BMC ‘A’ Series engine roller rocker valve gear modifications – and potential problems!

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Author:

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Ouch! Cam followers showing varying degrees of damage, as explained in the text by Hylton Reid.

Hylton Reid describes how the ‘roller rocker’ valvegear system he fitted to his Austin A30 (powered by a 1098cc ‘A’ Series engine) resulted in unforeseen difficulties that stopped the engine dead, when on a journey…

An alternative title, in Hylton’s own words, “The disaster of fitting roller rockers to an ‘A’ Series engine”!

Here he comprehensively explains his trials, tribulations and eventual triumph with this upgrade…

Kim adds: If you are a frequent visitor to the Wheels-Alive website you may have seen previous detailed features by Hylton covering various upgrades he has made to his A30 and his Austin Healey Sprite. These include installing a Mazda MX5 gearbox in his Sprite, plus fitting a front anti-roll bar set-up and rear 'A' frame suspension system, in both cases to his A30. These articles are still available on Wheels-Alive (and can be found by entering 'Hylton' in the 'search' box).

The photograph below shows his A30, when in 'bare body shell' form. He has restored the Austin and is gradually upgrading it step-by-step.



Hylton’s very smart two door A30 saloon, before re-assembly after restoration.

(All words and images in this feature copyright Hylton Reid).

My Austin A30 (which I have been restoring and modifying; please see photograph above) has been fitted with a 1098cc Austin Healey Sprite engine, to give it better performance.

I decided to fit some ‘roller’ rockers in place of the original cast items, to give better valve

lift, with a view of providing further increased performance.

Roller Rockers have a ratio of 1.5:1 instead of the normal 1.3:1. To achieve this, and keep the overall length of the rockers the same, the fulcrum of the rocker shaft is moved. The part of the rocker meeting the pushrod is made shorter and the portion meeting the valve is longer.

This means that in each case the pushrod is now slightly nearer to the inside of the pushrod hole in the cylinder head. This should not be a problem, provided there is clearance.

Unfortunately, in my case, there was an unidentified high spot in the head casting which was rubbing on number 1 pushrod. This caused metal filings to fall down into number 1 tappet, and also into numbers 2, 3 and 4.

The heading picture shows the front 4 tappets, as removed from my engine. From left to right, the first one is from No. 4 and can be seen to be in reasonable condition, whereas the second is severely scored, the third is even more severely scored and has failed at the top.

The last one has virtually disappeared. This was the one that fell into the block, jamming the camshaft lobe and shearing off the camshaft drive. This stopped the engine!

Obviously, the bores in the block would also be severely scored, so just fitting new tappets would be a waste of time. The answer would be to find a replacement block. These are now becoming very hard to find for the 10CC (1098cc) engine, although 1275cc blocks can be located.

The solution was offered to me by Keith Calver of Calver ST in Malton, North Yorkshire – 'A' Series specialists (https://www.calverst.com/). The block needs to be re-bored slightly oversize and larger tappets fitted. The ones he suggested came from a Hillman Hunter. The only firm in the UK who could undertake the machining of the block were Damico Engines of Norwich (engine performance specialists: https://www.damico-engines.co.uk/), because the tappet bores are not fully vertical but are angled at 2.5 degrees!

Now that this work has been completed I have checked the clearance around the pushrod holes in the cylinder head. That is when I found the casting irregularity. The solution was to drill out all of the pushrod holes to a slightly larger diameter. Every one of them was not a “clean” hole and needed to be tidied up.

I have cleaned out everything inside the engine, blown through all of the oilways in the block and crankshaft, fitted a new oil pump and filter, replaced the camshaft bearings, used new bearing shells for the crank and rods plus new pushrods, and have washed the sediment out of the sump.

I am hoping to have the whole car running again by Christmas 2023 because I have entered her in the 26th Monte Carlo Historique, starting in Glasgow at the end of January 2024.

Kim adds: “In due course watch this space for Hylton’s report on his participation in this event, in his A30”.