List of Workshop Manual Repair Groups

Repair Group

Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.

Codes		CPRA	CPKA
Research Octane Number (RON)	minimum	95 unleaded (in exceptional cases, minimum 91 RON, but with reduced performance)	95 unleaded (in exceptional cases, minimum 91 RON, but with reduced performance)
Injection system/ignition system		TFSI / SIMOS 12	TFSI / SIMOS 12
Ignition sequence		1-3-4-2	1-3-4-2
Turbocharger, Supercharger		Turbocharger	Turbocharger
Variable valve timing		yes (Intake)	yes (Intake)
Secondary air injection (AIR)		yes	no
Valves per cylinder		4	4
Oil Pressure Control		yes	yes

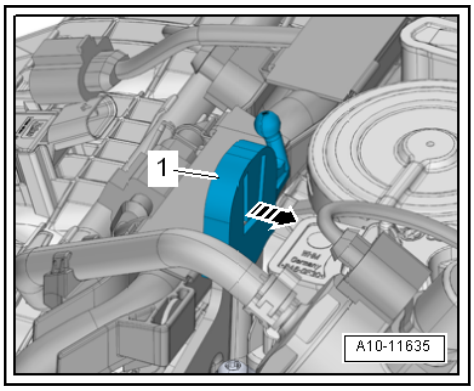
Codes		CPLA	CPLA	CPLA	CPLA	CPPA
Manufactured from		02/2013	02/2013	02/2013	02/2013	02/2013
Emissions values		BIN 5 TIER 2	EU 2	EU 5 Plus	Tier 2 BR	SULEV
Displacement	liters	2.0	2.0	2.0	2.0	2.0
Output	kW at RPM	155 at 5300 to 6200	155 at 5300 to 6200	155 at 5300 to 6200	155 at 5300 to 6200	155 at 5300 to 6200
Torque	Nm at RPM	280 at 1700 to 5200	280 at 1700 to 5200	280 at 1700 to 5200	280 at 1700 to 5200	280 at 1700 to 5200
Bore	Diameter in mm	82.5	82.5	82.5	82.5	82.5
Stroke	mm	92.8	92.8	92.8	92.8	92.8
Compression ratio		9.6:1	9.6:1	9.6:1	9.6:1	9.6:1
Research Octane Number (RON)	minimum	95 unleaded (in exceptional cases, minimum 91 RON, but with reduced performance)	95 unleaded (in exceptional cases, minimum 91 RON, but with reduced performance)	95 unleaded (in exceptional cases, minimum 91 RON, but with reduced performance)	95 unleaded (in exceptional cases, minimum 91 RON, but with reduced performance)	95 unleaded (in exceptional cases, minimum 91 RON, but with reduced performance)
Injection system/ignition system		TFSI / SIMOS 12	TFSI / SIMOS 12	TFSI / SIMOS 12	TFSI / SIMOS 12	TFSI / SIMOS 12
Ignition sequence		1-3-4-2	1-3-4-2	1-3-4-2	1-3-4-2	1-3-4-2
Turbocharger, Supercharger		Turbocharger	Turbocharger	Turbocharger	Turbocharger	Turbocharger
Variable valve timing		yes (Intake)	yes (Intake)	yes (Intake)	yes (Intake)	yes (Intake)
Secondary air injection (AIR)		no	no	no	no	yes
Valves per cylinder		4	4	4	4	4
Oil pressure control		yes	yes	yes	yes	yes

♦ Engine and Gearbox Bracket -VAS6095A-

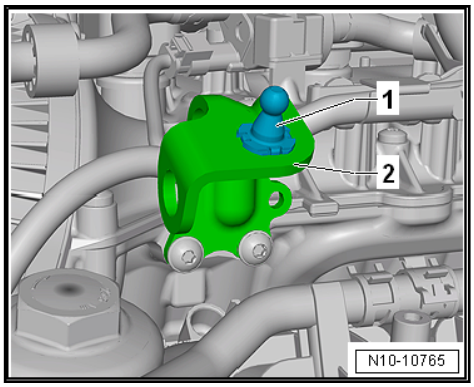
Procedure

- The transmission is separated from the engine. Refer to ⇒ a1.2 nd Transmission, Separating", page 19 .

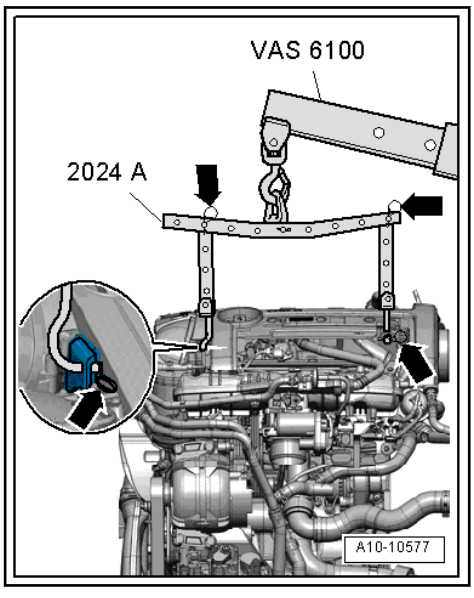
– Release the retainer in direction of -arrow- and remove the engine cover mount -1-.

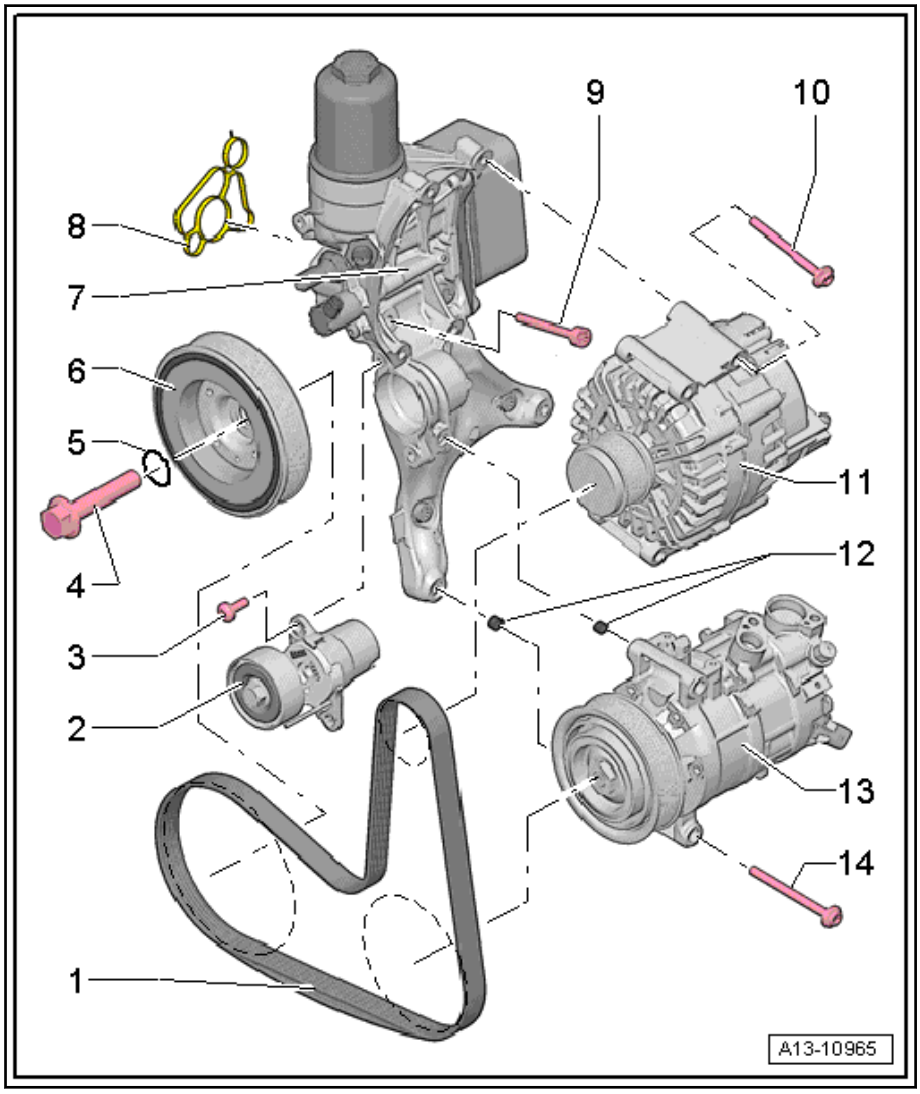


– Unclip the mount -1- for the right engine cover -2- from the hole.



– Engage the -2024A- onto the engine and onto the -VAS6100-.





1 - Ribbed Belt

- ❑ Check for wear
- ❑ Do not kink
- ❑ Ribbed belt routing. Refer to ⇒ page 50
- ❑ Removing and installing. Refer to ⇒ B1.2 elt, Removing and Installing", page 49 .
- ❑ When installing, make sure it is seated correctly on the belt pulleys

2 - Ribbed Belt Tensioner

- ❑ To release tension on the ribbed belt, pivot using an open end wrench.
- ❑ Secure using the -T10060A-
- ❑ Removing and installing. Refer to ⇒ B1.3 elt Tensioner, Removing and Installing", page 51 .

3 - Bolt

- ❑ 8 Nm +45°
- ❑ Replace after removing

4 - Bolt

- ❑ 150 Nm +90°
- ❑ Replace after removing
- ❑ Use the -T10355- to loosen and tighten

5 - O-ring

- ❑ Not a replacement part; supplied with the bolt

6 - Vibration Damper

- ❑ With ribbed belt pulley
- ❑ Removing and installing. Refer to ⇒ D1.4 amper, Removing and Installing", page 51 .

7 - Sub-Assembly Bracket

- ❑ Removing and installing. Refer to ⇒ B1.5 racket, Removing and Installing", page 58 .

8 - Seal

- ❑ Replace after removing

9 - Bolt

- ❑ Tightening specification and sequence. Refer to ⇒ Fig. ""Sub-Assembly Bracket - Tightening Specifications and Sequence"", page 49 .

10 - Bolt

- ❑ Tightening specification. Refer to ⇒ Electrical Equipment; Rep. Gr. 27; Generator; Overview - Generator.

11 - Generator

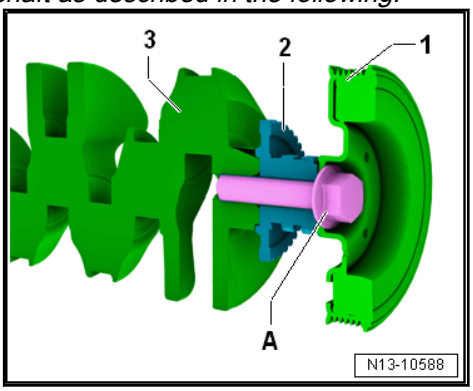
- ❑ Overview. Refer to ⇒ Electrical Equipment; Rep. Gr. 27; Generator; Overview - Generator.

12 - Alignment Sleeves

- ❑ For the A/C compressor

Note

The vibration damper bolt -A- connects the vibration damper -1-, the timing chain sprocket -2- and the crankshaft -3- with each other. Before removing the bolt, the chain sprocket must be secured to the crankshaft as described in the following.

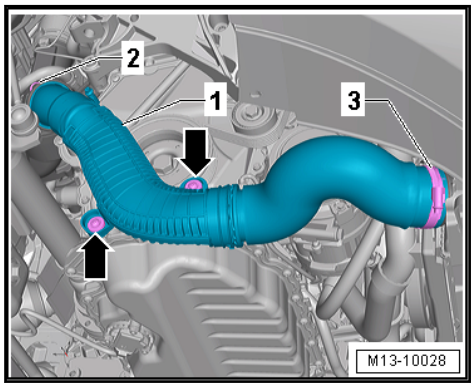


Removing

– Remove the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 66; Noise Insulation; Overview - Noise Insulation.

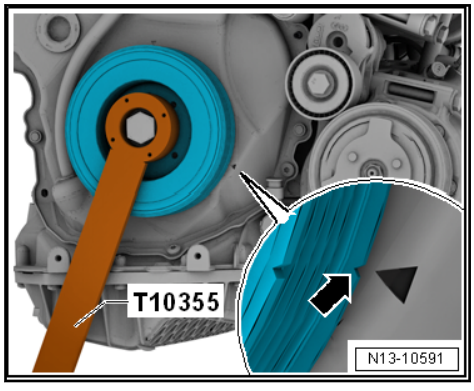
– Remove the right wheel housing liner. Refer to ⇒ Body Exterior; Rep. Gr. 66; Wheel Housing Liner; Front Wheel Housing Liner, Removing and Installing.

– Remove the bolts -arrows-.



– Remove the air duct pipe by lifting the clip -2- and opening the screw-type clamp -3-.

– Remove the ribbed belt. Refer to ⇒ B1.2 elt, Removing and Installing", page 49 .



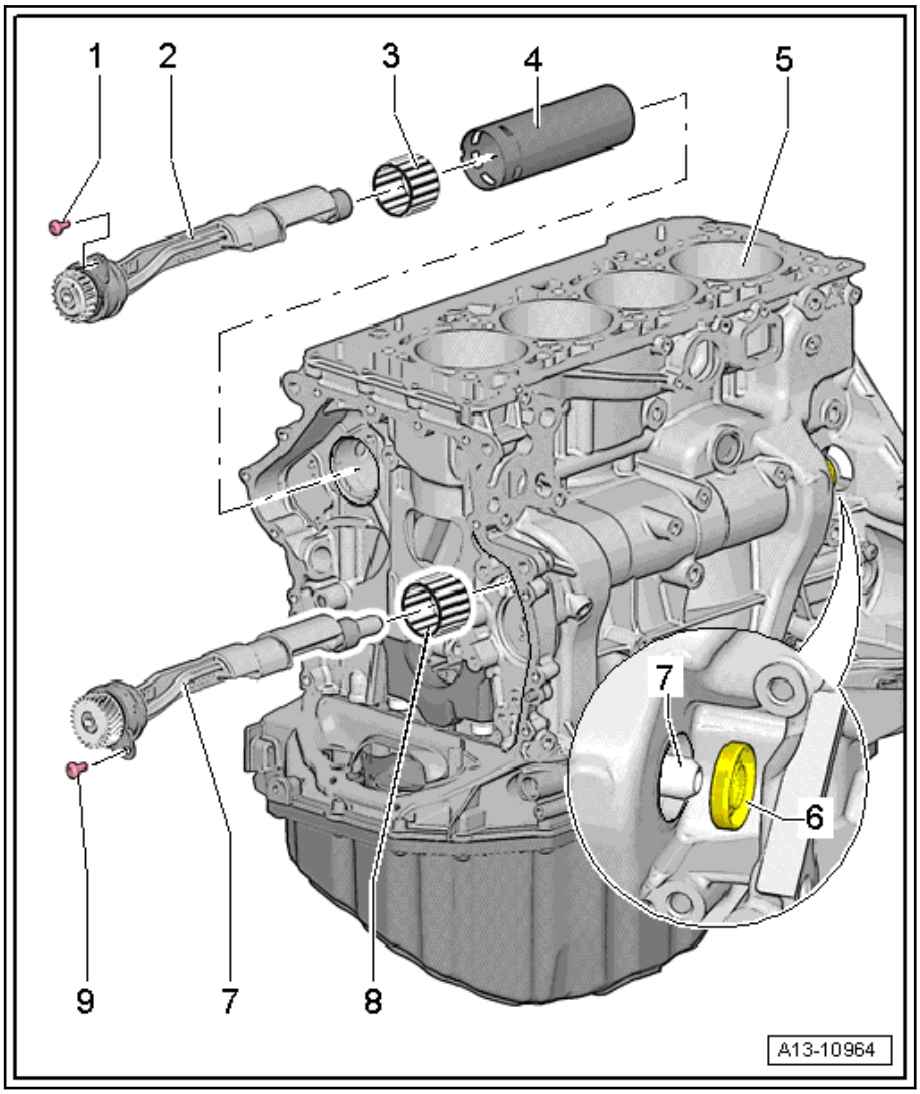
4 Balance Shaft

⇒ -4.1 Balance Shaft", page 89

⇒ S4.2 haft, Removing and Installing", page 90

⇒ S4.3 haft Sealing Ring, Replacing, Intake Side", page 95

4.1 Overview - Balance Shaft



1 - Bolt

- ❑ 4 Nm + 45° additional turn
- ❑ Replace after removing

2 - Balance Shaft

- ❑ Must be replaced after removing
- ❑ Exhaust side
- ❑ Lubricate the bearing with engine oil
- ❑ Replacing. Refer to ⇒ S4.2.2 haft, Removing and Installing, Exhaust Side", page 93 .

3 - Needle Bearing Rim

- ❑ Replace each time the balance shaft is removed
- ❑ No replacement part; part of the balance shaft delivery package

4 - Balance Shaft Pipe

- ❑ Installation position. Refer to ⇒ Fig. ""Balance Shaft Pipe Installation Position"", page 90

5 - Cylinder Block

6 - Intake Side Balance Shaft Seal

- ❑ Replacing. Refer to ⇒ S4.3 haft Sealing Ring, Replacing, Intake Side", page 95 .

7 - Balance Shaft

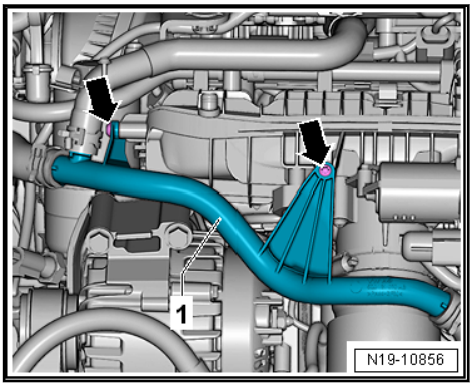
- ❑ Must be replaced after removing
- ❑ Intake side
- ❑ Lubricate the bearing with engine oil
- ❑ Replacing. Refer to ⇒ S4.2.1 haft, Removing and Installing, Intake Side", page 90 .

8 - Needle Bearing Rim

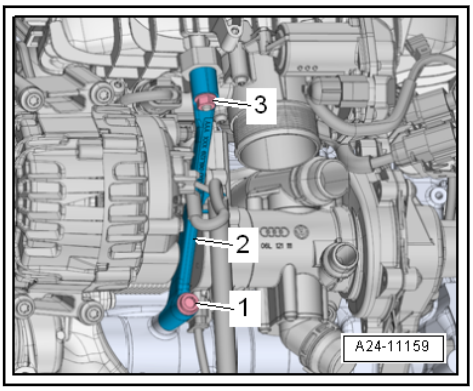
- ❑ No replacement part; part of the balance shaft delivery package

9 - Bolt

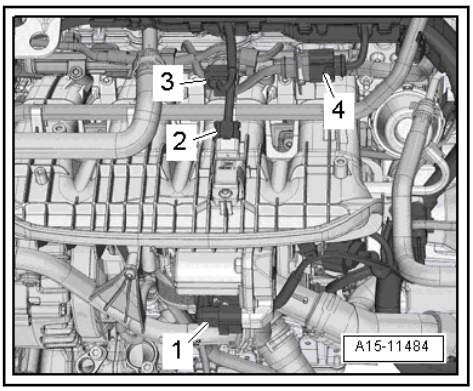
- ❑ Replace after removing
- ❑ 4 Nm + 45° additional turn



– Remove the bolt -1- and the nut -3- and then remove the bracket -2- for the intake manifold.



– Disconnect the connectors:



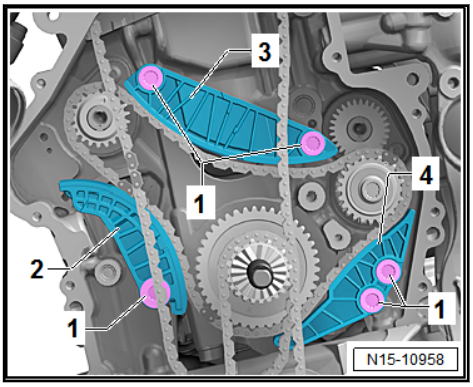
1 - For Throttle Valve Control Module -GX3-

2 - For the Intake Air Temperature Sensor -G42-/Manifold Absolute Pressure Sensor -G71-

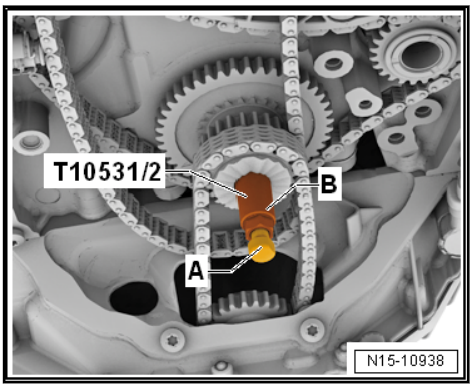
– Remove the connector -4- from the bracket.

– Free up the wiring harness and push it to the side.

– Loosen the hose clamp -3 and 5-.

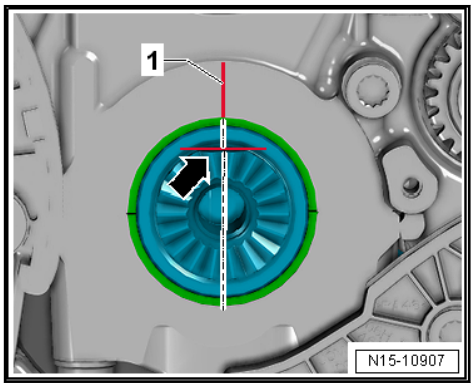


– Loosen the adjusting bolt -A- and remove the tensioning pin -B-.

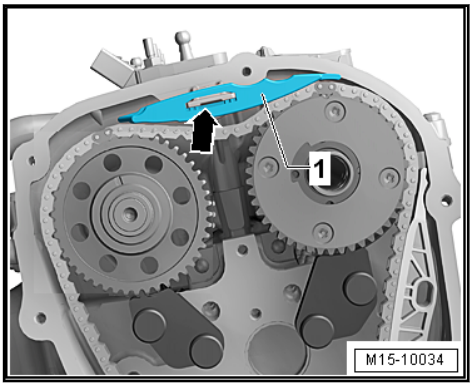


– Remove the oil pump drive timing chain to remove the three stage chain sprocket.
– Remove the camshaft timing chain and drive chain for the balance shaft.

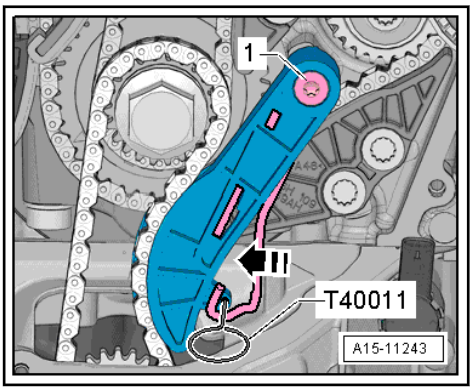
Installing



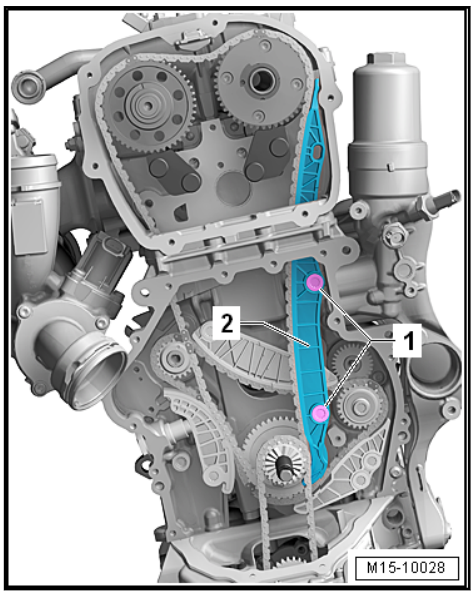
– Check the crankshaft at TDC. The flat area on the crankshaft -arrow- must be horizontal.
– Draw the markings on the cylinder block -1-, as shown, with a waterproof marker.
– Draw a marking -2- on the three stage chain sprocket tooth -1- with a waterproof marker.



– Press the oil pump chain tensioner bracket in direction of -arrow- and lock with -T40011-.

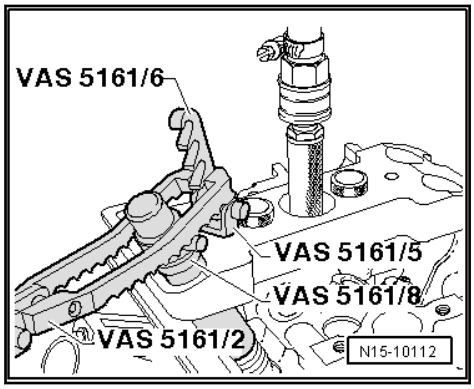


– Remove the bolt -1- and remove the chain tensioner.
– Remove the bolts -1- and remove the glide rail -2-.



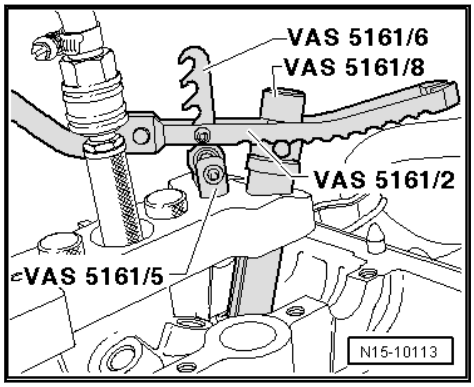
– Remove the camshaft timing chain from the camshaft bearing and guide downward.
– Install the -T10531/3-. In the “TDC point” the flat area -1- points upward. Install the -T10531/4-. Turn the crankshaft with a 32 mm open end wrench counter-clockwise out of “TDC”.

For the Intake Side



- Install the -VAS5161/6- with -VAS5161/5- in the center thread of the - VAS5161/19B-.
- Place the -VAS5161/8- in the -VAS5161/19B-.
- Engage the -VAS5161/2- on the -VAS5161/6-.

For the Exhaust Side

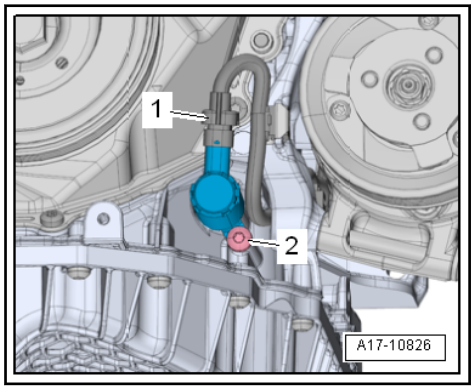


- Install the -VAS5161/6- with -VAS5161/5- in the outer thread of the -VAS5161/19B-.
- Press down the -VAS5161/8A- and at the same time turn the knurled thumb screw on the -VAS5161/8A- to the right until the points engage in the Valve retainers.
- Move the knurled thumb screw back and forth slightly. This presses the valve retainers apart and captures them in the installation cartridge.
- Release the -VAS5161/2-.
- Remove the -VAS5161/8A-.
- Remove the valve stem seals using -3364-.

– Remove the transmission side sealing flange. Refer to ⇒ F2.5 lange, Removing and Installing, Transmission Side", page 71 .

– Remove the oil pump. Refer to ⇒ P1.5 ump, Removing and Installing", page 215 .

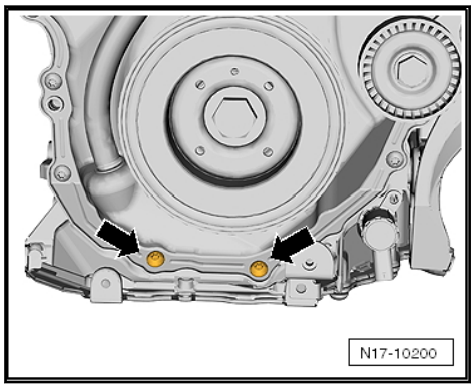
– Disconnect the connector -1-.



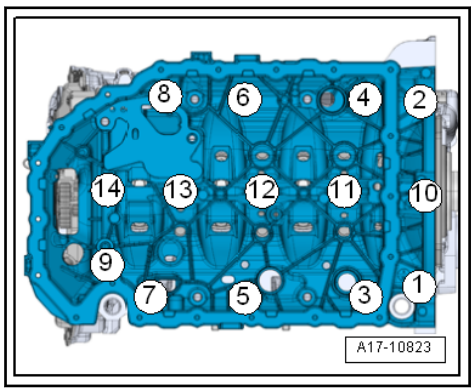
Note

Ignore -2-.

– Remove the bolts -arrows-.



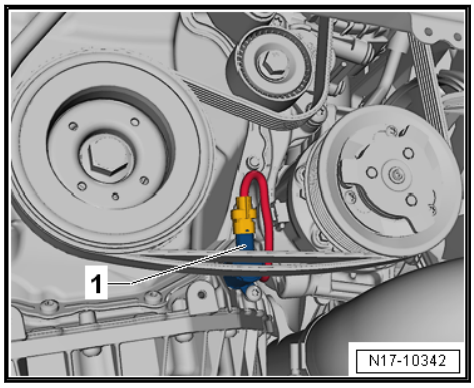
– Remove the bolts -1 through 14- and the upper section of the oil pan.



– First pry the oil pan upper section out on the transmission side. When prying out, be careful not to bend the timing chain cover.

– Remove the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 66; Noise Insulation; Overview - Noise Insulation.

– Remove the connector -1- from the Oil Pressure Regulation Valve -N428-. Unclip the cable and route downward so that is not in the belt drive unit. With the connector removed the oil pump only pumps in the higher pressure stage.



– Start the engine and check the oil pressure of the specified RPMs.

- Oil pressure at idle: 0.9 to 4.3 bar (13.05 to 62.36 psi)
- Oil pressure at 2000 RPM: 3.0 to 4.3 bar (43.5 to 62.36 psi)
- Oil pressure at 3700 RPM: 3.0 to 4.3 bar (43.5 to 62.36 psi)

If the specified value is not obtained:

– Check the oil intake pipe screen for contamination -item 11- ⇒ Item 11 (page 206) .

– Check the Oil Pressure Regulation Valve -N428-. Refer to Vehicle Diagnostic Tester.

Note

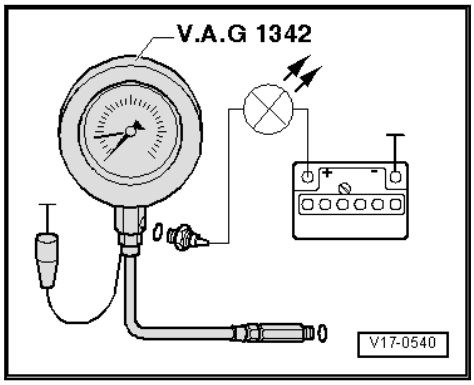
Also, mechanical damage, for example, bearing damage can also be the cause of too low oil pressure.

If no error can be found:

– Replace the oil pump. Refer to ⇒ P1.5 ump, Removing and Installing", page 215 .

Checking the Reduced Oil Pressure Switch -F378- (Brown):

– Switch the engine off.



– Connect the brown wire on the tester to the ground (-).

1 - Clip

- ❑ Check that it is secure

2 - O-ring

- ❑ Replace after removing

3 - Engine Coolant Temperature Sensor on Radiator Outlet -G83-

- ❑ Refer to ⇒ E2.9 ngine Coolant Temperature Sensor on Radiator Outlet G83, Removing and Installing", page 262

4 - Connector

- ❑ On the Engine Coolant Temperature Sensor - G62-

5 - Engine Coolant Temperature Sensor -G62-

- ❑ Refer to ⇒ E2.8 ngine Coolant Temperature Sensor G62, Removing and Installing", page 261

6 - O-ring

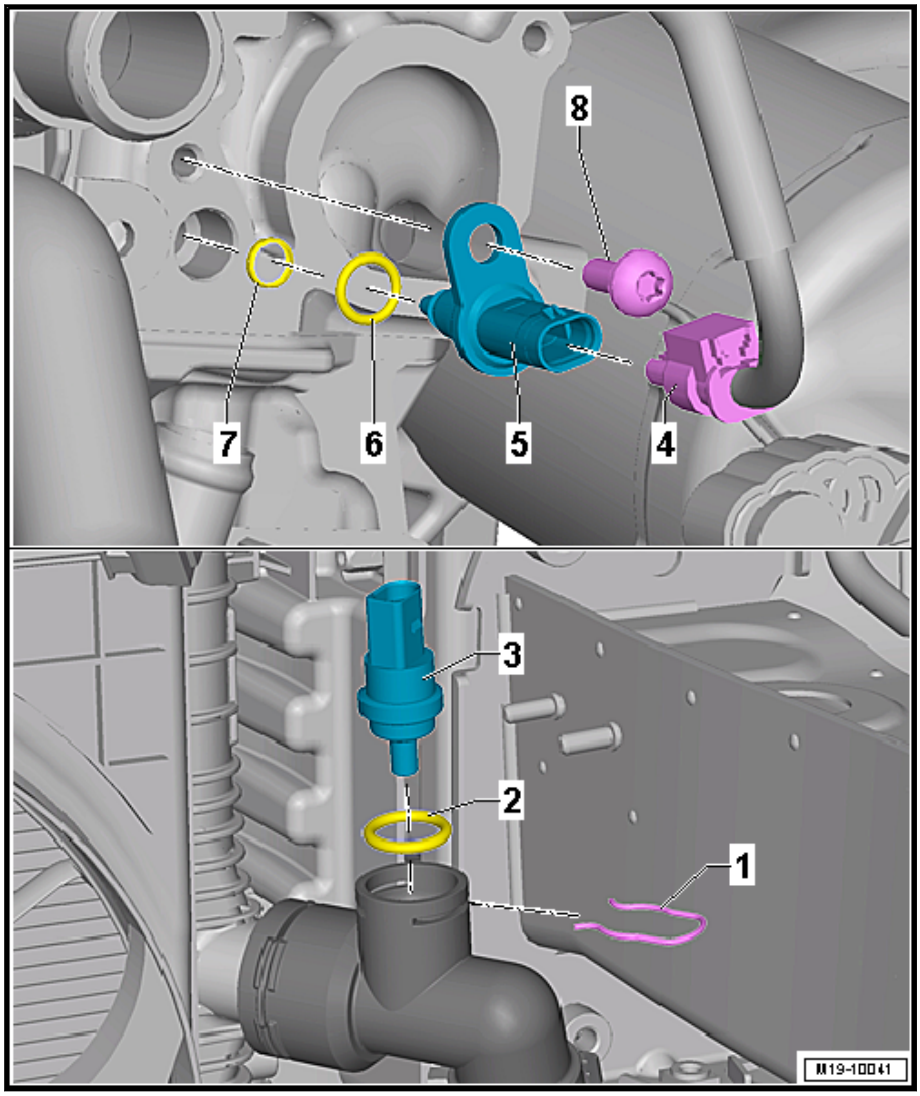
- ❑ Replace after removing
- ❑ Coat with coolant

7 - O-ring

- ❑ Replace after removing
- ❑ Coat with coolant

8 - Bolt

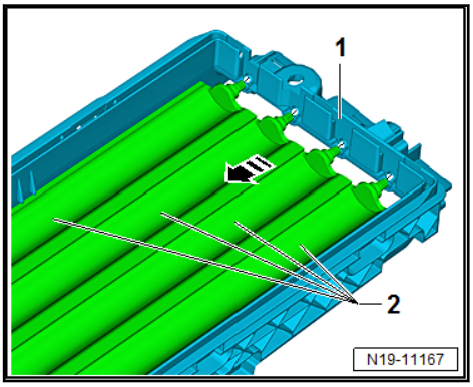
- ❑ 4 Nm +45°
- ❑ Replace after removing



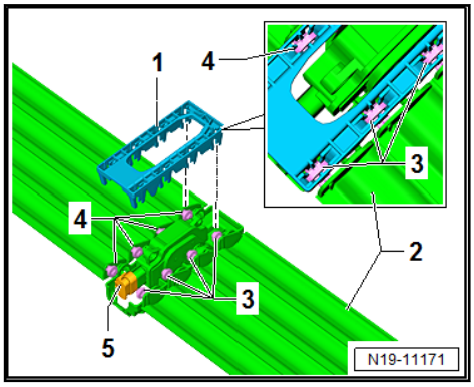
2.4 After-Run Coolant Pump -V51-, Removing and Installing

Special tools and workshop equipment required

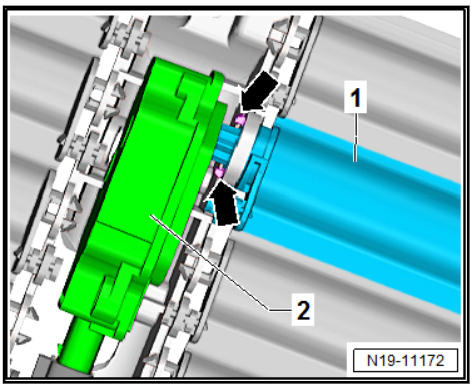
- ♦ Hose Clamps - Up To 25 mm -3094-
- ♦ Hose Clip Pliers -VAS6340-
- ♦ Hose Clip Pliers -VAS6362-



– Lift the doors -2- for the right side from the frame -1-.
– Mark the installation position of the connecting bridge -1-.



– Use the connector terminal -5- as a reference point.
– Lift the connecting bridge -1- from the guide rollers -3- and -4- of the doors -2-.
– Remove the control door -1- from the Radiator Shutter Motor -V544- -2-.



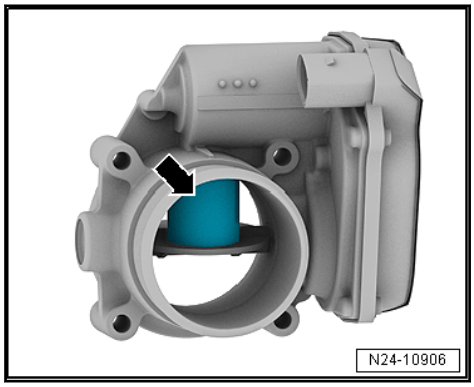
– To do so release the tabs -arrows-.
– Remove the bolt -3-, if equipped.

Note

- *If a new Engine Control Module -J623- is installed, then it must be adapted to the throttle valve control module.*
- *Dirt and coking on the end stop can produce incorrect adaptation values.*
- *The throttle valve connections must not be scratched when cleaning.*

– Remove the Throttle Valve Control Module -GX3-. Refer to ⇒ T4.3 hrottle Valve Control Module GX3, Removing and Installing", page 338 .

– Open the throttle valve by hand and hold it in this position using a plastic or wood wedge -arrow-.

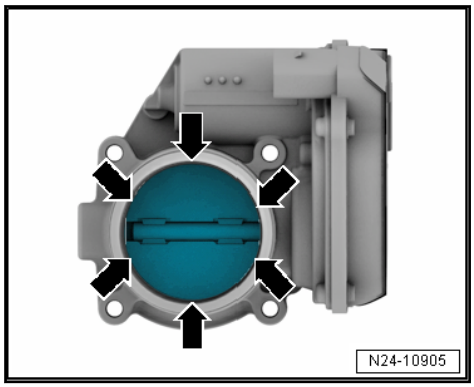


Caution

Risk of injury from acetone. Acetone is highly flammable and can cause eye and skin irritation.

- ***Wear protective eyewear.***
- ***Wear safety gloves.***

– Clean the throttle valve connection thoroughly with acetone and a brush especially in the area -arrows- near the closed throttle valve.



– Wipe the throttle valve connections with a lint-free cloth.

– Let the acetone dry completely.