

## Lagondaforum: Tappet clearances - why the variation?

### Tappet clearances - why the variation?

*Written by H 54 John at Aug 04, 2015 10:59 am*

I'm sure there's a simple answer to this one but I don't know it! All available guidance for the 2 Litre states that clearances should be 4 thou for the normal camshaft but 8 thou for a high lift one. Seems to me that, as the valves are the same (in length and expansion coefficient) and they are operating in the same thermal regime, there is no need for this change, given its unfortunate effects of reducing the open period and making an already clattery engine yet noisier.

Wise words please!

H54 John

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### Re: Tappet clearances - why the variation?

*Written by Peter S30 at Aug 09, 2015 11:21 am*

I discussed that with my friend John (B29) who told me this: the experience was that at least with modern fuels you can give the old cams a bit more overlap but should combine that with 6 thou inlet / 8 thou outlet clearance. I am running this setting at the moment (in combination with a downdraught head). For the improved profiles he recommends 8 / 8.

I only can imagine that optimising the valve timing gives more power, so more heat, therefore requires more gap (which reduces slightly the before increased overlap). Probably one can try anything between 4 and 8 depending on the timing of the cams, but at the risk of burning a valve. Is there a way to find the minimum (cold) gap before burning the valves (0 hot gap) ?

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### Re: Tappet clearances - why the variation?

*Written by H 54 John at Aug 10, 2015 2:26 pm*

Thanks for the interest Peter. I'm sure you are correct, the flaw in my assumptions is that the thermal regime is unchanged - it must be the case that the more mixture in, the bigger the bang and the more heat produced. So it will have been perfectly reasonable to play safe and increase the gap, thereby ensuring that the valve definitely closes under all circumstances. This would be especially so as the only penalty would be some increase in noise level and possibly some reduction in power. But to me the recommended doubling from 4 to 8 has an arbitrary look about it and I do wonder whether anyone has bravely tried other settings, whether with standard or high-lift cams.

BTW, these musings were prompted by a recent wedding where the car, an early Rolls, was so quiet that someone nearby wondered whether it was electrically powered. I was a bit envious.

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### Re: Tappet clearances - why the variation?

*Written by Julian at Aug 12, 2015 1:07 pm*

Hi All,

You must not assume that the only reason for valve clearance is to compensate for expansion.

Cams are designed with opening and closing ramps of differing profiles and having differing attributes.

cooking engines i.e. those used for shopping for food need to be quiet so the wife can be heard giving instructions and therefore the engineer designing the cam incorporates a "quietening ramp" this can have several forms but the most common is a slight increase of the cam's base circle dia at about 100 deg to full lift and staying all the way to the opening ramp. For this reason it is also not recommended to adjust your tappets at any other position than 180 deg from full lift on the appropriate cam lobe.

A gentle opening is also incooperated so cam to follower "slap" is reduced. RR were very good at this and their quality control was good also which helps to allow for tight valve clearances.

Fast road engines etc. are driven by men. Men don't mind not hearing the wife's instructions and in fact revel in the fact that they have raughty exhausts and a little noise from the engine so they can feel the power they normally do not have at home. Performance cams open the valves faster and let them close faster, they rarely have quietening ramps. (Bentley designed his race cams with 0.025" clearance and they work well) Heat is

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surely one reason for increased clearance but only a very small part of it.

Valve recession is also another factor we must consider, the faster we rev and the higher the lift, the more the hammering of the seat and the more the valves recess. 1 or 2 thou can happen very quickly, especially on a newly built engine and it's much much better to have to ask the wife to repeat her last instructions than have to stop and listen to her telling you repeatedly that you should have gone in the Renault because your valve has just burned out on the motorway due to too tight settings.

Won't go on now so have fun and keep it at 8 John, although I know Clair is wonderful to listen too ;o)

Please give her a kiss from me.

Regards,

Julian

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### Re: Tappet clearances - why the variation?

*Written by H 54 John at Aug 14, 2015 9:06 pm*

Thanks Julian. I must admit that as I read your post, with much interest and amusement, I did wonder whether it had been passed by Ann for censorship!javascript&#058;InsertTagsMenu('🤔', '"', 'bbsmileys')

JH

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### Re: Tappet clearances - why the variation?

*Written by Julian at Aug 15, 2015 2:13 pm*

Absolutely John,

It's her constant beatings that keep me in line and knowing my place!

J 🤔

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### Re: Tappet clearances - why the variation?

*Written by Tim Wadsworth at Nov 07, 2015 11:35 pm*

Sorry to come late to this discussion but my advice would be to stick to .004" Much as we love our cars not all Lagonda engineering was done with critical analysis and followed up by comprehensive testing. I suspect that doubling the tappet clearance between the standard and blown engine was just an "off the cuff" decision. I run a high lift cam and frequently take the engine to 5000 rpm. Never had a problem with a burnt valve and haven't needed to adjust the tappets for the last two seasons. Still getting 160 psi compressions. Large tappet clearances will only reduce the valve opening and may even cause the valve caps to fall off. Not to mention upsetting the wife !

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### Re: Tappet clearances - why the variation?

*Written by hinedavid at Mar 03, 2016 9:37 pm*

I have been helping Tim Gresty reset the camshaft timing on his 2 litre and I now realise that some of the section I wrote in the revised handbook is misleading. 4 thou tappet clearance is right for the standard 14/60 and speed model cams which have duration of 225 and 236 degrees respectively and should be timed to open at Top dead centre. However the Leonard Reece cams and Newman cams are designed to have a duration of 256 degrees with 8 thou tappet clearance . If 4 thou clearance is used with these later cams the duration goes up to approx 270 degrees .

It is also very important to have the inlet valve open position well before top dead centre at say 15-18 degrees and then double check that it closes 58-60 degrees after bottom dead centre. Any later closing will result in blow back through the carburettor at lower revs. This was what Tim had with his engine because I had timed it to open too close to top dead centre and the performance was very poor.

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### Re: Tappet clearances - why the variation?

*Written by Tim Wadsworth at Mar 13, 2016 12:07 am*

I run my 2 litre with 50 degrees overlap IVO at 20 BTDC, EVC at 30 ATDC With .004 tappets I get 265 deg opening on both cams. This means that IVC at 65 ABDC and, yes, I do get a modicum of "reverse pumping" at revs up to 2300 BUT once over these revs the full effect of the cross flow head becomes apparent and it "sings" You pays yer money and you takes yer choice !

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### Re: Tappet clearances - why the variation?

*Written by Hugo at May 12, 2018 8:09 pm*

Just joined the Club & seen this. A similar discussion came up on the E Type forum a while back; Jaguar changed the cam profile at some point, and altered the clearance from 4 I & 6 Ex, to 12-14 for both. I questioned why they had found it necessary to double the gap.

The consensus was that otherwise the valve timing would be wrong with the new cams. I made myself unpopular by refusing to buy this explanation. I cannot accept that Jaguar would re-design the cam and then say "Oops, now the timing is out but if we open up the gaps we can get it back to where it should be."

Others suggested that they opened the gap because the previous gap had been too small. Once again, I find it impossible to believe that it would take forty years for such a shortcoming to become apparent.

Still no idea why they did it though - it remains one of life's mysteries!

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