

## Mods 10

30/12/08

As you've probably noticed, I've fallen way behind with this web site again. I'm still using, modifying and enjoying the car, but I've struggled to find any enthusiasm for the PC. I'm using a computer at work a lot recently, so I'm not that keen to spend more time on another one at home.

I had hoped to bring the web site fully up to date with all the things I've done, but realistically, that's not going to happen. Here's a brief recap instead:

Bought five Toyo CF-1 tyres and had them fitted to the refurbished alloys. First impressions are that they're a big improvement over the A539s in the wet and dry.

Did an "Academy 2" day with Motorsport Events at Keevil.

Another ME track day at Coleme in late July.

Highlight of the year: went to Spa and the Nurburgring at the beginning of August. Had some more problems with the CV joint grease melting, which didn't spoil the fun thankfully.

Went to the Stafford kit car show in September.

Did another Auto Solo at Chepstow with the BPMC.

Removed the driveshafts again, completely dismantled and cleaned the CV joints, then rebuilt them using Red Line CV-2 synthetic grease. Hopefully that's the last time I have to do that filthy job.

Fitted ventilated discs and Metro GTi MPI calipers.

Another track day at Keevil at the end of November. Gave the brakes a lot of abuse - no more melted grease!

Went with Ken up to Chesterfield to collect another set of slicks and then to Lichfield to collect a newer, healthier engine for Ken's Marlin.

Visited the Exeter kit car show.

Finally, a ridiculously wet track day at Coleme in early December. Still enjoyed it though.

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06/01/09

It's a new year and I must overcome this computer phobia. I've got a few jobs to do on the car over the winter - nothing major, just a few upgrades:

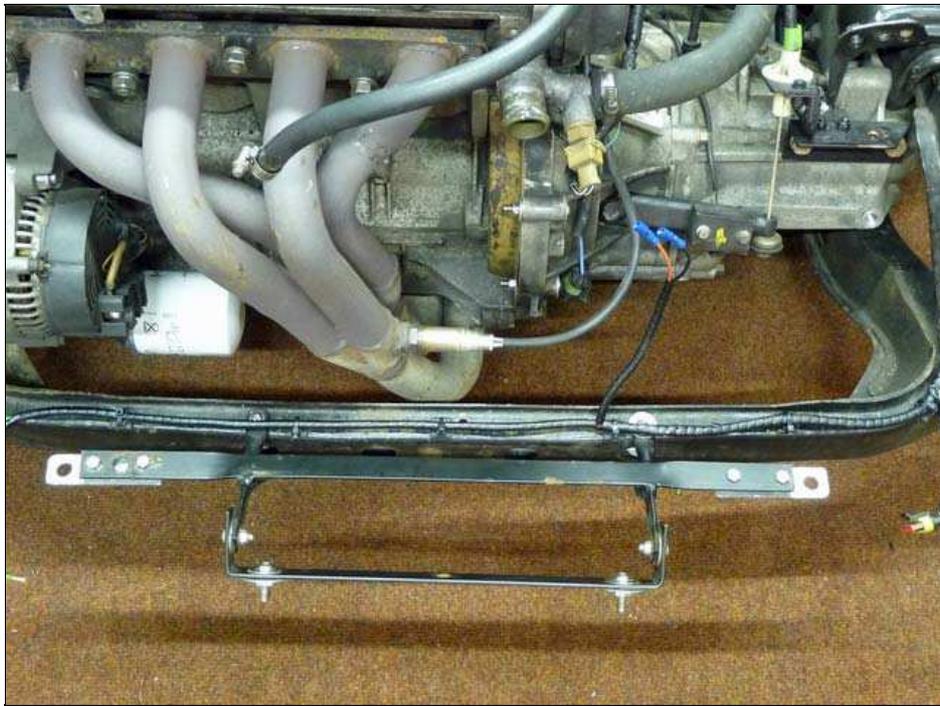
Firstly, the cooling system needs to be improved, as it's a bit marginal. Not surprising really, as I'm still using a radiator designed for a 1.4 Metro engine, not a 1.8VVC.

Secondly, the top end on my engine has got a bit rattly. I think it's coming from the VVC mechanisms. During the last couple of weeks, I've completed the engine swap on Ken's Marlin. In return for doing the work, he's given me the old engine. It's down on power as the liners have sunk, causing the head gasket between cylinders 2 and 3 to blow. However, his engine has always been quieter than mine, so I'm planning to swap the VVC mechs from his old head to mine. I'll have to measure everything carefully to make sure there are no bearing clearance issues, but hopefully it should be possible.

Finally, the chassis needs a bit of repainting. Fitting my front floor panel above the chassis has left the lower front chassis tubes exposed to the grit, salt and spray flung back from the front wheels, so there's not much powder coat left on some of them.

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10/01/09



I've found a suitable new radiator, usually fitted to a 1996 1.6 automatic Vauxhall Corsa. It's about 30mm wider and taller than the Metro rad, but nearly twice as thick, as it has two rows of internal tubes. Despite that, it was cheaper than the last Metro rad I bought! To fit it, I've had to bolt on small extensions, to make the lower mounting holes wider apart and slightly lower and further forward.



The back of the new rad. I got it from Advanced Autocooling in Keynsham. The fan came from Dean at All Car Spares and the fan switch from Millards. The top mounting pegs on the rad have been cut off - there wasn't room for them.



The new rad sitting in place. I've measured everything up and ordered some new hoses, joiners and clips. While I'm waiting for those to arrive, I'll make a start on the VVC swap.

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11/01/09

Right, let's have a go at these VVC units. I'll take lots of photos as I go, which will help me put it all back together again and they may be useful to others. You can click on the following pictures for larger versions.



Ken's head on the bench, with the pulleys and all cam carrier bolts removed. The bottom two bolts on each VVC mechanism have been removed and the top two loosened by one turn.

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Carefully lifting the cam carrier off leaves the exhaust cam in the head and the VVC mechs and cross-shaft in the carrier.

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I'll be dismantling the mech on the right in this picture - the one without the ring for the cam sensor. Before starting, the cross-shaft is rotated until the two pairs of timing notches line up.

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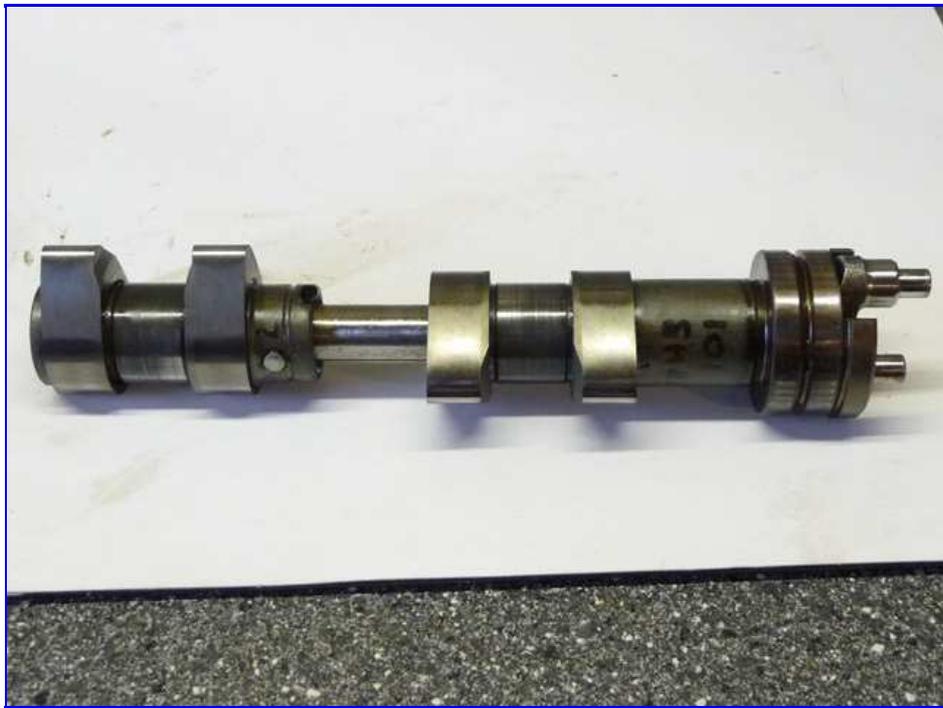
By removing the two remaining bolts and lifting the cross-shaft slightly, the whole cams/mech assembly comes out like this.

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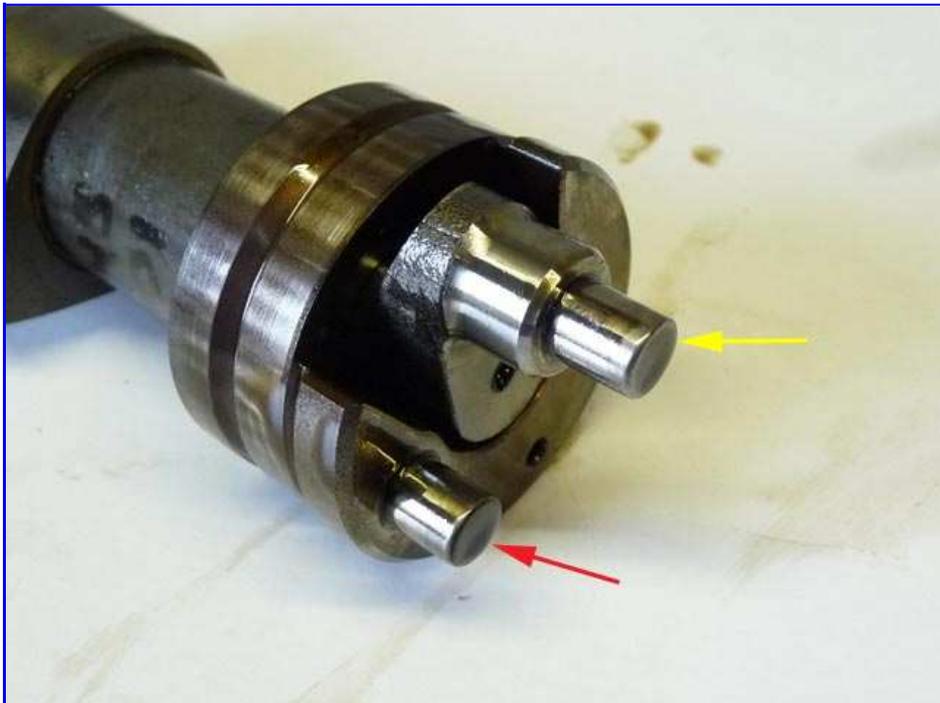
A close-up of the business end.

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The cams lifted out. Each VVC mech drives a pair of cams. The cam for cylinder two runs inside that for cylinder one.

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The drive pegs for the the cams...

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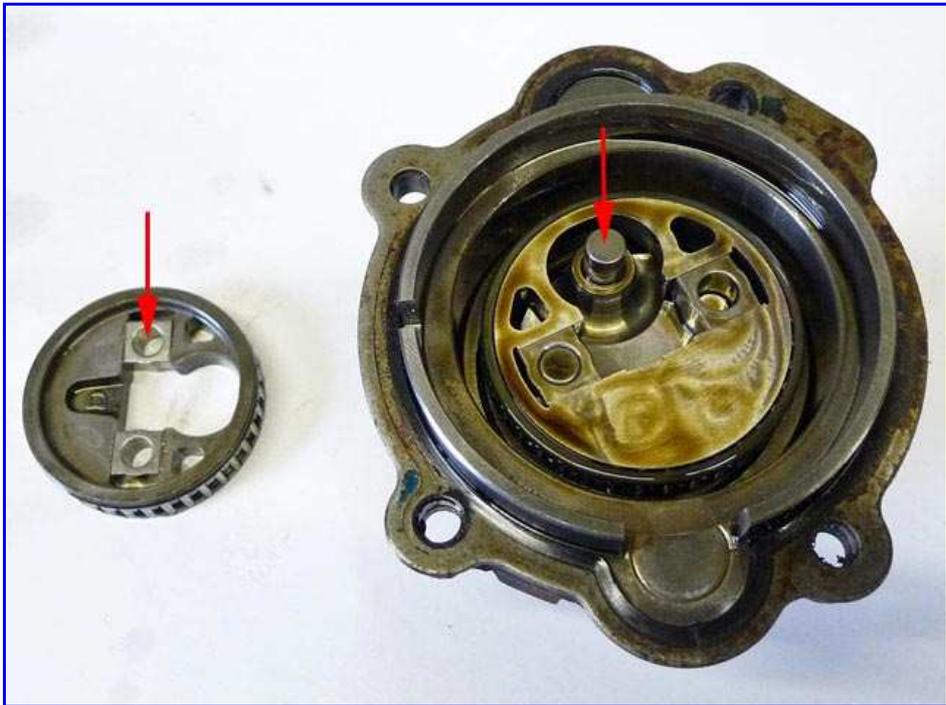
...which fit in these holes.



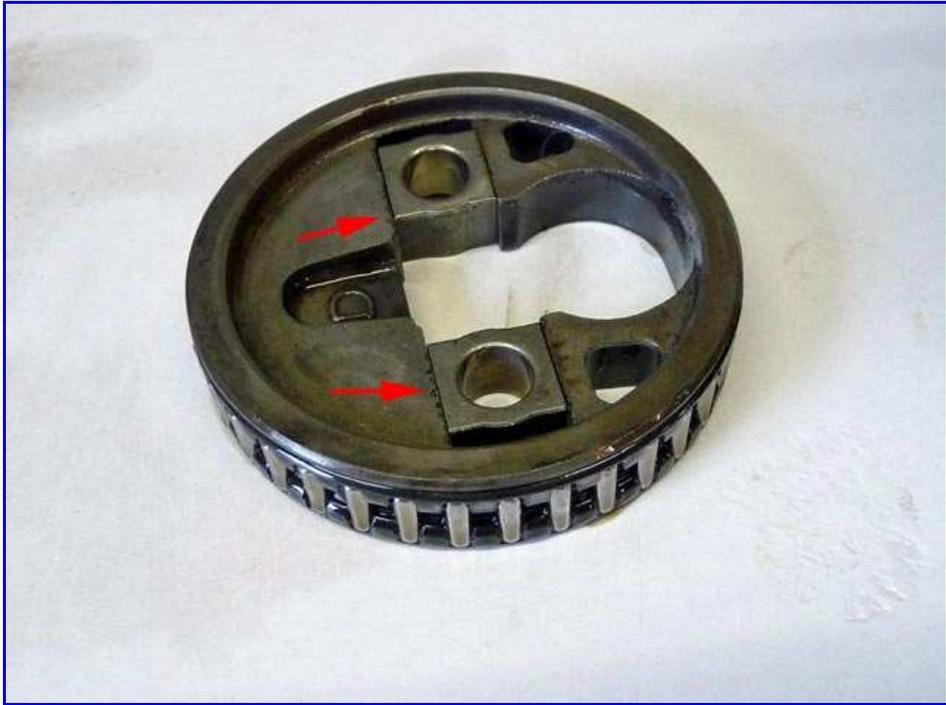
Next out is this eccentric collar.



A few wear marks can be seen, but not felt.



The top layer of bits, showing what went where.



The top layer in close up. Are these nicks cause for concern?

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The next layer out, again showing what went where.

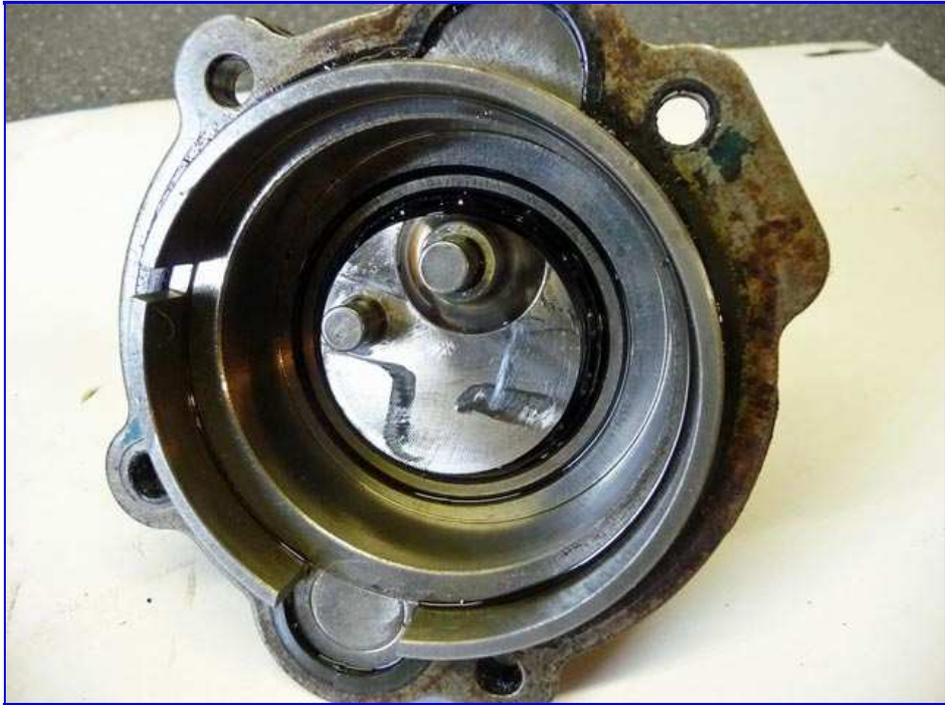
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A closer look at the second layer of components.



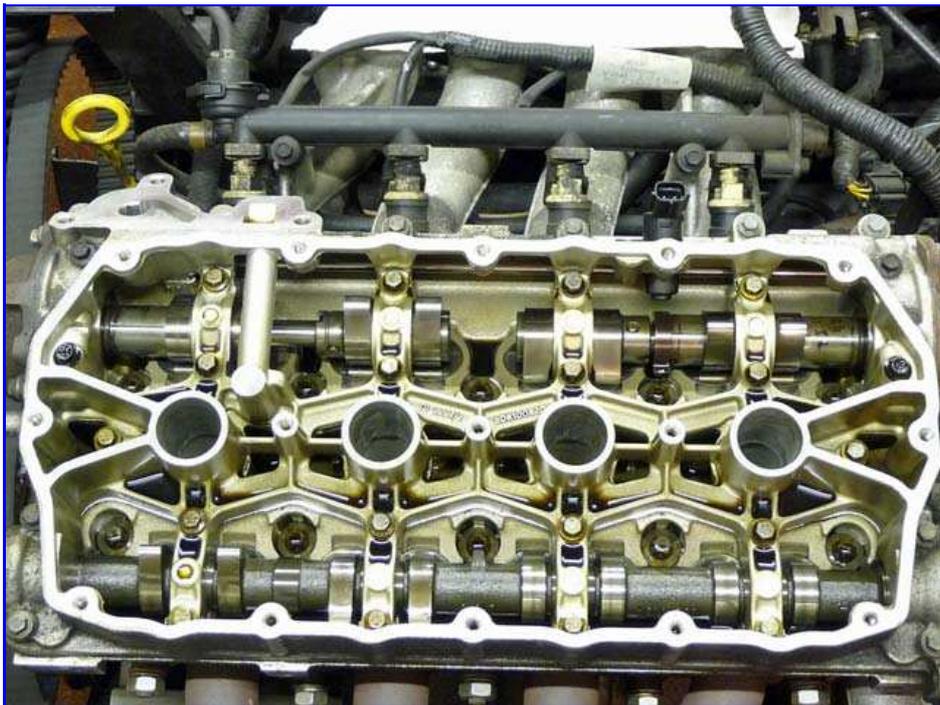
All the internal components out - that wasn't too difficult! I'll be giving it all a good soak and clean in paraffin, then put it all back together exactly as it was. It'll be interesting to compare the condition of these bits (and those from Ken's other VVC mechanism) with the ones from my engine.



Just the drive flange, bearing and seal left in. I won't be attempting to take these out, as the bearing rotates smoothly, with no play. There are some visible wear marks on the face of the flange, but again they cannot be felt with a finger nail.

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18/01/09



My engine with the cam cover removed. It all looks nice and clean in there to me.

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The internal components of one of my VVC mechanisms. They appear to be in even better condition than those from Ken's engine - everything is cleaner and brighter, they have fewer visible scuff marks and none of the nicks mentioned above. I'm no expert on these matters, but I can't really see or feel anything that could cause the rattling I was getting. I'm going to clean, oil and reassemble my mechs and then put them back in my engine. That'll avoid any possible compatibility issues.

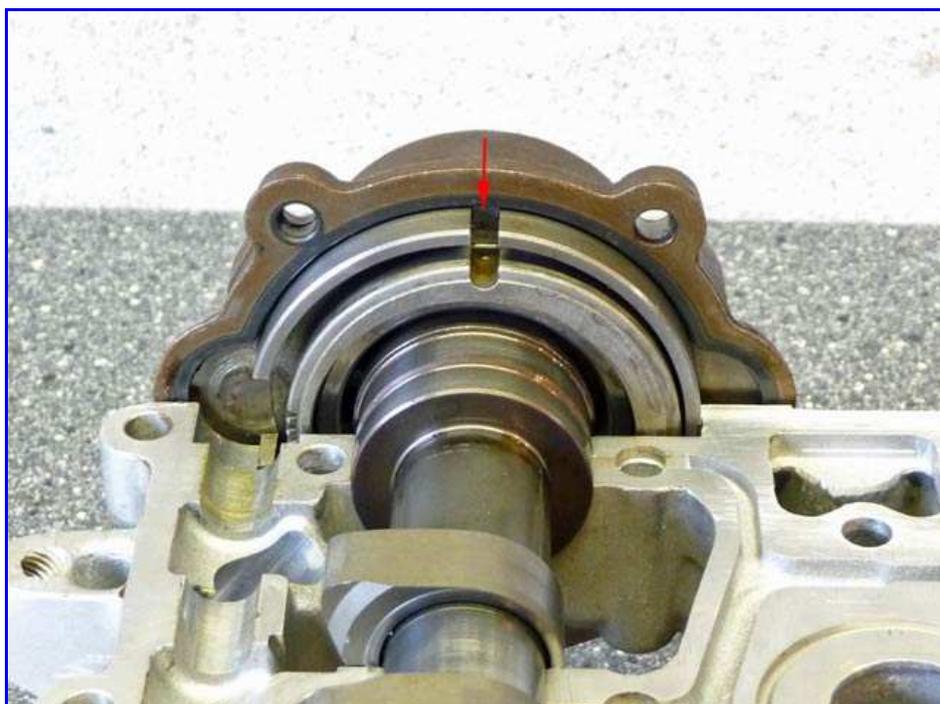
Next weekend, I'll examine the followers, to see if one or more of them could have been the source of the noise.

24/01/09

I failed miserably trying to examine the followers. I'd been told that they would come apart if they were banged down hard on a block of wood. I tried several, until my hands hurt and then gave up. After making a few phone calls, I found a supplier of genuine Rover VVC followers at a good price, so I ordered a complete set of sixteen. Meanwhile, back to the VVC mechanisms.

31/01/09

Everything has been cleaned up, ready for refitting. I've also ordered some new VVC gaskets, seals, O rings and cam carrier sealant to do the job. I'm following the guide for VVC assembly and synchronising written by Dave Andrews of DVAPower, which I found [here](#). I'm doing a "dry run" with no oil to get the hang of it first and to make it easier to photograph. All the bits I've ordered should be here by next weekend.



The first VVC mech (this is the one from the Off Side or timing belt end) is placed in position and the inner rotor is turned until the two timing marks line up.

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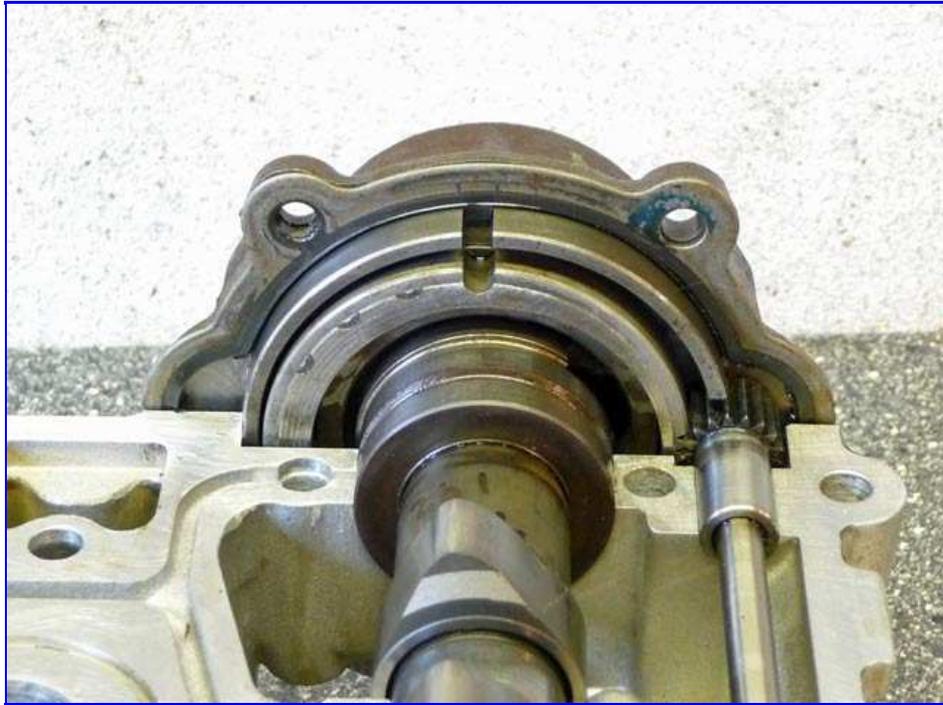
The whole VVC mech is then rotated slightly (clockwise in this picture), so that the cross shaft can be inserted.

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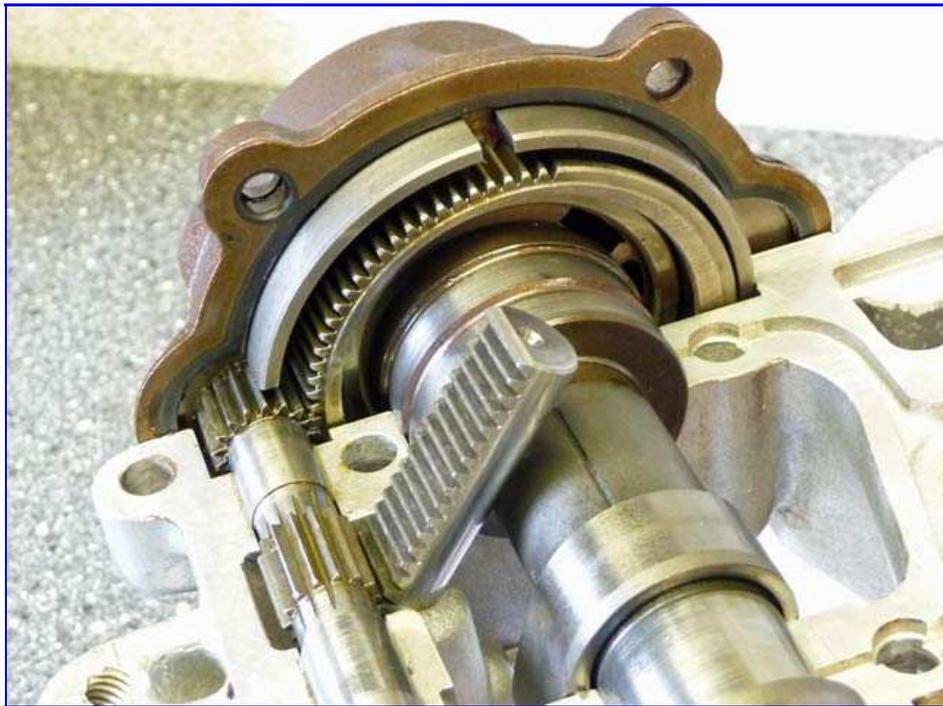
The mech is then rotated back so that the cross shaft sits properly in the carrier and engages in the last teeth of the rotor. The mech is then loosely bolted to the cam carrier.

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The other mech is carefully fitted, again ensuring that the timing marks on the rotor and the casing line up and that the cross shaft engages in the same tooth position on the mech. This mech can now also be bolted on loosely. Before fitting the HCU shaft/rack, both rotors are turned slightly more (clockwise in this photo) until they lock against the cross shaft

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The HCU shaft/rack and seal plate are removed from the HCU unit and carefully inserted from below. It's then pushed in fully and both VVC rotors are checked to ensure they have rotated by the same amount. In this case, the third tooth from the end on the rotor is exactly in the middle of the timing slot in the casing.

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The shaft/rack is then pushed down until the end is flush with the boss. I then checked that the cross shaft engaged with the same teeth position on each rotor.

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With a slave bolt holding the seal plate in position, the cam ladder is ready to have the sealant applied and can then be fitted to the cylinder head. Both sets of cams have been rotated so that the lobes point away from the followers, which should aid fitting. The exhaust cam will be fitted in the head and the carrier placed over it.

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