

Checking valve clearance and adjusting if necessary

Inspections I, III



Caution:

Never unscrew the spark plugs before measuring the valve clearance. Carbon particles may settle behind an exhaust valve head and falsify the measured result.

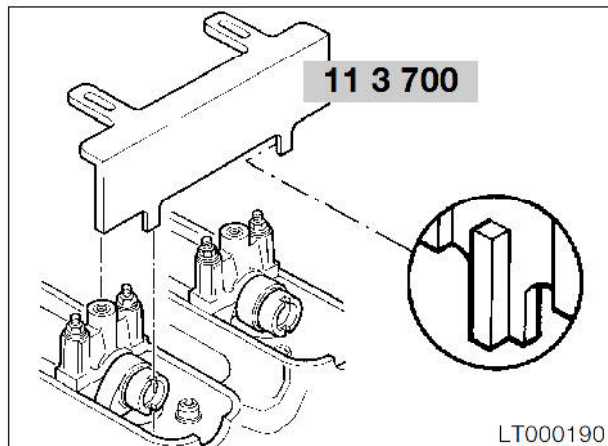
- [RS] Remove bottom section of fairing .
- Remove left side section of fairing.
- Remove cylinder head cover.
- Remove cover for Hall generator.
- Only crank engine at the crankshaft (counter-clockwise!).
- Measure valve clearance with feeler gauge.
- Max. engine temperature 35 °C.
- Determine the replacement tappet by way of nominal/actual value comparison.

Valve clearance:

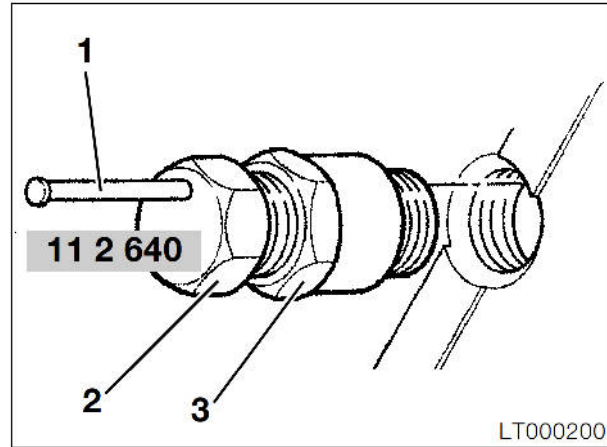
Inlet0.15 - 0.20 mm (0.0059 - 0.0079 in)
 Exhaust0.25 - 0.30 mm (0.0098 - 0.0118 in)

Adjusting valve clearance

- The camshafts must be removed in order to change the bucket tappets.
- Set cylinder No. 1 (timing end) to ignition TDC.

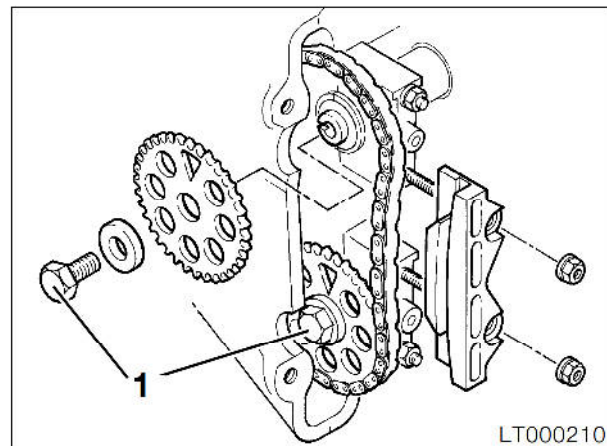


- The setting device for the camshafts, **BMW No. 11 3 700**, must fit in the slots at the ends of the shafts.
- Unscrew screw plug in chain case cover.



- Lock chain tensioner and timing chain in position with eccentric tensioner, **BMW No. 11 2 640**.
- Pull back clamping pin (1), screw in eccentric pin (2) by 3-4 turns.
- Push in clamping pin above the timing chain.
- Fix timing chain and chain tensioner in position by slightly turning eccentric pin in clockwise direction.
- Secure eccentric pin with locknut (3).

Removing sprockets



- Release retaining bolts of sprockets and remove sprockets.

Removing camshafts

- Remove chain guide from stud bolt.
- First remove thrust bearing of camshafts to avoid misalignment.
- Remove remaining camshaft bearings and lift out camshaft.
- Remove bucket tappets to be changed with relay pliers **BMW No. 61 1 250**, or a magnet.



Note:

Only the bucket tappets replaced during the 1000 km (600 miles) inspection can be re-used.

Installing camshafts

- The camshafts are marked to ensure they cannot be confused.



Caution:

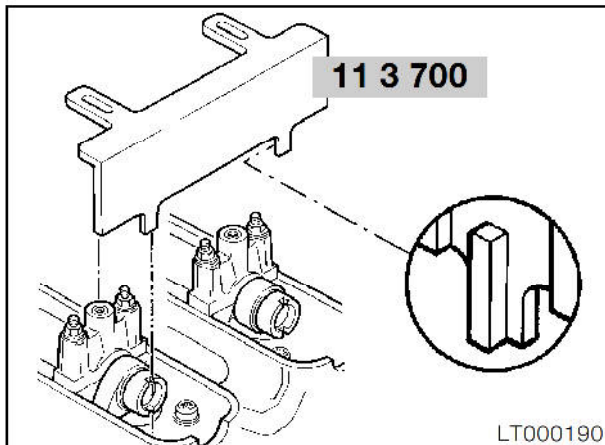
Camshaft identification.
Inlet: Groove after the thrust bearing
Exhaust: No groove

- The camshaft bearing caps are also identified.
Inlet side: Odd numbers
Exhaust side: Even numbers
- The order is ascending from the front (timing end) to the rear.
- Install camshafts with the bearing points slightly oiled.
- Evenly tighten bearing cap working from the inside towards the outside.
- Install thrust bearing (timing end) last.



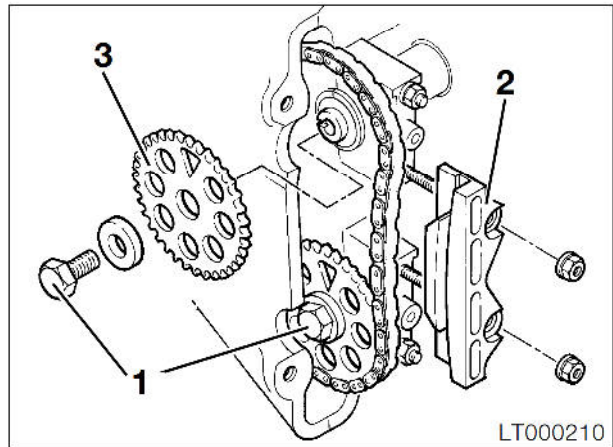
Tightening torque:

Bearing cap..... 9 Nm



- Turn camshafts so that the grooves at the rear ends are positioned vertically with respect to the cylinder head.
- The grooves at the front end must face the inside towards the crankshaft.
- Fit setting device, **BMW No. 11 3 700**, and secure to the bearings of the camshaft.

Installing sprockets



- Install lower sprocket (1) together with chain and chain guide (2); the pin on the sprocket must engage in the groove on the camshaft.
- When installed, the marking (triangle) on the sprocket must face upward.
- Then install the upper sprocket (3) with chain.
- Initially, only tighten sprocket retaining bolts hand-tight.



Caution:

Remove setting device before finally tightening the sprockets, otherwise the camshafts will be damaged.

- Remove eccentric tensioner.
- Firmly tighten sprockets while holding at the hexagon on the camshaft.

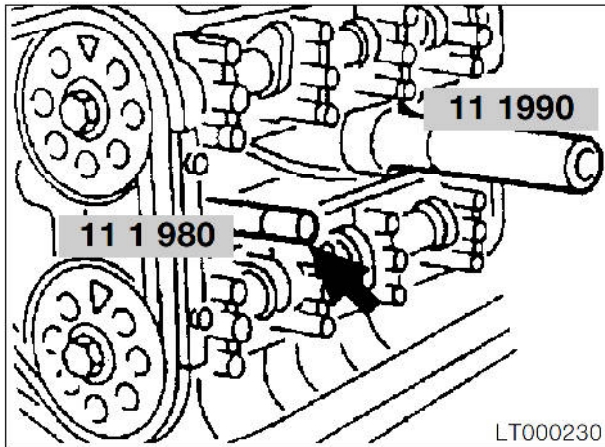


Tightening torque:

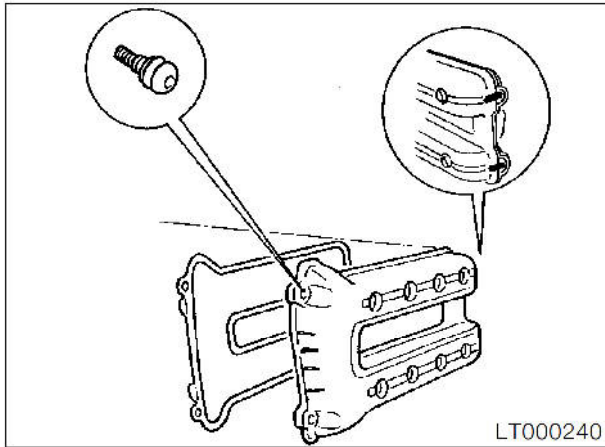
Sprocket to camshaft..... 54 Nm

- Check valve clearance once again.

Installing cylinder head cover



- Screw fitted bolt, **BMW No. 11 1 980**, (arrow) into inner hole at the front.
- Press centring pin, **BMW No. 11 1 990**, with gripper, **BMW No. 00 5 500**, into locating hole under the third camshaft bearing.



- Insert gasket into cylinder head cover.



Note:

Begin installation at the crescents (1).

- The marks (arrows) on the cover and gasket must agree at the front and rear.
- First press in the crescent at the rear (transmission end).
- Lightly coat the gasket groove and the crescent areas in the cover with oil to facilitate installation.
- Apply a little **3-bond 1209** in the joint area at the top and bottom chain case cover - cylinder head (surfaces free of grease).

- Fit cylinder head cover with gasket over the centring tools onto the cylinder head.
- Screw in all retaining bolts such that they are still not under preload.
- Firmly tighten retaining bolts crosswise working from the inside towards the outside.
- Remove fitted bolt and centring pin, screw in last retaining bolt and firmly tighten.



Tightening torque:

Cylinder head cover to cylinder head 9 Nm