

 **11 31 205 Replacing right camshaft(s) (9 FRUs)**

+ 11 31 793

**Preparatory work**

Removing right cover for spark plug

Removing right direct ignition coil

Removing right spark plug

Removing right injection valve cover

Removing right cylinder-head cover

Removing threaded plug from bore for locating pin

Setting right cylinder to firing TDC

Removing right chain tensioner

Installing right timing-chain tensioner

**Core activity**

**(-) Slackening threaded fasteners of right camshafts**

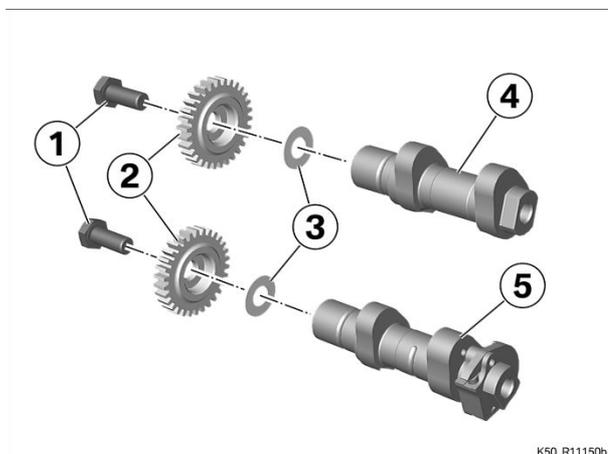
- Slacken screws (1).

**(-) Removing right camshaft bearing cap**

- Remove screws (1).
- Remove contact spring (2).
- Remove camshaft bearing cap (3) and O-ring (4).

**(-) Removing right camshafts**

- Remove inlet camshaft (1).
- Remove exhaust camshaft (2).

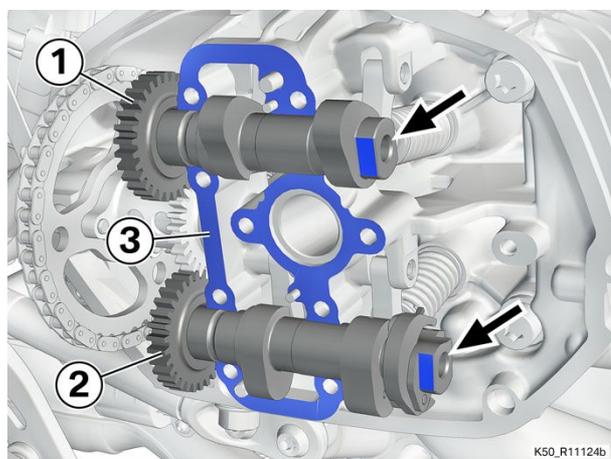


### (-) Replacing right camshafts

- Remove screws (1).
- Transfer camshaft sprockets (2) and friction washers (3) to new camshafts (4) and (5), taking care not to mix up camshaft sprockets (2).
- Install screws (1) and tighten until hand-tight.

### (-) Installing right camshafts

- Install inlet camshaft (1) and exhaust camshaft (2) with the cams (arrows) facing out.
  - Position inlet camshaft (1) and exhaust camshaft (2) in such a way that gearwheels (3) engage in intermediate shaft (4).
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- Check firing TDC position of inlet camshaft (1) and exhaust camshaft (2).
  - » Flats (arrows) are **parallel** with cylinder-head face (3).



### (-) Installing right camshaft bearing cap

- Check O-ring (4) for damage; replace if necessary.
- Install O-ring (4).
- Hold camshaft bearing cap (3) in position.
- Install contact spring (2).
- Install screws (1).

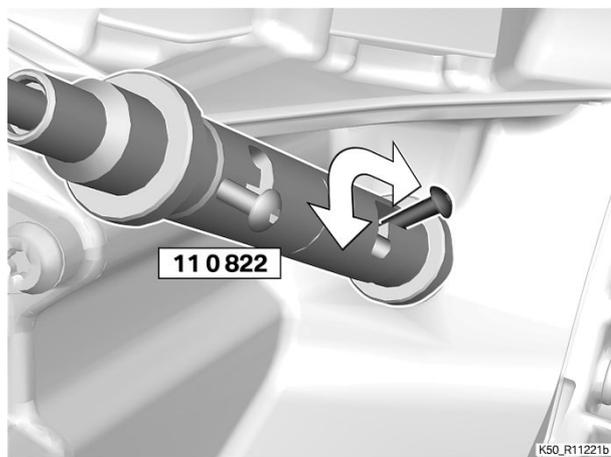
 <b>Tightening torques</b>		
<b>Camshaft bearing cap to cylinder head</b>		
M6 x 35	<b>Tightening sequence: tighten alternately</b>	
	10 Nm	

### (-) Adjusting right-side ignition timing

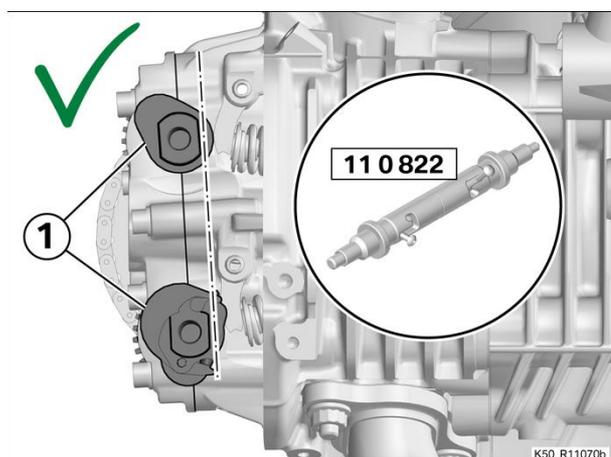
- Slacken screws (1) and (2).
- Turn camshafts (3) and (4) until locating device (No. 11 0 827) can be inserted.
- Tighten screws (1) and (2).

 <b>Tightening torques</b>		
<b>Camshaft sprocket to camshaft</b>		
Exhaust camshaft (with trigger for camshaft sensor), M10 x 1.25 x 35 - 10.9	65 Nm	
other camshafts, M10 x 1.25 x 25 - 10.9	65 Nm	

- Secure locating pin (No. 11 0 822) (pull back the pin and engage it).



- Insert barring tool (No. 11 0 821) into idler gear (1).



- Bar the engine until camshafts (1) are again at firing TDC.
  - Unlock locating pin (No. 11 0 822) and bar the engine until the locating pin engages.
- » Engine is locked at firing TDC.

- Use locating device (No. 11 0 827) to check that the engine is correctly positioned at firing TDC; if necessary readjust the timing.

### (-) Checking right valve clearance

## Requirement

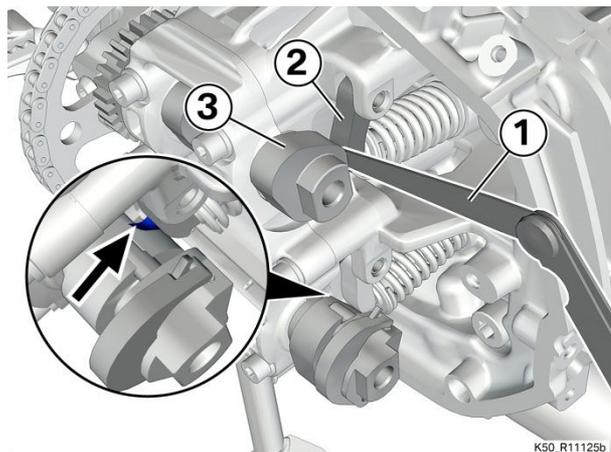
- Right cylinder is at firing TDC.



## Check

### ► Measuring valve clearance

- Check valve clearance with feeler gauge (1) inserted between cam follower (2) and cam (3); do not measure at the recess (arrow) of the cam.



 <b>Technical data</b>			
Inlet valve clearance	Engine cold max 35 °C	0.10...0.17 mm	
Exhaust valve clearance	Engine cold max 35 °C	0.34...0.41 mm	

### Result:

- Valve clearance is outside specified range.

### Measure:

#### ► Noting measured results

- Note down the measured results on a record sheet.

### NOTICE

This graphic is available as a template for printing.



=> 11 34 510, Adjusting right valve clearances (for checking valve clearances) (Billed as a separate item)

## Follow-up work

Removing right timing-chain tensioner

- Installing right timing chain tensioner
- Removing crankshaft locking device
- Installing threaded plug in bore for locating pin
- Installing right cylinder-head cover
- Installing right injection-valve cover
- Installing right spark plug
- Installing right direct ignition coil
- Installing right cover for spark plug
- Checking engine oil level
- Final check of work performed