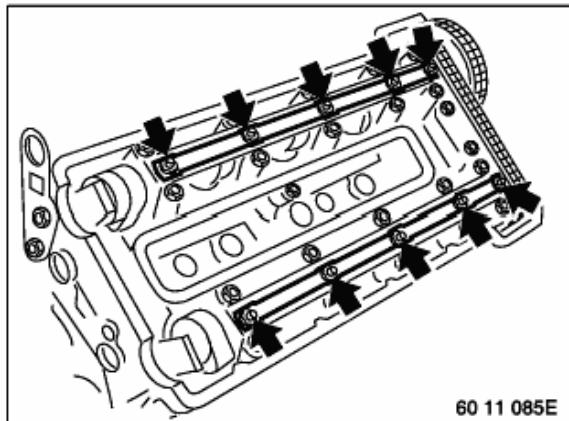


Unscrew and remove splash guard.

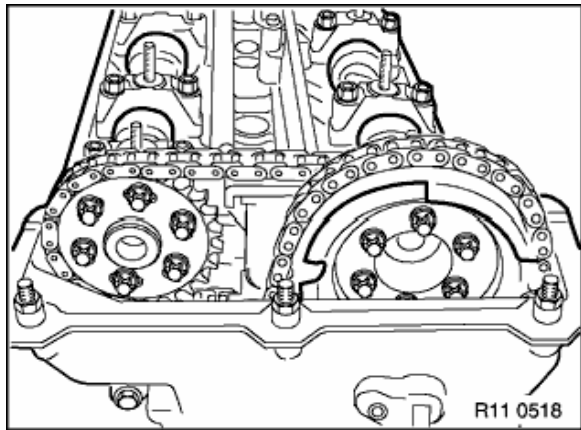
Remove both cylinder heads,  
refer to 11 12 004.

Remove all spark plugs,  
refer to 12 12 011.

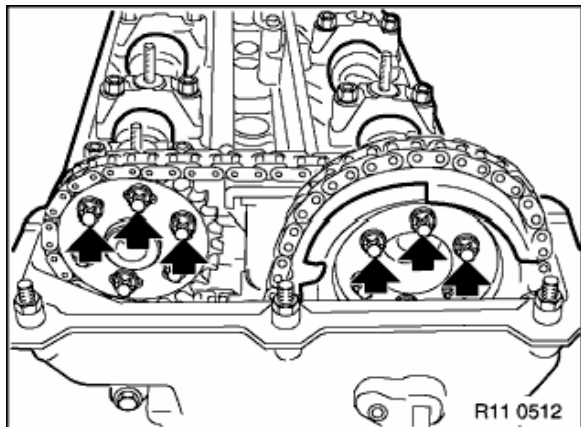
Remove fan clutch with impeller,  
refer to 11 52 020.



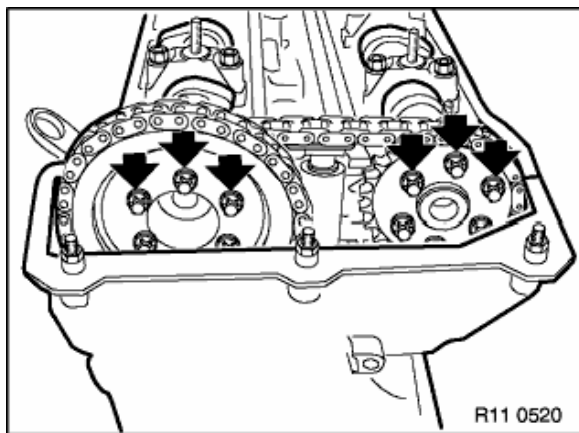
Remove all oil lines to left and right cylinder head.



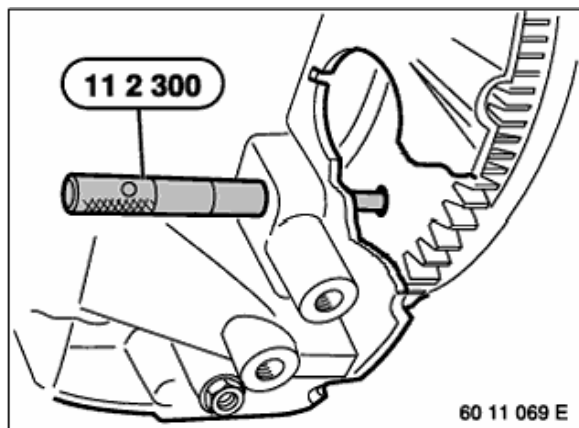
Crank engine at central bolt in direction of rotation until the first cylinder is in TDC position.



Unfasten the accessible three screws on exhaust and inlet camshafts on cylinder bank 1 to 4 approx. 1/2 a turn.



Unfasten the accessible three screws on exhaust and inlet camshafts on cylinder bank 5 to 8 approx. 1/2 a turn.



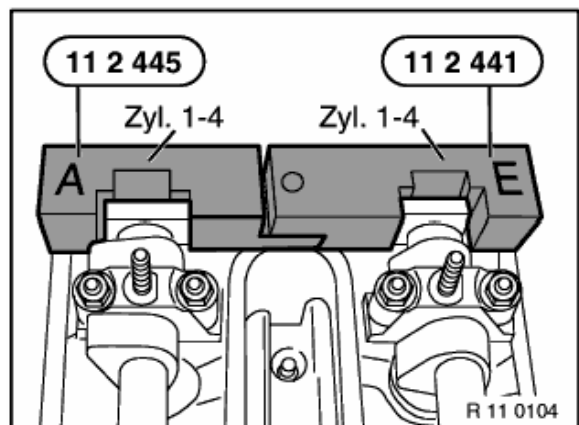
Turn over engine once.

**Caution!**

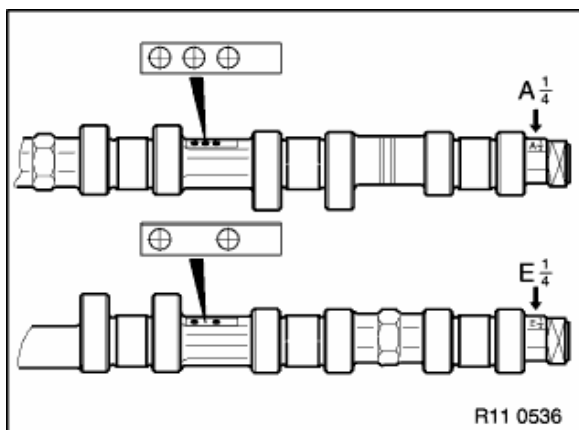
Do not turn the engine back.

Secure crankshaft with special tool 11 2 300 in TDC position of first cylinder.

Remove special tool 11 2 300 before switching on the engine.

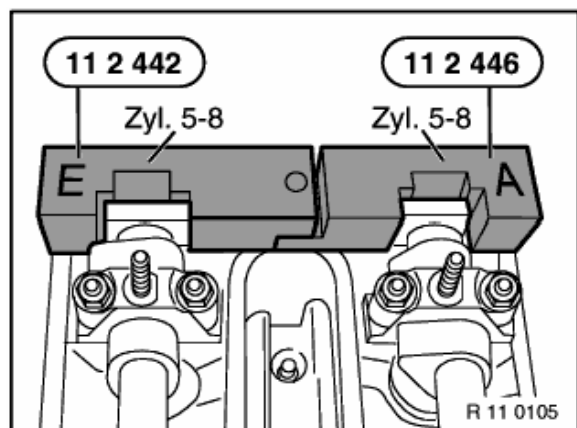


Fit special tool 11 2 445 / 441 to camshafts on cylinder bank 1 to 4.

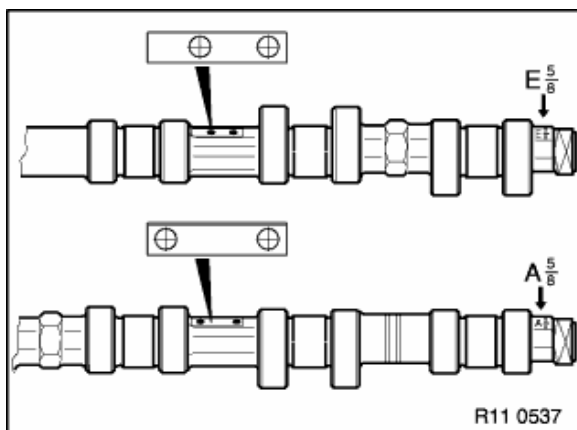


**Note:**

In TDC position of first cylinder, marker bores of camshafts point upwards.

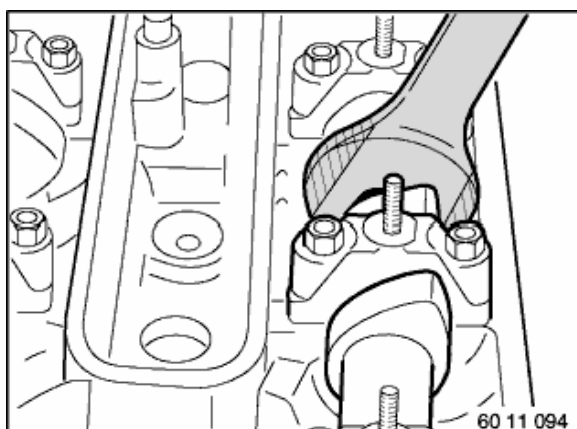


Fit special tool 11 2 446 / 442 to camshafts on cylinder bank 5-8.



**Note:**

In TDC position of first cylinder, marker bores of camshafts point upwards.

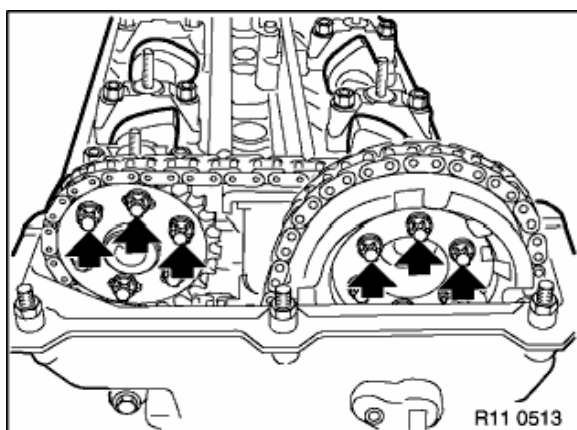


**Note:**

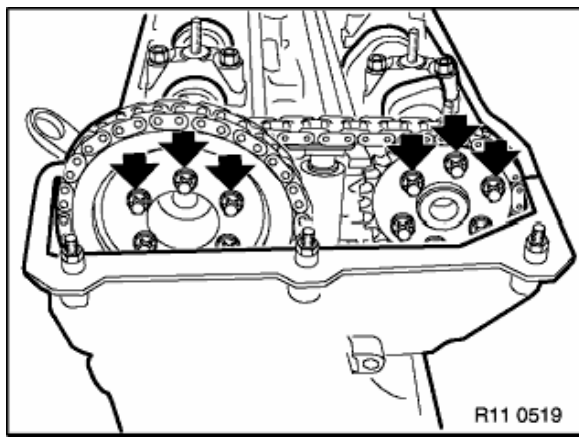
When unfastening screw connection on camshaft, brace camshaft on hex head.

**Caution!**

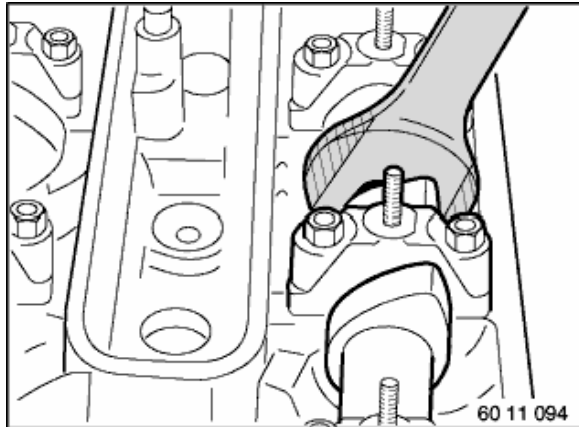
Do not damage the cylinder head.  
If necessary, machine open-end wrench accordingly.



Unfasten remaining three screws on exhaust and inlet camshafts on cylinder bank 1 to 4 approx. 1/2 a turn.



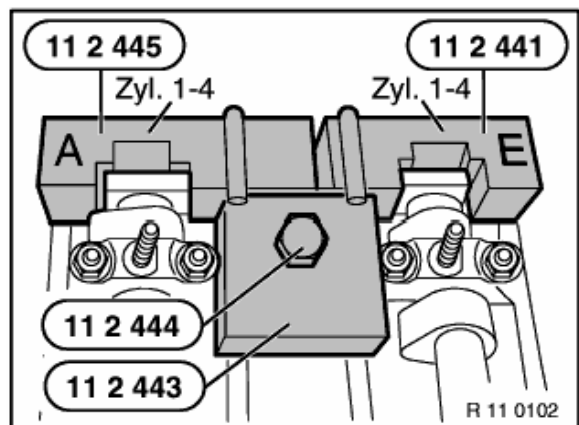
Unfasten remaining three screws on exhaust and inlet camshafts on cylinder bank 5 to 8 approx. 1/2 a turn.



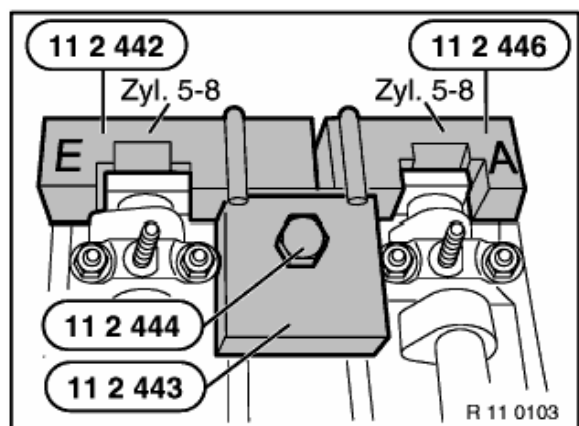
Align all camshafts with open-end wrench in such a way that special tools 11 2 445 / 441 / 446 / 442 locate firmly against cylinder heads.

**Caution!**

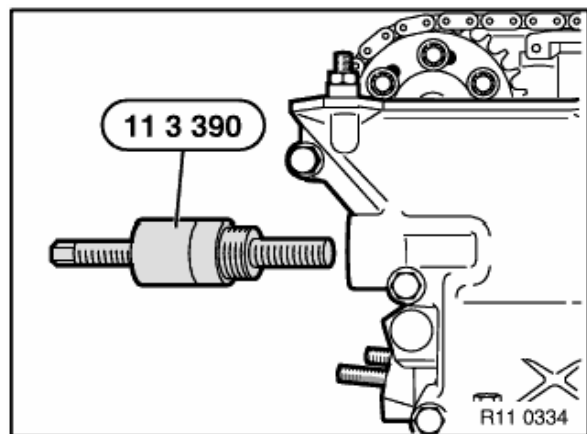
Do not damage the cylinder head.



Fit special tool 11 2 443 to special tool 11 2 445 / 441 and secure with special tool 11 2 444 using the spark plug thread.

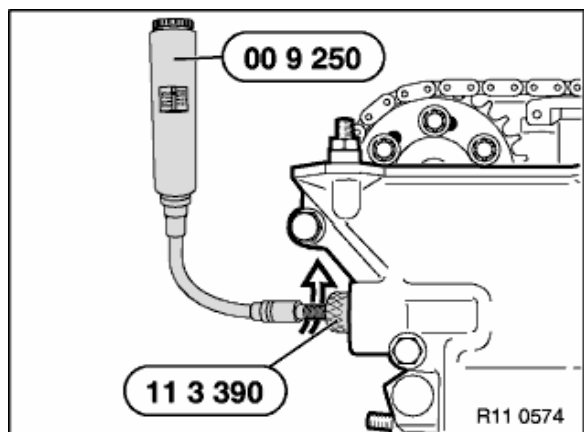


Fit special tool 11 2 443 to special tool 11 2 446 / 442 and secure with special tool 11 2 444 using the spark plug thread.



Remove piston for chain tensioner,  
refer to 11 31 090.

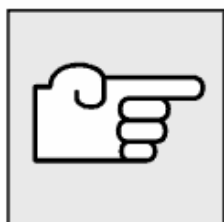
Install special tool 11 3 390 in right timing case cover.



Tighten bow cover by turning the adjusting screw on the special  
tool 11 3 390 with special tool 00 9 250 to 0.7 Nm.

**Note:**

If installation tolerance is unfavorable, attach special  
tool 00 9 250 from underside.



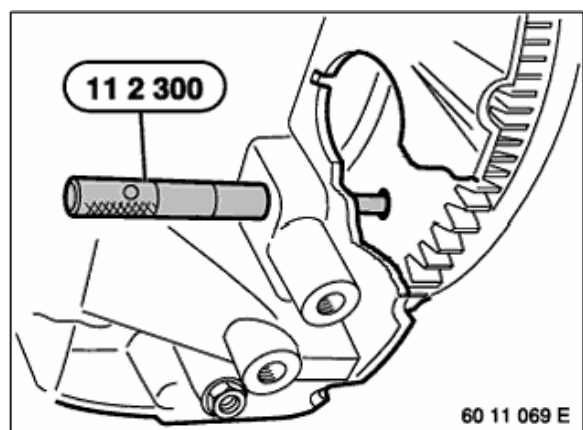
Tighten sprockets in the following order:

Three accessible screws on

1. Exhaust camshaft, left (5 to 8)
2. Exhaust camshaft, right (1 to 4)
3. Inlet camshaft, left (5 to 8)
4. Inlet camshaft, right (1 to 4)

Tightening Torque,

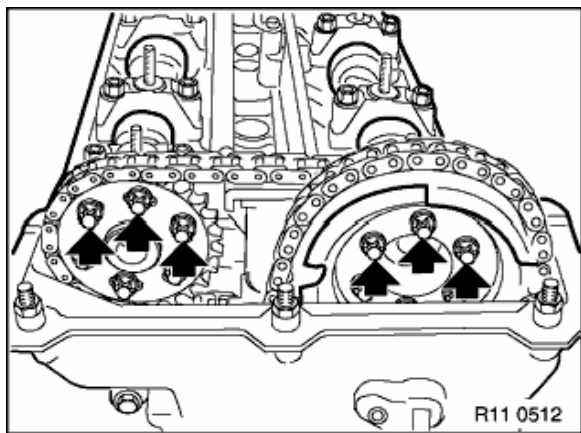
refer to Technical Data 11 31 3AZ.



Remove special tool 11 2 300.

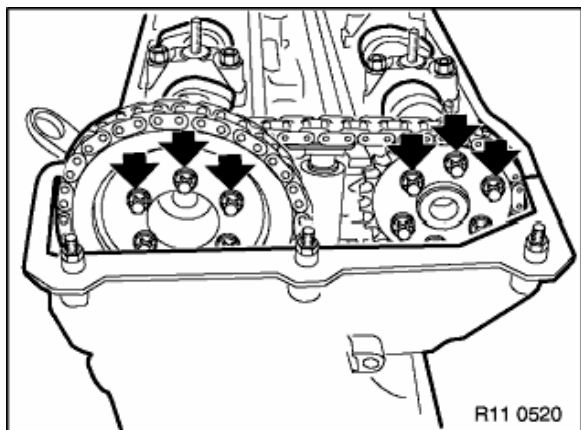
Remove special tools from camshafts.

Turn over engine once.



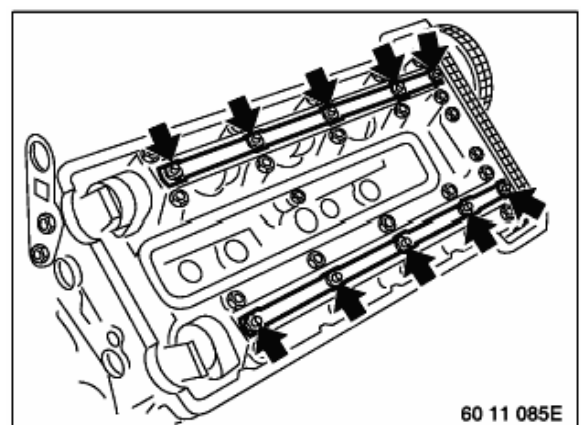
Tighten down remaining three screws on exhaust and inlet camshafts on cylinder bank 1 to 4 firmly.

Tightening Torque,  
refer to Technical Data 11 31 3AZ.

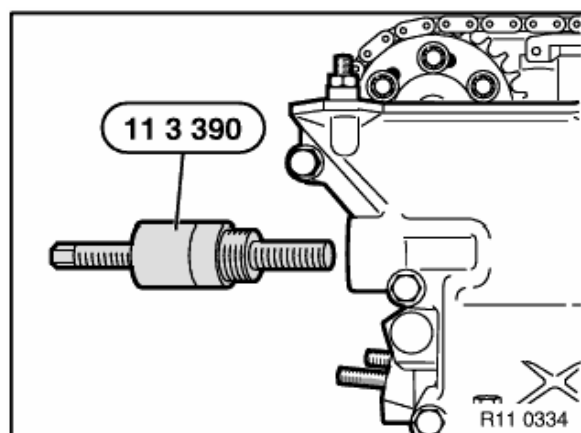


Tighten down remaining three screws on exhaust and inlet camshafts on cylinder bank 5 to 8 firmly.

Tightening Torque,  
refer to Technical Data 11 31 3AZ.



Install all oil lines to left and right cylinder heads.



Unfasten and remove special tool 11 3 390.

Assemble engine.