reply followed my question as to if his new C/W and pinion had the setting dimensions engraved on them, as all club stock should have.

The explanation as to the reason for the question is: if these dimensions are not present one has to revert to the mechanics method of blueing and adjusting until the correct contact pattern is achieved. This is not only time consuming but is not so accurate. It is unfortunate that original ENV. C/W & P had a code number engraved that referred to the dimensions and I have never seen the corresponding listing so, in these cases, blueing is the only way.

Dear Douglas.

I will try to explain.

The 0.005 / 0.007 is the backlash setting between the Crown wheel and the pinion teeth.

The other 4.312 inch dimension is the setting dimension from the flange at the back of the pinion teeth, see "2" on the drawing, to the centre of the of the Crown wheel, shown also as the centre of the Half shafts on the drawing.

How is this done.

To make it easer, first make a small mark on the face of the pinion, see picture No 1 (the face is marked ENV in this photo), with a marker pen, near the middle as shown as "3" on the drawing.

Now find the distance from the flange, marked "2" on the drawing, see also picture No 2, to this mark. Why? Because it is very difficult to ascertain the position of face 2 when it is assembled. **Trust me**. Make a note of the difference between this figure and the 4.312 inch dimension marked on the Crown wheel and pinion, let's call it "X".

Assemble the pinion in its housing with 0.002 to .003" preload on the bearings, this is obtained by adjusting the shims as shown by "1" on the drawing. Don't forget to oil the bearings.

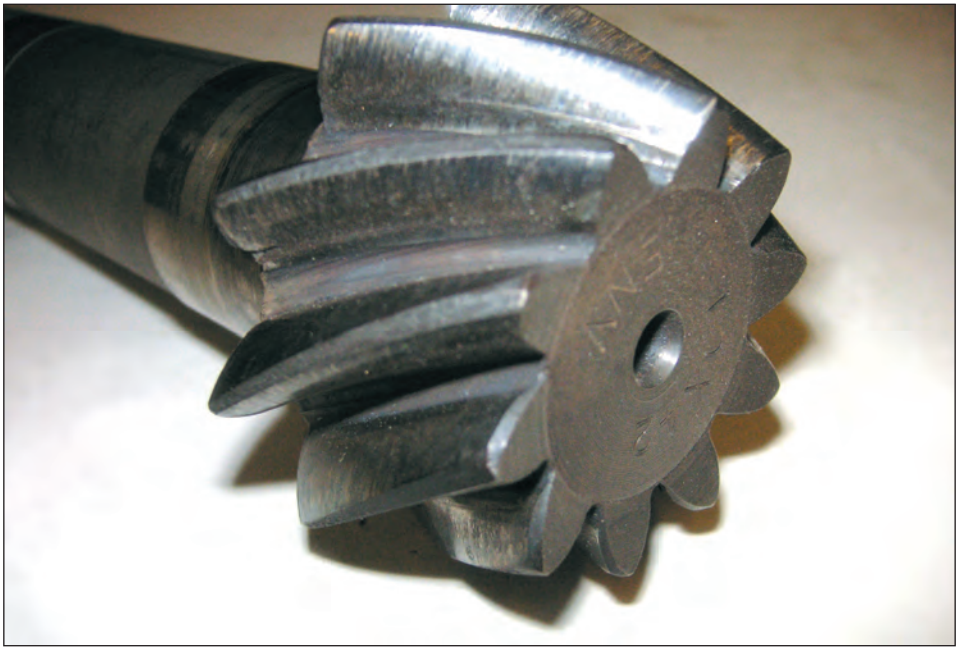
Next: with no other parts assembled, mount this with the original shims as shown as "4" on the drawing to its mating section of the Crown wheel housing. This is the section painted black, see Picture No 3, all other parts also shown in this picture having been removed.

Now measure the distance from the centre of the Crown Wheel location (the mating face of the bearing yoke) to the mark you made on the top end of the pinion. This should be the dimension X.

If this is not so you will need to adjust the shims at "4" to obtain the dimension X.

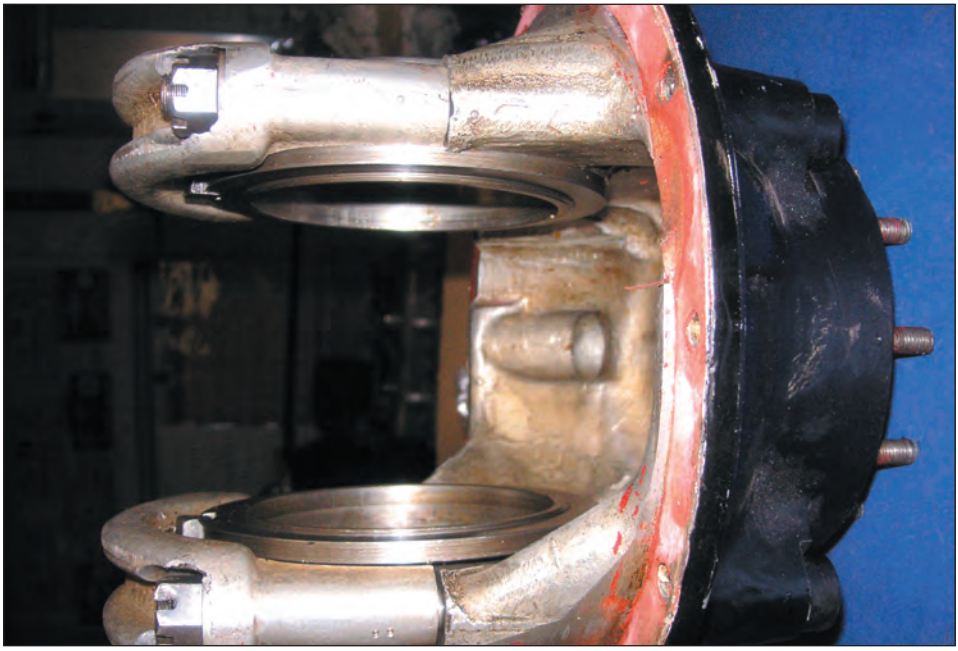
The remaining parts, less the lock tabs as seen in picture No 4 should be assembled. Only nip up the 4 bolts that hold the top yokes at this stage. Also the adjusting rings that the bearings are held in must be adjusted so that the crown wheel is not in contact with the pinion. It must however be close to it. If, previously, the housing had a 9/42 set assembled in it you may find that the casting fouls on the outer face of the crown wheel. Look at Picture No.3, a mark can be seen below one of the bearing housings where metal has been removed to alleviate this problem. You will have to do the same.

Now carefully adjust the screwed bearing housings so that the crown

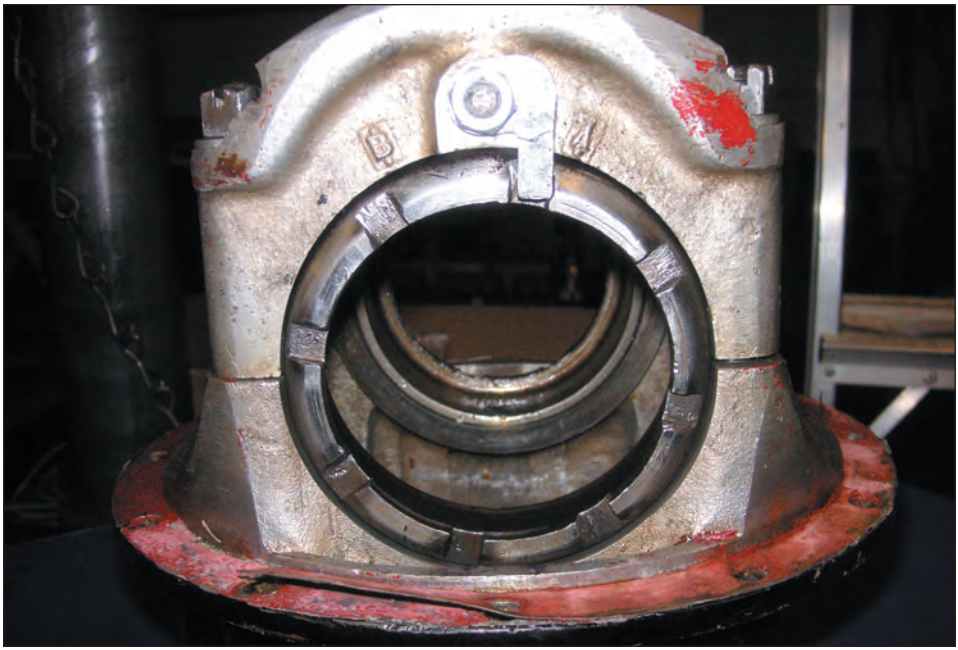


Picture No.1. See article opposite.

Picture No.2.



Picture No.3.



Picture No.4.

wheel is moved towards the pinion so that the clearance of 0.005 to 0.007 is obtained. Do not over tighten the bearing adjusters but also there must be no backlash.

Before the 4 main bolts are fully tightened the lock tabs are to be put in place. Lock tabs as shown in the photo can be turned so that another position is obtained. Also not shown is that a straight one will give another locking position for the adjusting rings. With both type of tabs available the rings can be positioned and locked to maintain the 0.005 to 0.007 clearance.

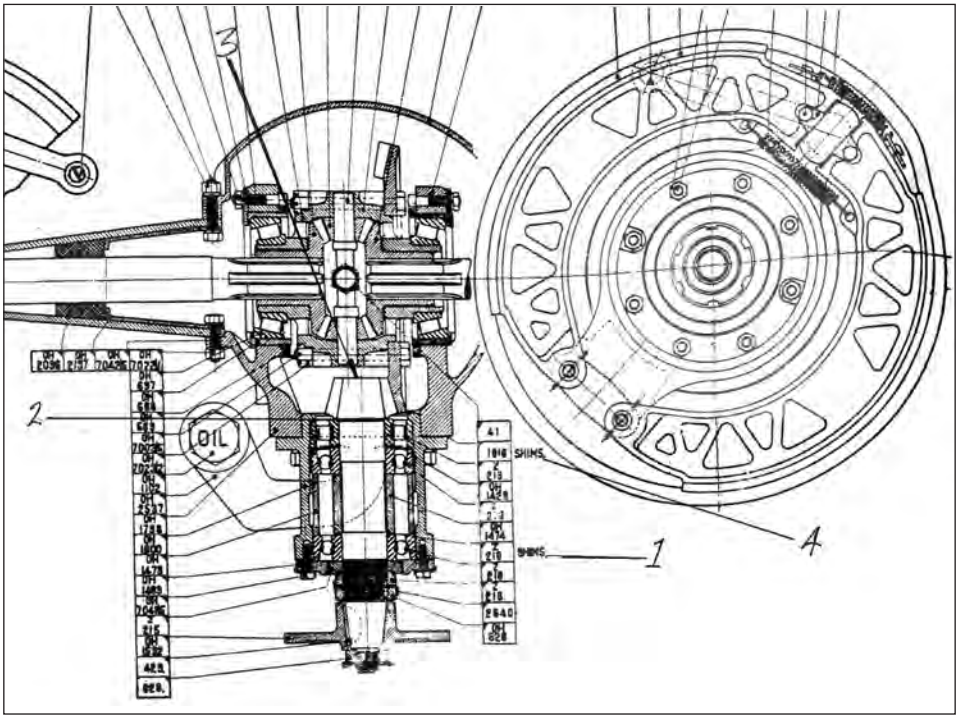
Now you can fully tighten the 4 main bolts and squirt some oil onto the bearings and gears.

Bearings.

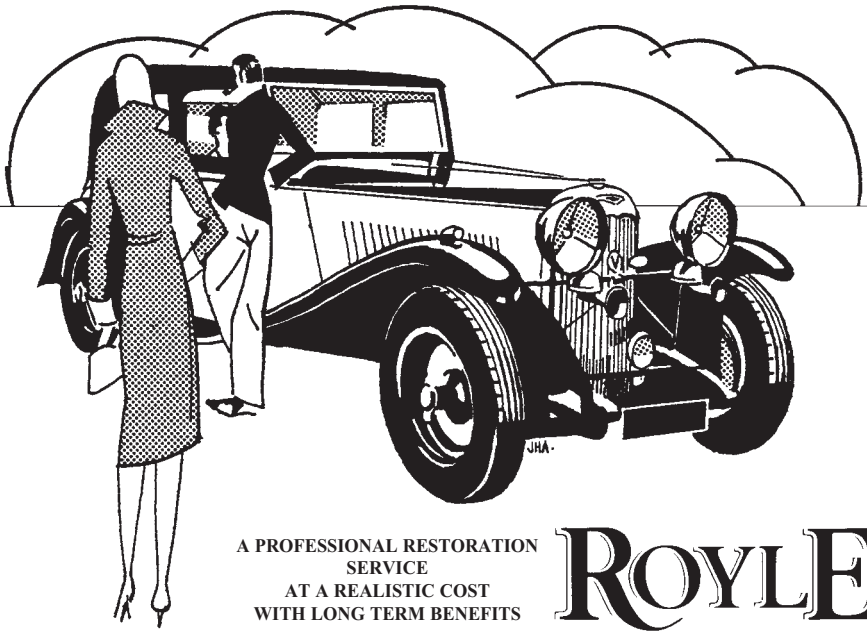
Pinion:
2 off Thrust race 80mm OD x 35 ID x 21 R&M Mjj35 FAG 7307B . TUP

1 off Roller race 80mm x 35 x 21 R&M MRJ35 34f94 outer 34F3 inner: SNR N307 E615.

Crown Wheel thrust bearing.
2 off 3.67185 x 2 1/6 x 1 3/32"
TIMKIN 3720 - 377.



The drawing of the CWP assembly.



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ROYLE

There is something about Lagondas that appeals to people, whether it is the styling, the fine engineering or the quality of the coachwork. Whichever it is it certainly attracted me, I have owned and enjoyed Lagondas for forty years. This company was founded because of them and our long established team of craftsmen and engineers have now restored over 700 motor cars in our Staindrop workshops (not all of them Lagondas!)

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Castrol Classic Oil With ZDDP Anti-Wear Additive

In response to a question about oils which do not contain zinc dialkydithiophosphate Castrol Technical Centre very kindly submitted the following article to the FBHVC Newsletter. To preserve technical accuracy Castrol request that it should only be reproduced in whole.

ESTABLISHED in 1899, originally as C.C. Wakefield, Castrol launched their first lubricant for cars in 1906 and have been at the leading edge of lubrication technology ever since. With the introduction of low viscosity engine oils and changes to anti-wear additives in modern oils in recent years, owners of veteran, vintage and classics are asking whether modern oils are suitable for their cars.

Choosing the correct lubricant for your veteran, vintage or classic vehicle is essential to ensure peak running and maximum wear protection. The technology of older vehicle engines is very different from today's modern cars, so to assist owners, Castrol reintroduced their older brands with their 'Classic Range' in the early 1990s. These Classic oils are produced to original viscosities and importantly have retained the necessary levels of additives including anti-wear additive ZDDP (zinc dialkyldithiophosphate) appropriate for the technology of the engines they are designed for and to provide overall protection. The ZDDP levels are appropriate for engines that are in use or running-in, including those fitted with new or reconditioned components, where care should always be taken to follow the manufacturers' recommendations when breaking in new components such as camshafts.

ZDDP additive provides a high level of anti-wear protection, but its phosphorous content is harmful to catalytic converters and other emission equipment fitted to many modern vehicles. It has therefore been reduced in the latest specification oils, designed for engines using the latest surface hardening technology and meeting the latest emission requirements for modern vehicles. These requirements also necessitate the use of other new emission equipment friendly additives not designed for use in veteran, vintage and classic car engines.

Oil formulations required for today's modern vehicles are very different from formulations needed for older vehicles, having thinner viscosity and alternative additive technology as stated earlier, making them generally unsuitable for use in older engines. This has been done in conjunction with new vehicle manufacturers who have increased the surface hardening of engine components to receive maximum protection from the new additives. Oils for modern engines comply with the latest API ratings and are designed for modern engine technology with tight tolerances and compatibility with catalytic converters. A car engine of old design has very different characteristics, with cork, graphite or rope seals, low pressure cog driven oil pumps, wider oil-ways with

greater dependence on 'splash and cling' lubrication, lower revving with lesser machine tolerances. Such widely different specifications demand totally different lubricants of thicker viscosity with appropriate additives specially included for the work they have to do. Oils even of the same viscosity supplied by different oil companies can have radically different formulations and thus have significantly different performance characteristics. Oil classifications are designated 'S' (for spark ignition petrol engines) and 'C' (for compression ignition engines. Oil classifications for older petrol vehicles range from SA for vehicles from the turn of the last century to SH, to the late 1980s and early '90s.

• *Inadequate anti-wear additive* (ZDDP) and the oil film between moving parts breaks down prematurely, resulting in metal to metal contact and damage to reground or new engine components.

• *Inadequate detergent* will result in gum and lacquer clinging to the hottest engine components.

• *Too much detergent* can cause a build-up of metallic ash in the combustion chambers of older engines. In older engines with traditionally high oil consumption, this will cause detonation and pinking. In older engines where the carbon has built up over a number of years the detergents can also have a scouring effect causing the carbon to flake off, blocking up oil galleries and spray jets. High levels of detergent will 'wash' traces of carbon from seals and gaskets, revealing oil leaks.

• *Inadequate anti-oxidant* and the oil will permanently thicken during high temperature motoring with large amounts of gum and varnish clogging filters and piston rings.

• *Inadequate corrosion inhibitors* and engine internals become pitted with corrosion and rust from acids and water formed during combustion.

• *Inadequate dispersing results* in soot, wear metals and the by-products of combustion settling out in the sump to form a thick sludge that will block filters and oil ways.

• *Inadequate pour point depressant* and the oil ceases to flow at low temperatures, with excessive strain on the oil pump or in certain cases, oil starvation on start-up causing complete failure of the lubrication system.

For older vehicles; veteran, vintage and classic, use an oil of the correct viscosity as recommended by the vehicle manufacturer and shown in your vehicle's handbook. Where your vehicle requires a specific viscosity such as 30, 40, 50 and 20w-5o, avoid inappropriate low viscosity engine lubricants designed for modern vehicles such as 0w, 5w, 10w, 15w. Castrol's vehicle lubrication records date back beyond the turn of the last century, detailing lubrication specifications for engine oils, gear oils and greases right through to today's classics, so to find out which Castrol grade is right for a vehicle owners can simply refer to their vehicle handbook and select that grade from Castrol's Classic range. Castrol's Classic engine oils XL30, XXL40, GP50 and XL20w-50 are formulated to the original viscosities and contain the necessary levels of ZDDP anti-wear additive to provide appropriate protection for veteran, vintage and classic engines. The range is available throughout the UK via leading car specialists. For further information either telephone the Castrol Classic helpdesk on 01954 231668 or visit www.castrol.com/uk/classics.

David Wall discovered this fascinating picture of a Lagonda on CD plates. Bill Crockford from Lagonda is the man smoking the cigarette.

A picture for the Editorial collection, Lagonda chases Talbot in the 1934 TT.

Aspects of the Use of Petrol Containing Ethanol

This is reproduced verbatim with permission from the FBHVC Newsletter No 5 - 2008 and will be of interest to all of us!

Fuel Volatility.

Blending small amounts of ethanol (up to 5%) into petrol does produce a measurable increase in volatility. Oil companies must ensure that fuel volatility meets specified limits (EN 228) so petrol containing ethanol will be adjusted to this specification. However, if fuel containing ethanol is mixed in the vehicle tank with purely hydrocarbon fuel an increase in the volatility of the blend can result. This may produce unwelcome symptoms associated with excessive fuel volatility, including poor hot starting, erratic running and running too rich or too lean. The FBHVC caters for a wide range of vehicle ages, and it is highly probable that some will be less able to cope with an unintended increase in fuel volatility, and some time-related deterioration in performance of cooling systems. Unfortunately, it seems that not all fuel containing up to 5% ethanol is labelled as such, so the scenario of mixing two types of fuel in the vehicle tank is a realistic one, with a significant probability that driving difficulties may result. Volatility related problems have been discussed before, and there are a number of often fairly simple remedies.

Octane quality

The addition of 5% ethanol increases petrol octane quality by about one octane number. For this reason high octane unleaded petrol (nominally 98 Research Octane Number or RON) is more likely to contain ethanol than the normal 95 RON standard or 'Premium' product. Refiners do not like giving quality away, so if ethanol is added to the standard product, the blend may be adjusted so that octane quality remains at 95 RON. Those owners of high performance cars requiring high octane five star petrol are more likely to buy 98 RON unleaded so they are more likely to encounter blends containing ethanol. However, given the high octane quality of ethanol and the EU-driven enthusiasm for bio-fuel inclusion, use of ethanol in the normal 95 RON unleaded petrol cannot be ruled out. Exposure of the majority of historic car owners to blends containing ethanol is increasingly likely as time goes on.

Effects on fuel system metals.

Briefly, the presence of ethanol in petrol increases the risk of corrosion in metallic fuel system materials. The difficulty is recognised from long experience, and effective corrosion inhibitors have been developed. Responsible fuel retailers should employ a suitable additive to protect their customers' treasured possession, but this may not always be the case. CONCAWE Report 3/08 gives a list of metals not recommended for use with petrol containing ethanol which reads like a metal who's who for vintage and classic cars, i.e. zinc, brass, copper, lead-coated steel. On this basis, the type of car favoured by those represented by the FBHVC could have problems in the petrol tank, fuel pipe carburettor and most fittings. Modern vehicles have tended to maximise the use of engineering plastics, so will have less of a problem. However, to avoid sounding too gloomy, it should be remembered that corrosion inhibitor additives are usually very effective in providing protection, and if the products used by

the fuel retailers do not perform, a low cost after-market product may well become available for owners of vulnerable vehicles to use.

Effects on seals, plastics and other materials

Other no-no materials mentioned by Report 3/08 are shellac, cork, nylon and GRP materials, plus various elastomer and seal materials. Recommended materials include Viton, Fluorosilicone, neoprene and Buna-N for hoses and gaskets (but neither of these for seals). Teflon tape is recommended in preference to alcohol based pipe and thread sealing materials. Tank lining materials used to prevent small leaks in tanks are also in the not-recommended category for ethanol fuels. This is consistent with a report received by the FBHVC this summer from one owner who had treated his tank with a proprietary sealing product, after which fuel containing ethanol had been used, resulting in a proverbial gooey mess. The scale of the problem in this case led to the need to strip the fuels system. It is not currently known whether tank sealant manufacturers are able to supply products compatible with fuels containing ethanol, but their availability would certainly be an advantage. In such products are not available, their use is likely to decline and rather more traditional methods of tank repair, or even re-manufacture may become a growth industry.

Effect on gums, sediments etc.

Over time all fuel handling systems tend to accumulate deposits of one kind or another in crevices and corners. Sediments, gums, rust, lacquer and other materials fall into this category, and generally the older the fuel system the more of such material there will be Unfortunately fuels containing ethanol tend to loosen these deposits which then move on to plague the driver with mysterious fuel starvation problems. There have been a number of references to such problems recently, including in cars used for racing, which arguably may be more likely to be using fuel containing ethanol through the high octane route. Irritating though this problem must be, there is arguably a finite amount of such material in fuel systems, and thus after a certain time, which will be shortened by thorough cleaning, further use of ethanol fuels will not dislodge more sediment to block filters or jets, so hopefully this problem will fade with time.

Fire safety.

Fuels containing ethanol at low levels (5-10%) behave very similarly to those not containing ethanol when burning, so safety considerations and fire-fighting techniques will be similar. However, high ethanol content fuels have been shown to be capable of de-stabilising or collapsing foams used to fight fuel fires. Also, pure ethanol burns with no visible flame so making fire fighting more difficult. Alcohol resistant fire fighting foam should be used with fires in fuel containing more than 10% ethanol, but given the difficulty in knowing what sort of fuel blend is in use in certain older racing vehicles, this type of foam would be a wise choice for all racing applications.

In conclusion, there are a number of unfortunate or negative aspects to the use in older vehicles, of fuel containing even 5% ethanol. These can be summarised as: an increased tendency to vapour lock, fuel system corrosion and random fuel starvation events from dislodged deposits. These potential problems in general would support the view 'if in doubt avoid'. Unfortunately it seems increasingly clear that it will become harder and harder to do this, so that perhaps inevitably such fuels will become just another part of the picture of using a historic vehicle in today's world. Experience is being gained all the time, so maybe a clearer picture will emerge with use. Historic vehicle owners should be aware of potential pitfalls, as they may be able to take precautions, or may more easily find a suitable remedy for problems which do occur.

Matt Vincent

2 Litre Rev counters

Clive Dalton resolves a very common problem

THE PICTURE ACCOMPANYING this article shows the rev counter of a Two Litre complete with its unusual graduations. Far from being one of the charming eccentricities of a vintage car there is a very good reason for it being graduated the way it is but I have never yet seen a written explanation of why. Here is one.

Imagine that you are starting from rest on a level road and that you are new to coping with a crash gearbox. Assume also that the clutch stop has not been set to come on early and fiercely by the previous owner. Engage first gear, set about 1000 rpm on and engage the clutch in the usual way. The car will gather speed until the rev counter reads about 16, a major graduation. Stop accelerating but hold the speed, disengage the clutch, select neutral and re-engage the clutch.

Now let the revs die away until the needle reaches the 8 graduation when it will be found that second gear can be engaged without any unseemly noises by simply de-clutching and putting the gear lever into the second slot more or less as one movement.

The gap between first and second being about the same as that between second and third exactly the same procedure can be repeated. Accelerate to 1600 rpm, hold, declutch, allow the revs to die away to 800 and then engage third.

Top is much closer to third so here accelerate to 1600, hold, declutch but then only let the revs die back to 1200, another major graduation, before engaging top.

The whole procedure works just as well going down the box as well. Revs fall to 1200, hold the revs and declutch, accelerate the engine to 1600 and engage third. To get into second though the rise is from 800 to 1600.

This procedure gives a rather stately progress. It can be hurried a bit by simply changing the major graduations one step in each case. Take the revs up to 20 in first then allow them to drop back to 12 to engage second. Repeat for second to third but from third to top allow the drop from 20 only down to 16.

The procedure also works from 25 down to 16 twice and then from 25 down to 20 for top. However by this time you will be proceeding rather more briskly and can probably sort it out by yourself.

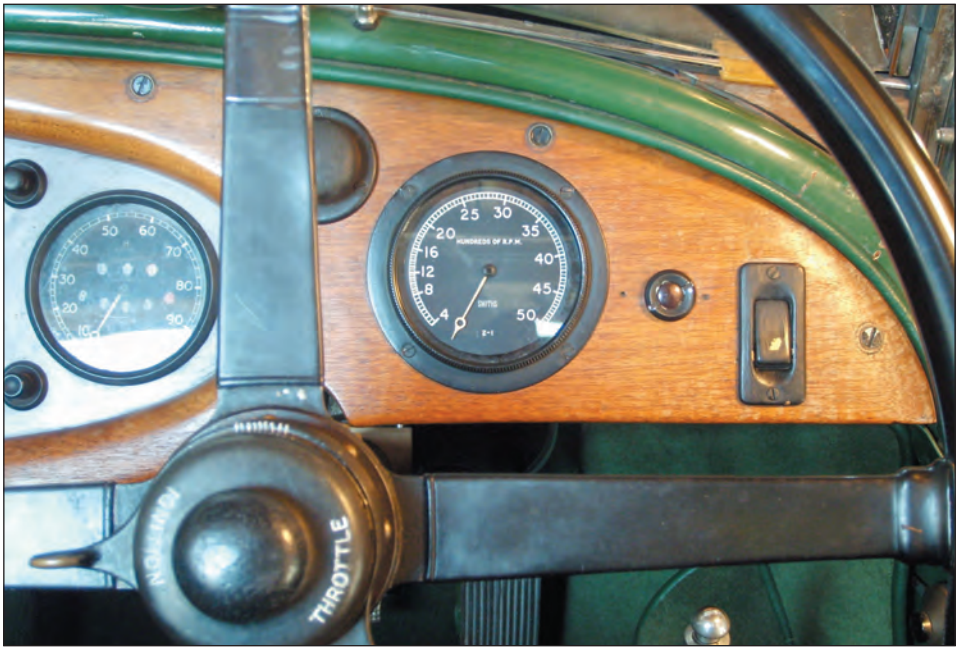
Of course the important words in paragraph 2 are ‘on a level road’. Things have to alter as soon as hills come on the scene. If you are going down hill changes up have to be made rather more quickly as the car will be gathering speed. Conversely, when you are going up hill the car will be losing speed between the gears and less acceleration of the engine will be required between them.

As to setting the clutch stop there is a very good article by on this Jeff Ody in a LagMag that none of us, Jeff, Ken and Chris nor myself can find despite prolonged searching.

There is also a second useful rule which I have only heard described recently. It comes from the late Phil Ridout. You are in traffic and some sudden crisis occurs leaving you in neutral but still travelling at some appreciable speed. You have no clear idea of what revs match which gear.

By setting the two needles on the rev counter and the speedometer parallel to each other top gear can be engaged. From here all the other gears come in known places and you can pick the right one easily.

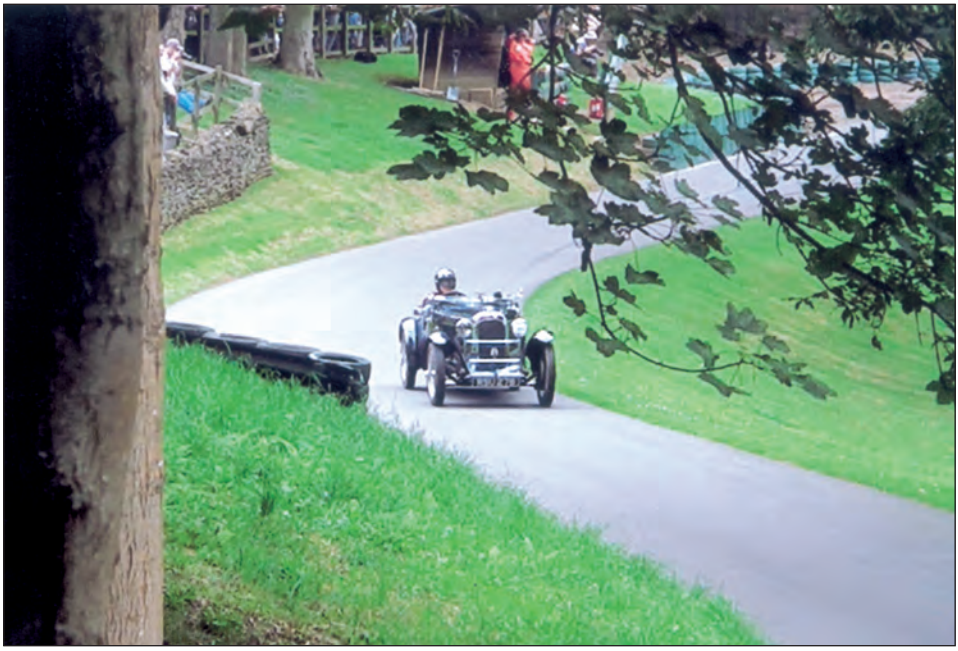
And finally: the hole in the floorboards where the rev counter drive passes through should not be too small. The bulkhead shakes relative to the engine more than I thought and I now need a new end on my cable.



The 2 litre Rev Counter, see article opposite.

Nick Hine and Angus Dudley at a wet Curborough meeting.

A relaxed Colin Bugler and, in spite of a damaged knee, a happy Valerie, at le Mans, just content to be there after the traumas of Silverstone.



Lagondas at Prescott, August 2008. This is Seabrook's Rapier.

Tim Gresty, our new Northern Representative, in his 2 litre.

Prescott again, Terry Brewster in his LG45.

And Mark Butterworth in his V12 LM Replica.

Tim Wadsworth presents the Ladies' Award to Binky Oates at the BDC Silverstone Meeting.

A cheerful Nigel Hall in front of Mark Butterworth's V12 LM Replica at Oulton Park.

The Lagonda Pits Garage at BDC Silverstone, the ex Ken Painter and then James Crocker Rapier in the foreground.

More of the cars in the garage.

BELGIUM

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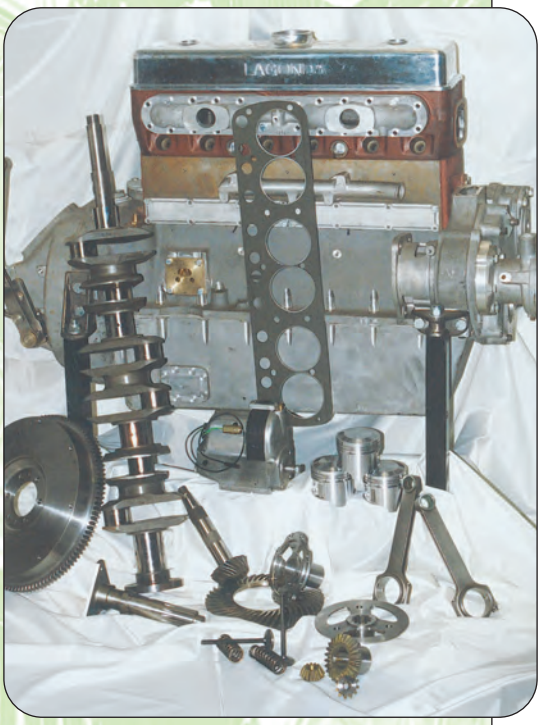
ENGLAND



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Tank Engines

Arnold Davey unravels the history,with the help of Tony Loch

MOST 4½ LITRE owners are aware that their favoured Meadows engine was shared with not only other makes of car, notably Invicta. but also with tractors, tanks and motor boats. While the basic structure of these engines are all the same, they differ very considerably in detail, with differing drive arrangements. states of tune and accessories, according to the intended use.

The marine engine, for example, used only a single small carburettor mounted in front of the timing case and produced only 80 bhp from a 5.75 to I compression ratio. But it had the most complicated control mechanism, vacuum operated, partly necessary to avoid over-speeding the engine if the propeller came out of the water when pulling hard, but also to give the helmsman the simplest possible control, which went from 'forward' through 'neutral' to 'reverse', with engine speed proportional to the amount of travel selected.

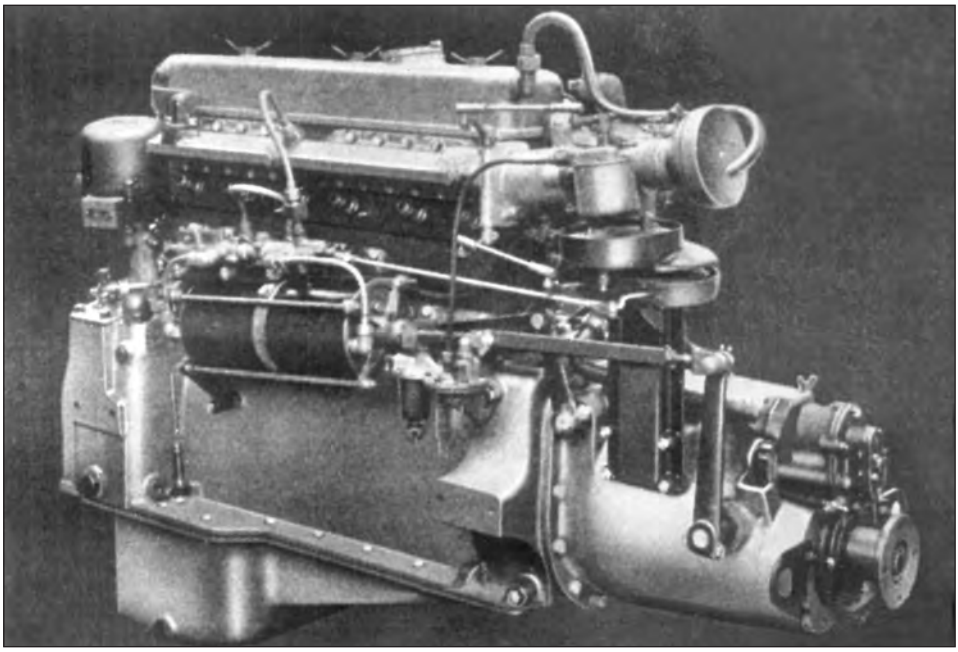
The marine engine took its drive out from the front of the engine via the forward/reverse clutches. Its sump was quite different from ours, quite deep and square at the flywheel end and tapering rapidly to nothing at the timing chain end. Meadows, always cavalier about metric conversions, said its bore and stroke were 3½ and 4½ inches, which they converted to 88.5 and 120 mm. The former gives 4493 cc and the latter 4429 cc. but Henry then called it 4422 cc. You pays your money and takes your choice. 4½ inches is actually 120.65 mm but engineers in those days, relying on slide rules, tended to ignore fractions of a millimetre. The 88.5 mm bore is more of a mystery, since 3½ inches is actually 88.9mm,but when, after the Ellard sale, a club member got his hands on a brand-new Meadows 4½ litre engine the bore proved to be exactly 88.5 mm, leading one to suppose this was as far as the existing castings would permit the over-boring to go.

One other difference on the marine engine was no magneto on the inlet side, since the bulky control gear got in the way, so there was just a single distributor on the exhaust side and only plugs on that side.

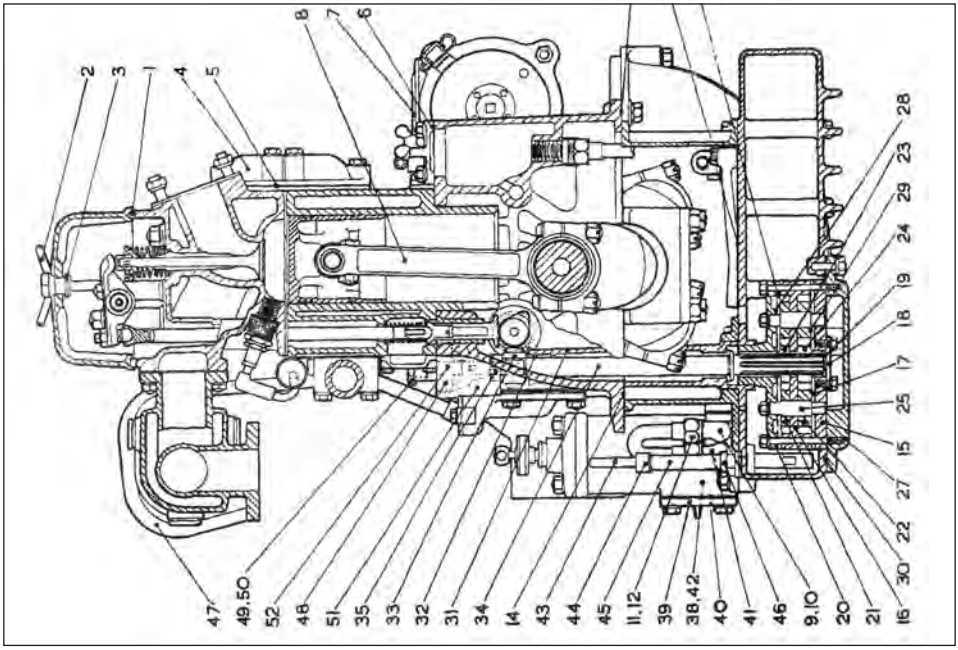
Our M45 engine, the 6ESC, was a development of the original 6EPC. whose 76.5 x120.65mm cylinders gave 3309 cc (or 3266 cc if you believe Meadows' paperwork). To get the bores out to our 88.5 mm they had to rearrange the internals quite considerably, by offsetting and shuffling them about. hence the odd set of angled rockers in our engines, since I believe the camshafts didn't change. This also results in the very thin lands between cylinders 1 and 2, 3 and 4 and 5 and 6.

I recently came across a book "Mechanised Force" by David Fletcher, published by the Bovington Tank Museum (HMSO 1991 £14.95), which covers the history of British tanks between 1918 and 1939. The Vickers Light Tanks which used Meadows engines are covered in detail and I have borrowed some illustrations for this article. I must, at this point. acknowledge the huge amount of work done by Tony Loch on unravelling the Meadows/Tank engine issues. He has made several visits to the Bovington Tank Museum and got them to copy vital documents and drawings for us; far more than can be reasonably incorporated in a magazine article. Tony had already drafted out a magazine article on the subject and has kindly allowed me to incorporate his findings in this piece.

First of all, Tony unscrambled Meadows' codes for their products.



Top: The marine version of the 6ESC engine.



Apologies for having to show this sideways... A cross section drawing of the Meadows tank engine, showing the wide sump and twin oil pumps.

E stands for engine. G for gearbox and so on. Then there is a number representing the number of cylinders for an engine. The next letter appears to be an order of manufacture, running through the alphabet in ascending order of size, so that six cylinder engines go:-

6EN 69 x 120mm	2706 cc
6EO 72.5 x 120mm	2988cc
6EP 76.5 x l20mm	3327cc
6ER 82.5 x 120mm	3870cc
6ES 88.5 x 120mm	4453cc
6EV 88.5 x l27mm	4687cc
6EW 82.5 x 127mm	4073cc
6EX 110 x l40mm	7383cc

(ln case anyone checks the arithmetic, I have used the correct 120.65 mm for the stroke and not Meadows' 120. In the case of the 6EV and 6EW, 127 mm is exactly 5 inches).

Then comes another letter that appears to represent intended use, C for cars, T for tank and possibly there was an M for marine. After that, a letter denoting the make of clutch with B standing for Borg & Beck. Then a diagonal slash, followed by another letter, a code for detail differences. A was a different oil pump. B a different, double-roller, dynamo driving train, C twin Solex carburettors and so on. Adding all this together we get the most commonly found tank engine, from the Mark VI light tank, bears the identity plate saying ESTB/C. It had a flameproof magneto by Simms. The SRM 6, and a redline at 2800 rpm, although power output was quoted as 88 bhp at 3000 rpm, which was permitted for short bursts. Timing was exactly the same as the M45 engine.

There were both major and minor differences from the car engine. Minor differences include an AC mechanical fuel pump and a single magneto. The

A production Light Tank Mark IV in front of two Medium Tanks in gas tests. The commander has hand grips and needs them on rough ground. BMM is a Middlesex registration of July 1934. Up to 1939 all military vehicles had Middlesex registrations.

first major difference lay in the lubrication system. The tank sump held four gallons against the car's two and was a completely different shape, shallower but finned and twice the width of the crankcase. It housed a double oil pump whose upper half supplied the auxiliaries and the lower half the main and big end bearings. It was mounted in the normal rear position but the pick-up arrangements were such that it could suck oil from either end of the sump, reflecting the extreme attitudes tanks can get into. The auxiliary oil supply was pumped first to the inlet manifold where it heated incoming air and then to an oil cooler fitted with a pressure relief valve set to blow off at 25 psi. From there it went to troughs for the big ends to dip into (deleted on later engines), and then back to the sump. The bigger oil pump directed oil first to an Auto-Klean fllter and then to a gallery which had a detachable cover plate for cleaning purposes. After that to the main, big-end and camshaft bearings. The gallery was tapped to supply the oil pressure gauge and also the main pressure relief valve, set at 40 psi. When this opens, the oil passing through it lubricates the rocker gear and timing chains.

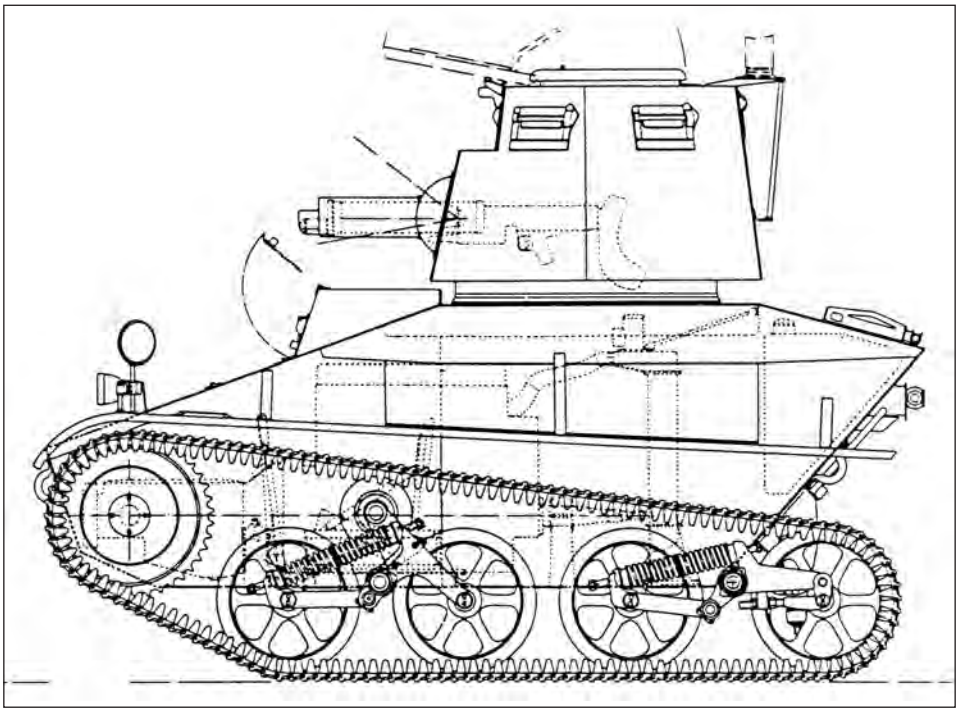
In some of the tanks, not all, a second, separate, dynamo was fitted to charge separate batteries for the wireless set. This second machine was attached to the hull of the tank and driven by a short shaft attached to the fan pulley, with universal joints at both ends to allow the engine to rock in the hull. The drive for the fan was completely different from any car application, with a long horizontal shaft placed alongside the engine on the inlet side, driven by the magneto drive gears. This shaft terminated in a gearbox which allowed the fan to be nearly horizontal underneath the radiator.

Having talked about the engines, let us now look at their uses in British army tanks. The Carden-Loyd company was founded in 1925 by Sir John Carden, an Army Service Corps officer in WW1 and Captain Vivian Loyd. also an ex-officer but by 1925 running a garage business in west London. During the war Carden had commanded a unit in Avonmouth Docks which unloaded Holt Caterpillar tractors from the USA and prepared them for service in France. He had, as a result, more experience than most of crawler operations. He had also designed a cyclecar and got it into production in 1922.

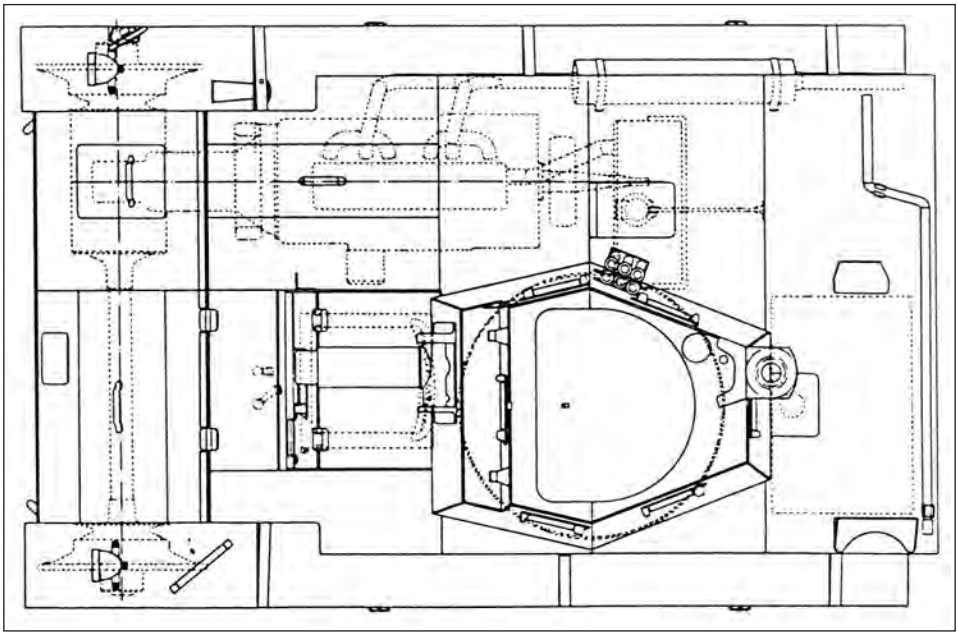
Carden-Loyd Tractors Ltd spent its first few years developing a really light (and hence cheap) tank, although, as is the way of these things, it grew steadily heavier and was eventually developed by others into the Bren Gun Carrier of World War 2. By 1928 they had developed it enough to seek orders and were so successful that their tiny firm could not possibly have met them, so a merger with the vast Vickers Armstrong organisation was carried out, although the company still traded as Carden-Loyd. Sir John Carden was killed in an aeroplane crash in December 1935 and although Vivian Loyd took over from him, he soon fell out with the Vickers management, who were also keen to rid themselves of the 5% royalty payments to Carden-Loyd written into the original agreement.

The concept of the light tank developed from the gun carrier idea, but with full enclosure of the crew and a proper revolving turret for the gun or guns.

The Mark I, a joint production of Vickers and Carden-Loyd, came out in October 1929 and used a Meadows 6EOC, a predecessor of the 6EPC. It weighed 3.5 tons, could do 32 mph and used a strange twin gearbox transmission, one a two-speed epicyclic and the other a two-speed sliding type. The reason for this was the discovery that the range of ratios needed to cover all the conditions of use, from flat out across fields to climbing near-vertical banks, was so great that a single four-speed gearbox that would cope couldn't be designed.

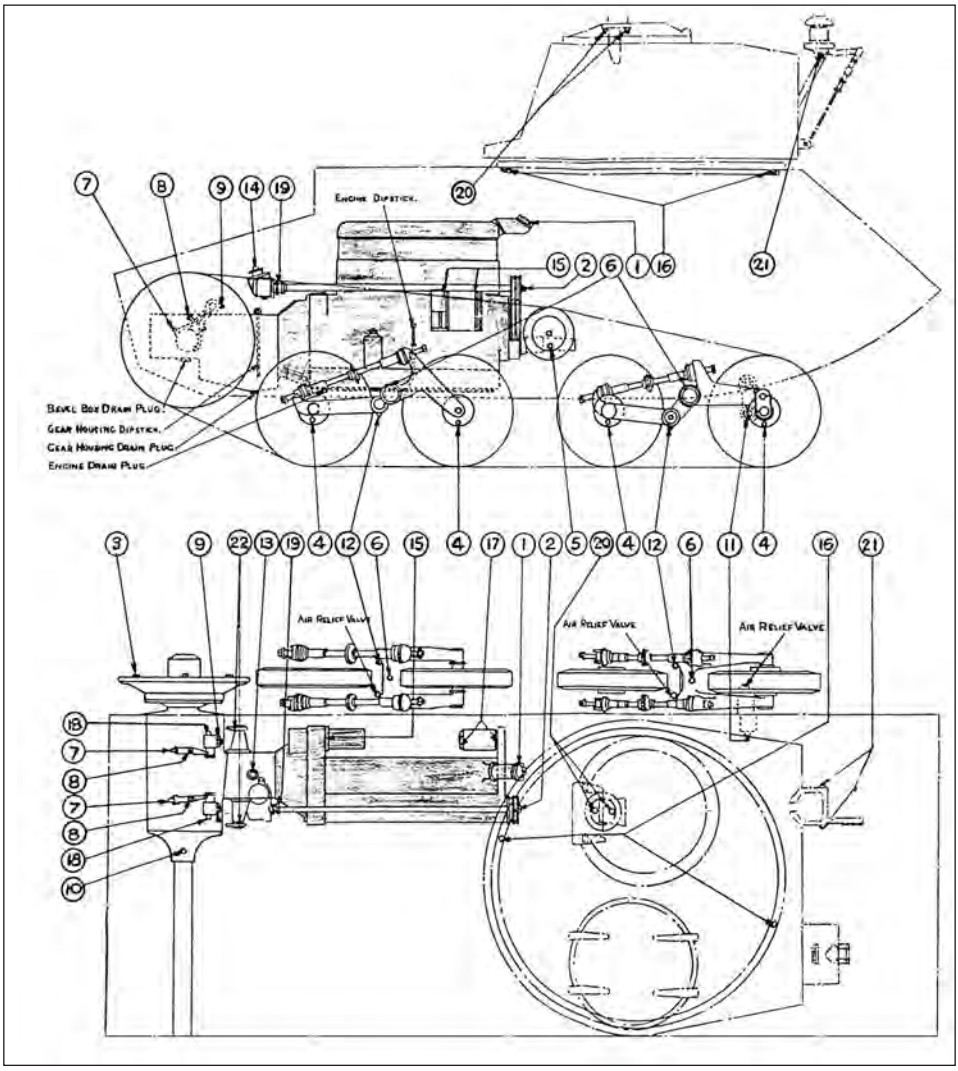


Drawings of the Mark IVB tank built for India.



There is a Lagonda connection here. The company changed its basic models so infrequently that there was never a need for a permanent staff of designers, so that after carrying out the 14/60 chassis design, Eddie Masters left to go to Carden-Loyd, where he worked on tank suspensions. Eventually this led to a post at the War Department's MWEE (Mechanical Warfare Experimental Establishment). By co-incidence, he returned to Staines in the Petter era, to fill the top job. Frank Feeley recalled that he seemed reluctant in his now exalted position to acknowledge old colleagues.

Various experimental tanks



Lubrication Drawing for the Mark VI light tank, showing the Meadows engine mounted back to front and driving the front track sprockets. The fan is mounted forward of the engine (at 14), driven by the long shaft from point 2. The list identifying the various numbers on the drawings was not suitable for reproduction.

occupied 1929 to 1931 including one using the 6ESC engine, rated at 100 bhp and fitted, strangely, with a Meadows T9 gearbox, which the makers only reckoned was good for 50 bhp. Additional armour had put the weight up to 4½ tons and reduced top speed to 24 mph. The Mark II of 1931 went back to the 6EPC and the twin gearboxes but the Mark IIA adopted a Wilson 5-speed epicyclic gearbox. Later versions tried a Rolls-Royce engine, based on the 20/25. The Mark III of 1932 also had the Rolls-Royce/Wilson combination but work continued on the Meadows versions. I should add that all these early tanks were produced in very small numbers, the Mark IA, for example, comprised only 16 vehicles. The Rolls-Royce choice was soon dropped as they were found to wear out extremely quickly in desert conditions (filtration was in its early days). Rolls-Royce's ability to deliver enough engines quickly may have been one reason for abandonment. I daresay cost came into the reckoning too.

The Mark IV brought in lots of changes, a shorter wheelbase meant that the driver was displaced to one side, sitting alongside the engine, which was installed back-to-front, driving forward to the front sprockets. The turret was immediately above the driver, so the whole tank looked asymmetric. 100 bhp was now quoted from the Meadows, driving a laden weight of 4·6 tons, with top speed 36 mph. although at that the commander, whose head stuck out of the turret, had to hold on very tightly as the short wheelbase gave a good impression of a bucking bronco.

With rather Lagonda-ish inconsistency, the Mark V came into service before the Mark IV and demonstrated a change of policy from two-man to three- man crews. Hitherto the commander had to fire the gun(s), read the map and try to keep tabs on the world outside. A three-man crew relieved him of gunnery duties. Naturally the Mark V turret had to be enlarged to accommodate two men. It appeared in 1934, to be replaced by the Mark VI of 1936, which was more heavily armoured and sought to offset the extra weight by using magnesium castings in the engine instead of aluminium alloys. A standard Borg & Beck clutch replaced the heavy Vickers/Meadows one. By then, rearmament was in full swing and 200 Mark VIs were built, followed by 1000 of the following Mark VIB and VIC. Plenty of work for Mr. Meadows.

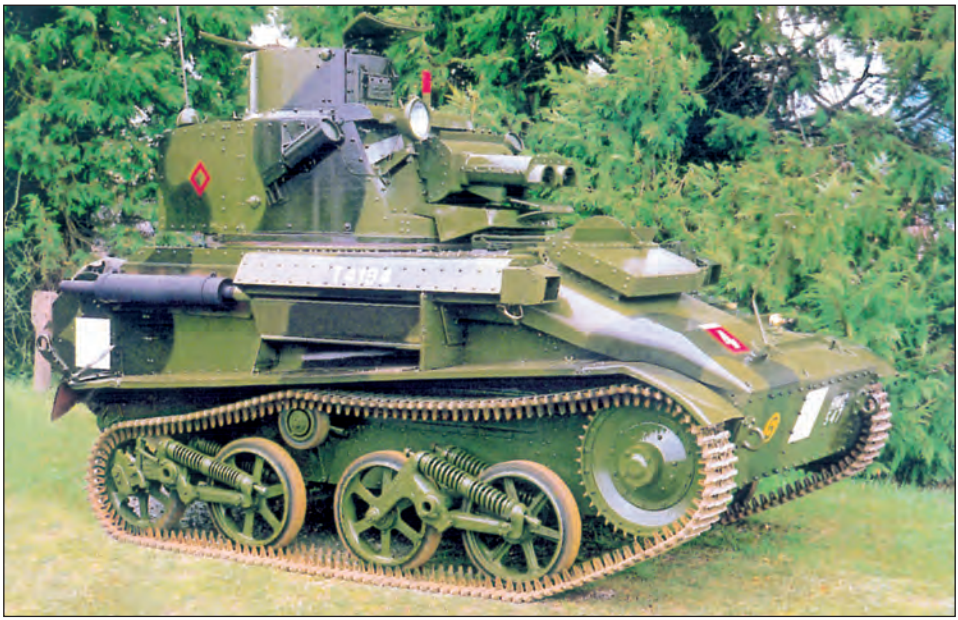
So there were thousands of Meadows 6ESTs loose in the world at one time, although most were probably destroyed in action or scrapped afterwards. But they still turn up from time to time and some are fitted to Lagondas that have lost their originals. The standard 6ESC only had plugs on the inlet side, but customers could specify twin plug heads, as Lagonda and Invicta did. Unfortunately, surviving documents are not clear on this and one feels that one magneto was the likeliest arrangement. All the tank engines I have seen in Lagondas have the twin plug head, so I assume the conversion is an easy one. As the marine engines had their plugs on the exhaust side, it is fair to assume the original design contemplated either or both sides.

As befits such a large production, the numbers stamped on by Meadows tend to be much higher than the 7xxx or 8xxx numbers on M45s. (LGs don't have the Meadows numbers stamped on). Of the tank engines I've seen they range from 9153 to 12670, which gives some idea of the extent, although Meadows were producing all sorts of other engines at the same time of course.

Just to round off the story, in 1938 Meadows built a flat 12 engine coded 12MAT which consisted of two 4½ litre sixes mounted on a common crankcase, giving 8906cc and 165 bhp at 2700 rpm. This was to power the Tetrarch light tank, also called the Mark VII. To keep both inlet sides uppermost, one block was reversed and both had a single Zenith 36TTHVL or Solex 4OZNHP carburettor. The Zenith was the original fitment but being of Italian origin, the British-made Solex replaced it.

Eventually this led to the HOP/2 engine, a complete redesign with seven main bearings and the blocks integral with the crankcase halves. This was intended for the Alecto self-propelled gun, which never got into production.

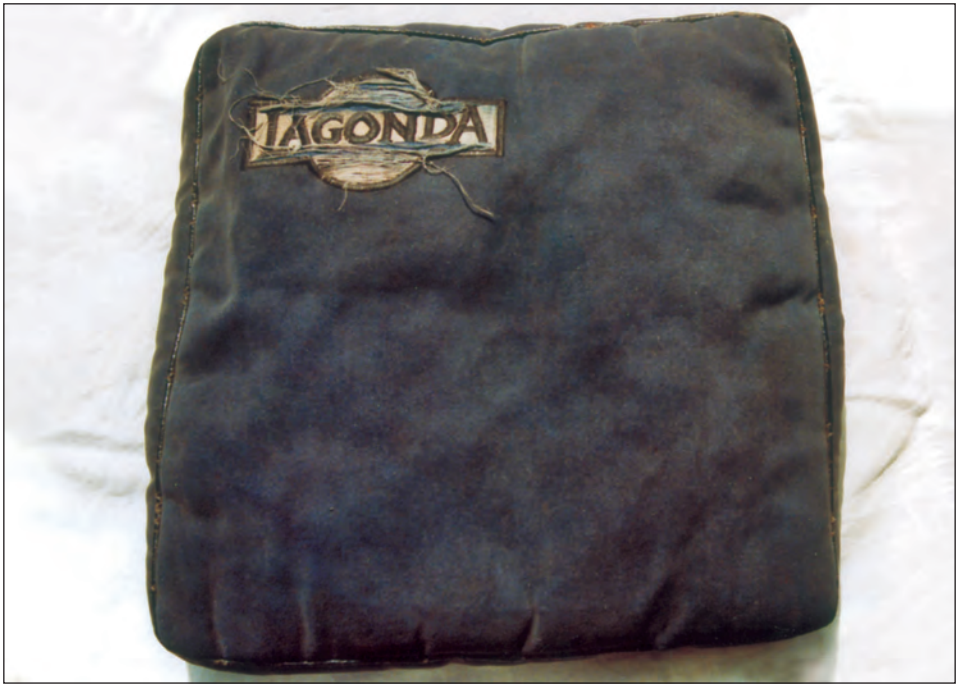
All the various versions of light tank were conceived in peacetime as reconnaissance vehicles, rather than expected to fight pitched battles. This being the result of antiquated thinking in the War office, still devoted to cavalry operations and choosing to ignore the Air Force. In the period leading up to Dunkirk, they proved to be a disaster, their thin armour easily penetrated and their 0.303 or 0.5 machine guns totally inadequate against Panzers. Scores were left behind and the Germans converted them to carry anti-tank guns. The Tetrarch was given a new lease of life when the Hamilcar glider was specifically designed to take it, although its 2-pounder gun was still inadequate.



Top: The restored Mark VIB tank at the Tank Museum at Bovington.

Derek Green produced this picture of a tank engine plate from an engine he restored in the past.

Memories of autumn. Lagondas in the mist before the start of the 2008 AGM at Aldermaston. Picture by Michael Drakeford.



An item from the Club archives. This is a cushion provided with the 3 litre. Apparently they were available for the 2 litre as well, but that version didn't have the badge on it!

The Suffolk Dinner

Saturday 28 March 2009, 6.45pm for 7.15pm

at

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Market Cross Place, Aldeburgh

Roast Butternut Squash & Thyme Soup

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Pressed Vegetable Terrine, Vinaigrette of Sunblessed Tomato & Herb

or

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❖

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❖

Sticky Toffee Pudding with Vanilla Ice Cream & Butterscotch Sauce

or

Fresh Fruit Salad and Cream

or

Selection of Local Cheeses with Biscuits, Celery & Grapes

❖

Coffee and Malakoft

❖

After dinner Dr. Jonathan Oppenheimer will entertain us with matters Lagonda.
Gary Guiver Gong award for the Rapier coming furthest. Dress optional.
Vegetarian main course available **if requested when you order tickets** –
see flyer for details.
Tickets £29 50 each + s.a.e., cheques payable to Mike Pilgrim, from
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The White Lion, tel. 01728 452720, offers rooms, or for details of other accommodation contact Mike on 01394 382773. Book in good time!

ALSO – on Sunday 29 March

Meet for lunch, from noon onwards at the Old Mill House, Saxstead Green near Framlingham

Bring your Lagonda!

Letters

Dear Ken,

I refer to the letter, which appeared in the magazine of the Lagonda club number 218, autumn 2008 written by Mr Philip Stephens.

Those members, who read the newsletters thoroughly, will know that the rallies, which have been organized, by my wife and myself in the West Country over the past 8 years have, without exception, been advertised by means of a flysheet in the autumn of the preceding year.

This gives all members an equal opportunity to apply for the event, as evidenced by new faces each year.

Had Mr Stephens taken the trouble to talk to an official of the Club or myself, he would have saved himself any embarrassment from his discredited allegations.

Yours Sincerely

John Fitton

I have been asked to point out that there are two types of events organised by, or for, the Club. John's fall into the first category. They are not funded in any way by the Club, are purely social events and the Club carries no liability for them since they fall outside the remit of events coming under the auspices of the Motor Sports Association. As such, it is really up to the organiser to decide on the extent of the advertising and which members and cars to accept. The decision whether to feature a report of the event in the Magazine rests with the Editor! The second category covers those events organised and run as official Club events under the rules set down by the MSA. These are, and must be open to every member on a 'first come first served' basis and are invariably given wide publicity and, after the event, full coverage in these pages. John has pointed out in his letter that he gives the widest publicity to his events and, so far, so has every other organiser of similar events.

Dear Ken

Brooklands. 7th August 1939.

I found this picture at VSCC Silverstone in April. Untitled, but I know a Lagonda when I see one.

It shows the cars lining up for Race 11 on the 0uter Circuit. In the previous race the two works V12s of Charles Brackenbury and Lord Selsdon had caught the handicapper napping, Brackenbury winning at 118.45 mph. For the second 0uter Circuit race they were hastily re-handicapped and stood no chance. Percy McClure in Riley number 5 winning at 122.71 mph.

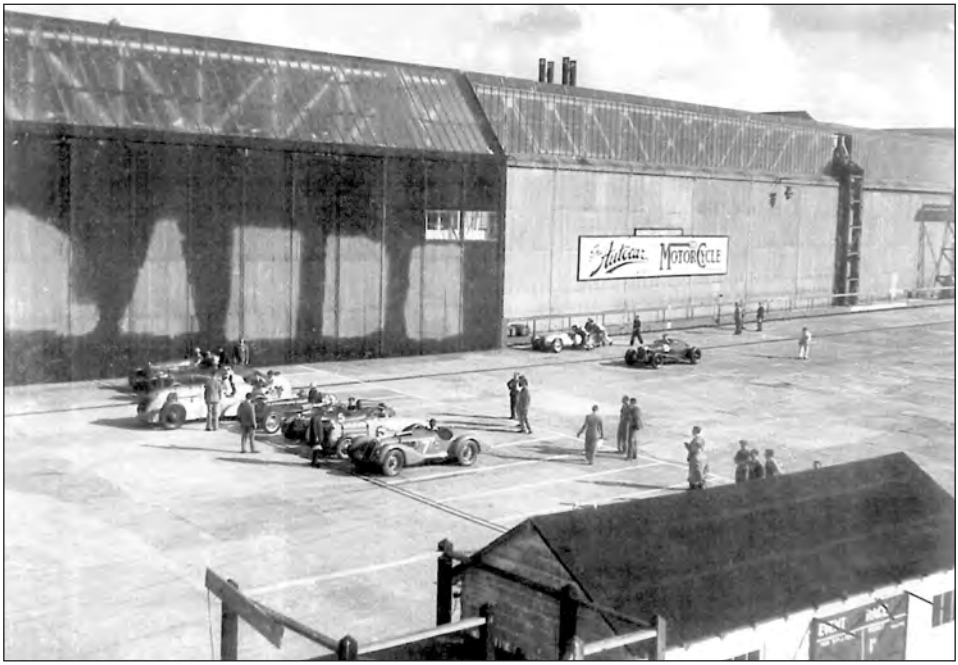
We know this is Race 11, because Lord Selsdon carried race number 5 in the previous race. The huge Vickers Brooklands lettering had been obliterated in 1938 at the time of the Munich crisis.

Selsdon's car is second from the left in the front row, Brackenbury's further back, still carrying the white circles round the horns added at Le Mans in June.

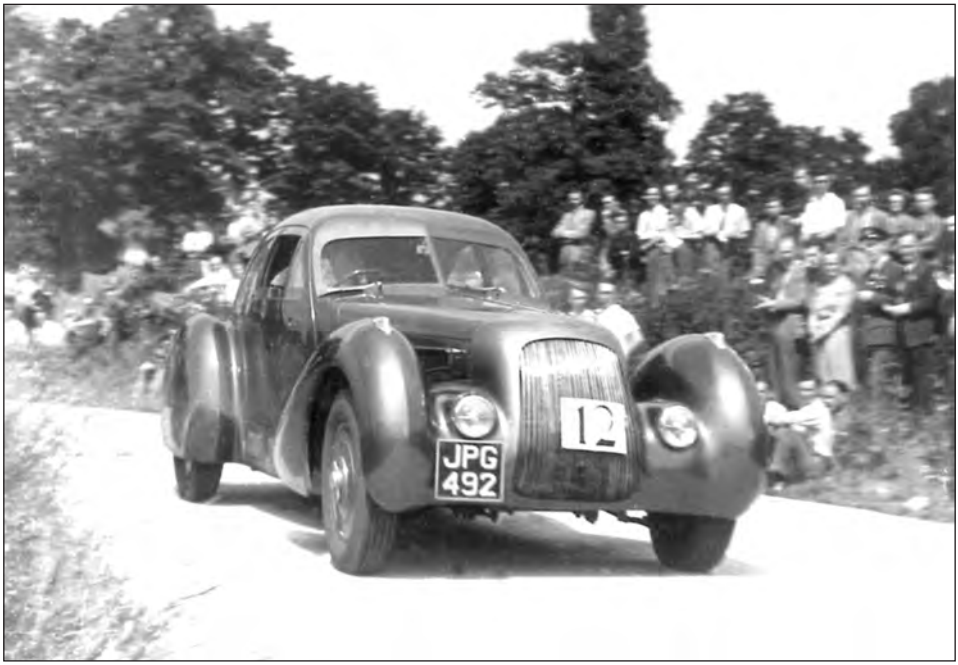
There was only one more race before it stopped for ever.

JPG 492 Chassis 14117

There was a good article in the VSCC Bulletin for Spring 2007 about the first motor race meeting after World War 2, held on an unfinished housing estate at Cockfosters in July 1945. If you had keen eyes, you could just see the tail of JPG 492, Alan Good's "Bentley Chaser",



See "Letters" opposite.



among the competing cars. Now through the good offices of Ted Walker's Ferret Fotographics, this picture has been discovered, showing J.G.Tice jn action on that day. The car was owned by T.C. Tice and it is a fair assumption that these two were the Tice & Son who built a couple of special bodied DB2.6s in 1949.

Best wishes,

Arnold Davey

This is not a "letter to the Editor" nor to any other member of the Board, but is an extract of one sent to Ken Hill, whose 16/80 "wedding car " was featured on the cover of the Winter 2006/7 magazine, after the wedding of Chris Leigh and Helen:

Dear Ken,

The day went off beautifully and my first Lagonda ride was certainly one of the many high-spots in a memorable day. I know that Helen enjoyed it too, with the added bonus of being tooted by the Fire Engine during the journey!

I know my Aunt Bert (Alberta) was always proud of her time with Lagonda. She was a book-keeper and, for a time, Company Secretary. I believe she was employed by Mr Gunn himself. She owned a car and drove, despite being crippled with childhood arthritis, but could never aspire to a Lagonda, driving instead a Bull-Nose Morris which rejoiced in the nickname "The Blue Cow". I have no idea why! They were a slightly eccentric lot, my family – firmly set in the Victorian era, in which they grew up. It lasted all their lives too and, when we went to live with my Aunt and Grandmother in 1954, two streets from the erstwhile Lagonda factory, the house was much as it must have been in the 1920s.

I recall, as a small child in the 1950s, taking my first bus ride from there. "Tell the conductor you want to get off at the Lagonda," she told me. I did, and the conductor had no idea what I was talking about! Lagonda hadn't been there since before the war and the stop was now called Petter's Corner. Today, I guess it's called Staines Sainsburys!

Yours faithfully,

C.J. Leigh

BELGIUM

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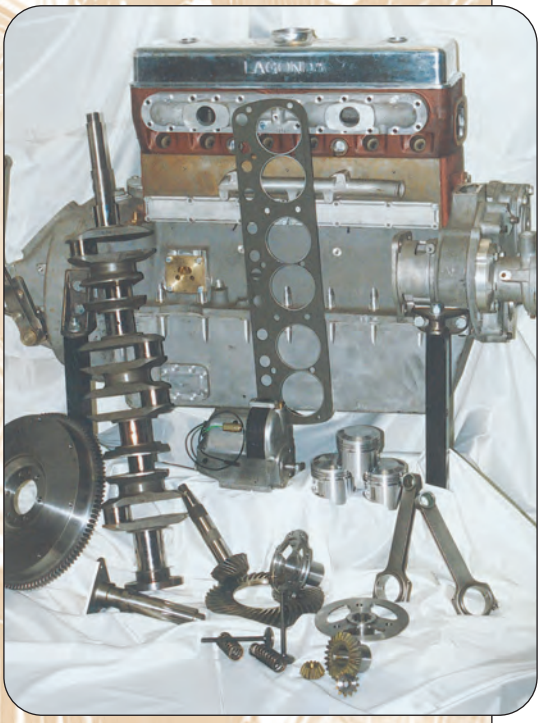
ENGLAND



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