

 **11 34 504 Adjusting valve clearance (cylinder-head cover removed)**

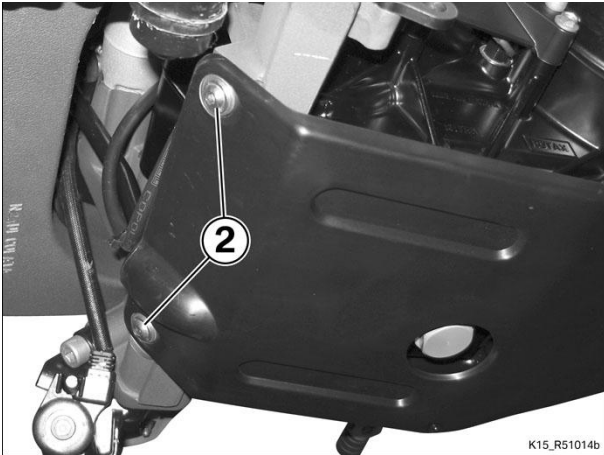
**Core activity**

**(-) Removing engine guard**

- Remove screws (1).

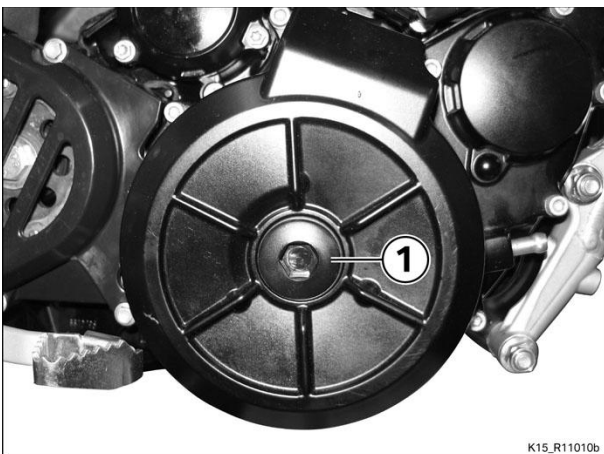


- Remove screws (2).
- Remove the engine guard.

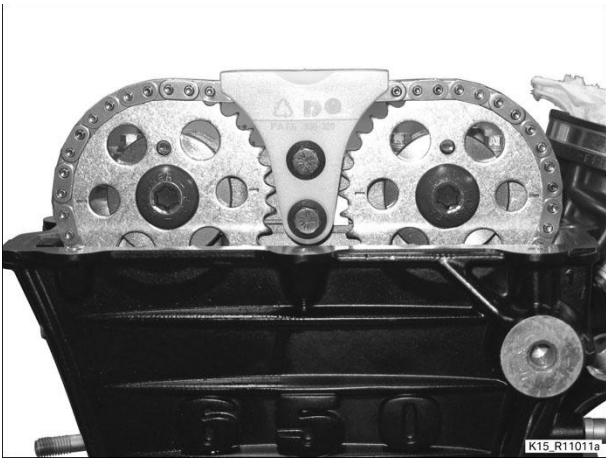


**(-) Setting engine to firing TDC**

- Remove threaded plug (1) from the magnet housing.
- Use an Allen key to turn the crankshaft clockwise to the TDC position.



- Turn the engine until the crankshaft it is at the TDC position.  
» TDC (top dead centre) = line is parallel with the cylinder head and bore in timing-chain sprockets at the top.

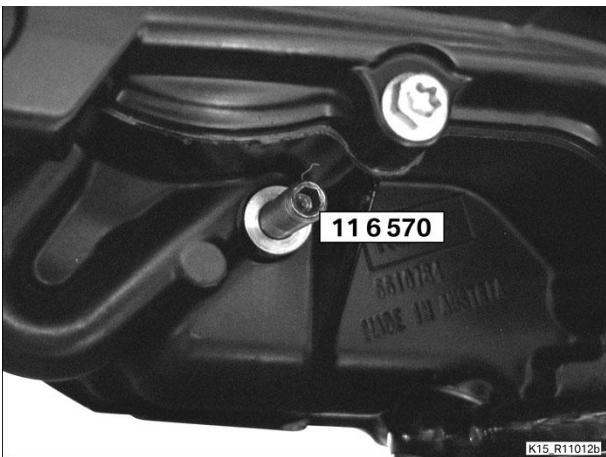


### **(-) Locking crankshaft in TDC position**

- Remove screw (1).



- Lock the crankshaft at the TDC position by inserting TDC locating screw (No. 11 6 570).

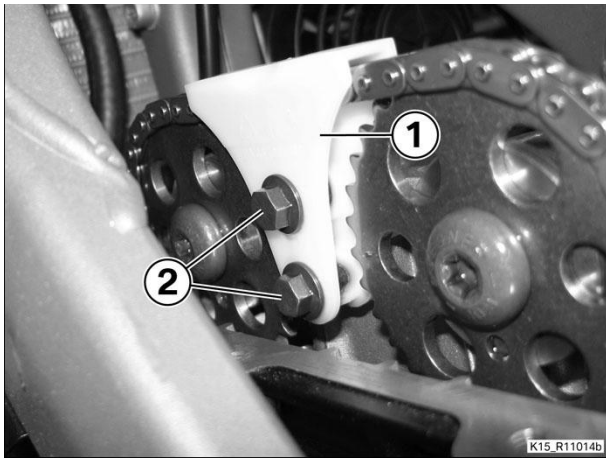


### **(-) Adjusting valve clearance**

#### **► Removing camshafts**

#### **▷ Removing chain guide**

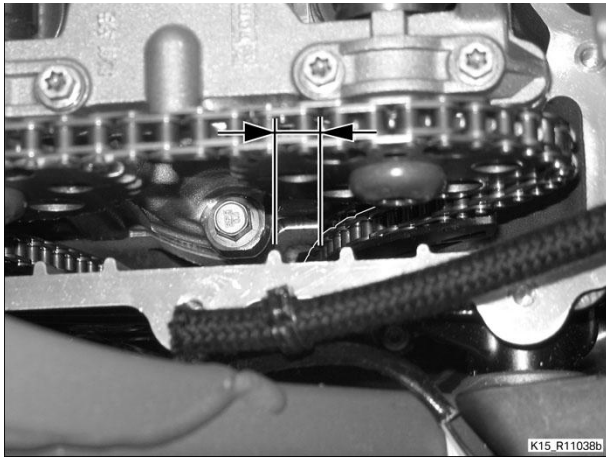
- Remove screws (2) and remove bowed chain guide (1).



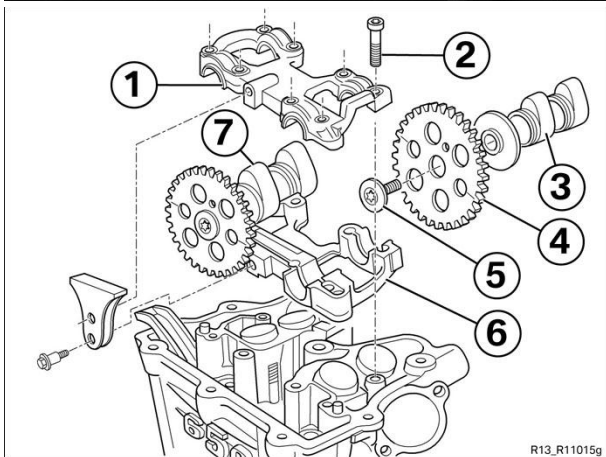
K15\_R11014b



- Using a suitable tool, push the chain tensioner rail back at the bottom (arrow) and secure it in this position.



K15\_R11038b



R13\_R11015g

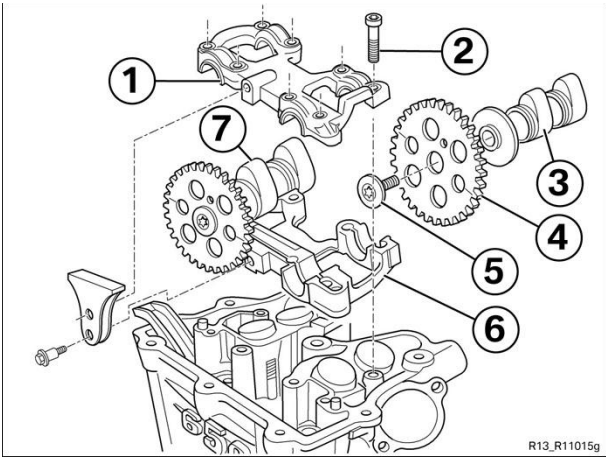
- Remove screw (5) and remove sprocket (4)
- Remove screws (2).
- Remove top section of bearing block (1).
- Remove inlet camshaft (3).
- Remove exhaust camshaft (7) with the sprocket.
- Remove bottom section of bearing block (6).



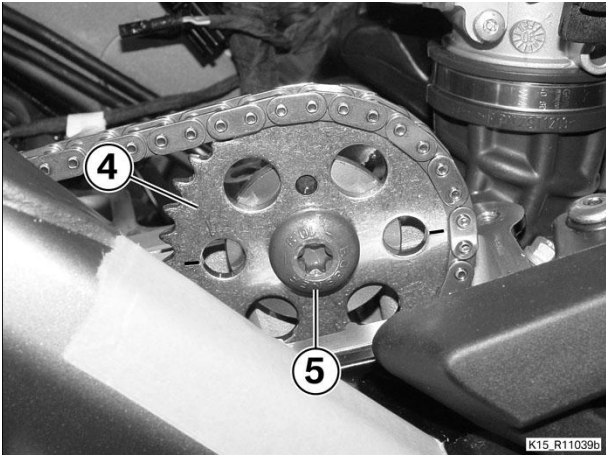
- Mark each bucket tappet with a felt pen or similar (e.g. I = inlet valve).
- Use rubber suction cup (No. 11 3 251) to remove the bucket tappets.
- Before installing each new shim, measure thickness with a caliper gauge.
- Change shim (1), making sure that it is correctly seated.
- Install each bucket tappet in its original position as marked.



R13\_11222b




R13\_R11015g




K15\_R11039b

► **Installing camshafts**

- Install bottom section of bearing block (6).
- Oil the camshaft journals.
- Install exhaust camshaft (7) with sprocket first, then install inlet camshaft (3), noting the TDC position.
- » TDC (top dead centre) = line is parallel with the cylinder head and bore in timing-chain sprockets at the top.
- Install top section of bearing block (1) with screws (2).


|   |       |  |
|---|-------|--|
|  <b>Tightening torques</b> |       |  |
| <b>Camshaft carrier to cylinder head</b>  |       |  |
| M6 x 45   | 10 Nm |  |

- Install sprocket (4) in the TDC position.
- » TDC (top dead centre) = line is parallel with the cylinder head and bore in timing-chain sprockets at the top.
- Install screw (5).

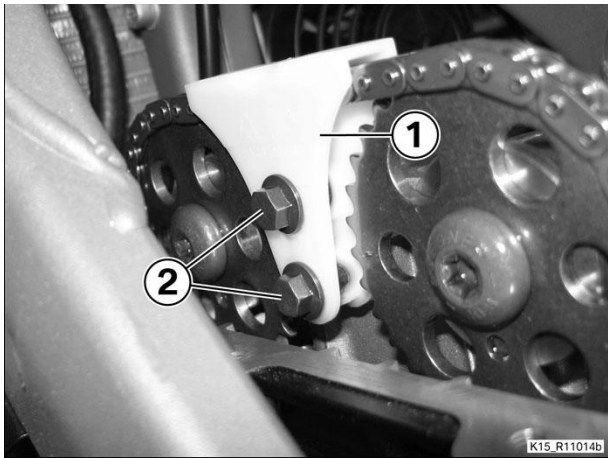
|   |       |  |
|---|-------|--|
|  <b>Tightening torques</b> |       |  |
| <b>Sprockets to camshafts</b>   |       |  |
| M10 x 30, lubricate with engine oil   | 60 Nm |  |

▷ **Installing chain guide**

- Clean the threads and the screws.
- Install bowed chain guide (1) with screws (2).

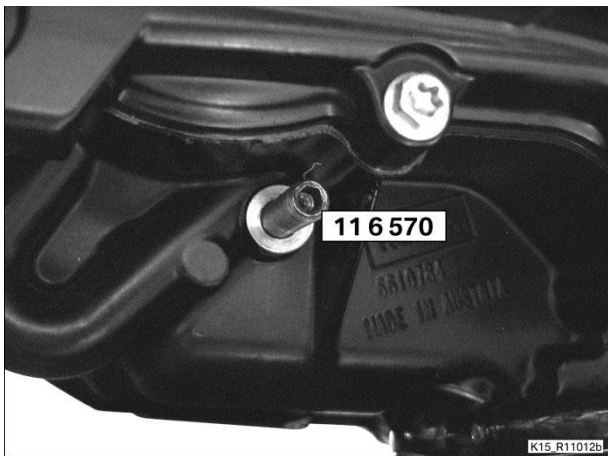
|   |       |  |
|---|-------|--|
|  <b>Tightening torques</b> |       |  |
| <b>Chain guide to camshaft carrier</b>  |       |  |
| M6 x 16<br>Loctite 243  | 10 Nm |  |



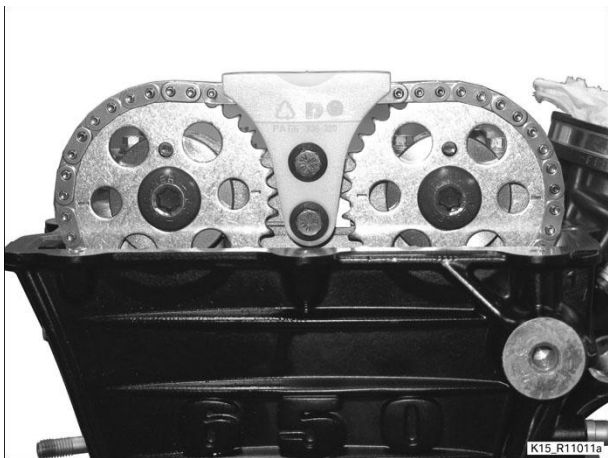


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▷ **Turning crankshaft**

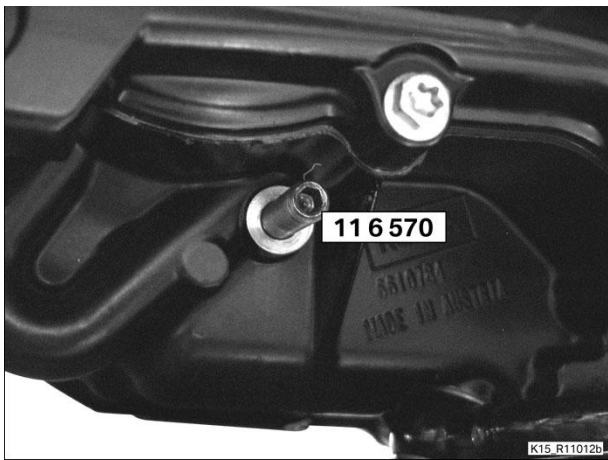
- Remove TDC locating screw (No. 11 6 570).



- Use the Allen key to turn the crankshaft clockwise through one complete revolution.
  - Turn the engine until the crankshaft it is at the TDC position.
- » TDC (top dead centre) = line is parallel with the cylinder head and bore in timing-chain sprockets at the top.



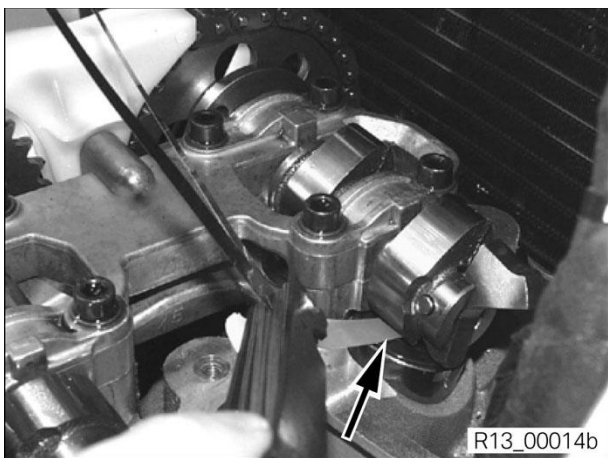
- Lock the crankshaft at the TDC position by inserting TDC locating screw (No. 11 6 570).




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 ▷ **Checking valve clearance**

**Test**

- Use a feeler gauge (**arrow**) to check valve clearance.



|  <b>Technical data</b> |                        |                |  |
|---|------------------------|----------------|--|
| Valve clearance, inlet valve  | engine cold max. 35 °C | 0.03...0.11 mm |  |
| Valve clearance, exhaust valve  | engine cold max. 35 °C | 0.25...0.33 mm |  |

**Result:** Valve clearance out of tolerance

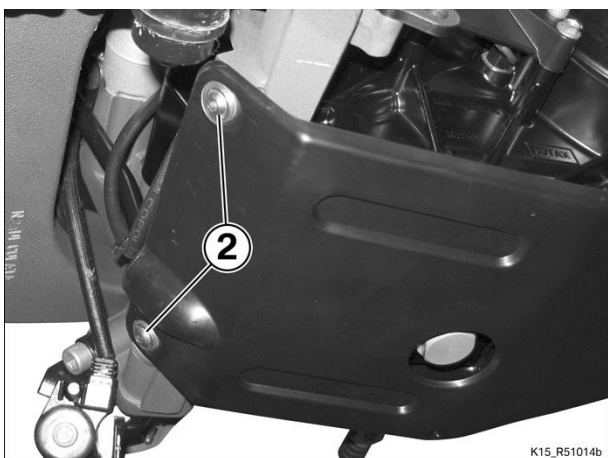
**Measure:**

- Repeat the procedure.

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 ▲

**(-) Installing engine guard**

- Hold the engine guard in position and align it correctly.
- Install screws (2) and tighten until hand-tight.



- Hand-tighten screws (1).
- Tighten all screws.



K15\_R51013b



**Tightening torques**

**Engine guard to frame**

M6 x 16

10 Nm