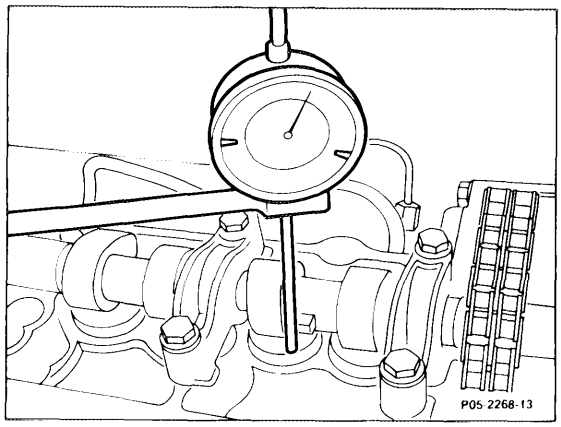
05-215 Checking camshaft timing

Preceding work:
Cylinder head cover removed.
Injection nozzles removed (07.1-230).
Charge air pipe removed (turbo engines).



Dial gauge holder 363 589 02 21 00 . . . . . attach, remove at the No. 1 cylinder inlet valve. Dial gauge with 3 mm preload on valve tappet.

Engine . . . . . turn in direction of rotation.

Caution!
Engine must not be turned by the camshaft.

With 2 mm valve stroke . . . . . engine must be at 12° after TDC.

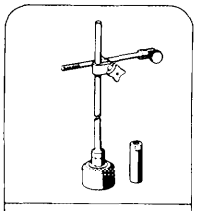
Timing

Engine	Camshafts Code number[1]	Inlet valve		Exhaust valve	
		opens after TDC	closes after BDC	opens before BDC	closes before BDC
602 603	06/10[3]/08[5]/12[6]	11° 12°[4]	17°	28°	15°
	07/11[3]/09[5]/13[6]				

[1]) The camshaft code number is stamped in on the collar next to the TDC notch.
[2]) Not used.
[3]) With M11 thread from 11/88.
[4]) On used camshafts.
[5]) Repair camshafts with 0.5 mm larger bearing diameter and M10 thread.
[6]) Repair camshafts with 0.5 mm larger bearing diameter and M11 thread.

Tightening torque	Nm
Bolts for cylinder head cover	10

Special tool



363 589 02 21 00
00

Conventional tool

Dial gauge A 1 DIN 878	e. g.	Mahr D-7300 Esslingen Part No. 810

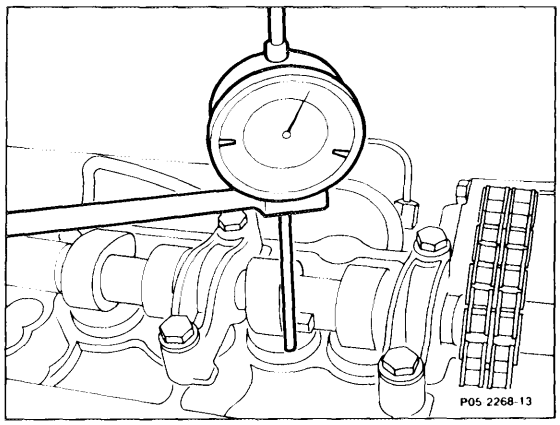
Note
It is not possible to correct timing. The timing chain should be checked for elongation if the test values differ.
The timing chain is to be replaced with more than 4° at the crankshaft.

Checking

Caution!
The engine must not be turned by the camshaft timing gear bolt. Do not turn engine backwards during measurement, otherwise measuring errors result.

1 Turn crankshaft in direction of rotation of the engine until cam tip of the 2nd cam points upwards.

2 Fasten dial gauge holder 363 589 02 21 00 on the cylinder head (above the No. 1 cylinder inlet valve).



3 Insert dial gauge and extension and fasten so that probe pin sits on the valve tappet with a preload of 3 mm (small dial gauge pointer).

4 Turn dial gauge scale until the large pointer is on "0".

Caution!
The probe pin of the dial gauge must be exactly vertical to the valve tappet.

5 Turn crankshaft further in direction of rotation of engine, until the small pointer of the dial gauge has moved back by 2 mm to 1 mm.

In this position the marking at the crankshaft pulley or vibration damper must be at 11 - 12° after TDC. If this value is more than 12° the camshaft is to be replaced or the timing chain checked for elongation.