Jaguar Drivers Club of Natal

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NEWSLETTER NOVEMBER 2010 (2)

Dear Jag Enthusiast

Editorial

In an effort to get more Jag Enthusiasts to use their cars on a monthly outing, I am requesting that the members indicate if they would prefer a weekday or a weekend run, which will be exclusively for Jag Club members. Alternatively, link up with another Car Club and join them on their runs. For instance the Durban Early Car Club has a monthly lunchtime run on a Sunday, to which we have been invited, whilst the V.C.C. has their monthly G.G. lunchtime run on a Thursday. I am not in anyways advocating that we amalgamate with another Car Club, which would be criminal, just that we link up with some of the clubs to join them on their runs. I would appreciate some feedback so we can plan the way forward.
Please don't forget to provide us with your stories about your cars that can be included in this newsletter for the Members enjoyment.

Interesting facts and articles

For this newsletter, we have received correspondence from Roger Parker of the MGOC of the UK on the use of LRP fuel and his contact details are as follows: RogerP@mgownersclub.co.uk

With his kind permission it is printed below but remember it is the UK condition.

The issue of unleaded has been somewhat overstated in my view, although that doesn't remove the fact that many engines including BMC A, B and C series engines, along with most other British classic marque cast iron engines from Rootes group through Vauxhall and to Ford were not designed or made with materials that

are fully compliant to run on unleaded fuels without accelerated wear. Indeed the manufacturers took advantage of the TEL (lead) in fuel to get away with using cheaper materials.

The subject though remains one where there is considerable complication and variation so often simple generalisations may be misleadingly incomplete.

In specific terms with the MG engines they are all cast iron and the valve seats are machined straight into the untreated cast iron. Alloy heads such as Jaguars and Rover V8 have to have steel or other hardened metal alloy seats inserted into the head as the alloy is not robust enough even for leaded fuels, and this then gives then a considerable head start when it comes to unleaded fuels as these inserts are harder than cast iron.

TEL in petrol provided two separate functions. One was to provide a solid lubricant in suspension that provides a 'buffer' between the valve and its seat. The second function is as a flame retardant and this is the octane improver function, so engines can run with higher compressions and ignition advance set for power rather than having to be retarded to discourage detonation.

So the true days of leaded petrol we can effectively say that engines were designed down in terms of their material qualities as using TEL was a cheaper option.

Let’s look at the effects of removing TEL and running engines designed to run on leaded fuel with pure unleaded. The simplest aspect concerns octane rating which has been easily boosted to levels seen with leaded fuel and higher and with no sign of TEL.

Whilst the octane levels have been restored the modern fuels burn faster and are more volatile, which is ideal for the modern direct injection petrol engines, but not for old cast iron carburettor engines which suffer more and more from that fuel volatility seeing fuel vapour locks, poor running and dreadful issues of non hot restarts. BMC engines being more prone to problems as they all have their fuel systems sitting on top of the now hotter running exhausts!!!!

However this is getting into another area of incompatibility of modern fuels with old design cast iron carb engines and away from the question of unleaded and these engines.

Valve Seat Recession (VSR) will occur when the right conditions are present, but this is far from the simple presumption that because the engine in not unleaded compatible that VSR will automatically occur by simply changing to unleaded. It is far more complex an issue.

Leaded only engines all have a degree of resistance to the stress effects of combustion and heat and it is important to appreciate (as you obviously do) that the heat and stress varies considerably dependant on the throttle load. It is essentially true that the MG engines need to see stress levels reach a point where there are higher rpms AND wider throttle openings to cross the threshold when a standard MG engines materials are being stressed to a point where VSR will start to occur.

I can refer to some testing done on A series Mini engines at MIRA (Motor Industry Research Association - which is but 10 miles from where I am sitting) a number of years ago when UK spec Mini's (the proper ones not BMW's) were being 'grey' imported by Japanese into unleaded only Japan, when BL was not exporting the cars there.

These tests were on brand new virgin engines in a number of cars that were run in a variety of conditions. The headline result was that it took only a matter of a thousand miles or so for engines to be so sick from VSR they stopped, but critically these were the engines run on the high speed circuit with predominately wide open throttles and higher rpms for long periods.

Those engines used in a much less aggressive way survived very considerably better, although they were not immune to VSR. This testing also involved engines that had seen induction hardening of cylinder head and others with hardened valve seat inserts, which were resistant to sings of VSR.

These test are illustrative of what will happen to the leaded only specification engines when the components are new or valves and seats have been recut. The point I make here is that valves and seats are virgin metal and this is where another interesting finding also of a number of years ago comes into the frame.

It was BMW who identified and publicised a condition known as 'lead memory effect', which in simple terms is some TEL in suspension in leaded fuel becomes engrained in the surfaces of the combustion chamber and its components. In the specific area of the valve and it's seat, the constant hammering of valve onto its seat hammers the TEL well into the surface.

The result, BMW explained, was that if the engine was to move onto an unleaded fuel diet then the residual TEL treated surfaces would resist the stress of even high speed wide throttle opening use for a very considerable time. You will now understand why a couple of paragraphs above I specifically mentioned used head that had has their seats and valve recut were vulnerable, and this is because that cutting removes the impregnated surfaces.

It is clear that Lead Replacement Petrol (LRP - which we lost from general sale around 4 years ago and almost completely about two years ago) which may use a Potassium or Sodium based compound in place of TEL, does see a similar memory effect.

So in summary the MG leaded engines will not suddenly degrade simply from moving onto unleaded fuel, and depending on how long the engine has been running on leaded (or LRP) will depend whether there is a very significant lead memory effect or a smaller one.

I specifically note positive feedback from well meaning and honest owners who fit some of the 'Snake Oil' additives and gadgets, such as non reactive lead pellets in fuel, or magnets tied around fuel lines, is generated not from those products but because of the engines limited ability to resist stress and wear, that has been added too by the memory effect. (Snake Oil being an Americanism that really does describe poor and misleading products.)

Attached is a simple graph I have used for a long time to illustrate the point that there has to be both speed and load for unleaded use to overcome the engines standard resistances. Below the green line all is well and a normal service life is a reasonable expectation. Above the green line and without lead memory effect VSR will occur and the greater the load and speed so the VSR rate increases. With lead memory effect it may be possible to achieve up to the red line, which is what the engine would achieve when using leaded fuel.

So when you mention up to 6000 miles per year then lower mileages will have an impact, but only in a subordinate role to the major element I mention above.

The other points you raise have simple answers. The intermittent misfiring is very probably is issue related to the higher volatility of modern unleaded fuels and that contradiction of the BMC engine having the fuel system sitting on top of the hottest part of the engine, the exhaust! These problems during driving conditions will usually be at their worst when fuel flow is at its lowest, such as idling in traffic or slow moving stop start traffic. In these conditions fuel is 'hanging around' much longer in the engine bay and is able to absorb much more heat.

Lastly the make up of unleaded additives are to replace the lubricating effects of TEL when using unleaded. If there is also an added octane improvement function this is indicated on the product packaging. For example one of the very best unleaded additives (tested and confirmed as such by MIRA) is Castrol Valvemaster. When you want an unleaded additive and an octane booster then Castrol Valvemaster Plus is the product giving both. Note that the octane improver pushes 95RON close to 97, but operates on a law of diminishing returns, so when added to 97 it raises it to just over 98 and add to 98 and it barely gets to 99.

I think this provides a ***brief*** covering of the salient points, and why I said at the beginning that it is a somewhat complicated!!

Future Events

Sunday 14 November The offer to accompany the DECC on their run to the valley of 1000 hills for lunch is still open. At this stage Mr and Mrs Keith Harris have indicated that they will be attending. We need to RSVP before the Friday 5th of November to secure the booking. This run is B.Y.O.B.

Thursday 16 December The offer to join up with the DECC to enjoy the Christmas lunch at the Westville Country Club still stands. If any member has an alternate suggestion please advise.

Queenstown June 2011 Please be aware that the date for deposit paying is around the corner. If you are interested, please email Jack @ swanfield@telkomsa.net so that he can pass all information on to you.

Future Articles

Following a very successful presentation by Robin Phipson and Mark Odendaal on the LRP at the VCC last week we have requested a copy of the presentation to distribute amongst our Jag enthusiasts. As soon as we have received the copy, we shall issue it.

Our patron Mr Peter Fielding has provided us with an interesting article on the 40th Anniversary of the E-type Jaguar which he wrote. We shall include it in the next newsletter.

Kind Regards

Steve Nell