

ATD Tune Up – Revisited

In recent times my Comet has exhibited bothering idle behavior. When the engine is first started it idled reliably and at what I considered a sensible idle speed (no tacho fitted) but after fully warming up – say around 10 miles of travel - the idle speed was no longer where I had set it; in fact, at a stop the motor would race. By engaging first gear and slipping the clutch, I could get the revs to fall to something I considered more acceptable but on pulling in the clutch the revs would quickly rise again.

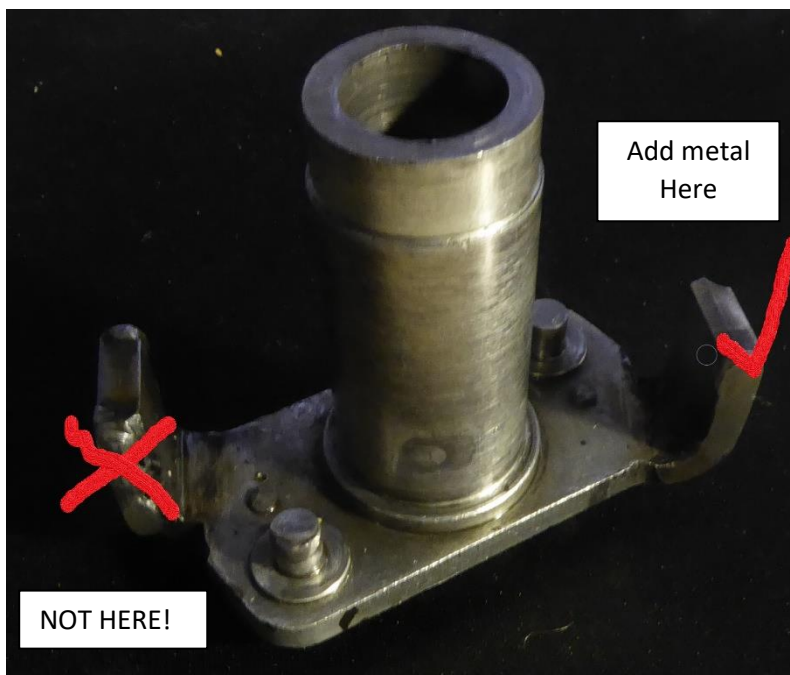
In OVR number 82 and 84 I covered the tuning of the Lucas ATD fitted to the standard magneto on our bikes. Since then, I have realized that there was a small oversight (err error?) in my original work and article, one that once rectified can lead to more reliable ATD operation.

It is all about ensuring that the bob weight springs have the best chance of doing their job.

I did suggest adding more metal to the bob weight arms in order to reduce the advance range of the ATD and while I was not specific about exactly where to add the metal. The photo provided in the earlier article that illustrated where I added metal to mine, while correctly showing what I did, I now realize I added metal in the wrong place! Pic to the right shows where it should be added.

What we need to aim for is sufficient pre-load on the ATD springs to ensure that once the engine gets up to operating temperature the springs still retain sufficient 'pull' to fully move the ATD mechanism into the retard position when the engine comes down to its intended idle speed. If there is insufficient 'pull' then full retard may not be achieved and at idle the engine will seem to be racing or at best, idling at a much higher speed than you intended. And this is exactly the issue I faced.

So how do we ensure sufficient ATD spring pre-load? When you add metal to the arms of the ATD in order to reduce its advance range that metal **MUST** be added to the side of the arm that rests up against the retarded position, this will force the **ROCKER** to pivot outwards further when the motor is not running and in doing so increase the pre-load on the ATD springs. But first **BE SURE TO READ OVR ISSUES 82 AND 84** – you will find them in the OVR archives.



My poor suffering ATD went back into my workshop (butchers' shop?) for a rework.

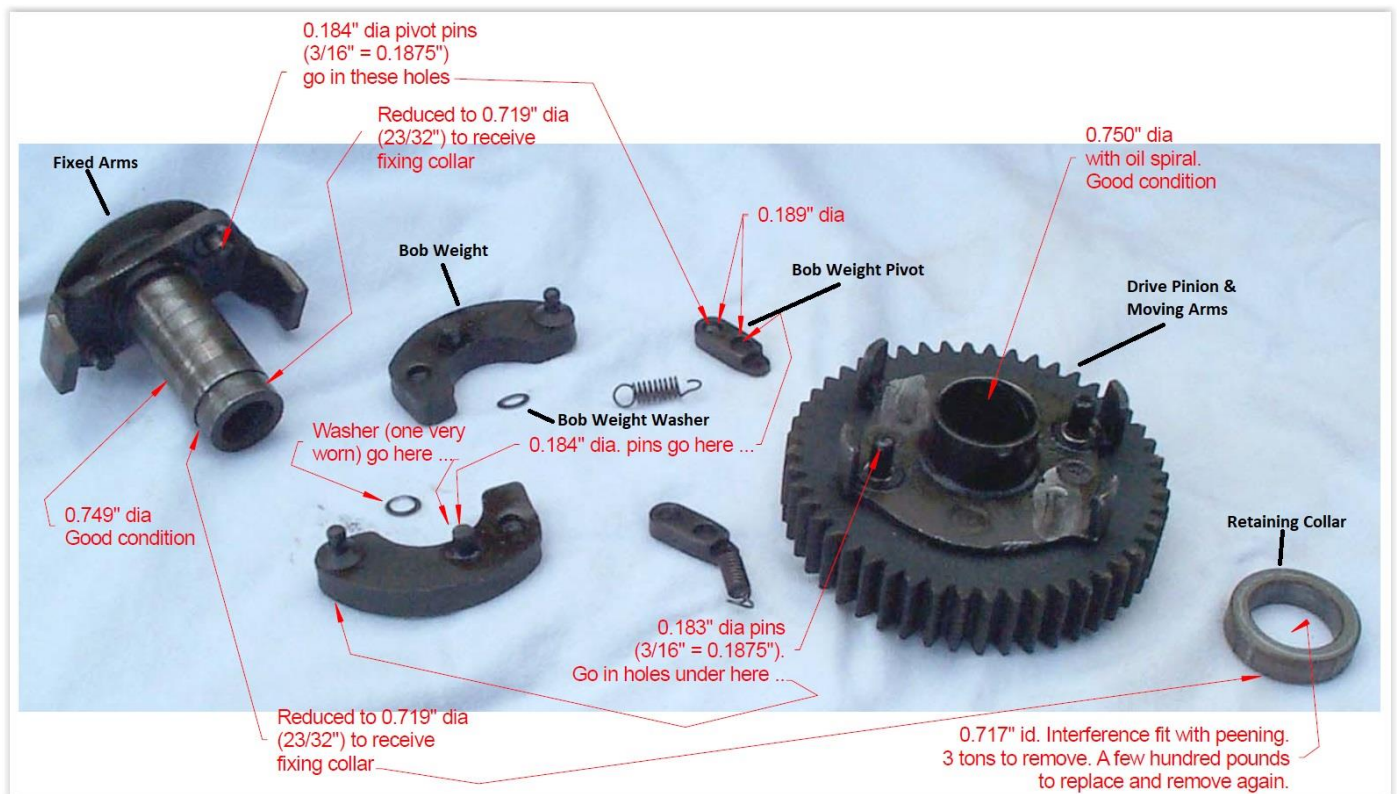
Having dismantled my ATD, using a stick welder, metal was added to the retard side of **BOTH** arms – that's the side furthest way from the bob weight pivot pins and yes, this will reduce the advance range. What it does do is force some pre-load into the springs by changing the resting angle of the bob weight pivot (see second photo).

CAUTION: Every ATD I have encountered is **NOT** completely symmetrical so I recommend

you mark your ATD base and moving arm so you always reassemble into the same relationship. I used yellow fingernail enamel on mine as you can see in the second photo.

So having done that you then remove the minimum amount of metal you just added in order to give positive and equal contact of both arms to the retard legs on the baseplate – it is this ‘extra’ metal that creates the additional spring preload by altering the relative position of the toggle levers. Check the advance range that you now have with your ATD. Not clear? Re-read the article in OVR 84! The ATD advance may now be less than you desire so you will need to carefully remove more metal (from that which you added) till you get the advance range you want. Of course, you DO NOT need to fully reassemble the ATD as you ‘tune’ the advance range, full assembly is only needed once the range has been set.

There are 2 small (easy to loose) anti-friction washers that MUST be in place between the Bob Weight Pivot and the Bob Weight for smooth and reliable ATD operation. If you have lost yours, contact the OVR editor ozvinreview@gmail.com who may be able to help out.



And keep in mind that the advance range at the crank is DOUBLE that at the ATD. So if you want an advance range at the crank of, for example 28 degrees (yielding 4 BTDC retarded and 32 BTDC advanced) you will need an advance range at the ATD of just 14 degrees.

What's coming next? A short item on refurbishing bob weights where the anti-friction ‘bump’ on the underside has worn away.