

# VVC Timing

To remove the cam rack, leave the bolts attaching vvc's to cam rack in, just slacken them a tad. Remove the bolts that attach the vvc units to the head, when you lift the cam rack off, the vvc's and inlet cams come with the cam rack, easy, as per RAVE. I have loads more advice, you don't need timing plates and all that gubbins if you are careful, some rubber strips will push into vvc timing slots to help lock them, just keep the inlet cams supported, some tape will do, just tape them to the cam rack until you are ready to re-assemble. One good tip is don't use the fast drying silicon and DONT put it on head face, carefully brush paint a thin layer of something like Wellseal onto the cam rack mating surfaces, easy peasy, better cleaner job. Use new vvc gaskets, careful here as you'll have to take vvc units and cam TOGETHER off the cam rack. Make sure you time the crossshaft to the head face, as per RAVE, make sure you have the 'notch' 'horizontal', despite popular belief, you DO HAVE to time the crossshaft to the head face (look carefully, the end cogs are out of sync with the driving cog) and then add each vvc, IN TIME! This is the tricky bit where clamping plates etc can help, I find if I am careful they are not necessary. Rubber 'pegs' help hold the vvc unit marks in place, hold the crossshaft in time using gaffer tape etc. Might need a few goes, bit like timing belt out a tooth at times but at least you can do one unit at a time and then put bolts in, some gasket paper will help protect new vvc seals. Fit everything except exhaust cam to cam rack.

Remember you need to time-

1. Crossshaft to head face, fix it in timed position with tape.
2. Each vvc unit to crossshaft.
3. VVC timing to HCU and Piston Rack, easiest done when cam rack is on head.

Cam racks are a nightmare if not torqued down carefully, they can nip up the crossshaft easily hence jammin the vvc's. Use a sealant that goes off slow, then you can back off the cam rack bolts and re-torque if necessary. Use the piston rack to test the crossshaft rotation, quickly time in the vvc's first(top timing marks from above) Bad design of bearing surfaces of crossshaft, bad machining too, I had to remove dowels from my cam rack, machined out of position, not ideal, just now have a floatin cam rack! won't jam up though! Hope this helps.

## Timing marks No.1 and No.2

No.1 = Crossshaft slot aligned to cam rack machined face.

No.2 = VVC Unit lower timing mark/slot.

No.1 and No.2 should be timed up together.



### Timing Marks No.3

Fit piston into HCU and fully insert into bore, wind crossshaft central cog all way back (anticlockwise when viewed from 'front' end of engine) gently with a screwdriver until vvc timing slots are visible, wind back a little more until it stops and the vvc timing slots disappear. Then mount the complete HCU assembly and lightly tighten the bolts, the piston rack teeth will engage with the crossshaft teeth and the timing slots should appear in the cam rack timing holes, you may need a few goes adjusting the crossshaft cog position and re-fitting the HCU to get it all to line up. Final torque setting in the MGR Rave manual for the HCU bolts is 25Nm, I used quite a bit less.







