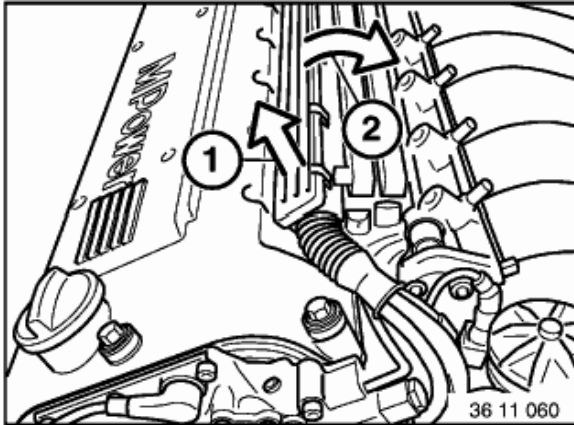


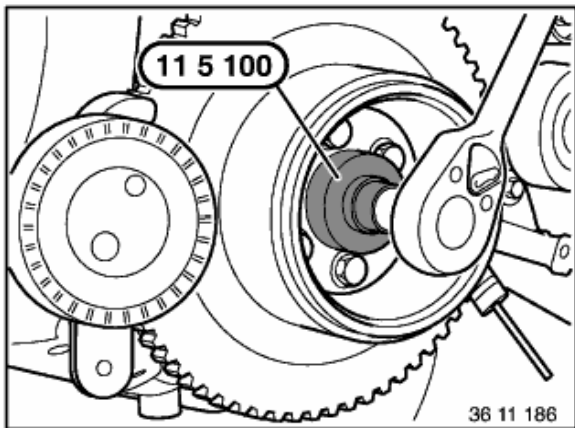
Removing fan coupling with fan shroud,  
refer to 17 11 031/11 52 020



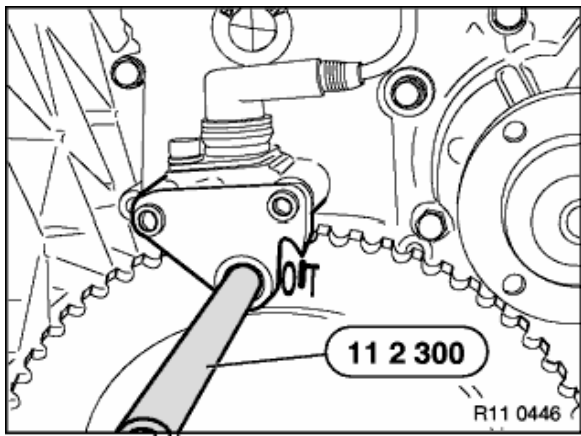
Remove connector strip for fuel injection valves (1), lift over fuel injection pipe and air lead and place to one side (2).

Removing cylinder head cover,  
refer to 11 12 000

Removing spark plugs,  
refer to 12 12 011



Fit special tool 11 5 100 to four screws on crankshaft hub.



Bar engine in direction of rotation as far as TDC firing position of first cylinder.

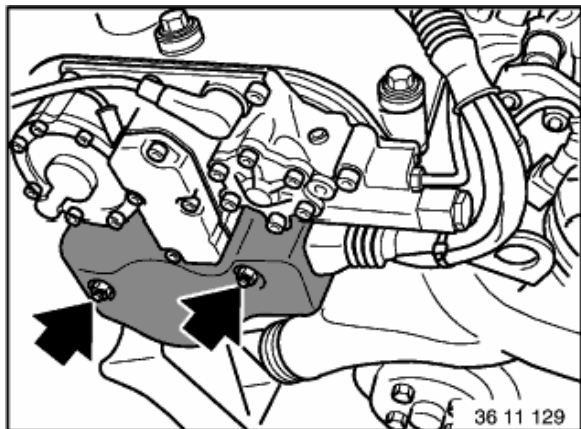
Secure vibration damper with special tool 11 2 300.



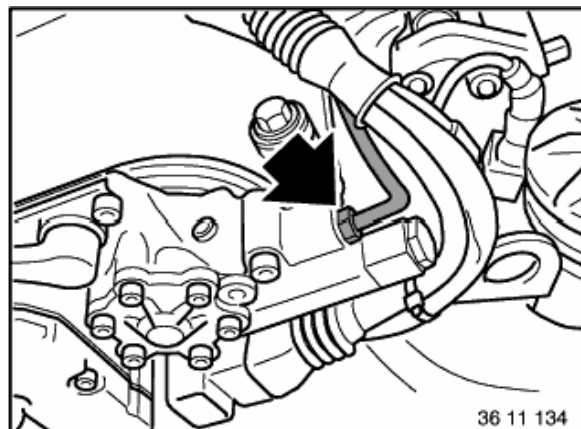
When the engine is switched off, VANOS moves the camshafts to a position which is advantageous to engine starting.

**Caution!**

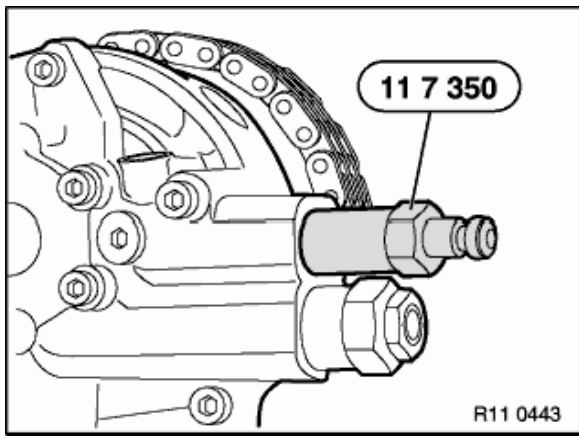
The camshaft timing is "not" permitted to be checked in this position. The camshafts must first be turned back to their initial position.



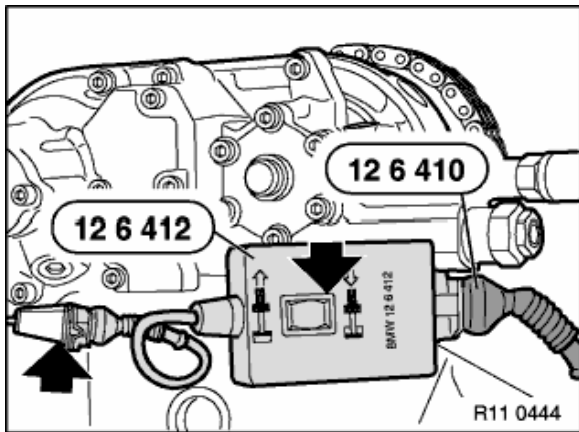
Remove cover from plug connectors.



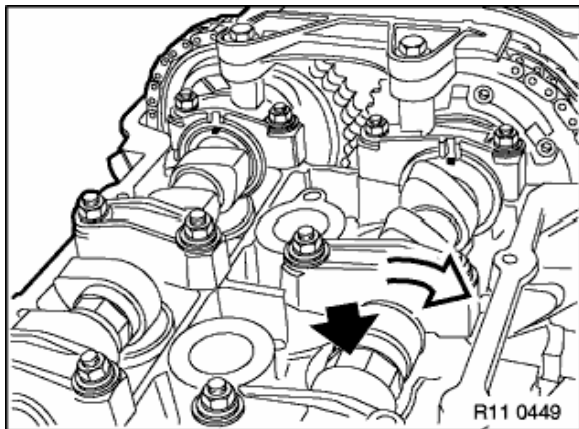
Unscrew oil pipe at VANOS control unit.



Fit special tool 11 7 350 to VANOS adjustment unit.  
Connect up compressed air (2 ... 8 bar).



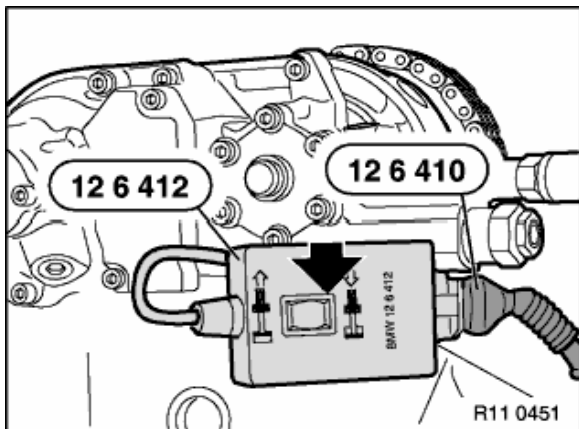
Disconnect plug connection on solenoid valves on exhaust side.  
Connect special tool 12 6 412 and special tool 12 6 410 to the solenoid valves on the exhaust end.  
Connect special tool 12 6 410 to correct terminals on vehicle battery.  
Depress toggle switch on special tool 12 6 412 in direction of VANOS splined shaft and hold down.



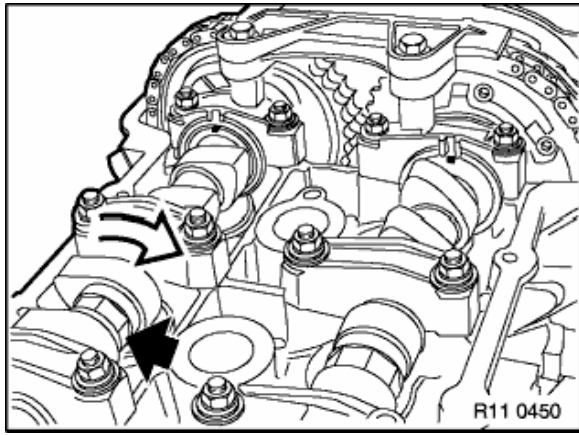
At the same time, rotate exhaust camshaft at hex head against direction of rotation until the camshaft noticeably reaches the stop.

**Note:**

If necessary, press toggle switches on special tool 12 6 412 several times in both directions until camshaft starts to move.



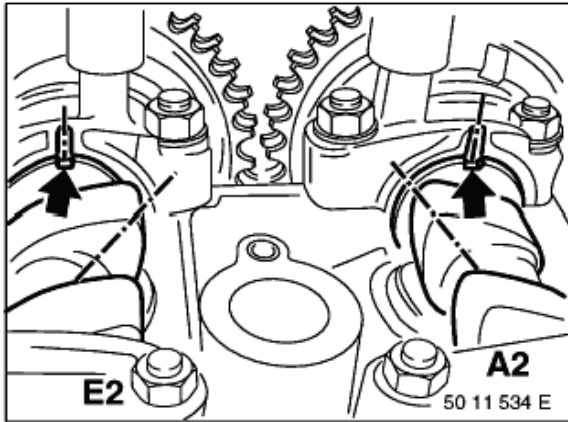
Disconnect plug connection of solenoid valves on intake end.  
Connect special tool 12 6 412 to the solenoid valves on the intake end.  
Depress toggle switch on special tool 12 6 412 in direction of VANOS splined shaft and hold down.



At the same time, rotate intake camshaft at hex head against direction of rotation until the camshaft noticeably reaches the stop.

**Note:**

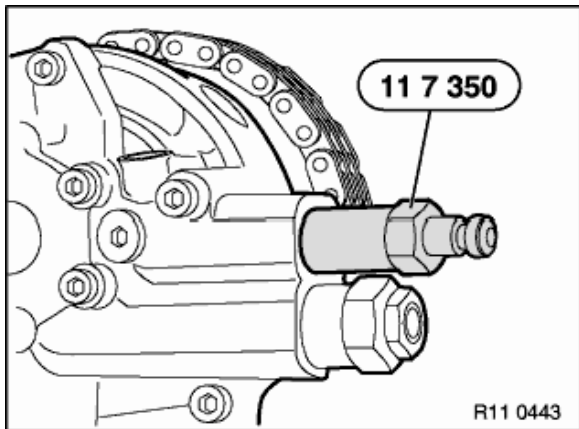
If necessary, press toggle switches on special tool 12 6 412 several times in both directions until camshaft starts to move.



**Note:**

The engine is at the TDC firing position of the first cylinder.  
The cam tips of the exhaust and intake camshafts point to each other.

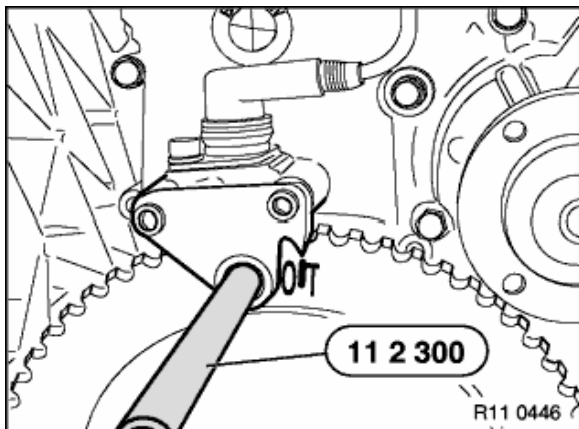
The grooves in the exhaust and intake camshafts point to the grooves in the first bearing cover.



Disconnect special tool 12 6 412 from the solenoid valves.

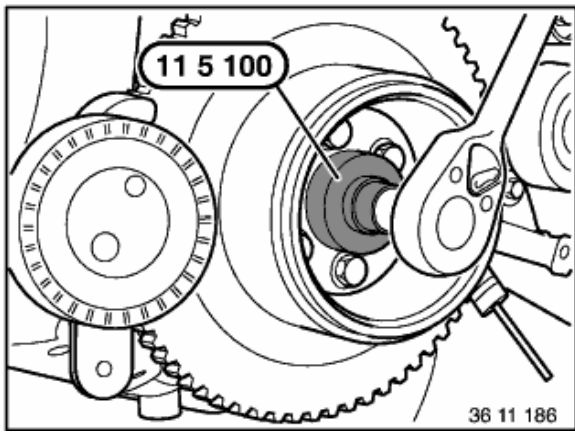
Disconnect compressed air.

Remove special tool 11 7 350.



Remove special tool 11 2 300.

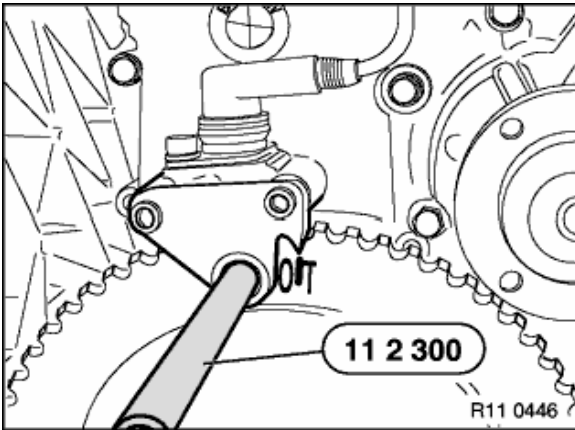
Fit special tool 11 5 100 to four screws on crankshaft hub.



**Caution!**

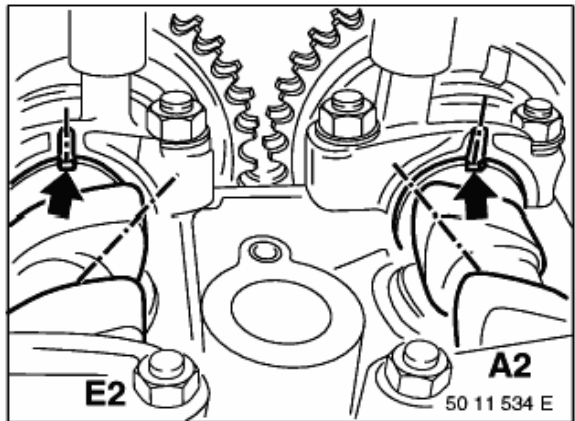
Do not turn crankshaft any further.

Continue to bar engine in direction of rotation through two complete revolutions until the first cylinder is at TDC firing position. Secure vibration damper with special tool 11 2 300.



**Note:**

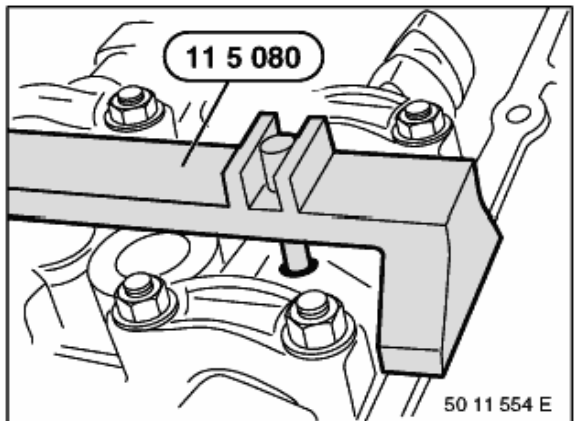
The grooves in the exhaust and intake camshafts are aligned with the grooves in the first bearing covers.

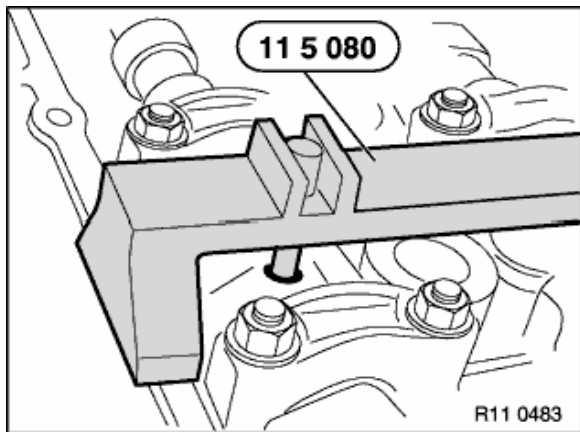


Insert special tool 11 5 080 into intake camshaft.

**Note:**

Special tool 11 5 080 must rest on the timing case without a gap.





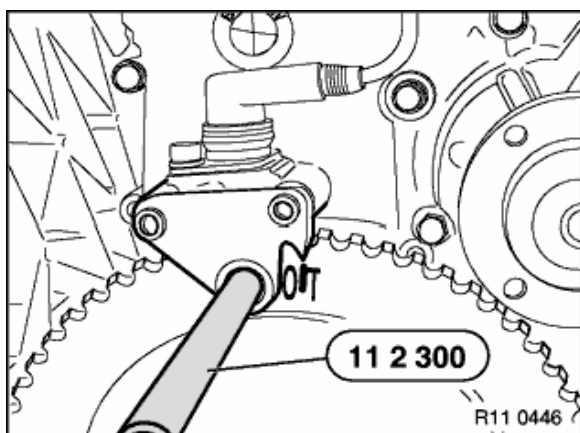
Insert special tool 11 5 080 into exhaust camshaft.

**Note:**

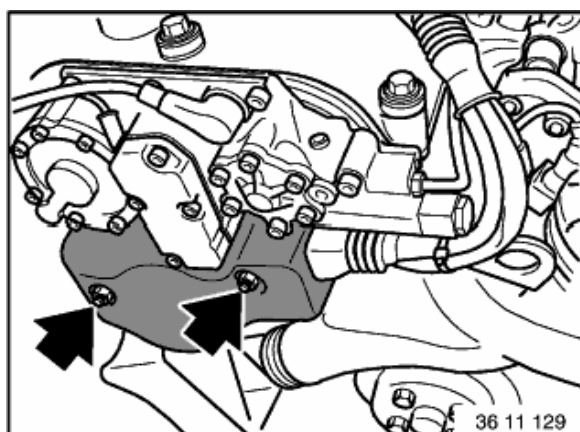
Special tool 11 5 080 must rest on the timing case without a gap.

If necessary, adjust timing of camshaft,  
refer to 11 31 505

Remove special tool 11 5 080.

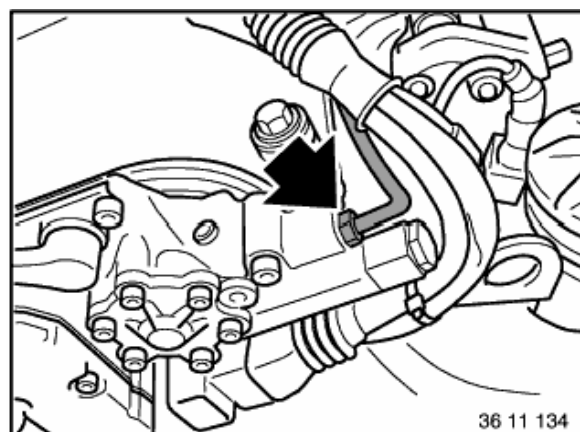


Remove special tool 11 2 300.



Insert screw connections in solenoid valves.

Fit cover to plug connections.



Fit oil pipe to VANOS adjusting unit.

Tightening Torque,  
refer to Technical Data 11 36 9AZ  
Assemble engine.