

## CBMTool Instructions Issue 1.2

**LIABILITY** - Neither the author or any sites from which this program was downloaded bear any liability for any damages arisen due to using or inability of using of the aforesaid program.

**WARNING** – As with any mechanical adjustment, if done improperly may be harmful to your bike and cause severe damage. If you are at all unsure of your ability to perform this task correctly, PLEASE do not attempt to do so.

You are strongly advised to test this tool on your current belts prior to fitting new belts. If you do not get reasonably repeatable results then do not use this tool to tension your new belts.

**NOTE:** It is up to the user to independently verify the correct method of belt tensioning and the correct target frequencies for his/her bike.

### Special tools required

Crankshaft turning tool ideally with degree wheel for rotating the engine. If this tool is not available it is possible to rotate the engine by selecting 5<sup>th</sup> or 6<sup>th</sup> gear and rotating the rear wheel. **WARNING:** If using the rear wheel method please remember to select neutral prior to starting the bike.

Torque wrench.

Personal computer running Windows 98 or Windows XP. The PC must have a sound card that supports a 44100 sample rate, I think they all do these days, and a microphone input connection. Minimum PC requirements are unknown but I'm using a 1998 vintage 300MHz Pentium II laptop with 384M bytes of RAM without any trouble.

A microphone. A tie clip microphone designed for use with personal computers is ideal and available for less than £5 from e-bay.

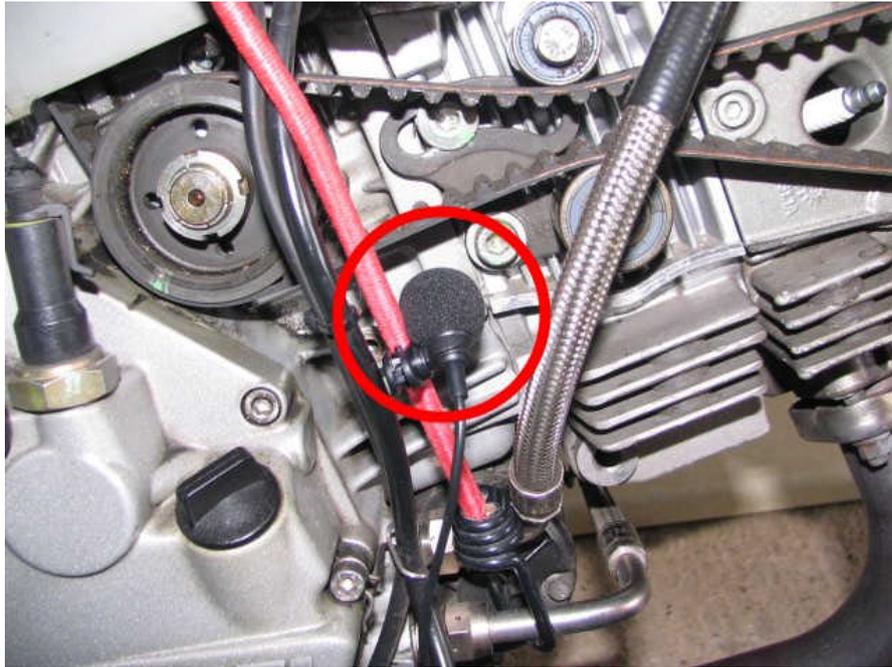
Software such as CBMTool for measuring belt frequency.

## Step by step guide to tensioning water cooled Ducati cam belts

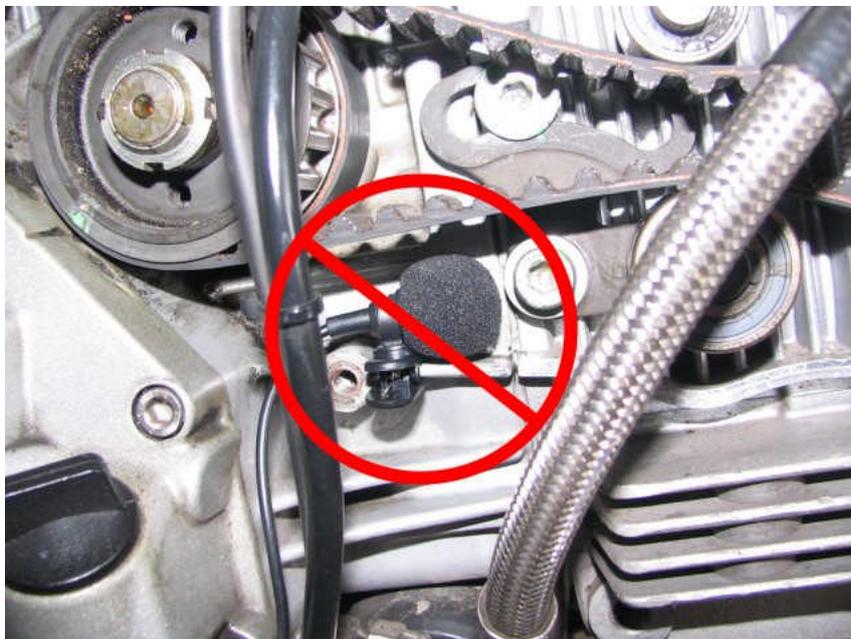
1. Remove cam belt covers, these are usually plastic and can be a bit fiddly so be careful. Note: You may need to remove fairing and or the tank to gain proper access.
2. Remove the spark plug from both cylinders.
3. Turn the crankshaft until the horizontal piston is at Top Dead Centre (TDC). This is indicated when the dot on the cam belt drive pulley aligns with the mark on the clutch housing as shown in the picture below.



4. Select the bike from the Settings menu. This will select and load the correct target belt frequencies together with the appropriate instructions. If the desired bike is greyed out or not listed then I do not know the correct settings for that bike. Settings can be entered manually by selecting the custom option if needed.
5. Attach the microphone so that the microphone is pointing towards the horizontal belt flick location as shown in the following picture.



Please note that the way the microphone is attached plays a significant role in the repeatability of the measured frequency. Initially I tried attaching the microphone to the engine casings as shown in the next picture. This gave very erratic results making it impossible to correctly tension the belt. My advice is attach the microphone with the front/top pointing towards the belt; an elasticated luggage strap can provide a convenient fixing point.



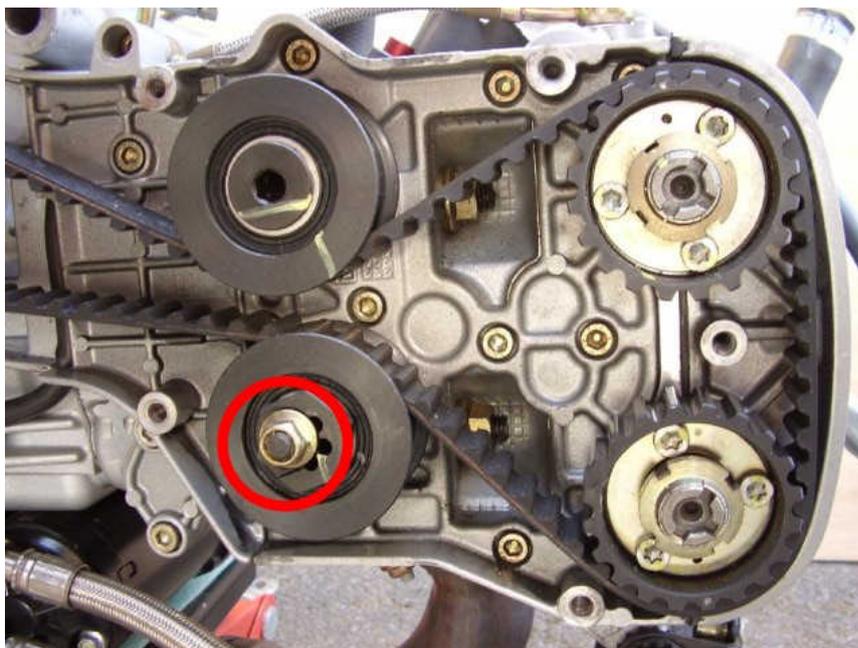
6. Select microphone as the input device. To do this open *Sounds and Audio Devices (Multimedia for Win98)* in *Control Panel*. Select *Volume* (Square button for Win98) in the *Sound Recording* section of the *Audio* tab. Check *Select* in the microphone volume section, if there is no microphone section open *Properties* in the *Options* menu and check *Microphone*, click *OK* and check *Select* in the microphone volume section.

NOTE: Some systems have a microphone boost feature. To enable this select *Advanced Controls* from the *Options* menu. Now press the *Advanced* button in the microphone section and select *Microphone boost*.

7. Adjust microphone volume. If the volume is set too high there is a danger that that the results will be influenced by background noise such as traffic noise, dogs barking etc. The easiest way to set this is to set both master and microphone volume to full, click the Start Recording button, gently flick the belt using something like the end of a biro or pencil and see if you get a reading. If you do halve the volume and try again, repeat this process until the reading stops. When you find the point at which readings cease increase the volume to the second from last setting that gave a reading.

NOTE: I flick the belt by gently pushing the belt with something like the end of a biro I then pull the biro forward and let the belt slip off. I have found that this gives good repeatability. For best results try to be as consistent as you can.

8. Make sure the horizontal cylinder is selected then click the Start Recording button. REC should now be flashing in the Measured Value display box.
9. Gently flick the belt and wait for the resonant frequency to be displayed in the Measured Value display box. If in specification the measured value will display green otherwise the display will be red. Note: The default is to display the measured value for 1 second and then revert to back to record however the hold time may be changed from within the view menu.
10. If the measured value is incorrect tension or slacken the belt by loosening the tensioner fixing nut and adjust the belt tensioner by rotating either clockwise or anti-clockwise.



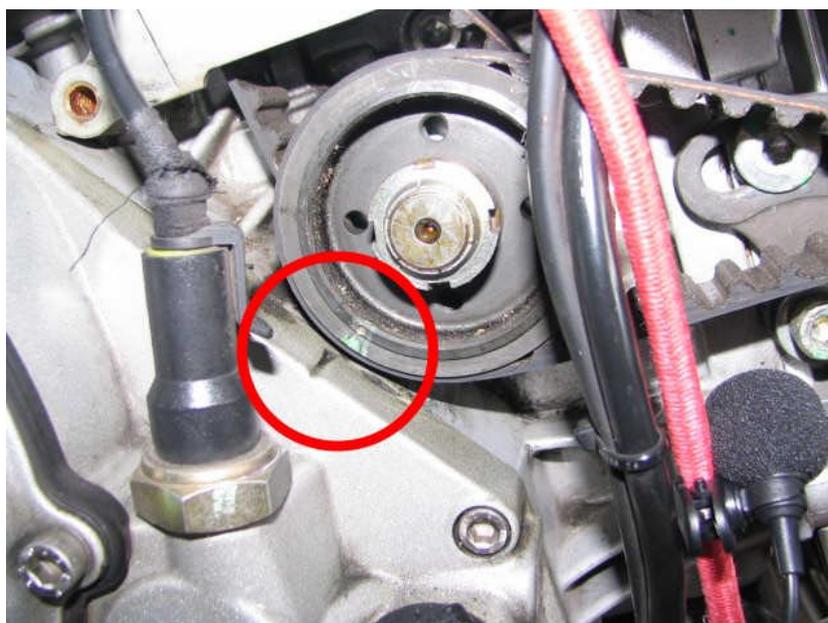
11. Tighten the tensioner fixing nut and repeat step 9.

12. Click the Stop button and attach the microphone so that it is pointing towards the vertical cylinder flick position.
13. Turn the crankshaft a further 270° (135° on the timing belt drive pulley) until the vertical cylinder is at TDC.
14. Select vertical cylinder, click the Start Recording button and repeat steps 9 to 11.
15. Refit spark plugs and cam belt covers.

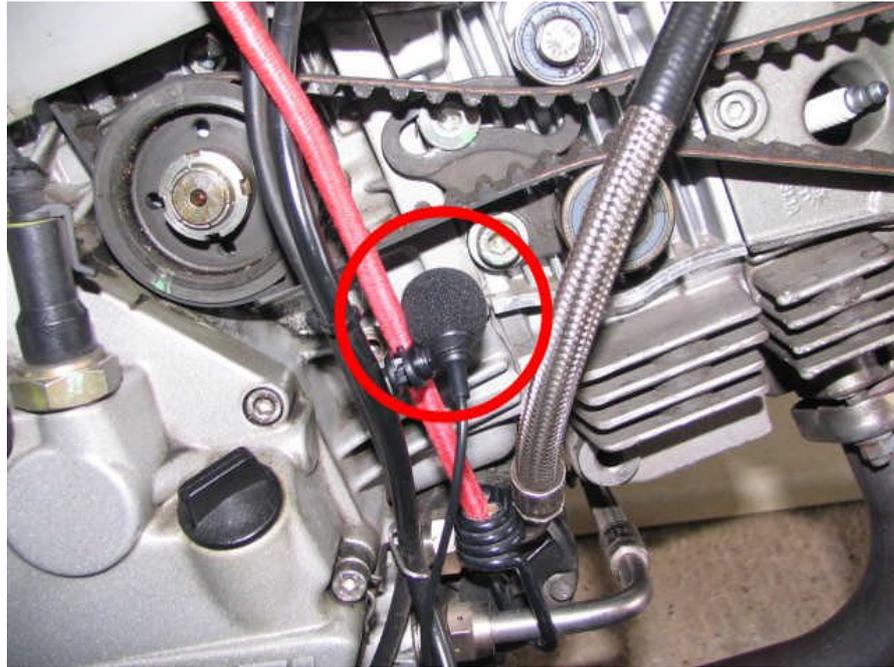
NOTE: As you use your bike it is normal for the belt tension to reduce. Tensioning the belt more frequently than recommended by Ducati is not necessary, for most bikes this is once a year or every 6000 miles. It is worth noting that Ducati have recently, as of 16/5/07, released revised belt tensioning guides which now include new and used belt tensions. For example for the 1000DS engine the new belt tension is 140Hz whereas the used belt tension is 100Hz.

## Step by step guide to tensioning air cooled Ducati cam belts

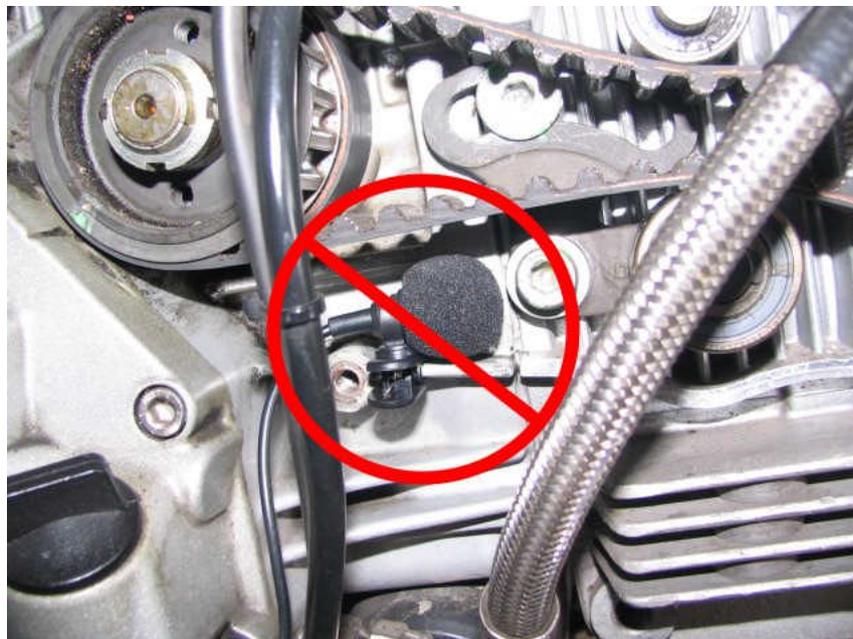
1. Remove cam belt covers, these are usually plastic and can be a bit fiddly so be careful. Note: You may need to remove fairing and or the tank to gain proper access.
2. Remove the spark plug from both cylinders.
3. Turn the crankshaft until the horizontal piston is at Top Dead Centre (TDC). This is indicated when the dot on the cam belt drive pulley aligns with the mark on the clutch housing as shown in the picture below.



4. Select the bike from the Settings menu. This will select and load the correct target belt frequencies together with the appropriate instructions. If the desired bike is greyed out or not listed then I do not know the correct settings for that bike. Settings can be entered manually by selecting the custom option if needed.
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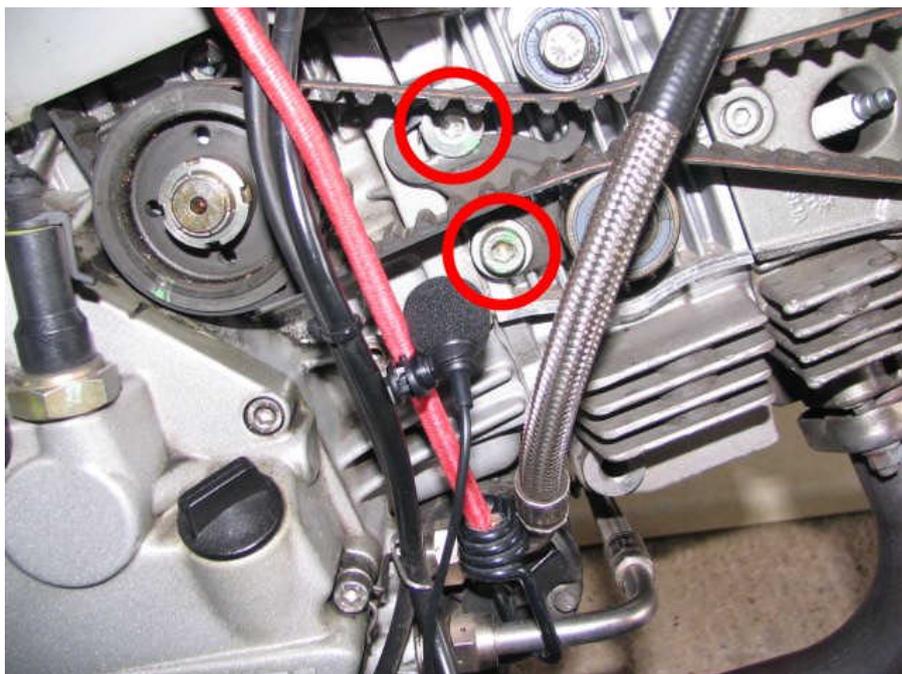
6. Select microphone as the input device. To do this open *Sounds and Audio Devices (Multimedia for Win98)* in *Control Panel*. Select *Volume* (Square button for Win98) in the *Sound Recording* section of the *Audio* tab. Check *Select* in the microphone volume section, if there is no microphone section open *Properties* in the *Options* menu and check *Microphone*, click *OK* and check *Select* in the microphone volume section.

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10. If the measured value is incorrect tension or slacken the belt by loosening the tensioner fixing nuts and adjust the belt tensioner by pushing the tensioner pulley towards the belt to increase tension or moving the pulley away from the belt to reduce tension.



11. Tighten the tensioner fixing nut and repeat step 9.
12. Click the Stop button and attach the microphone so that it is pointing towards the vertical cylinder flick position.
13. Turn the crankshaft a further 270° (135° on the timing belt drive pulley) until the vertical cylinder is at TDC.
14. Select vertical cylinder, click the Start Recording button and repeat steps 9 to 11.
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