

## DIY - Adjusting Valves on '08+ 250r (WITH Pictures)

Ok, so I've checked my **valve** clearances and the exhaust valves are all too tight. To adjust this it's not as simple as with OHV engines and you have to remove the cams. To accomplish THIS:

### Step 1 - Remove the CCT



Remove the 10mm center bolt in the Camshaft Chain Tensioner. Then remove the (2) outer 8mm bolts. The CCT should pull out easily.

### Step 2 - Time the engine



Turn the engine over (again use a 14mm socket and turn clock-wise). You're going to look in the alternator cover inspection hole (the little hole about 6 inches above THIS hole) until you see "2|T" in the middle.



I couldn't for the life of me get a good picture of this. Either there was too much light and it would create a glare, or like this not enough light to see the markings. Oh well.



With any 4-stroke engine you'll hit "2|T" TWICE per complete engine cycle. I made sure that I had the engine on "2|T" (which is cylinder #2 at TDC) at the end of its compression stroke. The camshafts should line up as you can see in the picture above. Notice the two white dots face each other? Timed!

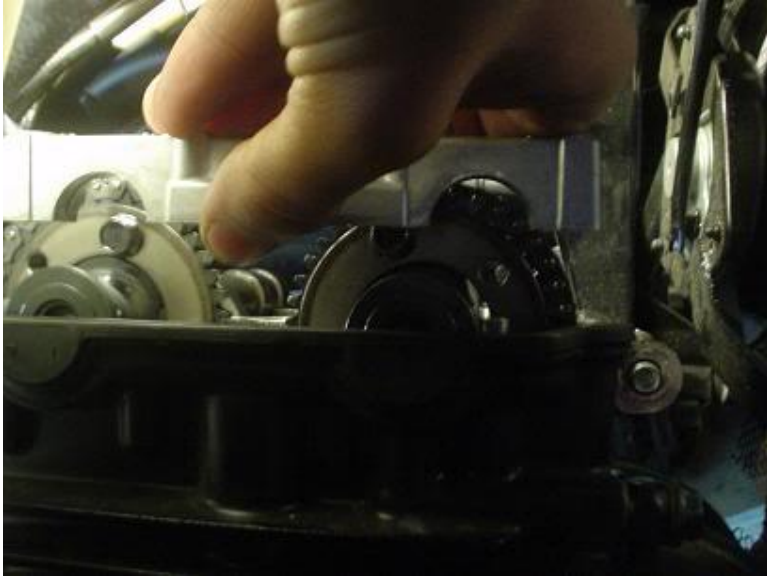
**Step 3 - Loosen camshaft cap bolts.**



These little 8mm bastards are pretty tight, but still exercise care when removing them. I always suggest when removing and installing camshaft caps to use a 'crossing' pattern instead of simply removing one cap at a time.

**Step 4 - Loosen camshaft top-chain guide/caps**





Then you can remove the camshaft caps:



**WATCH OUT** here:



Notice the (4) outer and (2) inner dowel pins? They're not pressed in, but they are 'floating'. Meaning you need to be careful when pulling the camshaft caps that these don't come out (and then fall into the engine). They're there to keep the camshaft caps (and the two center ones for aligning the **valve** cover). They WILL pull up especially if you don't lift the camshaft caps up evenly.

Anywho...

#### Step 5 - Remove camshafts



Oh joy of joys! If you push on the chain a little it should push the camshaft tensioner outward and put some slack into the chain. Lift the chain away from one sprocket at a time and remove the camshaft. Afterwards drape the chain over the side of the head so you don't have to fish it out of the engine later 🙏.

#### Step 6 - Remove tappets



They'll wiggle out (some of them might need some needle nose plier assistance). You can see I've removed one of the exhaust **valve** tappets here. I've popped the shim loose and you can see it laying inside the cover. They'll all stick to the tappet which is handy as you don't have to worry much about them falling into the engine while you remove them.

**Important** - Put them caps in ORDER



I've just tossed them all on a piece of cardboard in order. This comes in handy as I can write the shim thicknesses directly above each tappet.

**Step 7** - Measure the shims.



Most people have dial calipers which work fine or...



I prefer micrometers though as they often have higher degrees of accuracy.

Now... DON'T get confused with the conversions. I measured the lash with SAE standard feeler gauges. I then measured the shims ALSO in inches. You can convert in the last step (The less conversion you do the less the room for error). While each shim should have a number on each side of it which translates to a thickness on a chart these numbers are hard to read. That's why it's still wise to physically measure them. When you have the new shims though you can rely on the printed numbers on the shims...

So to find the 'new shim' heights here's my math (ALL in inches):

Exhaust **valve** - Number 1 - Number 2 - Number 3 - Number 4  
 Lash = \_\_\_\_\_ .0065 \_\_\_\_\_ .0080 \_\_\_\_\_ .0070 \_\_\_\_\_ .0060  
 Shim = \_\_\_\_\_ .1112 \_\_\_\_\_ .1102 \_\_\_\_\_ .1112 \_\_\_\_\_ .1083  
 Total = \_\_\_\_\_ .1177 \_\_\_\_\_ .1182 \_\_\_\_\_ .1182 \_\_\_\_\_ .1143

Intake **valve** - Number 5 - Number 6 - Number 7 - Number 8  
 Lash = \_\_\_\_\_ .0095 \_\_\_\_\_ .0070 \_\_\_\_\_ .0080 \_\_\_\_\_ .0080

Shim = \_\_\_\_\_ .1112 \_\_\_\_\_ .1112 \_\_\_\_\_ .1112 \_\_\_\_\_ .1112  
Total = \_\_\_\_\_ .1207 \_\_\_\_\_ .1182 \_\_\_\_\_ .1192 \_\_\_\_\_ .1192

Then you subtract what you WANT the total lash to be (in this case I'm looking for .010" on the exhaust and .0085" on the intake). This gives you your 'ideal' shim thickness.

Exhaust **valve** - Number 1 - Number 2 - Number 3 - Number 4  
\_\_\_\_\_ .1077 \_\_\_\_\_ .1082 \_\_\_\_\_ .1082 \_\_\_\_\_ .1043  
Intake **valve** - Number 5 - Number 6 - Number 7 - Number 8  
\_\_\_\_\_ .1122 \_\_\_\_\_ .1097 \_\_\_\_\_ .1107 \_\_\_\_\_ .1107

NOW I convert to metric and round to match shims on Kawaski charts:

Exhaust **valve** - Number 1 - Number 2 - Number 3 - Number 4  
\_\_\_\_\_ 2.80 \_\_\_\_\_ 2.75 \_\_\_\_\_ 2.75 \_\_\_\_\_ 2.65  
Intake **valve** - Number 5 - Number 6 - Number 7 - Number 8  
\_\_\_\_\_ 2.85 \_\_\_\_\_ 2.80 \_\_\_\_\_ 2.825 \_\_\_\_\_ 2.825

Whammy!

Edit: I've gone to converting so that I can have the PERFECT inch conversions (for what the shims really are) to make the numbers even tighter.

Got things back together and here are some notable things upon reinstallation:

1.) Remove the two seals that seal the spark plug holes from the underside of the **valve** cover:



and set them over the holes on the head. I didn't do this at first and one moved and got crushed. This caused an oil leak which I discovered quick enough...

RE-installing the CCT:



You need to 'reset' the CCT before reinstalling it!! This entails removing the 10mm bolt and inserting a little flat blade screwdriver. You're supposed to turn this clockwise (which in turn causes the shaft to pull backwards into the CCT housing... This is tricky to accomplish in this tight area so I....



Held the little screwdriver with one hand and turned the housing COUNTER-clockwise (thus doing the same thing as simply turning the screwdriver clockwise). Once you can't turn this any more fully press the housing into the block and put one of the 8mm bolts in to hold things. THEN you can let go of the flat-blade screwdriver, install the other 8mm housing bolt and then lastly the 10mm cap.