I just thought I should share my experiences with fixing the variator problem (diesel sound).

I decided to do all work by myself, despite having close to zero experience. I bought the variator fix kit 71715450 that is available on ebay for about 10 euro (search ebay.de or ebay.co.uk for "71715450"). I also bought the cam locking tools (1860847000, search for "cam lock tool" on ebay.co.uk) at about 20 euro.

Some key points:

- Tool 1860845000 to tension the cam belt is not necessary.
- Tool 1860831000 to tension the cam belt is not necessary either.
- There's no need to remove the spark plugs to find the TDC.
- You don't have to remove the aux belt.
- You don't have to remove the cam belt or cam shaft.
- Pay extreme caution when putting back the circlip keeping the body of the variator to the shaft. Believe me, I did this mistake and was one second from ruining my engine.
- Take good care when removing the cam belt cover. I used too much force the first time and cracked mine.
- The plastic washer is not needed and will actually not fit in some older variators (like mine). It may look like it fits, but it will be impossible to put the variator back. If you open your variator and there's no washer there – this is perfectly normal.

So, some basic steps:

Removing the variator

1. Remove the right wheel, the inner wheel arch, the coolant reservoir and the ignition coil cover.
2. Disconnect the cabling to the ignition coil (and the earth lead) and remove the oil vapor recovery.
3. Remove the cylinder head. Turn the engine by hand (I found the easiest way to do this was to put in the 5th gear and temporarily put back the wheel and turn the wheel by hand) until the 2nd intake cam and the third exhaust can seems to match the profiles of the two cam lock tools pretty well.
4. Remove the two camshaft caps (AND MAKE SURE YOU DON'T MIX THESE. When putting them back later on it's easy to confuse them and you can face a disaster). Now turn the wheel slowly until you can see that the cams line up exactly with the cam lock profiles. Mount the cam lock tools onto the camshafts.
5. Undo all bolts to the cam belt cover. Slowly and gently pull the cam belt cover upwards. You'll have to pull/bend/rotate the aux belt in order to remove the cam belt cover in one piece. It's tight but it's possible!
6. Put a couple of clamps on the exhaust camshaft pulley and on the crankshaft pulley to keep the cam belt from moving. Undo the nut from the cam belt tensioner.

7. Remove the circlip holding the two parts of the variator together. Remove the intake camshaft pulley with the outer part of the variator attached to it. Be careful not to drop any parts from the internal of the variator, in particular the two washers in the bottom.

Repairing the variator

1. Look closely inside the variator. If you cannot see any white plastic washer, lucky you. Skip step 2-4.
2. Remove the inner pistons. You need to pull hard to remove the first (outer) piston since there's an oil scraper ring that gets stuck in the grove where the circlip normally engages.
3. Replace the white plastic washer. Be careful not to mix up the position of the two small washers in the bottom of the variator, they should be positioned like this:)(
4. Put back the two inner pistons. There are three drill holes that can guide you how to put them back. Don't forget the oil scraper ring.
5. Replace the variator spring on the shaft. Be careful not to mix the new and old. They seem identical but the old one is slightly easier to compress. In my case, replacing the spring only completely fixed the variator problem, despite the fact that I couldn't see any difference between the old spring and the new one.

Putting the variator back

1. Make a couple of tests without the spring. Mounting the variator without the spring is a million times easier. For the body of the variator to go back on the shaft, the two pistons inside the variator need to be a couple of mm apart from each other. Without this gap, the inner splines are not aligned and you will not be able to fully engage the body onto the shaft.
2. Put the new spring on the shaft and try to put back the body of the variator. This is the only difficult part of the process. You can try to rotate the body (pulley) and wiggle it. Try to pray, swear, cry or use patience, yoga or whatever helps. I've read about people trying to pre-compress the spring with a nylon string, or aligning the inner splines before putting the body back. It's obvious when it engages fully onto the shaft. If you are too violent, the two inner washers at the bottom of the body will lose their ")("-position and you'll have to start over.
3. Put back the circlip. I cannot say this enough times: Make sure 110% that the circlip is COMPLETELY inside its groove. You have to push HARD on the intake pulley to give room for the circlip to reach the groove.

Now, as they say, just put everything back where it belongs. The tensioning of the cam belt can be done without any special tools by performing these steps:

1. Loosen the four torx-bolts on the intake pulley (avoiding the use of tool 1860831000)
2. Put a M8-bolt with a couple of M8 nuts on it in the hole next to the tensioner. This is a good replacement of tool 1860845000.
3. Put a screw driver between the bolt with nuts and the metal part that change position of the tensioner. Bend until the marker shows maximum tension and tighten the tensioner nut.

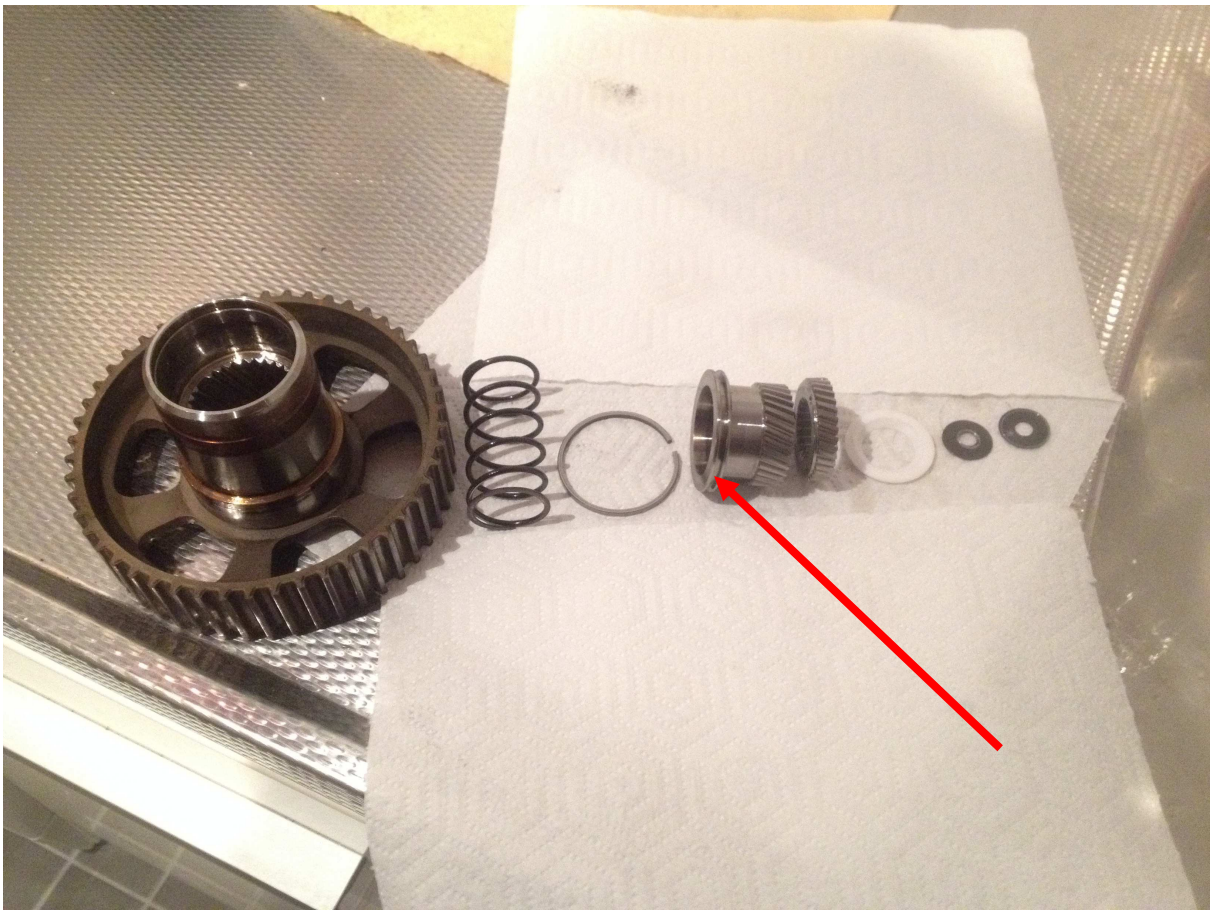
4. Tighten the four torx-bolts. Turn the engine by hand a couple of turns, undo the tensioner nut while keeping the tension with the screw driver. Ease up the tension until you reach the correct tension according to the marker and retighten the tension nut.

Once again, be careful when putting back the cam belt cover not to crack it!

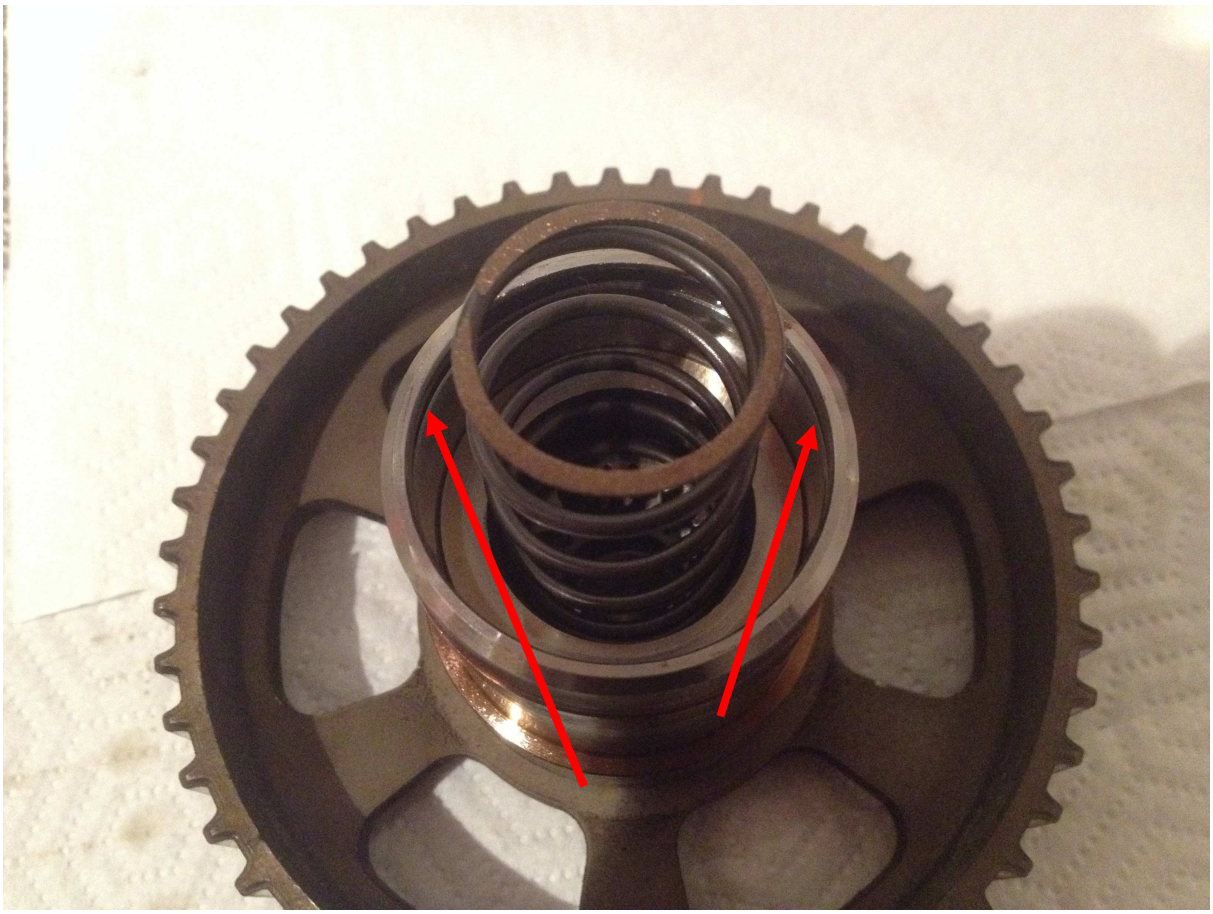
Now - some pictures!

Picture 1 – showing the black circlip that holds together the outer part of the variator with the camshaft.

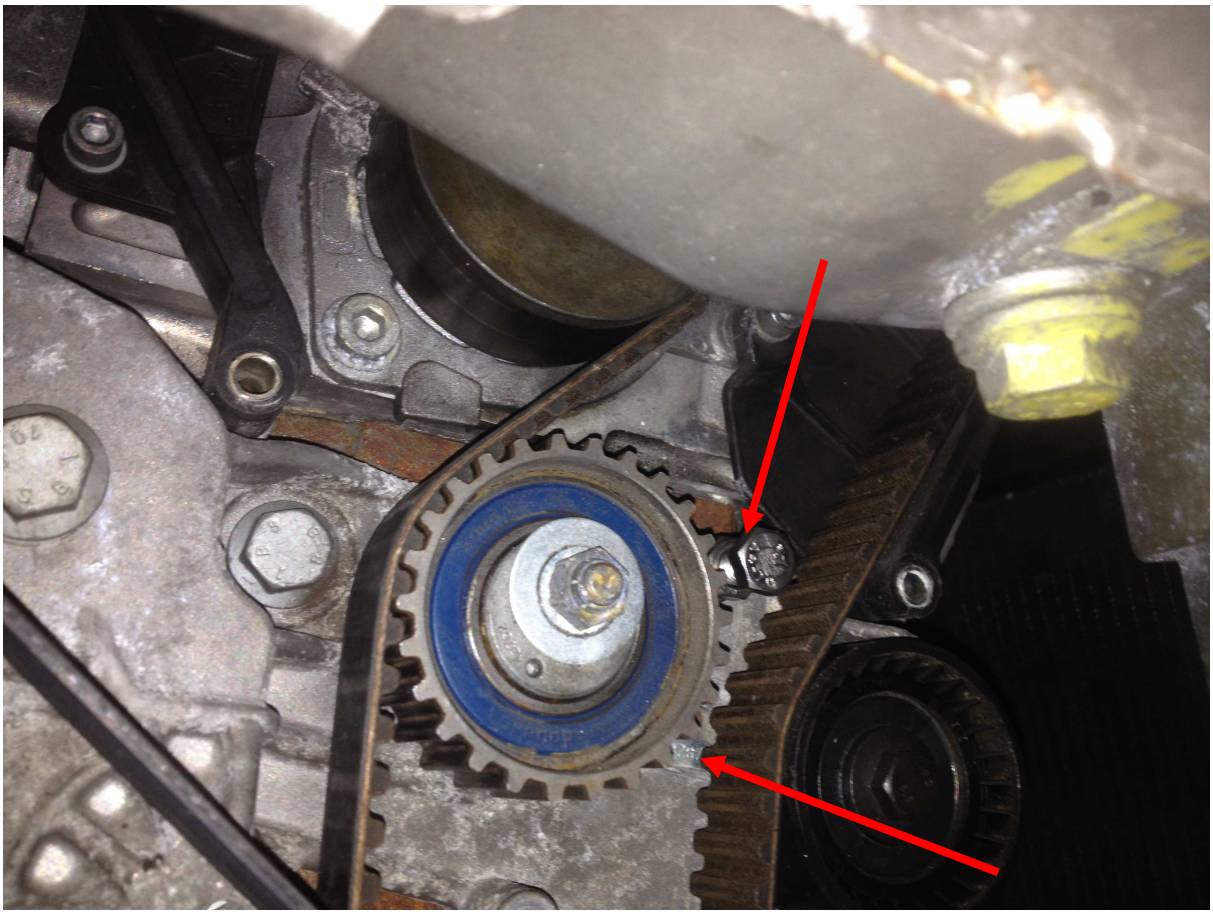
Picture 2 – the spines on the shaft where the variator sits.



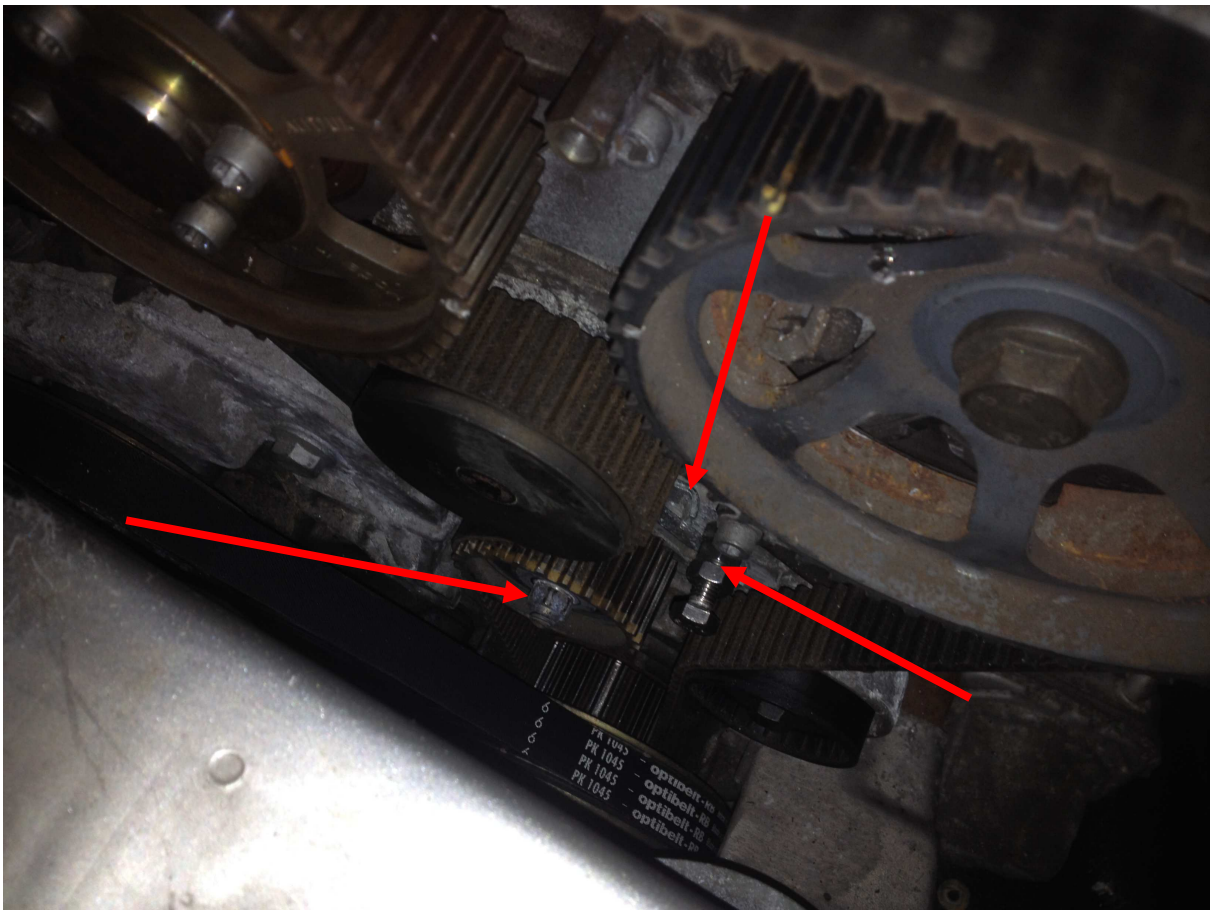
Picture 3 – all parts of the variator. Some variators does not have the white plastic washer. Note the grove where the oil scraper ring sits.



Picture 4 – This is the grove where the black circlip engage, to keep the variator on the camshaft. Make sure this is clean to make room for the circlip to fully expand when putting back the variator.



Picture 5 – the bolt with nuts replacing tool 1860845000. This will be used as a base for leveraging when tensioning the cambelt. This image also shows the indicator.



Picture 6 – The bolt with two nuts and the part that needs to be pushed upwards to tension the cambelt. Put a screwdriver between the nut and the metal part and bend until the belt has the correct tension. Keep the tension with one hand and tighten the tensioner nut.