

Cylinder Head

Special tools and workshop equipment required

Locking Pin -T40069-

Cam shaft Locator -T40070-

Removing

1 Engine installed.



Note

The following removal and installation procedure is for the left cylinder head. The procedure for the other side is identical.



WARNING

Fuel system is under high pressure! Before opening high pressure components of the fuel injection system, pressure must be relieved to residual pressure. Refer to [→ Fuel Injection and Ignition; Rep. Gr.24.](#)

- Drain the coolant. Refer to [→ Chapter „Cooling System, Draining and Filling“](#).
- Remove front exhaust pipe. Refer to: Left [→ Chapter „Left Front Exhaust Pipe with Catalytic Converter“](#), right [→ Chapter „Right Exhaust Pipe with Catalytic Converter“](#).
- Remove ribbed belt. Refer to [→ Chapter „Ribbed Belt“](#)
- Remove front coolant pipe. Refer to [→ Chapter „Front Coolant Pipe“](#).
- Remove the power steering pump. Refer to [→ Suspension, Wheels, Steering; Rep. Gr.48.](#)



Note

To remove the right cylinder head, the vacuum pump for brake booster must be removed. Refer to [→ Brake System; Rep. Gr.47.](#)

- Remove upper section of intake manifold. Refer to [→ Fuel Injection and Ignition; Rep. Gr.24.](#)
- Remove intake manifold lower part. Refer to [→ Fuel Injection and Ignition; Rep. Gr.24.](#)
- Disconnect electrical harness connectors at fuel injectors.

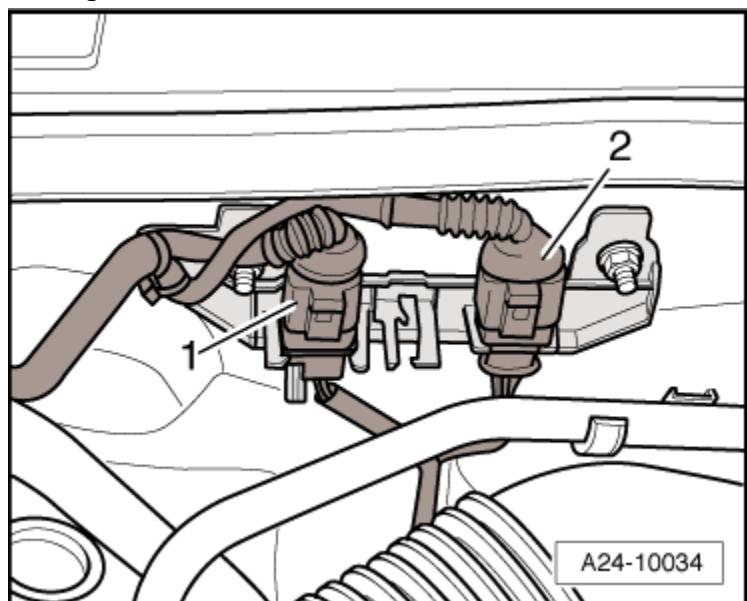
- Disconnect the oxygen sensor connector - 1 - in front of the catalytic converter and free up the wire.



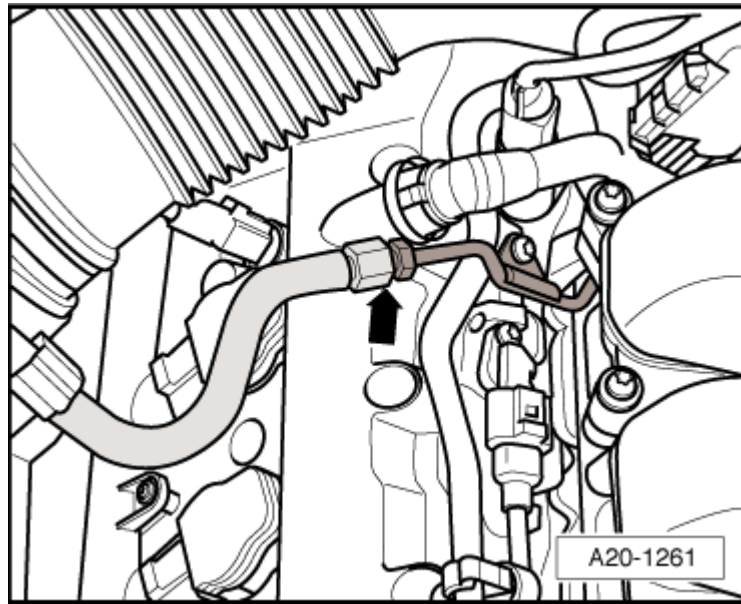
Note

Ignore -2-.

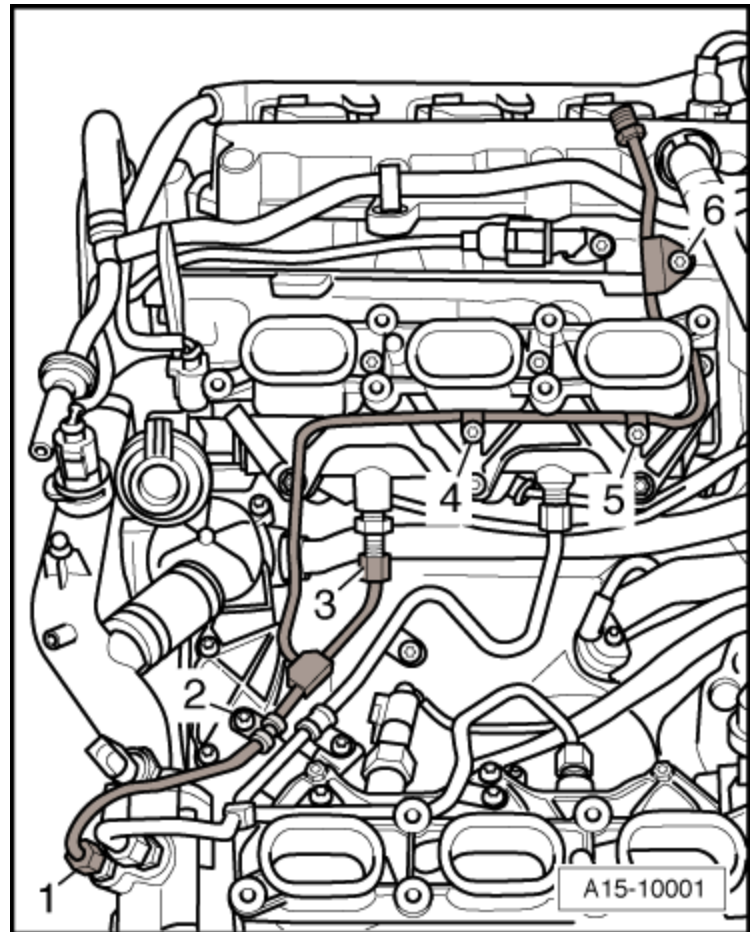
- Remove oil filter housing. Refer to [→ Chapter „Oil Filter Housing“](#).



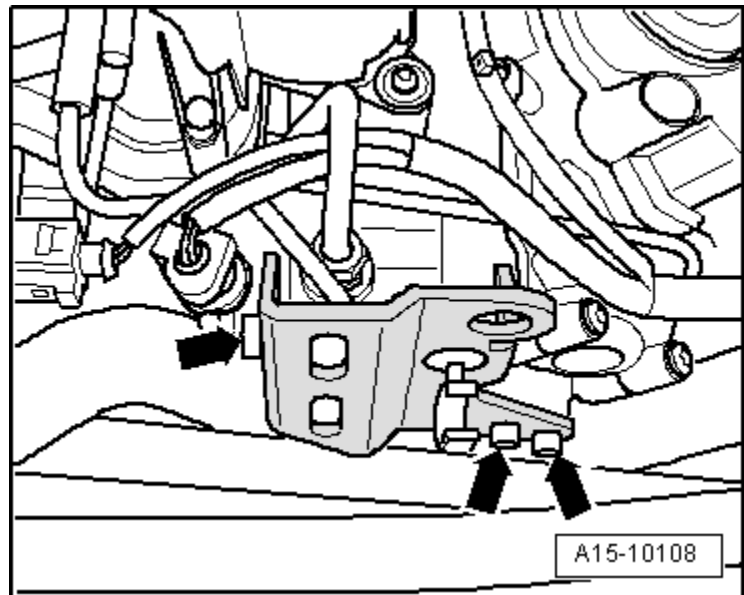
- Disconnect fuel line -arrow -.



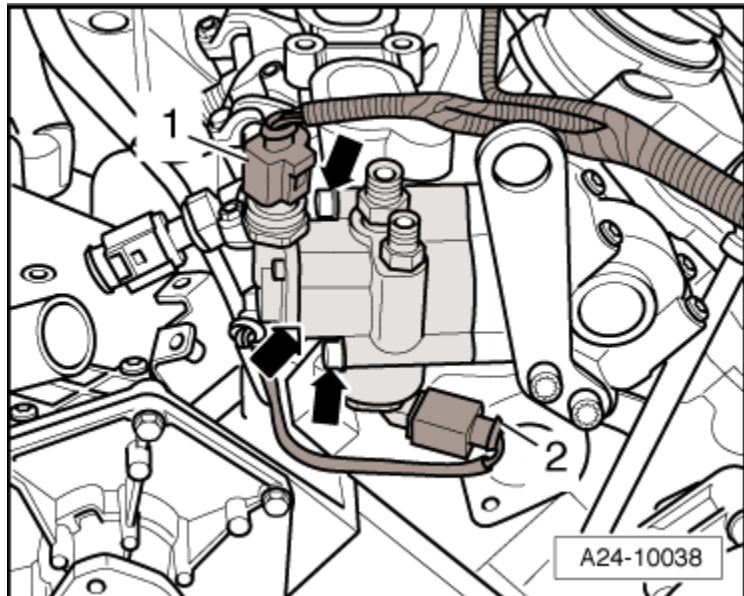
- Remove the low pressure line, thereby removing bolts and union nuts -1 through 6-.



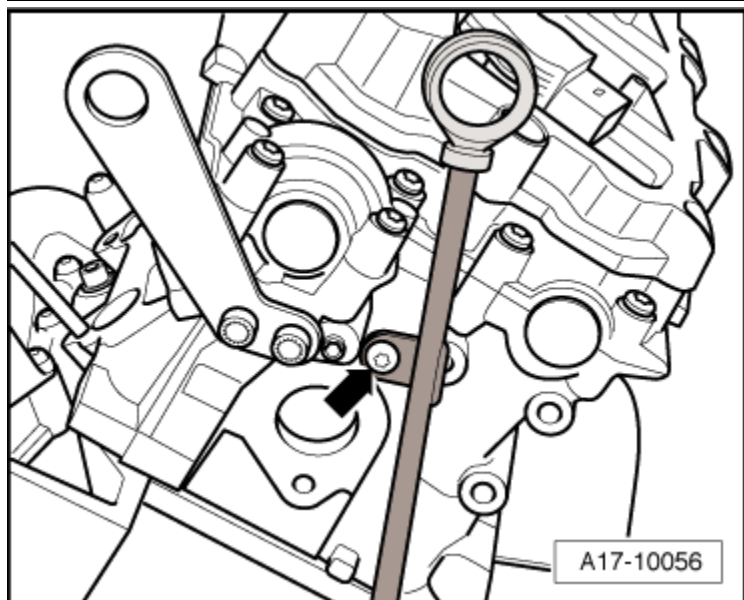
- Remove big lifting eye -arrows-, if equipped.



- Disconnect connectors -1- and -2-.
- If necessary, remove high pressure pump from left cylinder head -arrows-.



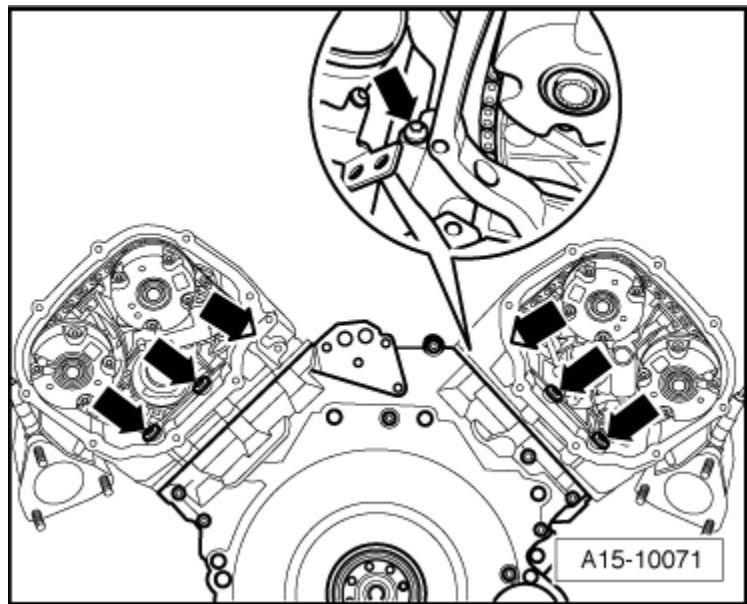
- Remove bolt -arrow- and pull oil dipstick guide tube upward and out.
- Remove cylinder head cover. Refer to: Left → [Chapter „Left Cylinder Head Cover“](#), right → [Chapter „Right Cylinder Head Cover“](#).
- Remove left and right timing chain covers. Refer to → [Chapter „Left and Right Timing Chain Covers“](#).
- Remove cam shaft timing chains from the cam shafts. Refer to → [Chapter „Cam shaft Timing Chain, Removing from Cam shaft Chain Tensioner“](#).



- Remove bolts -arrows- at rear of cylinder head.

t Left cylinder head: 3 bolts.

t Right cylinder head: 4 bolts.



- Follow sequence -1 to 8-when loosening cylinder head bolts.

- Carefully remove cylinder head.

Installing



Note

t Replace cylinder head bolts.

t During assembly, replace self-locking nuts and bolts.

t Always replace bolts that are tightened to torque as well as O-rings and gaskets.

t Carefully remove residual sealant from cylinder head and cylinder block. Make sure that no long scrapes or scratches result.

t Carefully remove all grinding and sanding residue.

t There must be no oil or coolant in the blind holes for the cylinder head bolts in the cylinder block.

Checking cylinder head for distortion.

t Refer to → [Fig. „Checking Cylinder Head for Distortion“](#).

t Only unpack new cylinder head gasket immediately prior to installation.

t Handle gasket carefully. Damage in silicon layer and recessed area lead to leakage.

t Install cylinder head gasket onto guide sleeves. Marking "oben" (top) or part number must face toward cylinder head.

After installing a replacement cylinder head with cam shafts installed, oil contact surfaces between roller cam followers and cam lubricating surfaces after installing cylinder head.

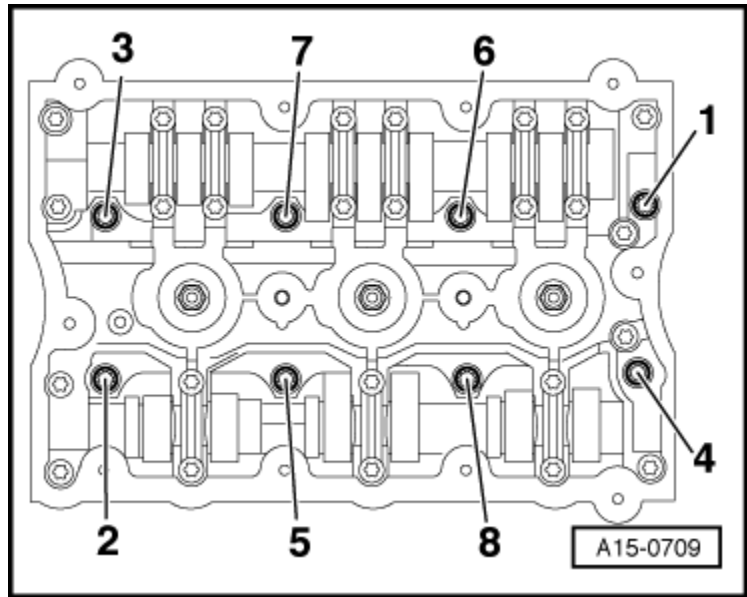
Do not remove plastic bases protecting free top valves until immediately before installing cylinder head.

When replacing cylinder head or cylinder head seal, coolant and engine oil must be changed.

Secure all hose connections with hose clamps appropriate for the model. Refer to [→ Electronic Parts Catalog "ETKA"](#).

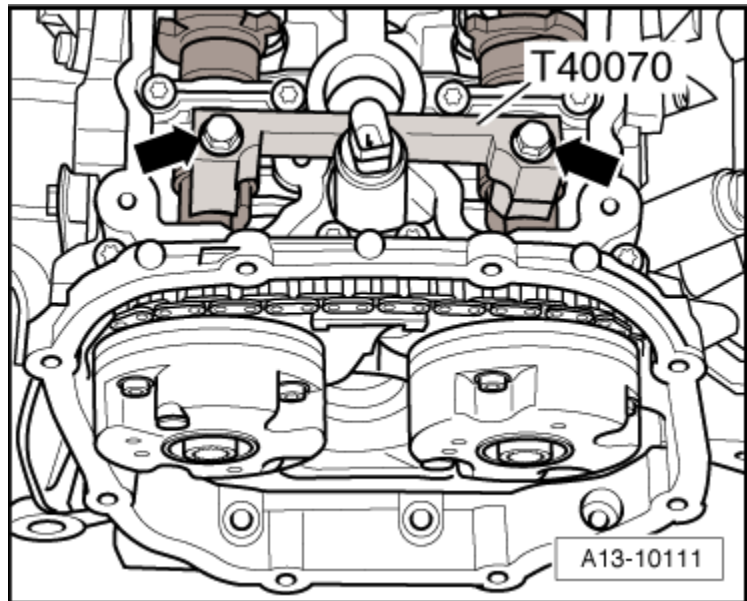
During installation, all cable ties must be re-installed at the same location.

After working on the valvetrain, carefully rotate engine by hand at least 2 full revolutions to ensure that valves do not strike the pistons when starting.



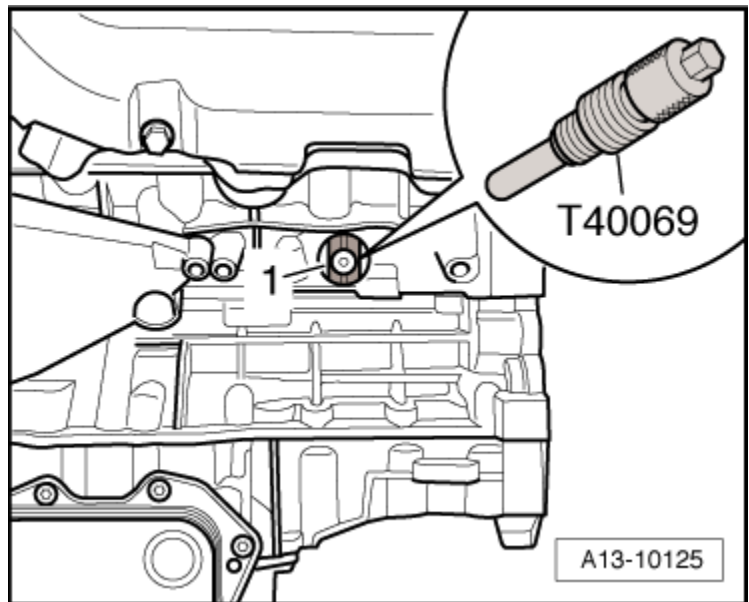
Before installing the cylinder head, set the crankshaft and cam shafts to the TDC setting by mounting the Cam shaft Locating Tool -T40070- on both cylinder heads and tightening it to 20 Nm.

The Cam shaft Locating Tool -T40070- is correctly positioned when the holes for the cylinder head bolts remain free.

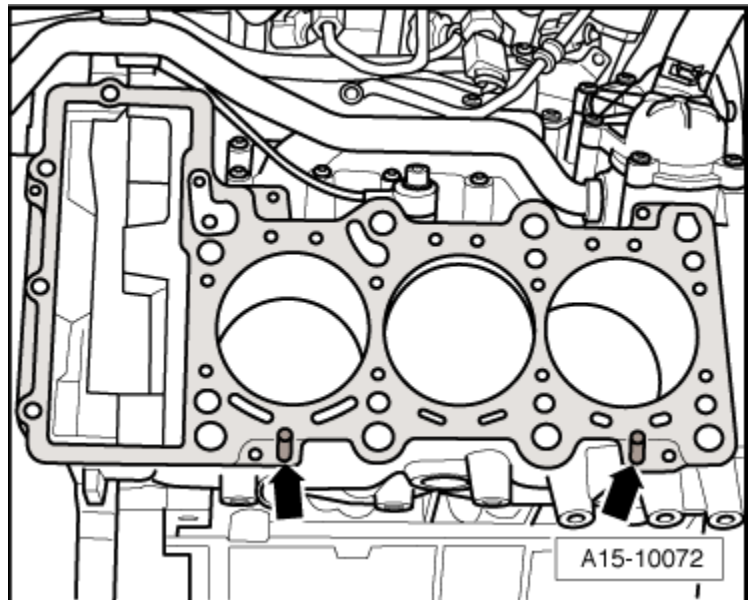


1 Crankshaft Holder -T40069- must be screwed into the crankshaft.

- Position cylinder head gasket.



- 1 Pay close attention to centering pins - arrow s- in cylinder block.
- Pay attention to installation position of cylinder head gasket, marking "oben" (top) or part number must face toward cylinder head.
- 1
- Install cylinder head.

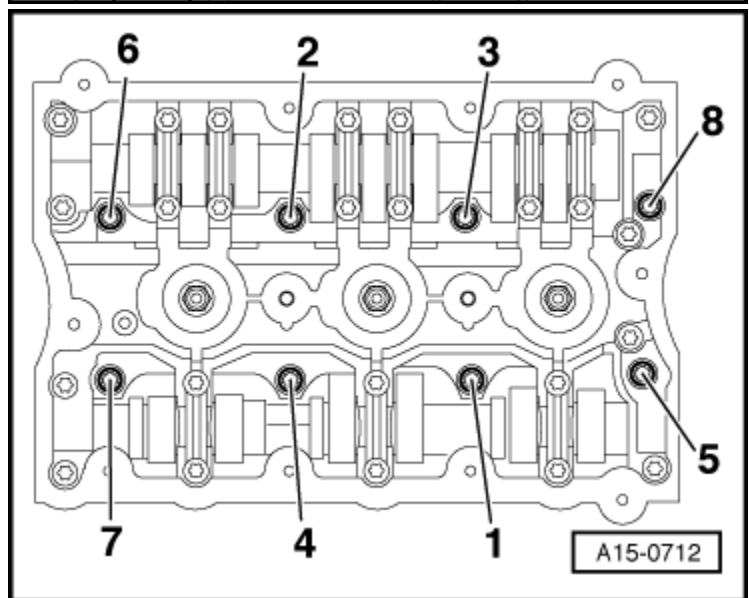


- Insert new cylinder head bolts and tighten by hand.
- Tighten cylinder head in sequence indicated, in 3 stages as follows:
- 1. Tighten to 40 Nm .
- 2. Tighten an additional 90°.
- 3. Tighten an additional 90°.



Note

There is no requirement to retighten the cylinder head bolts.



- Tighten the bolts -arrows- to 9 Nm .

t Left cylinder head: 3 bolts.

t Right cylinder head: 4 bolts.

Further installation is performed in reverse order of removal, noting the following:

- Install the cam shaft timing chains. Refer to [→ Anchor](#).

- Install left and right timing chain covers. Refer to [→ Chapter „Left and Right Timing Chain Covers“](#).

- Install cylinder head cover. Refer to: Left [→ Chapter „Left Cylinder Head Cover“](#), right [→ Chapter „Right Cylinder Head Cover“](#).

- Install high pressure pump. Refer to [→ Fuel Injection and Ignition; Rep. Gr.24](#).

- Install oil filter housing. Refer to [→ Chapter „Oil Filter Housing“](#).

- Install intake manifold lower-section with high and low pressure lines. Refer to [→ Fuel Injection and Ignition; Rep. Gr.24](#).

- Install intake manifold upper-section. Refer to [→ Fuel Injection and Ignition; Rep. Gr.24](#).

- Install the brake booster vacuum pump. Refer to [→ Brake System ; Rep. Gr.47](#).

- Install the power steering pump. Refer to [→ Suspension, Wheels, Steering; Rep. Gr.48](#).

- Install front coolant pipe. Refer to [→ Chapter „Front Coolant Pipe“](#).

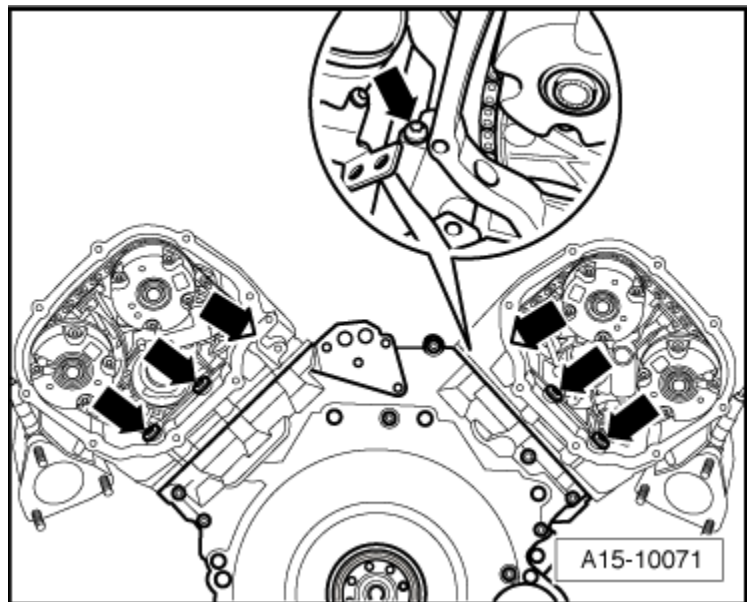
- Install ribbed belt. Refer to [→ Chapter „Ribbed Belt“](#).

- Install front exhaust pipe with catalytic converter. Refer to: Left [→ Chapter „Left Front Exhaust Pipe with Catalytic Converter“](#); right [→ Chapter „Right Exhaust Pipe with Catalytic Converter“](#).

- Align exhaust system free of tension. Refer to [→ Chapter „Exhaust System, Installing“](#).

- Replace engine oil. Refer to [→ Booklet 405](#).

- Replace coolant. Refer to [→ Chapter „Cooling System, Draining and Filling“](#).



- Fill the power steering fluid and bleed
– the steering system .Refer to
[→ Suspension, Wheels, Steering;Rep.
Gr.48.](#)

Tightening Specifications

Component	Nm
Oil dip stick guide tube to cylinder head	9
Fuel hose to fuel line	22