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BMW 3-Series 320i & 320xi (12-14), 325i, 325xi, 330i & 330xi (06) & 328i & 328xi (07-14) Haynes Online Manual

7 Variable valve timing system (VANOS) components – removal and installation

VANOS intake and exhaust camshaft adjusters

Note:

To test the operation of the VANOS intake and exhaust camshaft adjusters, special equipment is required. Testing must therefore be entrusted to a BMW dealer service department or other properly equipped repair facility.

Removal

- 1 Remove the valve cover (see [Section 4](#)).
- 2 Position the crankshaft and camshafts at TDC for the No 1 piston (see [Section 3](#)).
- 3 Remove the camshaft position (CMP) sensors from the cylinder head (see [Chapter 6](#)).
- 4 Remove the first camshaft cap lower mounting bolt for both camshafts, then install BMW special tool No. 83 30 2 212 831 (or equivalent) to the cylinder head and tighten the tool down to lock the camshafts in place.
- 5 Starting with the exhaust camshaft adjuster, loosen the VANOS solenoid from the center of the VANOS adjuster unit, then loosen the intake camshaft adjuster VANOS solenoid.

Note:

The VANOS solenoid is also referred to as the solenoid center bolt.

- 6 Remove the turbocharger wastegate vacuum unit bolts and move the unit back, slightly, to access the camshaft timing chain tensioner bolt head, then unscrew and remove the timing chain tensioner from the right-hand front corner of the cylinder head.

Note:

A new sealing ring must be installed .

Note:

If the chain tensioner is going to be reused, its oil chamber must be drained. To drain the tensioner, place chain tensioner on a level surface and slowly compress the tensioner two times.

7 Remove the VANOS solenoid valves (center bolt) from each camshaft adjuster unit, then slide the camshaft position (CMP) sensor wheel off of the adjusters. Be sure to keep them in order.

8 Slightly lift the timing chain up, then slide the exhaust camshaft adjuster forward while tilting it up, and remove the exhaust camshaft adjuster from the end of the exhaust camshaft.

9 Lift the timing chain up, slide the intake camshaft adjuster forward and remove the adjuster from the end of the intake camshaft.

Installation

10 Ensure that the crankshaft and camshafts are still at TDC on No 1 cylinder (see [Section 3](#)).

11 Position the camshaft VANOS units on the end of the camshafts, paying attention to the identifying marks. Note that although the VANOS units are marked IN and EX, the sensor rings are identical.

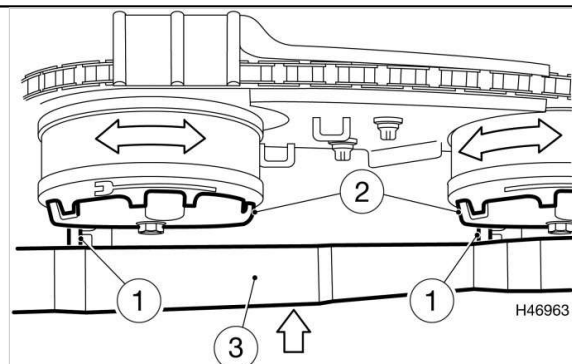
12 Install the camshaft position (CMP) sensor pulse rings on to the adjusters and set the timing chain on to the adjusters.

13 Place BMW special tool No. 83 30 2 212 830 (or equivalent) on end of the cylinder head. Starting with the intake camshaft adjuster, lift the chain up enough to rotate the adjuster until the alignment pin can be inserted from the special tool into the adjuster to lock it in place (approximately 2 o'clock position).

14 Place the timing chain over the intake camshaft adjuster, then lift the chain and rotate the exhaust adjuster until the alignment pin can be inserted into the adjuster to lock it in place (approximately 3 o'clock position) and lower the chain.

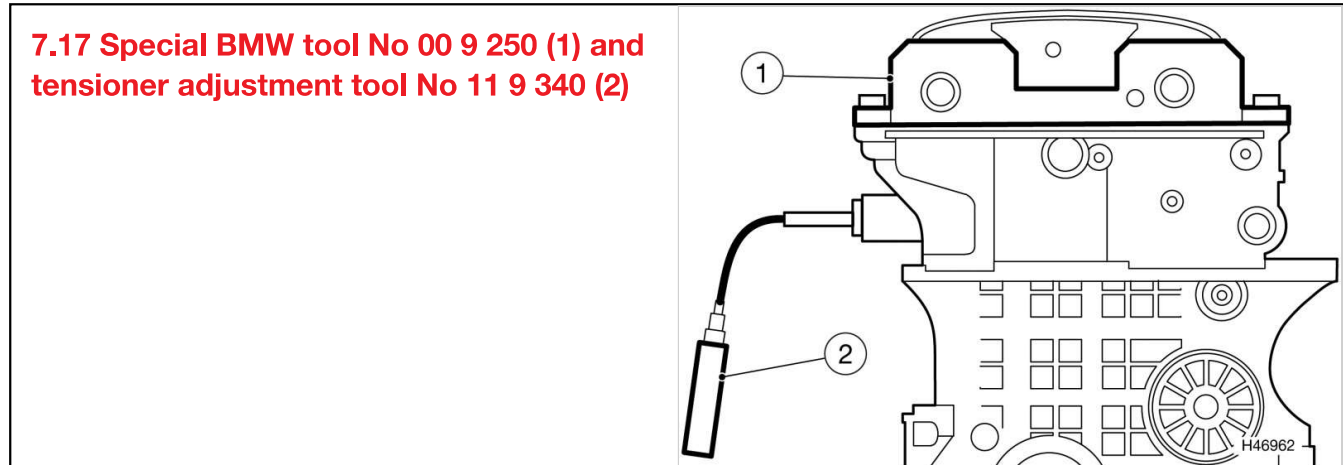
15 Mount BMW tool No. 83 30 2 212 830 (or equivalent) to the end of the cylinder head, ensuring that the locating pins of the tool engage correctly with the corresponding holes in the sensor ring gears (see illustration) . Screw the tool to the cylinder head using two old valve cover bolts.

7.15 Install special tool No 83 30 2 212 830 (or equivalent) (3) to the cylinder head and engage the pins (1) with the corresponding holes in the sensor ring gears (2)



16 Install the VANOS solenoid valve center bolt on each unit, and tighten them by hand until they just touch the sensor ring surface without any play.

17 Ensure that the timing chain rests correctly against the tensioner blade. Install BMW tool No 11 9 340 (or equivalent) into the tensioner piston hole, then turn the adjuster screw on the tool until the end of the screw just touches the tensioner rail without tensioning the chain (see illustration) .



18 Pre-tension the chain tensioner guide by screwing in the tool adjusting screw with a torque wrench to a value of 5.3 in-lbs (0.6 Nm). If no suitable torque wrench is available, turn in the adjusting screw by hand just enough to eliminate all freplay in the chain.

19 Tighten both VANOS adjuster unit solenoid valves to the to the torque listed in [this Chapter's Specifications](#) .

20 Remove the retaining bolts and remove tool No 83 30 2 212 830 from the end of the cylinder head.

21 Loosen the adjusting screw, and remove tool No 11 9 340 from the tensioner piston aperture.

22 Ensure the timing chain tensioner piston has been drained completely, then install it to the aperture in the cylinder head with a new sealing ring. Tighten it to the torque listed in [this Chapter's Specifications](#) .

23 Remove BMW special tool No. 83 30 2 212 831 from the cylinder head

24 The remainder of installation is the reverse of removal, noting the following points:

- A. Camshaft cap bolts are installed and tighten to the torque listed in this Chapter's Specifications
- B. Install the valve cover (see Section 4).
- C. Ensure the crankshaft locking tool is removed prior to starting the engine.

VANOS actuators

Note:

The VANOS actuators are mounted at the end of the valve covers in front of each camshaft.

- 25 Remove the engine cover, by lifting the front of the cover up and pulling it forwards.
- 26 Remove the strut tower crossbrace plastic push-pins and bolts then remove the brace.
- 27 Remove the sound insulator plastic retainers and lift the insulator off of the engine.
- 28 Remove the intake air duct (see [Chapter 1, Section 23](#)).
- 29 Disconnect the vacuum line holders and move the lines out of the way.
- 30 Working at the end of the cylinder head, disconnect the electrical connector to the VANOS intake or exhaust actuator.
- 31 Remove the actuator mounting bolts and pull the actuator(s) out of the valve cover.
- 32 Installation is the reverse of removal, making sure to replace the sealing ring on the actuator if it is damaged.

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