Workshop Manual

Ateca 2017 ➤
León 2013 ➤
León ST 2013 ➤

4-cylinder diesel engine (1.6 l and 2.0 l 4V, TDI Common Rail, EA288)									
Engine ID	DDYA	DFFA	DFHA	CRVA	CRVC	DFGA	DGTE	CLHA	CLHB
	CKFC	CUPA	CRMB	CKFB	CUNA	CRKB	CRLB	CRBC	CXXB
	CXXA	DBKA	CRGA	CRLD	DDYB	DCYA	DJGA		

Edition 06.2018

SEAT

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

erWin

List of Workshop Manual Repair Groups

Repair Group

00 - Technical data
10 - Removing and installing engine
13 - Crankshaft group
15 - Cylinder head, valve gear
17 - Lubrication
19 - Cooling
21 - Turbocharging/supercharging
23 - Mixture preparation - injection
26 - Exhaust system
28 - Glow plug system

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

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.

All rights reserved.
No reproduction without prior agreement from publisher.

Copyright © 2018 Seat S.A

Contents

00 - Technical data 1
1 Safety instructions 1
1.1 Safety precautions when working on fuel supply system 1
1.2 Safety precautions when working on vehicles with start/stop system 2
1.3 Safety precautions during road tests in which test and measuring equipment is used 2
1.4 Safety precautions when working on the cooling system 2
1.5 Safety precautions when working on the SCR system 2
1.6 Safety precautions when working on exhaust system 4
2 Identification 6
2.1 Engine number, engine data 6
3 Repair instructions 17
3.1 Rules for cleanliness 17
3.2 Foreign objects in engine 17
3.3 Contact corrosion 17
3.4 Routing and attachment of lines 18
3.5 Installing radiators, coolers and condensers 18
4 Technical data 19
4.1 Coolant 19

10 - Removing and installing engine 20
1 Removing and installing engine 20
1.1 Removing engine 20
1.2 Separating engine and gearbox 30
1.3 Securing engine to engine and gearbox support 35
1.4 Installing engine 37
2 Assembly mountings 42
2.1 Assembly overview - assembly mountings 42
2.2 Removing and installing engine mountings 43
2.3 Removing and installing gearbox mounting 45
2.4 Removing and installing pendulum support 47
2.5 Supporting engine in installation position 48
2.6 Adjusting assembly mounting 53
2.7 Checking adjustment of assembly mountings (engine and gearbox mountings) 55
3 Engine cover 56
3.1 Removing and installing engine cover panel 56

13 - Crankshaft group 57
1 Cylinder block (pulley end) 57
1.1 Assembly overview - cylinder block, pulley end 57
1.2 Assembly overview - sealing flange, pulley end 59
1.3 Removing and installing poly V-belt 59
1.4 Removing and installing tensioner for poly V-belt 61
1.5 Removing and installing vibration damper 61
1.6 Removing and installing ancillary bracket 62
1.7 Removing and installing engine support 63
1.8 Removing and installing sealing flange - pulley end 64
2 Cylinder block, gearbox end 68
2.1 Assembly overview - cylinder block, gearbox end 68
2.2 Removing and installing flywheel 69
2.3 Removing and installing sealing flange, gearbox side 70
3 Crankshaft 86
3.1 Assembly overview - crankshaft 86

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

3.2 Crankshaft dimensions . . . 87
3.3 Renewing needle bearing in crankshaft . . . 87
3.4 Measuring axial clearance of crankshaft . . . 89
4 Pistons and conrods . . . 91
4.1 Assembly overview - pistons and conrods . . . 91
4.2 Removing and installing pistons . . . 93
4.3 Measuring piston projection at TDC . . . 95
4.4 Checking pistons and cylinder bores . . . 97
4.5 Checking radial clearance of conrods . . . 98

15 - Cylinder head, valve gear . . . 100
1 Cylinder head . . . 100
1.1 Assembly overview - cylinder head . . . 100
1.2 Assembly overview - cylinder head cover . . . 102
1.3 Removing and installing cylinder head . . . 104
1.4 Removing and installing cylinder head cover . . . 114
1.5 Removing and installing seals for injectors . . . 115
1.6 Removing and installing camshaft housing . . . 116
1.7 Checking compression . . . 121
2 Toothed belt drive . . . 123
2.1 Assembly overview - toothed belt cover . . . 123
2.2 Assembly overview - toothed belt . . . 124
2.3 Removing and installing toothed belt cover . . . 125
2.4 Removing and installing toothed belt . . . 130
2.5 Removing toothed belt from camshaft . . . 141
3 Valve gear . . . 145
3.1 Assembly overview - valve gear . . . 145
3.2 Measuring axial play of camshaft . . . 148
3.3 Removing and installing camshaft oil seal . . . 149
3.4 Removing and installing camshaft adjuster . . . 150
3.5 Removing and installing camshaft control valve 1 N205 . . . 153
3.6 Checking hydraulic compensation elements . . . 153
3.7 Removing and installing valve stem seals . . . 154
3.8 Removing and installing control valve for the camshaft adjuster . . . 161
4 Inlet and exhaust valves . . . 164
4.1 Checking valve guides . . . 164
4.2 Checking valves . . . 165
4.3 Valve dimensions . . . 165

17 - Lubrication . . . 166
1 Sump, oil pump . . . 166
1.1 Assembly overview - sump, oil pump . . . 166
1.2 Engine oil . . . 171
1.3 Removing and installing sump . . . 172
1.4 Removing and installing lower part of sump . . . 175
1.5 Removing and installing upper part of sump . . . 179
1.6 Removing and installing oil pump . . . 184
1.7 Removing and installing oil level and oil temperature sender G266 . . . 184
2 Engine oil cooler . . . 186
3 Oil filter, oil pressure switch . . . 187
3.1 Assembly overview - oil filter housing, oil pressure switch . . . 187
3.2 Removing and installing oil pressure switch F1 . . . 188
3.3 Removing and installing oil pressure switch for reduced oil pressure F378 . . . 190
3.4 Checking oil pressure . . . 192
3.5 Removing and installing oil filter housing . . . 192

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

3.6 Removing and installing valve for oil pressure control N428 . . . 194
4 Oil circuit . . . 196
4.1 Oil supply pipe: removing and fitting . . . 196
4.2 Removing and installing oil return line for turbocharger . . . 197

19 - Cooling . . . 199
1 Cooling system, coolant . . . 199
1.1 Schematic diagram - coolant hoses . . . 199
1.2 Checking cooling system for leaks . . . 209
1.3 Draining coolant . . . 211
1.4 Filling with coolant: . . . 214
1.5 Checking electric vacuum pump VAS 6096/2 . . . 224
1.6 Flushing cooling system . . . 224
1.7 Flushing cooling system, quick reference guide . . . 244
2 Coolant pump, thermostat . . . 246
2.1 Assembly overview - coolant pump, thermostat . . . 246
2.2 Assembly overview - electric coolant pump . . . 250
2.3 Assembly overview - coolant temperature sender . . . 256
2.4 Removing and installing electric coolant pump . . . 257
2.5 Removing and replacing coolant pump . . . 272
2.6 Removing and installing thermostat . . . 273
2.7 Testing coolant thermostat . . . 277
2.8 Removing and installing the valve for the cylinder head coolant N489 . . . 278
2.9 Removing and installing coolant temperature sender G62 . . . 278
2.10 Removing and installing radiator outlet coolant temperature sender G83 . . . 280
3 Coolant pipes . . . 282
3.1 Assembly overview - coolant pipes . . . 282
3.2 Removing and installing coolant pipes . . . 283
4 Radiator, radiator fans . . . 303
4.1 Assembly overview - radiator, radiator fan . . . 303
4.2 Assembly overview - radiator cowl and radiator fans . . . 307
4.3 Assembly overview - radiator blind . . . 309
4.4 Removing and positioning radiator . . . 311
4.5 Removing and installing cooler for charge air cooling circuit . . . 312
4.6 Removing and installing radiator cowl . . . 317
4.7 Removing and installing radiator fan . . . 319
4.8 Removing and installing radiator blind . . . 320
4.9 Removing and installing radiator blind control motor V544 . . . 322

21 - Turbocharging/supercharging . . . 326
1 Turbocharger . . . 326
1.1 Assembly overview - turbocharger . . . 326
1.2 Removing and installing turbocharger . . . 333
1.3 Renewing vacuum unit for turbocharger . . . 355
1.4 Removing and installing connection for turbocharger . . . 360
2 Charge air system . . . 362
2.1 Assembly overview - charge air system . . . 362
2.2 Removing and installing charge pressure sender G31 . . . 364
2.3 Checking charge air system for leaks . . . 364
2.4 Removing and installing air intake pipe . . . 366
2.5 Checking charge air cooler for leaks . . . 368

23 - Mixture preparation - injection . . . 373
1 Injection system . . . 373
1.1 Schematic overview - fuel system . . . 373

SEAT
This document, or any part thereof, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

1.2 Fitting location overview - injection system . . . 376
1.3 Filling and bleeding fuel system . . . 388
1.4 Checking fuel system for leaks . . . 388
2 Vacuum system . . . 390
2.1 Schematic diagram - vacuum system . . . 390
2.2 Removing and installing vacuum line . . . 391
2.3 Checking vacuum system . . . 393
3 Injectors and high-pressure accumulator (fuel rail) . . . 394
3.1 Assembly overview - injectors . . . 394
3.2 Assembly overview - high-pressure accumulator (fuel rail) . . . 396
3.3 Adapting correction values for injectors . . . 397
3.4 Testing injectors . . . 397
3.5 Checking return flow rate of injectors with engine running . . . 397
3.6 Checking return flow rate of injectors at starter speed . . . 402
3.7 Testing jammed-open injectors . . . 406
3.8 Removing and installing injectors . . . 408
3.9 Removing and installing high-pressure pipes . . . 413
3.10 Removing and installing fuel rail (rail) . . . 416
4 Air filter . . . 420
4.1 Assembly overview - air filter housing . . . 420
4.2 Removing and installing air filter housing . . . 421
5 Intake manifold . . . 424
5.1 Assembly overview - intake manifold . . . 424
5.2 Removing and installing intake manifold . . . 426
5.3 Removing and installing throttle valve module J338 . . . 429
6 Senders and sensors . . . 432
6.1 Removing and installing fuel pressure regulating valve N276 . . . 432
6.2 Checking fuel pressure regulating valve N276 . . . 438
6.3 Removing and installing fuel pressure sender G247 . . . 439
6.4 Removing and installing air mass meter G70 . . . 440
6.5 Removing and installing pressure differential sender G505 . . . 442
6.6 Removing and installing exhaust pressure sensor 1 G450 . . . 446
6.7 Removing and installing NOx sender 2 G687 . . . 447
6.8 Removing and installing charge air temperature sender before charge air cooler G810 . . . 449
6.9 Removing and installing charge air temperature sender after charge air cooler G811 . . . 449
6.10 Removing and installing fuel temperature sender G81 . . . 449
6.11 Removing and installing control unit for NOx sender GX30 . . . 451
6.12 Removing and installing temperature and pressure sender for low-pressure fuel system GX20 . . . 453
7 Engine (motor) control unit . . . 455
7.1 Removing and installing engine control unit J623 . . . 455
7.2 Removing and installing engine control unit J623 with protective housing . . . 456
8 High-pressure pump . . . 461
8.1 Assembly overview - high-pressure pump . . . 461
8.2 Removing and installing high-pressure pump . . . 462
9 Lambda probe . . . 466
9.1 Assembly overview - Lambda probe . . . 466
9.2 Removing and installing Lambda probe . . . 469

26 - Exhaust system . . . 473
1 Exhaust pipes/silencers . . . 473
1.1 Assembly overview - silencers . . . 473
1.2 Assembly overview - front exhaust pipe . . . 488
1.3 Removing and installing front exhaust pipe . . . 489
1.4 Separating exhaust pipes, silencers . . . 491

This document, or any part thereof, may not be reproduced in whole or in part or otherwise disclosed in any way to any third party without the prior written permission of SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

1.5 Removing and installing central exhaust pipe . . . 493
1.6 Removing and installing rear silencer . . . 494
1.7 Aligning exhaust system free of stress . . . 497
1.8 Check exhaust system for leaks . . . 497
1.9 Installation position of clamp . . . 498
1.10 Aligning tailpipes . . . 499
2 Emission control . . . 500
2.1 Assembly overview - emission control . . . 500
2.2 Removing and installing catalytic converter . . . 504
2.3 Removing and installing particulate filter . . . 505
2.4 Removing and installing emission control module . . . 506
2.5 Removing and installing exhaust flap control unit J883 . . . 518
3 SCR system (selective catalytic reduction) . . . 520
3.1 Assembly overview - reducing-agent tank . . . 520
3.2 Assembly overview - delivery line for reducing agent . . . 523
3.3 Assembly overview - delivery module for reducing agent . . . 524
3.4 Removing and installing reducing agent tank . . . 524
3.5 Removing and installing reducing agent supply line . . . 527
3.6 Removing and installing delivery module for reducing agent . . . 534
3.7 Removing and installing injector for reduction agent N474 . . . 537
3.8 Removing and installing control unit for reducing-agent heater J891 . . . 540
3.9 Assembly overview - injector for reducing agent N474 . . . 540
3.10 Drain the reducing agent tank . . . 541
3.11 Removing and installing filler pipe for tank for reducing agent . . . 544
3.12 Disconnecting reducing agent supply line . . . 545
3.13 Resetting SCR learnt values . . . 547
4 Exhaust gas temperature regulation . . . 548
4.1 Assembly overview - exhaust gas temperature regulation . . . 548
4.2 Removing and installing exhaust gas temperature sender 1 G235 . . . 551
4.3 Removing and installing exhaust gas temperature sender 2 G448 . . . 555
4.4 Removing and installing exhaust gas temperature sender 3 G495 . . . 557
4.5 Removing and installing exhaust gas temperature sender 4 G648 . . . 559
5 Exhaust gas recirculation . . . 562
5.1 Assembly overview - exhaust gas recirculation . . . 562
5.2 Assembly overview - exhaust gas recirculation valve 1 GX5 . . . 566
5.3 Removing and installing exhaust gas recirculation cooler . . . 567
5.4 Removing and installing exhaust gas recirculation valve 1 GX5 . . . 574
5.5 Removing and installing exhaust gas recirculation valve 2 GX6 . . . 575
5.6 Removing and installing exhaust gas recirculation temperature sensor G98 . . . 577
5.7 Checking exhaust gas recirculation cooler for leaks . . . 580
28 - Glow plug system . . . 581
1 Glow plug system . . . 581
1.1 Assembly overview - glow plug system . . . 581
1.2 Removing and installing glow plug . . . 582
1.3 Removing and installing automatic glow period control unit J179 . . . 584
1.4 Removing and installing Hall sender G40 . . . 585
1.5 Removing and installing engine speed sender G28 . . . 585

permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

00 – Technical data

1 Safety instructions

(ERL003770; Edition 06.2018)

⇒ “1.1 Safety precautions when working on fuel supply system”, page 1

⇒ “1.2 Safety precautions when working on vehicles with start/stop system”, page 2

⇒ “1.3 Safety precautions during road tests in which test and measuring equipment is used”, page 2

⇒ “1.4 Safety precautions when working on the cooling system”, page 2

⇒ “1.5 Safety precautions when working on the SCR system”, page 2

⇒ “1.6 Safety precautions when working on exhaust system”, page 4

1.1 Safety precautions when working on fuel supply system

Risk of fire due to escaping fuel

If the battery is connected, the door contact switch will activate the fuel pump when the door is opened. Escaping fuel may ignite and cause a fire.

– Disconnect the fuel pump from the power supply before opening the fuel system.

Risk of injury due to highly-pressurised fuel.

The fuel system is pressurised. Injury possible due to fuel which may spurt out.

Before opening the fuel system:

– Wear safety goggles.

– Wear protective gloves.

– Release pressure: place clean cloth around connection and carefully open connection.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Malfunction caused by air in the fuel supply system

Upon repair work on the fuel tank or the fuel delivery unit, air will be drawn in by the metering pump and conveyed to the auxiliary heater. Malfunctions in the auxiliary heater operation caused by air in the heater fuel supply are possible.

– Fill fuel take-off pipe with fuel.

1.2 Safety precautions when working on vehicles with start/stop system

Risk of injury due to unexpected engine start-up

In the case of vehicles with activated Start/Stop system, the engine may start up unexpectedly. The status of the Start/Stop system is indicated by a message in the dash panel insert.

– Deactivate Start/Stop system by switching off the ignition.

1.3 Safety precautions during road tests in which test and measuring equipment is used

There is a risk of injury due to unsafe test and measuring equipment.

If a front passenger airbag is triggered during an accident, unsecured test and measuring equipment can become dangerous projectiles.

– Secure test and measuring equipment with seat belts on the rear seat.

or

– Have a second person operate test and measuring equipment on the rear seat.

1.4 Safety precautions when working on the cooling system

Danger of scalding by hot coolant

On a warm engine, the cooling system is under high pressure. Danger of scalding by steam and hot coolant.

– Wear protective gloves.

– Wear safety goggles.

– Reduce excess pressure by covering cap of coolant expansion tank with cloths and opening it carefully.

1.5 Safety precautions when working on the SCR system

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Risk of injury due to reducing agent

The reducing agent may cause eye and skin irritations as well as injuries to the respiratory system and poisoning.

– Wear safety goggles.

– Wear protective gloves.

– Always wear protective clothes.

– Make sure that a sufficient amount of fresh air is supplied. In closed areas, switch on the exhaust gas extractor system.

Risk of damage caused by reducing agent

If reducing agent gets onto trim panels and body components, the reducing agent may solidify after a while and thus damage the surface.

– Make sure that no reduction agent gets onto the trim panels or body components.

– If any reducing agent does get onto surfaces, remove it immediately using water and a cloth.

Risk of injury due to reducing agent

The reducing agent may cause eye and skin irritations as well as injuries to the respiratory system and poisoning.

– Wear safety goggles.

– Wear protective gloves.

– Always wear protective clothes.

– Make sure that a sufficient amount of fresh air is supplied. In closed areas, switch on the exhaust gas extractor system.

Risk of damage caused by reducing agent

If reducing agent gets onto trim panels and body components, the reducing agent may solidify after a while and thus damage the surface.

– Make sure that no reduction agent gets onto the trim panels or body components.

– If any reducing agent does get onto surfaces, remove it immediately using water and a cloth.

When removing and installing components at the SCR system, note the following:

♦ The tank for reducing agent must be empty when working on the SCR system. Information on when the tank for reducing agent has to be emptied can be obtained from the respective description of work. Emptying tank for reduction agent ⇒ page 541 .

Automatic drawing back of reducing agent

- After the ignition has been switched off, the reducing agent is returned from the metering line leading to the reducing agent injector - N474- back to the reducing agent tank.
- Before performing work in this area, you must therefore wait until the reducing agent has been drawn back; this can take up to 10 minutes after the ignition has been switched off.
- Similarly, it is not permissible to disconnect the battery until all the reducing agent has been returned to the tank, i.e. 10 minutes after the ignition is switched off ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with

1.6 Safety precautions when working on exhaust system

CAUTION

Risk of poisoning due to chemical substances

Exhaust gas temperature senders may contain chemical substances. There is a risk of poisoning or injuries to respiratory system.

- **Never open an exhaust gas temperature sender by cutting, sawing or any other means.**

Risk of injury due to hot condensate and particles in the exhaust system.

The exhaust system could contain hot condensate and/or particles. There is a risk of injury to the eyes, skin and respiratory system, as well as poisoning.

- **Always wear protective gloves and eye protection when cutting the exhaust system.**
- **When cutting, use an extraction system or otherwise ensure sufficient ventilation.**

NOTICE

Risk of damage to decoupling element.

- **Do not allow the decoupling element to kink by more than 10°.**
- **Install decoupling element so that it is not under tension.**
- **Take care not to damage wire mesh on decoupling element.**

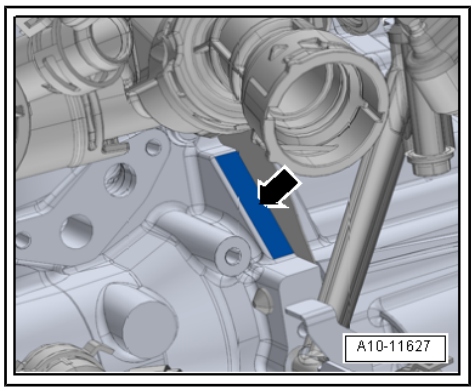
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

2 Identification

⇒ “2.1 Engine number, engine data”, page 6

2.1 Engine number, engine data



- The engine number (“engine code” and “serial number”) is located at the front at the joint between engine and gearbox -arrow-.
- Additionally there is a sticker on the toothed belt cover (top) with “engine code” and “serial number”.
- Starting with the letter “C”, the engine codes consist of 4 letters.
- The first 3 characters of the engine code stand for the engine capacity and the mechanical construction and design. They are stamped on the cylinder block, together with the serial number.
- The 4th character indicates the power output and torque of the engine, and is determined by the engine control unit.

Note

- *The 4-character engine code can be found on the type plate (in versions for some countries only) and on the vehicle data sticker and the engine control unit.*
- *Fittings locations for vehicle data sticker (country-specific) and identification plate Ateca ⇒ Maintenance ; Booklet KH1 ; Leon ⇒ Maintenance ; Booklet 501 .*

SEAT
erWin

Identification code	CLHA	CLHB	CRKB	CXXA	CXXB
Injection system	Bosch	Bosch	Bosch	Delphi	Delphi
Exhaust emissions fulfil	EU5 plus	EU5 plus	EU5 plus	EU6	EU6
Displacement l	1.598	1.598	1.598	1.598	1.598
Power kW at rpm	77/3000 … 4000	66/2750 … 4800	81/3000 … 4000	66/2750 … 4800	81/3000 … 4000
Torque Nm at rpm	250/1500 to 2750	230/1400 to 2750	250/1400 to 2750	230/1500 to 2750	250/1500 to 3000
Cylinder bore ∅ mm	79.5	79.5	79.5	79.5	79.5
Stroke mm	80.5	80.5	80.5	80.5	80.5
Compression ratio	16.2	16.2	16.2	16.2	16.2
Fuel: according to	DIN EN 590	DIN EN 590	DIN EN 590	DIN EN 590	DIN EN 590
Ignition sequence	1-3-4-2	1-3-4-2	1-3-4-2	1-3-4-2	1-3-4-2
Exhaust gas recirculation	yes	yes	yes	yes	yes
Balancer shafts	No	NO	no	yes	yes
Exhaust gas temperature regulation	yes	yes	yes	No	NO
Turbocharging/supercharging	Turbocharger	Turbocharger	Turbocharger	Turbocharger	Turbocharger
Supercharging air refrigeration	yes	yes	yes	yes	yes
Lambda control	1 lambda probe	1 lambda probe	2 lambda probes	2 lambda probes	2 lambda sensors
Diesel particulate filter with catalytic converter	yes	yes	yes	yes	yes

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Identification code	CLHA	CLHB	CRKB	CXXA	CXXB
SCR catalytic converter	no	no	no	no	no
Valves per cylinder	4	4	4	4	4

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Identification code	CRBC	CRLB	CRLD	CKFB	CKFC
Injection system	Bosch	Bosch	Bosch	Bosch	Bosch
Exhaust emissions fulfil	EU5 plus	EU6	EU6	EU5 plus	EU5 plus
Displacement l	1.968	1.968	1.968	1.968	1.968
Power kW at rpm	110/3500 … 4000	110/4000	81/3250 … 4500	105/3500 … 4000	110/3500 … 4000
Torque Nm at rpm	320/1750 to 3000	340/1750 … 3000	250/1500 … 3000	320/1750 … 3000	320/1750 to 3000
Cylinder bore ∅ mm	81.0	81.0	81.0	79.5	81.0
Stroke mm	95.5	95.5	95.5	81.0	95.5
Compression ratio	16.2	16.2	16.2	16.2	16.2
Fuel: according to	DIN EN 590	DIN EN 590	DIN EN 590	DIN EN 590	DIN EN 590
Ignition sequence	1-3-4-2	1-3-4-2	1-3-4-2	1-3-4-2	1-3-4-2
Exhaust gas recirculation	yes	yes	yes	yes	yes
Balancer shafts	yes	yes	yes	No	NO
Exhaust gas temperature regulation	yes	yes	yes	yes	yes
Turbocharging/supercharging	Turbocharger	Turbocharger	Turbocharger	Turbocharger	Turbocharger
Supercharging air refrigeration	yes	yes	yes	yes	yes
Lambda control	1 lambda probe	2 lambda probes	2 lambda probes	1 lambda probe	1 lambda probe
Diesel particulate filter with catalytic converter	yes	yes	yes	yes	yes

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Identification code	CRBC	CRLB	CRLD	CKFB	CKFC
SCR catalytic converter	no	no	no	no	no
Valves per cylinder	4	4	4	4	4

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Identification code	CRGA	CRVA	CRVC	CRMB	CUPA
Injection system	Bosch	Bosch	Bosch	Bosch	Bosch
Exhaust emissions fulfil	EURO4	EURO4	EURO4	EU6	EU5
Displacement l	1.968	1.968	1.968	1.968	1.968
Power kW at rpm	130/3500 … 4000	81/3500 … 4000	105/3,500 … 4,000	110/4000	135/3,500 … 4,000
Torque Nm at rpm	350/1750 to 3000	250/1250 … 2500	320/1750 … 3000	340/1750 … 3000	380/1750 … 3000
Cylinder bore ∅ mm	81.0	81.0	81.0	81.0	81.0
Stroke mm	95.5	95.5	95.5	95.5	95.5
Compression ratio	16.2	16.2	16.2	16.2	15.8
Fuel: according to	DIN EN 590	DIN EN 590	DIN EN 590	DIN EN 590	DIN EN 590
Ignition sequence	1-3-4-2	1-3-4-2	1-3-4-2	1-3-4-2	1-3-4-2
Exhaust gas recirculation	yes	yes	yes	yes	yes
Balancer shafts	yes	No	NO	no	yes
Exhaust gas temperature regulation	Yes (reduced)	Yes (reduced)	Yes (reduced)	yes	yes
Turbocharging/supercharging	Turbocharger	Turbocharger	Turbocharger	Turbocharger	Turbocharger
Supercharging air refrigeration	yes	yes	yes	yes	yes
Lambda control	1 lambda probe	No	NO	2 lambda probes	1 lambda probe
Diesel particulate filter with catalytic converter	Depending on variant	Depending on variant	Depending on variant	yes	yes

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Identification code	CRGA	CRVA	CRVC	CRMB	CUPA
SCR catalytic converter	no	no	no	no	no
Valves per cylinder	4	4	4	4	4

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Identification code	CUNA	DBKA	DCYA	DDYA	DDYB
Injection system	Bosch	Bosch	Bosch	Delphi	Delphi
Exhaust emissions fulfil	EU6	EU6	EU6	EU6	EU6
Displacement l	1.968	1.598	1.968	1.598	1.598
Power kW at rpm	135/3500 … 4000	81/3250 … 4000	110/3500 … 4000	85/3250 … 4000	66/3000 … 4000
Torque Nm at rpm	380/1750 … 3000	380/1500 … 3000	340/1750 to 3000	250/1500 to 3250	230/1500 to 3000
Cylinder bore ∅ mm	81.0	79.5	81.0	79.5	79.5
Stroke mm	95.5	80.5	95.5	80.5	80.5
Compression ratio	15.8	16.2	16.2	16.2	16.2
Fuel: according to	DIN EN 590	DIN EN 590	DIN EN 590	DIN EN 590	DIN EN 590
Ignition sequence	1-3-4-2	1-3-4-2	1-3-4-2	1-3-4-2	1-3-4-2
Exhaust gas recirculation	yes	yes	yes	yes	yes
Balancer shafts	yes	No	yes	No	NO
Exhaust gas temperature regulation	yes	yes	yes	yes	yes
Turbocharging/supercharging	Turbocharger	Turbocharger	Turbocharger	Turbocharger	Turbocharger
Supercharging air refrigeration	yes	yes	yes	yes	yes
Lambda control	2 lambda probes	2 lambda probes	1 lambda probe	1 lambda probe	1 lambda probe
Diesel particulate filter with catalytic converter	yes	yes	yes	yes	yes

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Identification code	CUNA	DBKA	DCYA	DDYA	DDYB
SCR catalytic converter	no	no	no	no	no
Valves per cylinder	4	4	4	4	4

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Identification code	DFFA	DFGA	DFHA	DGTE	DJGA
Injection system	Bosch	Bosch	Bosch	Delphi	Bosch
Exhaust emissions fulfil	EU6	EU6	EU6	EU6	EU6
Displacement l	1.968	1.968	1.968	1.598	1.968
Power kW at rpm	110/3500 … 4000	110/3500 … 4000	140/3500 ... 4000	85/3250 … 4000	135/3500 … 4000
Torque Nm at rpm	340/1750 to 3000	340/1750 to 3000	400/1750 ... 3250	250/1750 to 3200	380/1750 to 3250
Cylinder bore ∅ mm	81.0	81.0	81.0	79.5	81.0
Stroke mm	95.5	95.5	95.5	80.5	95.5
Compression ratio	16.2	16.2	15.5	16.2	15.8
Fuel: according to	DIN EN 590	DIN EN 590	DIN EN 590	DIN EN 590	DIN EN 590
Ignition sequence	1-3-4-2	1-3-4-2	1-3-4-2	1-3-4-2	1-3-4-2
Exhaust gas recirculation	yes	yes	yes	yes	yes
Balancer shafts	No	yes	yes	No	NO
Exhaust gas temperature regulation	yes	yes	yes	yes	yes
Turbocharging/supercharging	Turbocharger	Turbocharger	Turbocharger	Turbocharger	Turbocharger
Supercharging air refrigeration	yes	yes	yes	yes	yes
Lambda control	2 lambda probes	2 lambda probes	1 lambda probe	1 lambda probe	1 lambda probe
Diesel particulate filter with catalytic converter	yes	yes	yes	yes	yes

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Identification code	DFFA	DFGA	DFHA	DGTE	DJGA
SCR catalytic converter	yes	yes	yes	yes	yes
Valves per cylinder	4	4	4	4	4

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

3 Repair instructions

⇒ “3.1 Rules for cleanliness”, page 17

⇒ “3.2 Foreign objects in engine”, page 17

⇒ “3.3 Contact corrosion”, page 17

⇒ “3.4 Routing and attachment of lines”, page 18

⇒ “3.5 Installing radiators, coolers and condensers”, page 18

3.1 Rules for cleanliness

Even small amounts of dirt can cause malfunctions. You must therefore comply with the following cleanliness rules when working on the fuel supply system, injectors or the turbocharger:

- Thoroughly clean all unions and surrounding areas with engine or brake system cleanser before disconnecting. Dry cleaned area thoroughly.
- Immediately seal open lines and connections with clean plugs, for example from engine bung set - VAS 6122- .
- Place removed parts on a clean surface and cover them up. Do not use fluffy cloths.
- Carefully cover or seal open components if repairs cannot be carried out immediately.
- Only install clean components; replacement parts should only be unpacked immediately prior to installation. Do not use parts that have not been stored in the proper packaging (e.g. in tool boxes etc.).
- When the system is open: Do not work with compressed air. Do not move vehicle unless absolutely necessary.
- Protect unplugged electrical connectors against dirt and moisture and make sure connections are dry when attaching.

3.2 Foreign objects in engine

To prevent the ingress of foreign bodies during work on the engine, seal all open connections. To do this, use suitable plugs from the engine bung set - VAS 6122- .

Note

In the event of mechanical damage on turbocharger, observe ⇒ page 333 .

3.3 Contact corrosion

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Contact corrosion can occur if unsuitable connecting elements (bolts, nuts, washers...) are used.

For this reason, joint elements are mounted only with surfaces treated with a special cover.

In addition, all rubber and plastic parts and all adhesives are made of non-conductive materials.

Always install new parts if you are not sure whether used parts can be re-fitted ⇒ Electronic parts catalogue .

Observe the following:

- Use genuine parts which are tested and compatible with aluminium.

- Use Seat accessories.
- Damage caused by contact corrosion is not covered under warranty.

3.4 Routing and attachment of lines

There is a risk that the pipes and wiring may be damaged

Lines may become damaged by moving or hot components.

– Route lines in their original positions.

– Ensure that there is sufficient clearance to moving or hot components.

SEAT
Copyright SEAT S.A. Use for commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

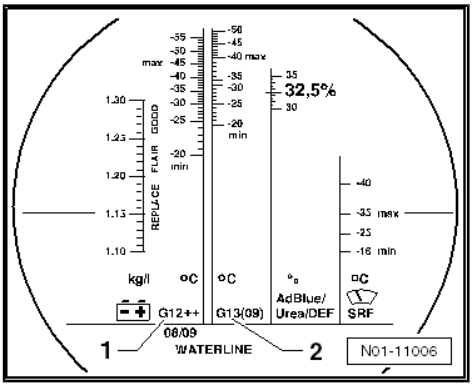
3.5 Installing radiators, coolers and condensers

Even when the radiator, condenser and charge air cooler are correctly installed, slight impressions may be visible on the fins of these components. This does not mean that the components are damaged. If the fins are only very slightly distorted, this does not justify renewal of the radiator, charge air cooler or condenser.

4 Technical data

⇒ “4.1 Coolant”, page 19

4.1 Coolant



Note

- *The water used for mixing has a major influence on the effectiveness of the coolant. Because the water quality differs from country to country and even from region to region, the quality of the water to be used in the cooling system has been specified by Volkswagen. Distilled water fulfils all requirements. For this reason, we recommend using distilled water when mixing coolant for topping up or replacing coolant.*
- *Use only coolant additives in accordance with the ⇒ Electronic parts catalogue . Other coolant additives may reduce corrosion protection substantially. The resulting damage could lead to loss of coolant and subsequent severe damage to the engine.*
- *The correct coolant solution ratio helps prevent damage from freezing and corrosion as well as scaling. It also raises the boiling point of coolant. For this reason the cooling system must be filled all year round with the correct coolant additive.*
- *Because of its high boiling point, the coolant improves engine reliability under heavy loads, particularly in countries with tropical climates.*
- *ONLY refractometer - T10007A- may be used for determining current anti-freeze value.*
- *The frost protection must be effective down to at least -25 °C, and approx. -36 °C in cold countries. The effectiveness of the frost protection may only be increased if a higher level of frost protection is required due to the climate. It may, however, be increased only to a maximum of -48°C. Otherwise, the cooling effect will be impaired.*
- *The coolant concentration must not be reduced by adding water even in warmer seasons and in warmer countries. Frost protection must be guaranteed down to at least -25 °C.*
- *Read off the level of frost protection on the scale for the relevant coolant additive.*
- *The temperature read off the refractometer - T10007A- equates to the »ice flocculation point«. Ice flocculation can start forming in the coolant below this temperature.*
- *Never reuse old coolant.*
- *Use only a water/anti-freeze mixture as a slip agent for coolant hoses.*

Recommended mixture ratio for coolant

- Coolant (40 %) and water (60 %) for frost protection to -25 °C
- Coolant (50 %) and water (50 %) for frost protection to -36 °C
- Coolant ⇒ Electronic parts catalogue

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted. Unauthorized distribution and/or modification is prohibited. No liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

10 – Removing and installing engine

1 Removing and installing engine

⇒ “1.1 Removing engine”, page 20

⇒ “1.2 Separating engine and gearbox”, page 30

⇒ “1.3 Securing engine to engine and gearbox support”, page 35

⇒ “1.4 Installing engine”, page 37

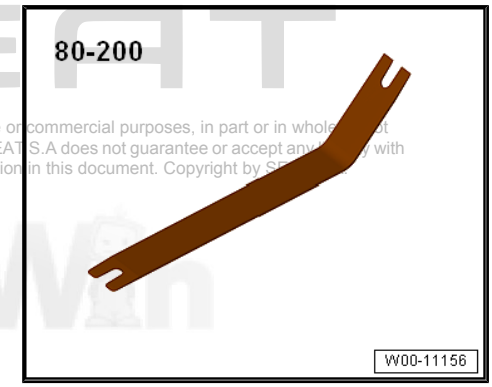
1.1 Removing engine

NOTICE

When installing a new base engine, it is essential that the clamping pieces for the injectors are tightened to the specified torque ⇒ page 394 after installing the high-pressure pipes. The clamping pieces are only secured »hand-tight« at the factory so the injectors can be aligned during installation. Non-observance of these details may lead to damage to the engine.

Special tools and workshop equipment required

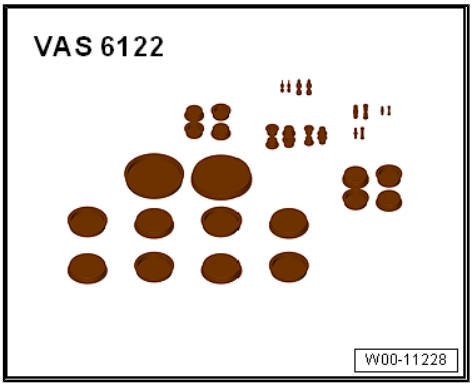
- Removal lever - 80 - 200-



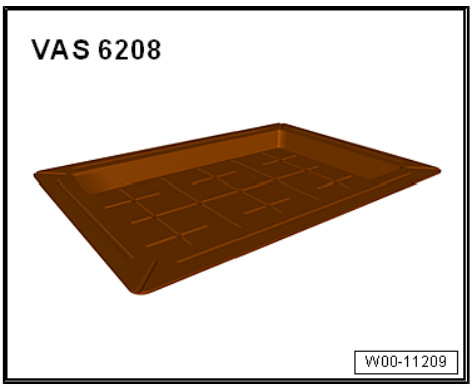
- Hydraulic column jack - VAS 6931-

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT

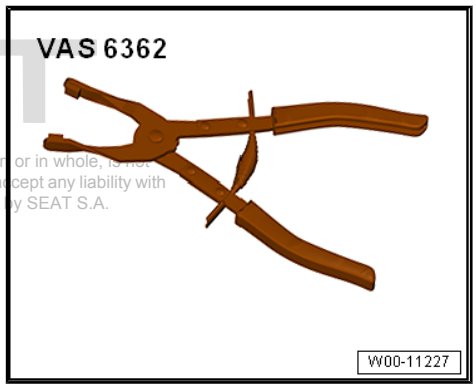
- Engine bung set - VAS 6122-



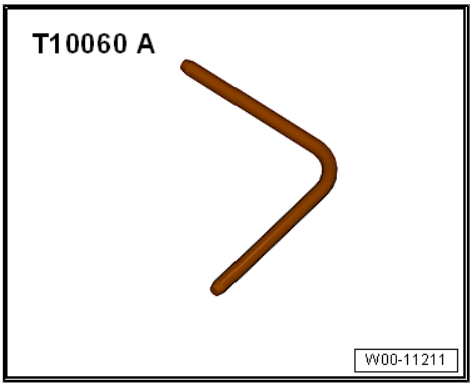
- Drip tray for workshop hoist - VAS 6208-



- Hose clip pliers - VAS 6362-

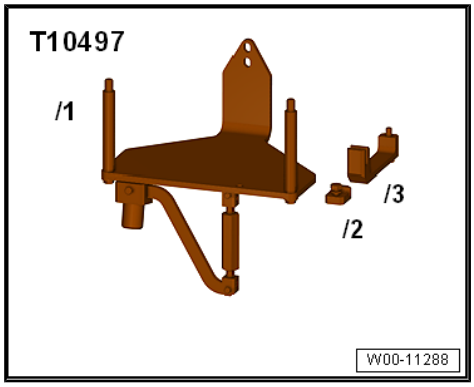


- Locking pin - T10060 A-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- Engine support -T10497- with drift -T10497/1-



- Wing protection - VAS 6805-
- Front cladding - VAS 6808A-
- Safety goggles
- Protective gloves
- Commercially available stepladder

Procedure

Note

- *The engine is removed from underneath together with the gearbox.*
- *Attach cable ties in all the same places when installing.*
- *Attach all heat-shielding sleeves in the same places when installing.*

– Open filler cap -arrow- on coolant expansion tank.

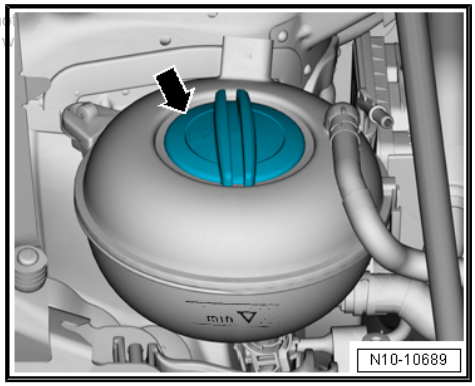
Copyright SEAT S.A. This document, or parts thereof, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to it. SEAT S.A.

CAUTION

If the engine is hot, the coolant system is exposed to high pressure. Danger of scalding by steam and hot coolant.

Skin and other parts of the body may be scalded.

– Wear protective gloves.
– Wear safety goggles.
– Reduce excess pressure by covering cap of coolant expansion tank with cloths and opening it carefully.



– Remove engine cover panel ⇒ page 56 .
– For reasons of space, remove the air filter housing together with the intake hose ⇒ page 422 .

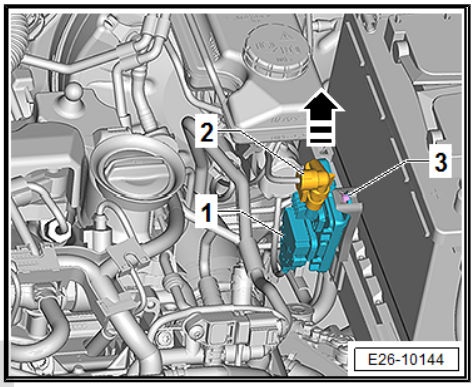
Vehicles with SCR system

– Disconnect connector -2- at NOx sender control unit - J583- -1-.

– Remove control device for NOx sender - J583- -1- from the battery holder, for this, unlock the framework -3- and remove in the -direction of arrow-.

– Unclip wiring harness from brake fluid reservoir.

– Lay control unit for NOx sender - J583- -1- to one side.



Continued for all vehicles

– Remove battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray .

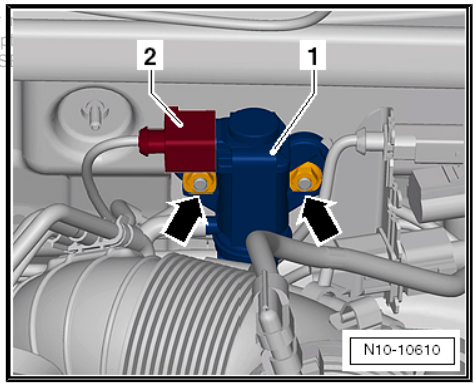
– Release and detach connector -2- from charge pressure control solenoid valve - N75- -1-.

– Unscrew nuts -arrows-.

– Place charge pressure control solenoid valve - N75- -1- with vacuum lines on engine.

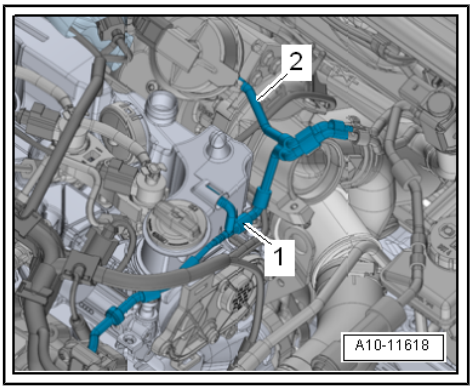
– Release and pull off connectors on the bulkhead ⇒ page 387

– Lay wires on plenum chamber bulkhead to one side.



– Detach vacuum hose -2- from vacuum unit of turbocharger.

– Disconnect vacuum hose -1- from T-piece.

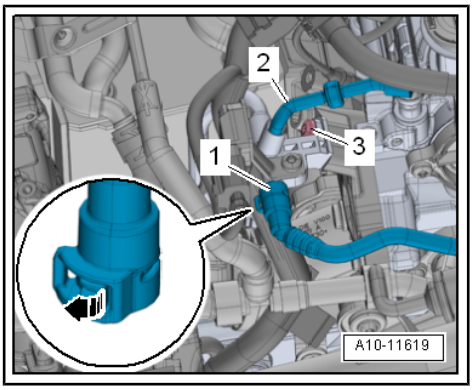


– Release the fastener -arrow-, remove the vacuum hose -1-.

Note

-Ignore positions 2 and 3-.

– Pull off and remove the vacuum line from the brake servo.



SEAT
erWin
respect to the correctness of information in this document. Copyright by S

Vehicles with SCR system

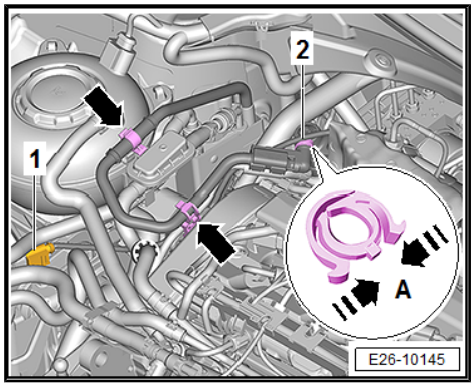
– Release and pull off connector of injector for reducing agent -N474- -1-.

– Unclip the reducing agent line from the fastenings -arrows-.

– Place a cloth underneath coupling point to catch any escaping reducing agent.

– Release and pull off the reducing agent line -2- by pressing together the clamps securing the line in -the direction of the arrows A-.

– Pull back the reducing agent line.

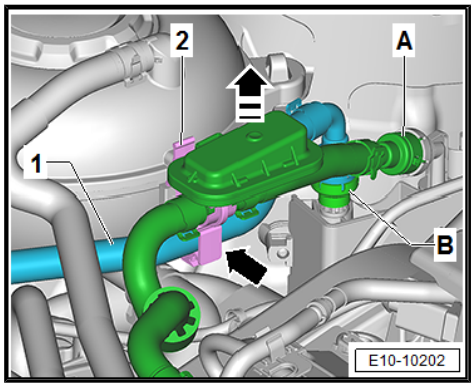


Continued for all vehicles

– Open push-fit couplings -A- and -B- of fuel lines and pull fuel lines off. Separate connector couplings ⇒ Rep. gr. 20 ; Connector couplings; Separating connector couplings .

– Press on the fastening -2- and pull in -the direction of the arrow- to remove the fuel lines from the compensating reservoir.

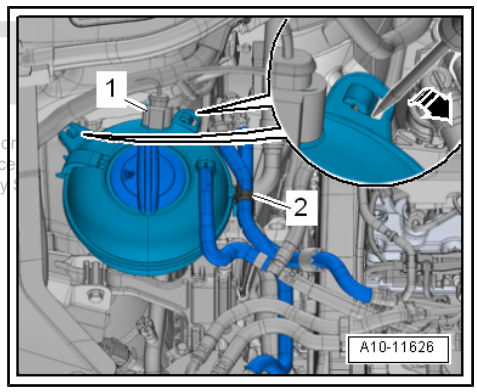
– Unclip the fastening -arrow- and pull off the fuel supply lines -1-.



– Unplug the electrical connector -1-.

– Release the catch with a screwdriver -arrow- and lay the coolant compensation reservoir with the lines connected on the engine.

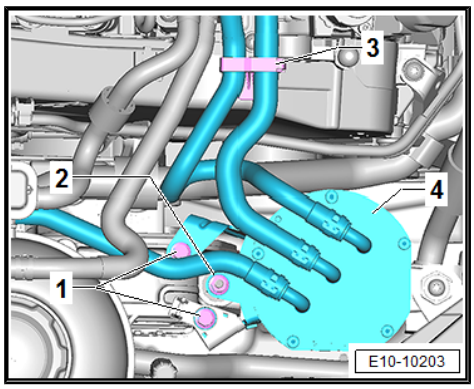
Protected by copyright. Copying for private or commercial purposes, in part or
permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept
respect to the correctness of information in this document. Copyright by



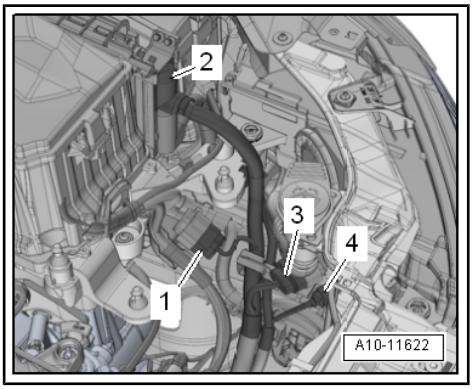
– Move clear bracket -3- with fuel hoses.

– Unscrew nut -2- and bolts -1-.

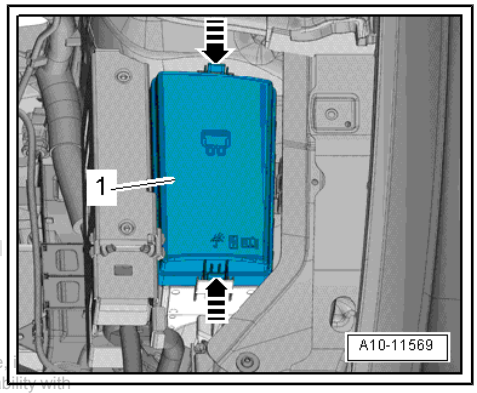
– Remove the fuel filter -4- and lay it with the fuel lines connected on the engine.



– Pull the electrical connector -2- off the engine control unit -J623- ⇒ page 455 .
– Take out, release and unplug electrical connectors -3- and -4- from the bracket.
– Move electrical wiring clear.



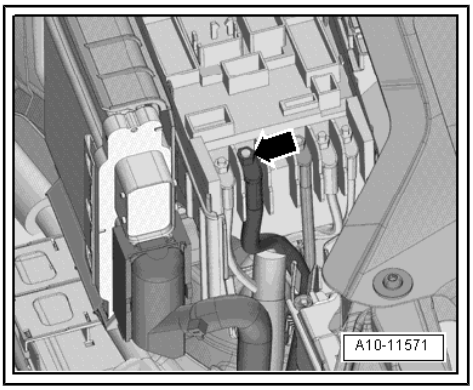
– Release catches -arrows- and detach cover -1- for electronics box in engine compartment.



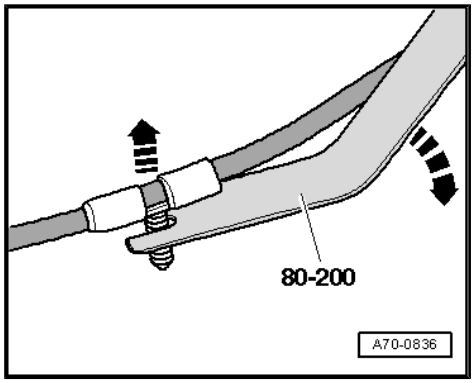
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Release catch using a screwdriver -arrow- and detach cover -1- for electronics box in engine compartment upwards.

– Remove nut -arrow-, detach electrical wiring and move clear.



– Use removal lever - 80 - 200- to lever out the wiring clips when performing the next work steps.



Vehicles with manual gearbox

– Detach lines from starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Assembly overview - starter .

– Release and pull off electrical connectors on gearbox ⇒ Rep. gr. 34 ; Removing and installing gearbox .

– Detach clutch slave cylinder with clutch line connected ⇒ Rep. gr. 30 ; Clutch mechanism; Removing and installing clutch slave cylinder . Do not open hydraulic system.

– Lay clutch slave cylinder with clutch line connected to one side.

– Remove selector mechanism from gearbox ⇒ Rep. gr. 34 ; Selector mechanism; Removing and installing selector mechanism .

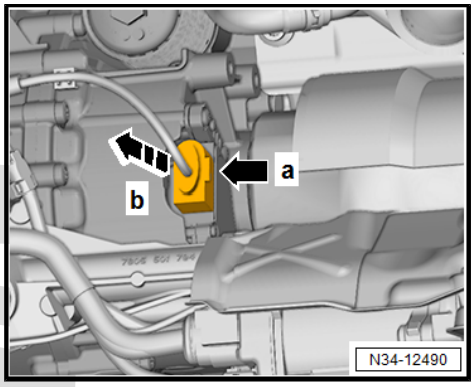
Vehicles with dual clutch gearbox

– Release and pull off connector for mechatronic unit for dual clutch gearbox - J743- ⇒ Rep. gr. 34 ; Mechatronic unit .

– Detach lines from starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Assembly overview - starter .

– Remove selector mechanism from gearbox ⇒ Rep. gr. 34 ; Selector mechanism; Removing and installing selector mechanism .

– If fitted, release electrical connector for auxiliary hydraulic pump 1 for gearbox oil - V475- -a-, and pull off connector -b-.



Continued for all vehicles

– Remove front wheels ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Specified torque for wheel bolts .

– Remove left and right front wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Assembly overview - front wheel housing liner .

– Place drip tray for workshop hoist - VAS 6208- underneath.

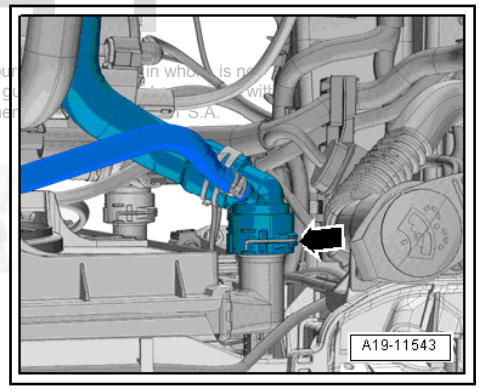
– Drain coolant ⇒ page 211 .

– Remove bracket of the pump for charge air cooling - V188- from the engine ⇒ page 250 .

– Release and pull off the connector of the pump for charge air cooling - V188- .

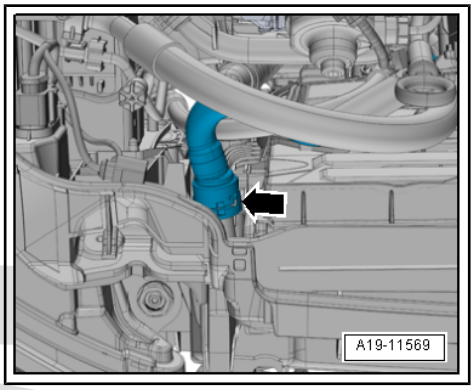
– To make space, push the pump for charge air cooling - V188- , with hoses connected, to the side.

– Lift the retaining clip -arrow-, remove the coolant hose at the top left from the radiator.



Protected by copyright. Copying for private or commercial pu in who is n
permitted unless authorised by SEAT S.A. SEAT S.A does not g with
respect to the correctness of information in this docume of S.A.

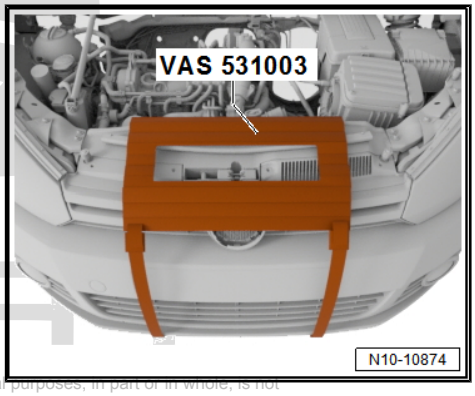
– Lift retaining clip -arrow- and remove coolant hose (top right) from water radiator for charge air cooling circuit.



– Set the lock carrier to its Service position ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Switching from and back to the Service position .

– Remove radiator cowl ⇒ page 317 .

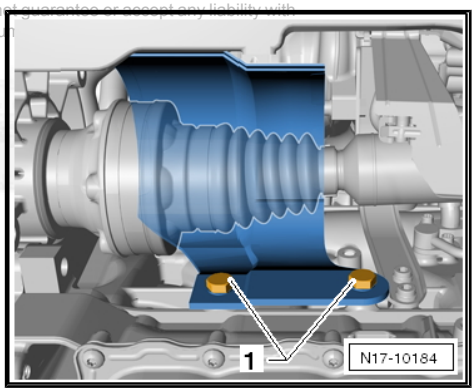
– Install protective mat - VAS 531003- to vehicle as shown in illustration.



– Remove pendulum support ⇒ page 47 .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this docu

– If installed, remove bolts -1- and the heat guard.



– Remove right drive shaft ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .

– Detach left drive shaft flange from gearbox ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; removing and installing drive shaft .

– Release and pull off connector on oil level and oil temperature sensor - G266- .

– Remove front exhaust pipe ⇒ page 489 .

Vehicles with lambda probe 1 after catalytic converter - GX7-

– Release and pull off connector of lambda sensor 1 after catalytic converter - GX7- ⇒ page 470 .

– Move clear wire, and place it on engine.

Vehicles with air conditioner.

⚠ CAUTION

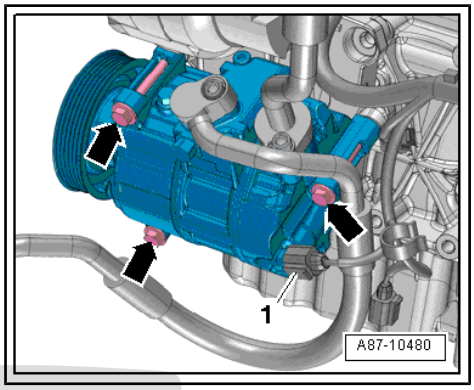
Risk of freezing injury caused by refrigerant.

– Do not open refrigerant circuit of air conditioning system.

– Remove poly V-belt ⇒ page 59 .

– Unclip refrigerant hoses from right longitudinal member.

– Disconnect electrical connector -1- from regulating valve of the air conditioning compressor - N280- .
– Remove bolts -arrows- for air conditioner compressor.



NOTICE

Risk of damage to refrigerant lines from rupture of inner foil.

– **Never bend refrigerant lines to a radius of less than 100 mm (r < 100 mm).**

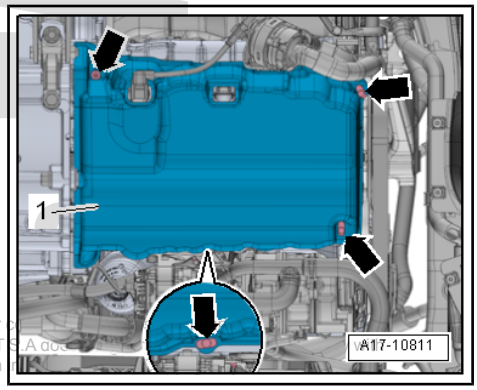
– Detach air conditioner compressor from bracket (refrigerant hoses remain connected) and tie up to right side.

Vehicles with all-wheel drive

– Remove propshaft on bevel box ⇒ Rep. gr. 39 ; Propshaft; Assembly overview - propshaft .

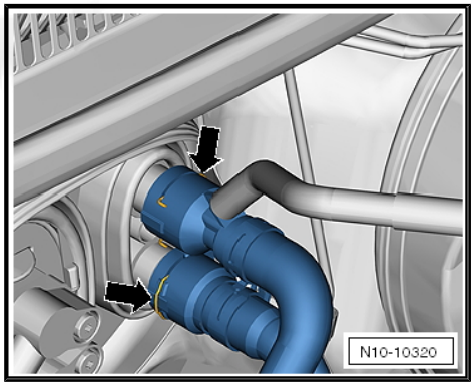
Continued for all vehicles

– Release fasteners -arrows- and detach noise insulation -1- for sump.
– To do this, pull pins out of spreader rivets.

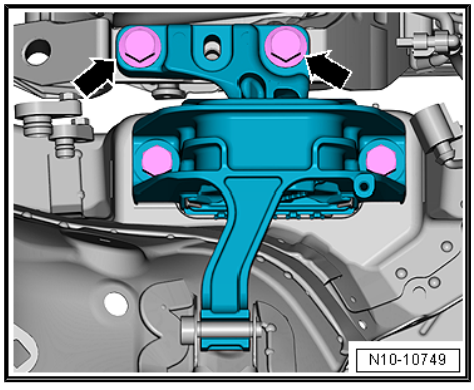


Protected by copyright. Copying for private or
permitted unless authorised by SEAT S.A. SEAT
respect to the correctness of information

– Place a cloth underneath heat exchanger for heater to catch escaping coolant.
– Lift the retaining clips -arrows- and detach the coolant hoses from the heat exchanger for heater.

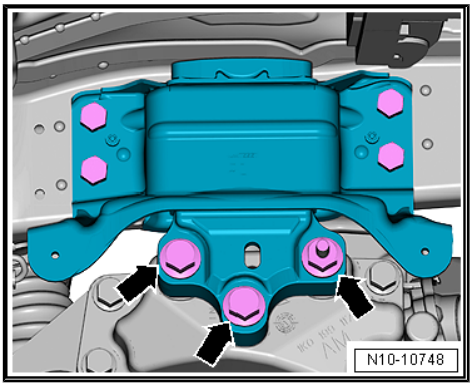


– Unscrew bolts -arrows- on engine mounting approx. 2 turns.



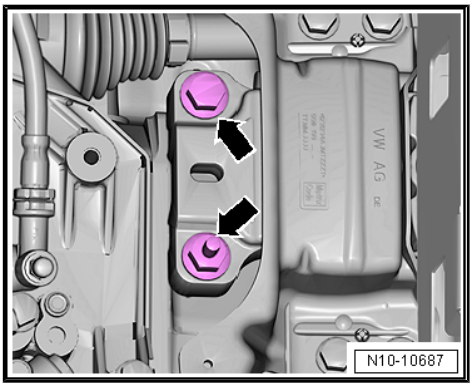
Vehicles with 3 gearbox securing bolts:

– Unscrew bolts -arrows- on gearbox mounting approx. 2 turns.



Vehicles with two gearbox securing bolts:

– Unscrew bolts -arrows- on gearbox mounting approx. 2 turns.

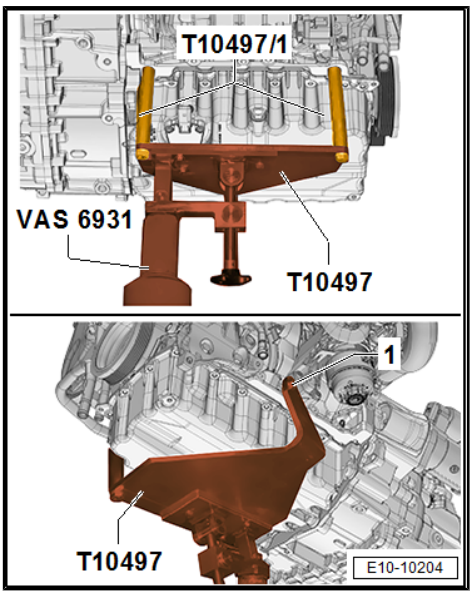


Continued for all vehicles

– Tighten engine bracket -T10497- with the bolts -T10497/1- and the screw -1- (approx. 20 Nm) on the cylinder block.

– Attach engine and gearbox jack - VAS 6931- to the engine bracket -T10497- .

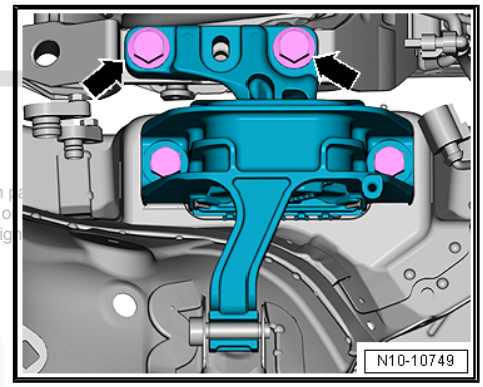
– Raise engine/gearbox assembly slightly.



Note

A stepladder is needed to unscrew the bolts of the assembly mountings.

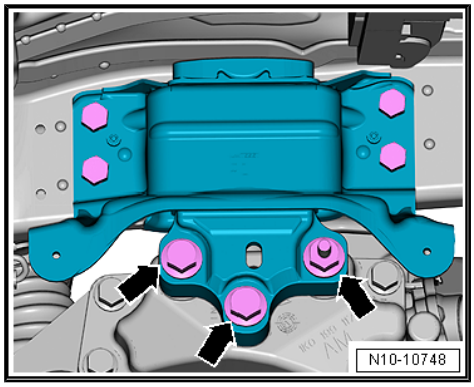
– Remove bolts -arrows- for engine mounting.



Protected by copyright. Copying for private or commercial purposes, in p
permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee o
respect to the correctness of information in this document. Copyrig

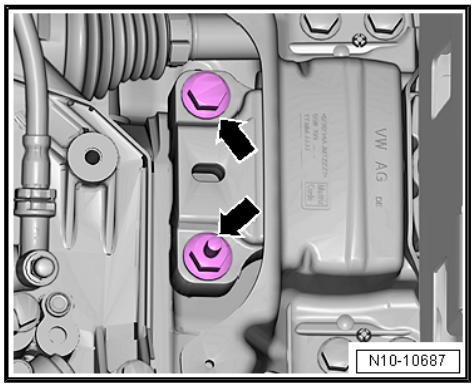
Vehicles with 3 gearbox securing bolts:

– Remove bolts -arrows- securing gearbox mounting.



Vehicles with two gearbox securing bolts:

– Remove bolts -arrows- securing gearbox mounting.



NOTICE

Avoid the risk of damage to the vacuum line or electrical leads and to the engine compartment.

- **Check that all vacuum lines and electrical wiring between engine, gearbox and body have been detached.**
- **Carefully guide engine/gearbox assembly out of engine compartment when lowering.**

– Lower engine/gearbox assembly.

1.2 Separating engine and gearbox

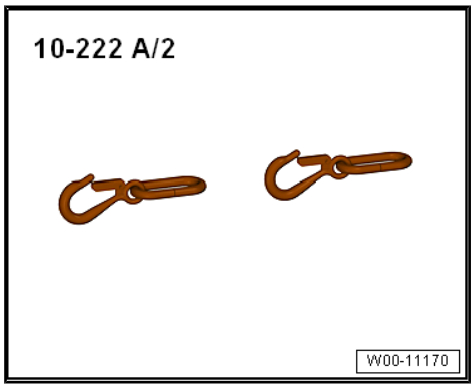
⇒ “1.2.1 Separating engine and gearbox - models with manual gearbox”, page 30

⇒ “1.2.2 Separating engine and gearbox - models with dual clutch gearbox”, page 32

1.2.1 Separating engine and gearbox - models with manual gearbox

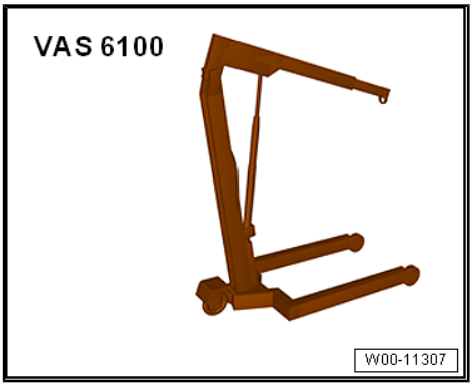
Special tools and workshop equipment required

- Hooks - 10 - 222 A /2-

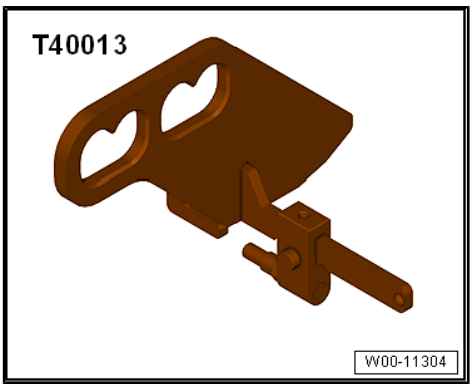


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

♦ Workshop hoist - VAS 6100-



♦ Lifting tackle - T40013-

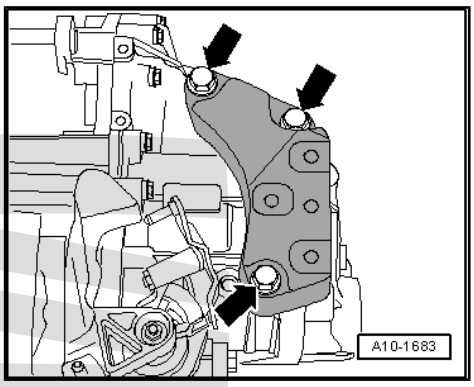


Procedure

- Engine/gearbox assembly removed and attached to engine support -T10497- .

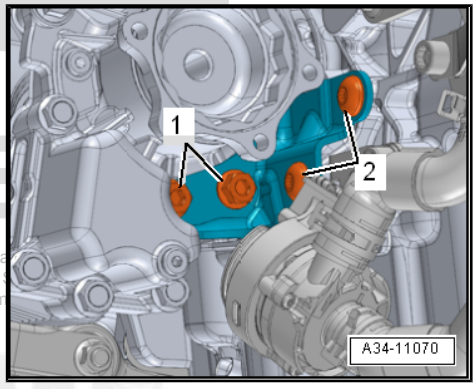
– Remove starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Removing and installing starter

– Unscrew bolts -arrows- and detach gearbox support.



Vehicles with all-wheel drive

– Unscrew bolts -1 and 2-, and remove bracket for bevel box.

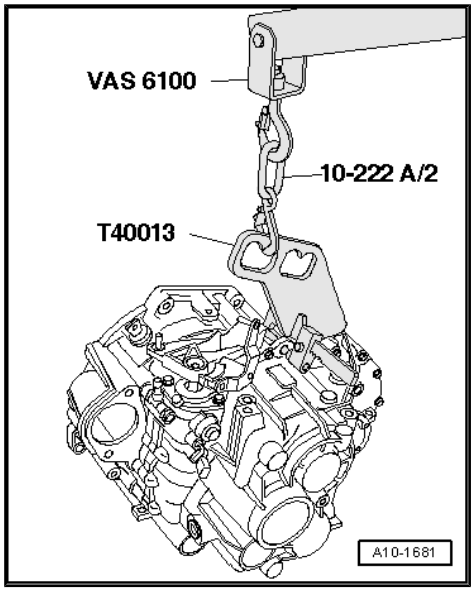


Protected by copyright. Copying for priva
permitted unless authorised by SEAT S.A.
respect to the correctness of inform

Continued for all vehicles

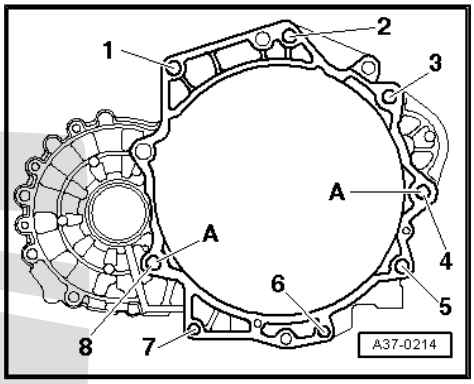
– Attach lifting tackle - T40013- to gearbox and close lock.

– Attach workshop crane - VAS 6100- with hooks - 10 - 222 A / 2- to lifting tackle.



– Unscrew bolts -1, 2, 5, 6, 7, 8- from gearbox to engine connection.

– Detach gearbox from engine (pay attention to intermediate plate).



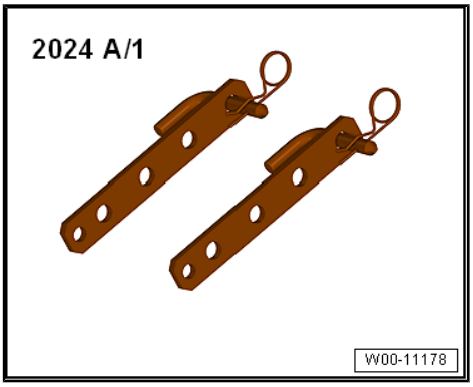
1.2.2 Separating engine and gearbox - models with dual clutch gearbox

Special tools and workshop equipment required

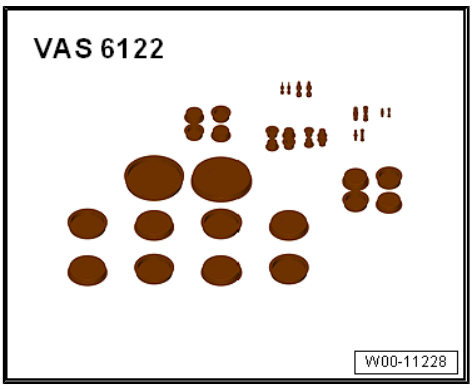
♦ Adapters - 10 - 222 A /20-

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT

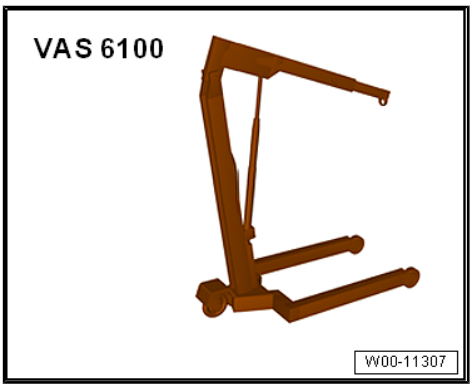
♦ Hook -2024 A /1- of lifting tackle - 2024 A-



♦ Engine bung set - VAS 6122-



♦ Workshop hoist - VAS 6100-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

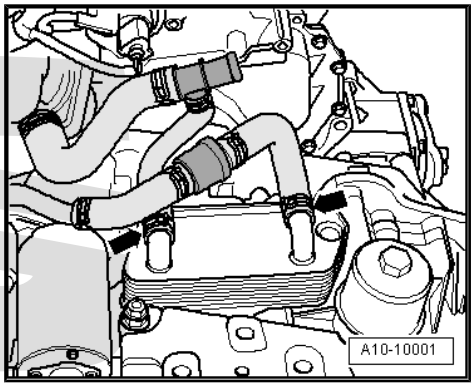
Procedure

- Engine/gearbox assembly removed and attached to engine bracket - T10497- .

Note

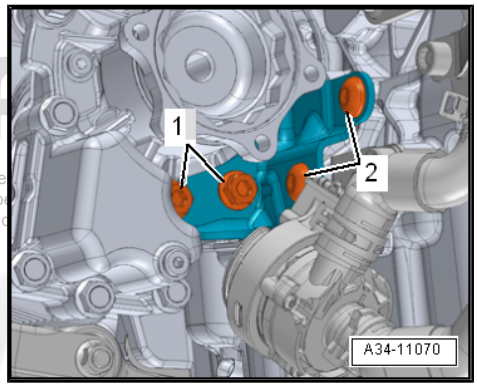
After each time the engine and gearbox have been separated, the needle bearing in the crankshaft must be renewed ⇒ page 87 .

– Remove the coolant hoses from the gear oil cooler, to do this open the hose clips -arrows-.



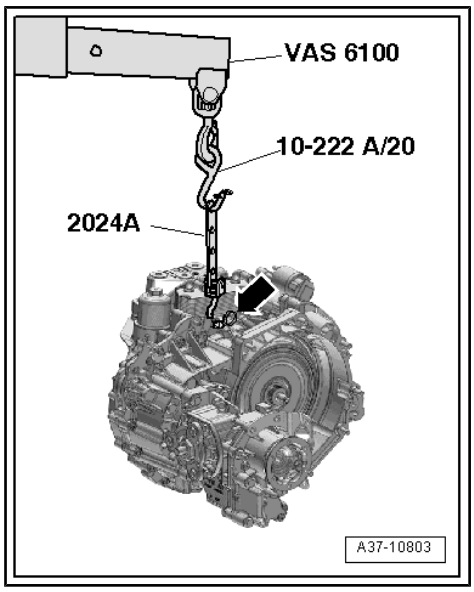
Vehicles with all-wheel drive

– Unscrew bolts -1 and 2-, and remove bracket for bevel box.

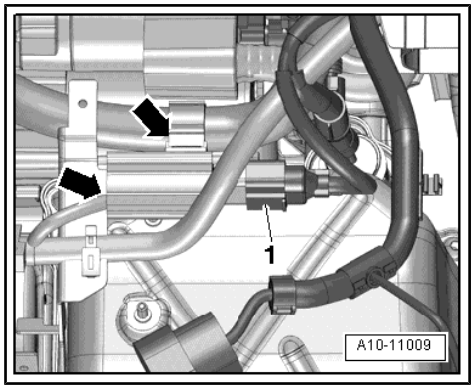


Protected by copyright. Copying for private or comme
permitted unless authorised by SEAT S.A. SEAT S.A do
respect to the correctness of information in this

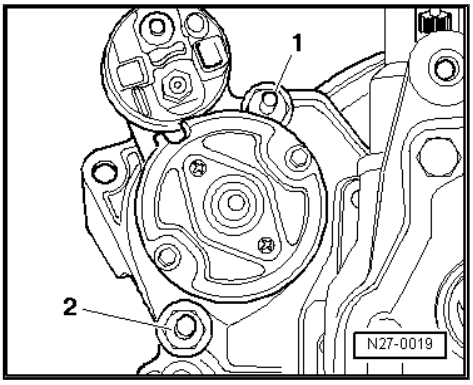
– Attach hook of lifting tackle - 2024 A- to gearbox lifting eye.
– Secure hook with pin -arrow-.
– Attach workshop hoist - VAS 6100- to lifting tackle with adapter - 10 - 222 A /20- .



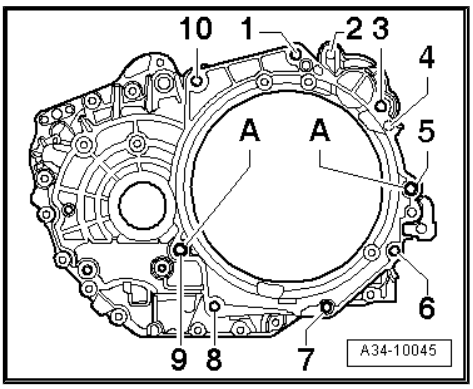
– Free wiring harnesses -arrows- and electrical connector -1- at bracket.



– Unscrew bolts -1- and -2- and remove starter from gearbox.



– Unscrew remaining bolts -1, 3, 5, 6, 7, 8, 9, 10- from gearbox to engine connection.



Note

Bolt -3- is only accessible after removing starter.

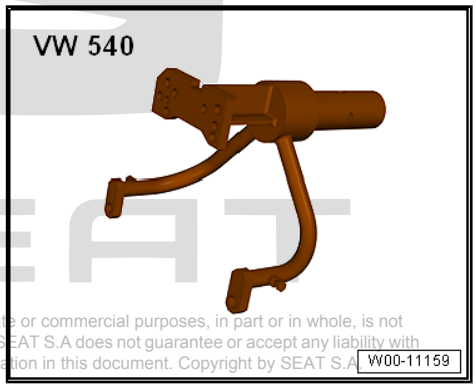
– Detach gearbox from engine.

1.3 Securing engine to engine and gearbox support

Before carrying out repair work, secure engine to the engine and gearbox support - VAS 6095- with universal mounting - VW 540- or engine and gearbox support - VAS 6095/1- .

Special tools and workshop equipment required

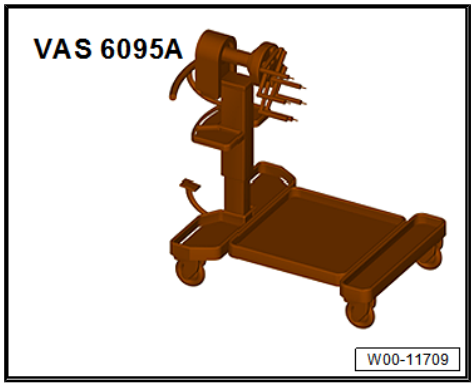
♦ Engine and gearbox support - VW 540-



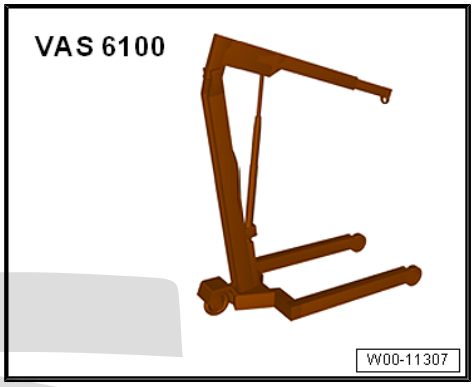
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

♦ Lifting tackle - 3033-

- Engine and gearbox support - VAS 6095A-



- Workshop hoist - VAS 6100-



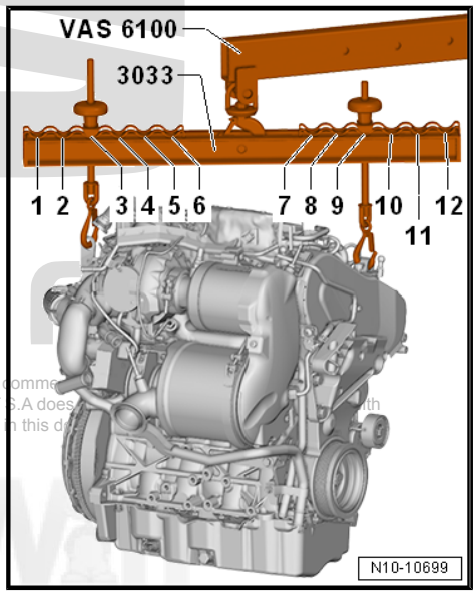
Procedure

– Separate gearbox from engine ⇒ page 30 .

– Engage lifting tackle - 3033- as follows:

Posición 3 - Flywheel end

Posición 9 - Vibration damper end

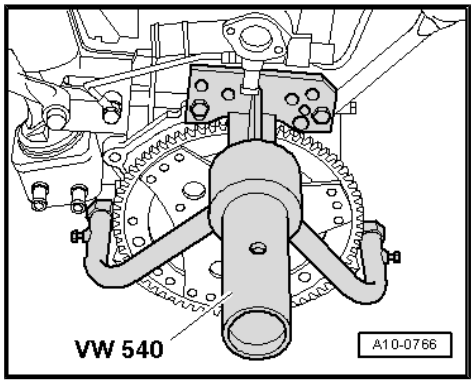


Note

- *To adjust to the centre of gravity of the assembly, the perforated rails must be positioned as shown.*
- *The mounting hooks and dowel pins on the lifting tackle must be secured with locking pins -arrows-.*

– Lift engine out of engine support - T10497- using workshop hoist - VAS 6100- .

– Secure engine on engine and gearbox support - VW 540- with universal mounting - VAS 6095/1- or engine and gearbox support - VAS 6095- .



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document.

1.4 Installing engine

Specified torques

NOTICE

When installing a new base engine, it is essential that the clamping pieces for the injectors are tightened to the specified torque ⇒ page 394 after installing the high-pressure pipes. The clamping pieces are only secured »hand-tight« at the factory so the injectors can be aligned during installation. Non-observance of these details may lead to damage to the engine.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. All rights reserved. Copyright © SEAT S.A.

Note

- *After new components have been installed (engine/short engine, cylinder head, camshaft housing or turbocharger), the oil pressure control must be set to max. pressure for approx. 1000 km if the function is available in the engine control unit. This will compensate for the increased friction during run-in of new components, and a better transport of wear-related particles is guaranteed. To do this, connect vehicle diagnostic tester, switch on ignition, and select the following menu options:*

- `0001 - Engine electronics, functions`
- `0001 - Adaptation`
- `Oil pressure for entry in the engine`

Note

Depending on the vehicle, the engine and the firmware version of the vehicle diagnostic and service information system , the specified path may vary slightly.

Component		Nm
Nuts/bolts	M6	10
	M7	15
	M8	20
	M10	40
	M12	65

- Assembly mountings
  ⇒ “2.1 Assembly overview - assembly mountings”, page 42
- Securing gearbox to engine ⇒ Rep. gr. 34 ; Removing and installing gearbox; Installing gearbox

Procedure

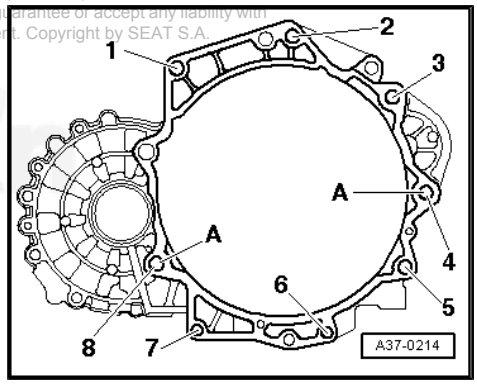
Note

- *Renew bolts that are tightened with turning further angle after each removal.*
- *Renew self-locking nuts and bolts as well as gaskets, seals and O-rings after each removal.*
- *Hose unions and air intake pipes/hoses must be free of oil and grease when installing.*
- *Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ Electronic parts catalogue .*
- *Attach cable ties in all the same places when installing.*

– Install intermediate plate ⇒ page 69 .

– If there are no dowel sleeves -A- in cylinder block for centring engine and gearbox, insert new ones.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



Note

The illustration shows a vehicle with a manual gearbox.

Vehicles with manual gearbox

– Remove needle bearing in crankshaft if fitted ⇒ page 87 .

– If clutch release bearing is worn, renew it ⇒ Rep. gr. 30 ; Clutch mechanism; Repairing clutch release mechanism .

– Lightly grease input shaft splines ⇒ Electronic Part Catalogue .

– Check centring of clutch plate.

Vehicles with all-wheel drive

– Install bracket for bevel box ⇒ Rep. gr. 34 ; Bevel box .

Vehicles with dual clutch gearbox

– Install needle bearing if not fitted in crankshaft ⇒ page 87 .

Continued for all vehicles

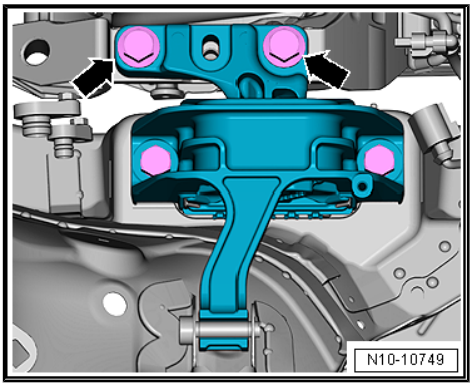
– Secure gearbox to engine.

– Install gearbox support.

– Take up engine/gearbox assembly with engine bracket -T10497- .

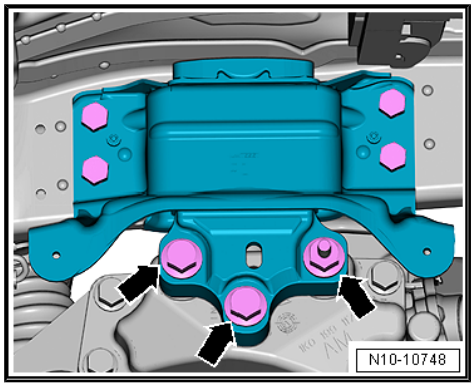
– Guide engine/gearbox assembly into body.

– Initially screw in bolts -arrows- for engine mounting by hand until they make contact.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Initially screw in bolts -arrows- for gearbox mounting by hand until they make contact.



Note

The bolts are tightened to final torque only after adjusting the assembly mountings ⇒ page 53 .

– Remove engine mounting from engine -T10497- .
– Install starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Starter: assembly overview .
– Install charge air cooling pump - V188- ⇒ page 257 .
– Install air intake pipe ⇒ page 362 .
– Install front exhaust pipe ⇒ page 489 .
– Install drive shafts ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Assembly overview - drive shaft .

Vehicles with all-wheel drive

– Install propshaft to bevel box ⇒ Rep. gr. 39 ; Propshaft; Assembly overview - propshaft .

Vehicles with air conditioner.

– Install air conditioner compressor ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Assembly overview - drive unit of air conditioner compressor .

Vehicles with lambda probe 1 after catalytic converter - GX7-

– Connect electrical connector of the lambda sensor 1 after catalytic converter - GX7- ⇒ page 469 .

Continued for all vehicles

– Install poly V-belt ⇒ page 59 .
– Install fuel filter ⇒ Rep. gr. 20 ; Fuel filter; Assembly overview - fuel filter .
– Install engine control unit ⇒ page 455 .
– Connect clutch slave cylinder ⇒ Rep. gr. 30 ; Clutch mechanism; Clutch slave cylinder: removing and installing .
– Bleed clutch hydraulics ⇒ Rep. gr. 30 ; Clutch mechanism; Bleeding clutch mechanism .
– Installing control cables with counter-hold tool ⇒ Rep. gr. 34 ; Selector mechanism; Control cables: assembly overview .
– Adjust the mechanical group mountings ⇒ page 53 .
– Install battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Battery: assembly overview .

Vehicles with SCR system

– Install control unit for NOx sensor - J583- to battery tray ⇒ page 452 .
– Connect line for reducing agent ⇒ page 545 .

Continued for all vehicles

– Install radiator cowl ⇒ page 317 .
– Install the lock carrier to its Service position ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Assembly overview - Lock carrier .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Install front wheel housing liners ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing; assembly overview- front wheel housing liner .

– Observe electrical connections and routing ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

– Connect vacuum hoses ⇒ page 390 .

– Install the air cleaner housing ⇒ page 421 .

– Install connection ⇒ page 326 .

NOTICE

It is possible to destroy control units with excessive voltage.

♦ **Never use battery charging equipment for boost starting.**

– Bleeding the fuel system ⇒ page 388 .

– Connect coolant hoses with plug-in connectors to heat exchanger for heater ⇒ page 306 .

– Check oil level ⇒ page 171 .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Note

Never reuse old coolant.

– Add coolant ⇒ page 214 .

2 Assembly mountings

⇒ “2.1 Assembly overview - assembly mountings”, page 42

⇒ “2.2 Removing and installing engine mountings”, page 43

⇒ “2.3 Removing and installing gearbox mounting”, page 45

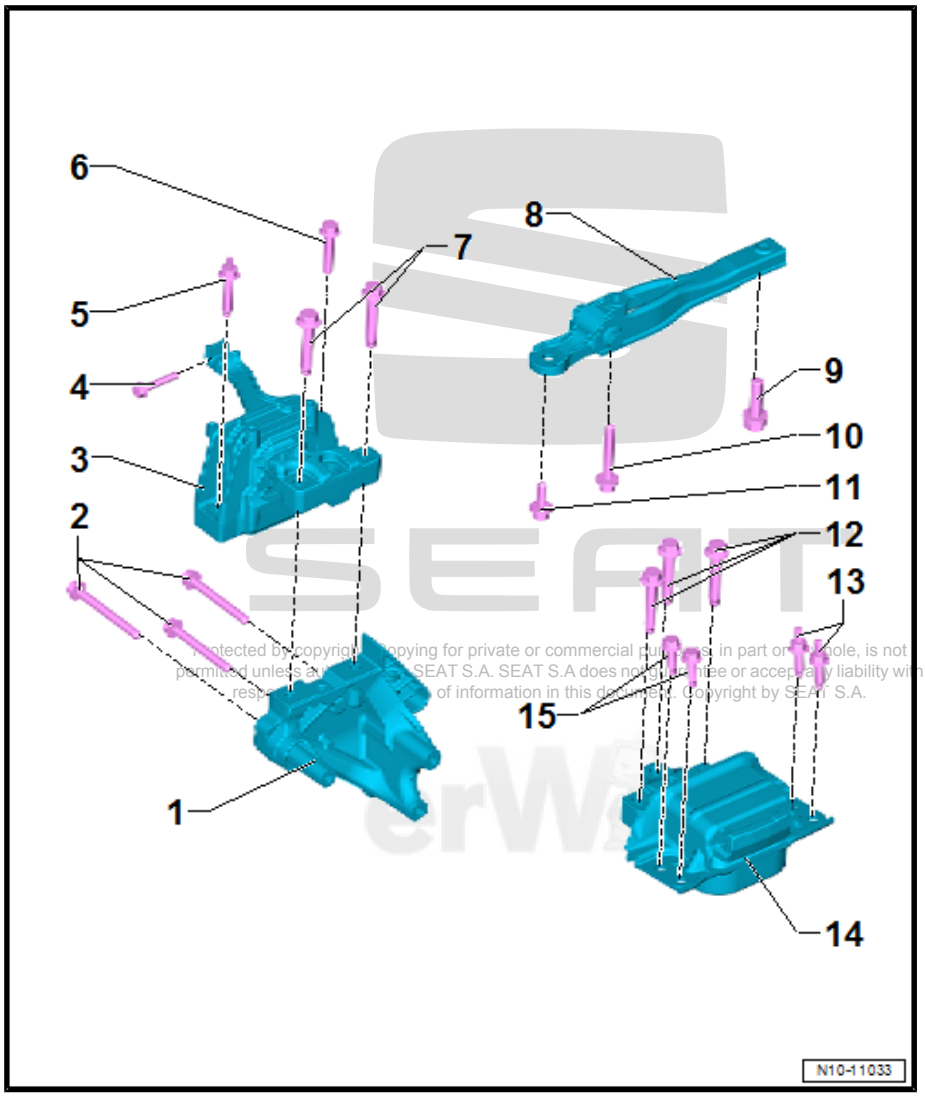
⇒ “2.4 Removing and installing pendulum support”, page 47

⇒ “2.5 Supporting engine in installation position”, page 48

⇒ “2.6 Adjusting assembly mounting”, page 53

⇒ “2.7 Checking adjustment of assembly mountings (engine and gearbox mountings)”, page 55

2.1 Assembly overview - assembly mountings



1 - Engine support

- ❑ Removing and installing ⇒ page 63

2 - Bolt

- ❑ Renew after removal
- ❑ Specified torque and tightening sequence, bolt allocation ⇒ page 64

3 - Engine mounting

- ❑ With support arm
- ❑ Removing and installing ⇒ page 43

4 - Bolt

- ❑ Renew after removal
- ❑ 20 Nm +90°

5 - Bolt

- ❑ Renew after removal
- ❑ 40 Nm +90°

6 - Bolt

- ❑ Renew after removal
- ❑ 40 Nm +90°

7 - Bolt

- ❑ Renew after removal
- ❑ 60 Nm +90°

8 - Torque reaction support

- ❑ Removing and installing ⇒ page 47
- ❑ Specified torque and sequence ⇒ page 43 .

9 - Bolt

- ❑ Renew after removal
- ❑ Specified torque and sequence ⇒ page 48 .

10 - Bolt

- ❑ Renew after removal
- ❑ Specified torque and sequence ⇒ page 48 .

protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

11 - Bolts

- ❑ Renew after removal
- ❑ Specified torque and sequence ⇒ page 48 .

12 - Bolt

- ❑ Renew after removal
- ❑ 60 Nm +90°

13 - Centre hex stud

- ❑ Renew after removal
- ❑ 50 Nm +90°

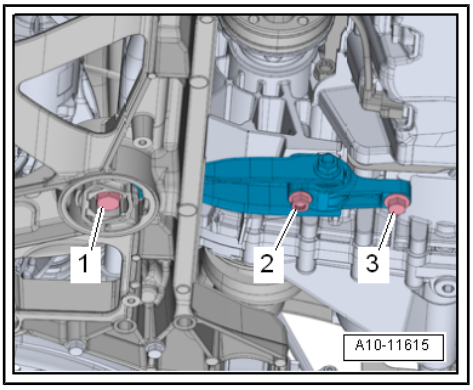
14 - Bevel box carrier

- ❑ With support arm
- ❑ Removing and installing ⇒ page 45

15 - Bolt

- ❑ Renew after removal
- ❑ 50 Nm +90°

Bolted connection for pendulum support



Note

Renew bolts that are tightened with turning further angle after each removal.

– Tighten bolts in stages in the sequence shown:

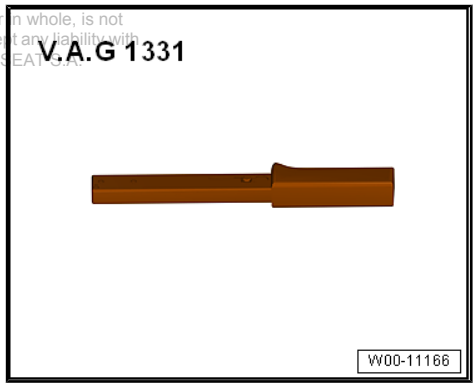
Specified torques

Stage	Bolts	Specified torque/turning further angle
1st	-2, 3-	50 Nm
2nd	-1-	130 Nm
3rd	-1 - 3-	Turn 90° further

2.2 Removing and installing engine mountings

Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1331-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

♦ Torque wrench - V.A.G 1332-

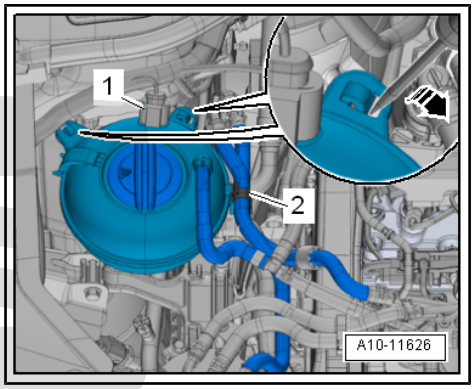
Removing

– Remove engine cover panel ⇒ page 56 .

– Unplug the electrical connector -1-.

– Remove the bracket -2- with fuel hoses.

– Using a screwdriver, release fasteners -arrow- and move coolant expansion tank to one side.



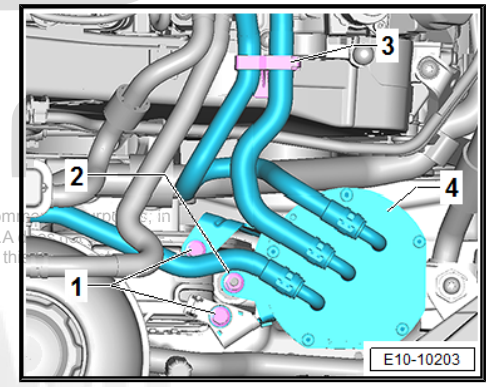
– Move clear bracket -3- with fuel hoses.

– Unscrew nut -2- and bolts -1-.

– Remove the fuel filter -4- and lay it with the fuel lines connected on the engine.

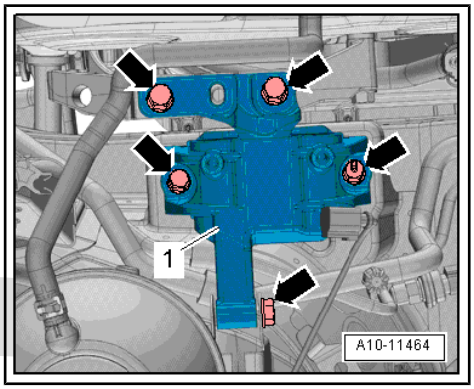
– Support engine and gearbox in installation position ⇒ page 48 .

– Take up weight of engine/gearbox assembly slightly with spindle; do not lift.



Protected by copyright. Copying for private or com... In
permitted unless authorised by SEAT S.A. SEAT S.A
...ion in th...

– Unscrew and remove the bolts -arrows-, remove gearbox mounting -1-.



Installing

Install in reverse order of removal, observing the following.

Note

- *There is a risk of damage to the threads if bolts are started at an angle.*
- *Renew bolts that are tightened with turning further angle after each removal.*
- *Only remove support bracket - 10 - 222 A- when bolts on assembly mounting have been tightened to specified torque.*

– Check adjustment of assembly mountings (engine/gearbox mountings) ⇒ page 55 .

Specified torques

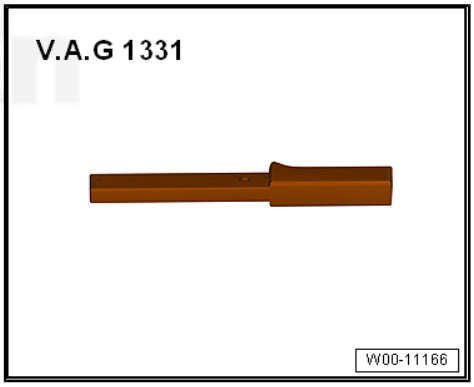
- ⇒ “2.1 Assembly overview - assembly mountings”, page 42
- Assembly overview - fuel filter ⇒ Rep. gr. 20 ; Fuel filter; Assembly overview - fuel filter .

2.3 Removing and installing gearbox mounting

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-



- Torque wrench - V.A.G 1332-

Removing

– For reasons of space, remove the air filter housing together with the intake hose ⇒ page 422 .

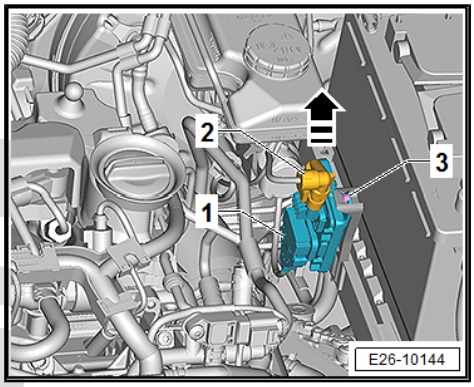
Vehicles with SCR system

– Disconnect connector -2- at NOx sender control unit - J583- -1-.

– Remove control device for NOx sender - J583- -1- from the battery holder, for this, unlock the framework -3- and remove in the -direction of arrow-.

– Unclip wiring harness from brake fluid reservoir.

– Lay control unit for NOx sender - J583- -1- to one side.

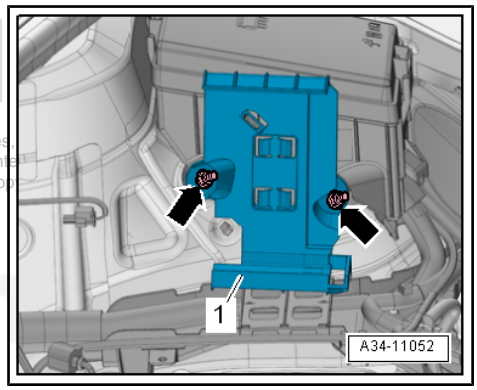


Continued for all vehicles

– Remove battery tray -1- ⇒ Electrical system; Rep. gr. 27 ; Battery; battery tray: removing and installing .

– Remove the engine control unit - J623- from the bracket ⇒ page 455 .

– Remove nuts -arrows- and detach bracket -1-.



Note

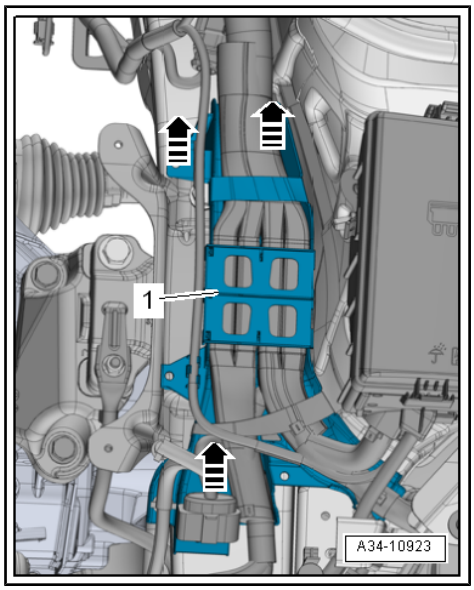
Different types of brackets are fitted depending on version.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT does not guarantee respect to the correctness of information in this document. Co

– Unclip wire guide -1- upwards -arrows- and push slightly to one side.

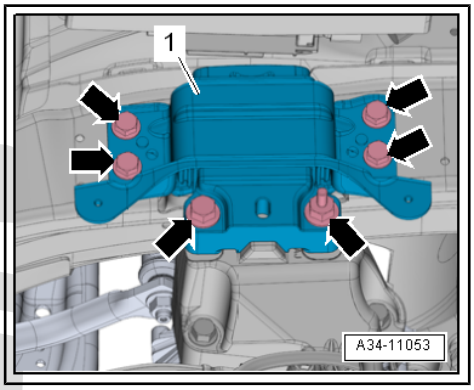
– Support engine and gearbox in installation position ⇒ page 48 .

– Take up weight of engine/gearbox assembly slightly with spindle; do not lift.



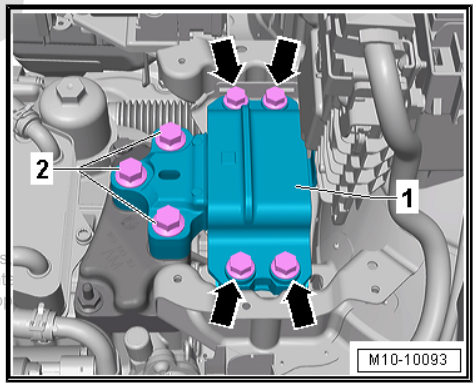
Vehicles with two gearbox securing bolts:

– Remove bolts -arrows- and detach gearbox mounting -1-.



Vehicles with 3 gearbox securing bolts:

– Unscrew bolts -2-. Then unscrew bolts -arrows-, and remove gearbox mounting -1-.



Installing

Install in reverse order of removal, observing the following.

Note

Protected by copyright. Copying for private or commercial purposes permitted unless authorised by SEAT S.A. SEAT S.A does not guarant respect to the correctness of information in this document. Co

Renew bolts that are tightened with turning further angle after each removal.

– Tighten gearbox mounting on longitudinal member.

CAUTION

There is a risk of damage to the threads if bolts are started at an angle.

Gearbox support and support arm of gearbox mounting must be perfectly parallel to each other before screwing in bolts. If necessary, lift gearbox at rear using trolley jack.

Only remove support bracket - 10 - 222 A- when bolts on assembly mounting have been tightened to specified torque.

– Pull gearbox up with spindle on support bracket until gearbox support contacts support arm of gearbox mounting.

– Check adjustment of assembly mountings (engine/gearbox mountings) ⇒ page 55 .

– Remove the gearbox support - 10 - 222 A- from the engine.

Specified torques

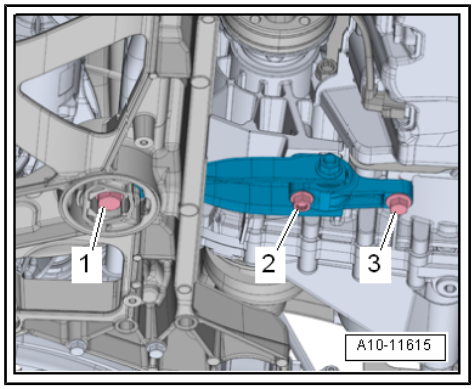
- ⇒ “2.1 Assembly overview - assembly mountings”, page 42
- ⇒ Electrical system; Rep. gr. 27 ; Battery; Assembly overview - battery

2.4 Removing and installing pendulum support

Removing

– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

– Unscrew bolts -1, 2 and 3-, and remove pendulum support.

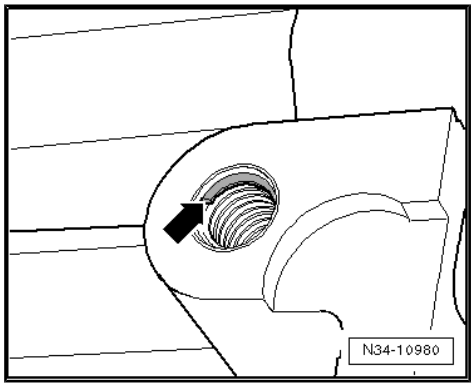


Installing

Install in reverse order of removal, observing the following.

Note

- *Bolt holes for pendulum support are fitted with thread inserts (e.g. "HeliCoil").*
- *The shoulder on the first thread pitch -arrow- is an identifying feature.*

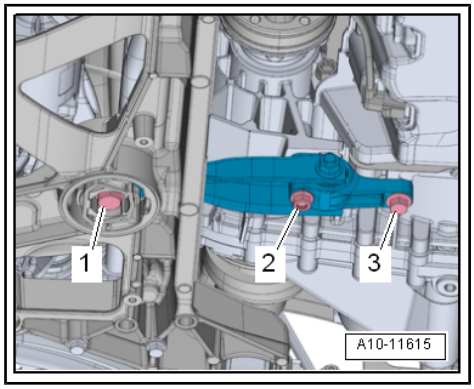


Bolted connection for pendulum support

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Note

Renew bolts that are tightened with turning further angle after each removal.



– Tighten bolts in stages in the sequence shown:

Specified torques

Stage	Bolts	Specified torque/turning further angle
1st	-2, 3-	50 Nm
2nd	-1-	130 Nm
3rd	-1 - 3-	Turn 90° further

- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation

2.5 Supporting engine in installation position

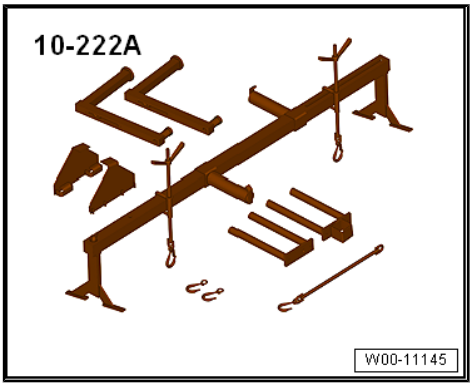
⇒ "2.5.1 Supporting engine in installation position, Ateca", page 48

⇒ "2.5.2 Supporting engine in installation position, Leon", page 50

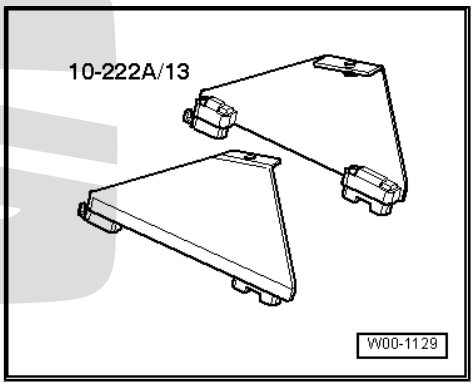
2.5.1 Supporting engine in installation position, Ateca

Special tools and workshop equipment required

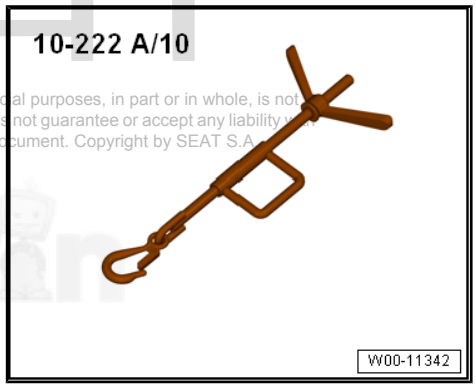
- Support bracket - 10 - 222 A-



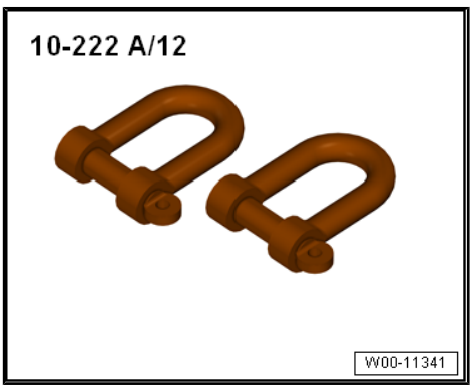
- Adapters - 10-222A/13-



- Spindle - 10 - 222 A /10-

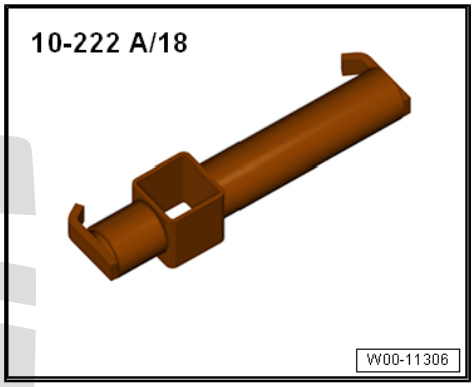


- Shackle - 10 - 222 A /12-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- Adapters - 10 - 222 A /18-

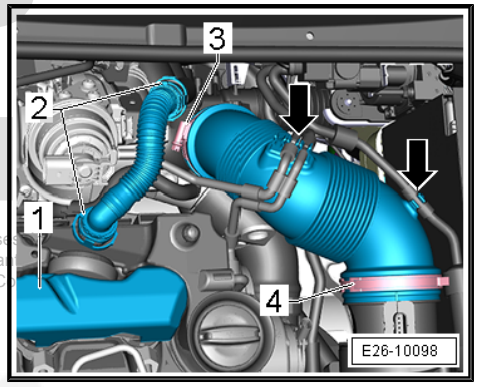


Procedure

– Remove engine cover panel ⇒ page 56 .

– Loosen clamps -3- and -4-, and remove the air hose.

– Move clear vacuum hoses at air pipe -arrows-.



Note

Disregard -items 1 and 2-.

Protected by copyright. Copying for private or commercial purpose
permitted unless authorised by SEAT S.A. SEAT S.A does not guara
respect to the correctness of information in this document. C

– Position engine support bracket - 10 - 222 A- on left and right onto longitudinal members as shown in illustration.

– Push the adapter - 10 - 222 A /18- onto the support bracket - 10 - 222 A- .

– Bolt adapter - 10 - 222 A /13- labelled »L« to right side of support bracket - 10-222 A- .

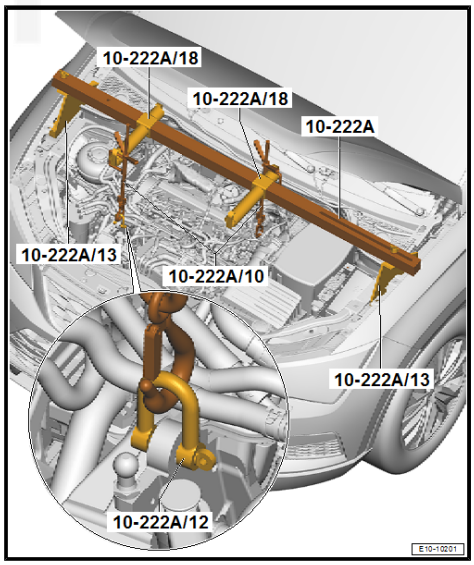
– Bolt adapter - 10 - 222 A /13- labelled »R« to left side of support bracket - 10-222 A- .

– Attach the spindles - 10 - 222 A /10- to the adapters - 10 - 222 A /18- .

– Attach the shackle - 10 - 222 A /12- to the eye of the right engine mounting.

– Attach hook of spindles - 10 - 222 A /10- to engine lifting eyes.

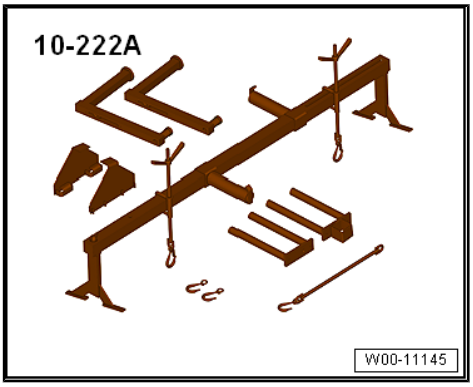
– Tighten spindle to take up weight of engine/gearbox assembly; do not lift.



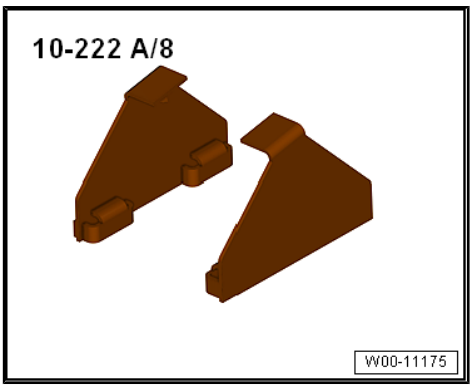
2.5.2 Supporting engine in installation position, Leon

Special tools and workshop equipment required

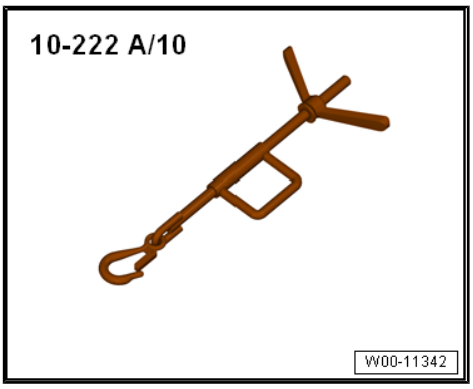
♦ Support bracket - 10 - 222 A-



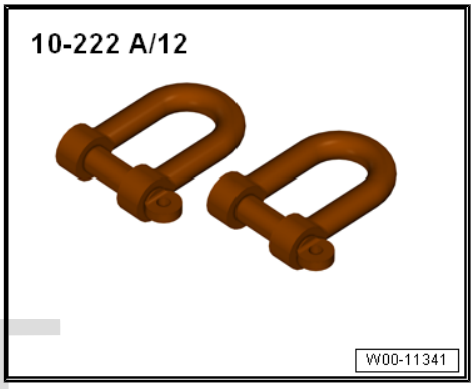
♦ Adapters - 10-222A/8-



♦ Spindle - 10 - 222 A /10-

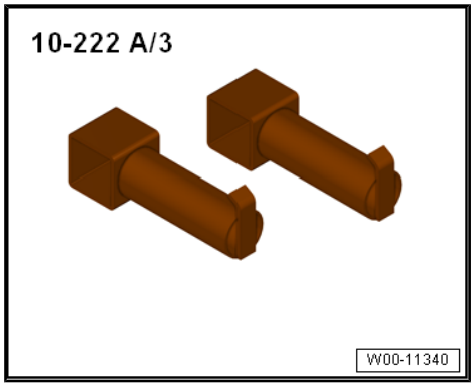


♦ Shackle - 10 - 222 A /12-

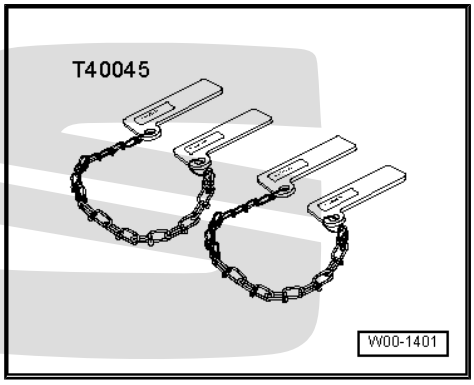


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

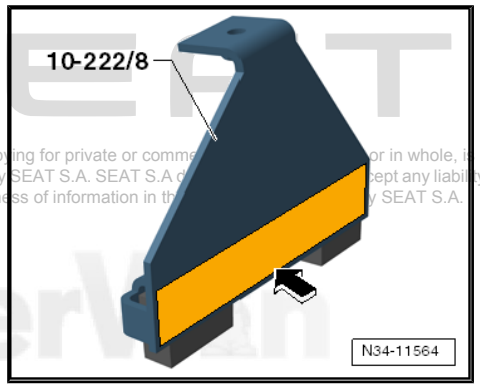
- Adapters - 10 222A/3-



- Gauge - T40045-



To prevent damage to edges of wings, cover lower areas of both adapters - 10 - 222 A /8- with woven adhesive tape -arrow- ⇒ Electronic Parts Catalogue .



Protected by copyright. Copying for private or comme or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A d cept any liability with respect to the correctness of information in th SEAT S.A.

Procedure

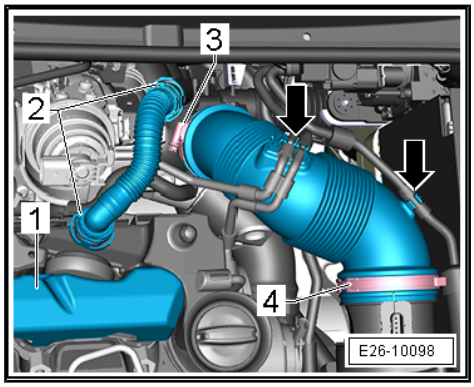
– Remove engine cover panel ⇒ page 56 .

– Loosen clamps -3- and -4-, and remove the air hose.

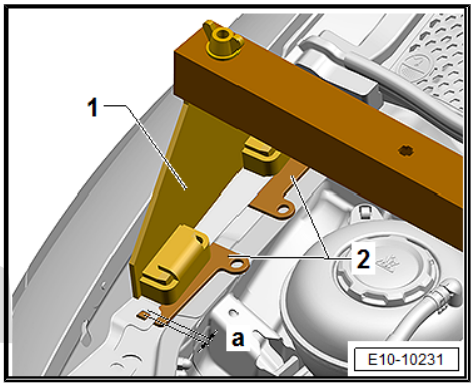
– Move clear vacuum hoses at air pipe -arrows-.

Note

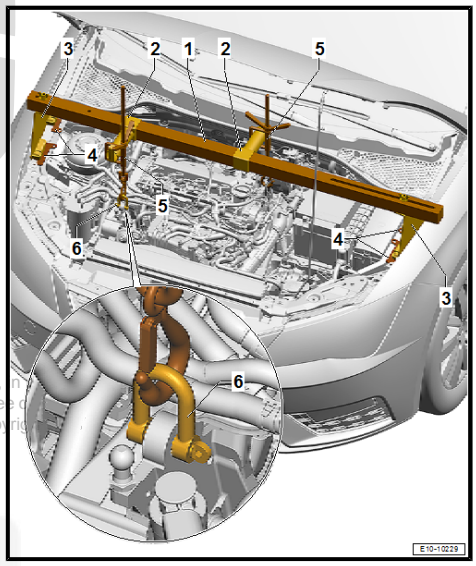
Disregard -items 1 and 2-.



- Insert and align the gauges - T40045- -2- as shown in the illustration in the front longitudinal members right and left. When doing so, observe the height -a-.
- Attach the adapter - 10 - 222 A /8- -1- on left and right onto longitudinal members as shown in illustration.



– Slide the adapters - 10 - 222 A /3- -2- onto the engine interception device - 10 - 222 A- -1-.
– Screw in the adapter - 10 - 222 A /8- -3- into the engine interception device - 10-222 A- -1-.
– Insert the engine interception device - 10 - 222 A- -1- and the adapter - 10 - 222 A /8- -3- on left and right onto longitudinal members as shown.



Observe the position and setting of the gauge - T40045- -4- ⇒ page 53 .

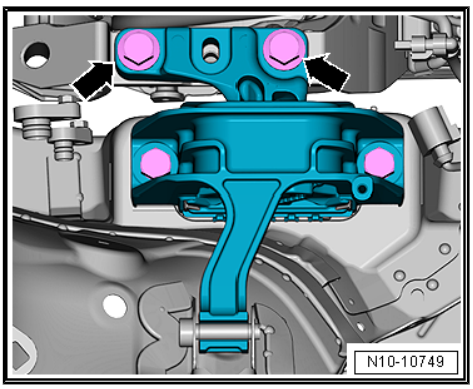
– Fit the spindles - 10 - 222 A /10- -5- on the adapters - 10 - 222 A /3- -2-.
– Fit the shackle - 10 - 222 A /12- -6- in the right lifting eye of the engine.
– Hook the karabiners of the spindles - 10 - 222 A /10- -5- onto the shackle - 10 - 222 A /12- -6-.
– Tighten spindle to take up weight of engine/gearbox assembly; do not lift.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

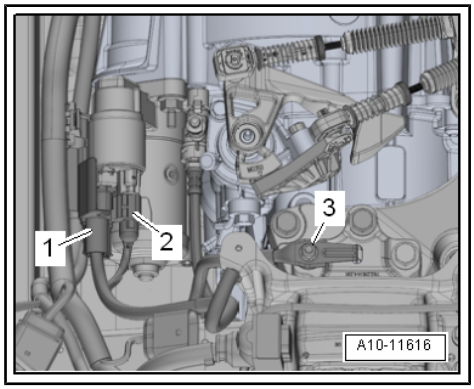
2.6 Adjusting assembly mounting

Procedure

– Remove battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray .
– Support engine and gearbox in installation position ⇒ page 48 .
– Take up weight of engine/gearbox assembly slightly with spindle; do not lift.
– One after another, unscrew and replace the engine mounting bolts -arrows- (if they were not renewed when installing engine).
– First screw bolts in loosely.



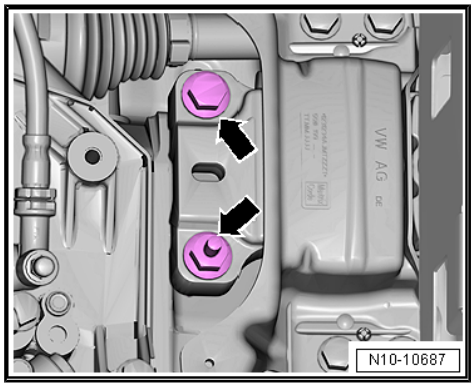
– Unscrew nut -3- and expose earth line



Vehicles with two gearbox securing bolts:

– Unscrew bolts -arrows- for gearbox mounting -1- in succession and renew (if not already carried out on installing engine).

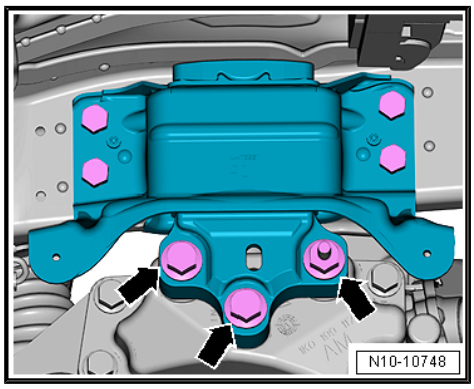
– First screw bolts in loosely.



Vehicles with 3 gearbox securing bolts:

– Unscrew bolts -arrows- for gearbox mounting -1- in succession and renew (if not already carried out on installing engine).

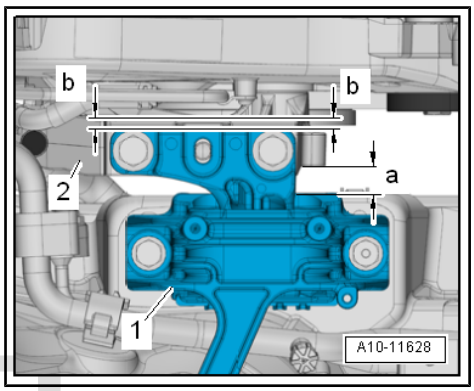
– First screw bolts in loosely.



Continued for all vehicles

– Using assembly lever, adjust engine/gearbox assembly so that specifications listed below are attained:

- There must be a distance of -a- = 10 mm between engine support -2- and engine mounting -1-.
- Side surface of the engine support casting should be located parallel to support arm of engine mounting.
- Distance -b- at front = distance -b- at rear.



Note

For example, distance -a- = 10 mm can be checked with a metal rod of suitable size.

– Tighten bolts for engine mounting.

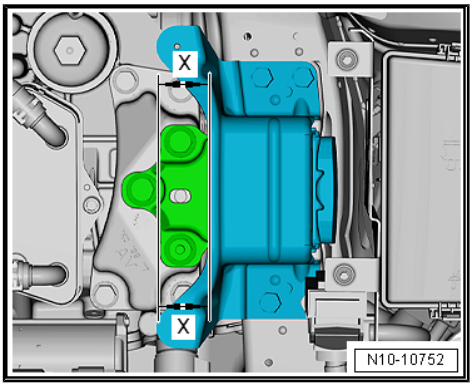
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Vehicles with 3 gearbox securing bolts:

– On gearbox side, make sure that the edges on support arm and gearbox mounting are parallel.

• Dimension -x- = dimension -x-.

– Tighten bolts for gearbox mounting.

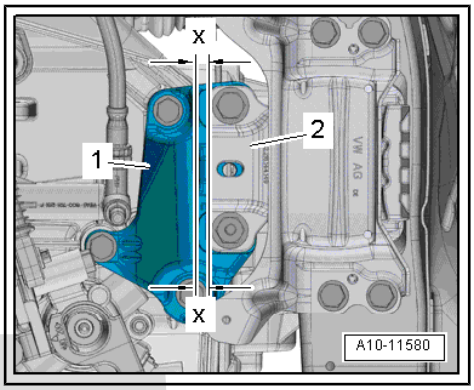


Vehicles with two gearbox securing bolts:

– On the gearbox side, ensure that the edges of the support arm -2- and gearbox support -1- are parallel.

• Dimension -x- = dimension -x-.

– Tighten bolts for gearbox mounting.



Continued for all vehicles

Install in reverse order of removal.

Specified torques

♦ ⇒ “2.1 Assembly overview - assembly mountings”, page 42

♦ Assembly overview - battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Assembly overview - battery .

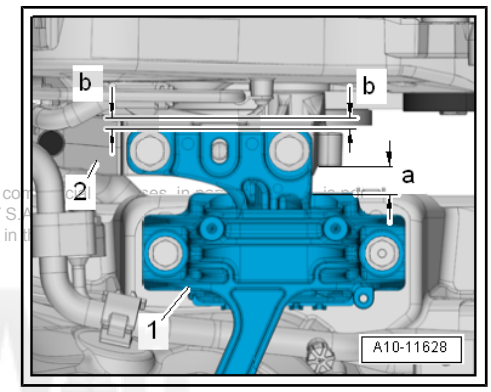
2.7 Checking adjustment of assembly mountings (engine and gearbox mountings)

Procedure

The following dimensions must be reached:

• There must be a distance of -a- = 10 mm between engine support -2- and engine mounting -1-.

• Side surface of engine support casting should be located parallel to support arm of engine mounting.



Protected by copyright. Copying for private or co
permitted unless authorised by SEAT S.A. SEAT S.A
respect to the correctness of information in t

Note

For example, distance -a- = 10 mm can be checked with a metal rod of suitable size.

– If the gap is too narrow or too wide when measured you must adjust the assembly mounting ⇒ page 53 .

3 Engine cover

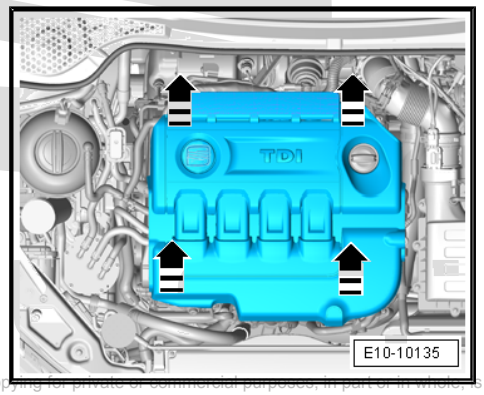
⇒ “3.1 Removing and installing engine cover panel”, page 56

3.1 Removing and installing engine cover panel

Removing

NOTICE

Make sure not to pull on fuel return lines when removing and installing the engine cover panel. Make sure to not grasp the line unintentionally. Otherwise the connections on the injectors may break, The consequences would be leaks in the fuel system.



– Carefully pull engine cover off holding pins -arrows- one after another. Do not jerk engine cover panel away, and do not try to pull on one side only.

Installing

– To avoid damage, do not strike the engine cover panel with your fist or with any kind of tool.

– Position engine cover panel, paying attention to oil filler neck and dipstick.

– Press engine cover panel into rubber grommets first on the left side and then on the right side as seen facing direction of travel.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

13 – Crankshaft group

1 Cylinder block (pulley end)

⇒ “1.1 Assembly overview - cylinder block, pulley end”, page 57

⇒ “1.2 Assembly overview - sealing flange, pulley end”, page 59

⇒ “1.3 Removing and installing poly V-belt”, page 59

⇒ “1.4 Removing and installing tensioner for poly V-belt”, page 61

⇒ “1.5 Removing and installing vibration damper”, page 61

⇒ “1.6 Removing and installing ancillary bracket”, page 62

⇒ “1.7 Removing and installing engine support”, page 63

⇒ “1.8 Removing and installing sealing flange - pulley end”, page 64

1.1 Assembly overview - cylinder block, pulley end

1 - Poly V-belt

- ❑ Check for wear
- ❑ Before removing, mark direction of rotation with chalk or felt-tipped pen
- ❑ Do not kink.
- ❑ Routing of poly V-belt ⇒ page 60
- ❑ Removing and installing ⇒ page 59
- ❑ When installing, make sure it is properly seated on pulleys.

2 - Bolt

- ❑ Renew after removal
- ❑ ⇒ electronic parts catalogue
- ❑ 10 Nm +90°

3 - Vibration damper

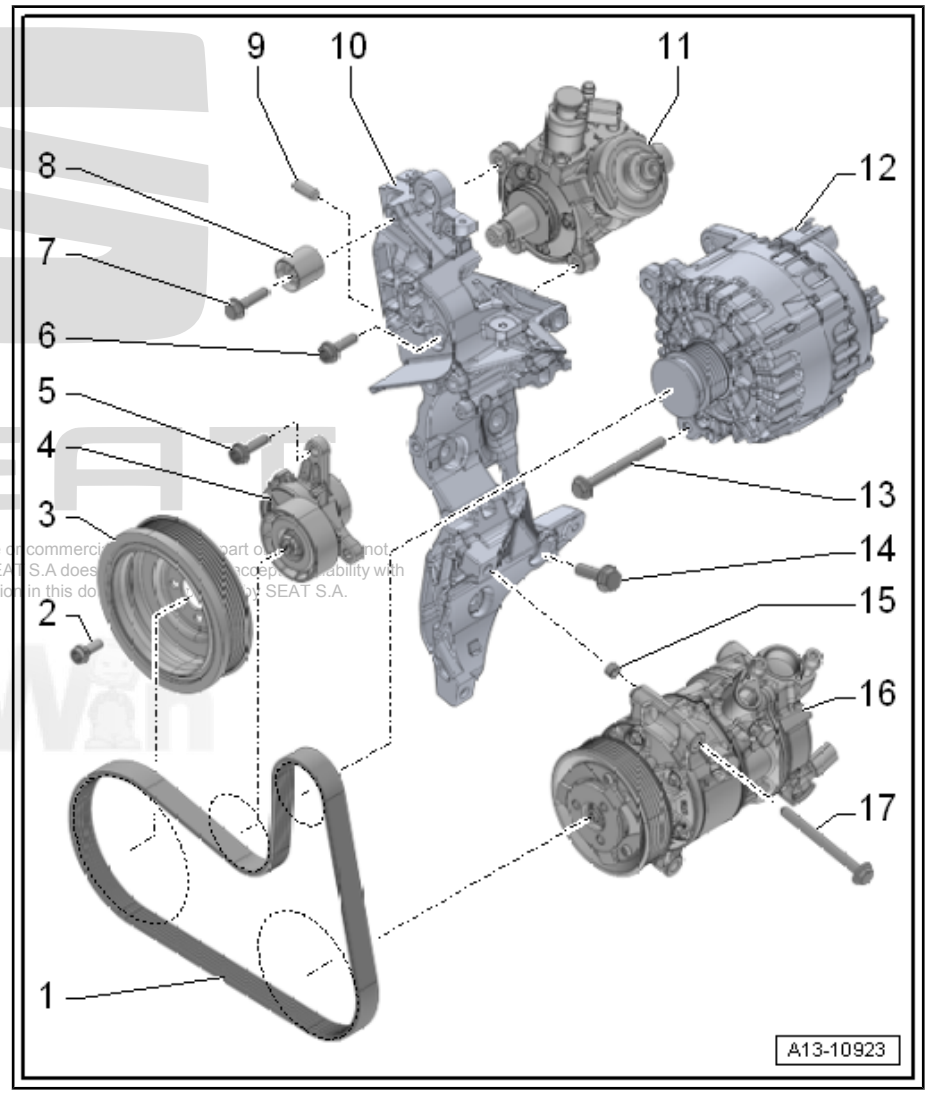
- ❑ With poly V-belt pulley
- ❑ Installation position: hole in vibration damper must align over protrusion on crankshaft toothed belt pulley.
- ❑ Removing and installing ⇒ page 61

4 - Tensioning device for V-ribbed belt

- ❑ Removing and installing ⇒ page 61

5 - Bolt

- ❑ Renew after removal



Protected by copyright. Copying for private or commercial purposes, part of this publication is not permitted unless authorised by SEAT S.A. SEAT S.A does not accept liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- ❑ 20 Nm +90°

6 - Bolt

- ❑ Specified torque ⇒ page 461

7 - Bolt

- ❑ Specified torque ⇒ Item 14 (page 125)

8 - Stabiliser roller

9 - Dowel sleeve

- ❑ Check for correct seating in ancillary bracket.

10 - Bracket for ancillary mechanical units

- ❑ Removing and installing ⇒ page 62

11 - High-pressure pump

- ❑ Assembly overview ⇒ page 461

12 - Alternator:

- ❑ Assembly overview ⇒ Electrical system; Rep. gr. 27 ; Alternator; Assembly overview - Alternator

13 - Bolt

- ❑ Specified torque ⇒ Electrical system; Rep. gr. 27 ; Alternator; Assembly overview - alternator

14 - Bolt

- ❑ Different lengths ⇒ page 58
- ❑ Specified torque and sequence ⇒ page 58 .

15 - Dowel sleeve

- ❑ Ensure correct seating in air conditioner compressor

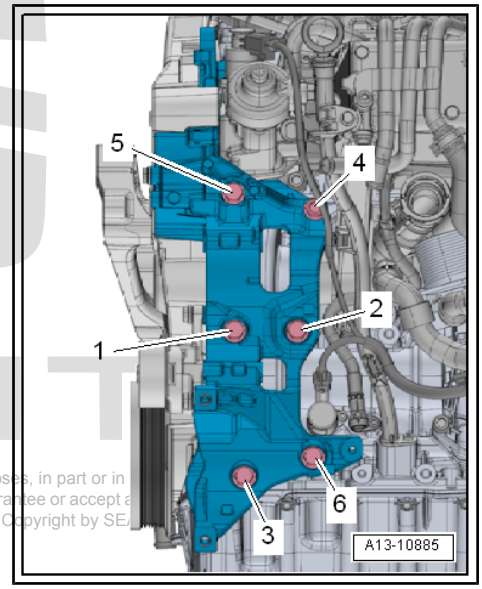
16 - Air conditioner compressor

- ❑ Assembly overview ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Assembly overview - drive unit of air conditioner compressor .

17 - Bolt

- ❑ Specified torque ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Assembly overview - drive unit of air conditioner compressor .

Ancillary bracket - specified torques and tightening sequence



Note

Renew bolts that are tightened with turning further angle after each removal.

– Fit bolts in the following sequence:

♦ Bolts -1, 2, 3, 6- M10x35

♦ Bolt -4- M10x115

♦ Bolt -5- M10x175

– Tighten bolts in stages in the sequence shown:

Stage	Bolts	Specified torque/turning further angle
1st	-1 - 6-	Screw in by hand as far as stop
2nd	-1 - 6-	40 Nm
3rd	-4- and -5-	Turn 180° further
4th	-1, 2, 3, 6-	Turn 45° further

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

1.2 Assembly overview - sealing flange, pulley end

1 - Sealing flange (pulley end)

- ❑ With crankshaft oil seal
- ❑ Renew after removal
- ❑ Removing and installing ⇒ page 64

2 - Bolt

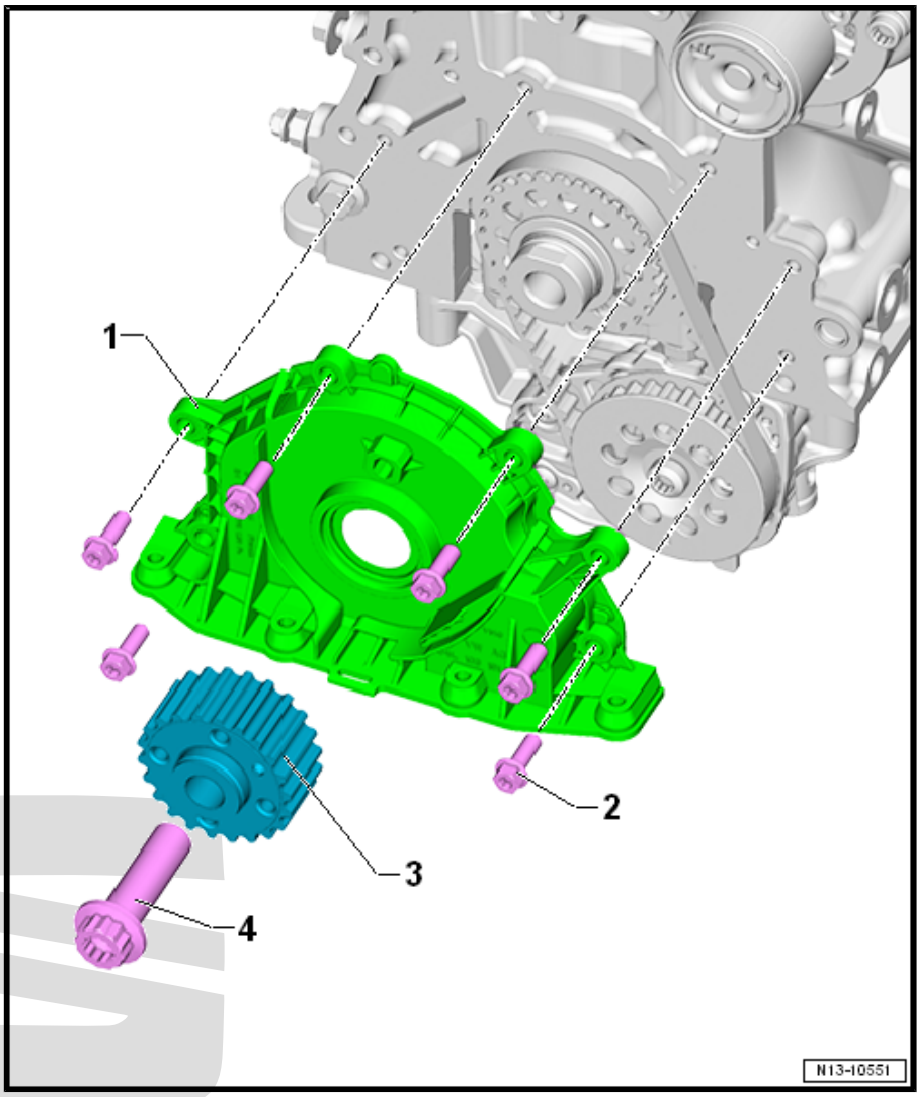
- ❑ Specified torque and sequence ⇒ page 59 .

3 - Crankshaft pulley

- ❑ Contact surface between sprocket and crankshaft must be free of oil
- ❑ Fitting possible in one position only.

4 - Bolt

- ❑ Specified torque ⇒ Item 1 (page 124)

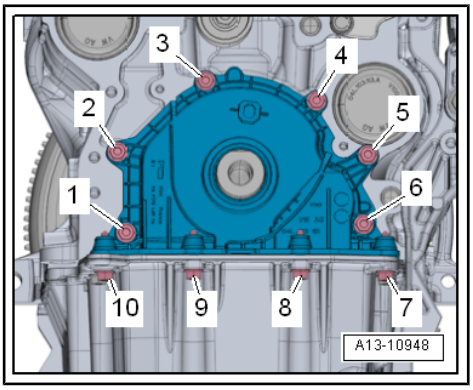


Sealing flange (pulley end) - specified torque and sequence

– Tighten bolts in stages in the sequence shown:

Stage	Bolts	Specified torque
1st	-1 … 10-	Screw in by hand as far as stop
2nd	-1 - 6-	Tighten in stages and in diagonal sequence; final torque 13 Nm
3rd	-7 - 10-	13 Nm

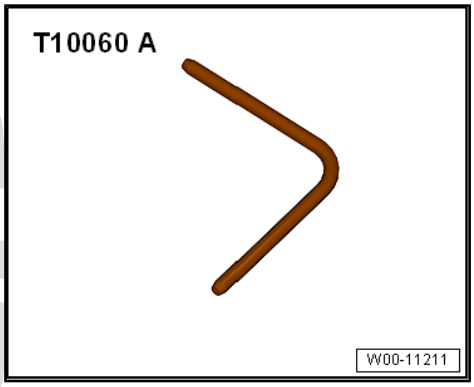
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



1.3 Removing and installing poly V-belt

Special tools and workshop equipment required

♦ Locking pin - T10060 A-



Removing

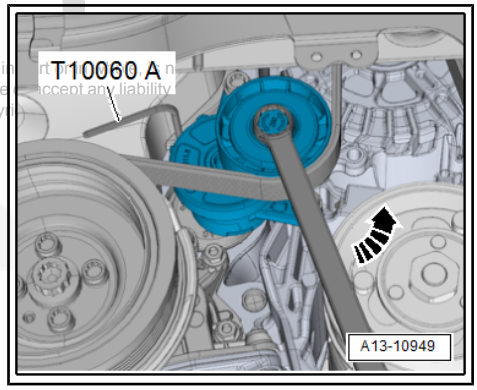
– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

– Before removing, mark direction of rotation of poly V-belt with chalk or felt-tipped pen for re-installation.

– To slacken poly V-belt use a ring spanner to swing tensioner in -direction of arrow-.

– Lock tensioner with locking pin - T10060 A- .

– Remove the V-ribbed belt.



Installing

Install in reverse order of removal, observing the following.

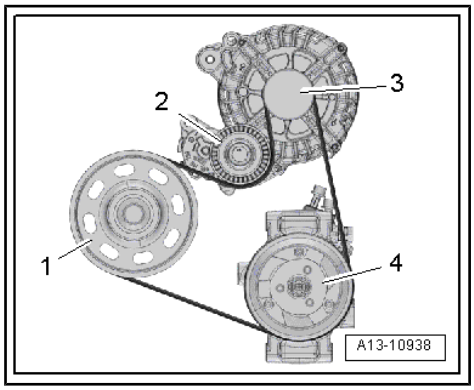
– Fit poly V-belt on poly V-belt pulley:

1 - Vibration damper

2 - Tensioning roller

3 - Alternator:

4 - Air conditioner compressor

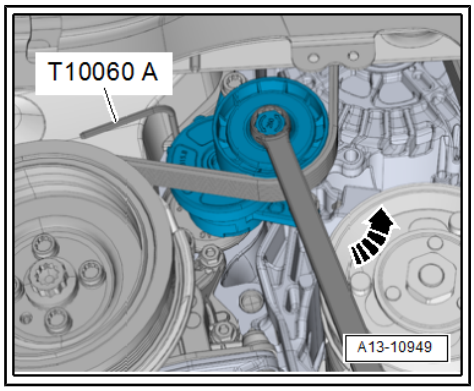


– Hold tensioner with ring spanner and remove locking pin - T10060 A- .

– Release tensioner.

– Check that Poly-V belt is properly positioned.

– Start engine and check that belt runs properly.

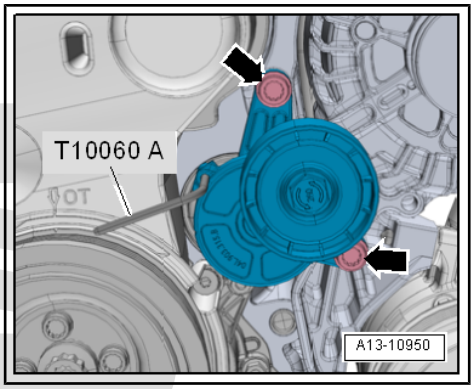


Specified torques

♦ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation

1.4 Removing and installing tensioner for poly V-belt

Removing



– Remove poly V-belt ⇒ page 59 .

– Unscrew bolts -arrows-, Detach tensioning device from poly V-belt.

Installing

Install in reverse order of removal, observing the following.

Note

Renew bolts that are tightened with turning further angle after each removal.

– Install poly V-belt ⇒ page 59 .

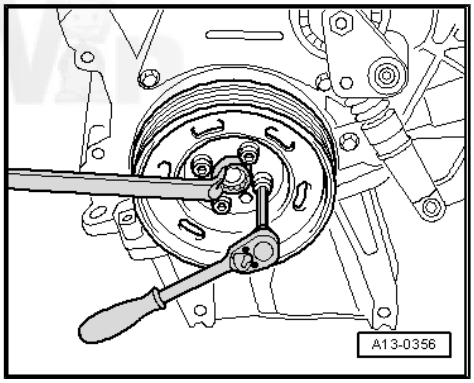
Specified torques

◆ ⇒ “1.1 Assembly overview - cylinder block, pulley end”, page 57

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

1.5 Removing and installing vibration damper

Removing

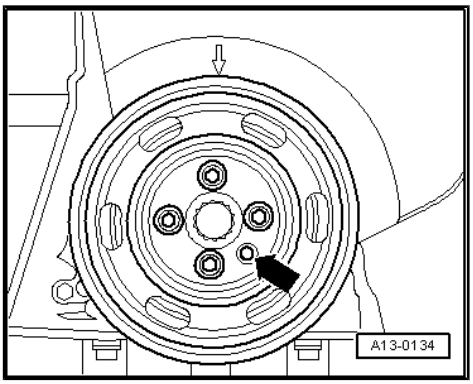


– Remove poly V-belt ⇒ page 59 .

– Counterhold by applying ring spanner to bolt for crankshaft sprocket and slacken bolts for vibration damper.

– Remove bolts and take off vibration damper.

Installing



Install in reverse order of removal, observing the following.

Note

Renew bolts that are tightened with turning further angle after each removal.

• Installation position: hole -arrow- in vibration damper must be positioned over raised section of crankshaft sprocket.

– Install poly V-belt ⇒ page 59 .

Specified torques

◆ ⇒ “1.1 Assembly overview - cylinder block, pulley end”, page 57

1.6 Removing and installing ancillary bracket

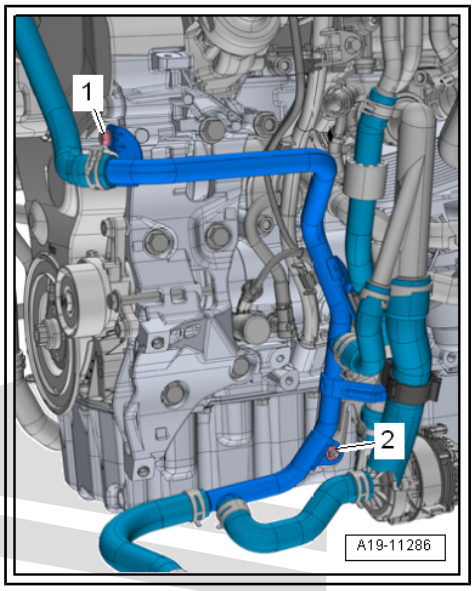
Removing

– Remove alternator ⇒ Electrical system; Rep. gr. 27 ; Alternator; Removing and installing alternator .

– Remove high-pressure pump ⇒ page 462 .

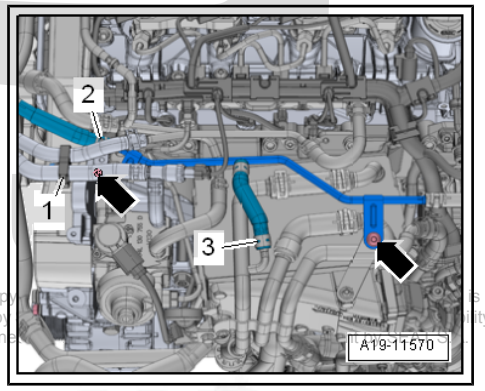
– If fitted, unscrew nut -2- and bolt -1-.

– Push front right coolant pipe slightly towards front.



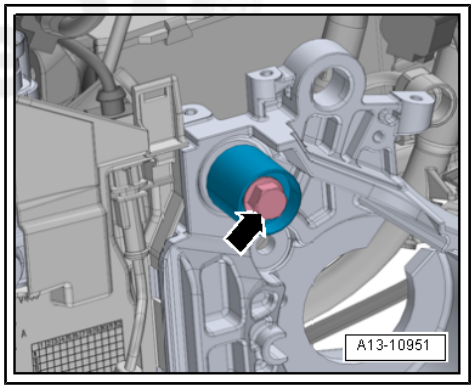
– Unclip bracket -1- with fuel hoses.

– Remove bolts -arrows-.



Protected by copyright. Copy
permitted unless authorised by
respect to the correctn
s not
ity with

– Remove bolt -arrow- and detach damper wheel.



– Loosen bolts in the sequence -6 ... 1-.

– Remove bolts and detach bracket for ancillaries.

Installing

Install in reverse order of removal, observing the following.

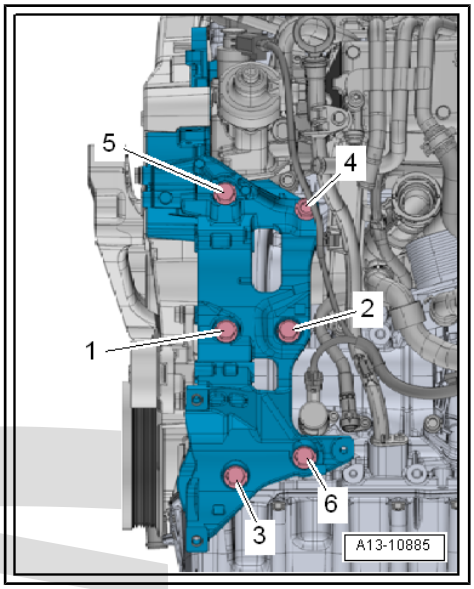
Note

Renew bolts that are tightened with turning further angle after each removal.

– Check that a dowel sleeve is fitted between bracket for ancillaries and cylinder block.

Specified torques

- ⇒ Fig. ""Ancillary bracket - specified torques and tightening sequence"" , page 58
- ⇒ "2.2 Assembly overview - toothed belt", page 124
- ⇒ "3.1 Assembly overview - coolant pipes", page 282
- ⇒ "8.1 Assembly overview - high-pressure pump", page 461
- Assembly overview - alternator ⇒ Electrical system; Rep. gr. 27 ; Alternator; Assembly overview - alternator .
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation



1.7 Removing and installing engine support

Removing

– Remove engine mounting ⇒ page 43 .

– Remove toothed belt cover (top) ⇒ page 125 .

– Using spindle - 10 - 222 A /10- raise or lower engine until the respective bolt of the engine support is accessible.

Note

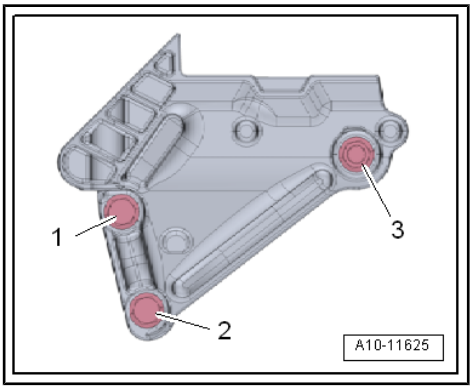
To remove bolt -2- the engine support must first be removed.

– Unscrew bolts -1, 2 and 3- and detach engine support.

Installing

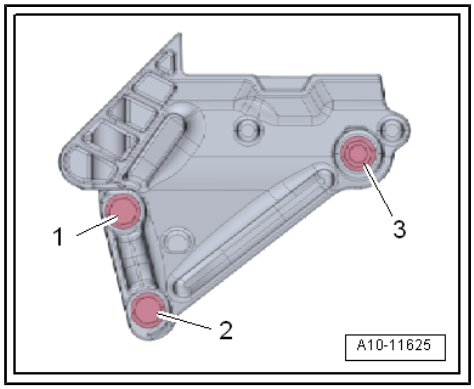
Install in reverse order of removal, observing the following.

– Fit bolt -2- into hole in engine support before inserting engine support.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Fit engine support.
– Tighten bolts -1- to -3- hand-tight.
– Then, tighten bolts to specified torque and in correct tightening sequence ⇒ page 64 .
– Install toothed belt cover (top) ⇒ page 125 .
– Install engine mountings ⇒ page 43 .

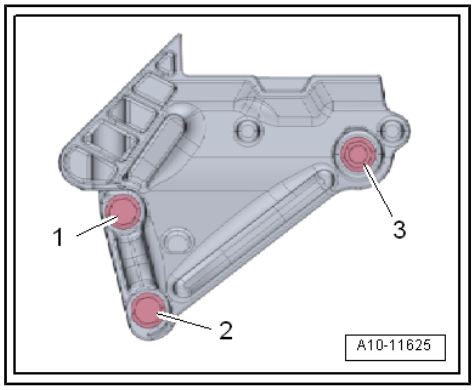


Engine support - Specified torque and sequence

Note

Renew bolts that are tightened with turning further angle after each removal.

– Tighten bolts in stages in the sequence shown:



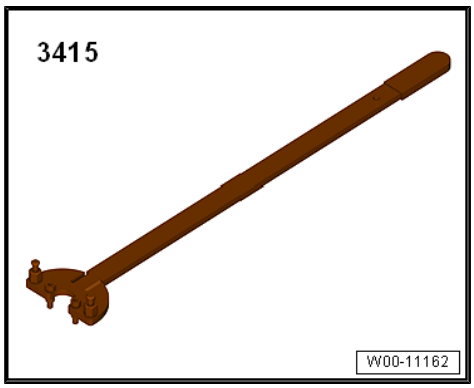
Specified torques

Stage	Bolts	Specified torque/turning further angle
1st	-1 - 3-	7 Nm
2nd	-1 - 3-	40 Nm
3rd	-1 - 3-	Turn 180° further

1.8 Removing and installing sealing flange - pulley end

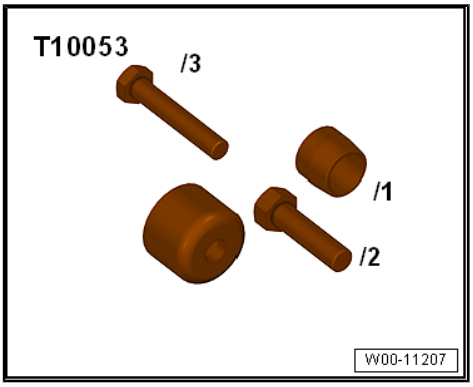
Special tools and workshop equipment required

♦ Counterhold - 3415-

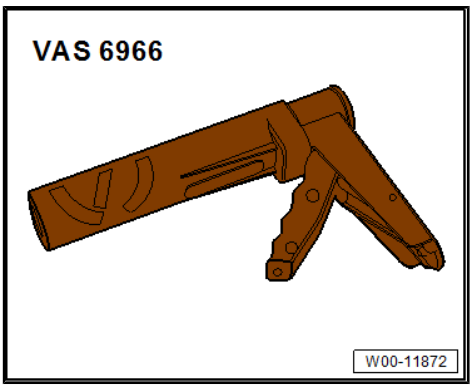


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- Assembly tool - T10053-



- Applicator gun - VAS 6966-



- Hand drill with plastic brush
- Safety goggles
- Sealant ⇒ Electronic parts catalogue

Removing

– Remove the front right wheel housing lining ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liner; Assembly overview. - Front wheel housing liner

– Detach toothed belt from camshaft ⇒ page 141 .

– Remove toothed belt cover (bottom section) ⇒ page 129 .

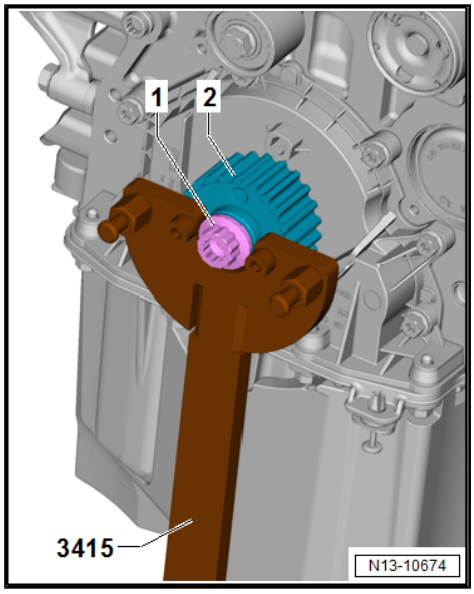
– Detach the toothed belt from the remaining toothed belt sprockets.

– As far as possible, lift out the toothed belt upwards in order to avoid contamination and damage.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Loosen bolt -1- for crankshaft sprocket -2- using counter-hold tool - 3415- .

– Unscrew bolt -1- and remove crankshaft sprocket -2-.



Vehicles with one-piece sump:

– Remove the oil sump ⇒ page 172 .

Vehicles with two-piece sump:

– Remove upper part of sump ⇒ page 179 .

Continued for all vehicles

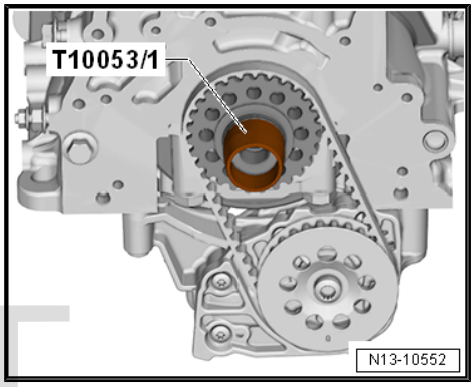
– Unscrew remaining bolts and carefully release sealing flange from bonded joint.

– Remove sealant residue on cylinder block and oil pan using commercially available, chemical sealant remover.

– The sealing surfaces must be free of oil and grease.

Installing

– Fit guide sleeve -T10053/1- onto crankshaft journal.

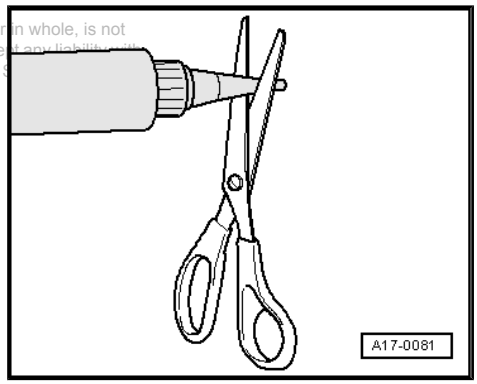


NOTICE

A new sealing flange can be supplied with or without a sealing lip on the sealing surface to the sump. If the sealing lip is missing, a bead of sealant must be applied.

Procedure for sealing flange without sealing lip

– Observe use-by-date of sealant.



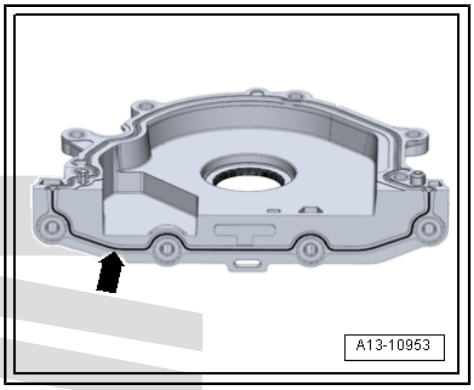
NOTICE

Risk of blocking lubrication system with excess sealant.

♦ **Thickness of sealant bead: 2…3 mm.**

Protected copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Apply bead of sealant -arrow- onto clean sealing surface of sealing flange as shown in illustration.



– If necessary, use applicator gun - VAS 6966- when applying.

– Apply sealant bead of about 2 … 3 mm in thickness.

– Install the sealing flange within 5 minutes after the sealant has been applied.

For other versions

– Slide new sealing flange over guide sleeve.

• Dowel pins should then engage in bores on cylinder block.

– Take off guide sleeve.

– Screw in sealing flange bolts as far as stop by hand.

– Tighten securing bolts of sealing flange diagonally to specified torque ⇒ page 59 .

– Install sump ⇒ page 172 .

– Install notched belt (adjusting valve timing) ⇒ page 135 .

– Install toothed belt cover ⇒ page 125 .

Remaining installation sequence carried out in reverse sequence; note the following:

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Specified torques

♦ Bolt for crankshaft pulley ⇒ Item 1 (page 124)

♦ ⇒ General body repairs, external; Rep. gr. 66 ; wheel housing liners; assembly overview. - Front wheel housing liner

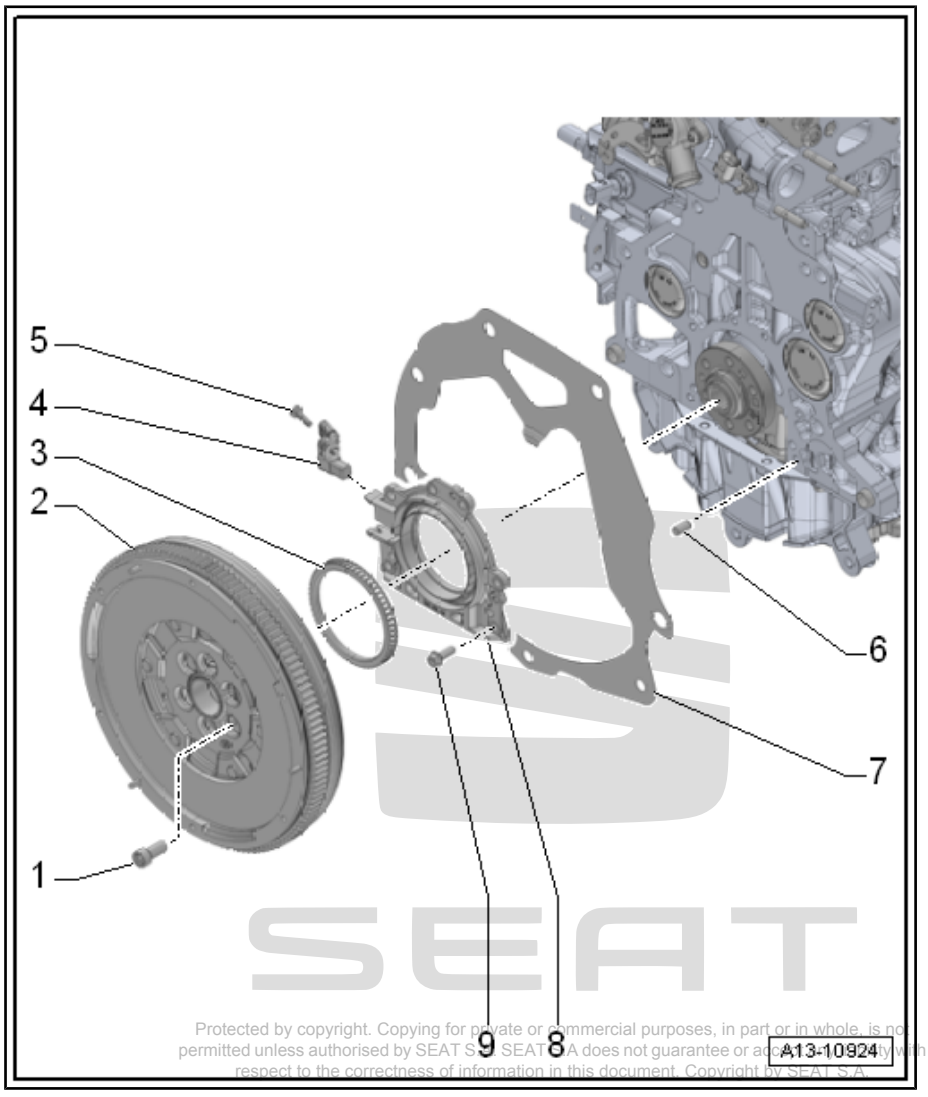
2 Cylinder block, gearbox end

⇒ “2.1 Assembly overview - cylinder block, gearbox end”, page 68

⇒ “2.2 Removing and installing flywheel”, page 69

⇒ “2.3 Removing and installing sealing flange, gearbox side”, page 70

2.1 Assembly overview - cylinder block, gearbox end



1 - Bolt

- ❑ Renew after removal
- ❑ 60 Nm +90°

2 - Flywheel

- ❑ Removing and installing ⇒ page 69
- ❑ Fitting possible in one position only.

3 - Sender wheel

- ❑ For engine speed sender - G28- .
- ❑ Removing and installing ⇒ “2.3 Removing and installing sealing flange, gearbox side”, page 70

4 - Engine speed sensor - G28-

- ❑ Assembly overview ⇒ page 581

5 - Bolt

- ❑ Specified torque ⇒ page 581

6 - Dowel pin

- ❑ 2x.

7 - Intermediate plate

- ❑ Do not damage or bend when assembling
- ❑ Installing ⇒ page 69

8 - Sealing flange (gearbox end)

- ❑ with shaft seal
- ❑ Renew after removal ⇒ page 70

9 - Bolt

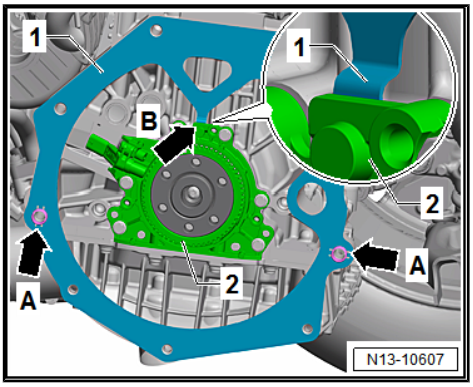
- ❑ Specified torque and sequence ⇒ page 69 .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Install intermediate plate.

– Attach intermediate plate -1- to sealing flange -2- -arrow B-.

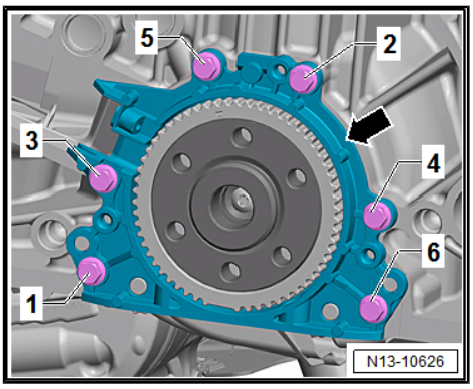
– Slide intermediate plate onto dowel sleeves -arrows A-



Sealing flange on gearbox side - specified torque and tightening sequence

– Tighten bolts in stages in the sequence shown:

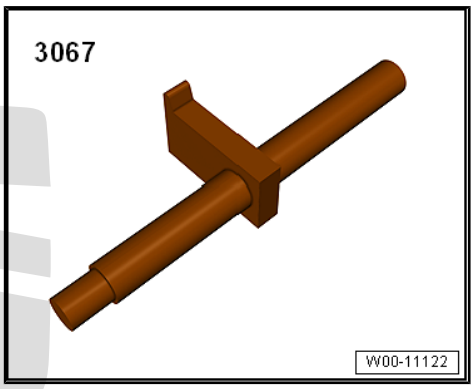
Stage	Bolts	Specified torque
1st	-1 - 6-	Screw in by hand as far as stop
2nd	-1 - 6-	Tighten in stages and in diagonal sequence; final torque 13 Nm



2.2 Removing and installing flywheel

Special tools and workshop equipment required

♦ Counterhold - 3067-



Removing

• Gearbox removed

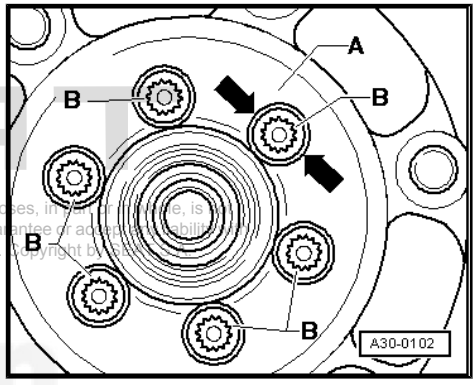
NOTICE

Risk of serious damage to flywheel.

♦ **Remove bolts -B- using normal hand tools (do not use pneumatic wrench or impact driver, etc.).**

♦ **When removing the bolts, make sure that the bolt heads do not come into contact with the flywheel.**

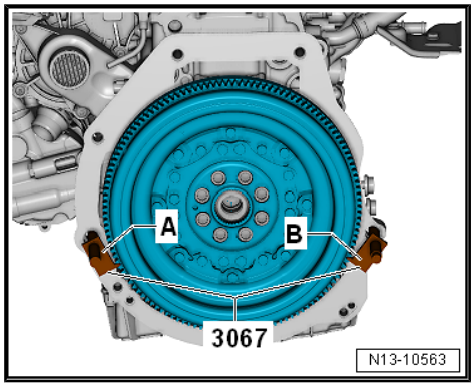
♦ **Rotate the flywheel -A- so that the bolts -B- align centrally with the holes -arrows-.**



Reproduction and distribution for sale or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Insert counterhold tool - 3067- in hole on cylinder block -item B-, slacken the bolts for the flywheel.

– Remove bolts and take off flywheel.



Installing

Install in reverse order of removal, observing the following.

Note

Renew the bolts tightened with specified tightening angle.

– Insert counter-hold tool - 3067- in hole in cylinder block -item A-.

Specified torques

♦ ⇒ “2.1 Assembly overview - cylinder block, gearbox end”, page 68

2.3 Removing and installing sealing flange, gearbox side

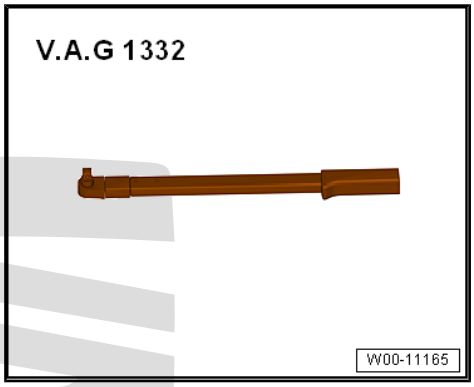
⇒ “2.3.1 Removing and installing sealing flange, crankshaft flange with 6 bolting points”, page 70

⇒ “2.3.2 Removing and installing sealing flange, crankshaft flange with 8 bolting points”, page 78

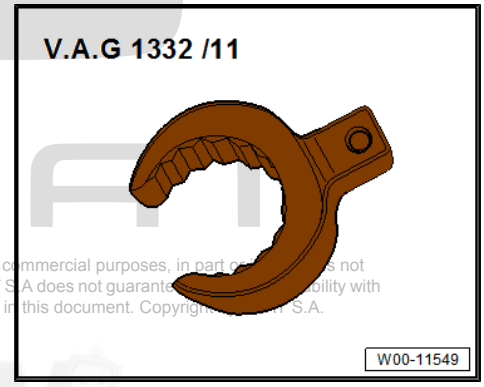
2.3.1 Removing and installing sealing flange, crankshaft flange with 6 bolting points

Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1332-

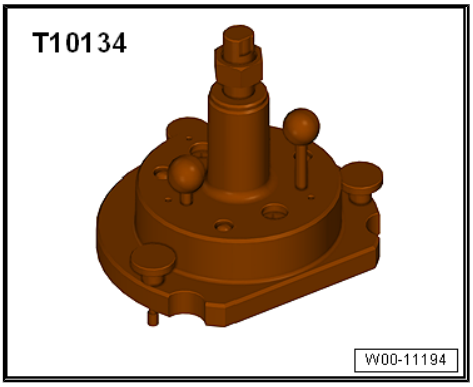


♦ Open end spanner insert, AF 24 - V.A.G 1332/11-

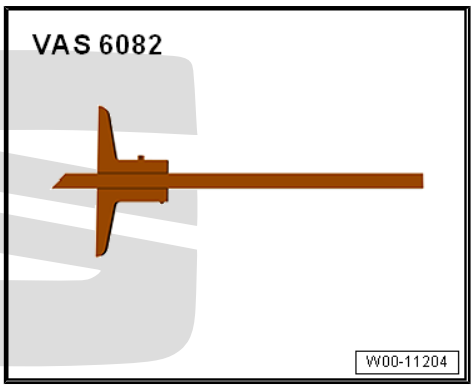


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee the correctness and completeness of the information in this document. Copyright SEAT S.A.

♦ Assembly tool - T10134-



♦ Depth gauge - VAS 6082-



♦ Bolt M6x35 (3x)

♦ Bolt M7x35 (2x)

Pressing out sealing flange with sender wheel

• Gearbox removed

– Remove flywheel ⇒ page 69 .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

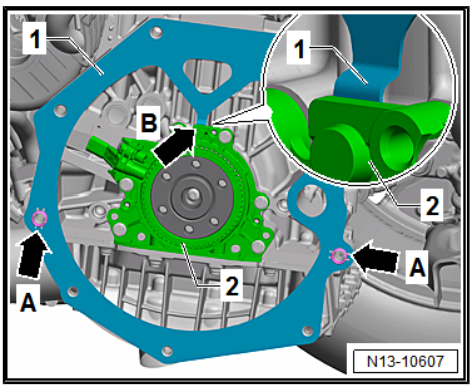
Note

For reasons of clarity, the following work procedures are shown with the engine removed.

– Remove intermediate plate -1- from dowel sleeves -arrows A-.

– Guide intermediate plate -1- upwards.

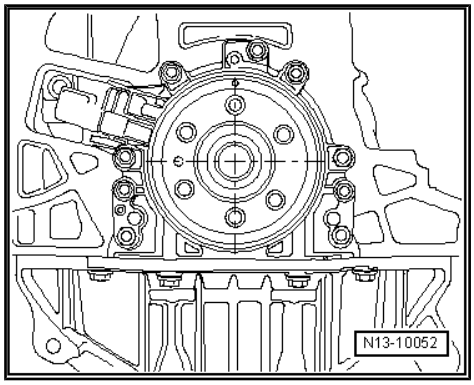
– While doing so, pull retaining lug -arrow B- of intermediate plate -1- out of recess behind sealing flange.



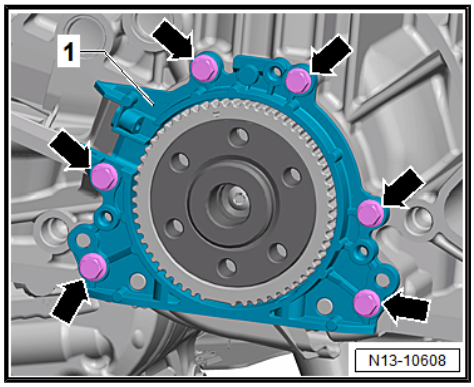
– Rotate crankshaft by turning bolt for toothed belt sprocket until crankshaft is positioned at “TDC”, as shown in illustration.

– Remove the oil sump ⇒ page 172 .

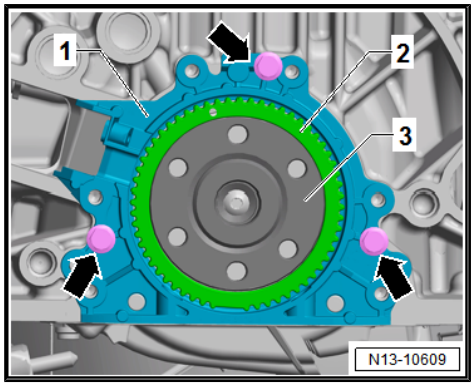
– Remove engine speed sender - G28- ⇒ page 585 .



– Unscrew bolts -arrows- for sealing flange -1-.



– To press off, screw 3 M6 x 35 bolts -arrows- into sealing flange -1-.



Note

The sealing flange -1- is pressed off crankshaft -3- together with the sensor wheel -2-.

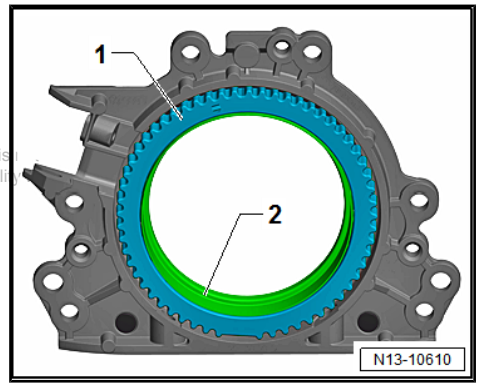
– Turn the screws in an alternating manner by a maximum of 1/2 a turn into the sealing flange.

– Remove sealing flange -1- together with sender wheel -2-.

To insert the sealing flange with sensor wheel

Note

- *The sealing flange with PTFE oil seal is fitted with a sealing lip support ring -2-. This pressure ring fulfils the function of an assembly sleeve and cannot be removed before fitting.*
- *Sealing flange and sender wheel -1- must not be separated or rotated out of position after removal from packaging.*
- *The sender wheel -1- is held in its installation position on the assembly tool - T10134- ⇒ page 73 by a locating pin.*
- *Sealing flange and oil seal form one unit and must only be renewed together with the sender wheel.*
- *The assembly tool - T10134- is held in the correct position relative to the crankshaft by a guide pin which is inserted into a hole in the crankshaft ⇒ page 73 .*



SEAT
The data by Cetronic GmbH is for private, commercial use only and, in part or in whole, is not to be translated or converted to any electronic medium or machine readable form without prior written permission. SEAT does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Structure of the assembly tool - T10134- :

A - Attachment surface

B - Nut

C - Assembly housing

D -
Locating pin

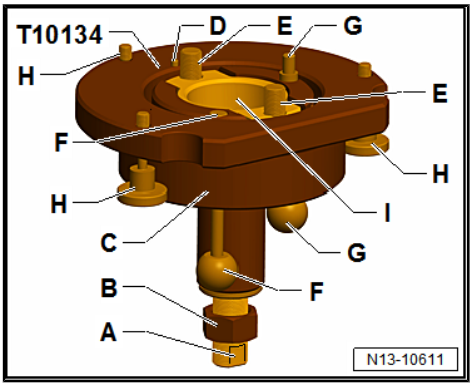
E - Hexagon socket head bolts (2x)

F - Guide pin for petrol engines (red handle)

G -
Guide pin for diesel engines (black handle)

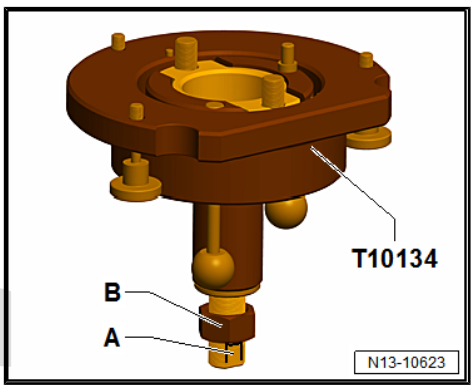
H - Knurled screws (3x)

I - Inner side



Securing sealing flange with sender wheel onto assembly tool - T10134- :

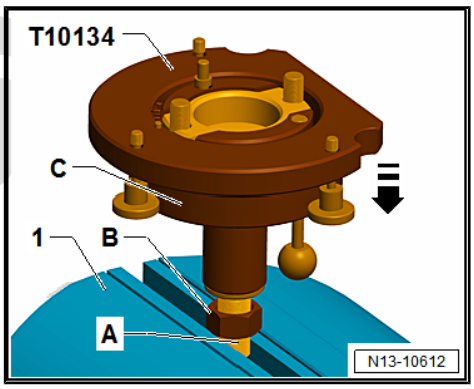
– Screw on nut -B- until just before it touches clamping surface -A- of threaded spindle.



– Clamp assembly tool - T10134- in a vice -1- on tightening flats -A- of threaded spindle.

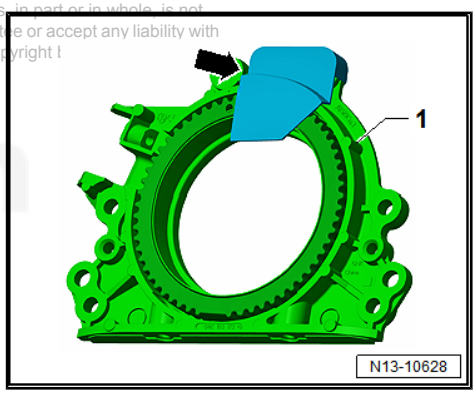
– Press assembly housing -C- downward so that it rests against nut -B-.

• Inner part of assembly device and installation socket must be level with each other.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not
respect to the correctness of information in this document. Copyright

– If fitted, remove securing clip -arrow- from new sealing flange -1-.

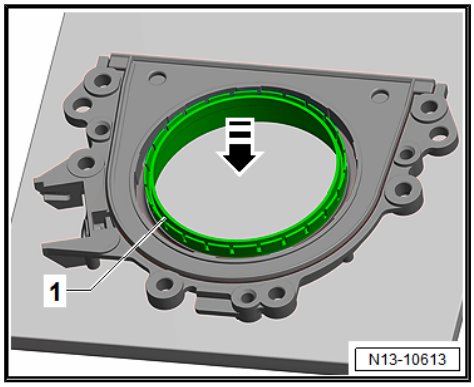


Note

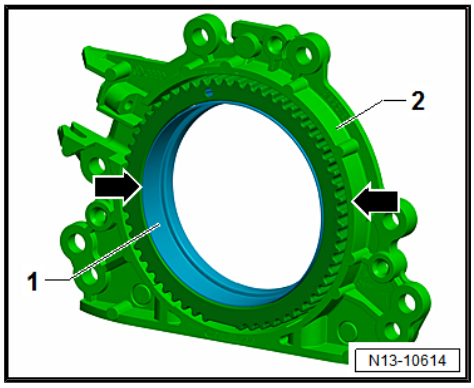
Do not take the sensor wheel out of the sealing flange or rotate it out of position.

– Place sealing flange with front side facing down on a clean level surface.

– Push sealing lip support ring -1- downwards in -direction of arrow- until it rests against the flat surface.



• The upper edge of the sealing lip support ring -1- must be flush with the front edge of the sealing flange -2- -arrows-.

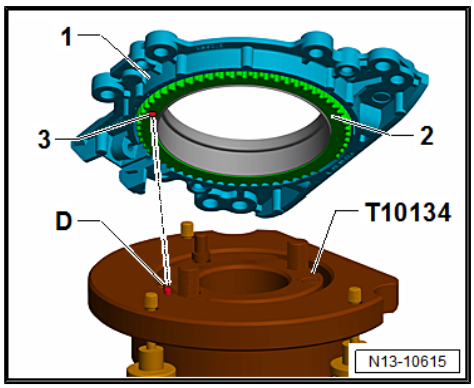


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Place front side of sealing flange -1- on assembly tool - T10134- so that locating pin -D- is seated in hole -3- in sender wheel -2-.

• Ensure that sealing flange lies flat on assembly tool.

• Only 2 of the 3 knurled screws -H- can be screwed in.

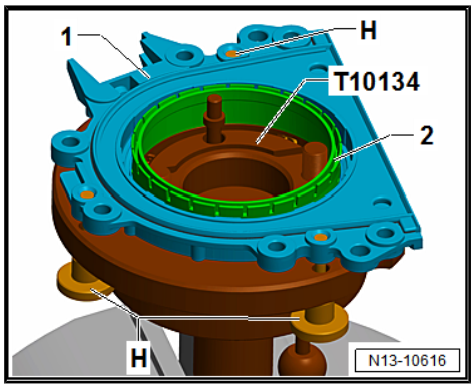


– Screw knurled screws -H- onto sealing flange -1-.

– When tightening, press sealing flange -1- and sealing lip support ring -2- against surface of assembly tool - T10134- .

– This prevents the locating pin from slipping out of the sensor wheel hole.

– When installing sealing flange, ensure that sensor wheel remains fixed in assembly device.



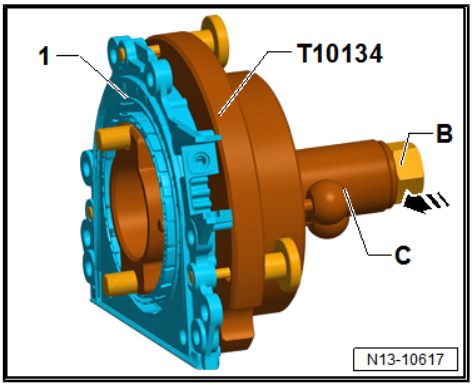
Securing assembly tool - T10134- with sealing flange -1- on crankshaft flange:

- The crankshaft flange must be free of grease and oil.
- Engine is at “TDC” position ⇒ page 135 .

– Screw nut -B- to end of threaded spindle.

– Press threaded spindle of assembly tool - T10134- in direction of -arrow- until nut -B- makes contact with assembly housing -C-.

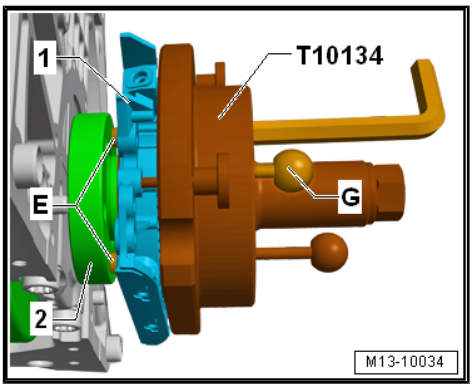
– Align flat side of assembly housing to sealing surface of cylinder block on sump side.



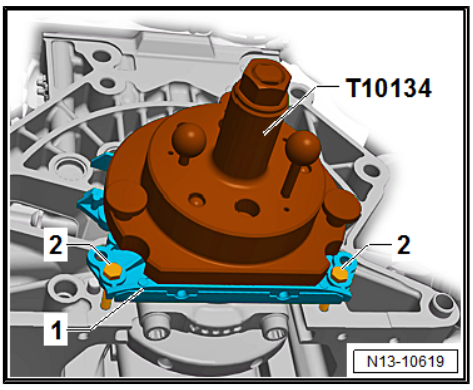
– Fasten assembly tool - T10134- together with the sealing flange -1- to the crankshaft flange -2-.

– To do this, screw hexagon socket head bolts -E- into crankshaft flange (approx. 5 full turns) using a hexagon key.

– Insert guide pin for diesel engines (black handle) -G- into crankshaft flange.



– Screw 2 bolts M 6 x 35 mm -2- into the engine block to guide the sealing flange -1-.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

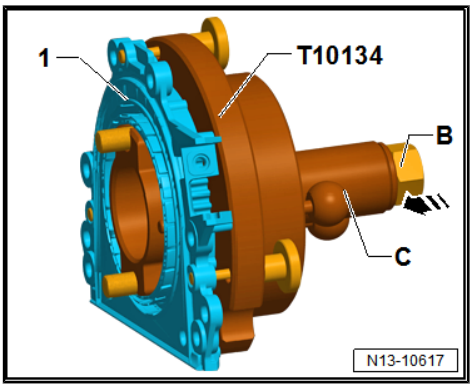
Securing assembly tool - T10134- with sealing flange -1- on crankshaft flange:

- The crankshaft flange must be free of grease and oil.
- Engine is at “TDC” position ⇒ page 135 .

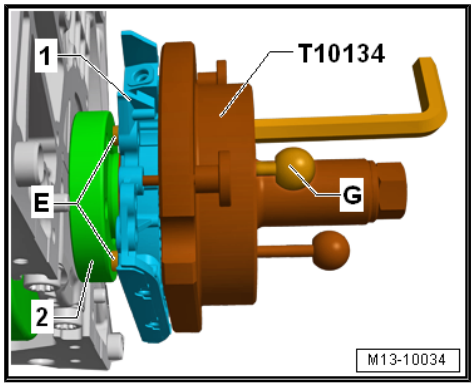
– Screw nut -B- to end of threaded spindle.

– Press threaded spindle of assembly tool - T10134- in direction of -arrow- until nut -B- makes contact with assembly housing -C-.

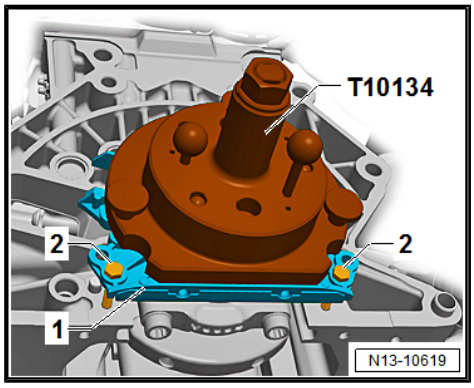
– Align flat side of assembly housing to sealing surface of cylinder block on sump side.



– Fasten assembly tool - T10134- together with the sealing flange -1- to the crankshaft flange -2-.
– To do this, screw hexagon socket head bolts -E- into crankshaft flange (approx. 5 full turns) using a hexagon key.
– Insert guide pin for diesel engines (black handle) -G- into crankshaft flange.

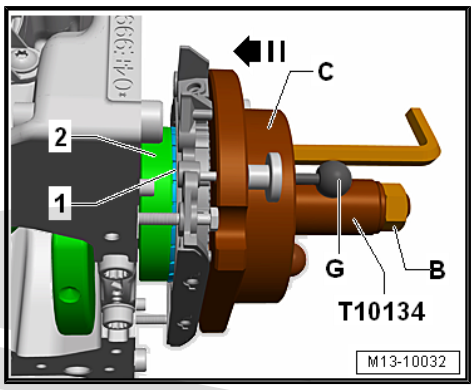


– Screw 2 bolts M 6 x 35 mm -2- into the engine block to guide the sealing flange -1-.



Securing assembly tool - T10134- on crankshaft flange:

– Press the assembly housing -C- by hand in the direction of the -arrow- until the sealing lip support ring -1- lies on the surface of the crankshaft flange -2-.
– Make sure that guide pin for diesel engines (black knob) -G- is properly seated in hole in crankshaft. This ensures that sender wheel reaches its final installation position.



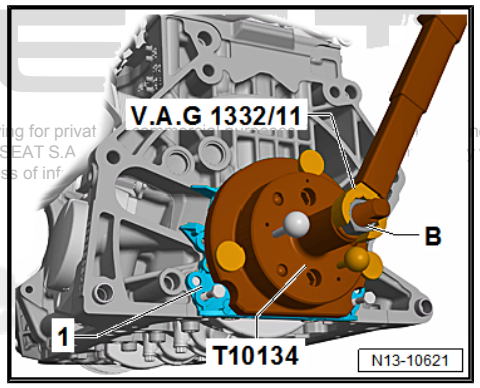
Note

The guide pin for PETROL engines (red handle) MUST NOT be inserted into the threaded hole in the crankshaft.

– Tighten the two hexagon socket head bolts on assembly tool hand-tight.
– Screw nut -B- onto threaded spindle by hand until it lies against assembly housing -C-.

Pressing sender wheel onto the crankshaft flange using assembly tool - T10134- :

– Tighten nut -B- on assembly tool - T10134- to 35 Nm.
• A small gap must be present between cylinder block and sealing flange after tightening nut to 35 Nm -1-.



Protected by copyright. Copying for privat
permitted unless authorised by SEAT S.A
respect to the correctness of inf
not
with

Checking sender wheel installation position on crankshaft:

– Screw nut -B- to end of threaded spindle.

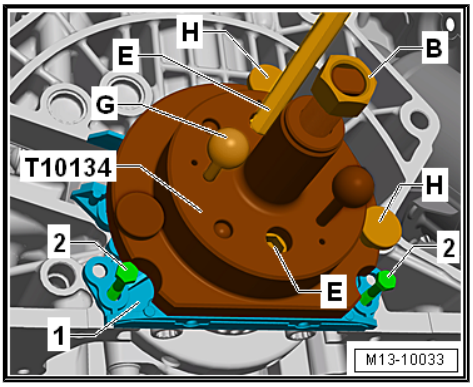
– Remove both bolts -2- from cylinder block.

– Pull guide pin for diesel engines (black knob) -G- out of crankshaft flange.

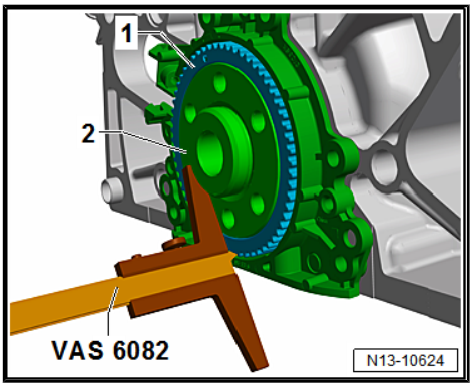
– Unscrew knurled screws -H- from sealing flange -1-.

– Unbolt assembly tool - T10134- from crankshaft flange (remove hexagon socket head bolts -E- from crankshaft flange).

– Remove sealing lip support ring.



– Apply depth gauge - VAS 6082- to crankshaft flange -2-.

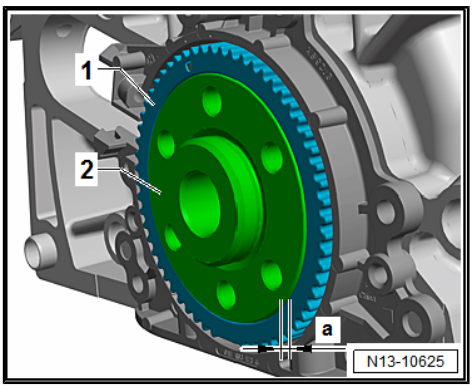


– Measure distance -a- between crankshaft flange -2- and sensor wheel -1-.

• Specification: Distance -a- = 0.5 mm

– Press sensor wheel in further if distance is too small ⇒ page 77 .

– If reading matches specification, continue with assembly ⇒ page 78 .



Re-pressing sender wheel:

– Secure assembly tool - T10134- on crankshaft flange.

– Take care to ensure that the locating pin of the assembly tool - T10134- is seated in the hole in the sender wheel.

– Hand-tighten hexagon socket head bolts -E-.

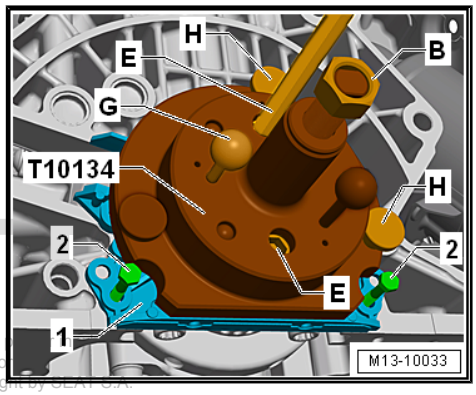
– Slide assembly tool - T10134- onto sealing flange -1- by hand.

– Screw nut -B- onto threaded spindle by hand until it touches assembly tool - T10134- .

– Insert guide pin for diesel engines (black handle) -G- into crankshaft flange.

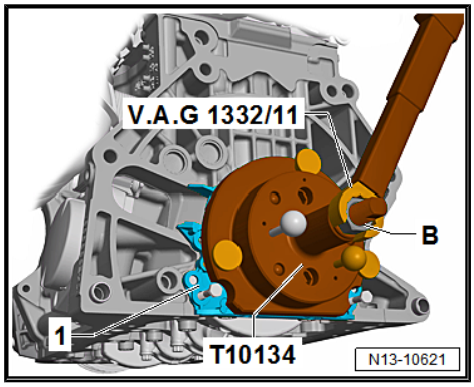
– Screw knurled screws -H- onto sealing flange -1-.

– Screw 2 bolts M 6 x 35 mm -2- into the engine block to guide the sealing flange.



Reproduction, copyright or distribution for commercial purposes, in any form, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or assume any respect to the correctness of information in this document. Copyright by SEAT S.A.

– Tighten nut -B- on assembly tool - T10134- to 40 Nm.
– Check the sender wheel installation position on the crankshaft again ⇒ page 77 .
– Tighten nut on assembly tool - T10134- to 45 Nm if distance is too small.
– Check the sender wheel installation position on the crankshaft again ⇒ page 77 .



Assembling

Installation is carried out in reverse order; noting the following:

– Install sump ⇒ page 172 .
– Install intermediate plate ⇒ page 68 .
– Install flywheel ⇒ page 69 .

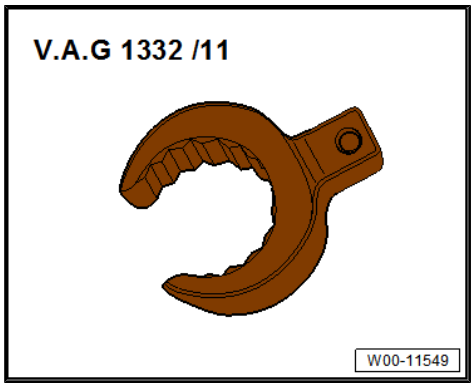
Specified torques

♦ Sealing flange on gearbox side - specified torque and tightening sequence ⇒ page 69
♦ ⇒ “1.1 Assembly overview - glow plug system”, page 581

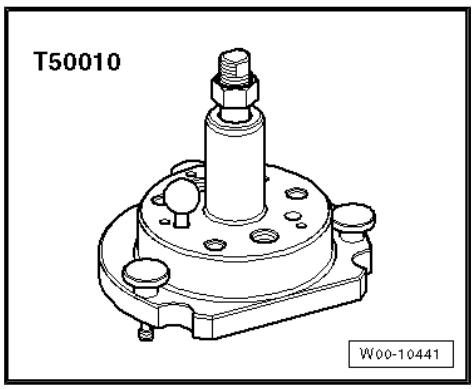
2.3.2 Removing and installing sealing flange, crankshaft flange with 8 bolting points

Special tools and workshop equipment required

♦ Open end spanner insert, AF 24 - V.A.G 1332/11-

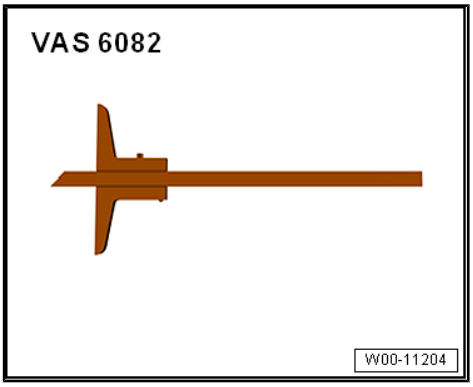


♦ Assembly tool - T50010-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

♦ Depth gauge - VAS 6082-



♦ M6 x 35 bolt, qty. 3

♦ M7 x 35 bolt, qty. 2

– Remove exhaust gas recirculation cooler ⇒ page 567 .

– Remove bevel box ⇒ Rep. gr. 34 ; Bevel box; Removing bevel box .

– Remove gearbox ⇒ Rep. gr. 34 ; Removing and installing gearbox; Removing gearbox .

– Remove flywheel ⇒ page 69 .

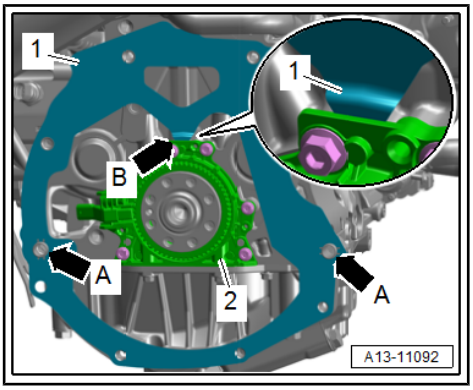
Note

For reasons of clarity, the following work procedures are shown with the engine removed.

– Remove intermediate plate -1- from dowel sleeves -arrows A-.

– Guide intermediate plate -1- upwards.

– While doing so, pull retaining lug -arrow B- of intermediate plate -1- out of recess behind sealing flange.

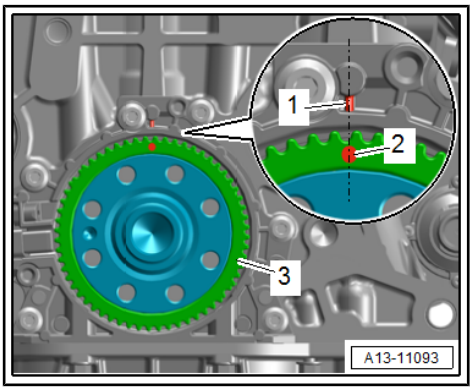


– Rotate crankshaft by turning bolt for toothed belt sprocket until crankshaft is positioned at “TDC”, as shown in illustration.

• Hole -2- in sender wheel -3- faces vertical ridge -1- on sealing flange.

– Remove the oil sump ⇒ page 172 .

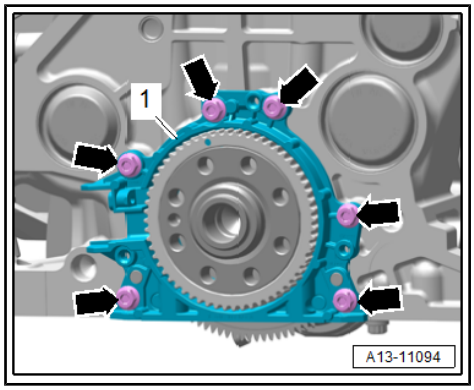
– Remove engine speed sender - G28- ⇒ page 585 .



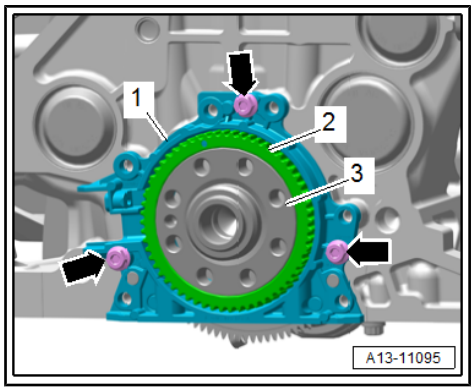
Protected by copyright. Copying for private or commercial purposes, in any form and by any media, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Pressing out sealing flange with sender wheel

– Unscrew bolts -arrows- for sealing flange -1-.



– To press off, screw 3 M6 x 35 bolts -arrows- into sealing flange -1-.



Note

The sealing flange -1- is pressed off crankshaft -3- together with the sensor wheel -2-.

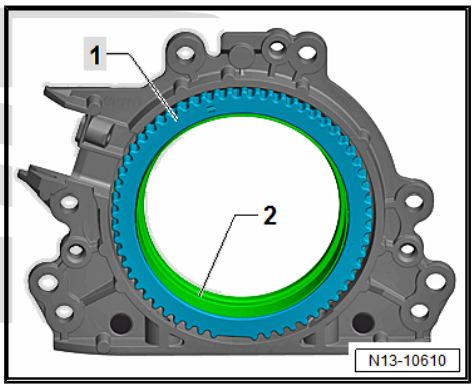
– Turn the screws in an alternating manner by a maximum of 1/2 a turn into the sealing flange.

– Remove sealing flange -1- together with sender wheel -2-.

To insert the sealing flange with sensor wheel

Note

- *The sealing flange with PTFE oil seal is fitted with a sealing lip support ring -2-. This pressure ring fulfils the function of an assembly sleeve and cannot be removed before fitting.*
- *Sealing flange and sender wheel -1- must not be separated or rotated out of position after removal from packaging.*
- *The sender wheel -1- is held in its installation position on the locating pin of the assembly tool - T50010- .*
- *Sealing flange and oil seal form one unit and must only be renewed together with the sender wheel.*
- *The assembly device - T50010- is held in its position relative to the crankshaft by a guide pin inserted into a hole in the crankshaft.*



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Structure of the assembly tool - T50010- :

A - Attachment surface

B - Nut

C - Guide pin

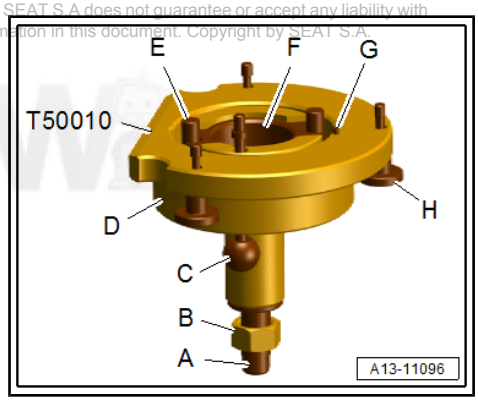
D - Assembly housing

E - Hexagon socket head bolts (2x)

F - Inner part

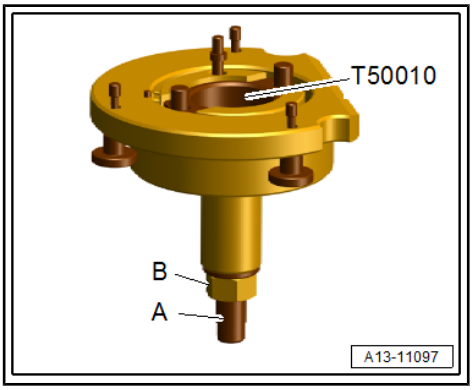
G - Locating pin

H - Knurled screws (3x)



Fitting sealing flange with sender wheel on assembly tool - T50010- :

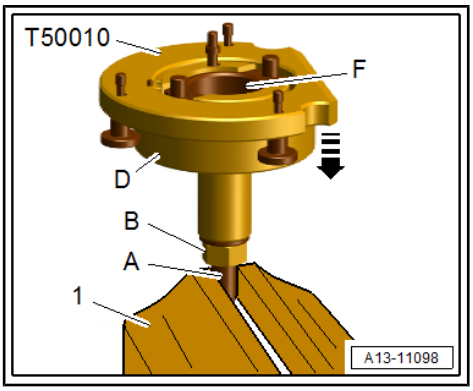
– Screw on nut -B- until just before it touches clamping surface -A- of threaded spindle.



– Clamp assembly tool - T50010- in a vice -1- on tightening flats -A- of threaded spindle.

– Press down assembly housing -D- -arrow-. Assembly housing -D- must rest against nut -B-.

• Inner part -F- of assembly tool and assembly housing -D- must be at same height.

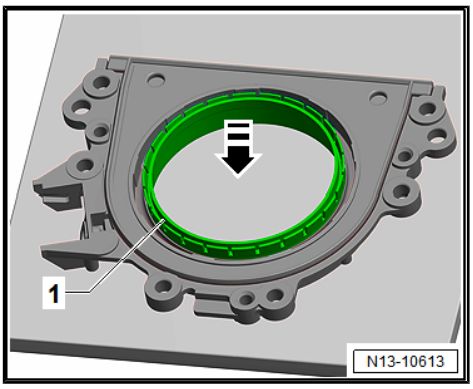


– Place sealing flange with front side facing down on a clean level surface.

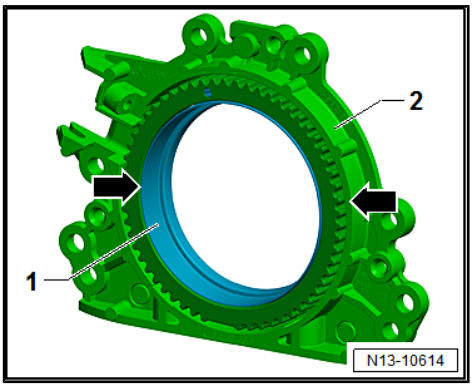
• Do not take the sensor wheel out of the sealing flange or rotate it out of position.

– Push sealing lip support ring -1- downwards in -direction of arrow- until it rests against the flat surface.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

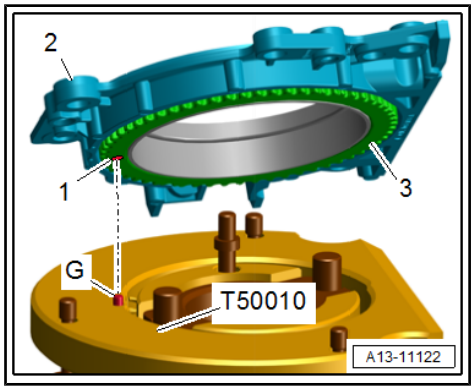


• The upper edge of the sealing lip support ring -1- must be flush with the front edge of the sealing flange -2- -arrows-.



– Place sealing flange -2- with front side facing downwards onto assembly tool - T50010- so that locating pin -G- is seated in hole -1- in sender wheel -3-.

• Ensure that sealing flange lies flat on assembly tool.



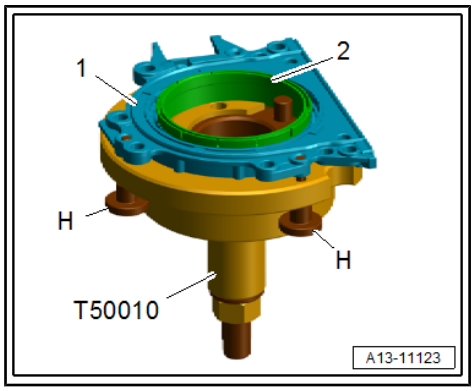
– Screw knurled screws -H- onto sealing flange -1-.

– Only the two knurled screws shown in this illustration can be screwed in.

– Press sealing flange and sealing lip support ring -2- against surface of assembly tool - T50010- whilst tightening knurled screws.

– This prevents the locating pin from slipping out of the sensor wheel hole.

– When installing sealing flange, ensure that sensor wheel remains fixed in assembly device.



Securing assembly tool - T50010- with sealing flange -1- on crankshaft flange:

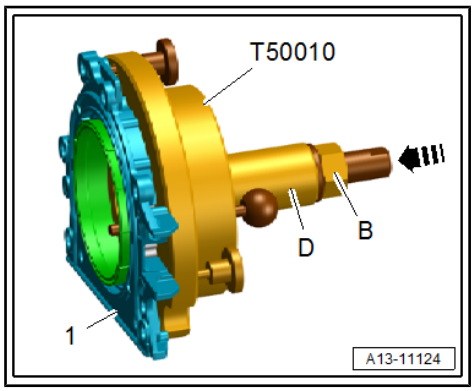
• Crankshaft flange must be free of oil or grease.

• Engine is at “TDC” position.

– Screw nut -B- to end of threaded spindle.

– Press threaded spindle of assembly tool - T50010- in -direction of arrow- until nut -B- rests against assembly housing -D-.

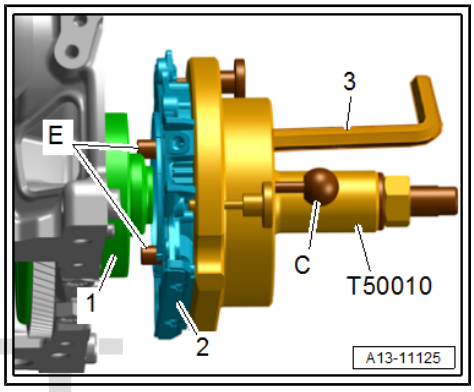
– Align flat side of assembly housing to sealing surface of cylinder block on sump side.



– Fasten assembly tool - T50010- together with the sealing flange -2- to the crankshaft flange -1-.

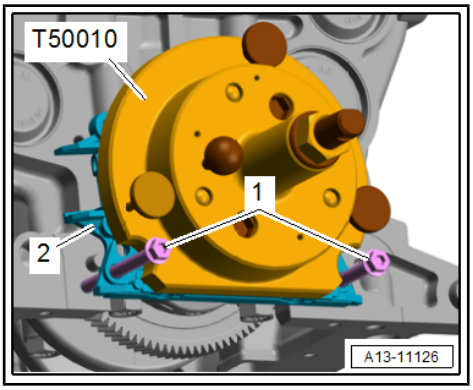
– To do this, screw hexagon socket head bolts -E- into crankshaft flange (approx. 5 full turns) using a hexagon key -3-.

– Push guide pin -C- into crankshaft flange.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– To guide sealing flange -2-, screw qty. 2 M6 x 35 mm bolts -1- into cylinder block.



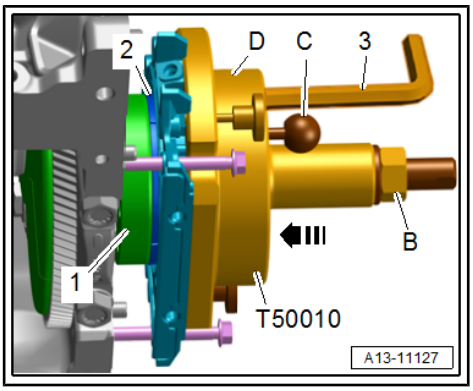
Securing assembly tool - T50010- on crankshaft flange:

– Push assembly housing -D- by hand in direction of -arrow- until sealing lip support ring -2- rests against crankshaft flange -1-.

– Make sure that guide pin -C- is properly seated in hole in crankshaft. This ensures that sender wheel reaches its final installation position.

– Tighten the two hexagon socket head bolts of the assembly tool - T50010- hand-tight with hexagon key-3-.

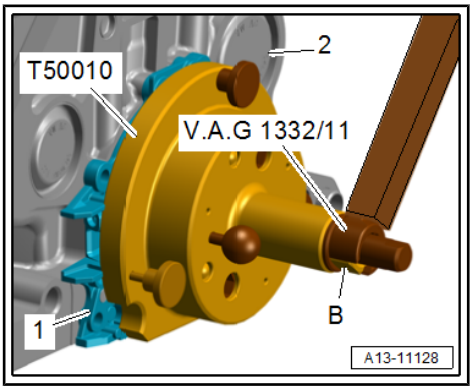
– Screw nut -B- onto threaded spindle by hand until nut rests against assembly housing -D-.



Pressing sender wheel onto the crankshaft flange using assembly tool - T50010- :

– Tighten nut -B- on assembly tool - T50010- to 35 Nm.

• After nut has been tightened to 35 Nm, a small air gap must still be present between cylinder block -2- and sealing flange -1-.



Checking sender wheel installation position on crankshaft:

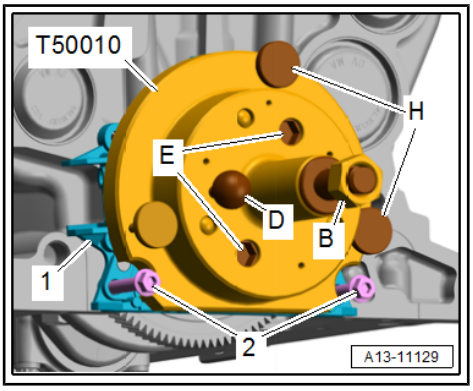
– Screw nut -B- to end of threaded spindle.

– Remove both bolts -2- from cylinder block.

– Unscrew knurled screws -H- from sealing flange -1-.

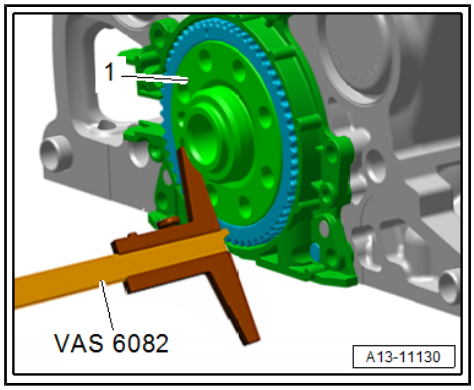
– Unbolt assembly tool - T50010- from crankshaft flange (remove hexagon socket head bolts -E- from crankshaft flange).

– Remove sealing lip support ring.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

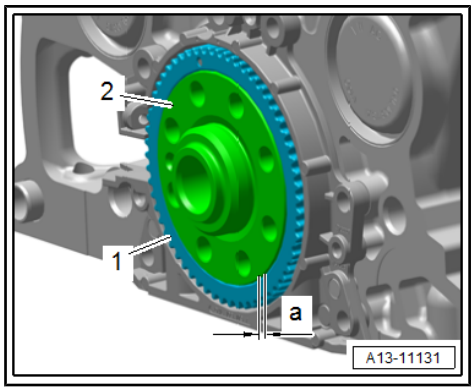
– Apply depth gauge - VAS 6082- to crankshaft flange -1-.



– Measure distance -a- between crankshaft flange -2- and sensor wheel -1-.

• Specification: Distance -a- = 0.5 mm

– Press sensor wheel in further if distance is too small ⇒ page 84 .

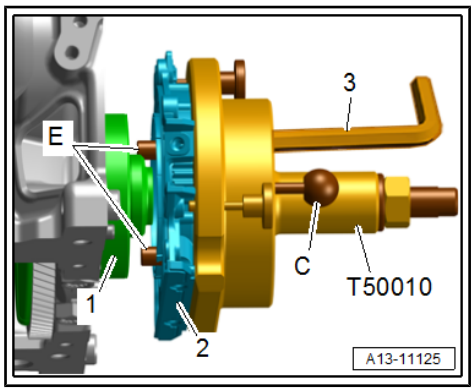


Re-pressing sender wheel:

– Secure assembly tool - T50010- on crankshaft flange.

– Take care to ensure that the locating pin of the assembly tool - T50010- is seated in the hole in the sender wheel.

– Tighten the two hexagon socket head bolts -E- hand-tight with hexagon key -3-.

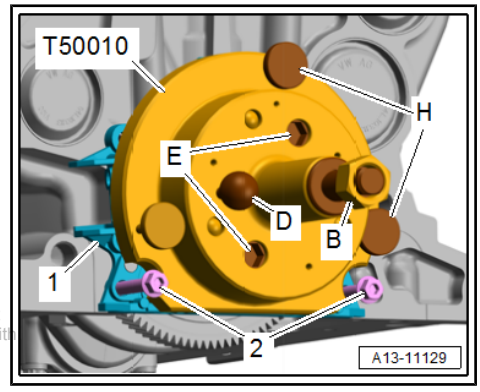


– Slide assembly tool - T50010- onto sealing flange -1- by hand.

– Screw nut -B- onto threaded spindle by hand until it touches assembly tool - T50010- .

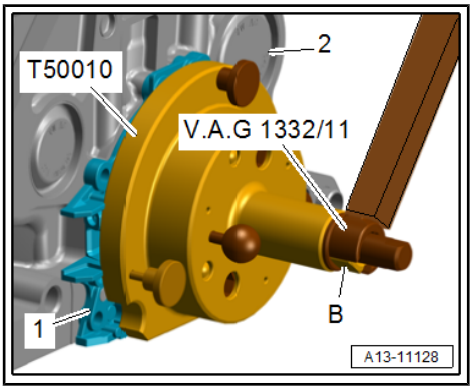
– Push guide pin -C- into crankshaft flange.

– Screw 2 bolts M 6 x 35 mm -2- into the engine block to guide the sealing flange -1-.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Tighten nut -B- on assembly tool - T50010- to 40 Nm.
– Check the sender wheel installation position on the crankshaft again ⇒ page 83 .
– If the measured value is too low, tighten nut of assembly tool - T50010- to 45 Nm.
– Check the sender wheel installation position on the crankshaft again ⇒ page 83 .



Assembling

The assembly is done in the reverse order; note the following:

– Install sump ⇒ page 172 .
– Install flywheel ⇒ page 69 .
– Install intermediate plate ⇒ page 69 .

Specified torques

- ⇒ “2.1 Assembly overview - cylinder block, gearbox end”, page 68
- ⇒ “1.1 Assembly overview - sump, oil pump”, page 166
- ⇒ Fig. ““Sealing flange on gearbox side - specified torque and tightening sequence”“ , page 69
- ⇒ “1.1 Assembly overview - glow plug system”, page 581
- ⇒ Rep. gr. 34 ; Removing and installing gearbox; Specified torques for gearbox

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

3 Crankshaft

⇒ “3.1 Assembly overview - crankshaft”, page 86

⇒ “3.2 Crankshaft dimensions”, page 87

⇒ “3.3 Renewing needle bearing in crankshaft”, page 87

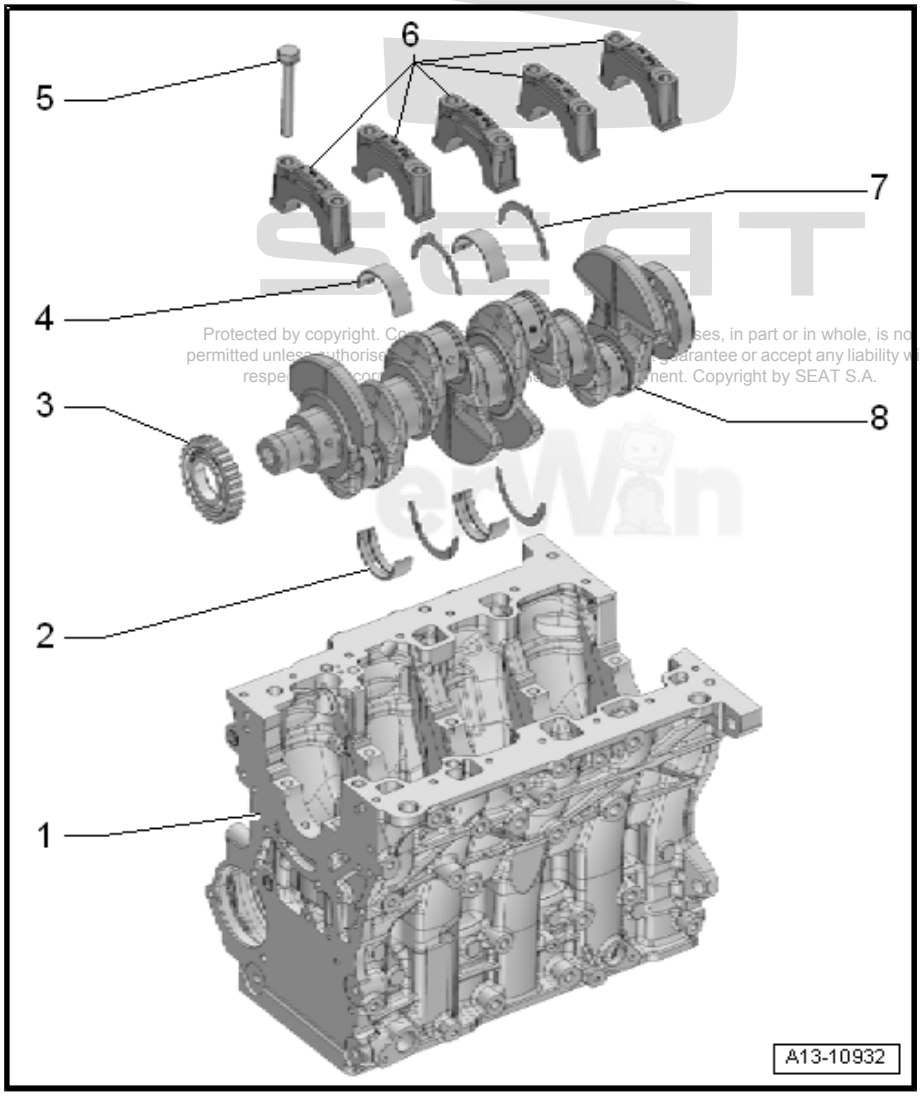
⇒ “3.4 Measuring axial clearance of crankshaft”, page 89

3.1 Assembly overview - crankshaft

CAUTION

The crankshaft must not be loosened on engines with balance shafts.

The correct alignment of the crankshaft with the balance shafts cannot be established using workshop equipment.



1 - Cylinder block

2 - Bearing shell

- ❑ For cylinder block with oil supply bore
- ❑ Renew used bearing shells

3 - Toothed belt sprocket

- ❑ For oil pump drive
- ❑ Not available as separate replacement part

4 - Bearing shell

- ❑ For bearing cap without lubricating groove
- ❑ Renew used bearing shells

5 - Bolt

- ❑ Renew after removal
- ❑ 65 Nm +90°

6 - Bearing cap

- ❑ Bearing cap 1: Pulley end.
- ❑ Bearing cap 3 with recesses for thrust washers.
- ❑ Installation position: retaining lugs on bearing shells in cylinder block and bearing caps must be on the same side

7 - Thrust washer

- ❑ For bearing 3
- ❑ Different types for cylinder block and bearing cap
- ❑ Note location

8 - Crankshaft

- ❑ There should be no needle bearing fitted in the crankshaft on vehicles with manual gearbox; remove needle bearing if necessary ⇒ page 87

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- ❑ A needle bearing must be fitted in the crankshaft on vehicles with dual-clutch gearbox; install needle bearing if not yet fitted ⇒ page 87 .
- ❑ Measuring axial clearance ⇒ page 89
- ❑ Check radial clearance with Plastigage.
- ❑ N radial clearance: 0.03 ... 0.08 mm Wear limit: 0.17 mm
- ❑ Do not rotate the crankshaft when checking the radial clearance
- ❑ Crankshaft dimensions ⇒ page 87

3.2 Crankshaft dimensions

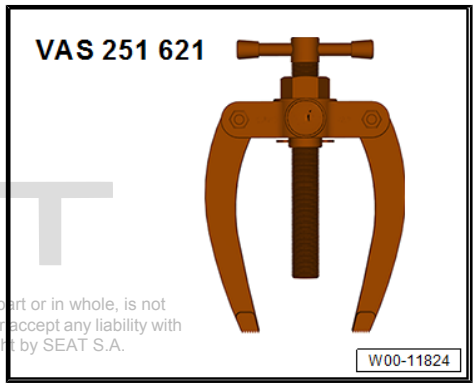
Honing dimension	∅ Bench pin mm	∅ Conrod journal mm	
		Engine 1.6	**Engine 2.0**
Basic dimension	54.00 –0.022 –0.042	47.80 –0.022 –0.042	50.90 –0.022 –0.042

3.3 Renewing needle bearing in crankshaft

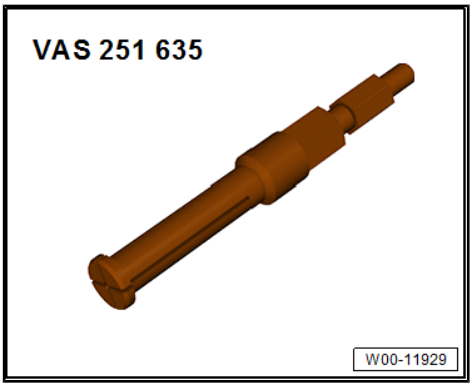
Only for vehicles with DSG gearbox

Special tools and workshop equipment required

- ♦ Counter support e.g. KUKKO 22-1 - VAS 251 621-



- ♦ Internal puller - VAS 251 635-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- Mandrel - VW 207 C-

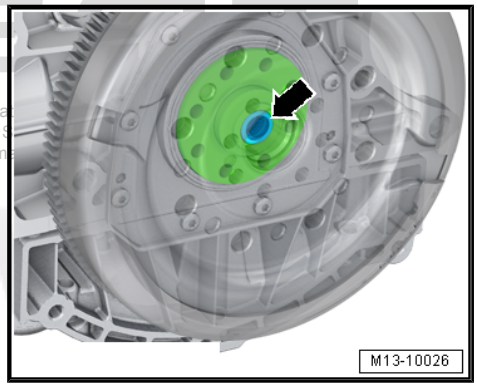
Note

- *Vehicles with dual clutch gearbox, the needle bearing must be installed in rear end of crankshaft.*
- *For vehicles with manual gearbox, no needle bearing must be installed in the crankshaft.*

Prerequisites:

- Gearbox is removed ⇒ Rep. gr. 34 ; Removing and installing gearbox; Removing gearbox .
- Always renew needle bearing -arrow- after separating engine and gearbox.
- The front edges of the internal puller must not be chipped.

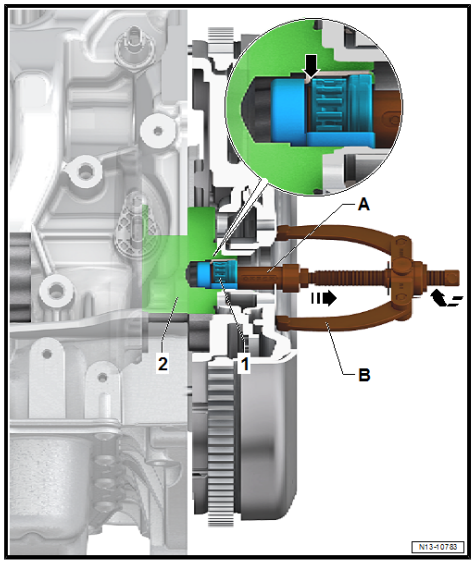
Protected by copyright. Copying for priva
permitted unless authorised by SEAT S.A. S
respect to the correctness of inform



Pulling out needle roller bearing

– Pull out needle bearing -1- with internal puller - VAS 251 635- -A- and counter support, e.g. KUKKO 22-1 - VAS 251 621- -B- from crankshaft -2-.

– The internal puller must be positioned behind the needle roller and cage assembly -arrow-.



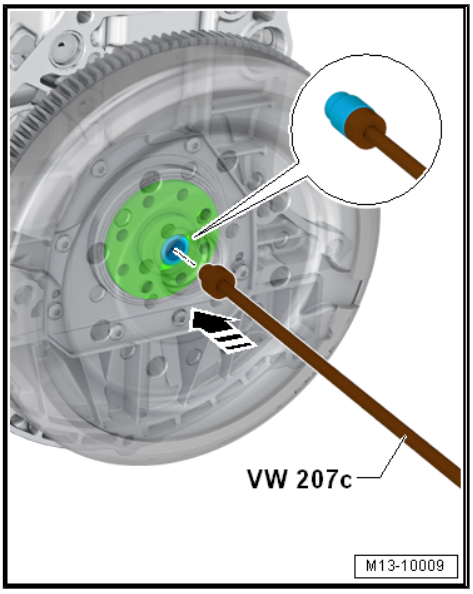
Installing

Note

The inscribed side of an open needle bearing must be visible when installed. Bearings which are sealed on one side must be driven in with the sealed side facing the crankshaft.

– Clean bearing seat in crankshaft and grease lightly.

– Drive needle bearing into crankshaft to installation depth using drift - VW 207 C- .

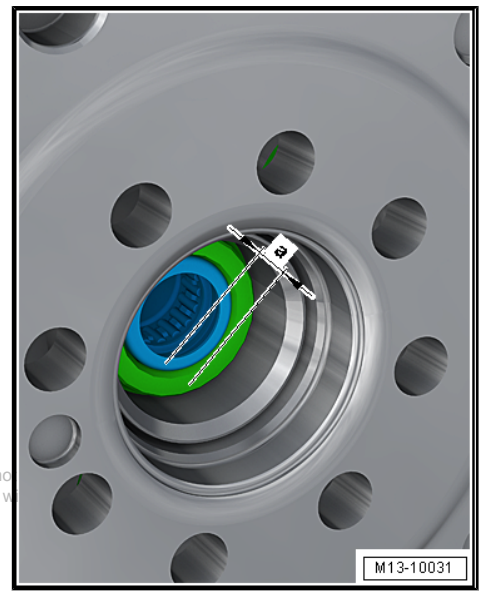


Installation depth: Dimension -a- = 2.0 mm.

Note

If the needle bearing has been accidentally driven in too far, the needle bearing must be renewed because it will be damaged when it is pulled out.

– Install gearbox ⇒ Rep. gr. 34 ; Removing and installing gearbox; Installing gearbox .

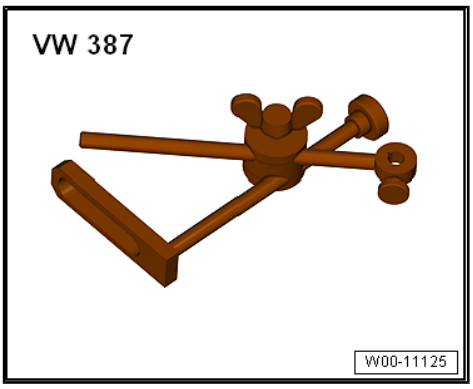


SEAT
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is no
permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability w
respect to the correctness of information in this document. Copyright by SEAT S.A.

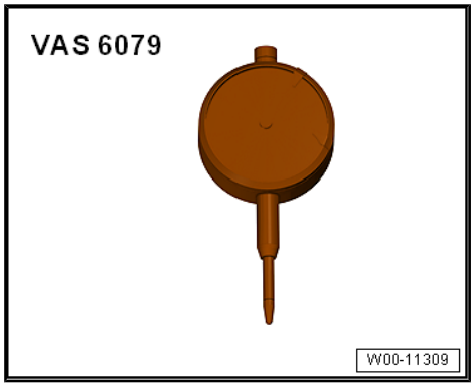
3.4 Measuring axial clearance of crankshaft

Special tools and workshop equipment required

♦ Universal dial gauge bracket - VW 387-



♦ Dial gauge - VAS 6079-



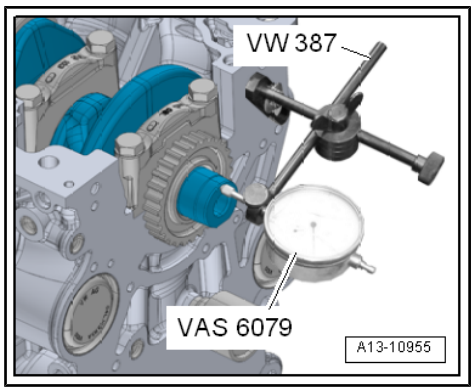
Procedure

– Bolt dial gauge - VAS 6079- with universal dial gauge bracket - VW 387- onto cylinder block as shown in illustration and set it against crankshaft.

– Press crankshaft against dial gauge by hand.

– Set the dial gauge to “0”.

– Push crankshaft away from dial gauge and read off measured value.



Axial clearance:

- New: 0.07 ... 0.17 mm
- Wear limit: 0.37 mm

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

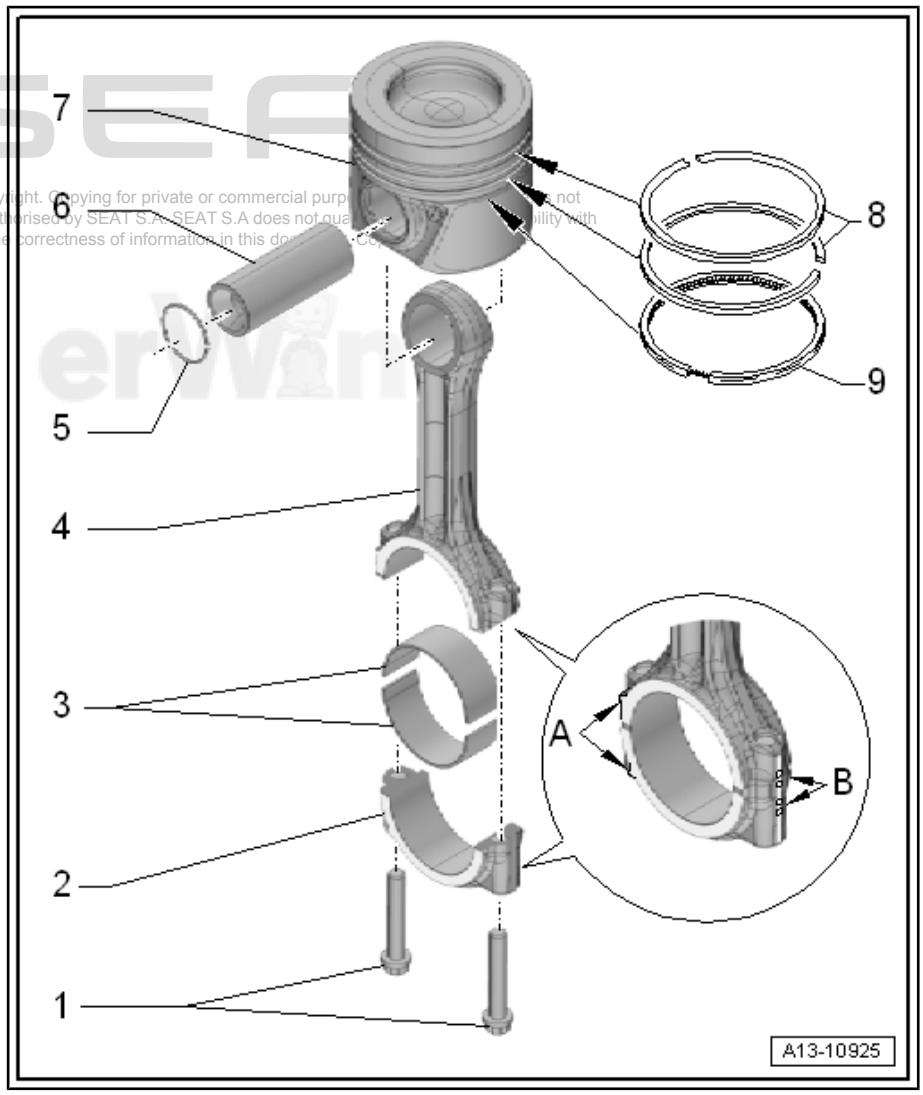
4 Pistons and conrods

⇒ “4.1 Assembly overview - pistons and conrods”, page 91
⇒ “4.2 Removing and installing pistons”, page 93
⇒ “4.3 Measuring piston projection at TDC”, page 95
⇒ “4.4 Checking pistons and cylinder bores”, page 97
⇒ “4.5 Checking radial clearance of conrods”, page 98

4.1 Assembly overview - pistons and conrods

Note

Assembly overview of oil jets and pressure relief valve ⇒ page 93 .



1 - Bolts

- ❑ Renew after removal
- ❑ Lubricate threads and contact surface
- ❑ 30 Nm +90°

2 - Conrod bearing cap

- ❑ Observe installation position
- ❑ Due to the cracking method used to separate the bearing cap from the conrod in manufacture, the caps only fit in one position and only on the appropriate conrod
- ❑ Mark conrod and cylinder allocation in colour -B-
- ❑ Installation position: the marks -A- must point toward the pulley side

3 - Bearing shells

- ❑ Installation position ⇒ page 93
- ❑ Renew used bearing shells
- ❑ Note the version: Upper half bearing shell (to piston) made from high resistance material. Distinguishing feature on new bearing shells: black marking on bearing surface near joint
- ❑ Check for secure seating.

4 - Conrod

- ❑ With industrially cracked conrod bearing cap
- ❑ only renew as a complete set
- ❑ Mark conrod bearing cap and cylinder allocation in colour -B-

Protected by copyright. Copying for private or commercial purposes, not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee compatibility with the correctness of information in this document.

- ❑ Axial clearance: wear limit: 0.37 mm
- ❑ Measuring radial clearance ⇒ page 98
- ❑ Separating parts of new conrod ⇒ page 93
- ❑ Installation position: Show markings -A- face towards pulley end

5 - Securing ring

- ❑ 2x.
- ❑ Renew after removal

6 - Piston pin

- ❑ Removing and installing ⇒ “4.2 Removing and installing pistons”, page 93

7 - Piston

- ❑ With combustion chamber
- ❑ Renew piston if cracking is visible on piston crown or piston skirt
- ❑ Mark installation position and cylinder number ⇒ page 92
- ❑ Removing and installing ⇒ page 93
- ❑ Checking pistons and cylinder bores ⇒ page 97
- ❑ Measuring piston projection at “TDC” ⇒ page 95

8 - Compression rings

- ❑ Measuring piston ring gap ⇒ page 98
- ❑ Measuring clearance ⇒ page 98
- ❑ Use piston ring pliers (commercially available) to remove and install
- ❑ Installation position: marking “TOP” or side with lettering faces towards piston crown
- ❑ Displace the gaps at 120° from each other

9 - Oil scraper ring

- ❑ Measuring piston ring gap ⇒ page 98
- ❑ Measuring clearance ⇒ page 98
- ❑ remove and fit using pliers adapted for piston rings
- ❑ Installation position: marking “TOP” or side with lettering faces towards piston crown
- ❑ Offset gap 120° from bottom compression ring

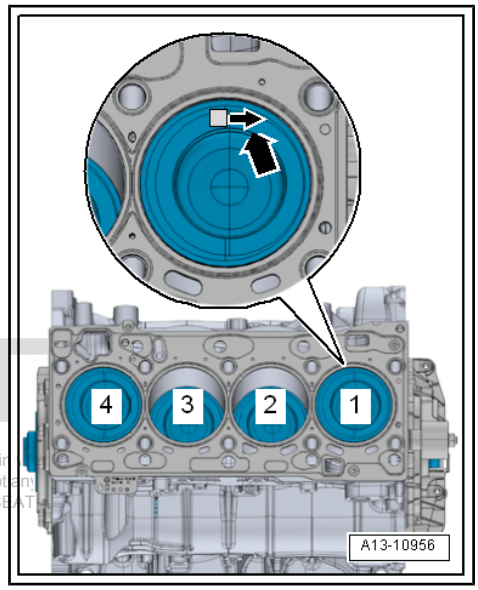
Installation position of pistons and allocation of piston/cylinder

NOTICE

Risk of damage to piston crown.

- ♦ **If worn pistons are to be reinstalled, mark their allocation to the cylinder on the piston crown. Use paint for this. Do not use indentation, scratches, notches, or similar to mark piston crown.**

- Arrow on piston crown points to pulley end -arrow-.

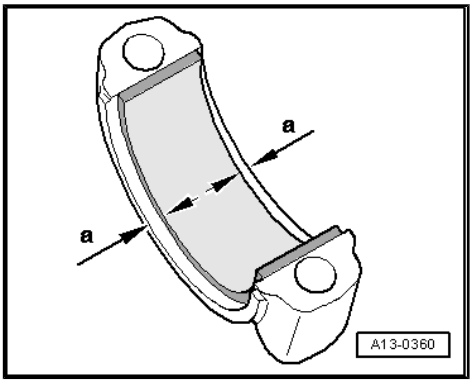


Protected by copyright. Copying for private or commercial purposes, in part or in
permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept
respect to the correctness of information in this document. Copyright by SEAT

Installation position of bearing shells in conrods

– Insert bearing shells centrally in conrod and conrod bearing cap.

• Dimension -a- = 2.5 mm



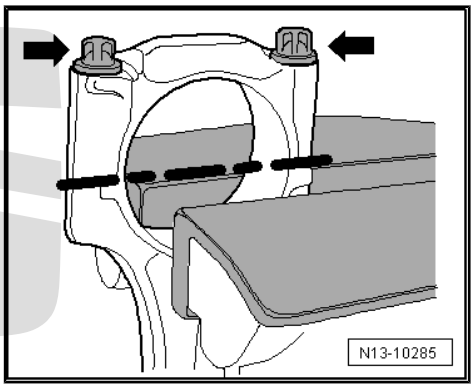
Separate new conrod

On new conrods it is possible that conrod and conrod bearing cap are very firmly bonded. Proceed as follows if the conrod bearing cap cannot be removed by hand:

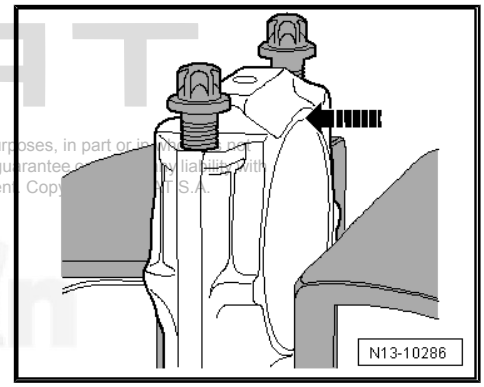
– To avoid any risk of damage, the conrod should only be clamped lightly in a vice using jaw covers as shown in illustration.

• The conrod is clamped in position below the dotted line.

– Unscrew bolts -arrows- approx. 5 turns.



– Using a plastic hammer, carefully knock against conrod bearing cap -arrow-, and detach it.



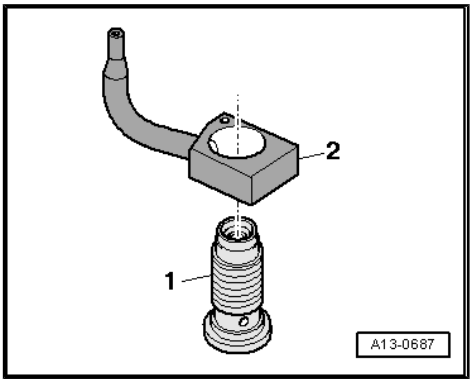
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Oil spray jet and pressure relief valve

1 - Bolt with pressure relief valve - 27 Nm

2 - Oil spray jet (for cooling of piston)

• Installation position: align leading edge of oil spray jet with machined surface of cylinder block.



NOTICE

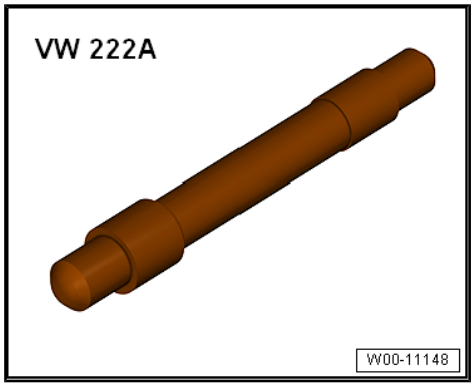
Risk of damage to oil spray jets.

- **Do not bend oil spray jets.**
- **Check that oil spray jets adequate clearance after re-installing pistons.**
- **Bent oil spray jets must be renewed.**

4.2 Removing and installing pistons

Special tools and workshop equipment required

♦ Punch - VW 222 A-



♦ Commercially available tapered sleeve for mounting the piston rings

Removing

– Remove cylinder head ⇒ page 104 .

– Remove oil pump ⇒ page 184 .

– Mark installation position and matching of conrod bearing caps to cylinder and to conrods for reinstallation ⇒ Item 2 (page 91) .

– Unbolt conrod bearing caps.

– Remove the piston with the conrod upwards.

Note

If the piston pin is difficult to move, heat the piston to approx. 60 ° C.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

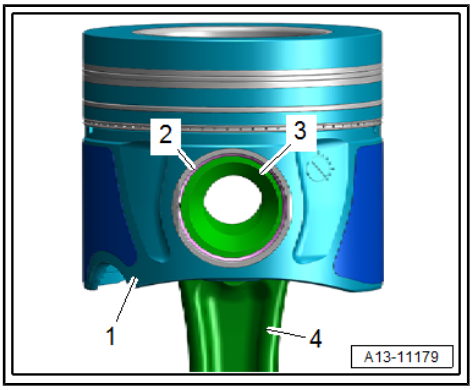
– Take circlip -2- out of piston pin boss.

– Use -- drift - VW 222A- to drive out piston pin 3.

TIP:

If the drift is sluggish, the pistons must be heated to approx. 60 ° C.

– Remove piston -1- from conrod -4-.



Installing

Install in reverse order of removal, observing the following.

Note

Renew the bolts tightened with specified tightening angle.

– Lubricate the friction surfaces of the half bearings.

– Mount the piston with tapered sleeve in order to mount the piston rings

Installation position

- Pistons ⇒ page 92 .
- Bearing shells in conrods ⇒ page 93 .

– Install the conrod bearing cover corresponding with the markings previously made.

– Fit the oil pump ⇒ page 184 .

– Installing the cylinder head ⇒ page 104 .

Specified torques

◆ ⇒ “4.1 Assembly overview - pistons and conrods”, page 91

4.3 Measuring piston projection at TDC

Note

◆ *Piston projection at “TDC” must be measured when installing new pistons or a short engine.*

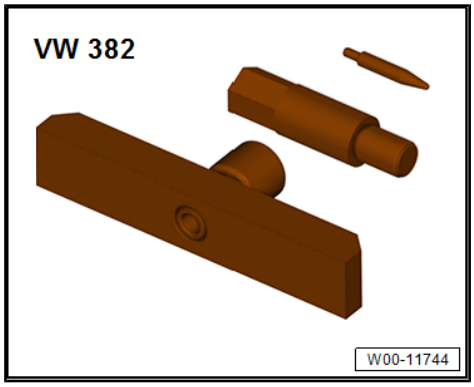
◆ *If the measured values for piston projection are not the same for all pistons, use the highest value to determine the correct cylinder head gasket size.*

◆ *Install the appropriate cylinder head gasket depending upon piston projection, according to following table:*

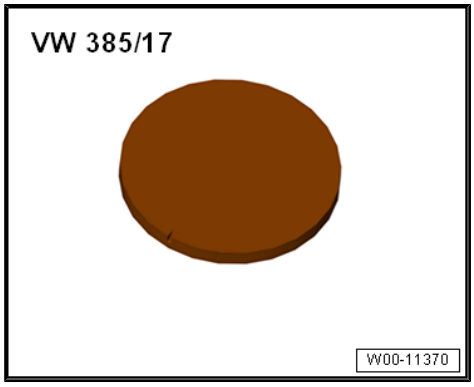
Special tools and workshop equipment required

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted without the written authorization of SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

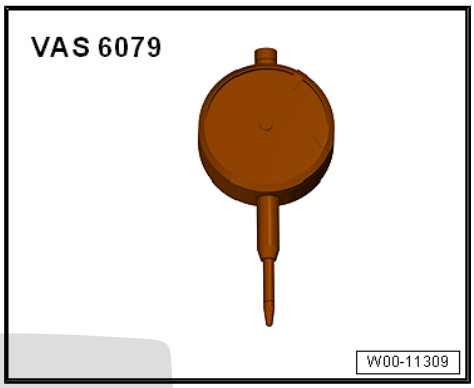
- Measuring bridge - VW 382/7- from measuring tool - VW 382-



- Measuring plate -VW 385/17- from universal measuring tool - VW 385-



- Dial gauge - VAS 6079-



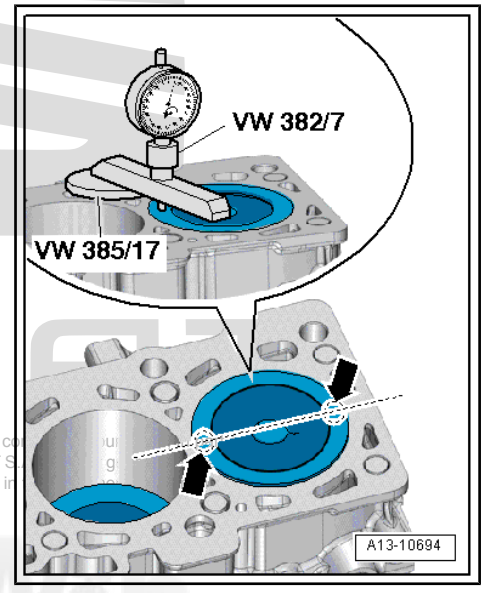
Procedure

– Secure dial gauge - VAS 6079- with measuring bridge - VW 382/7- and measuring plate -VW 385/17- to cylinder block as shown in illustration.

– Measure piston projection at two points marked with -arrows- for each piston. Measure at the front and back of the pistons on the longitudinal axis of the engine.

– Install the appropriate cylinder head gasket depending upon piston projection, according to following table:

Piston projection above top surface of cylinder block mm	Identification Holes
0.91 - 1.00	1
1.01 - 1.10	2
1.11 - 1.20	3



Protected by copyright. Copying for private or co
permitted unless authorised by SEAT S.A. SEAT S
respect to the correctness of information in

Cylinder head identification

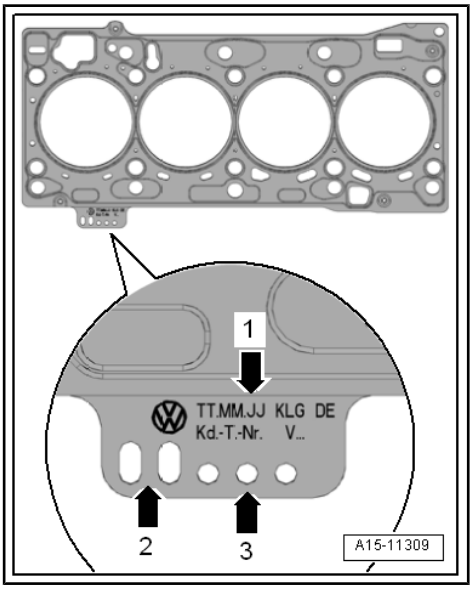
1 - Part number

2 - Ignore

3 - Holes

TIP:

If the measured values for piston projection are not the same for all pistons, use the highest value to determine the correct cylinder head gasket size.



4.4 Checking pistons and cylinder bores

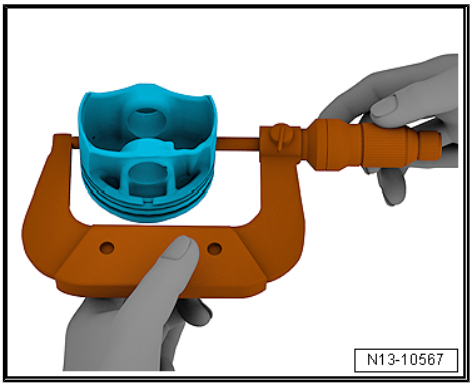
Checking piston

– Using a micrometer (75 ... 100 mm), measure approx. 15 mm from the lower edge, perpendicular to the piston pin axis.

• Maximum deviation compared with nominal dimension; 0.04 mm cut back

– Ensure that the coating in the piston skirt does not show any wear and that there are no signs of coking.

• Piston must be changed if piston shaft reveals cracking.



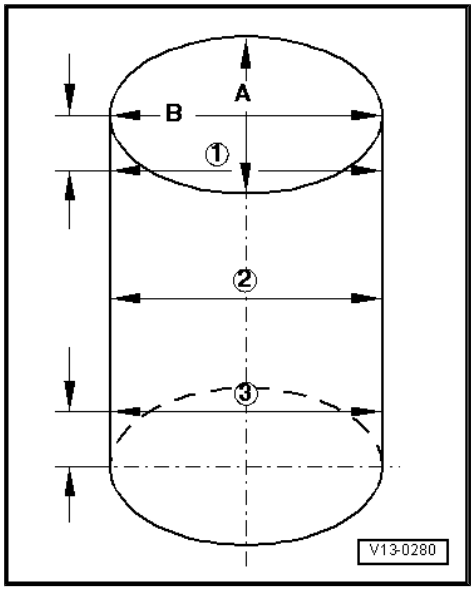
Piston Ø mm		
Nominal dimension	1.6 l	79.455[1)]
	2.0 l	80.92 [1)]
• [1)] Dimensions include coating (thickness 0.02 mm). The coating will wear down.		

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Measuring cylinder bore

– Using cylinder gauge - VAS 6078- take measurements at 3 positions diagonally in lateral direction -A- and longitudinal direction -B-.

• Maximum deviation compared with nominal dimension; 0.10 mm cut back



Checking cylinder bores

– Check the diameter of the cylinder for wear, scoring and other deviations.

Cylinder bore diameter, mm		
Nominal dimension	1.6 l	79.5
	2.0 l	81.03

Note

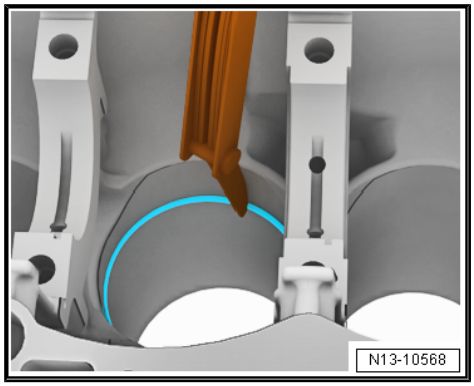
Measuring the cylinder bores must not be done when the cylinder block is mounted to the engine and gearbox stand - VAS 6095- , as incorrect measurements may result.

Measuring piston ring gap

– Push in piston ring at right angles.

– Push into bottom cylinder section from above to a depth of about 15 mm from the edge of the cylinder.

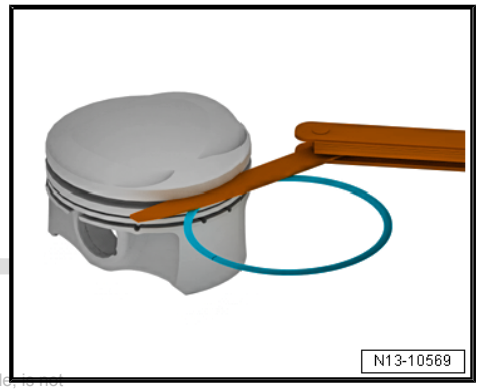
– Push in using a piston without piston rings.



Segment ring	New mm	Wear limit mm
1st compression ring	0.30 - 0.40	0.55
2nd compression ring	0.20 - 0.45	0.95
Oil scraper ring	0.25 - 0.50	0.75

Measuring ring-to-groove clearance

– Clean groove in piston before checking clearance.



Segment ring	New mm	Wear limit mm
1st compression ring	0.06 - 0.09	0.08
2nd compression ring	0.05 - 0.08	0.08
Oil scraper ring	0.03 - 0.06	0.08

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with [illegible] by SEAT S.A.

4.5 Checking radial clearance of conrods

Special tools and workshop equipment required

♦ Plastigage

Procedure

– Remove conrod bearing cap. Clean bearing cap and bearing journal.

– Place a Plastigage corresponding to the width of the bearing on the journal or into the bearing shells.
– Fit conrod bearing cap and tighten to 30 Nm (without additional turning further to a torque angle).
– Do not rotate crankshaft.
– Remove conrod bearing cap again.
– Compare width of Plastigage with the measurement scale.

Radial play:

• Wear limit: 0.08 mm.

– Renew conrod bolts.

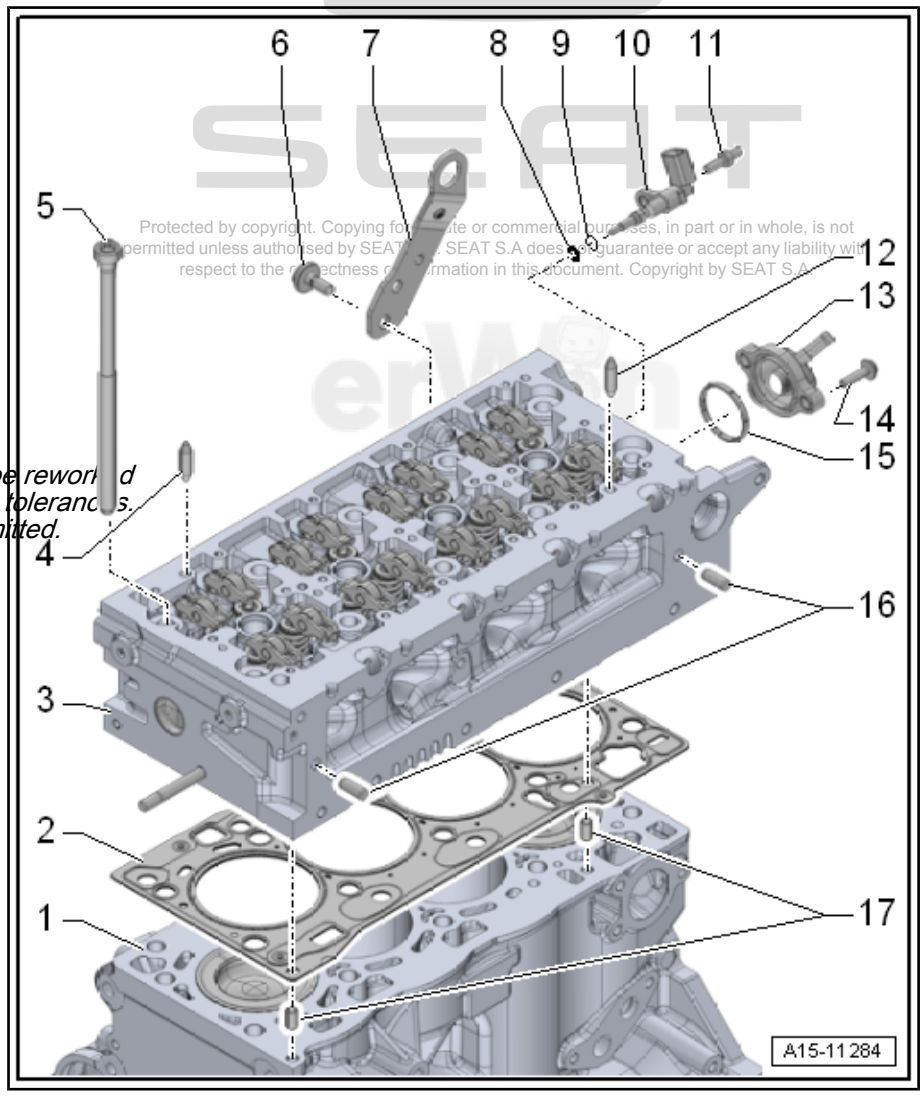
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

15 – Cylinder head, valve gear

1 Cylinder head

⇒ “1.1 Assembly overview - cylinder head”, page 100
⇒ “1.2 Assembly overview - cylinder head cover”, page 102
⇒ “1.3 Removing and installing cylinder head”, page 104
⇒ “1.4 Removing and installing cylinder head cover”, page 114
⇒ “1.5 Removing and installing seals for injectors”, page 115
⇒ “1.6 Removing and installing camshaft housing”, page 116
⇒ “1.7 Checking compression”, page 121

1.1 Assembly overview - cylinder head



1 - Cylinder block

2 - Cylinder head gasket

- ❑ Renew after removal ⇒ “1.3 Removing and installing cylinder head”, page 104
- ❑ Cylinder head identification ⇒ page 102
- ❑ If renewed, change coolant and engine oil

3 - Cylinder head

Note

Valve seats must not be reworked due to the very narrow tolerances. Only lapping-in is permitted.

- ❑ Removing and installing ⇒ page 104
- ❑ To avoid the possibility of glow plug damage, only set down cylinder removed on a foam pad
- ❑ Check for deformations ⇒ page 101
- ❑ Must not be machined
- ❑ Before installing, check that the two dowel sleeves for centring cylinder head are fitted on cylinder block
- ❑ Change engine oil after renewing
- ❑ Information on plug ⇒ page 101

4 - Dowel pin

- ❑ For camshaft housing

5 - Bolt

- ❑ Renew after removal

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- ❑ Sequence when loosening ⇒ page 110 .
- ❑ Specified torque and sequence ⇒ page 102 .

6 - Bolt

- ❑ 20 Nm

7 - Engine lifting eye

8 - Spacer ring

- ❑ Renew if damaged

9 - O-ring

- ❑ Renew after removal
- ❑ Moisten with coolant

10 - Coolant temperature sender - G62-

- ❑ Removing and installing ⇒ page 278

11 - Centre hex stud

- ❑ Specified torque ⇒ Item 4 (page 256)

12 - Dowel pin

- ❑ For camshaft housing

13 - Connection

- ❑ For coolant hoses

14 - Bolt

- ❑ 10 Nm

15 - Radial oil seal

- ❑ Renew after removal

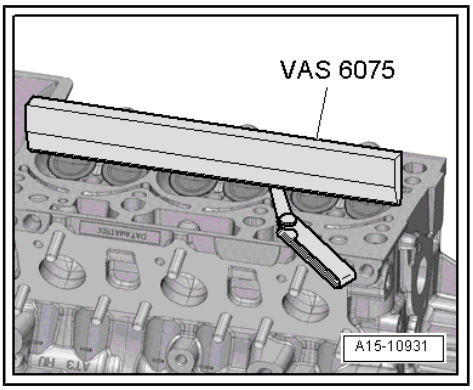
16 - Dowel pin

- ❑ For intake manifold with charge air cooler

17 - Dowel sleeves

SEAT
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.
erWin

Plug in cylinder head:



Note

- ♦ *There is a plug with a seal in the cylinder head on the gearbox end (not illustrated).*
- ♦ *Plug M10 x 18.*
- ♦ *Specified torque: 15 Nm*
- ♦ *For allocation, refer to ⇒ Electronic Parts Catalogue*

Check that the cylinder head is not deformed

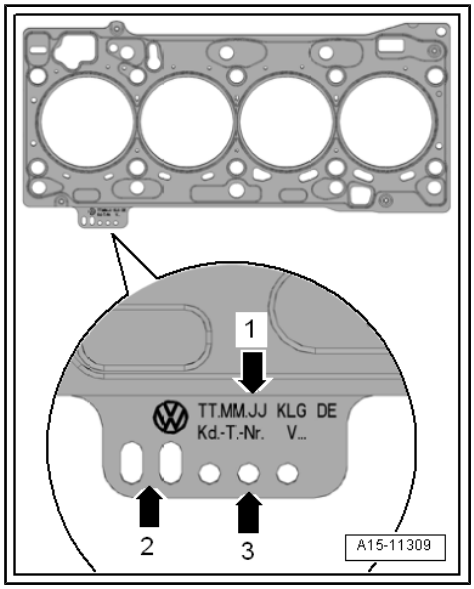
– Use straight edge 500 mm - VAS 6075- and feeler gauge to measure cylinder head for distortion at several points.

• Maximum permitted deformation: 0.1 mm

Note

Cylinder heads must not be reworked on TDI engines.

Cylinder head identification



1 - Part number

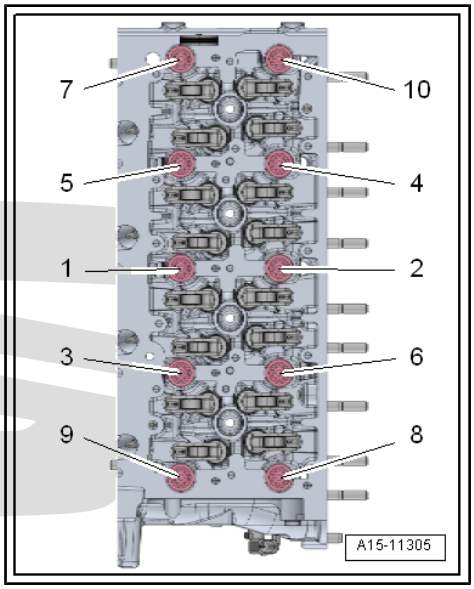
2 - Ignore

3 - Holes

Note

Depending on the projection measurement of the pistons, gaskets of varying thickness are fitted ⇒ page 95 . If only the cylinder head gasket is renewed, install a new cylinder head gasket with the same identification.

Cylinder head - specified torque and sequence



Note

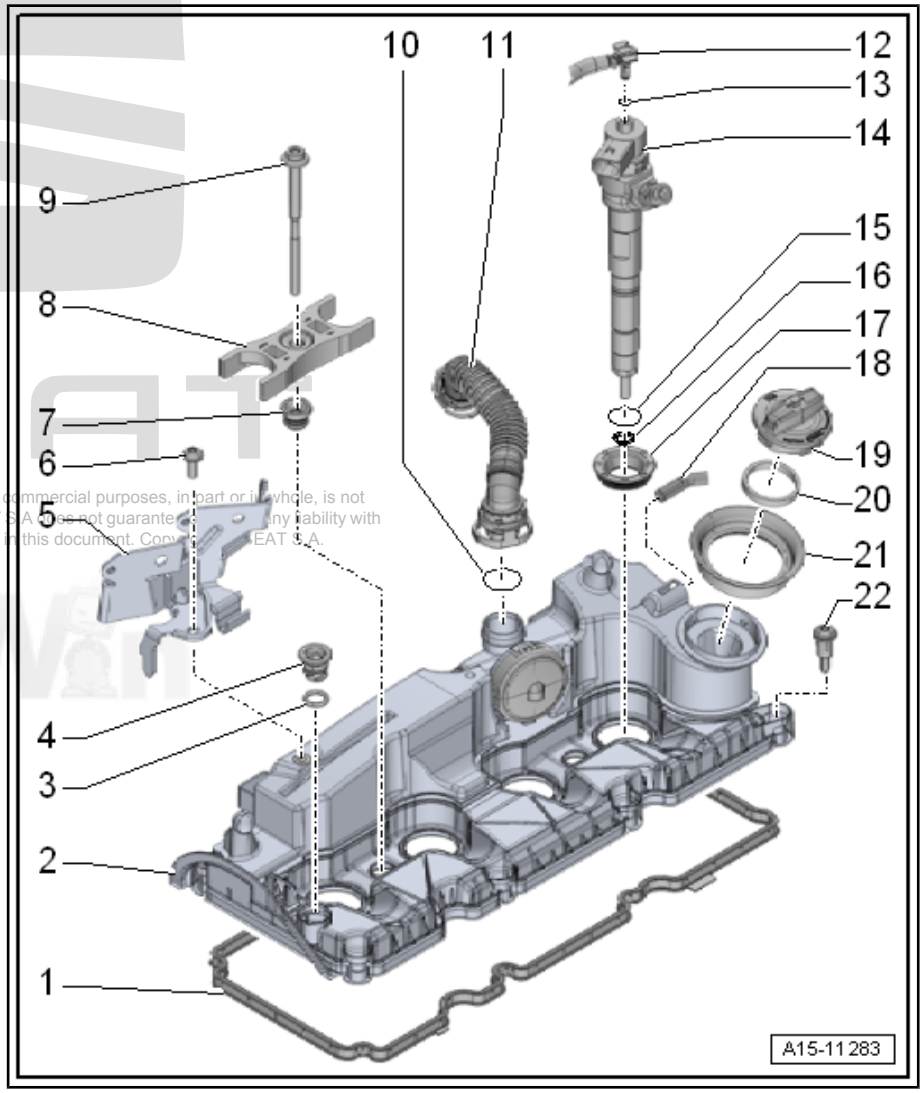
Renew bolts that are tightened with turning further angle after each removal.

– Tighten bolts in stages in the sequence shown:

Stage	Bolts	Specified torque/turning further angle
1st	-1 … 10-	30 Nm
2nd	-1 … 10-	70 Nm
3rd	-1 … 10-	Turn 90° further
4th	-1 … 10-	Turn 90° further
5.	-1 … 10-	Turn 90° further

1.2 Assembly overview - cylinder head cover

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



1 - Gasket

- ❑ Renew if damaged or leaking.

2 - Cylinder head cover:

- ❑ Removing and installing ⇒ page 114

3 - O-ring

- ❑ Renew after removal

4 - Sealing cap

5 - Bracket/bearing/support

- ❑ For electrical wiring

6 - Bolt

- ❑ 8 Nm

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. do not guarantee the correctness of information in this document. Copyright © SEAT S.A.

7 - Nozzle/spout

- ❑ In cylinder head cover

8 - Clamping piece

- ❑ Installation position ⇒ Fig. ""Installation position clamping piece, variant 1"" , page 395
- ❑ Installation position ⇒ Fig. ""Installation position of clamping piece, version 2 for engine codes CXXA, CXXB, DDYA, DDYB, and DGTB"" , page 395

9 - Bolt

- ❑ Specified torque ⇒ page 394

10 - O-ring

- ❑ Renew after removal

11 - Hose

- ❑ for crankcase breather
- ❑ Press release tabs to detach

12 - Fuel return

13 - O-ring

- ❑ Renew after removal

14 - Injector

- ❑ Observe rules for cleanliness ⇒ page 17
- ❑ Assembly overview ⇒ page 394

15 - O-ring

- ❑ Renew after removal

16 - Insulating seal

- ❑ Renew after removal

17 - Radial oil seal

- ❑ For injector
- ❑ Renew after removal ⇒ page 115

18 - Vacuum hose

19 - Sealing cap

20 - Gasket

- ❑ For filler cap

21 - Sleeve

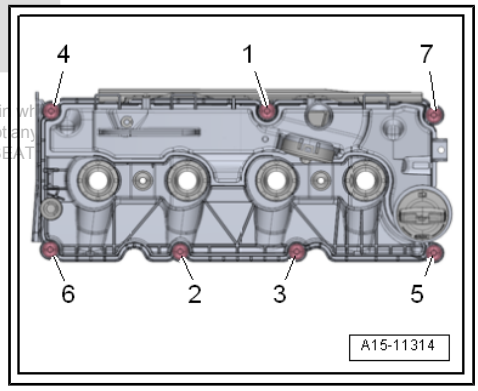
22 - Bolt

- ❑ Renew seal if damaged.
- ❑ Specified torque and sequence ⇒ page 104 .

Cylinder head cover - specified torque and sequence

– Tighten bolts for cylinder head cover in the sequence -1 ... 7- to 9 Nm.

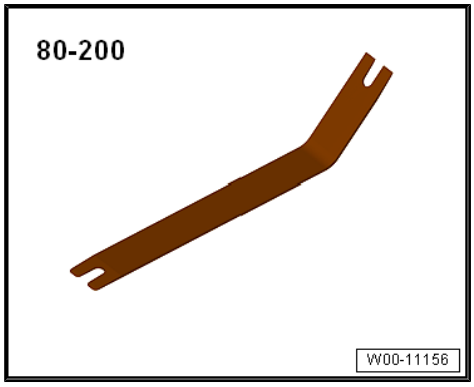
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT



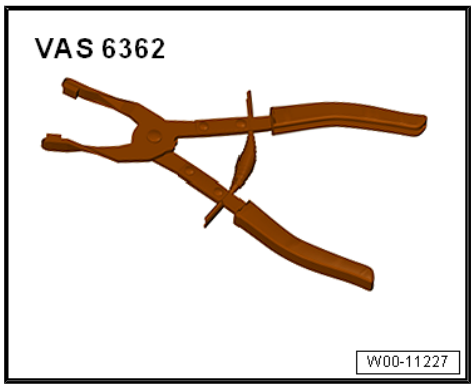
1.3 Removing and installing cylinder head

Special tools and workshop equipment required

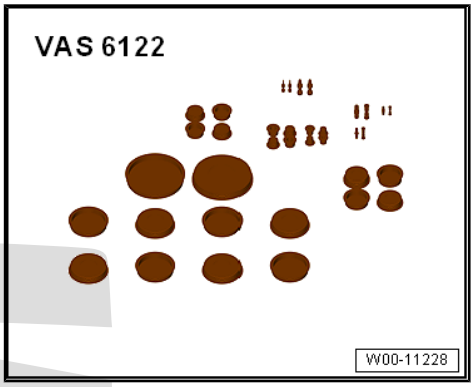
♦ Removal lever - 80 - 200-



♦ Hose clip pliers - VAS 6362-



- Engine bung set - VAS 6122-



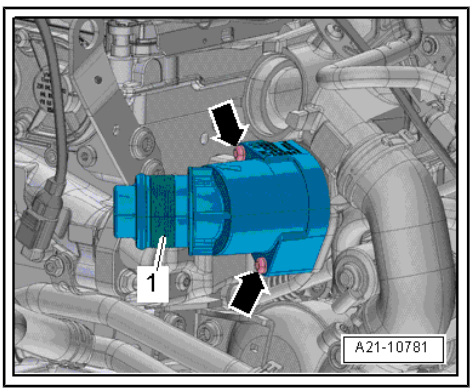
Removing

Note

- *Attach all heat-shielding sleeves in the same places when installing.*
- *Fit the cable ties in the original position when installing.*
- *Seal open channels/ports using suitable plugs from engine bung set - VAS 6122- .*
- *Cover the openings in the gearbox with a cloth to prevent any coolant from getting into the clutch housing.*

Any reproduction or distribution for commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Remove engine cover panel ⇒ page 56 .
– Remove coolant pipes (top front) ⇒ page 283 .
– Remove rear coolant pipe ⇒ page 293 .
– Remove coolant pipes (left-side) ⇒ page 291 .
– Remove front exhaust pipe ⇒ page 489 .
– Remove heat shield for right drive shaft ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft heat shield .
– Detach toothed belt from camshaft ⇒ page 141 .
– Removing and installing the cylinder head cover ⇒ page 114 .
– Remove connecting piece on turbocharger ⇒ page 360 .
– Unscrew bolts -arrows- and remove resonator -1-.



– Release and pull off connectors on plenum chamber bulkhead ⇒ page 387 .
– Move clear connectors and wires on plenum chamber bulkhead.

Vehicles with particulate filter or catalytic converter:

– Disconnect particulate filter or catalytic converter ⇒ page 504 .

Vehicles with all-wheel drive and emission control module:

– Remove exhaust gas recirculation cooler ⇒ page 567 .

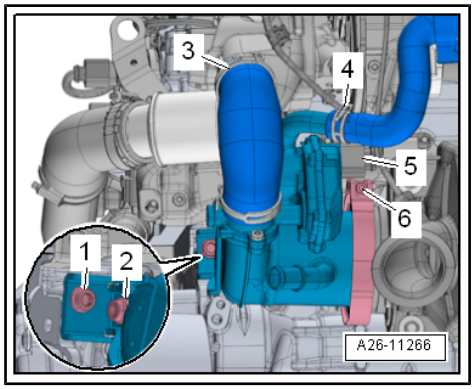
Models with front-wheel drive

– Push heat insulation sleeve to one side and unplug electrical connector -5-.

– Loosen the hose clip -3-, remove the air intake hose.

– Loosen the hose clip -4-, remove the coolant hose.

– Remove bolt -1- and loosen bolt -2-.

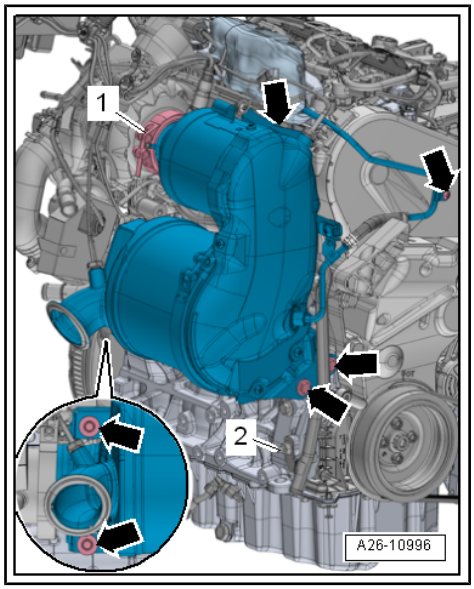


Continued for all vehicles

– Loosen bolt -1- and remove screw-type clip.

– Loosen centre hex stud -2- and move coolant pipe slightly towards rear.

– Remove bolts -arrows- and press emission control module and (on front-wheel drive vehicles) exhaust gas recirculation cooler towards rear.

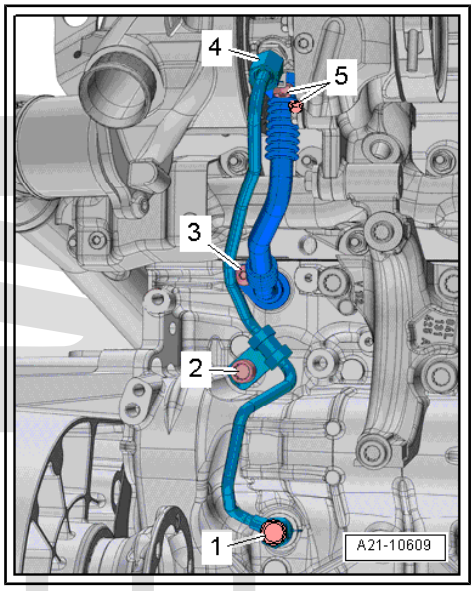


– Unscrew bolt -2- and union nut -4-.

– Remove bolts -3, 5- and detach oil return pipe.

Vehicles with auxiliary heater

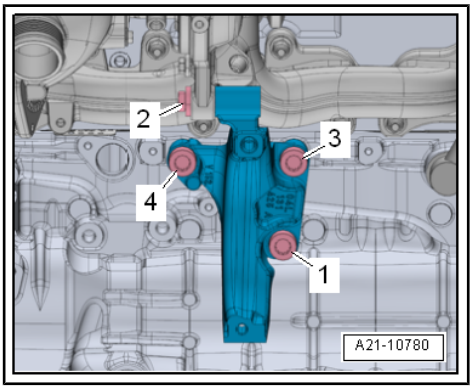
– Remove coolant pipes on plenum chamber bulkhead ⇒ Auxiliary heater, supplementary heater; Rep. gr. 82 ; Coolant circuit with auxiliary heater .



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

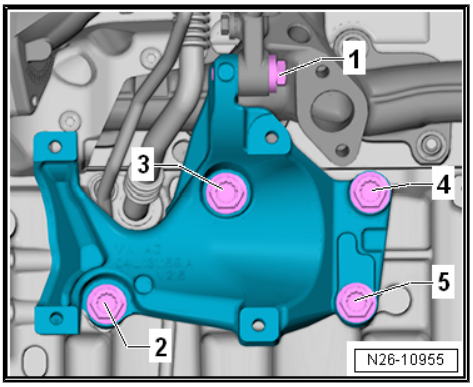
Continued for vehicles with emission control module:

– Remove bolt -2- and loosen bolts -1, 3, 4-.



Vehicles with particulate filter or catalytic converter:

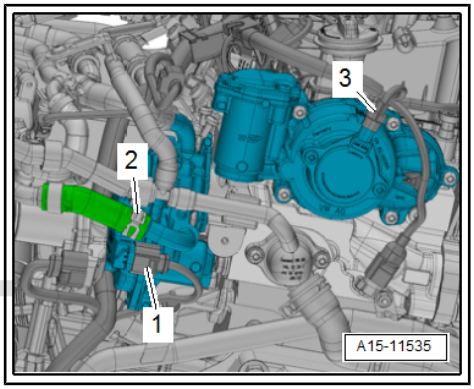
– Unscrew bolt -1-, and loosen bolts -2- to -5-.



Vehicles with variable valve timing

– Unplug electrical connectors -1, 3-.

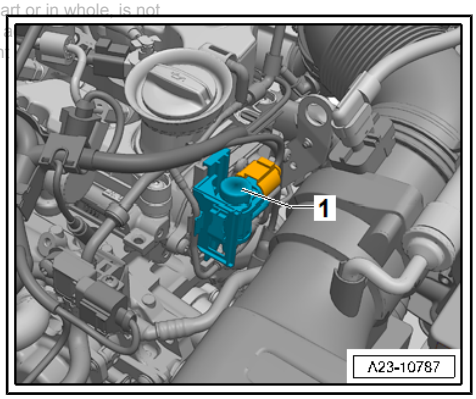
– Loosen clamp -2-.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not
SEAT S.A does not guarantee or
respect to the correctness of information in this document. Copyrigh

Vehicles with particulate filter or catalytic converter:

– Release and pull off connector on exhaust gas recirculation cooler changeover valve - N345- -1-.



Continued for all vehicles

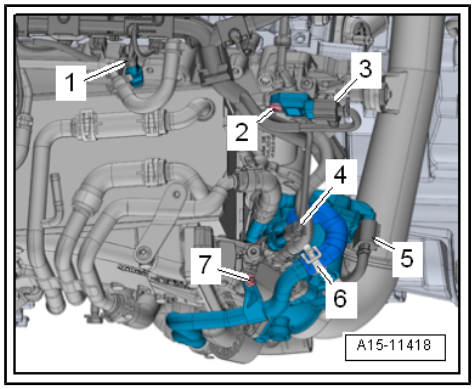
– Disconnect connectors and lay them to one side.

1 - For charge air temperature sender after charge air cooler - G811-

3 - For charge pressure sender - G31-

4 - For charge air temperature sender before charge air cooler - G810-

5 - for throttle valve control unit - J338-



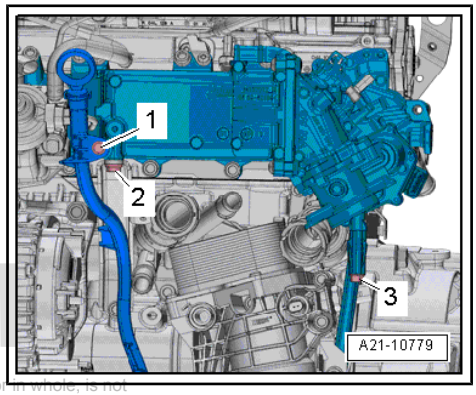
– Unscrew and remove the bolts -2, 7-, remove the coolant hose -6-.

– Remove bolt -1- for dipstick guide tube.

– Remove bolts -2, 3- for bracket for intake manifold.

Vehicles with variable valve timing:

– Remove throttle valve control unit - J338- ⇒ page 429



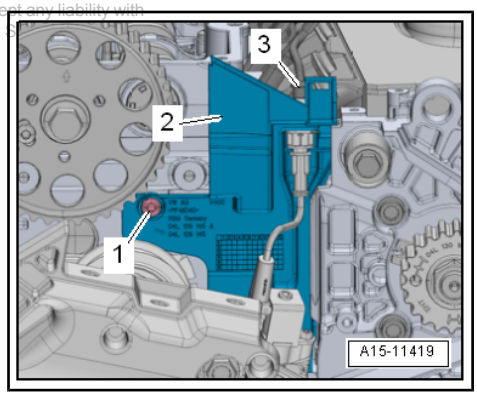
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Continued for all vehicles

– Remove camshaft housing ⇒ page 116 .

– Unplug electrical connector -3- and detach from cover -2-.

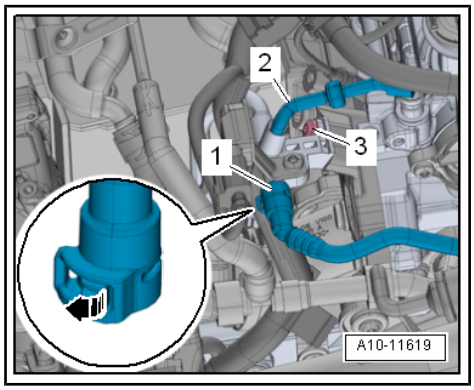
– Unscrew bolt -1- and remove cover.



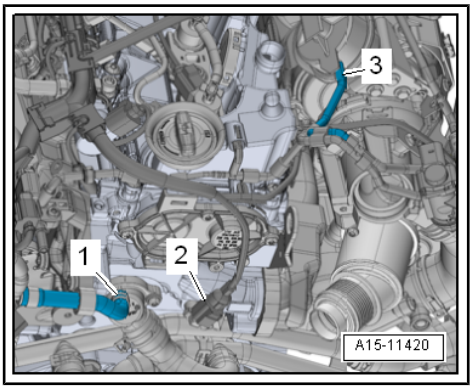
– Release the fastener -arrow-, remove the vacuum hose -1-.

– Disconnect vacuum hose -2-.

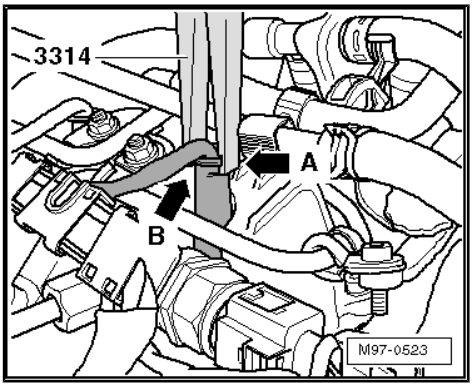
– Unscrew bolt -3-.



– Unplug electrical connector -2- for coolant temperature sender - G62- .
– Release hose clip -1- and detach coolant hose.
– Disconnect vacuum hose -3-.

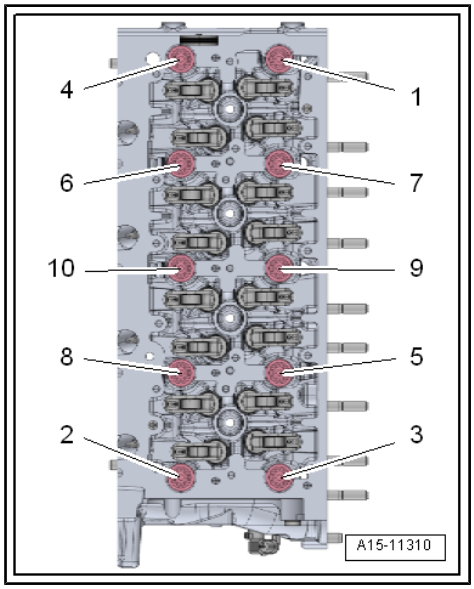


– Disconnect connectors on glow plugs.
– Move electrical wiring harness clear to side.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Loosen cylinder head bolts in the sequence -1 … 10-.



Note

A second mechanic is required to remove the cylinder head.

– Swivel cylinder head to left and out of rear toothed belt cover and detach tensioning roller at the same time.

– Take care not to damage oil return line for turbocharger.

– Take care to place the cylinder head down without bending the oil return line. If necessary, place a block of wood below exhaust manifold.

NOTICE

Risk of damage to glow pins when cylinder head is set down.

- **After removal, the cylinder head must not be put down on the gasket side with the glow plugs still installed, because the glow plugs project slightly beyond the gasket surface**

Installing

NOTICE

Avoid damage to sealing surfaces.

- **Carefully remove sealant residue from cylinder head and cylinder block.**
- **Ensure that no scoring or scratching is produced.**

Avoid damage to cylinder block.

- **No oil or coolant must be allowed to remain in the blind holes for the cylinder head bolts in the cylinder block.**

Danger of cylinder head gasket leaks.

- **Carefully remove sealant residue from cylinder head and cylinder block. Ensure that no scoring or scratching is produced.**
- **Carefully remove any remaining emery and abrasive material.**
- **Do not remove the new cylinder head gasket from its packing until immediately before its installation.**
- **Handle the cylinder head gasket very carefully to prevent damage to the silicone coating or the indented area of the gasket.**

Avoid damage to valves and piston crowns after working on valve gear.

- **Turn the crankshaft carefully at least 2 rotations to ensure that none of the valves make contact when the starter is operated.**

Reproduction, copying or saving for private or commercial purposes, in part or in whole, is not permitted unless authorized by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Note

- *Cylinder heads must not be reworked on TDI engines.*
- *Renew bolts that are tightened with turning further angle after each removal.*
- *Renew self-locking nuts, seals, gaskets and O-rings after each removal.*
- *Oil contact surfaces between roller rocker fingers and cams.*
- *Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .*
- *After fitting a new cylinder head or cylinder head gasket, change the engine oil and refill the complete cooling system with fresh coolant.*

– Before fitting cylinder head, remove crankshaft stop -T10490- and turn crankshaft against normal direction of rotation until all pistons are positioned approximately equally below “TDC”.

– If not already fitted, install dowel sleeves in cylinder block for centring cylinder block and cylinder head.

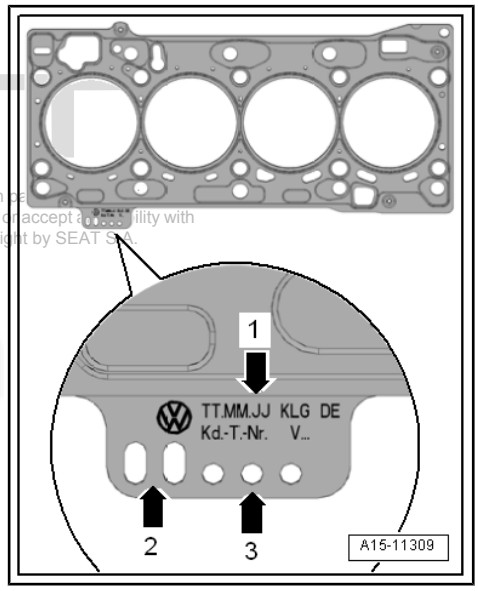
– Note cylinder head gasket identification:

1 - Part number

2 - Ignore

3 - Holes

Protected by copyright. Copying for private or commercial purposes, in p
permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept a ility with
respect to the correctness of information in this document. Copyright by SEAT S.A.

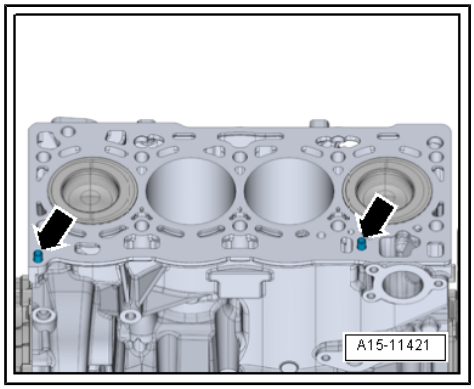


Note

- *If the cylinder head gasket or cylinder head have been replaced, select new cylinder head gasket according to number of holes in old cylinder head gasket.*
- *If parts of the crankshaft assembly have been renewed, the new cylinder head gasket must be selected by measuring the piston projection at “TDC” ⇒ page 95 .*

– Fit cylinder head gasket onto dowel sleeves -arrows- in cylinder block.

• Installation position of cylinder head gasket: The word “Top” or the spare part number must be facing the cylinder head.



Note

A second mechanic is required to mount the cylinder head.

– Insert the cylinder head.

– Fit and tighten cylinder head bolts ⇒ page 102 .

Note

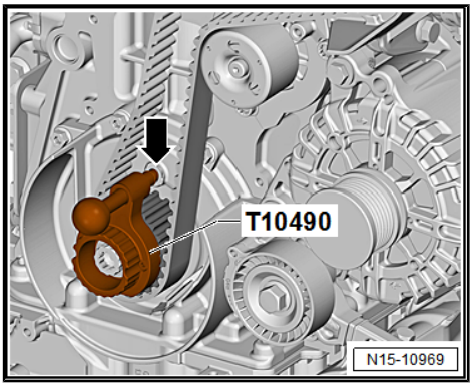
Cylinder head bolts do not have to be torqued down again later after repair work.

– Install camshaft housing ⇒ page 116 .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Then turn the crankshaft in direction of engine rotation until the pin -arrow- on the crankshaft stop -T10490- engages in the sealing flange as the crankshaft rotates.

– Install notched belt (adjusting valve timing) ⇒ page 135 .



Remaining installation sequence carried out in reverse sequence; note the following:

– Install emission control module ⇒ page 506 .

– Install front exhaust pipe ⇒ page 489 .

– Install coolant pipes (left-side) ⇒ page 291 .

– Install coolant pipe (rear) ⇒ page 293 .

– Install coolant pipes (top front) ⇒ page 283 .

– Observe electrical connections and routing ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

– Install engine cover panel ⇒ page 56 .

– Change the engine oil; Ateca ⇒ Maintenance ; Booklet KH1 .

– Change the engine oil; Leon ⇒ Maintenance ; Booklet 501 .

NOTICE

If a new cylinder head has been installed, the cooling system must be flushed and the coolant must be renewed to ensure optimum surface protection
⇒ “1.6 Flushing cooling system”, page 224 .

If the existing cylinder head has been installed:

– Add coolant ⇒ page 214 .

Note

♦ *After new components have been installed (engine/short engine, cylinder head, camshaft housing or turbocharger), the oil pressure control must be set to max. pressure for approx. 1000 km if the function is available in the engine control unit. This will compensate for the increased friction during run-in of new components, and a better transport of wear-related particles is guaranteed. To do this, connect vehicle diagnostic tester, switch on ignition, and select the following menu options:*

♦ `0001 - Engine electronics, functions`

♦ `0001 - Adaptation`

♦ `Oil pressure for entry in the engine`

Note

Depending on the vehicle, the engine and the firmware version of the vehicle diagnostic and service information system , the specified path may vary slightly.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with Copyright by SEAT S.A.

Specified torques

♦ ⇒ “1.1 Assembly overview - cylinder head”, page 100

- ⇒ “1.1 Assembly overview - sump, oil pump”, page 166
- ⇒ “1.1 Assembly overview - turbocharger”, page 326
- ⇒ “5.1 Assembly overview - intake manifold”, page 424

1.4 Removing and installing cylinder head cover

Removing

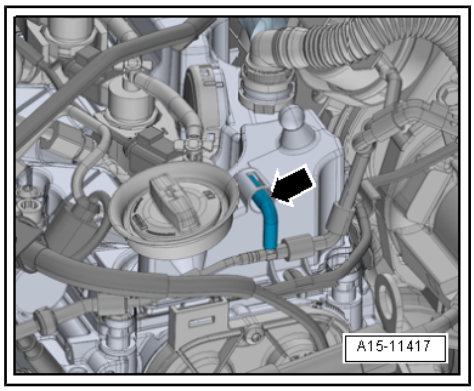
– Remove engine cover panel ⇒ page 56 .

– Remove toothed belt cover (top) ⇒ page 125 .

– Remove injectors ⇒ page 394 .

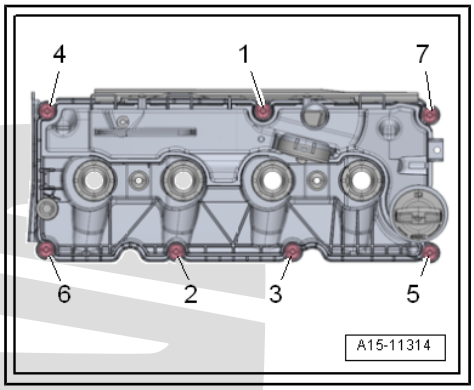
– Remove connecting piece on turbocharger ⇒ page 360 .

– Disconnect vacuum hose -arrow-.



– Slacken cylinder head cover bolts in the sequence -7 ... 1- and remove.

– Remove cylinder head cover.



Installing

Install in reverse order of removal, observing the following.

Note

- *Renew O-ring.*
- *Renew gasket and bolts for cylinder head cover if damaged or leaking.*

– Connect vacuum hose ⇒ page 390 .

– Install engine cover panel ⇒ page 56 .

Specified torques

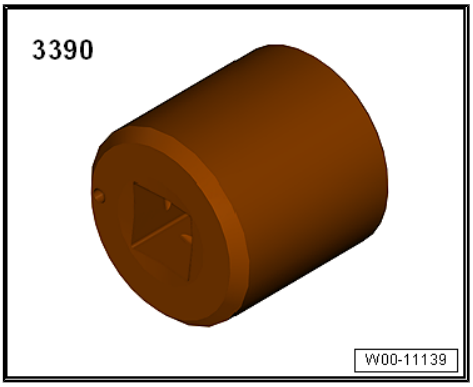
- Cylinder head cover - specified torque and sequence ⇒ page 104
- ⇒ “2.1 Assembly overview - toothed belt cover”, page 123
- ⇒ “1.1 Assembly overview - turbocharger”, page 326
- ⇒ “4.1 Assembly overview - exhaust gas temperature regulation”, page 548
- ⇒ “3.1 Assembly overview - injectors”, page 394

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

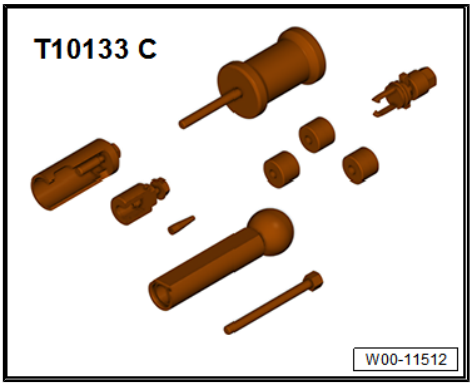
1.5 Removing and installing seals for injectors

Special tools and workshop equipment required

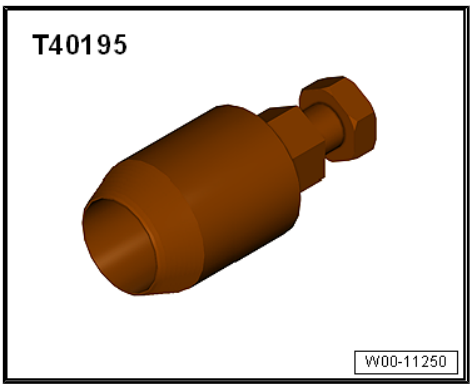
- Coupling - 3390-



- Tool set - T10133C-



- Oil seal extractor - T40195-

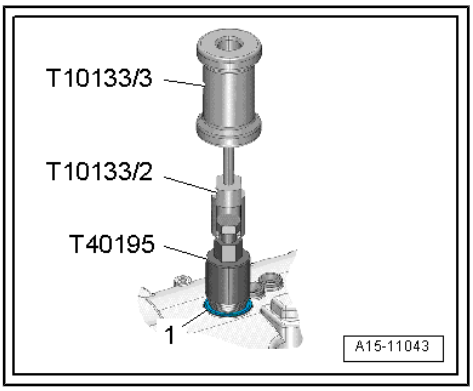


Procedure

– Remove corresponding injector ⇒ page 394

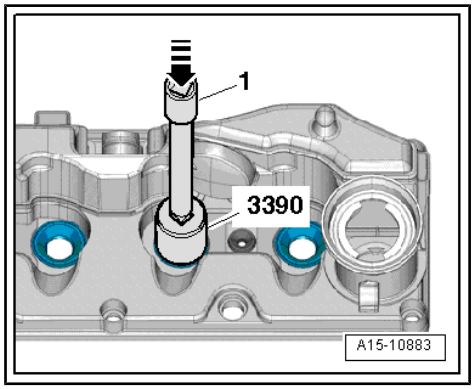
– Screw oil seal extractor - T40195- into seal -1-.

– Fit striker -T10133/3- with adapter -T10133/2- on oil seal extractor, as shown in illustration, and pull out seal upwards by tapping gently.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this copy. ©Copyright by SEAT S.A.

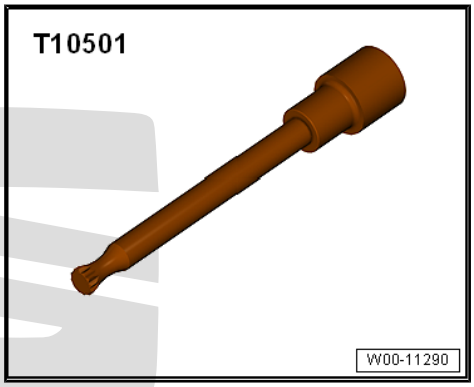
– Press in new seal for injector using carrier - 3390- and short extension -1- from top to stop.



1.6 Removing and installing camshaft housing

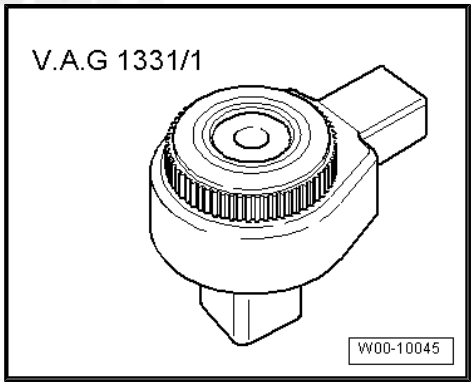
Special tools and workshop equipment required

♦ Socket insert XZN 10 - T10501-



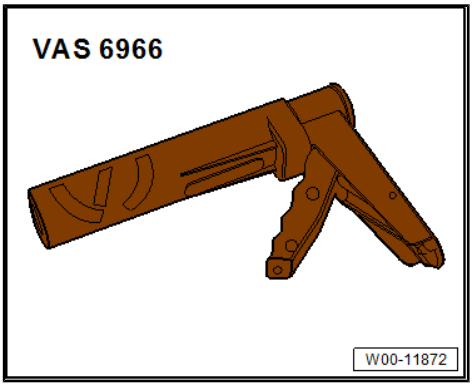
♦ Torque wrench - V.A.G 1410-

♦ Ratchet - V.A.G 1331/1-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

♦ Applicator gun - VAS 6966-



♦ Hand drill with plastic brush

♦ Safety goggles

♦ Sealant ⇒ Electronic parts catalogue

Removing

• Cylinder head installed.

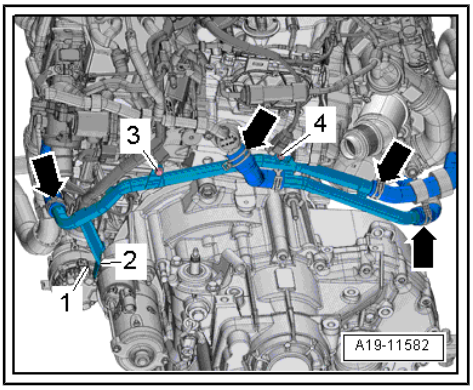
– Remove engine cover panel ⇒ page 56 .

– Remove air pipe ⇒ page 366 .

– Unscrew bolts -1- and -3-.

– Unscrew nut on centre hex stud -4-.

– Pull coolant pipe off double hex stud and press it downwards.



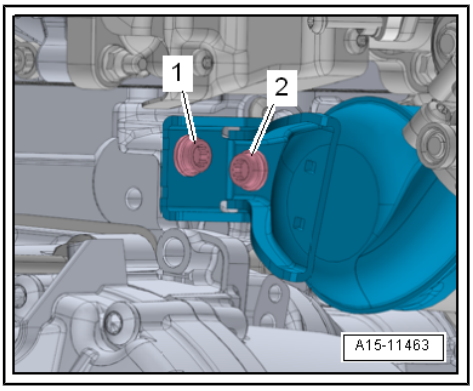
– Unscrew bolt -1- using bit XZN 10 - T10501- and loosen bolt -2-.

– Detach toothed belt from camshaft ⇒ page 141 .

– Removing and installing the cylinder head cover ⇒ page 114 .

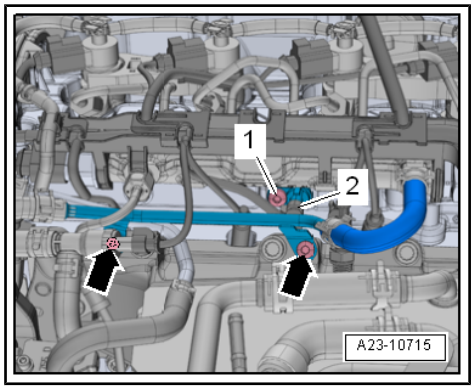
– Removing high-pressure accumulator (rail) ⇒ page 416 .

– Remove coolant pipes (left-side) ⇒ page 291 .



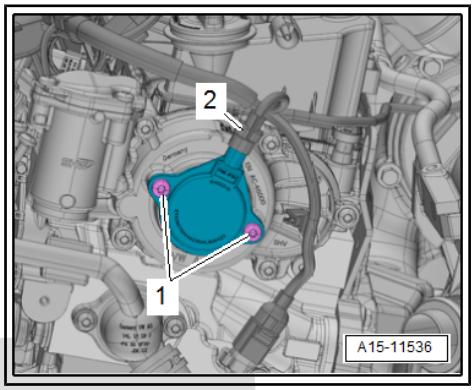
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Remove bolts -arrows- and push fuel lines slightly towards front.
– Unplug electrical connector -2- at Hall sensor - G40- .



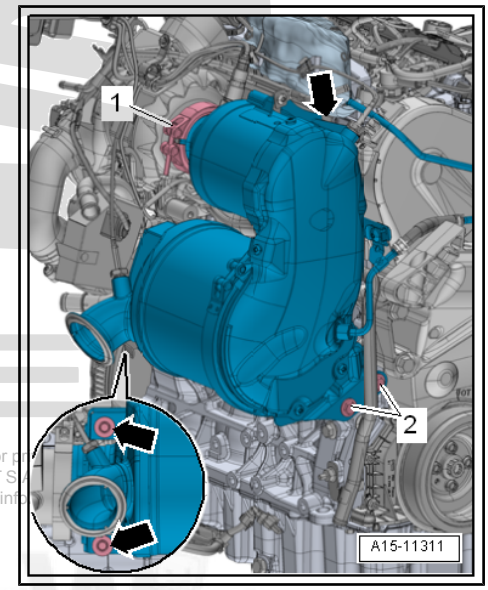
Vehicles with variable valve timing

– Unplug the electrical connector -2-.



Continued for all vehicles

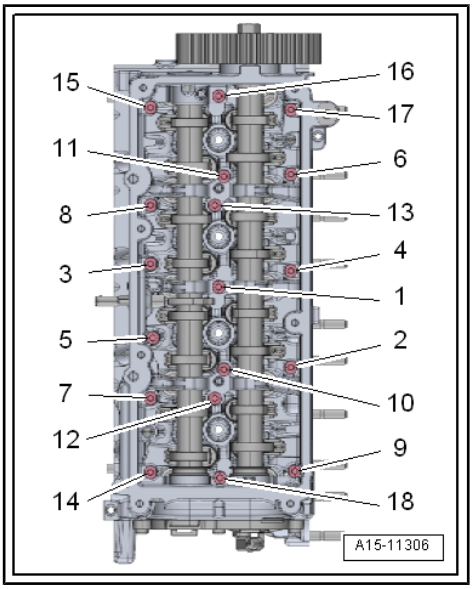
– Loosen bolt -1- and remove screw-type clip.
– Loosen bolts -2- and remove bolts -arrows-.
– Push catalytic converter with particulate filter slightly towards the rear.



Protected by copyright. Copying for p
permitted unless authorised by SEAT S
respect to the correctness of inf

– Loosen bolts for camshaft housing in the sequence -18 … 1-.

– Unscrew bolts, carefully release camshaft housing from bonded joint and remove it.



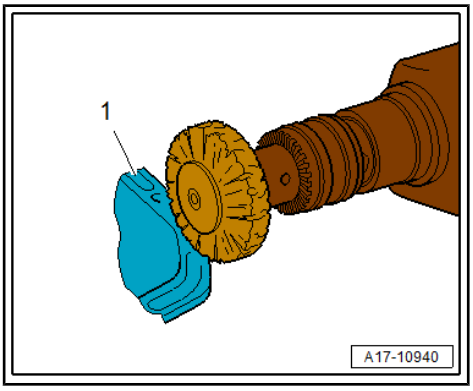
Installing

– Remove sealant residue from sump using rotating plastic brush.

NOTICE

Danger of lubrication system and bearings becoming soiled!

♦ **Cover open parts of engine.**



WARNING

Risk of eye injury.

♦ **Use safety goggles!**

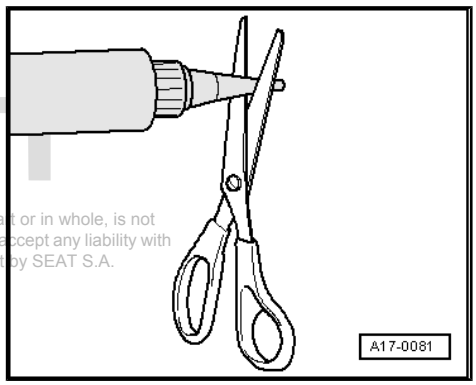
– Remove remaining sealant from cylinder head and camshaft housing using rotating plastic brush or similar.

– Clean surfaces; they must be free of oil and grease.

Note

Observe use-by date of sealant.

– Cut off nozzle of tube at front marking (nozzle ∅ approx. 1.5 mm).



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with opyright by SEAT S.A.

NOTICE

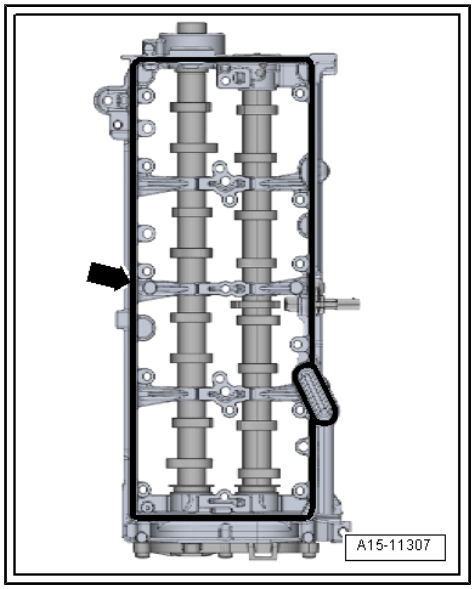
Make sure excess sealant does not contaminate camshaft bearings.

♦ **The beads of sealant must not be thicker than specified.**

– Apply bead of sealant -arrow- onto clean sealing surfaces of camshaft housing as shown in illustration.

– If necessary, use applicator gun - VAS 6966- when applying.

• Width of beads of sealant: 2 mm.



Note

♦ *The camshaft housing must be installed within 5 minutes after sealant is applied.*

♦ *After installing the camshaft housing, wait about 30 minutes for the sealant to dry.*

– Carefully fit camshaft housing on cylinder head, paying attention to dowel pins.

– Tighten camshaft housing bolts ⇒ page 148 .

Remaining installation sequence carried out in reverse sequence; note the following:

– Install emission control module ⇒ page 506 .

– Fit the camshaft seal ⇒ page 149 .

– Install the cylinder head cover ⇒ page 114 .

– Install notched belt (adjusting valve timing) ⇒ page 135 .

NOTICE

Risk of damage to valves and piston crowns after working on valve gear.

♦ **Because hydraulic compensation elements have to settle, engine must not be started for approx. 30 minutes after installing camshafts.**

♦ **Turn the crankshaft carefully at least 2 rotations to ensure that none of the valves make contact when the starter is operated.**

Note

♦ *After new components have been installed (engine/short engine, cylinder head, camshaft housing or turbocharger), the oil pressure control must be set to max. pressure for approx. 1000 km if the function is available in the engine control unit. This will compensate for the increased friction during run-in of new components, and a better transport of wear-related particles is guaranteed. To do this, connect vehicle diagnostic tester, switch on ignition, and select the following menu options:*

♦ `0001 - Engine electronics, functions`

♦ `0001 - Adaptation`

♦ `Oil pressure for entry in the engine`

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the accuracy or completeness of the downloaded content. Copyright by SEAT S.A.

Note

Depending on the vehicle, the engine and the firmware version of the vehicle diagnostic and service information system , the specified path may vary slightly.

Specified torques

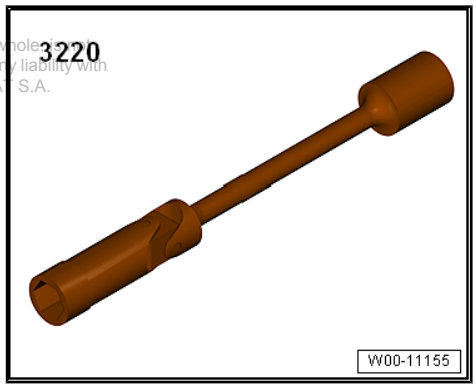
- ⇒ Fig. ""Camshaft housing - specified torque and sequence"" , page 148
- ⇒ "1.1 Assembly overview - turbocharger", page 326
- ⇒ "2.1 Assembly overview - emission control", page 500
- ⇒ "5.1 Assembly overview - exhaust gas recirculation", page 562
- ⇒ "4.1 Assembly overview - exhaust gas temperature regulation", page 548
- ⇒ "1.1 Assembly overview - silencers", page 473
- ⇒ "3.1 Assembly overview - coolant pipes", page 282
- ⇒ "2.1 Assembly overview - toothed belt cover", page 123
- ⇒ "3.9 Assembly overview - injector for reducing agent N474 ", page 540
- ⇒ "4.1 Assembly overview - air filter housing", page 420
- ⇒ "5.1 Assembly overview - intake manifold", page 424
- ⇒ "1.2 Assembly overview - cylinder head cover", page 102
- ⇒ "3.2 Assembly overview - high-pressure accumulator (fuel rail)", page 396
- ⇒ "2.1 Assembly overview - charge air system", page 362
- ⇒ "3.1 Assembly overview - coolant pipes", page 282

1.7 Checking compression

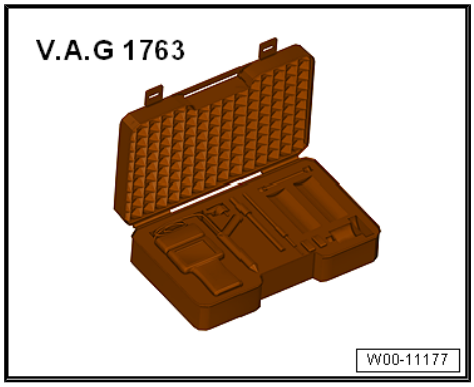
Special tools and workshop equipment required

- Jointed wrench - 3220-

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



♦ Compression tester - V.A.G 1763- with adapter - V.A.G 1763/8-



Procedure

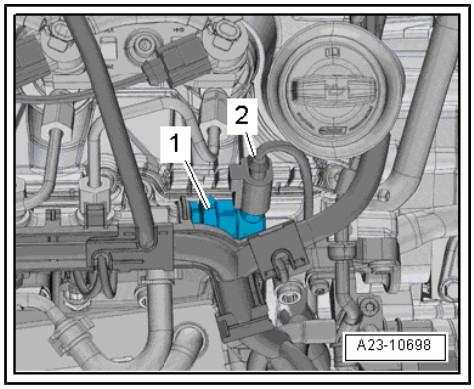
- Engine oil temperature around 80 °C.
- Battery voltage: at least 12.5 V.

– Remove engine cover panel ⇒ page 56 .

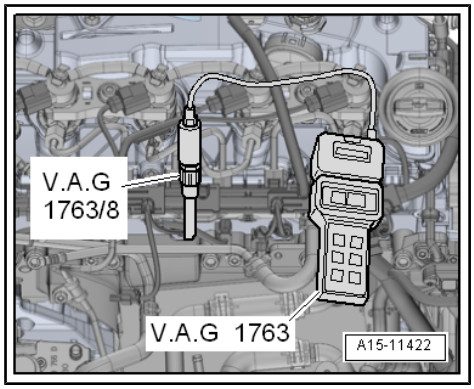
– Unplug electrical connector on fuel pressure regulating valve - N276- -item 2-.

– Briefly start engine to relieve fuel pressure in high-pressure reservoir.

– Remove all glow plugs ⇒ page 582 .



– Screw in adapter - V.A.G 1763/8- in place of corresponding glow plug and connect compression tester - V.A.G 1763-.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Note

How to use the test unit is described in the respective ⇒ operating instructions .

– Have a second mechanic operate starter until tester shows no further pressure increase.

– Repeat procedure on each cylinder.

Compression pressure	bar
New	25.0 - 31.0
Wear limit	19.0
Maximum difference between cylinders	5.0

Assembling

Installation is carried out in reverse order; noting the following:

– Entries will have been made in the event memory of the engine control unit because connectors were separated and the engine was started ⇒ Vehicle diagnostic tester.

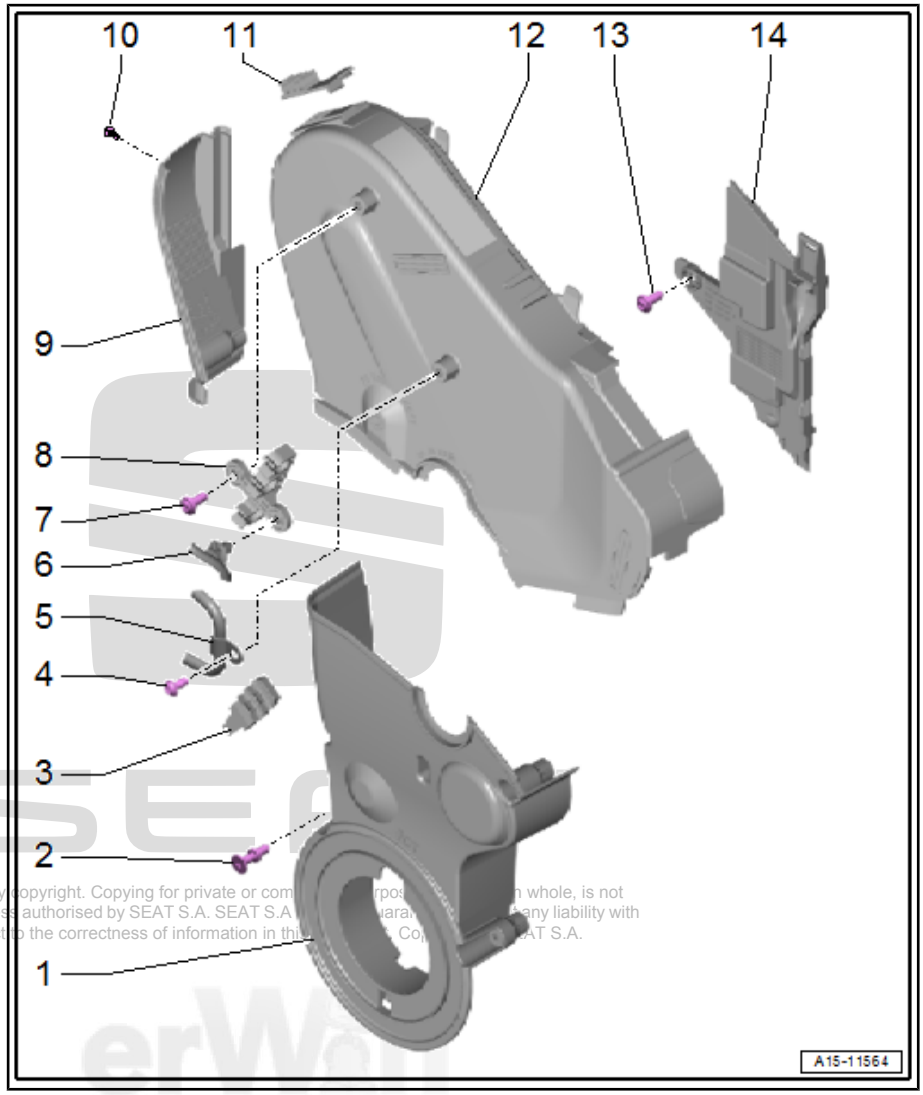
Specified torques

♦ ⇒ “1.1 Assembly overview - glow plug system”, page 581

2 Toothed belt drive

⇒ “2.1 Assembly overview - toothed belt cover”, page 123
⇒ “2.2 Assembly overview - toothed belt”, page 124
⇒ “2.3 Removing and installing toothed belt cover”, page 125
⇒ “2.4 Removing and installing toothed belt”, page 130
⇒ “2.5 Removing toothed belt from camshaft”, page 141

2.1 Assembly overview - toothed belt cover



1 - Lower toothed belt guard
- ❑ Removing and installing ⇒ page 129

2 - Bolt
- ❑ With collar
- ❑ Captive in toothed belt cover (bottom)
- ❑ 12 Nm

3 - Support bracket
- ❑ for coolant lines

4 - Bolt
- ❑ 5 Nm

5 - Pipe line
- ❑ To pressure differential sender - G505-

6 - Clip

7 - Bolt
- ❑ 5 Nm

8 - Bracket/bearing/support
- ❑ For coolant lines and reducing agent supply line

9 - Heat shield

10 - Bolt
- ❑ 5 Nm

11 - Support bracket
- ❑ For measuring tube

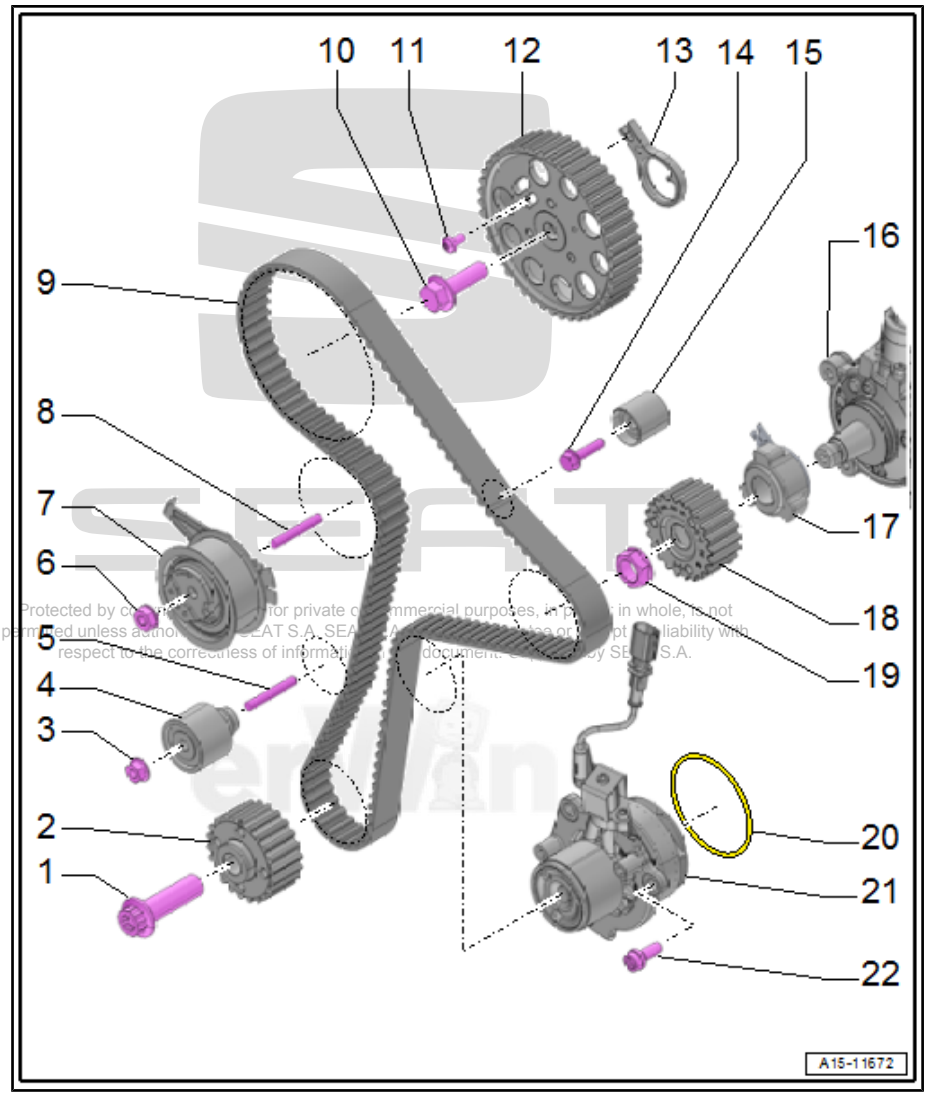
12 - Toothed belt guard upper part
- ❑ Removing and installing ⇒ page 125

13 - Bolt
- ❑ Apply locking fluid when installing; refer to ⇒ Electronic parts catalogue
- ❑ 12 Nm

14 - Rear toothed belt guard
- ❑ To remove, take out coolant pump ⇒ page 272

Protected by copyright. Copying for private or commercial purposes, in whole or in part, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this Repair Manual. Copyright by SEAT S.A.

2.2 Assembly overview - toothed belt



1 - Bolt

- ❑ Renew after removal
- ❑ Loosen and tighten with retention tool - 3415-
- ❑ Do not additionally oil or grease thread and shoulder
- ❑ Tighten in three stages as follows:

- ♦ 1st stage: 180 Nm
- ♦ 2nd stage: use rigid wrench to turn 90° further
- ♦ 3rd stage: use rigid wrench to turn 45° further

2 - Crankshaft pulley

- ❑ Contact surface between sprocket and crankshaft must be free of oil
- ❑ Fitting possible in one position only.

3 - Nut

- ❑ 20 Nm

4 - Stabiliser roller

5 - Stud

- ❑ 15 Nm
- ❑ Replace only if damaged

6 - Nut

- ❑ Renew after removal
- ❑ 20 Nm +45°

7 - Tensioning roller

8 - Stud

- ❑ 15 Nm
- ❑ Replace only if damaged

9 - Toothed belt

- ❑ Before removing, mark direction of rotation with chalk or felt-tip pen
- ❑ Check for wear
- ❑ Removing ⇒ page 130
- ❑ Installing (adjusting valve timing) ⇒ page 135

10 - Bolt

- ❑ Use counterhold tool - T10172- with adapters -T10172/11- to loosen and tighten
- ❑ Do not additionally oil or grease thread and shoulder
- ❑ 100 Nm

11 - Fixing screw

- ❑ 9 Nm

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. accepts no liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

12 - Camshaft sprocket

- ❑ Contact surface between sprocket and camshaft must be free of oil

13 - Locating arm for camshaft

- ❑ Removing and installing ⇒ “1.6 Removing and installing camshaft housing”, page 116

14 - Bolt

- ❑ 20 Nm

15 - Stabiliser roller

16 - High-pressure pump

- ❑ Assembly overview ⇒ page 461

17 - Hub for the high pressure pump

- ❑ Assembly overview ⇒ page 461
- ❑ Contact surface between hub and toothed belt sprocket must be free of oil

18 - High-pressure pump sprocket

- ❑ Assembly overview ⇒ page 461
- ❑ Contact surface between hub and toothed belt sprocket must be free of oil

19 - Nut

- ❑ Do not additionally oil or grease thread and shoulder
- ❑ Use counterholder - T10051- to loosen and tighten.
- ❑ Specified torque ⇒ page 461

20 - O-ring

- ❑ Renew after removal
- ❑ Moisten with coolant

21 - Coolant pump

- ❑ Removing and installing ⇒ page 272

22 - Bolt

- ❑ Renew after removal
- ❑ 20 Nm +45°

2.3 Removing and installing toothed belt cover

⇒ “2.3.1 Removing and installing upper toothed belt cover, models without selective catalytic reduction”, page 125

⇒ “2.3.2 Removing and installing upper toothed belt cover, models with selective catalytic reduction”, page 127

⇒ “2.3.3 Removing and installing lower toothed belt guard (fully enclosed)”, page 129

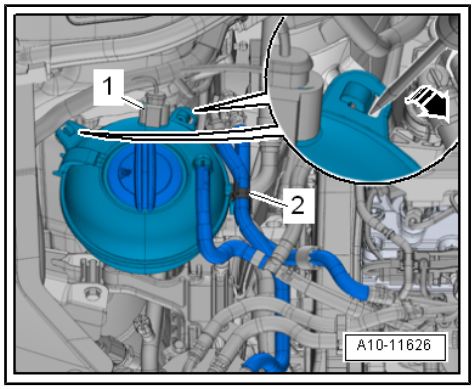
2.3.1 Removing and installing upper toothed belt cover, models without selective catalytic reduction

Removing

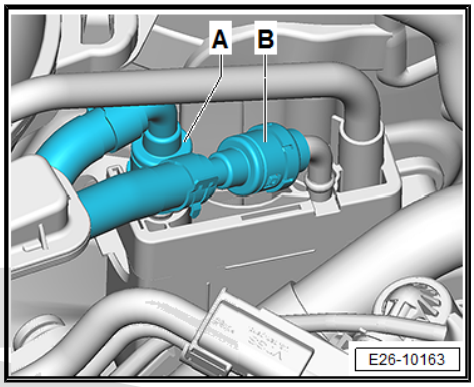
– Remove engine cover panel ⇒ page 56 .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

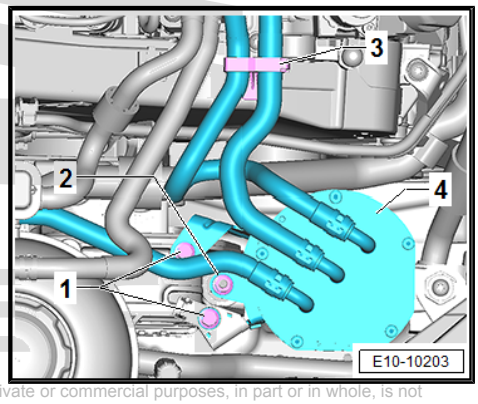
– Unplug the electrical connector -1-.
– Remove the bracket -2- with fuel hoses.
– Remove coolant hoses from engine. To do this, open retainers.
– Using a screwdriver, release fasteners -arrow- and move coolant expansion tank to one side.



– Open push-fit couplings -A- and -B- of fuel lines and pull fuel lines off. Separate connector couplings ⇒ Rep. gr. 20 ; Connector couplings; Separating connector couplings .



– Move clear bracket -3- with fuel hoses.
– Unscrew nut -2- and bolts -1-.
– Remove the fuel filter -4- and lay it with the fuel lines connected on the engine.
– Unscrew exhaust gas temperature sender 3 - G495- ⇒ page 557 .

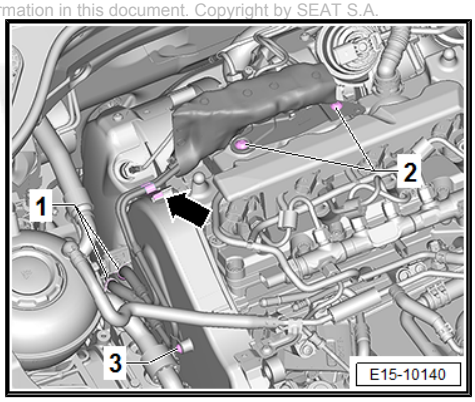


NOTICE

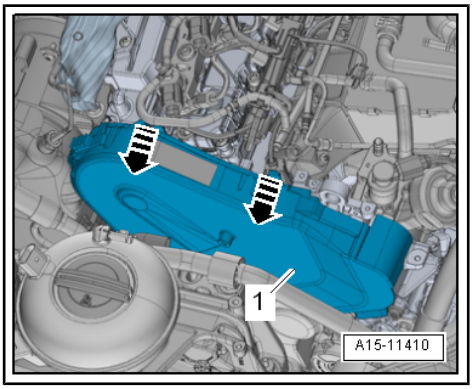
To avoid damage to the vacuum connection on the pressure differential sender or the pressure sensor, removal is necessary.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Unscrew bolts -2-.
– Unscrew bolt -3-.
– Release hose clips -1- and detach hoses.
– Free the pipes -arrow- and unclip them from the toothed belt cover.
– Remove the differential pressure sensor - G505- and lay it on the engine.



– Release catches -arrows-, disengage toothed belt cover (top) -1- and detach.



Installing

Install in reverse order of removal, observing the following.

– Install engine cover panel ⇒ page 56 .

Specified torques

- ⇒ “4.1 Assembly overview - exhaust gas temperature regulation”, page 548
- ⇒ Rep. gr. 20 ; Fuel filter; Assembly overview - fuel filter
- ⇒ “2.1 Assembly overview - toothed belt cover”, page 123

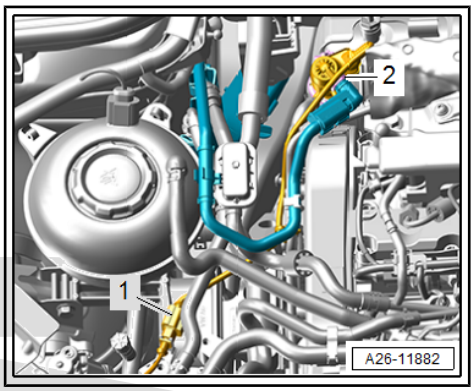
2.3.2 Removing and installing upper toothed belt cover, models with selective catalytic reduction

Removing

– Remove engine cover panel ⇒ page 56 .

– Remove the electrical connector -1- for the injector for reducing agent - N474- from the bracket and disconnect it.

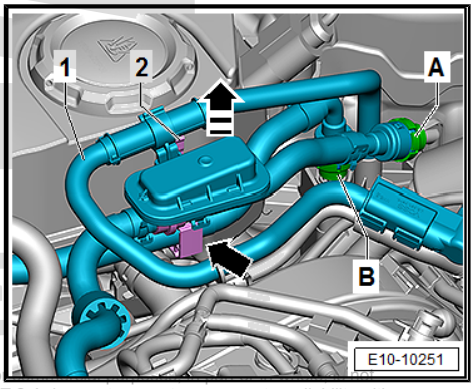
– Separate reducing agent supply line -2- ⇒ page 545 .



– Open push-fit couplings -A- and -B- of fuel lines and pull fuel lines off. Separate connector couplings ⇒ Rep. gr. 20 ; Connector couplings; Separating connector couplings .

– Push in the fastening -2- and pull out the fuel line/reducing agent line unit -1- in -the direction of the arrow-.

– Place the reducing agent line -1- to one side.

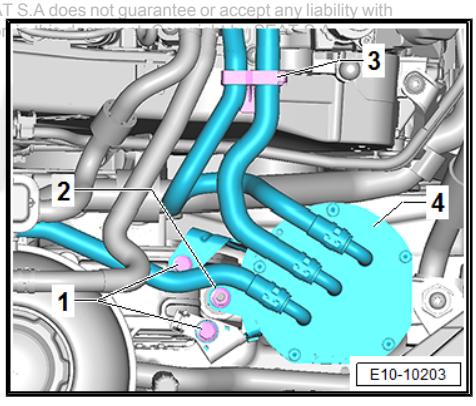


Protected by copyright. Copying for private o
permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with
respect to the correctness of information

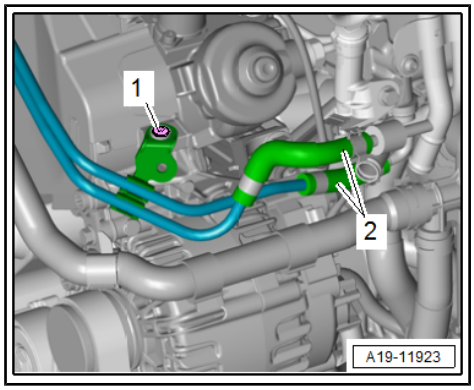
– Move clear bracket -3- with fuel hoses.

– Unscrew nut -2- and bolts -1-.

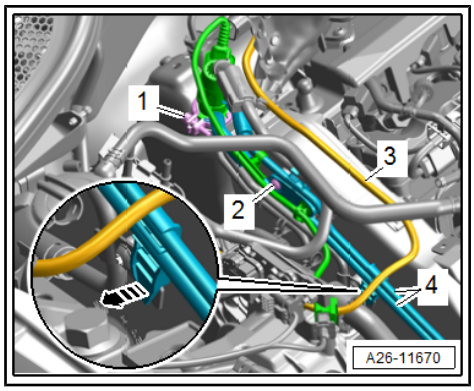
– Remove the fuel filter -4- and lay it with the fuel lines connected on the engine.



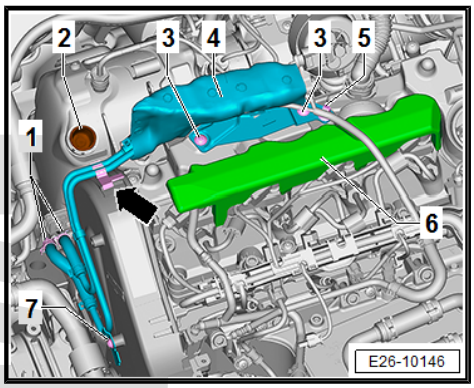
– Unscrew bolt -1- on bracket for coolant lines.



– Unscrew bolt -2-.
– Detach the coolant lines -4-; to do this, release the catch -arrow-.
– Release the retaining clip -1-, remove the injector for reducing agent - N474- and place it on the right hand side.



– Close off all open lines and connections with clean stoppers from the -2- stopper set for engine - VAS 6122- .
– Loosen and remove the wiring harness from the clip -5-.
– Remove bolts -3- and -7-.
– Free the pipes -arrow- and unclip them from the toothed belt cover.
– Move pipes with pressure differential senders towards rear right.

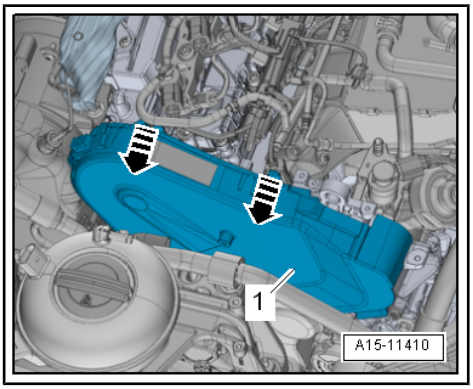


Note

Disregard -items 1, 4 and 6-.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Release catches -arrows-, disengage toothed belt cover (top) -1- and detach.



Installing

Install in reverse order of removal, observing the following.

– Install the injector for reducing agent - N474- with a new seal ⇒ page 537 .

– Install engine cover panel ⇒ page 56 .

– Bleeding fuel system ⇒ page 388 .

Specified torques

- ⇒ “4.1 Assembly overview - exhaust gas temperature regulation”, page 548
- ⇒ Rep. gr. 20 ; Fuel filter; Assembly overview - fuel filter
- ⇒ “2.1 Assembly overview - toothed belt cover”, page 123
- ⇒ “3.9 Assembly overview - injector for reducing agent N474”, page 540

2.3.3 Removing and installing lower toothed belt guard (fully enclosed)

Removing

Note

- *To simplify the production process during manufacturing, the toothed belt cover (bottom) has a guide lug which engages in the sealing flange. This guide lug must be irreparably damaged in order to remove the toothed belt cover (bottom), even with the engine support installed.*
- *Note different versions.*

– Remove vibration damper ⇒ page 61 .

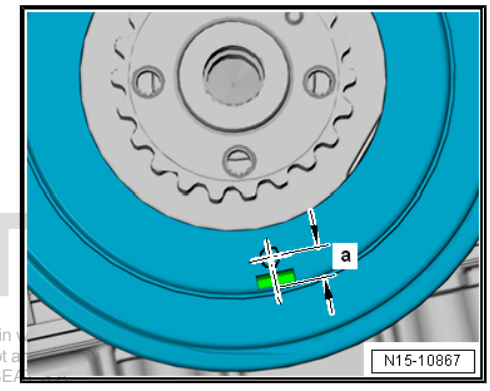
NOTICE

Take great care when performing the following step. If the toothed belt is damaged, damage to the engine may result.

– For old version of toothed belt cover, drill a hole according to following dimensions:

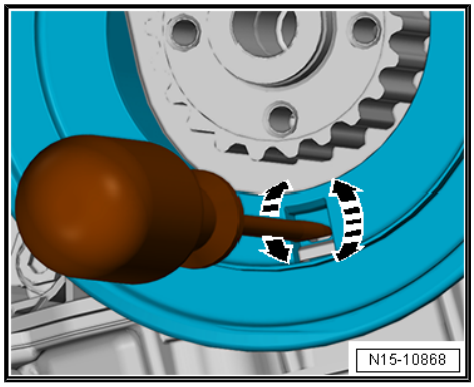
- Dimension -a- = 10 mm
- Diameter: 8 mm

– Insert screwdriver though hole and press back guide lug of toothed belt cover to break it off.

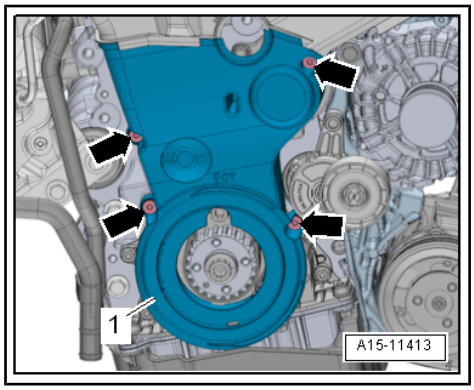


Protected by copyright. Copying for private or commercial purposes, in part or in
permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept a
respect to the correctness of information in this document. Copyright by SE

– For new version of toothed belt cover, insert screwdriver into slot in guide lug.
– Break off guide lug by turning screwdriver in direction of -arrow-.



– Remove bolts -arrows-.
– Remove lower toothed belt guard -1-.



Installing

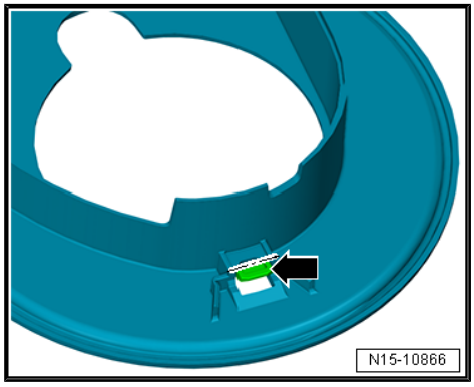
Install in reverse order of removal, observing the following.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Note

If a new toothed belt guard is installed, the guide lug -arrow- must be cut off prior to installing.

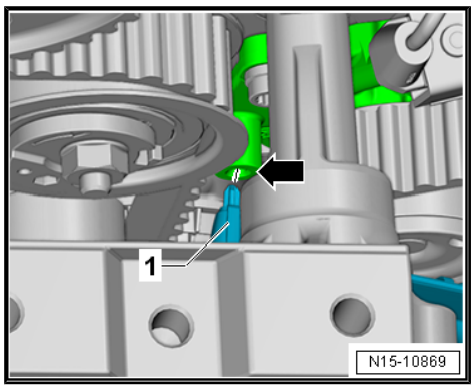
Guide lug on toothed belt guard



– Fit toothed belt cover (note position of dowel pin -arrow-).
– Tighten the bolts for the toothed belt cover.
– Install vibration damper ⇒ page 61 .

Specified torques

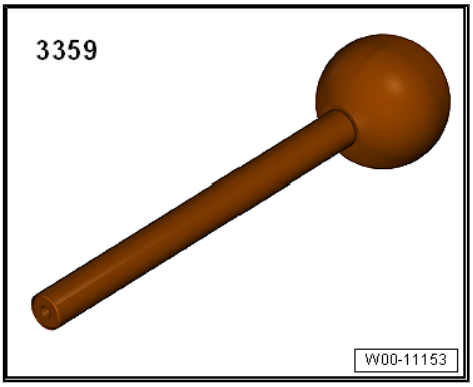
◆ ⇒ “2.1 Assembly overview - toothed belt cover”, page 123



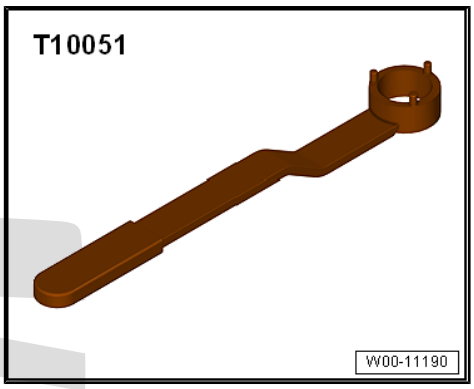
2.4 Removing and installing toothed belt

Special tools and workshop equipment required

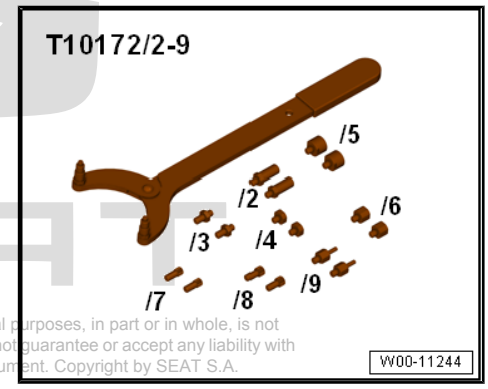
- Diesel injection pump locking pin - 3359-



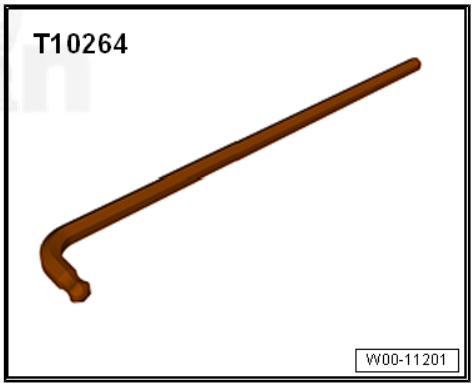
- Counterhold - T10051-



- Counterhold tool - T10172- with adapters -T10172/11-

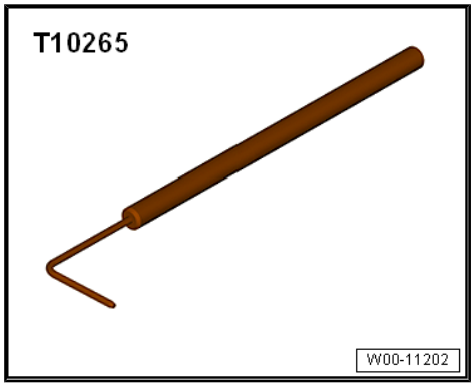


- Special wrench, long reach - T10264-

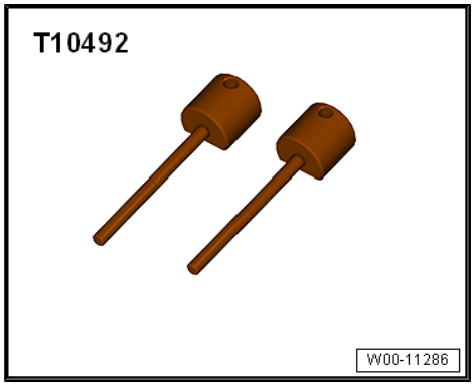


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

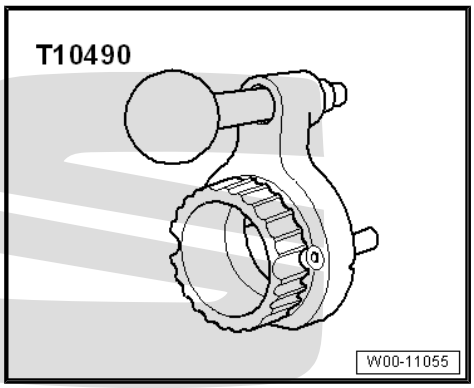
- Locking tool - T10265-



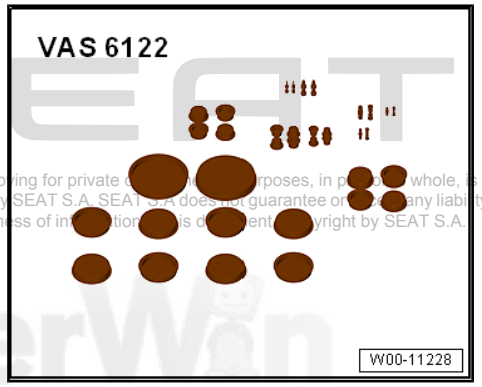
- Dowel pin -T10492-



- Crankshaft stop -T10490-



- Engine plug set - VAS 6122-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Removing

– Remove engine cover panel ⇒ page 56 .
– Remove engine support ⇒ page 63 .
– Remove toothed belt cover (bottom section) ⇒ page 129 .

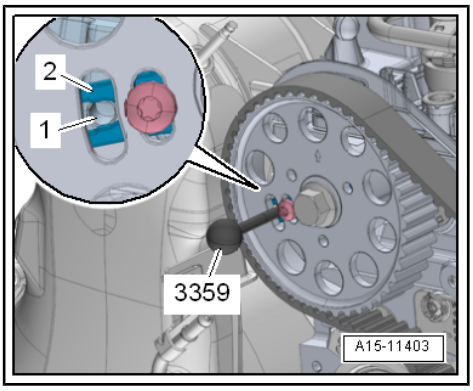
NOTICE

Avoid irreparable engine damage caused by the toothed belt's jumping.

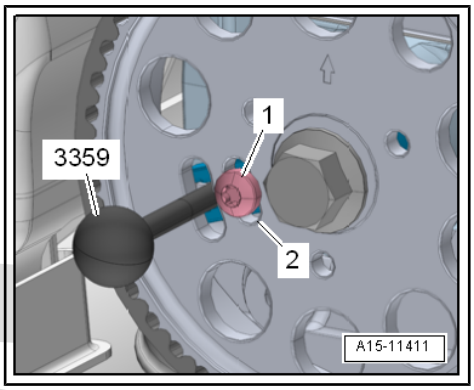
- **Turn crankshaft only in direction of engine rotation.**

– Turn crankshaft by bolt for crankshaft pulley until camshaft pulley is at "TDC".

– Lock camshaft hub with diesel injection pump locking pin -3359- ; to do so, insert locking pin into fork on locating arm -2- and into hole -1- behind it in cylinder head.

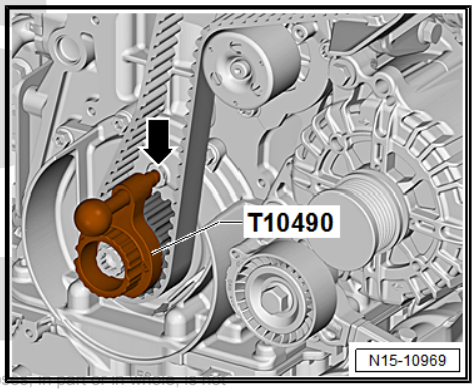


– Loosen locking bolt -1- in camshaft sprocket one half turn, but do not remove.



– Lock crankshaft pulley in position with crankshaft stop -T10490- .

- The lugs of the crankshaft stop - T10490- must engage in the threaded holes of the crankshaft sprocket.
- The locking pin of the crankshaft stop - T10490- must engage in the hole -arrow- in the sealing flange.

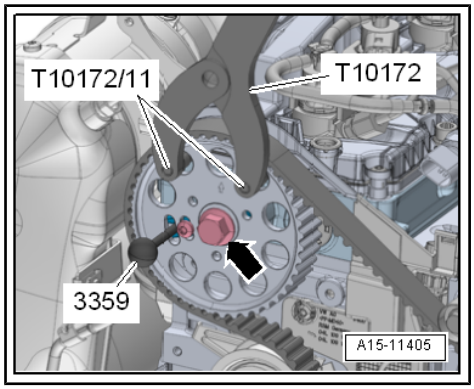


NOTICE

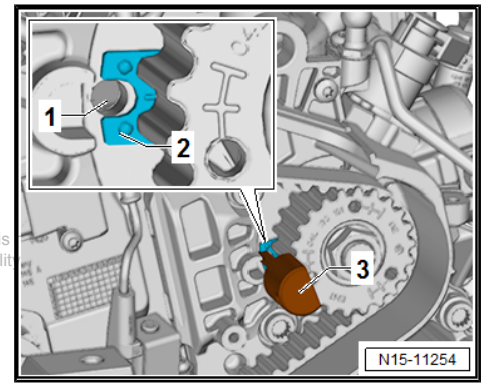
The torque for loosening and tightening the centre bolts on camshaft and high-pressure pump must not be transferred to the locking pin. Otherwise the »follower« may be damaged even if a counterhold is used. This can result in damage to the engine. Therefore, pull out locking pin for loosening and tightening the central bolt, and reinsert the locking pin afterwards if necessary.

ial purpos
s not guarantee or accept any liability with
ocument. Copyright by SEAT S.A.

– Pull out locking pin, and slightly loosen bolt -arrow- for camshaft pulley.
– To do this, use counterhold - T10172- with adapters - T10172/11- .
– To release fully, insert the dowel pin again.

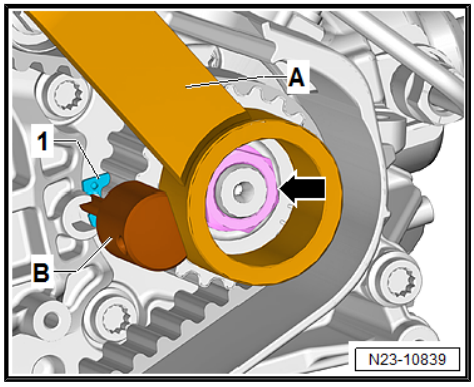


– Lock high-pressure pump hub in position using locking pin - T10492- -3-.
– To do this, insert locking pin into fork -2- on hub and into hole -1- behind it in bracket for ancillaries.
– Pull out locking pin - T10492- , and slightly loosen nut -arrow- for high-pressure pump pulley by approx. 90°.

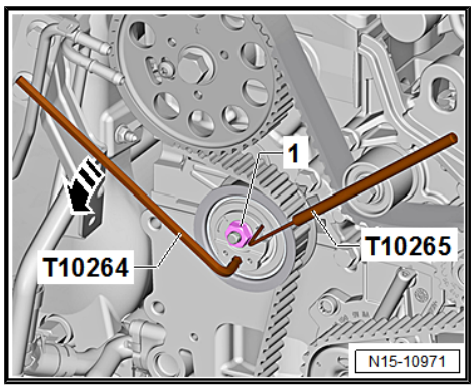


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability respect to the correctness of information in this document. Copyright by SEAT S.A.

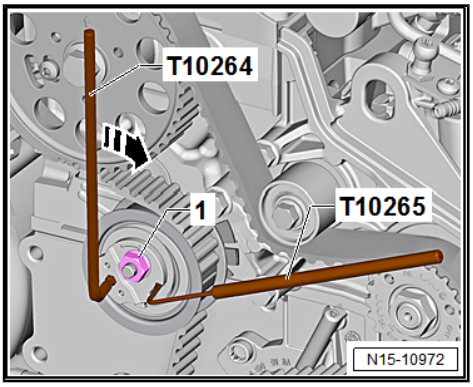
– Turn locking pin - T10492- -B- until straight edge points to right as shown.
– Bring counterhold - T10051- -A- into position.
– Pull out locking pin, and slightly loosen nut for high-pressure pulley. To release fully, insert the dowel pin again.
– Loosen nut -arrow- for high-pressure pump pulley by approx. 90°.
– Before loosening completely, reinsert locking pin - T10492- -B-.



– Loosen nut -1- for tensioning roller.
– Turn eccentric of tensioning roller in -direction of arrow- using angle driver - T10264- until tensioning roller can be locked with locking tool - T10265- .



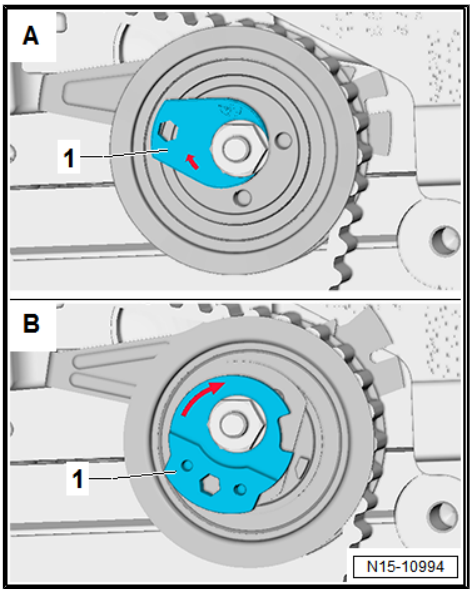
– Turn belt tensioner eccentric clockwise -arrow- to stop using special wrench, long reach - T10264- .
– Hand-tighten nut -1-.
– Before removing, mark direction of rotation of toothed belt with chalk or felt-tip pen for re-installation.
– Remove toothed belt first from coolant pump and then from remaining toothed pulleys.



Installing (adjusting valve timing)

Note

The installed tensioning rollers -A and B- differ from each other. The adjustment jig -1- is the distinguishing feature. The tensioning roller -A- is not locked in position using locking tool - T10265- . Instead, the angle driver 8mm - T10409- must be used for tensioning. Apart from that the procedure is identical.



Note

Perform adjustments on toothed belt only when engine is cold.

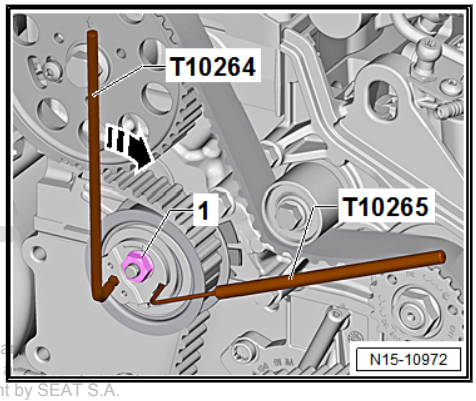
NOTICE

Avoid damage to valves and piston crowns.

♦ **The crankshaft must not be at "TDC" at any cylinder when the camshaft is turned.**

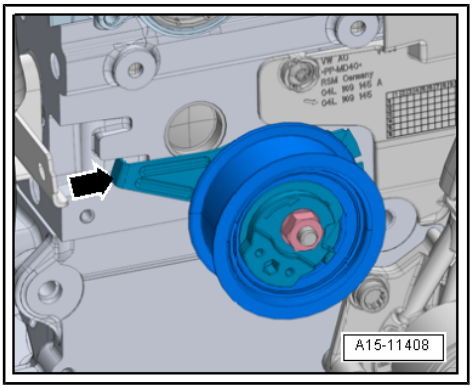
Preconditions:

- Tensioning roller -B- locked with locking tool - T10265- and secured to right stop with nut -1-.

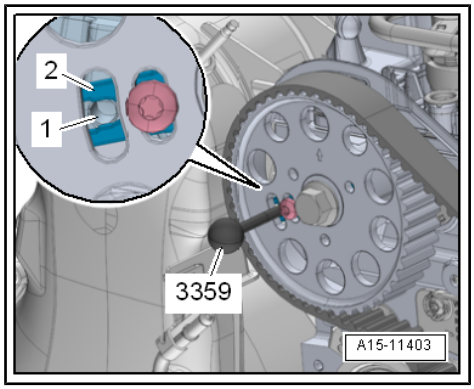


Protected by copyright. Copying for private or commercial purposes, in pa
permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or
respect to the correctness of information in this document. Copyright by SEAT S.A.

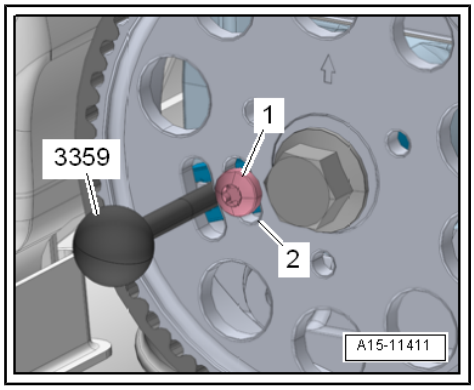
- The sheet-metal tab -arrow- of the tensioning roller must engage in the cast notch in the cylinder head.



- Camshaft hub locked with diesel injection pump locking pin -3359- .
- Bolt fitted but not tightened.
- It should just be possible to turn camshaft pulley easily without axial movement.

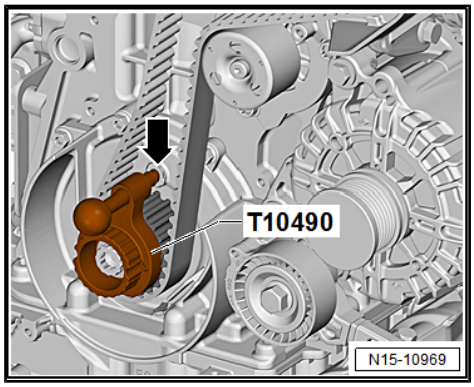


Locking bolt -1- in locating arm loosened one half turn, positioned in centre of elongated hole -2-.

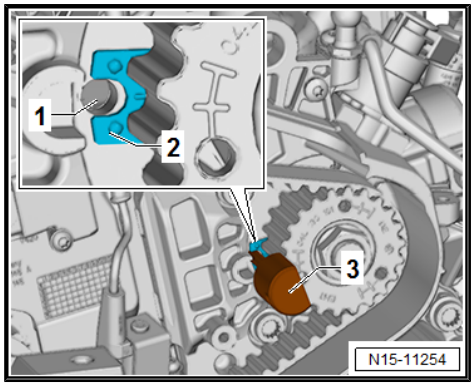


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- The crankshaft is locked with the crankshaft stop - T10490- -arrow-.



- High-pressure pump locked with the dowel pin -T10492- .
- Nut fitted but not tightened.
- It should just be possible to turn high-pressure pump pulley easily without axial movement.



– Turn camshaft pulley and high-pressure pump pulley within their range of rotation clockwise to stop.

– Install toothed belt in the specified sequence:

1 - Crankshaft pulley

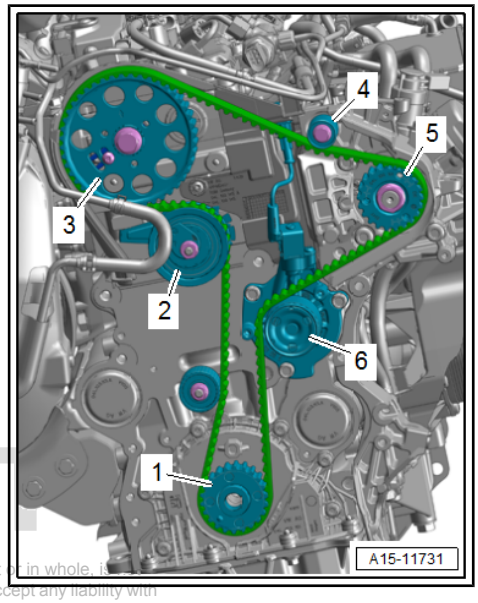
2 - Tensioning roller

3 - Camshaft sprocket

4 - Damper wheel

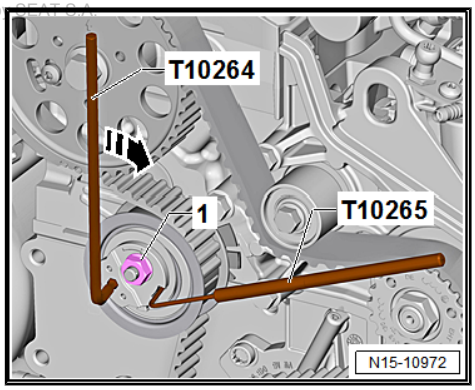
5 - High-pressure pump sprocket

6 - Coolant pump toothed belt pulley



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Loosen nut -1- for tensioning roller -B-, and remove locking tool - T10265- .



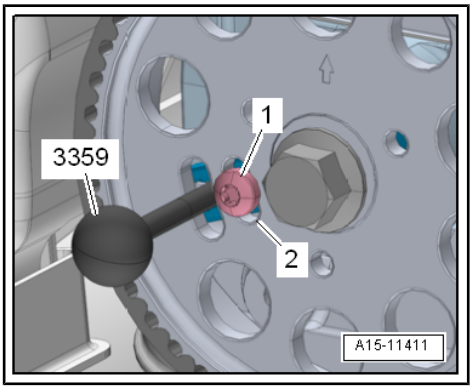
Note

- *Metal lug of tensioning roller must remain engaged in cast recess on cylinder head.*
- *Ignore -arrow-.*

NOTICE

The locking bolt must not lie against upper stop of elongated hole after toothed belt has been tensioned.

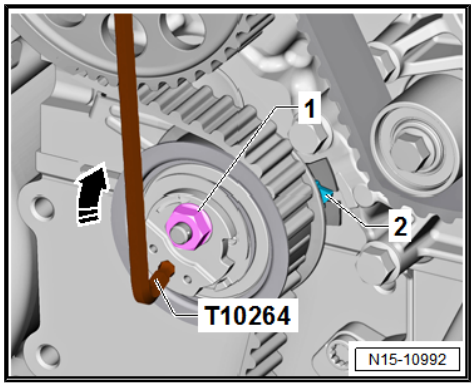
– Check whether the securing bolt -1- is still between the centre of the elongated bore and the lower stop -2-. If necessary correct the position of the toothed belt pulley by turning it clockwise by one tooth and then fitting the toothed belt again.



– Using angle drover - T10264- or angle driver 8mm - T10409- , carefully turn tensioning roller eccentric clockwise -arrow- until indicator -2- is in the middle of gap in base plate.

• Nut -1- must not turn.

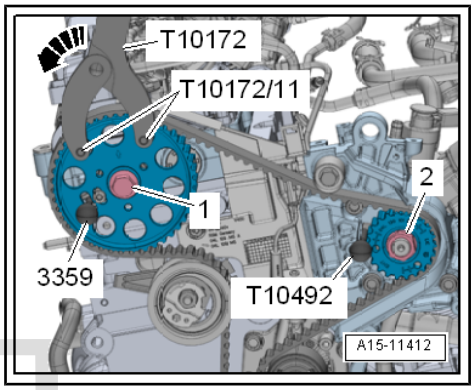
– Hold tensioning roller in this position and tighten nut.



– Position counterhold tool - T10172- with adapters -T10172/11- on camshaft sprocket as shown in illustration.

– Push counterhold tool in -direction of arrow-, and keep it in this position.

– In this position, tighten bolt -1- for camshaft pulley and nut -2- for high-pressure pump pulley to 10 Nm.



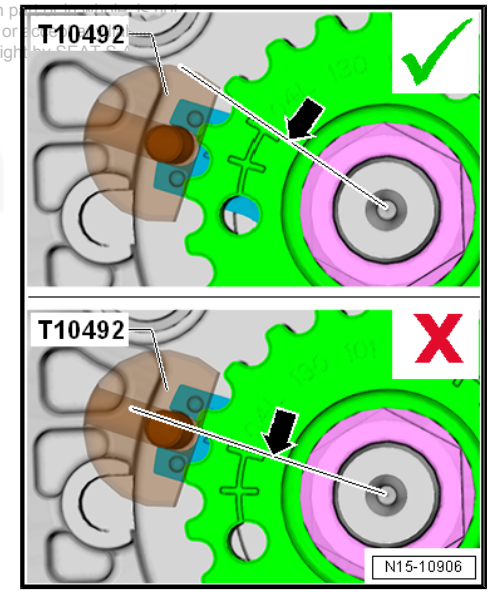
Note

The high-pressure pump pulley can only be turned to a limited extent. It is therefore essential to ensure that the toothed belt pulley has not been turned to the »limit« after tensioning.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Ensure that marking on high-pressure pump toothed belt pulley is not in alignment with locking pin. If necessary, move position of toothed belt pulley one tooth in clockwise direction and fit toothed belt again.

– Remove locking pins -3359- , -T10492- and crankshaft stop -T10490- and check valve timing ⇒ page 138 .



Check valve timing:

NOTICE

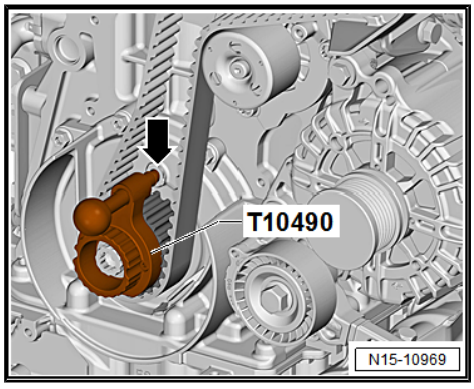
Avoid irreparable engine damage caused by the toothed belt's jumping.

♦ **Turn crankshaft only in direction of engine rotation.**

– Turn crankshaft two rotations in direction of engine rotation by turning bolt for crankshaft sprocket until crankshaft is just before "TDC".

– Fit crankshaft stop -T10490- on crankshaft sprocket again.

– Turn crankshaft in engine direction of rotation until crankshaft stop pin -arrow- engages in sealing flange whilst turning.

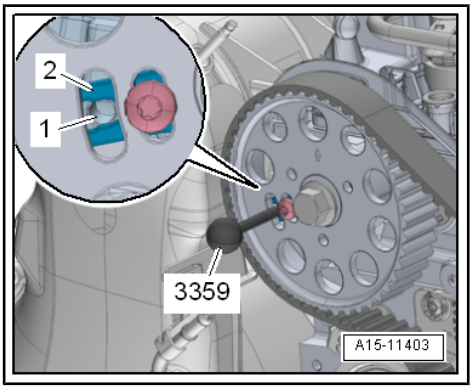


NOTICE

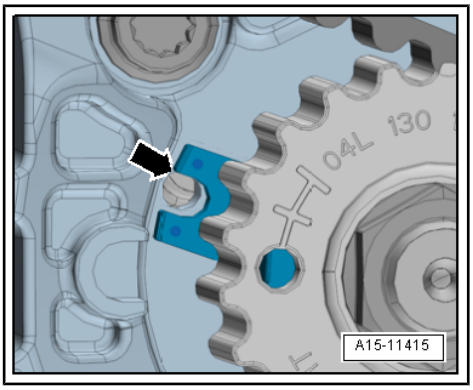
Avoid incorrect adjustment due to inexact "TDC" position.

♦ **If camshaft has been turned beyond "TDC", turn camshaft twice again, stopping it is just before "TDC". Then turn further in the same direction and lock crankshaft with crankshaft stop -T10490- .**

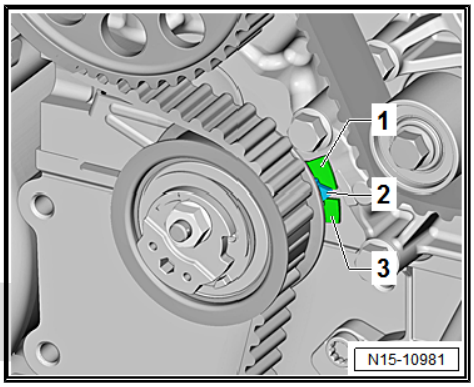
- It should now be possible to lock camshaft hub with diesel injection pump locking pin - 3359- .



- It is very difficult to find the securing position of the high-pressure pump hub again. However, a slight deviation -arrow- does not influence engine operation.



- The belt tensioner indicator -2- must be in the middle between lugs -1- and -3- of the base plate.



Note

The maximum permissible sideways deviation from the specified position is 5 mm.

If requirements are met, continue with procedure after adjusting valve timing correctly as described below ⇒ page 140 .

Re-adjust valve timing if requirements are not met ⇒ page 139 .

Re-adjusting the valve timing:

– If camshaft hub cannot be locked, withdraw crankshaft stop - T10490- until pin is clear of bore.

– Turn crankshaft in opposite direction of engine rotation slightly past “TDC”.

– Now slowly the crankshaft in the direction of the engine rotation till the hub of the camshaft can be locked.

– Loosen bolts for camshaft sprocket after locking hub.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

A - If pin of crankshaft stop -T10490- is on left side of bore:

– Turn crankshaft in engine direction of rotation until crankshaft stop pin -arrow- engages in sealing flange whilst turning.

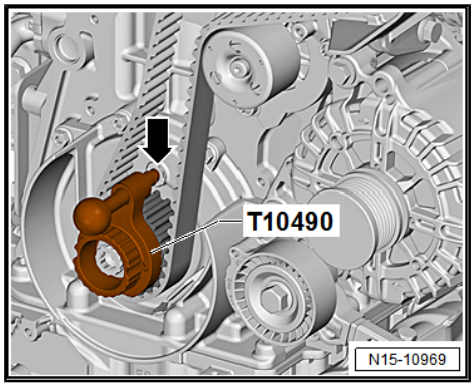
– Tighten camshaft sprocket bolts to 20 Nm.

B - If pin of crankshaft stop -T10490- is on right side of bore:

– Turn crankshaft slightly in opposite direction to engine rotation.

– Turn crankshaft in direction of engine rotation again until pin of crankshaft stop engages in sealing flange as crankshaft rotates.

– Tighten camshaft sprocket bolts to 20 Nm.



Procedure after adjusting valve timing correctly:

– Remove diesel injection pump locking pin - 3359- and crankshaft stop -T10490- .

– Turn crankshaft two rotations in direction of engine rotation by turning bolt for crankshaft sprocket until crankshaft is just before “TDC”.

– Check valve timing again ⇒ page 138 .

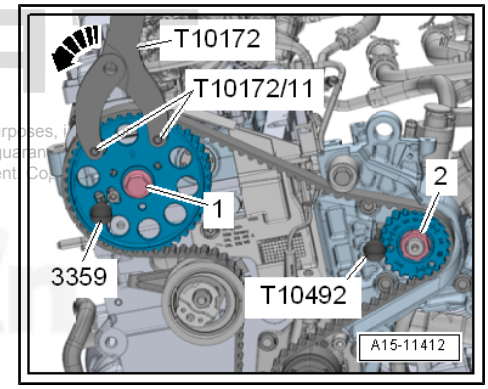
NOTICE

The torque for loosening and tightening the centre bolts on camshaft and high-pressure pump must not be transferred to the respective locking pin. Otherwise the »follower« may be damaged even if a counterhold is used. This can result in damage to the engine. Therefore, pull out locking pin for loosening and tightening the central bolt, and reinsert the locking pin afterwards if necessary.

– If camshaft hub can now be locked, tighten bolt -1- for camshaft pulley to final torque using counter-hold tool - T10172- with adapters -T10172/11- ⇒ Item 10 (page 124) (8).

– Full tighten the nut -2- for the toothed belt sprocket of the high pressure pump ⇒ Item 3 (page 461) ; for this, use the counterhold tool - T10051- .

– Check valve timing again ⇒ page 138 .



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT. SEAT does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT.

Assembling

Further installation is carried out in the reverse order; note the following:

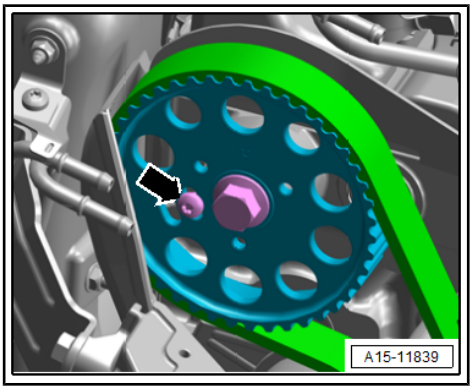
Note

- *Renew seals after removal.*
- *Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .*

– Install bolt -arrow-.

Specified torques

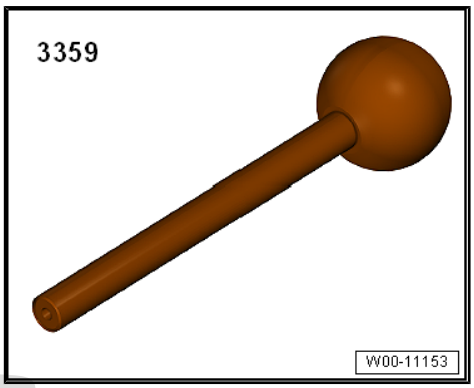
- ⇒ “2.2 Assembly overview - toothed belt”, page 124
- ⇒ “2.1 Assembly overview - toothed belt cover”, page 123



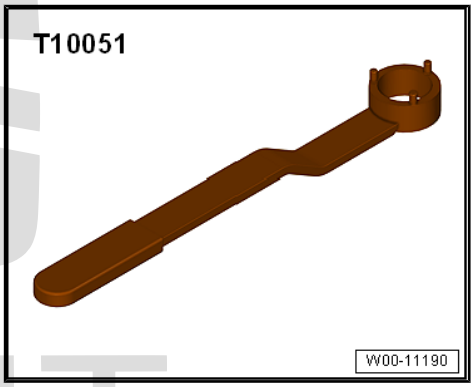
2.5 Removing toothed belt from camshaft

Special tools and workshop equipment required

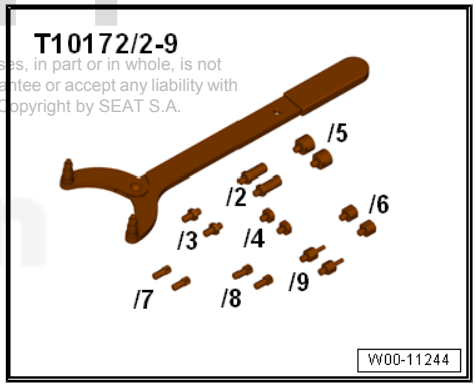
- Diesel injection pump locking pin - 3359-



- Counterhold - T10051-

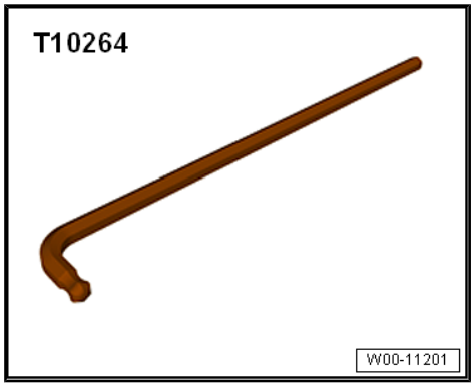


- Counterhold tool - T10172- with adapters -T10172/11-

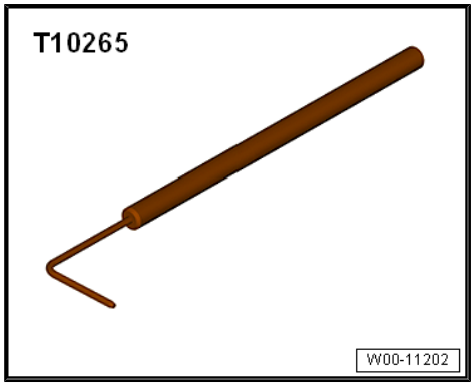


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

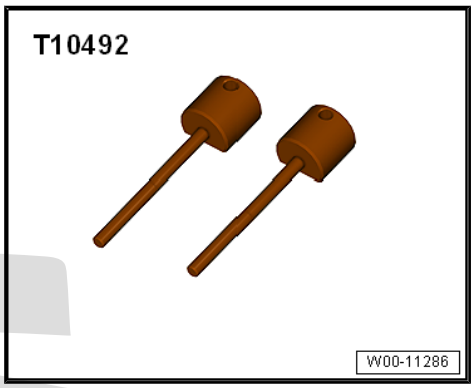
- Special wrench, long reach - T10264-



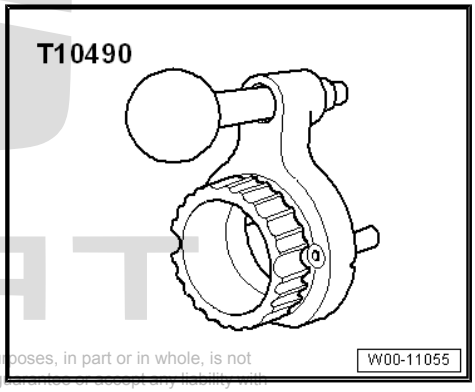
- Locking tool - T10265-



- Dowel pin -T10492-



- Crankshaft stop -T10490-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Removing

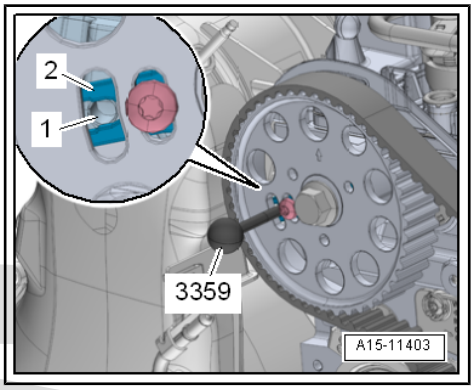
– Remove toothed belt cover (top) ⇒ page 125 .

– Remove vibration damper ⇒ page 61 .

NOTICE

Irreparable damage can be caused if the toothed belt slips.

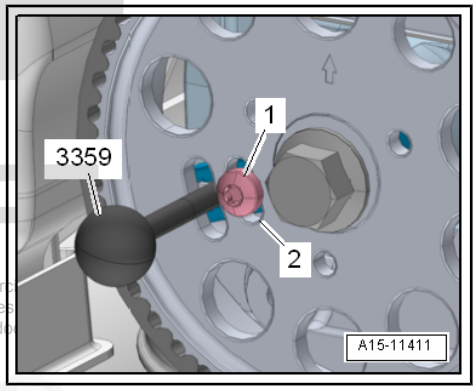
♦ **Turn crankshaft only in direction of engine rotation.**



– Rotate crankshaft by turning bolt on crankshaft sprocket until camshaft sprocket is positioned at “TDC”.

– Lock camshaft hub with diesel injection pump locking pin - 3359- ; to do so, insert locking pin into fork on locating arm -2- and into hole -1- behind it in cylinder head.

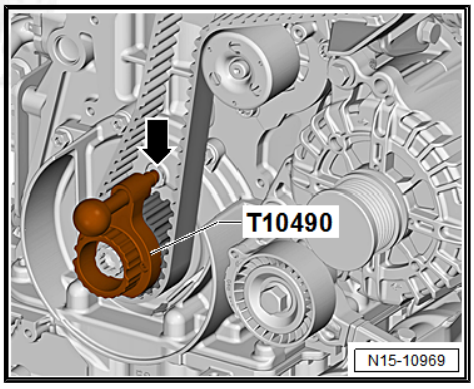
– Loosen locking bolt -1- in camshaft sprocket one half turn, but do not remove.



Protected by copyright. Copying for private or commerc
permitted unless authorised by SEAT S.A. SEAT S.A does
respect to the correctness of information in this d

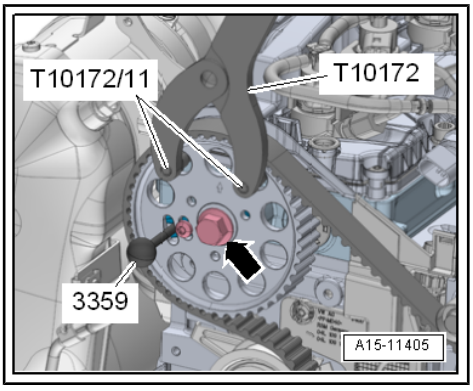
– Lock crankshaft pulley in position with crankshaft stop - T10490- .

- The lugs of the crankshaft stop - T10490- must engage in the threaded holes of the crankshaft sprocket.
- The locking pin of the crankshaft stop - T10490- must engage in the hole -arrow- in the sealing flange.

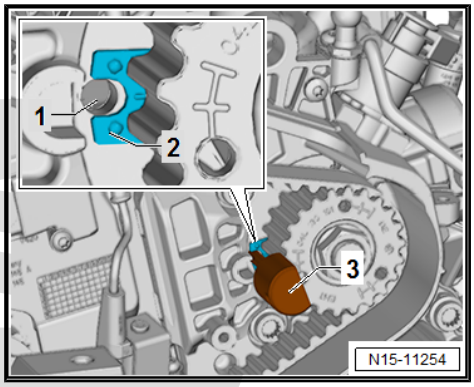


– Loosen bolt -arrow- for camshaft pulley.

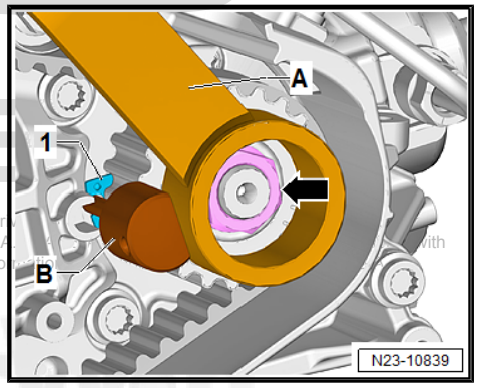
– To do this, use counterhold - T10172- with adapters - T10172/11- .



– Lock hub of high-pressure pump in place with locking pin - T10492- -3-.
– To do this, insert locking pin - T10492- into fork -2- of hub and into hole -1- behind it in ancillary bracket.

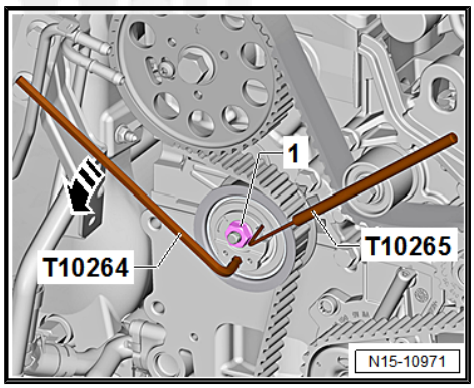


– Loosen nut -arrow- for high-pressure pump pulley by approx. 90°.
– Use counter-hold tool - T10051- -A- to do this.



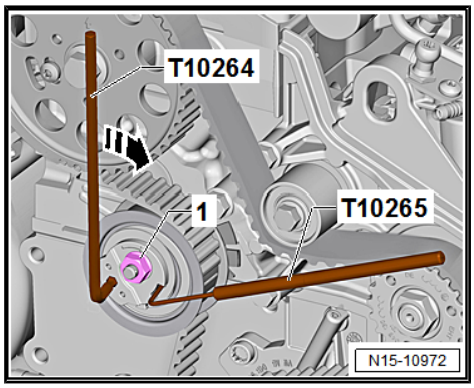
Protected by copyright. Copying for pr
permitted unless authorised by SEAT S.A
respect to the correctness of info

– Loosen nut -1- for tensioning roller.
– Turn eccentric of tensioning roller in -direction of arrow- using angle driver - T10264- until tensioning roller can be locked with locking tool - T10265- .



– Turn belt tensioner eccentric clockwise -arrow- to stop using special wrench, long reach - T10264- .
– Hand-tighten nut -1-.
– Take notched belt off camshaft sprocket.

Installing (adjusting valve timing) ⇒ page 135



3 Valve gear

⇒ “3.1 Assembly overview - valve gear”, page 145

⇒ “3.2 Measuring axial play of camshaft”, page 148

⇒ “3.3 Removing and installing camshaft oil seal”, page 149

⇒ “3.4 Removing and installing camshaft adjuster”, page 150

⇒ “3.5 Removing and installing camshaft control valve 1 N205 ”, page 153

⇒ “3.6 Checking hydraulic compensation elements”, page 153

⇒ “3.7 Removing and installing valve stem seals”, page 154

⇒ “3.8 Removing and installing control valve for the camshaft adjuster”, page 161

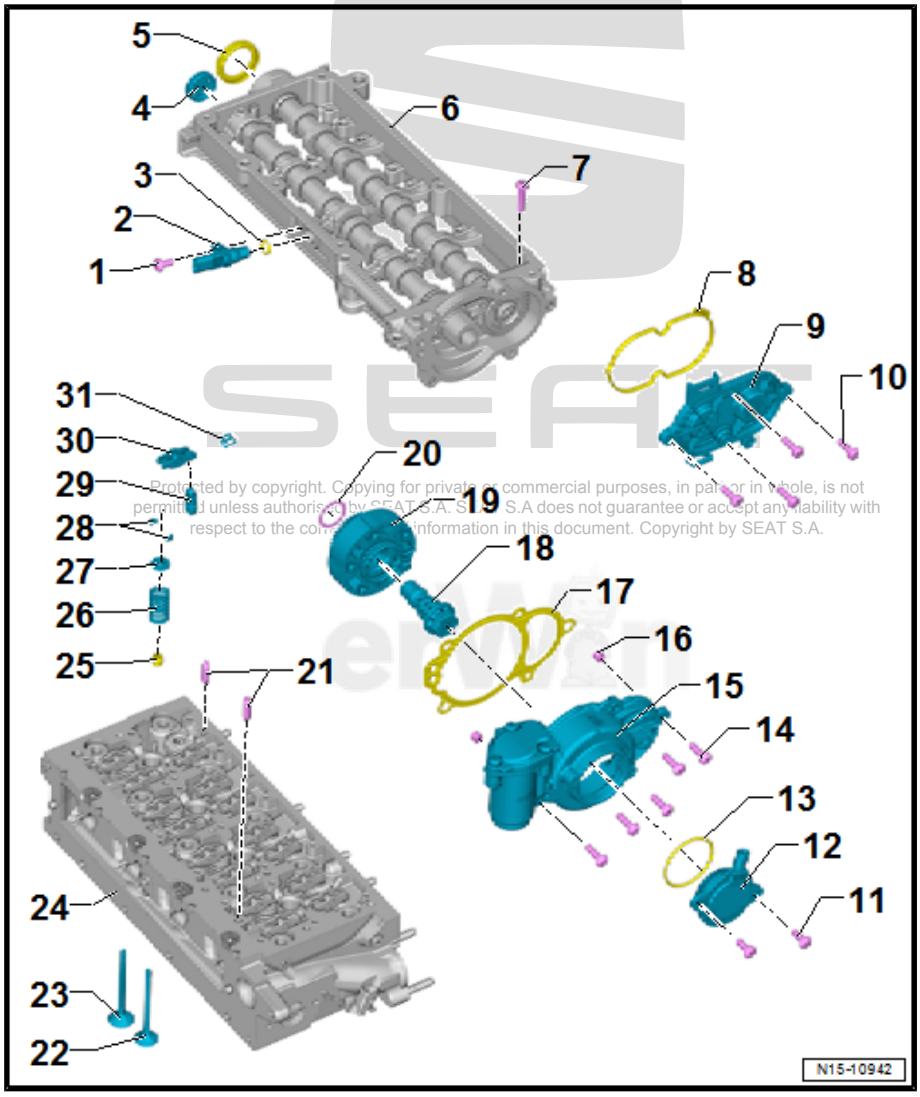
3.1 Assembly overview - valve gear

NOTICE

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Risk of damage to valves and piston crowns after working on valve gear.

- Because hydraulic compensation elements have to settle, engine must not be started for approx. 30 minutes after installing camshafts.
- Turn the crankshaft carefully at least 2 rotations to ensure that none of the valves make contact when the starter is operated.



1 - Bolt

- ❑ Specified torque ⇒ page 581

2 - Hall sender - G40-

- ❑ Assembly overview ⇒ page 581

3 - O-ring

- ❑ Renew after removal

4 - Sealing cap

- ❑ Renew after removal
- ❑ Removal: With the camshaft housing fitted, use an awl to prick one side of the cover and lift it off.
- ❑ Installing: Drive in without sealant until flush using suitable thrust piece, e.g. carrier - 3390-

5 - Camshaft oil seal

- ❑ Renew after removal ⇒ page 149

6 - Camshaft housing

- ❑ With integrated camshafts
- ❑ Removing and installing ⇒ “1.6 Removing and installing camshaft housing”, page 116

7 - Bolt

- ❑ Renew after removal
- ❑ Sequence when loosening ⇒ page 119 .
- ❑ Specified torque and sequence ⇒ page 148 .

8 - Radial oil seal

- ❑ Renew after removal

9 - Cover

10 - Bolt

- ❑ 8 Nm

11 - Bolt

- ❑ Depending on version, not installed in all vehicles
- ❑ 8 Nm

12 - Camshaft control valve 1 - N205-

- ❑ Depending on version, not installed in all vehicles
- ❑ Removing and installing ⇒ page 153

13 - Radial oil seal

- ❑ Depending on version, not installed in all vehicles
- ❑ Renew after removal

14 - Bolt

- ❑ Depending on version, not installed in all vehicles
- ❑ Specified torque and sequence ⇒ page 148 .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

15 - Housing

- ❑ For camshaft adjuster
- ❑ Depending on version, not installed in all vehicles

16 - Dowel sleeve

- ❑ Depending on version, not installed in all vehicles

17 - Gasket

- ❑ Depending on version, not installed in all vehicles
- ❑ Renew after removal

18 - Control valve

- ❑ Depending on version, not installed in all vehicles
- ❑ Removing and installing ⇒ page 161
- ❑ 50 Nm

19 - Camshaft adjuster

- ❑ Depending on version, not installed in all vehicles
- ❑ Removing and installing ⇒ page 150

20 - Friction washer

- ❑ Before the installation of the camshaft adjuster check it is fitted

21 - Dowel pin

- ❑ For camshaft housing

22 - Exhaust valve

- ❑ Do not rework. Only lapping in is permitted.
- ❑ Mark installation position for re-installation
- ❑ Checking ⇒ page 165
- ❑ Valve dimensions ⇒ page 165
- ❑ Checking valve guides ⇒ page 164

23 - Inlet valve

- ❑ Do not rework. Only lapping in is permitted.
- ❑ Mark installation position for re-installation
- ❑ Checking ⇒ page 165
- ❑ Valve dimensions ⇒ page 165
- ❑ Checking valve guides ⇒ page 164

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not allowed unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

24 - Cylinder head

- ❑ Valve seats may not be machined due to the very small tolerances

25 - Valve stem seal

- ❑ Renew after removal ⇒ page 154

26 - Valve spring

27 - Valve spring plate

28 - Valve cotters

29 - Hydraulic compensation element

- ❑ Checking ⇒ page 153
- ❑ Mark installation position for re-installation
- ❑ Lubricate contact surfaces before installing.

30 - Roller rocker finger

- ❑ Removing and installing ⇒ “1.6 Removing and installing camshaft housing”, page 116
- ❑ Mark installation position for re-installation
- ❑ Check tapered roller bearing for ease of movement.

❑ Lubricate contact surfaces before installing.

31 - Securing clip

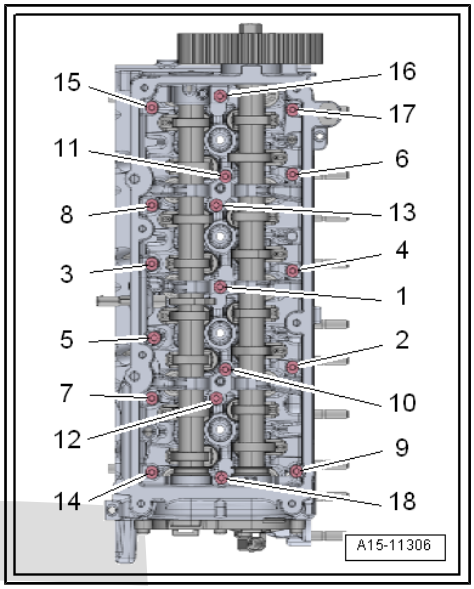
❑ For hydraulic compensation element

Camshaft housing - specified torque and sequence

- After removal, renew the bolts that are tightened with turning further angle.

– Tighten bolts in stages in the sequence shown:

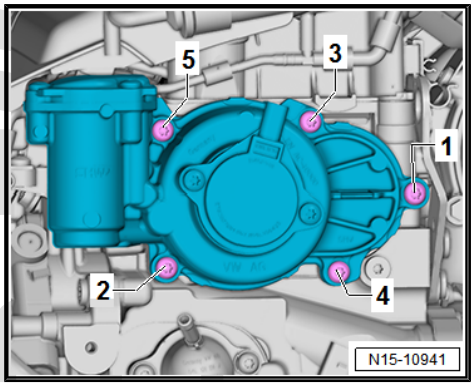
Stage	Bolts	Specified torque
1st	-1 … 18-	Screw in by hand as far as stop • The camshaft housing should make contact with the cylinder head over the full surface.
2nd	-1 … 18-	8 Nm
3rd	-1 … 18-	Turn 90° further



Housing for camshaft adjuster - specified torque and sequence

– Tighten bolts in stages in the sequence shown:

Stage	Bolts	Specified torque
1st	-1 - 5-	Screw in by hand as far as stop
2nd	-1 - 5-	8 Nm

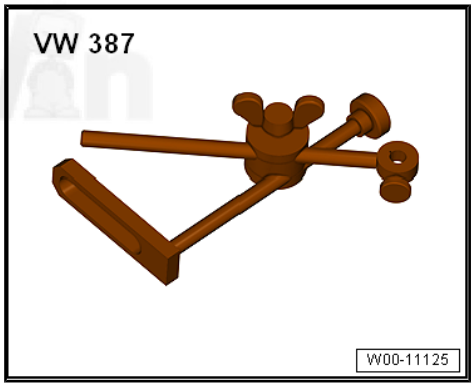


3.2 Measuring axial play of camshaft

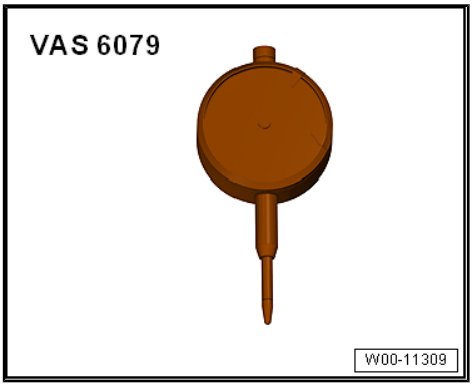
Copyright
ng for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Special tools and workshop equipment required

♦ Universal dial gauge bracket - VW 387-



♦ Dial gauge - VAS 6079-



Procedure

– Remove camshaft housing
⇒ “1.6 Removing and installing camshaft housing”, page 116 .

– Secure dial gauge - VAS 6079- to camshaft housing with universal dial gauge bracket - VW 387- as shown in illustration.

– Press camshaft against dial gauge by hand.

– Set the dial gauge to “0”.

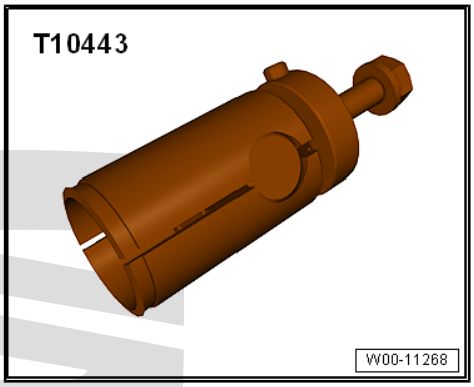
– Press camshaft away from dial gauge and read off value:

• Axial clearance: 0.05 ... 0.15 mm.

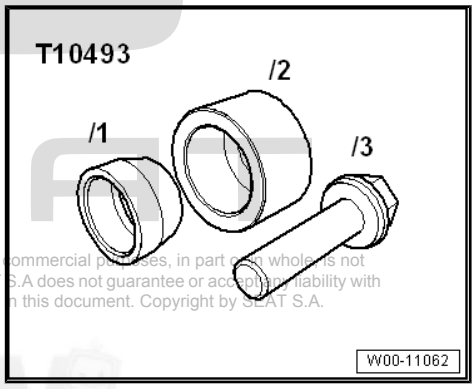
3.3 Removing and installing camshaft oil seal

Special tools and workshop equipment required

♦ Puller - T10443-



♦ Assembly tool -T10493-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

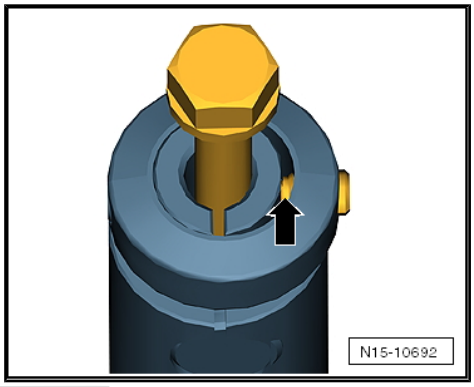
Procedure

– Detach toothed belt from camshaft ⇒ page 141 .

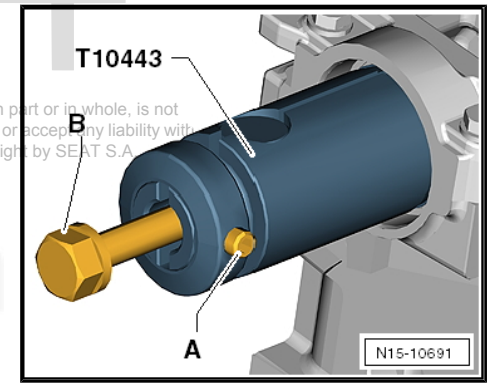
NOTICE

If the grub screw is unscrewed too far the thrust plate inside the puller -T10443- will come loose from the thrust bolt. If this happens, the thrust plate must be pushed back onto the thrust bolt.

– Carefully unscrew grub screw -arrow- of puller -T10443- until slight resistance is felt.



– Apply puller - T10443- in a straight line, as shown in illustration, and lock by screwing in grub screw.-A-.
– Screw in thrust bolt -B- until oil seal is pulled out.
– Clean contact surface and sealing surface.

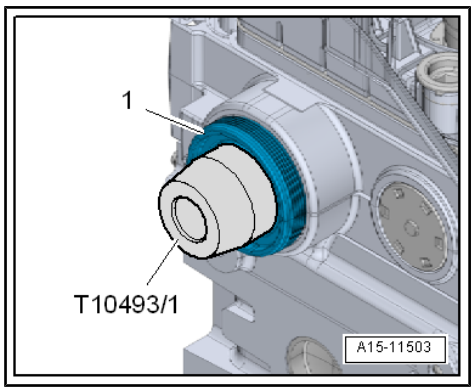


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Note

The oil seal sealing lip must not be additionally oiled or greased.

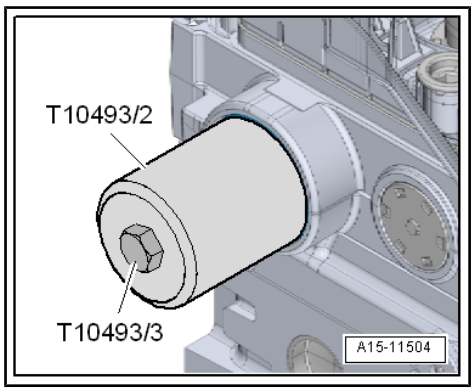
– Fit guide sleeve -T10493/1- onto camshaft as shown in illustration.
– Carefully push oil seal -1- over guide sleeve and onto camshaft.



Note

When pressing in oil seal, guide sleeve remains on camshaft as a stop.

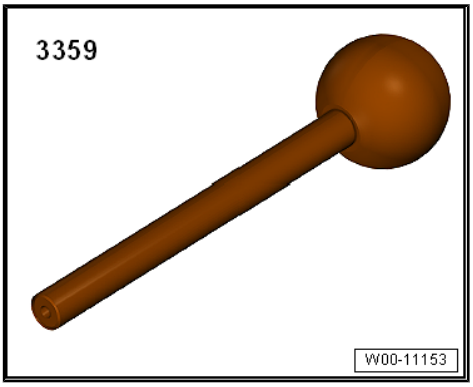
– Using press tool -T10493/2- and screw -T10493/3- press the shaft seal to the stop.
– Install notched belt (adjusting valve timing) ⇒ page 135 .



3.4 Removing and installing camshaft adjuster

Special tools and workshop equipment required

♦ Diesel injection pump locking pin - 3359-



♦ Dowel pin - T10492-

Removing

– Remove toothed belt cover (top) ⇒ page 125 .

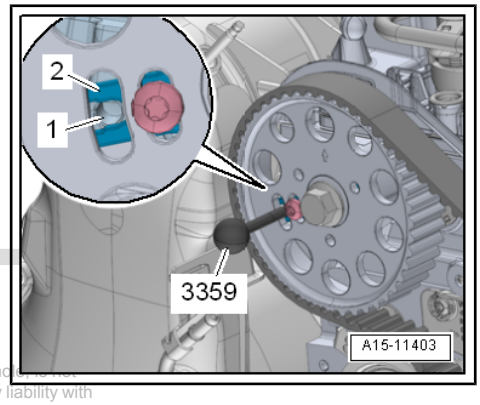
– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

NOTICE

Irreparable damage can be caused if the toothed belt slips.

♦ **Turn crankshaft only in direction of engine rotation.**

– Rotate crankshaft by turning bolt on crankshaft sprocket until camshaft sprocket is positioned at “TDC”.

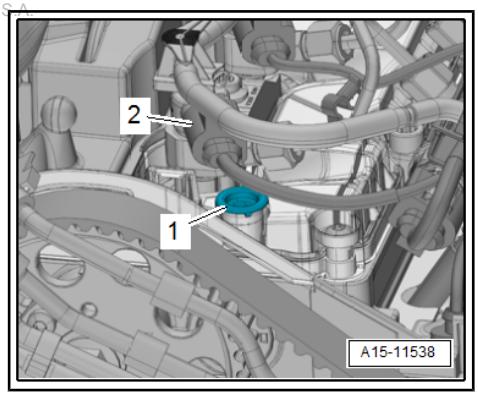


Proceed as follows to secure camshaft in position:

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Disconnect plug-in connector -2- in the injector unit for cylinder 1.

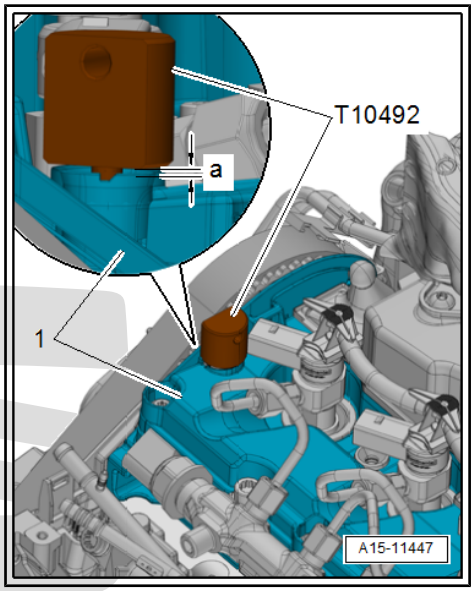
– Unlock cap -1- in the cylinder head cover, turn anti-clockwise and remove.



– Lock inlet camshaft with the dowel pin - T10492- taking the following into account:

Cylinder head cover -1- installed:

- Clearance -a- is approx. 1 mm.

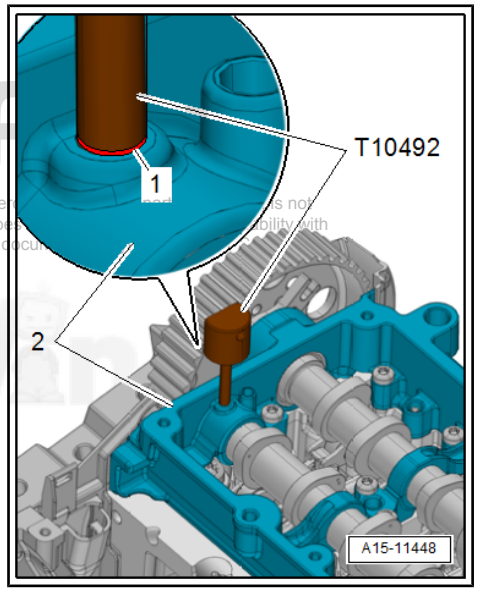


Cylinder head cover removed:

- The groove -1- of the dowel pin - T10492- must finish camshaft housing -2-.

– For reasons of space, remove the air filter housing together with the intake hose ⇒ page 422 .

Protected by copyright. Copying for private or comme... is not permitted unless authorised by SEAT S.A. SEAT S.A doe... bility with respect to the correctness of information in this docu...

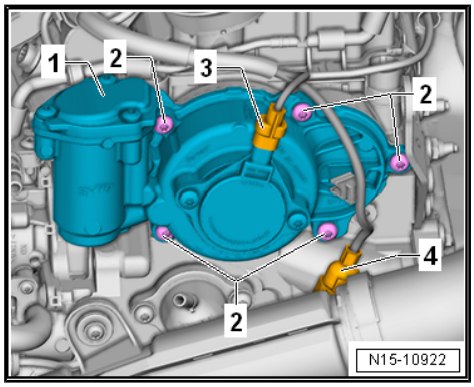


– Unplug electrical connectors -3- and -4-. Remove the retaining clip from the cover.

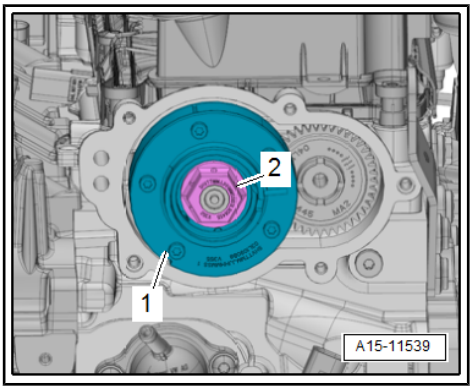
– Remove the screws -2- and remove the cover -1-.

NOTICE

Prior to the removal of the control valve, check the small piston in the middle of the control valve for ease of movement. Press with a finger on the piston and check whether it can be pushed in and whether it subsequently returns to its end position. If the piston gets stuck, remove the control valve. Otherwise there is a risk of engine damage.



– Remove control valve -2-, remove cam adjuster-1-.



Installing

NOTICE

A diamond-coated washer is fitted between the camshaft adjuster and the camshaft stub to ensure proper connection. Prior to installation, it is essential to ensure that this diamond-coated washer is fitted in the camshaft adjuster. Otherwise the camshaft adjuster can come loose during operation and cause damage to the engine.

Install in reverse order of removal, observing the following.

– Install toothed belt cover (top) ⇒ page 125 .

Specified torques

- ⇒ “3.1 Assembly overview - valve gear”, page 145
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation

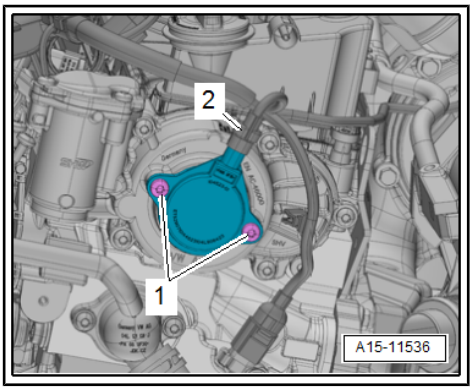
3.5 Removing and installing camshaft control valve 1 - N205-

Removing

– Remove air filter housing ⇒ page 422 .

– Unplug the electrical connector -2-.

– Unscrew bolt -1- and remove camshaft control valve 1 - N205- .



Installing

Install in reverse order of removal, observing the following.

Note

Renew oil seal.

Specified torques

- ⇒ “3.1 Assembly overview - valve gear”, page 145
- ⇒ “4.1 Assembly overview - air filter housing”, page 420

3.6 Checking hydraulic compensation elements

Note

- *The hydraulic compensation elements cannot be repaired.*
- *Irregular valve noises when starting engine are normal.*

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Special tools and workshop equipment required

- Calibre

Procedure

– Start engine and run until radiator fan has started up once.

– Increase engine speed to approx. 2,500 rpm for 2 minutes (perform road test if necessary).

Note

If irregular valve noise disappears but repeatedly re-occurs when travelling short distances, renew oil retention valve. The oil retention valve is located in the oil filter housing ⇒ Item 9 (page 188) .

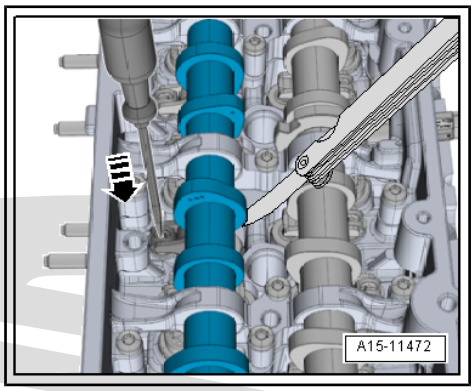
– If the compensation elements are still noisy, locate the defective compensation element as follows:

– Removing and installing the cylinder head cover ⇒ page 114 .

– Rotate crankshaft by turning bolt for toothed belt sprocket until cam of supporting element to be tested is facing upwards.

– Press roller rocker finger down -arrow- to determine clearance between cam and roller rocker finger.

– If it is possible to insert a feeler gauge of 0.20 mm between cam and roller rocker finger, renew hydraulic compensation element ⇒ “1.6 Removing and installing camshaft housing”, page 116 .



Additional steps required

– Install the cylinder head cover ⇒ page 114 .

3.7 Removing and installing valve stem seals

⇒ “3.7.1 Removing and installing valve stem oil seals (cylinder head installed)”, page 154

⇒ “3.7.2 Removing and installing valve stem oil seals (cylinder head removed)”, page 158

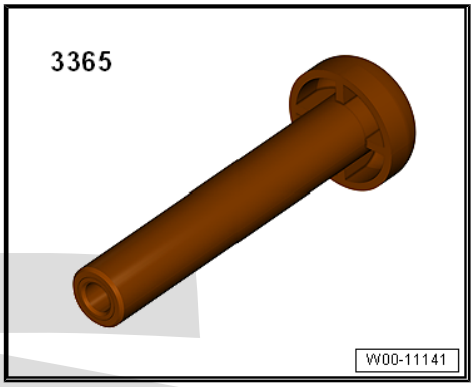
3.7.1 Removing and installing valve stem oil seals (cylinder head installed)

ected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

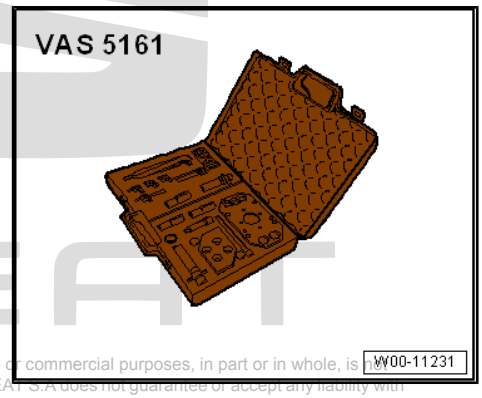
Special tools and workshop equipment required

♦ Valve stem seal puller - 3364-

♦ Valve stem seal fitting tool - 3365-



♦ Removal and installation device for valve cotters - VAS 5161-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

♦ Sealing pin -VAS 5161/29-2-

♦ Guide plate -VAS 5161/31-

♦ Sleeve -VAS 5161/31-1-

Procedure

– Remove all glow plugs ⇒ page 582 .

– Remove camshaft housing ⇒ page 116 .

– Mark original positions of roller rocker fingers and hydraulic compensation elements for re-installation.

– Remove roller rocker fingers together with hydraulic compensation elements and place down on a clean surface.

– Set piston of the respective cylinder to “bottom dead centre”.

Cylinders 1, 3, 4:

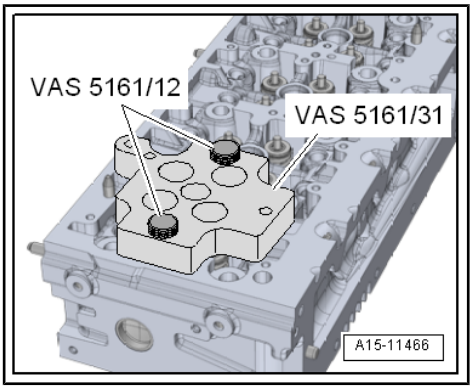
– Fit guide plate -VAS 5161/31- onto cylinder head.

• Lettering -A- points towards exhaust side

• Lettering -E- points towards intake side

– Secure guide plate with knurled screws -VAS 5161/12- by hand.

• Position of knurled screws, as shown in illustration



Cylinder 2:

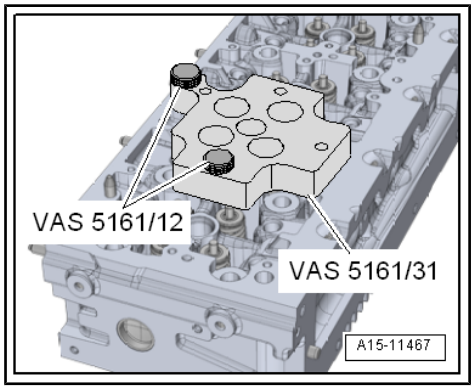
– Fit guide plate -VAS 5161/31- onto cylinder head.

• Lettering -A- points towards exhaust side

• Lettering -E- points towards intake side

– Secure guide plate with knurled screws -VAS 5161/12- by hand.

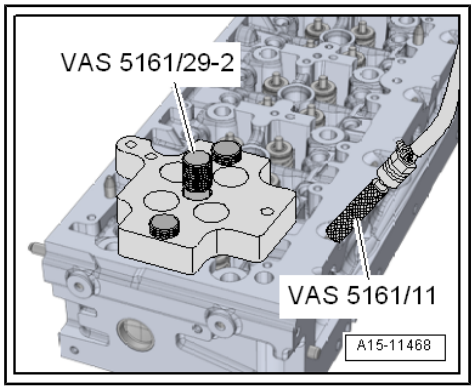
• Position of knurled screws as shown in illustration.



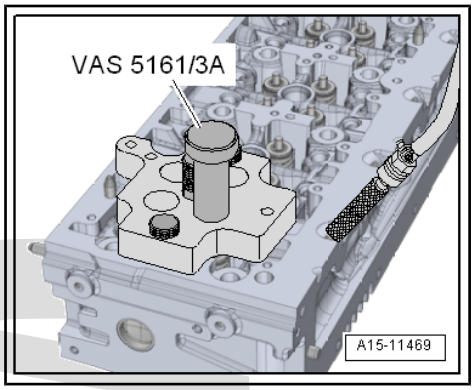
Continued for all cylinders:

– Screw sealing pin -VAS 5161/29-2- into guide plate.

– Screw adapter -VAS 5161/11- hand-tight into corresponding glow plug thread.



– Insert drift -VAS 5161/3A- into guide plate and use plastic-headed hammer to release sticking valve cotters.



– Screw snap-in device -VAS 5161/6- with engaging fork -VAS 5161/5- into guide plate.

– Insert assembly cartridge -VAS 5161/8- (slide on sleeve -VAS 5161/31-1-) in guide plate.

– Connect adapter to compressed air line using a commercially available connection piece, and apply constant air pressure.

• Minimum pressure: 6 bar

– Attach pressure fork -VAS 5161/2- to snap-in device and push assembly cartridge down.

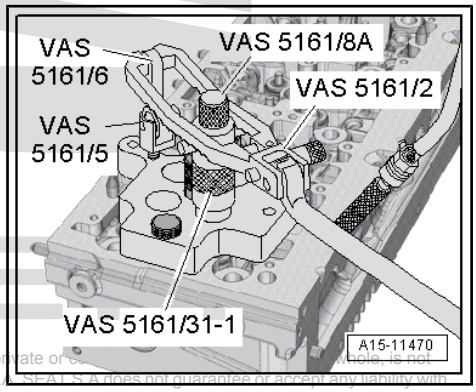
– At the same time, turn knurled screw of assembly cartridge clockwise until tips engage in valve cotters.

– Move knurled screw back and forth to press apart valve cotters and capture them in assembly cartridge.

– Release pressure fork.

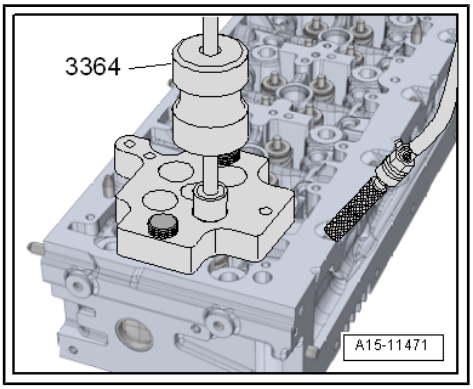
– Take off assembly cartridge with sleeve.

– Detach valve spring with valve spring plate.



Assembly by copying for private or ed... whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Pull off valve stem oil seal with valve stem seal puller - 3364- .



NOTICE

Risk of damage when installing valve stem seals.

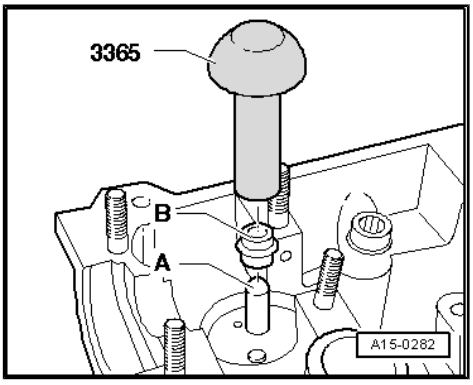
- **New valve stem oil seals -B- are supplied with plastic sleeve; fit plastic sleeve -A- onto valve stem.**

– Lightly oil sealing lip of valve stem seal.

– Slide valve stem oil seal onto plastic sleeve.

– Carefully press valve stem oil seal onto valve guide using valve stem seal fitting - 3365- tool.

– Remove plastic sleeve.

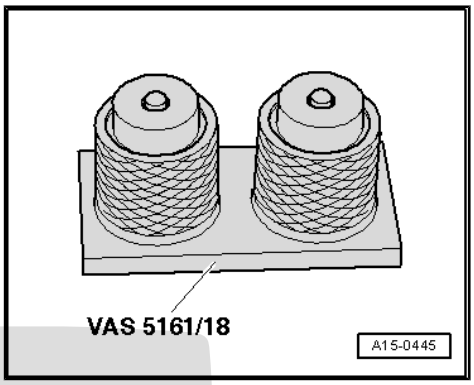


If the valve cotters have been removed from the assembly cartridge, the valve cotters must be inserted into the insert tool - VAS 5161/18- first.

• Larger diameter of valve cotters faces upwards.

– Position the valve spring and the valve spring plate.

– Press assembly cartridge onto insertion device from above and take up valve cotters.

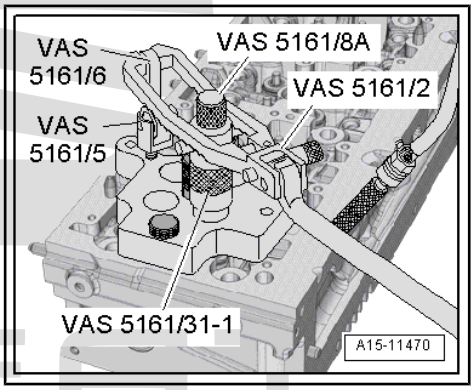


– Insert assembly cartridge into guide plate -VAS 5161/31- again.

– Press the pressure fork together and pull upwards towards the knurled screw and at the same time turn towards the left and right. The valve cones are mounted in this way.

– Release pressure fork with knurled screw still in pulled position.

– Repeat procedure for each valve.



Assembling

Installation is carried out in reverse order; noting the following:

– Ensure that all roller rocker fingers make contact with the ends of the valve stems correctly and are clipped onto their respective hydraulic compensation elements.

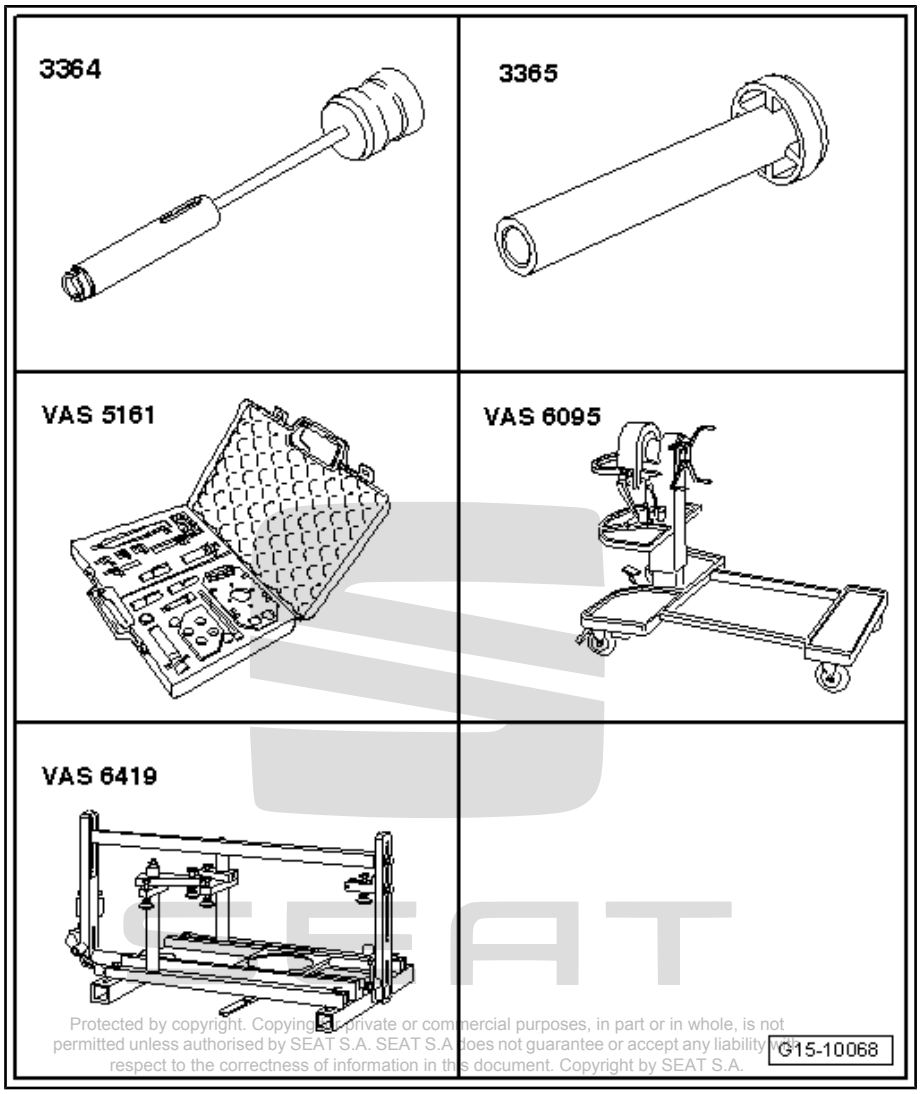
– Install camshaft housing ⇒ page 116 .

– Install the glow plug ⇒ page 582 .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

3.7.2 Removing and installing valve stem oil seals (cylinder head removed)

Special tools and workshop equipment required



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- ♦ Valve stem seal puller - 3364-
- ♦ Valve stem seal fitting tool - 3365-
- ♦ Removal and installation device for valve cotters - VAS 5161-
- ♦ Guide plate -VAS 5161/31-
- ♦ Sleeve -VAS 5161/31-1-
- ♦ Engine and gearbox support - VAS 6095-
- ♦ Cylinder head tensioning device - VAS 6419-

Procedure

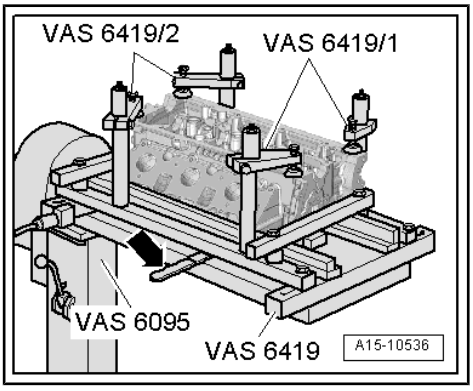
Requirement:

- Intake manifold removed ⇒ page 424
- Exhaust manifold/turbocharger is removed ⇒ page 326 .

– Remove camshaft housing ⇒ page 116 .

– Mark original positions of roller rocker fingers and hydraulic compensation elements for re-installation.

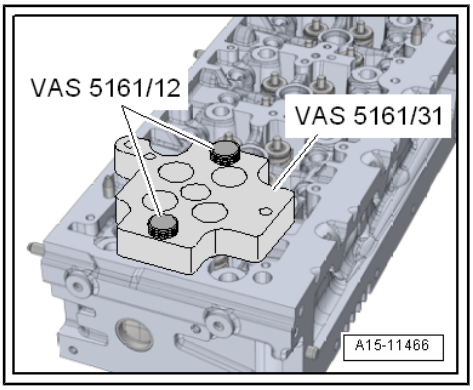
– Remove roller rocker fingers together with hydraulic compensation elements and place down on a clean surface.
– Insert cylinder head tensioning device - VAS 6419- into engine and gearbox support - VAS 6095- .
– Secure cylinder head in cylinder head tensioning device, as shown in illustration.
– Connect cylinder head tensioning device to compressed air.
– Use lever -arrow- to slide air cushion under combustion chamber from which valve stem seal is to be removed.
– Apply just enough compressed air to bring air pad into contact with valve heads.



SEAT
Copyright by SEAT. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this Document. Copyright by SEAT S.A.

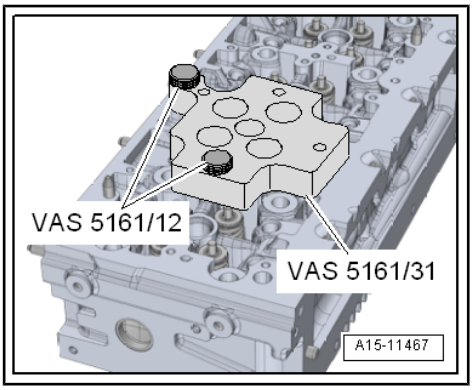
Cylinders 1, 3, 4:

– Fit guide plate -VAS 5161/31- onto cylinder head.
• Lettering -A- points towards exhaust side
• Lettering -E- points towards intake side
– Secure guide plate with knurled screws -VAS 5161/12- by hand.
• Position of knurled screws, as shown in illustration



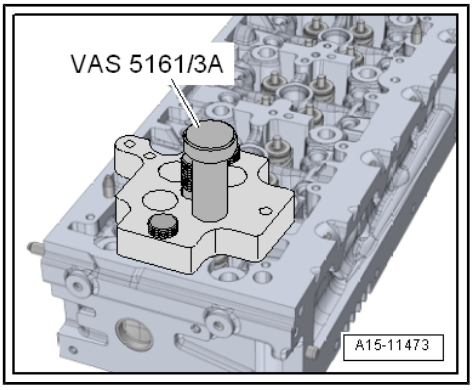
Cylinder 2:

– Fit guide plate -VAS 5161/31- onto cylinder head.
• Lettering -A- points towards exhaust side
• Lettering -E- points towards intake side
– Secure guide plate with knurled screws -VAS 5161/12- by hand.
• Position of knurled screws, as shown in illustration

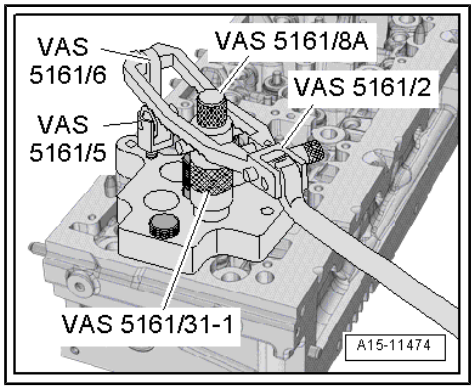


Continued for all cylinders:

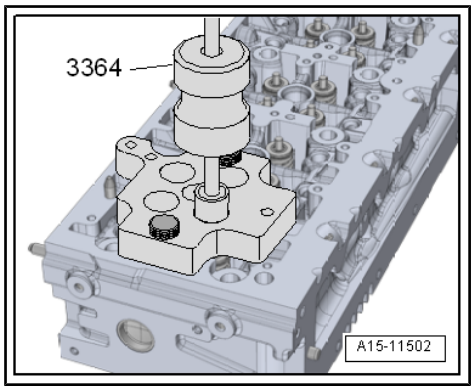
– Insert drift -VAS 5161/3A- into guide plate and use plastic-headed hammer to release sticking valve cotters.



– Screw snap-in device -VAS 5161/6- with engaging fork -VAS 5161/5- into guide plate.
– Insert assembly cartridge -VAS 5161/8- (slide on sleeve -VAS 5161/31-1-) in guide plate.
– Attach pressure fork -VAS 5161/2- to snap-in device and push assembly cartridge down.
– At the same time, turn knurled screw of assembly cartridge clockwise until tips engage in valve cotters.
– Move knurled screw back and forth to press apart valve cotters and capture them in assembly cartridge.
– Release pressure fork.
– Take off assembly cartridge with sleeve.
– Detach valve spring with valve spring plate.



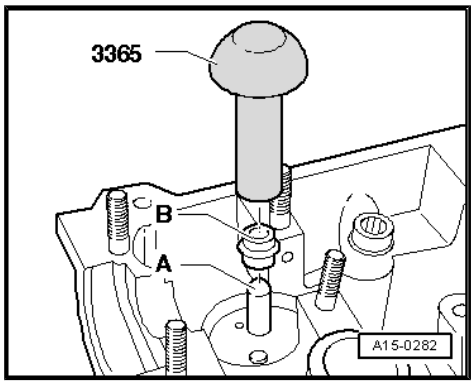
– Pull off valve stem oil seal with valve stem seal puller - 3364- .



NOTICE

Risk of damage when installing valve stem seals.

♦ **New valve stem oil seals -B- are supplied with plastic sleeve; fit plastic sleeve -A- onto valve stem.**

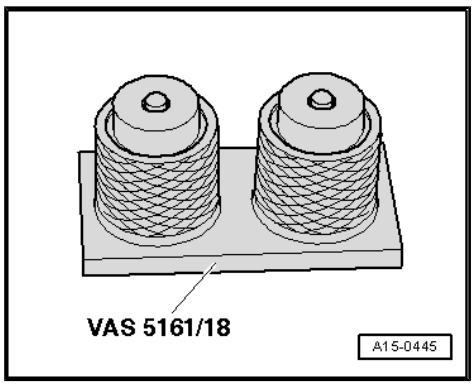


– Lightly oil sealing lip of valve stem seal.
– Slide valve stem oil seal onto plastic sleeve.
– Carefully press valve stem oil seal onto valve guide using valve stem seal fitting - 3365- tool.
– Remove plastic sleeve.

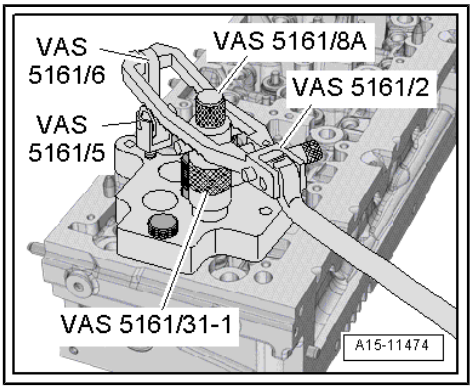
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee the accuracy, liability with respect to the correctness or completeness of the information in this document. Copyright by SEAT S.A.

If the valve cotters have been removed from the assembly cartridge, the valve cotters must be inserted into the insert tool -VAS 5161/18- first.

• Larger diameter of valve cotters faces upwards.
– Press assembly cartridge onto insertion device from above and take up valve cotters.
– Position the valve spring and the valve spring plate.



– Insert assembly cartridge into guide plate -VAS 5161/31- again.
– Press the pressure fork together and pull upwards towards the knurled screw and at the same time turn towards the left and right. The valve cones are mounted in this way.
– Release pressure fork with knurled screw still in pulled position.
– Repeat procedure for each valve.



Assembling

Installation is carried out in reverse order; noting the following:

– Ensure that all roller rocker fingers make contact with the ends of the valve stems correctly and are clipped onto their respective hydraulic compensation elements.
– Install camshaft housing ⇒ page 116 .

3.8 Removing and installing control valve for the camshaft adjuster

Note

If the control valve ⇒ Item 18 (page 147) (25) of for the camshaft adjuster is diagnosed as faulty, the camshaft adjuster can remain in place and only the control valve needs to be changed.

– Remove toothed belt cover (top) ⇒ page 125 .
– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Remove and install noise insulation .

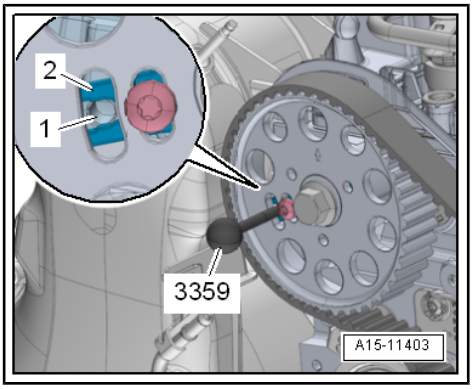
NOTICE

Irreparable damage can be caused if the toothed belt slips.

♦ **Turn crankshaft only in direction of engine rotation.**

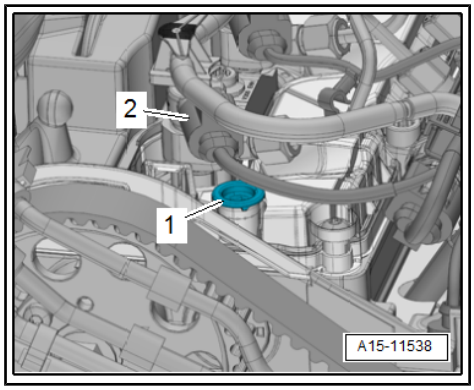
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright © SEAT S.A.

– Rotate crankshaft by turning bolt on crankshaft sprocket until camshaft sprocket is positioned at “TDC”.
– Lock camshaft hub with diesel injection pump locking pin -3359- ; to do so, insert locking pin into fork on locating arm -2- and into hole -1- behind it in cylinder head.



Proceed as follows to secure camshaft in position:

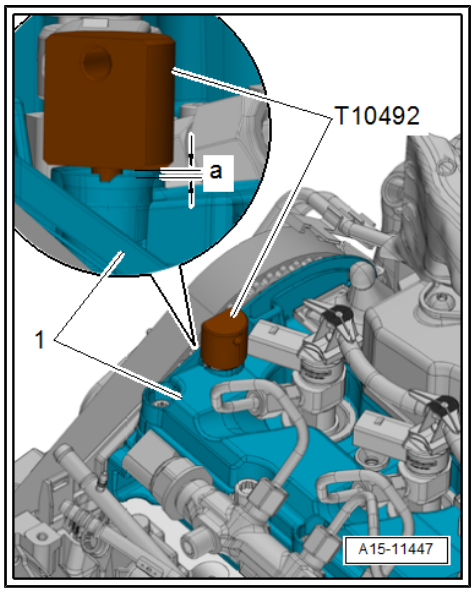
– Disconnect connector -2- from injector in cylinder 1.
– Unlock cap -1- in the cylinder head cover, turn anti-clockwise and remove.



– Lock inlet camshaft with the dowel pin - T10492- taking the following into account:

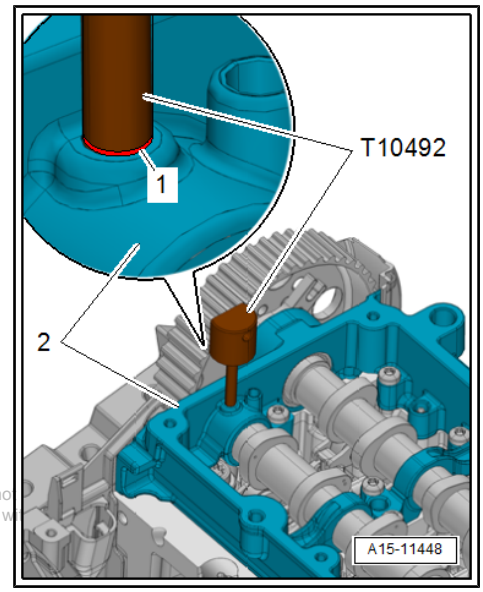
Cylinder head cover -1- installed:

• Clearance -a- is approx. 1 mm.



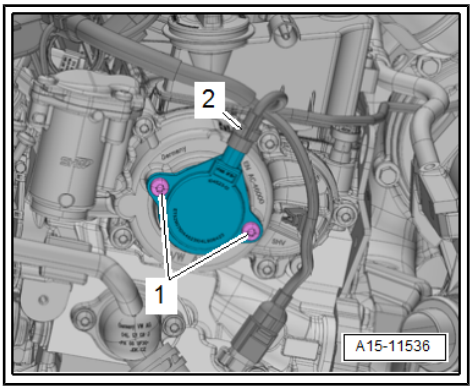
Cylinder head cover removed:

• The groove -1- of the dowel pin - T10492- must finish camshaft housing -2-.
– Remove air filter housing ⇒ page 422 .
– Unplug the electrical connector -2-.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

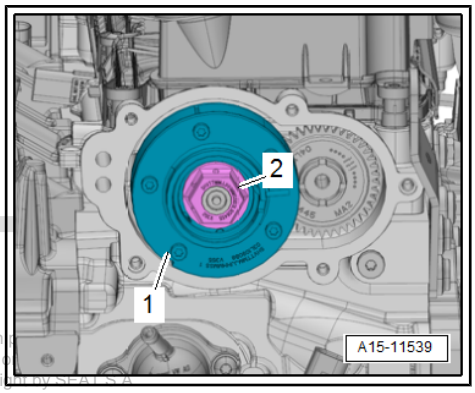
– Unscrew bolt -1- and remove camshaft control valve 1 - N205- .



Note

For reasons of clarity, the control valve -2- and camshaft adjuster-1- in the picture are shown without covers.

– Unscrew control valve -2-.



Installing

Install in reverse order of removal, observing the following.

– Install toothed belt cover (top) ⇒ page 125 .

Specified torques

- ⇒ “3.1 Assembly overview - valve gear”, page 145
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation

Protected by copyright. Copying for private or commercial purposes, in
permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee
respect to the correctness of information in this document. Copyright by SEAT S.A.

4 Inlet and exhaust valves

⇒ “4.1 Checking valve guides”, page 164

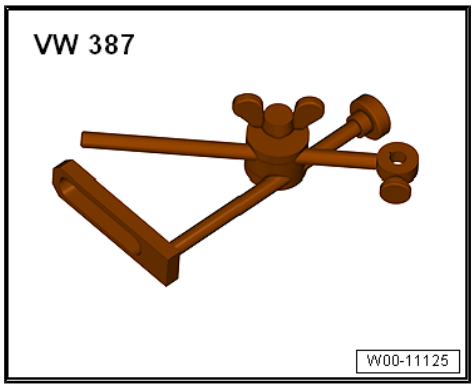
⇒ “4.2 Checking valves”, page 165

⇒ “4.3 Valve dimensions”, page 165

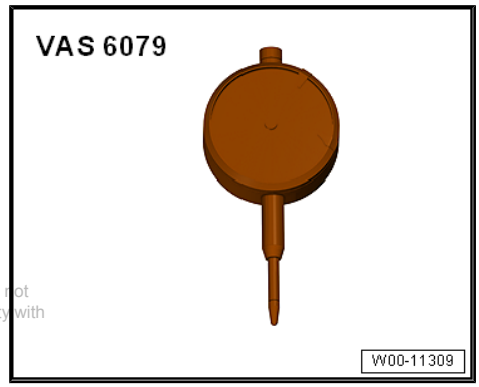
4.1 Checking valve guides

Special tools and workshop equipment required

- Universal dial gauge bracket - VW 387-



- Dial gauge - VAS 6079-



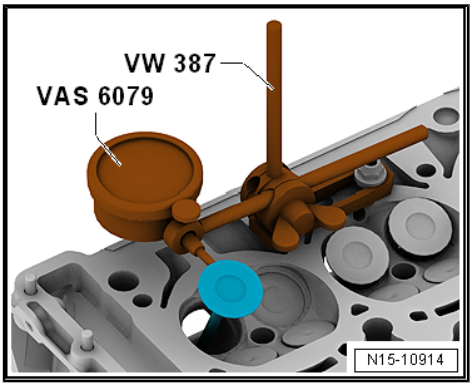
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Procedure

Note

- *If the valve is to be renewed as part of a repair, use a new valve for the calculation.*
- *Only insert inlet valve into inlet valve guide and exhaust valve into exhaust valve guide, as the stem diameters are different.*

– Attach dial gauge - VAS 6079- with dial gauge bracket - VW 387- to cylinder head.
– Insert valve into valve guide.
• The end of the valve stem must be flush with the guide.
– Determine rock.
• Wear limit: 1.0 mm.
– If the wear limit is exceeded, repeat the measurement with new valves.
– Renew cylinder head if wear limit is still exceeded.



Note

Valve guides cannot be exchanged.

4.2 Checking valves

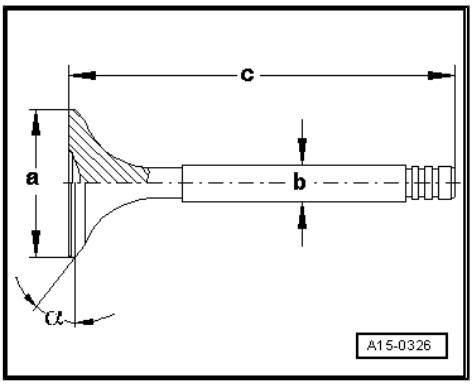
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Visually inspect for scoring on valve stems and valve seat surfaces.
– Renew valve if scoring is clearly visible.

4.3 Valve dimensions

Note

Inlet and exhaust valves must not be reworked. Only lapping-in is permitted.



Dim.		Inlet valve	Exhaust valve
∅ a	mm	28.10	26.00
∅ b	mm	5.975	5.965
c	mm	99.30	99.10
α	∠°	45	45

17 – Lubrication

1 Sump, oil pump

⇒ “1.1 Assembly overview - sump, oil pump”, page 166

⇒ “1.2 Engine oil”, page 171

⇒ “1.3 Removing and installing sump”, page 172

⇒ “1.4 Removing and installing lower part of sump”, page 175

⇒ “1.5 Removing and installing upper part of sump”, page 179

⇒ “1.6 Removing and installing oil pump”, page 184

⇒ “1.7 Removing and installing oil level and oil temperature sender G266 ”, page 184

1.1 Assembly overview - sump, oil pump

⇒ “1.1.1 Assembly overview - sump, oil pump”, page 166

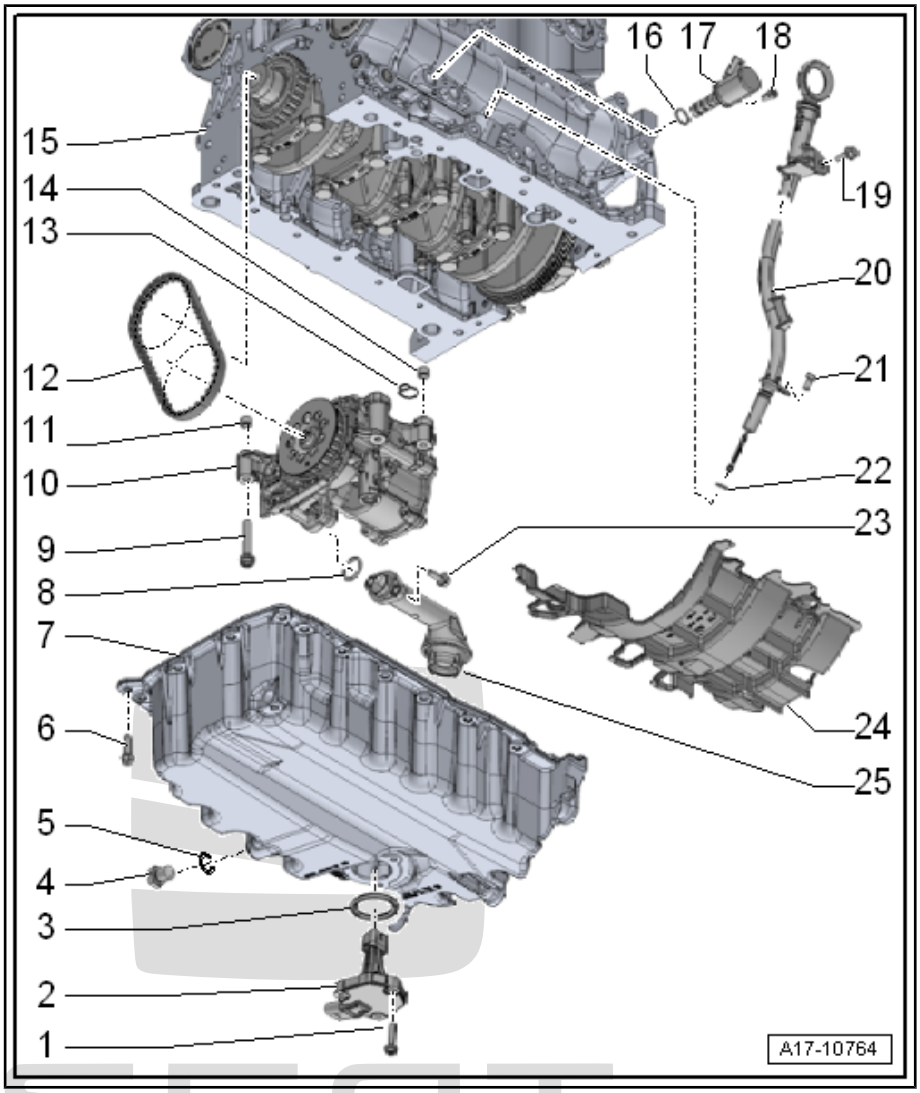
⇒ “1.1.2 Assembly overview - sump/oil pump, two-piece sump”, page 169

1.1.1 Assembly overview - sump, oil pump

Note

- *Metal shavings or a large quantity of small metal particles found during engine repair could indicate. that the crankshaft bearings or conrod bearings are damaged. To avoid any secondary damage, carry out the following work following the repair: carefully clean oil channels and renew oil spray jets, engine oil cooler and oil filter.*
- *Oil spray jet and pressure relief valve ⇒ page 93*

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



1 - Bolt

- ❑ Self-locking
- ❑ Renew after removal
- ❑ 8 Nm

2 - Oil level/oil temperature sensor - G266-

- ❑ Removing and installing ⇒ page 184

3 - Radial oil seal

- ❑ Renew after removal

4 - Oil drain plug

- ❑ 30 Nm

5 - Radial oil seal

- ❑ Renew after removal

6 - Bolt

- ❑ Specified torque and sequence ⇒ page 168 .

7 - Oil sump

- ❑ Removing and installing ⇒ page 172

8 - O-ring

- ❑ Renew after removal

9 - Bolt

- ❑ Renew after removal

Different types of bolted connections:

- ♦ Inner Torx bolt: 12 Nm +180°
- ♦ Hexagonal bolt: 10 Nm +180°

10 - Oil pump

- ❑ With vacuum pump
- ❑ Removing and installing ⇒ page 184

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

11 - Dowel sleeve

12 - Toothed belt

- ❑ Removing:

- ♦ ⇒ “1.6 Removing and installing oil pump”, page 184
- ♦ ⇒ “1.8 Removing and installing sealing flange - pulley end”, page 64

13 - Gasket

- ❑ Renew after removal

14 - Dowel sleeve

15 - Cylinder block

16 - O-ring

- ❑ Renew after removal

17 - Valve for oil pressure control - N428-

- ❑ Removing and installing ⇒ page 194

18 - Bolt

- ❑ 8 Nm

19 - Bolt

- ❑ 8 Nm

20 - Guide tube for oil dipstick

21 - Bolt

- ❑ 8 Nm

22 - O-ring

- ❑ Renew after removal

23 - Bolt

- ❑ 8 Nm +90°

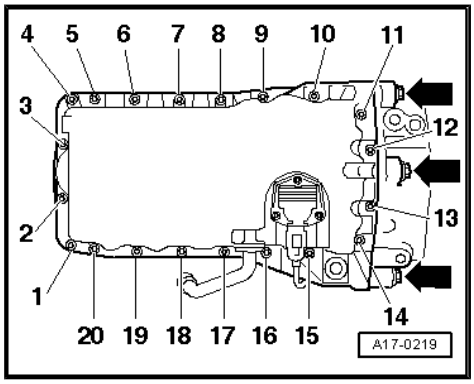
24 - Oil separator

25 - Oil suction pipe

Sump - specified torque and sequence

– Tighten bolts in stages as follows:

Stage	Bolts	Specified torque
1st	-1 … 20-	In diagonal sequence to 5 Nm
2nd	-arrows-	40 Nm
3rd	-1 … 20-	Tighten in stages and in diagonal sequence; final torque 13 Nm

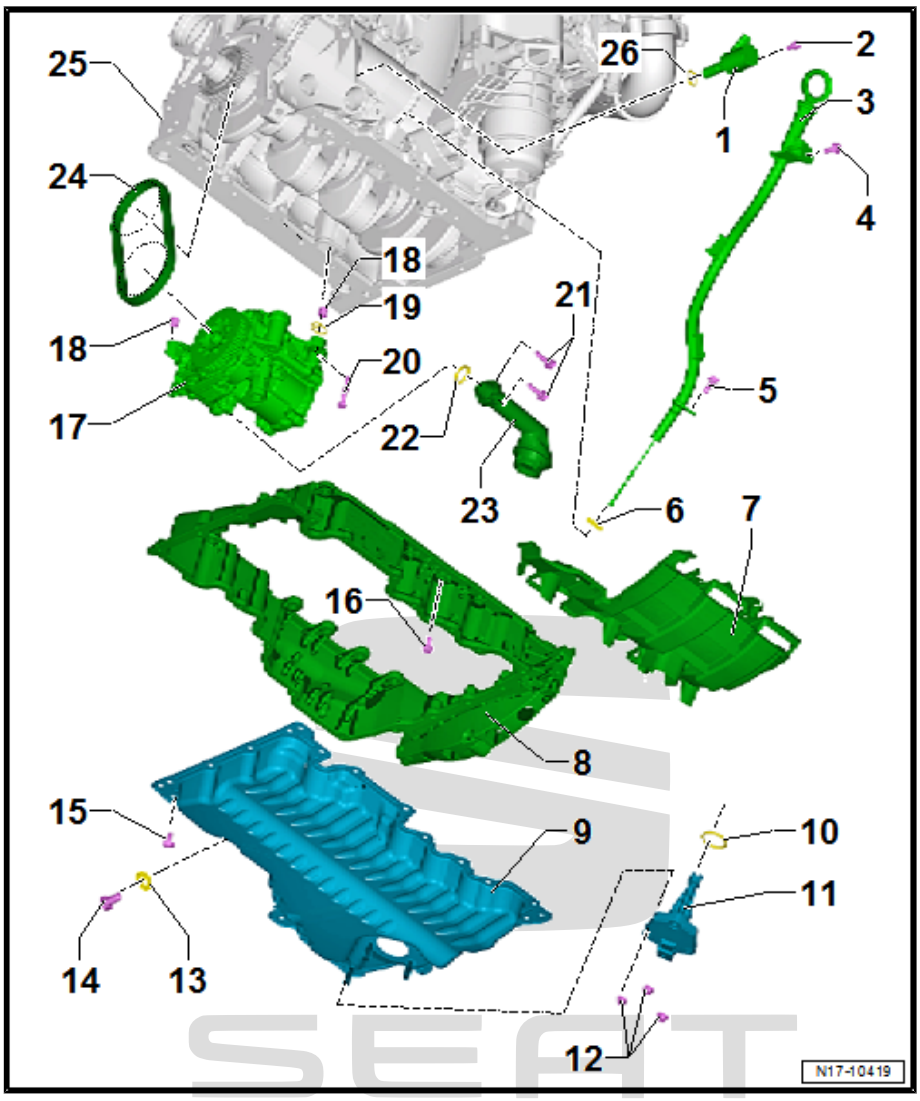


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

1.1.2 Assembly overview - sump/oil pump, two-piece sump

Note

- *Large quantities of swarf or metal particles found when performing repairs to the engine could indicate that the crankshaft bearings or conrod bearings are damaged. To avoid any secondary damage, carry out the following work following the repair: carefully clean oil channels and renew oil spray jets, engine oil cooler and oil filter.*
- *Oil spray jet and pressure relief valve* ⇒ page 93 .



1 - Valve for oil pressure control - N428-
- ❑ Removing and installing ⇒ page 194

2 - Bolt
- ❑ 8 Nm

3 - Guide tube for oil dipstick

4 - Bolt
- ❑ 8 Nm

5 - Bolt
- ❑ 8 Nm

6 - O-ring
- ❑ Renew after removal

7 - Oil separator

8 - Oil sump - upper part
- ❑ Removing and installing ⇒ page 179
- ❑ Tightening sequence and specified torque ⇒ page 171

9 - for oil sump - lower part
- ❑ Removing and installing ⇒ page 172
- ❑ Tightening sequence and specified torque ⇒ page 170

10 - Radial oil seal
- ❑ Renew after removal

11 - Oil level/oil temperature sensor - G266-
- ❑ Removing and installing ⇒ page 184

12 - Nut
- ❑ 9 Nm

13 - Radial oil seal
- ❑ Renew after removal

14 - Oil drain plug
- ❑ 30 Nm

15 - Bolt
- ❑ For bottom section of sump

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

❑ Tightening sequence and specified torque ⇒ page 170

16 - Bolt

❑ For top section of sump

❑ Tightening sequence and specified torque ⇒ page 171

17 - Oil pump

❑ With vacuum pump

❑ Removing and installing ⇒ page 184

18 - Dowel sleeve

19 - Gasket

❑ Renew after removal

20 - Bolt

❑ Renew after removal

Different types of bolted connections:

♦ Torx bolt, 12 Nm + 180°

♦ Hexagon bolt: 10 Nm +180°

21 - Bolt

❑ 8 Nm +90°

22 - O-ring

❑ Renew after removal

23 - Oil suction pipe

24 - Toothed belt

❑ Removing:

♦ ⇒ “1.6 Removing and installing oil pump”, page 184

♦ ⇒ “1.8 Removing and installing sealing flange - pulley end”, page 64

25 - Cylinder block

26 - O-ring

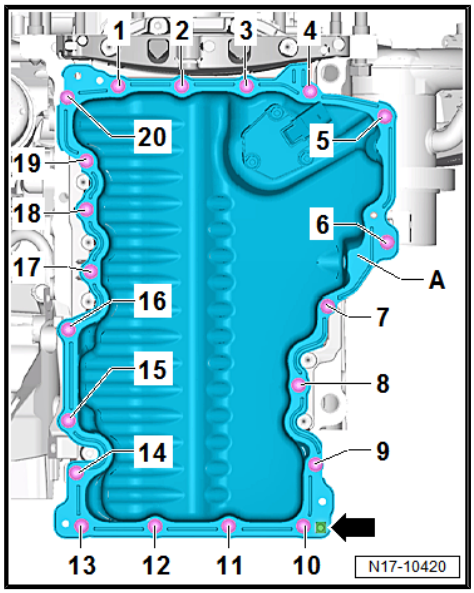
❑ Renew after removal

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

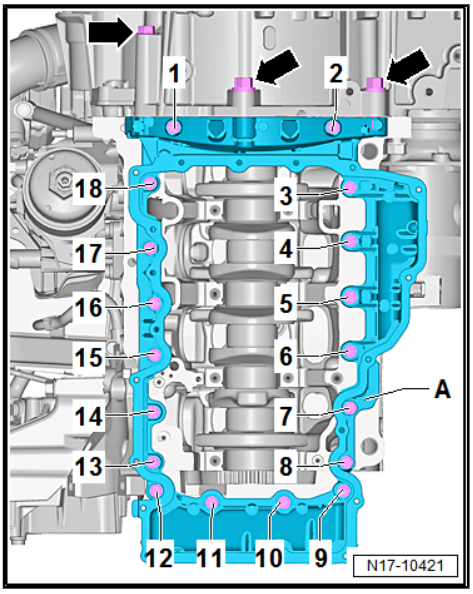
Sump (bottom section) - tightening torque and sequence

– Tighten bolts in stages as follows:

Stage	Bolts	Specified torque
1st	-1 … 20-	Screw in diagonally by hand until they make contact.
2nd	-1 … 20-	in diagonal sequence to 12 Nm



Sump (top section) - tightening torque and sequence



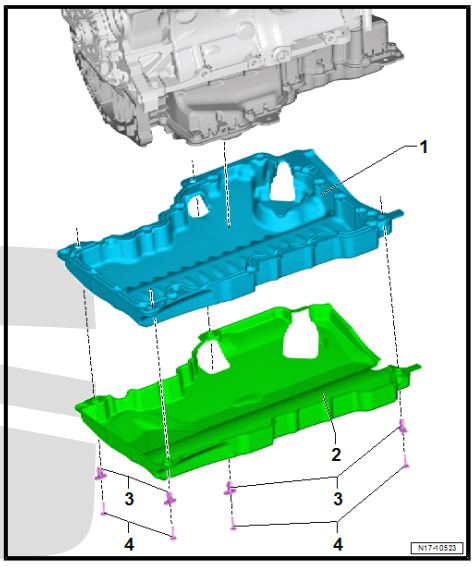
Note

- *The 3 bolts -9- to -11- are coated with a special sealing varnish. Ensure the correct allocation when installing.*
- *For allocation of bolts refer to ⇒ Electronic Parts Catalogue .*
- *Renew bolts.*

– Tighten bolts in stages as follows:

Stage	Bolts	Specified torque/turning further angle
1st	-1 … 18-	Screw in diagonally by hand until they make contact.
2nd	-arrows-	⇒ Rep. gr. 34 ; Removing and installing gearbox; Specified torques for gearbox
3rd	-1 … 18-	in diagonal sequence to 13 Nm

Noise insulation, oil sump



1 - Noise insulation

2 - Cover

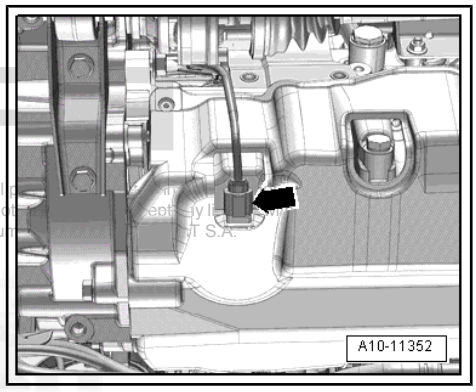
3 - Expanding rivet

4 - Dowel pins

Removing:

– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .

– Release and pull off connector -arrow- on oil level and oil temperature sensor - G266- .



– To remove, pull pins out of spreader rivets.

Protected by copyright. Copying for private or commercial p
permitted unless authorised by SEAT S.A. SEAT S.A does no
respect to the correctness of information in this docu

1.2 Engine oil

Capacities and oil specifications

- Ateca ⇒ Maintenance ; Booklet KH1 ; Engine oil: capacities and specifications
- Leon ⇒ Maintenance ; Booklet 501 ; Engine oil: capacities and specifications

Engine oil: Change

- Ateca ⇒ Maintenance ; Booklet KH1 ; Changing engine oil and oil filter .
- Leon ⇒ Maintenance ; Booklet 501 ; Changing engine oil and oil filter .

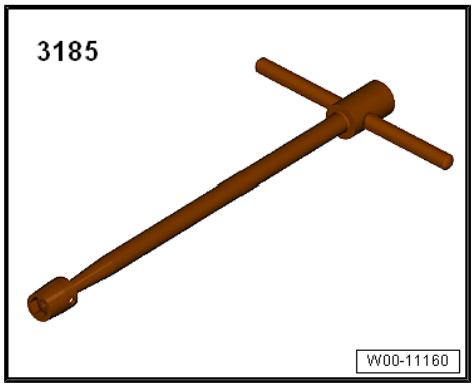
Check oil level.

- Ateca ⇒ Maintenance ; Booklet KH1 ; Check engine oil level
- Leon ⇒ Maintenance ; Booklet 501 ; Check engine oil level

1.3 Removing and installing sump

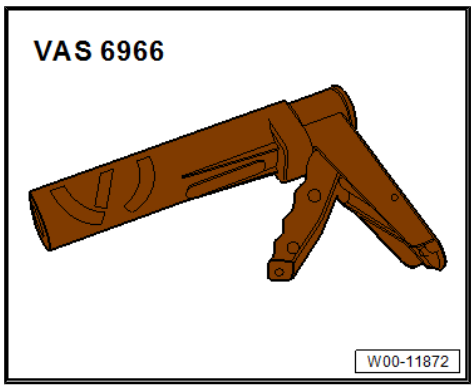
Special tools and workshop equipment required

- 10 mm articulated wrench - 3185-



- Socket insert - T10058-

- Applicator gun - VAS 6966-



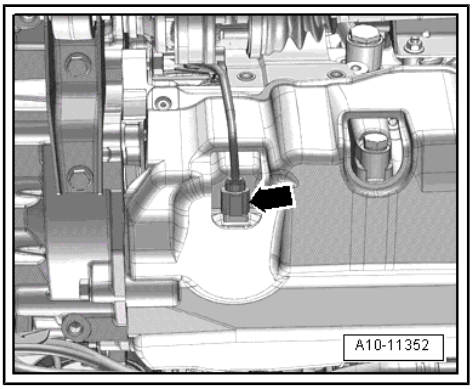
- Hand drill with plastic brush
- Sealant ⇒ Electronic parts catalogue
- Safety goggles

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Removing

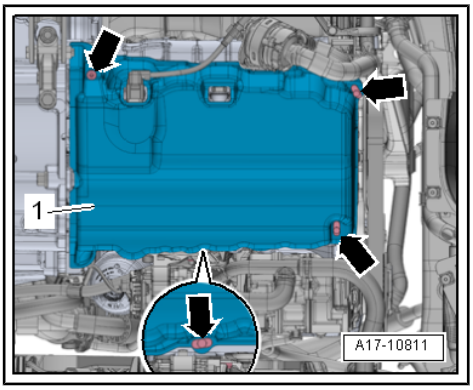
- Drain engine oil; Ateca ⇒ Maintenance ; Booklet KH1 .
- Drain engine oil; Leon ⇒ Maintenance ; Booklet 501 .

– Unplug electrical connector -arrow- at oil level and oil temperature sender - G266- .



– Release clips -arrows- and detach noise insulation -1- for sump.

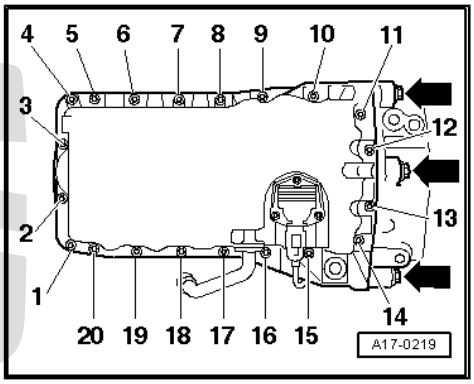
– To do this, pull pins out of spreader rivets.



– Remove bolts securing sump to gearbox -arrows-.

– Slacken bolts -1 ... 20- in diagonal sequence and remove.

– Carefully release sump from bonded joint.



Installing

NOTICE

Avoid soiling lubrication system and bearings.

♦ **Cover open parts of engine.**

CAUTION

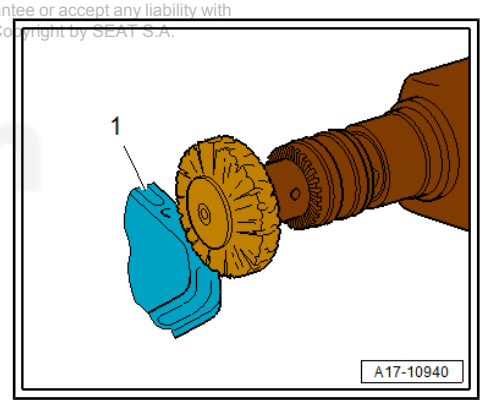
Wear protective gloves when working with sealant and grease remover!

– Remove sealant residue on cylinder block and oil pan using commercially available, chemical sealant remover.

– Remove sealant residue from sump using rotating plastic brush.

– Clean sealing surfaces.

– Sealing surfaces must be free of grease and oil.

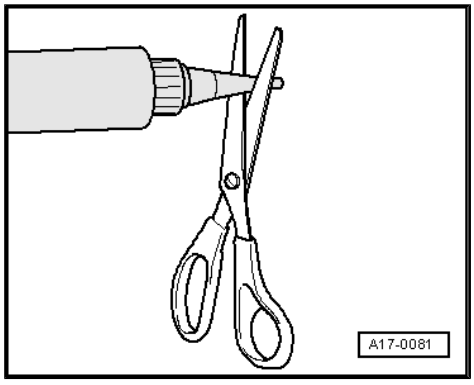


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with [illegible] document. Copyright by SEAT S.A.

Note

Observe use-by-date of sealant.

– Cut nozzle of tube at front marking (nozzle diameter approx. 2 ... 3 mm).



NOTICE

Risk of blocking lubrication system with excess sealant.

- **Do not apply sealant bead thicker than specified.**

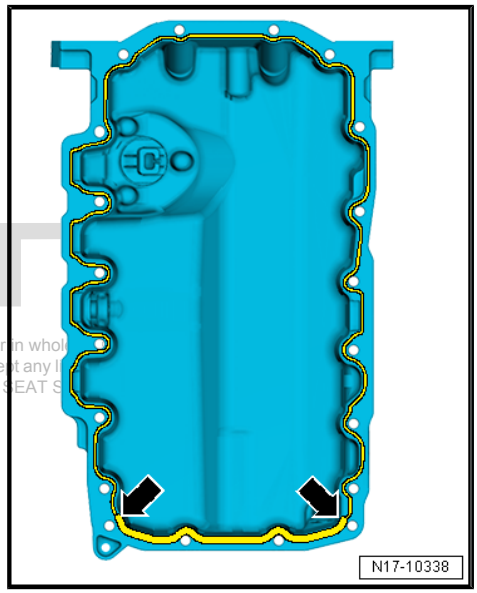
If sealing flange on belt pulley end has not been renewed

Note

After removing the old silicon seal, the lower surface of the sealing flange has an offset of approx. 1 mm on the pulley side toward the lower cylinder block surface. The offset must be compensated by applying sealant to the relevant section.

– Apply bead of sealant onto clean sealing surface of sump as illustrated.

– If necessary, use applicator gun - VAS 6966- when applying.



- In area of sealing surface of sealing flange on belt pulley end -between arrows-, sealant bead : 3-4 mm thick.
- In area of sealing surfaces between cylinder block and sealing flange on gearbox end: 2 to 3 mm.
- The sealant bead in the area of the sealing flange on belt pulley end must be able to substitute the no longer existent silicone gasket in terms of height and width.

Note

The sump must be installed within 5 minutes after applying the sealant.

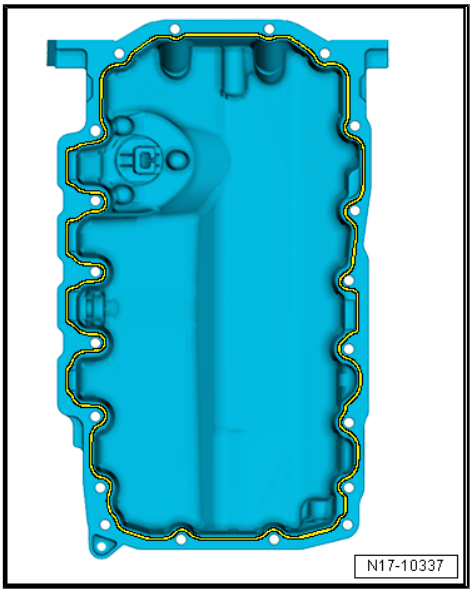
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

If sealing flange on belt pulley end has been renewed

– Apply bead of sealant onto clean sealing surface of sump as illustrated.

– If necessary, use applicator gun - VAS 6966- when applying.

♦ Thickness of sealant bead: 2 to 3 mm.



Note

♦ *The sealant bead must be applied to the part of the rear sealing flange with special care.*

♦ *The sump must be installed within 5 minutes after applying the sealant.*

Continuation for both procedures

– Insert baffle plate.

– Fit sump and tighten bolts ⇒ page 168 .

• The sump must make flush contact with intermediate plate/ gearbox flange.

Note

♦ *When installing sump with engine removed, ensure that sump is flush with cylinder block at flywheel end.*

♦ *After fitting sump assembly, the sealant must dry for approx. 30 minutes. Then (and only then) fill the engine with engine oil.*

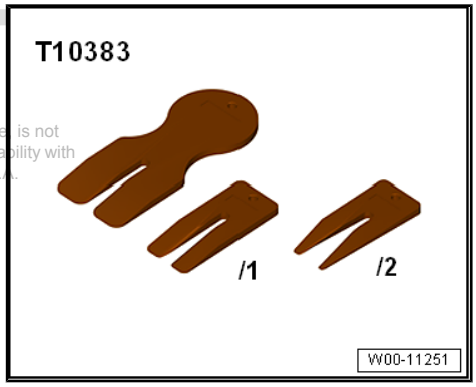
– Replenish engine oil and check oil level, Ateca ⇒ Maintenance ; Booklet KH1 .

– Replenish engine oil and check oil level, Leon ⇒ Maintenance ; Booklet 501 .

1.4 Removing and installing lower part of sump

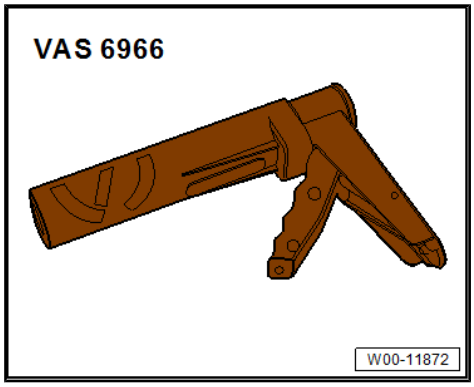
Special tools and workshop equipment required

♦ Wedges - T10383/2-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- Applicator gun - VAS 6966-



- Plastic mallet
- Scraper
- Sealant remover
- Hand drill with plastic brush
- Safety goggles
- Sealant ⇒ Electronic parts catalogue

Removing

– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .

– Remove front right wheel housing liners ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liner; Assembly overview - front wheel housing liner .

– Detach noise insulation for sump ⇒ page 171 .

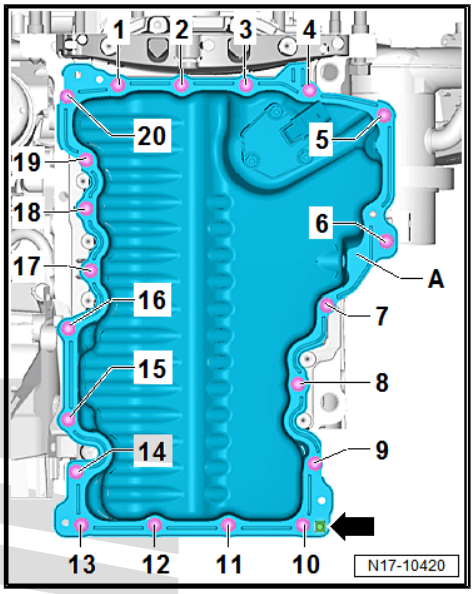
– Drain engine oil; Ateca ⇒ Maintenance ; Booklet KH1 .

– Drain engine oil; Leon ⇒ Maintenance ; Booklet 501 .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Loosen and unscrew bolts -1- to -20-.

– Screw in bolt for bottom section of sump 3 turns at welded nut -arrow-.



Note

- *Do not use excessive force when screwing in the bolt.*
- *If the bolt is screwed in too far, the bottom section of the sump may be deformed.*
- *Do not bend the bottom section of the sump when detaching the bonded joint.*

– Insert wedge - T10383/2- in the detached section of the bonded joint -arrow-.

– Fit recess at wedge - T10383/2- to the bolt.

Note

When driving in the wedge - T10383/2- , observe the toothed belt of the oil pump running in the sump.

– Use a plastic hammer to drive in the wedge. Carefully detach bottom section of sump from bonded joint.

– Keep bottom section of sump slightly under tension with wedge - T10383/2- .

– Apply another wedge - T10383/1- , and continue separating the remaining boded joint.

The reproduction, distribution and utilisation of this document for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Installing

– Check bottom section of sump for deformation, and straighten it as necessary in the area of the welded nut ⇒ page 177 .

NOTICE

Avoid soiling lubrication system and bearings.

- **Cover open parts of engine.**

– Spray sealing surface with sealant remover and wait for it to take effect.

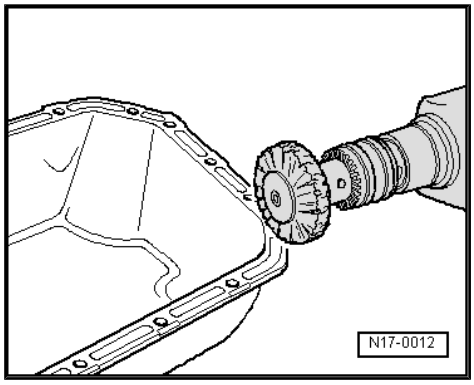
– Remove any sealant residue from bottom section of sump using a flat scraper.

– Make sure to not damage the surface coating of the bottom section of sump.

CAUTION

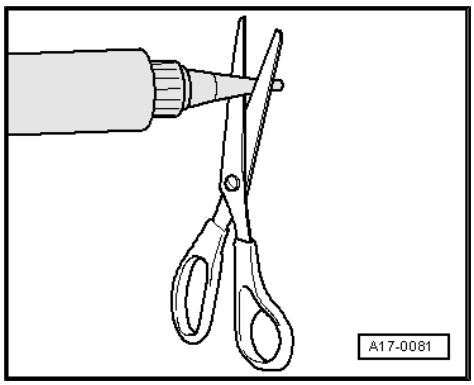
Wear protective gloves when working with sealant and grease remover!

– Remove sealant residue on sump (bottom section) using rotating plastic brush or similar.
– Completely remove any residual oil, grease and sealant remover from sealing surfaces, including the recesses in the bottom section of sump.
– The coating on the bottom section of sump must not be damaged. Risk of corrosion!



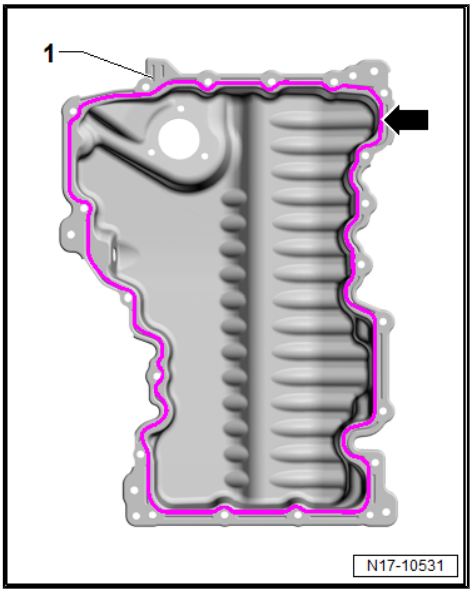
Note

Observe use-by date of sealant.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Cut off nozzle on tube at front marking (∅ of nozzle approx. 2 mm).



NOTICE

Risk of blocking lubrication system with excess sealant.

- **Do not apply sealant bead thicker than specified.**

– Apply bead of sealant -arrow- onto clean sealing surfaces of bottom section of sump -1- as shown in illustration.

– If necessary, use applicator gun - VAS 6966- when applying.

• Thickness of sealant bead: 2 to 3 mm.

Note

- *Take particular care when applying sealant bead in area of the sealing flange.*
- *Lower part of sump must be installed within 5 minutes after applying sealant.*

– Position bottom section of sump and tighten bolts ⇒ page 170 .

Note

After installing the sump (bottom section), wait about 30 minutes for the sealant to dry. Then (and only then) fill the engine with engine oil.

– Replenish engine oil and check oil level, Ateca ⇒ Maintenance ; Booklet KH1 .

– Replenish engine oil and check oil level, Leon ⇒ Maintenance ; Booklet 501 .

Specified torques

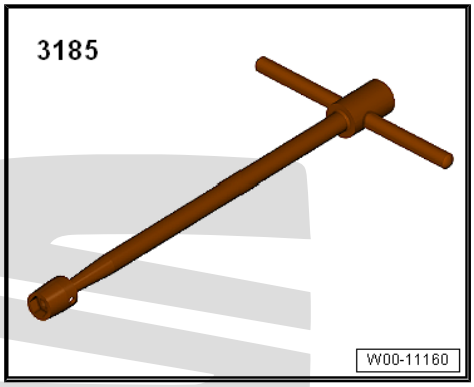
- ⇒ “1.1 Assembly overview - sump, oil pump”, page 166
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Assembly view - front wheel housing liner

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the information in this document. Copyright by SEAT S.A.

1.5 Removing and installing upper part of sump

Special tools and workshop equipment required

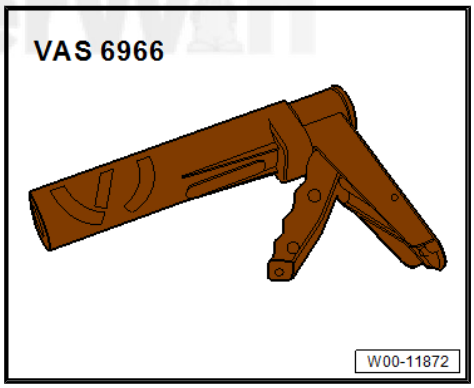
- U/J extension and socket, 10 mm - 3185-



- Socket wrench - T10058-

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- Applicator gun - VAS 6966-

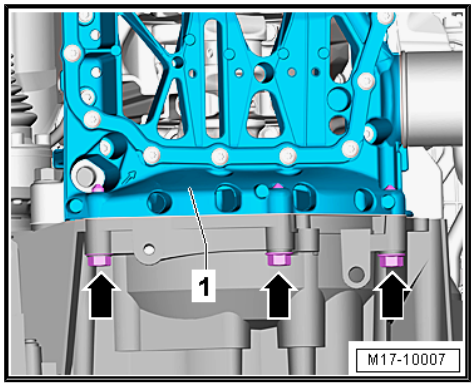


- Hand drill with plastic brush
- Sealant ⇒ Electronic parts catalogue
- Safety goggles

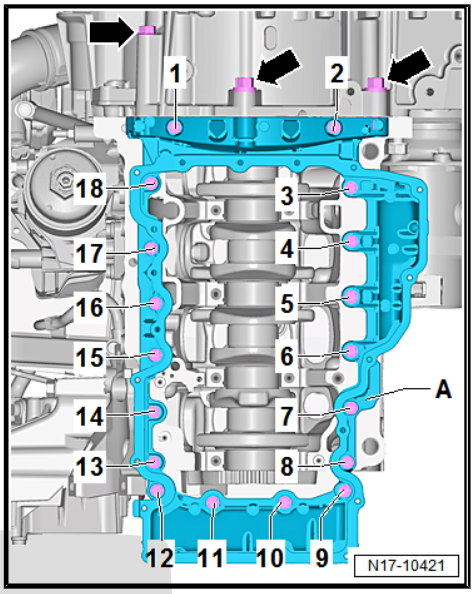
Removing

– Remove lower part of sump ⇒ page 172 .

– Unscrew securing bolts -arrows- for gearbox to upper section of sump -1-.



– Loosen bolts -1- to -18- diagonally, and unscrew them.
– Carefully release sump (top section) from bonded joint.
– Remove baffle plate.



Installing

NOTICE

Avoid soiling lubrication system and bearings.

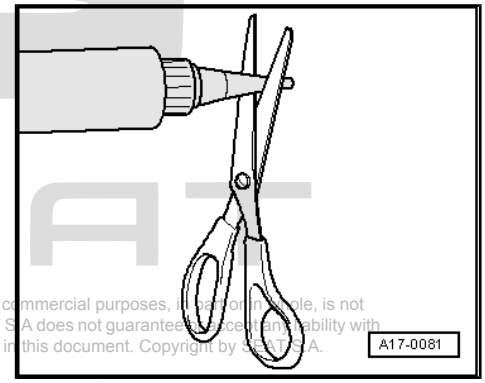
♦ **Cover open parts of engine.**

CAUTION

Wear protective gloves when working with sealant and grease remover!

– Remove sealant residue on cylinder block and top section of sump using commercially available, chemical sealant remover.
– Clean sealing surfaces, and make sure they are free of oil and grease.
– Observe use-by date of sealant.

– Cut nozzle of tube at front marking (nozzle diameter approx. 2 ... 3 mm).



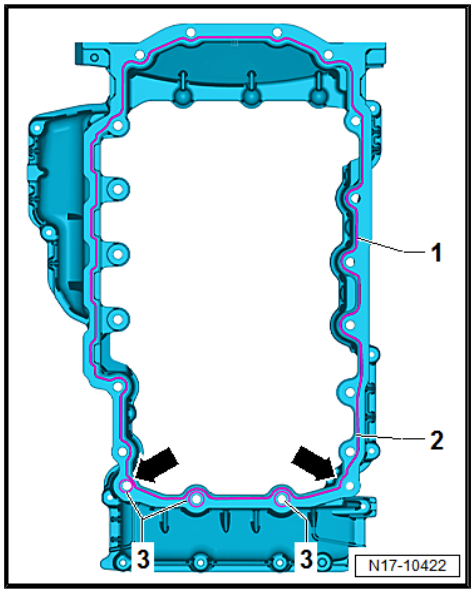
NOTICE

Risk of blocking lubrication system with excess sealant.

♦ **Do not apply sealant bead thicker than specified.**

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee the correctness and availability with respect to the correctness of information in this document. Copyright by SEAT S.A.

If sealing flange on belt pulley end has not been renewed



Note

- ♦ *After removing the old silicon seal, the lower surface of the sealing flange has an offset of approx. 1 mm on the pulley side toward the lower cylinder block surface.*
- ♦ *The offset must be compensated by applying sealant to the relevant area of the sealing surface of the top section of the sump.*

– Apply sealant bead -2- evenly onto clean sealing surface of top section of sump -1- as shown in illustration.

– If necessary, use applicator gun - VAS 6966- when applying.

- Apply sealant all around in area of holes -3-. Thickness of sealant bead: 2 ... 3 mm
- In area of sealing surface of sealing flange on belt pulley end -between arrows-, sealant bead : 3-4 mm thick.
- In area of sealing surfaces between cylinder block and sealing flange on gearbox end: 2 to 3 mm.
- The sealant bead in the area of the sealing flange on belt pulley end must be able to substitute the no longer existent silicone gasket in terms of height and width.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Note

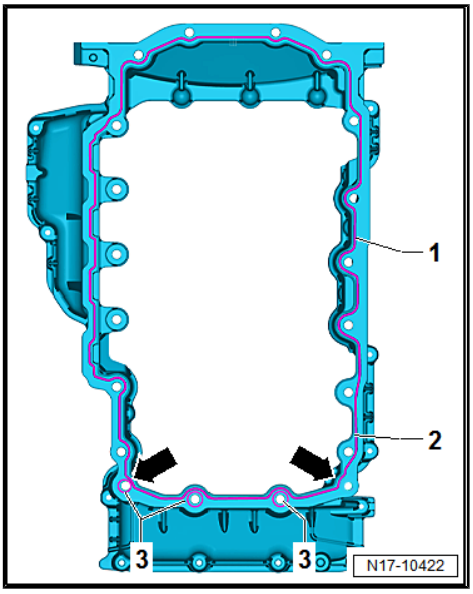
- ♦ *Apply the sealant bead with particular care around the sealing flanges.*
- ♦ *The top section of the sump must be installed within 5 minutes of the sealant being applied.*

If sealing flange on belt pulley end has been renewed

– Apply sealant bead -2- evenly onto clean sealing surface of top section of sump -1- as shown in illustration.

– If necessary, use applicator gun - VAS 6966- when applying.

- Apply sealant all around in area of holes -3-.
- Thickness of sealant bead: 2 ... 3 mm



Note

- *Apply the sealant bead with particular care around the sealing flanges.*
- *The top section of the sump must be installed within 5 minutes of the sealant being applied.*

Continuation for both procedures

– Insert baffle plate.

– Fit sump (top section) and tighten bolts ⇒ page 171 .

Note

- *The 3 bolts are coated with a special sealing varnish. Ensure the correct allocation when installing ⇒ page 171 .*
- *For allocation of bolts refer to ⇒ Electronic Parts Catalogue .*
- *Renew bolts.*
- *When installing the top section of sump with the engine removed from the vehicle, ensure that the top section of the sump is flush with the cylinder block at the flywheel end.*
- *Allow sealant to cure for approx. 30 minutes after installing top section of sump. Then (and only then) fill the engine with engine oil.*

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- The top section of the sump must be flush with the gearbox flange at the intermediate plate.

– Replenish engine oil, and check oil level ⇒ Maintenance ; Booklet .

Specified torques

- ⇒ “1.1 Assembly overview - sump, oil pump”, page 166
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liner; Assembly overview- front wheel housing liner .

1.6 Removing and installing oil pump

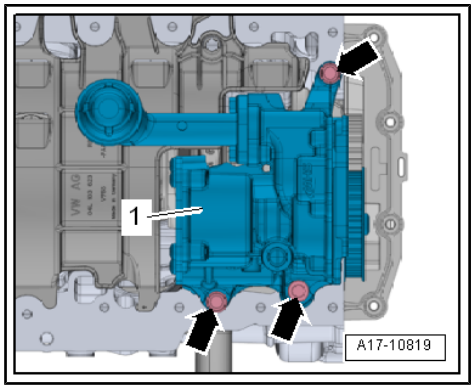
Removing

– Remove the oil sump ⇒ page 172 .

NOTICE

Do not kink or twist toothed belt or damage it on sharp edges.

– Remove bolts -arrows- and detach oil pump -1-.



NOTICE

The bolt on the pump impeller must NOT be loosened.

Installing

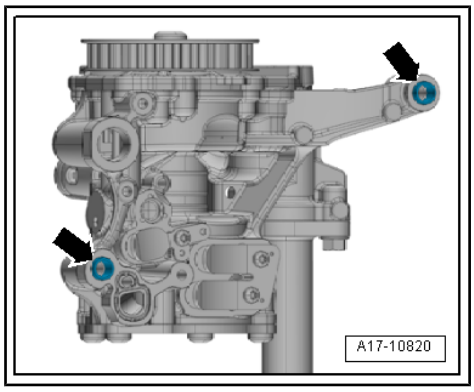
Install in reverse order of removal, observing the following.

Note

- *Seal must be renewed if removed*
- *Renew bolts that are tightened with turning further angle after each removal.*

– Insert dowel sleeves -arrows- in oil pump, if not fitted.

– Install sump ⇒ page 172 .



Specified torques

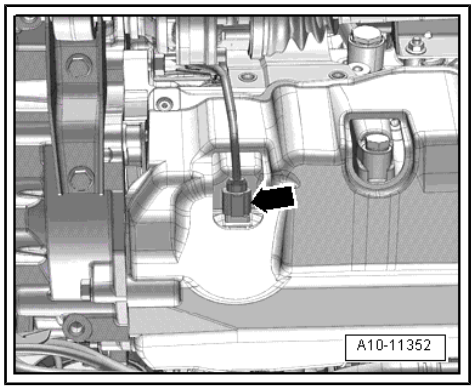
- ⇒ “1.1 Assembly overview - sump, oil pump”, page 166

1.7 Removing and installing oil level and oil temperature sender - G266-

Removing

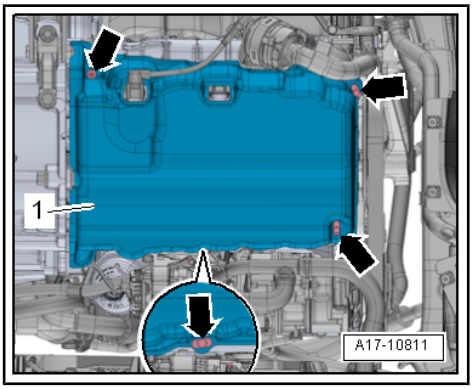
- Drain engine oil; Ateca ⇒ Maintenance ; Booklet KH1 .
- Drain engine oil; Leon ⇒ Maintenance ; Booklet 501 .

– Unplug electrical connector -arrow- at oil level and oil temperature sender - G266- .



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Release fasteners -arrows- and detach noise insulation -1- for sump.
– To do this, pull pins out of spreader rivets.



– Unscrew bolts -1-, and remove oil level and oil temperature sender - G266- -4-.

Installing

Install in reverse order of removal, observing the following.

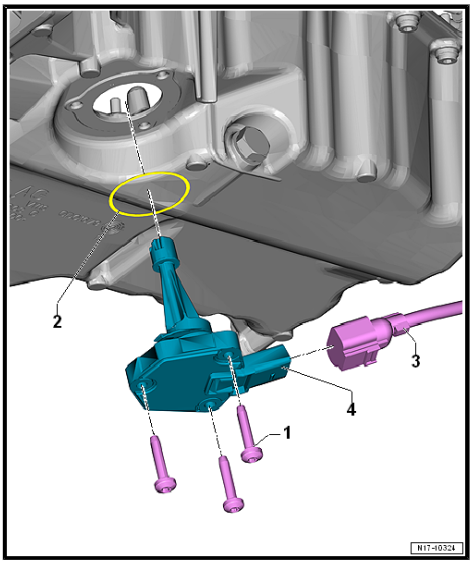
Note

Renew seal -2- and self-locking bolts -1-.

– Replenish engine oil and check oil level, Ateca ⇒ Maintenance ; Booklet KH1 .
– Replenish engine oil and check oil level, Leon ⇒ Maintenance ; Booklet 501 .

Specified torques

♦ ⇒ “1.1 Assembly overview - sump, oil pump”, page 166



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

2 Engine oil cooler

Note

Engine oil cooler must not be separated from oil filter housing. If defective, engine oil cooler must be renewed together with oil filter housing *⇒ page 192* *.*

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

3 Oil filter, oil pressure switch

⇒ “3.1 Assembly overview - oil filter housing, oil pressure switch”, page 187

⇒ “3.2 Removing and installing oil pressure switch F1 ”, page 188

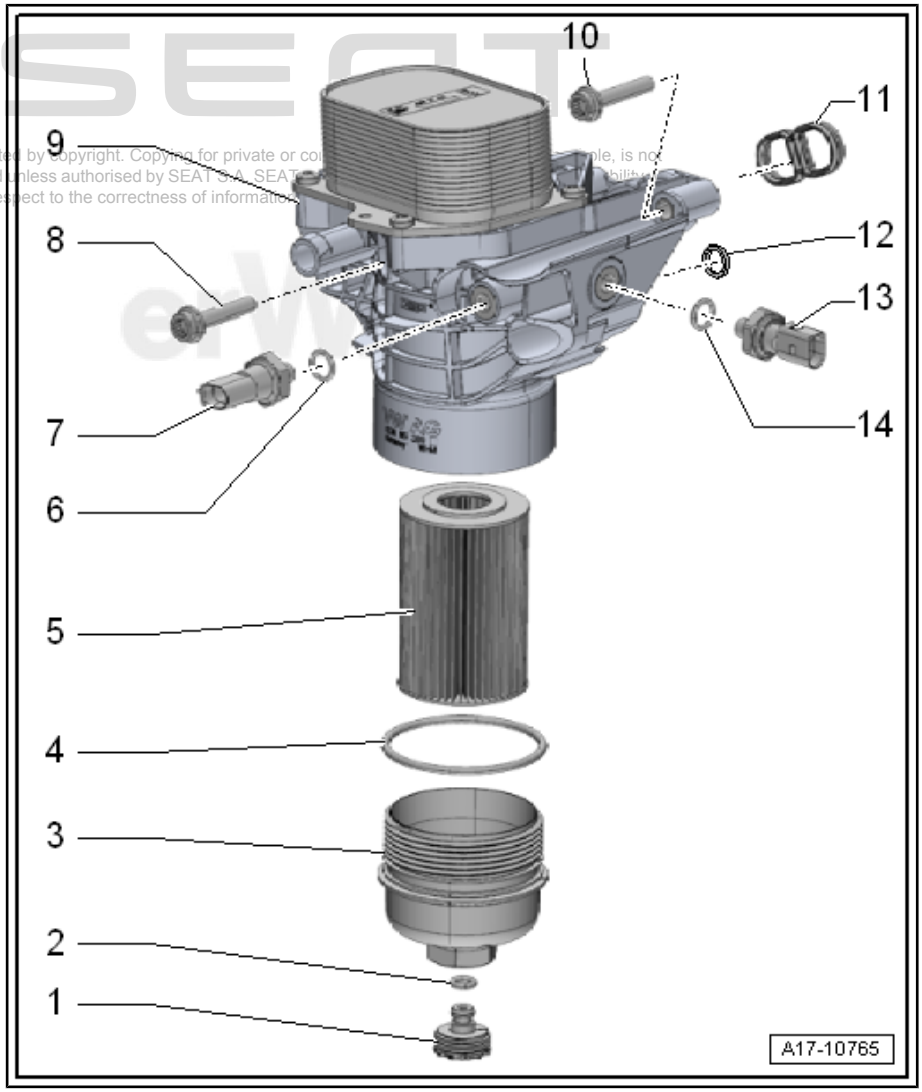
⇒ “3.3 Removing and installing oil pressure switch for reduced oil pressure F378 ”, page 190

⇒ “3.4 Checking oil pressure”, page 192

⇒ “3.5 Removing and installing oil filter housing”, page 192

⇒ “3.6 Removing and installing valve for oil pressure control N428 ”, page 194

3.1 Assembly overview - oil filter housing, oil pressure switch



1 - Oil drain plug
- ❑ 5 Nm

2 - O-ring
- ❑ Renew after removal

3 - Sealing cap
- ❑ 25 Nm

4 - O-ring
- ❑ Renew after removal
- ❑ Lubricate lightly with engine oil

5 - Oil filter cartridge
- ❑ See note ⇒ page 166 .
- ❑ Removing and installing; Ateca ⇒ Maintenance ; Booklet KH1 .
- ❑ Removing and installing; Leon ⇒ Maintenance ; Booklet 501 .

6 - Radial oil seal
- ❑ Captive. In the event of leaks, renew oil pressure switch.

7 - Oil pressure switch - F1-
- ❑ Opening/closing pressure 2.5 ... 3.2 bar
- ❑ Brown insulation
- ❑ Checking in Guided Fault Finding ⇒ Vehicle diagnostic tester
- ❑ Removing and installing ⇒ page 188
- ❑ 20 Nm

8 - Bolt
- ❑ Renew after removal
- ❑ Specified torque and sequence ⇒ page 188 .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document.

9 - Oil filter housing with engine oil cooler

- ❑ Do not separate oil filter housing and engine oil cooler
- ❑ Removing and installing ⇒ page 192

10 - Bolt

- ❑ Renew after removal
- ❑ Specified torque and sequence ⇒ page 188 .

11 - Gasket

- ❑ Renew after removal

12 - Radial oil seal

- ❑ Renew after removal

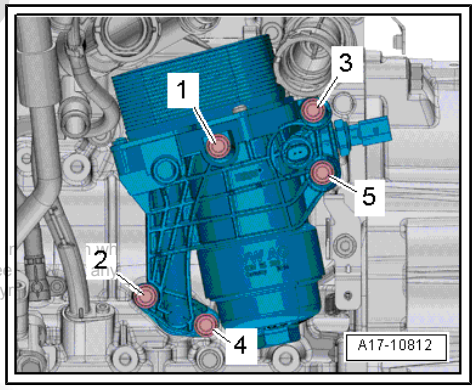
13 - Oil pressure switch for reduced oil pressure - F378-

- ❑ Opening/closing pressure 0.3 ... 0.6 bar
- ❑ Green insulation
- ❑ Checking in `Guided Fault Finding` ⇒ Vehicle diagnostic tester
- ❑ Removing and installing ⇒ page 190
- ❑ 20 Nm

14 - O-ring

- ❑ Captive. In the event of leaks, renew oil pressure switch.

Oil filter housing - specified torque and sequence



Note

Renew bolts that are tightened with turning further angle after each removal.

Protected by copyright. Copying for private or commercial purposes, ... permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee ... respect to the correctness of information in this document. Copy...

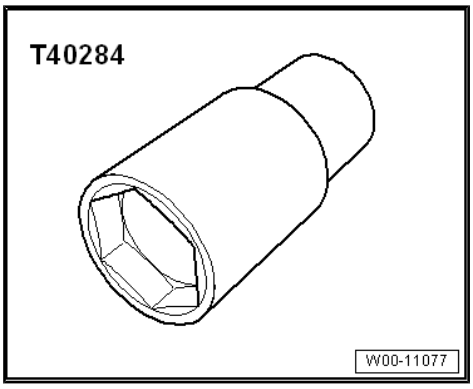
– Fit bolts at top left and bottom right first.
– Tighten bolts in stages in the sequence shown:

Stage	Bolts	Specified torque/turning further angle
1st	-1 - 5-	20 Nm
2nd	-1 - 5-	Turn 90° further

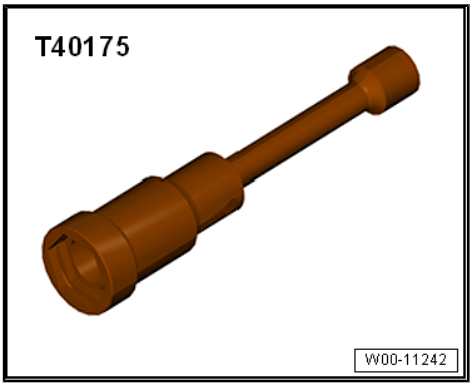
3.2 Removing and installing oil pressure switch - F1-

Special tools and workshop equipment required

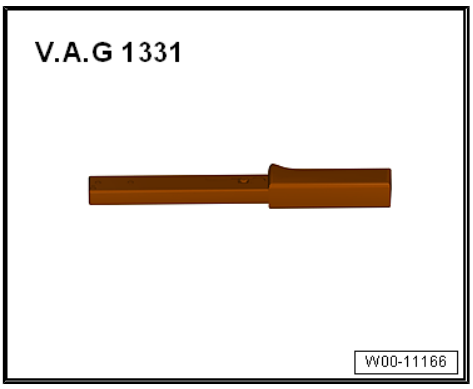
♦ Socket AF 24 - T40284-



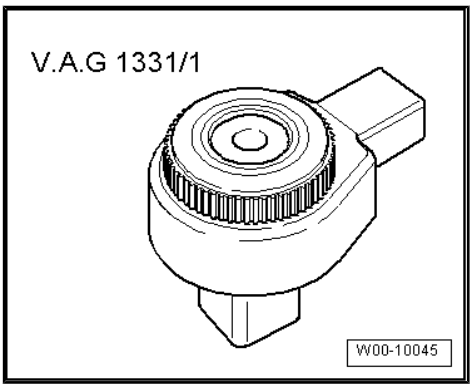
- Jointed wrench 24 mm - T40175-



- Torque wrench - V.A.G 1331-



- Ratchet - V.A.G 1331/1-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

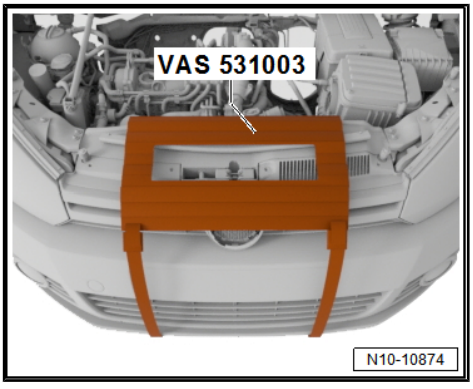
- Protective mat - VAS 531003-

Removing

– Remove engine cover panel ⇒ page 56 .

– Remove radiator cowl ⇒ page 317 .

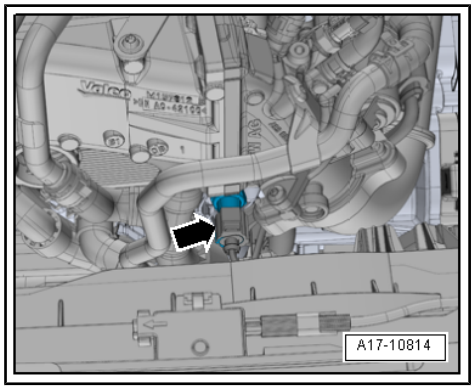
– Install protective mat - VAS 531003- to vehicle as shown in illustration.



– Disconnect electrical connector -arrow-.

– Use cloth to catch escaping engine oil.

– Unscrew oil pressure switch - F1- using socket 24 mm - T40284- or articulated socket 24 mm - T40175- .



Installing

Install in reverse order of removal, observing the following.

– Renew drain plug seal after removing ⇒ Item 6 (page 187) . For allocation, refer to ⇒ Electronic Parts Catalogue

– Cut off seal to replace.

– Install engine cover panel ⇒ page 56 .

– Check oil level ⇒ page 171 .

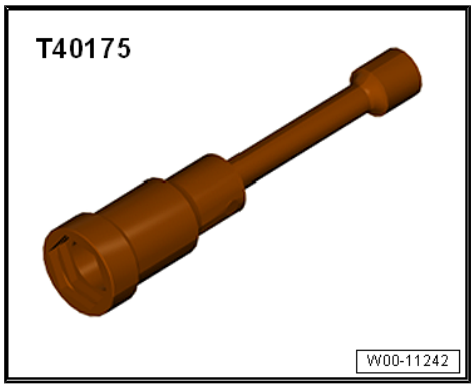
Specified torques

- ⇒ “3.1 Assembly overview - oil filter housing, oil pressure switch”, page 187
- ⇒ “4.1 Assembly overview - air filter housing”, page 420
- ⇒ “4.2 Assembly overview - radiator cowl and radiator fans”, page 307

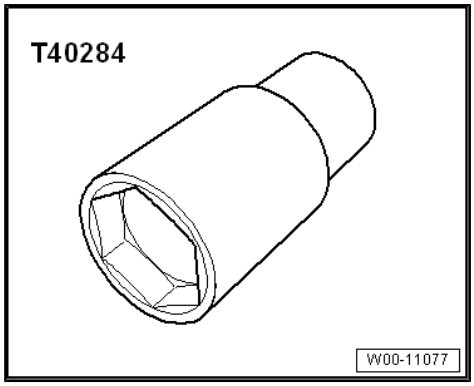
3.3 Removing and installing oil pressure switch for reduced oil pressure - F378-

Special tools and workshop equipment required

- 24 mm jointed spanner - T40175-

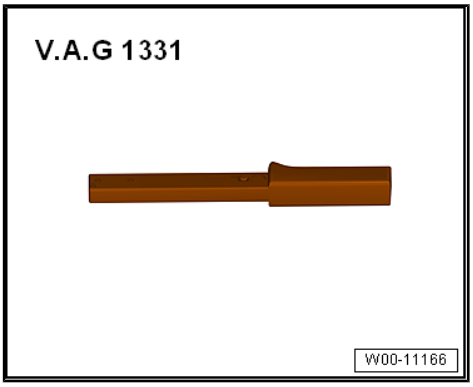


- Socket AF 24 - T40284-

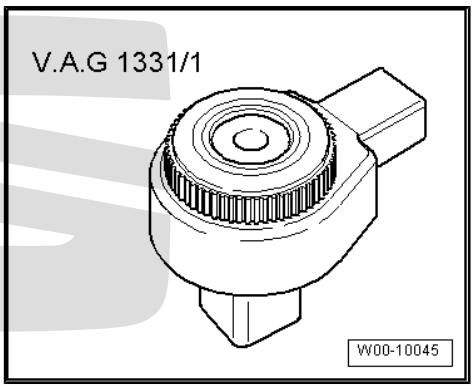


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- Torque wrench - V.A.G 1331-



- Ratchet - V.A.G 1331/1-



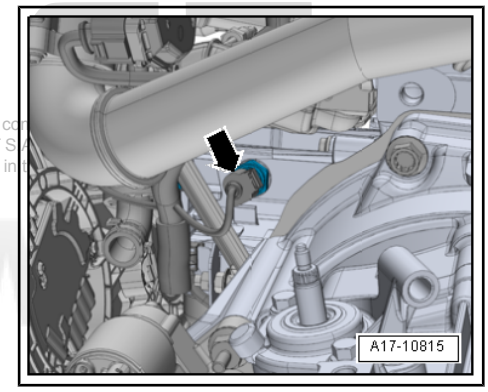
Removing

– Remove air filter housing ⇒ page 422 .

– Disconnect electrical connector -arrow-.

– Use cloth to catch escaping engine oil.

– Use socket 24 mm - T40284- or articulated wrench 24 mm - T40175- to unscrew oil pressure switch for reduced oil pressure - F378- .



Installing

Install in reverse order of removal, observing the following.

– Renew drain plug seal after removing ⇒ Item 14 (page 188) . For allocation, refer to ⇒ Electronic Parts Catalogue

– Cut off seal to replace.

Note

After removal, renew the oil pressure switch.

– Check oil level, Ateca ⇒ Maintenance ; Booklet KH1 .

– Check oil level, Leon ⇒ Maintenance ; Booklet 501 .

Specified torques

- ⇒ “3.1 Assembly overview - oil filter housing, oil pressure switch”, page 187
- ⇒ “4.1 Assembly overview - air filter housing”, page 420

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. will not assume any liability with respect to the correctness of information in this document.

3.4 Checking oil pressure

Note

Due to the clutch speed protection system it is not possible to select all stages of the oil pressure control when the vehicle is stationary. For this reason, oil pressure must be checked using the vehicle diagnostic tester.

– Connect vehicle diagnostic tester.

– Follow the following path to the oil pressure check:

`Self-diagnosis-capable systems`

`0001 - Repair groups`

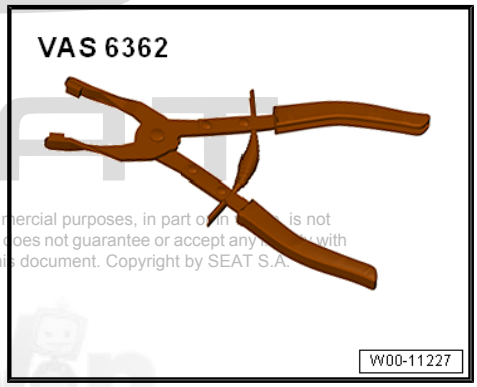
`17 - Lubrication`

`Checking oil pressure`

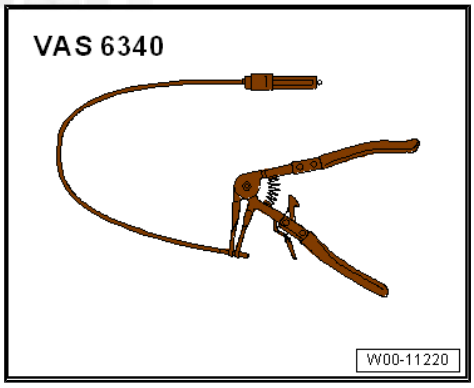
3.5 Removing and installing oil filter housing

Special tools and workshop equipment required

♦ Hose clip pliers - VAS 6362-



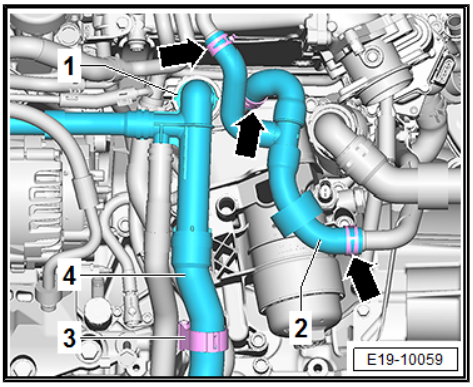
♦ Hose clip pliers - VAS 6340-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Removing

– Remove air filter housing ⇒ page 421 .
– Remove radiator cowl ⇒ page 317 .
– Remove coolant pipe (front left) ⇒ page 288 .
– Release hose clamps -arrow-, remove coolant hose -2-.
– Detach coolant hose -4- from retainer -3-.
– Lift retaining clip -1- and detach connection for coolant.

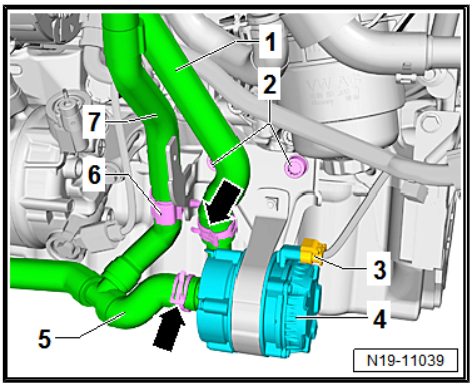


– Release and unplug electrical connector -3-.

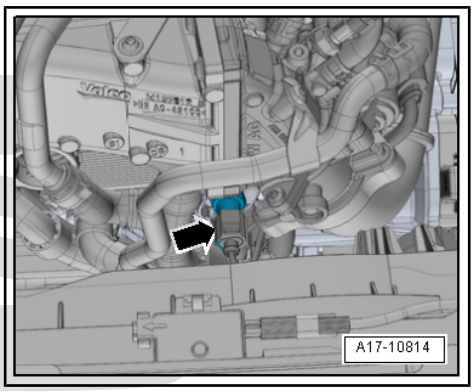
Note

Ignore -positions 1, 5, 6 and 7- and -arrows-.

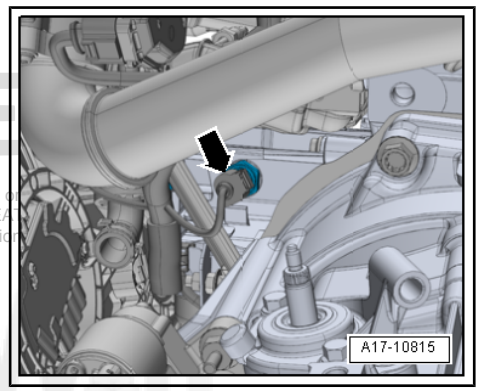
– Unscrew the two bolts -2-.
– Remove the pump for charge air cooling - V188- -4- together with the bracket.



– Unplug the electrical connector -arrow- on the oil pressure switch - F1- .
– Unclip wiring harness from retainer.



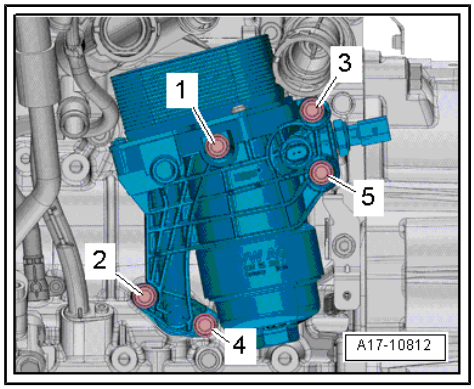
– Unplug electrical connector -arrow- at oil pressure switch for reduced oil pressure - F378- .



Protected by copyright. Copying for private
permitted unless authorised by SEAT S.A. SE
respect to the correctness of information

– Use cloth to catch escaping engine oil.

– Unscrew bolts in the sequence -5 ... 1- and detach oil filter housing together with engine oil cooler.



Installing

Install in reverse order of removal, observing the following.

Note

- *Renew seal and O-ring after removal.*
- *Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .*

– Install coolant pipe (front left) ⇒ page 288 .

– Install radiator cowl ⇒ page 317 .

– Connect coolant hose with plug-in connector ⇒ page 306 .

– Add coolant ⇒ page 214 .

Specified torques

- ⇒ “3.1 Assembly overview - oil filter housing, oil pressure switch”, page 187
- ⇒ “2.2 Assembly overview - electric coolant pump”, page 250
- ⇒ “4.1 Assembly overview - air filter housing”, page 420

3.6 Removing and installing valve for oil pressure control - N428-

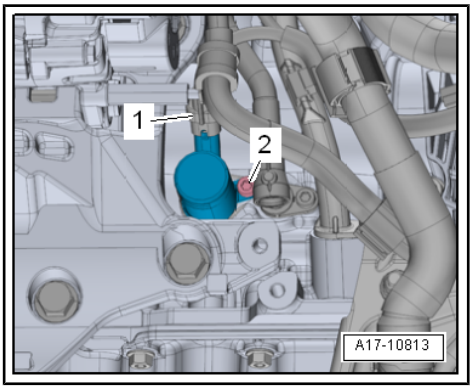
Removing

– Remove poly V-belt ⇒ page 59 .

– Detach air conditioner compressor from bracket with refrigerant hoses connected ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioning compressor; removing from and installing in bracket and tie up to right side.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Unplug the electrical connector -1-.
– Use cloth to catch escaping engine oil.
– Unscrew bolt -2- and remove valve for oil pressure control - N428- .



Installing

Install in reverse order of removal, observing the following.

Note

O-ring must be renewed if removed

– Install poly V-belt ⇒ page 59 .
– Check oil level, Ateca ⇒ Maintenance ; Booklet KH1 .
– Check oil level, Leon ⇒ Maintenance ; Booklet 501 .

Specified torques

♦ ⇒ “1.1 Assembly overview - sump, oil pump”, page 166
♦ Drive unit of air conditioner compressor ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Assembly overview - drive unit of air conditioner compressor .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

4 Oil circuit

⇒ “4.1 Oil supply pipe: removing and fitting”, page 196

⇒ “4.2 Removing and installing oil return line for turbocharger”, page 197

4.1 Oil supply pipe: removing and fitting

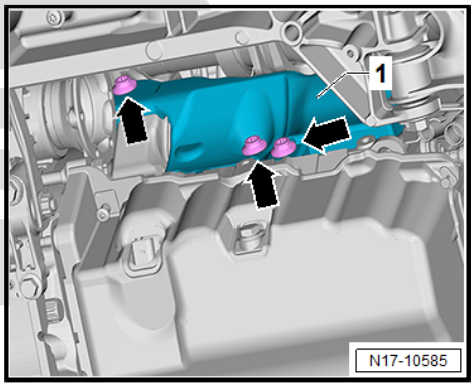
Front-wheel drive vehicles:

– Remove heat shield for right drive shaft ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft heat shield .

– Detach drive shaft on right of gearbox ⇒ Rep. gr. 40 ; Drive shaft; Assembly overview - drive shaft .

– Remove exhaust gas recirculation cooler ⇒ page 567 .

– Remove heat shield -1-. To do so, remove bolts -arrows-.



Vehicles with four wheel drive:

– Remove bevel box ⇒ Rep. gr. 34 ; Bevel box; Removing bevel box .

– Remove exhaust gas recirculation cooler ⇒ page 567 .

– Remove heat shield between bevel box and engine.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Continued for all vehicles:

– Unscrew bolt -2-.

– Screw union nut -4- off.

– Unscrew banjo bolt -1-.

– Remove the oil feed tube,

Installing

Installation is carried out in reverse order; noting the following:

– Renew seals after removal.

Note

After installing turbocharger, run engine for about 1 minute at idling speed to ensure that oil is supplied to turbocharger. Do not rev engine immediately.

Specified torques

Component	Specified torque
Bolts for heat shield on gearbox at rear	16 Nm

- ⇒ “1.1 Assembly overview - turbocharger”, page 326
- ⇒ “3.1 Assembly overview - coolant pipes”, page 282
- ⇒ “1.1 Assembly overview - silencers”, page 473
- ⇒ “5.1 Assembly overview - exhaust gas recirculation”, page 562
- ⇒ “2.1 Assembly overview - emission control”, page 500
- ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Assembly overview - drive shaft .
- ⇒ Rep. gr. 34 ; bevel box

4.2 Removing and installing oil return line for turbocharger

Front-wheel drive vehicles:

– Remove heat shield for right drive shaft ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft heat shield .

– Detach drive shaft on right of gearbox ⇒ Rep. gr. 40 ; Drive shaft; Assembly overview - drive shaft .

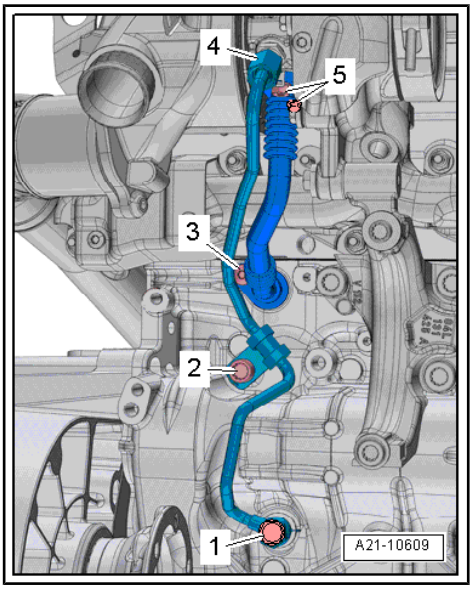
– Remove exhaust gas recirculation cooler ⇒ page 567 .

Vehicles with four wheel drive:

– Remove exhaust gas recirculation cooler ⇒ page 567 .

– Remove heat shield between bevel box and engine.

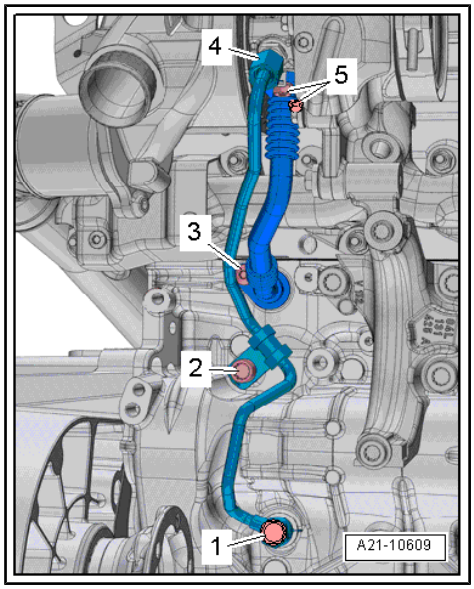
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



Continued for all vehicles:

– Unscrew bolts -3- and -5-.

– Remove oil return line.



Installing:

Installation is carried out in reverse order; noting the following:

– Renew gasket and seal after removal.

Note

After installing turbocharger, run engine for about 1 minute at idling speed to ensure that oil is supplied to turbocharger. Do not rev engine immediately.

- ⇒ “1.1 Assembly overview - turbocharger”, page 326
- ⇒ “3.1 Assembly overview - coolant pipes”, page 282
- ⇒ “1.1 Assembly overview - silencers”, page 473
- ⇒ “5.1 Assembly overview - exhaust gas recirculation”, page 562
- ⇒ “2.1 Assembly overview - emission control”, page 500
- ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Assembly overview - drive shaft .
- ⇒ Rep. gr. 34 ; bevel box

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

19 – Cooling

1 Cooling system, coolant

⇒ “1.1 Schematic diagram - coolant hoses”, page 199

⇒ “1.2 Checking cooling system for leaks”, page 209

⇒ “1.3 Draining coolant”, page 211

⇒ “1.4 Filling with coolant:”, page 214

⇒ “1.5 Checking electric vacuum pump VAS 6096/2 ”, page 224

⇒ “1.6 Flushing cooling system”, page 224

⇒ “1.7 Flushing cooling system, quick reference guide”, page 244

1.1 Schematic diagram - coolant hoses

⇒ “1.1.1 Schematic diagram for coolant hoses, vehicles with water-cooled turbocharger”, page 199

⇒ “1.1.2 Schematic diagram - coolant hoses”, page 202

⇒ “1.1.3 Coolant hose schematic diagram, vehicles with gear oil cooler and auxiliary heater”, page 204

⇒ “1.1.4 Coolant hose schematic diagram, vehicles with exhaust gas recirculation valve 1 GX5 ”, page 206

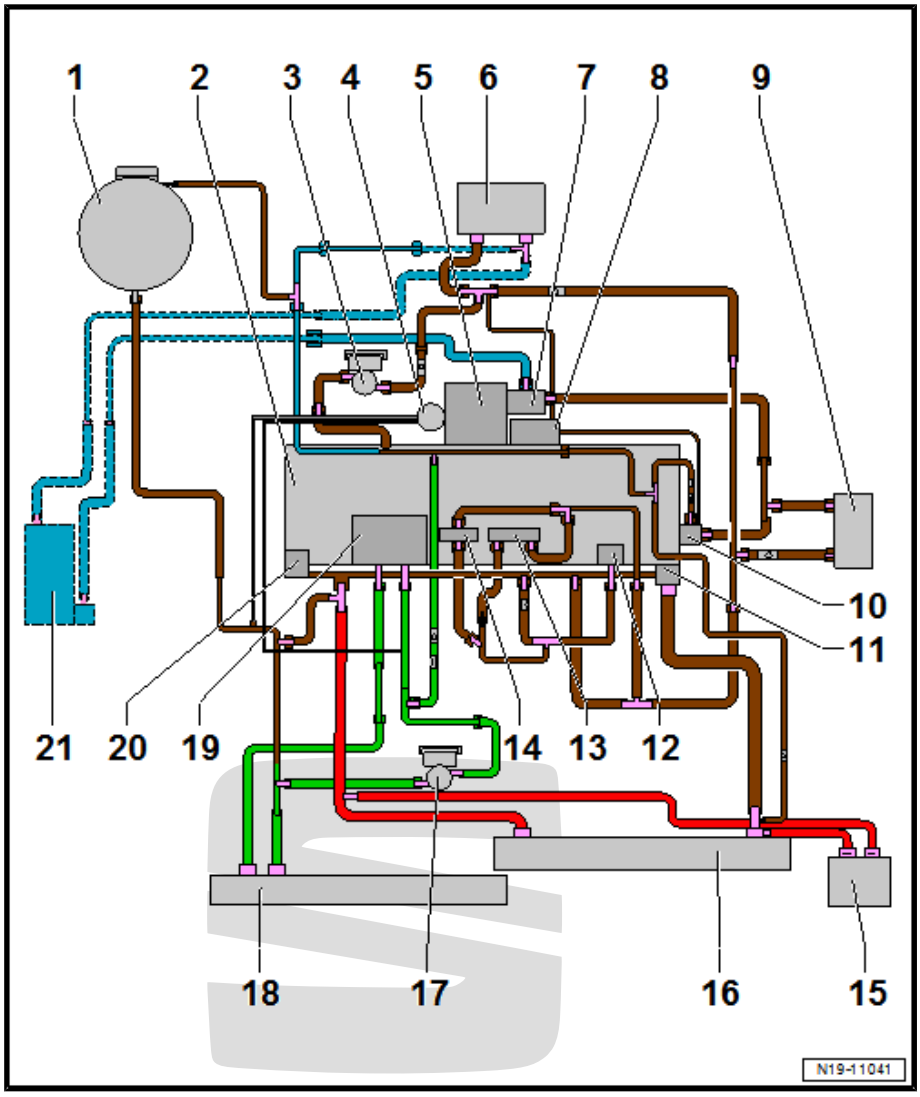
⇒ “1.1.5 Coolant hose schematic diagram, vehicles with exhaust gas recirculation valve 1 GX5 , gear oil cooler and auxiliary heater”, page 208

1.1.1 Schematic diagram for coolant hoses, vehicles with water-cooled turbocharger

Note

- *Blue = Large coolant circuit.*
- *Red = Small coolant circuit.*
- *Orange = Coolant circuit for charge air cooler.*
- *Brown = Heating circuit.*
- *Arrows show direction of coolant flow.*

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



1 - Coolant expansion tank

- With filler cap for coolant expansion tank
- Checking pressure relief valve ⇒ page 211

2 - Cylinder head/cylinder block

- Assembly overview - cylinder head ⇒ page 100
- Assembly overview - cylinder block ⇒ page 57

3 - Auxiliary pump for heating - V488-

- Assembly overview ⇒ page 250
- Removing and installing ⇒ page 257

4 - Injector for reduction agent - N474-

- Assembly overview ⇒ page 540
- Removing and installing ⇒ page 537

5 - Emission control module

- Assembly overview ⇒ page 500
- Removing and installing ⇒ page 506

6 - Heat exchanger for heater

- ⇒ Heating, air conditioning; Rep. gr. 80 ; Overview of fitting locations - heating

7 - Exhaust gas recirculation cooler

- Assembly overview ⇒ page 562
- Removing and installing ⇒ page 567
- Check for leaks ⇒ page 580

8 - Turbocharger

- Assembly overview ⇒ page 328
- Removing and installing ⇒ page 346

9 - Gear oil cooler

- ⇒ Rep. gr. 34 ; Gear oil circuit; Removing and installing gear oil cooler

10 - Coolant hose/pipe connection

- Fitting location ⇒ Item 13 (page 101)

11 - Thermostat

- Assembly overview ⇒ page 246
- Removing and installing ⇒ page 273

12 - Engine oil cooler

- Assembly overview ⇒ page 187
- Removing and installing ⇒ page 186

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

13 - Exhaust gas recirculation valve 1 - GX5-

- ❑ Consisting of: Potentiometer for exhaust gas - G212- and control motor for exhaust gas - V338-
- ❑ Assembly overview ⇒ page 566
- ❑ Removing and installing ⇒ page 574

14 - Throttle valve control mechanism - J338-

- ❑ Assembly overview ⇒ page 424
- ❑ Removing and installing ⇒ page 429

15 - Auxiliary radiator

- ❑ Other versions

16 - Radiator

- ❑ Assembly overview ⇒ page 303
- ❑ Removing and installing ⇒ page 311

17 - Charge air cooling pump - V188-

- ❑ Assembly overview ⇒ page 250
- ❑ Removing and installing ⇒ page 257

18 - Radiator for charge air cooling circuit

- ❑ Assembly overview ⇒ page 303
- ❑ Removing and installing ⇒ page 312

19 - Intake manifold with charge air cooler

- ❑ Assembly overview ⇒ page 424
- ❑ Removing and installing ⇒ page 426
- ❑ Check for leaks ⇒ page 368

20 - Coolant pump

- ❑ Assembly overview ⇒ page 246
- ❑ Removing and installing ⇒ page 272

21 - Auxiliary Heater

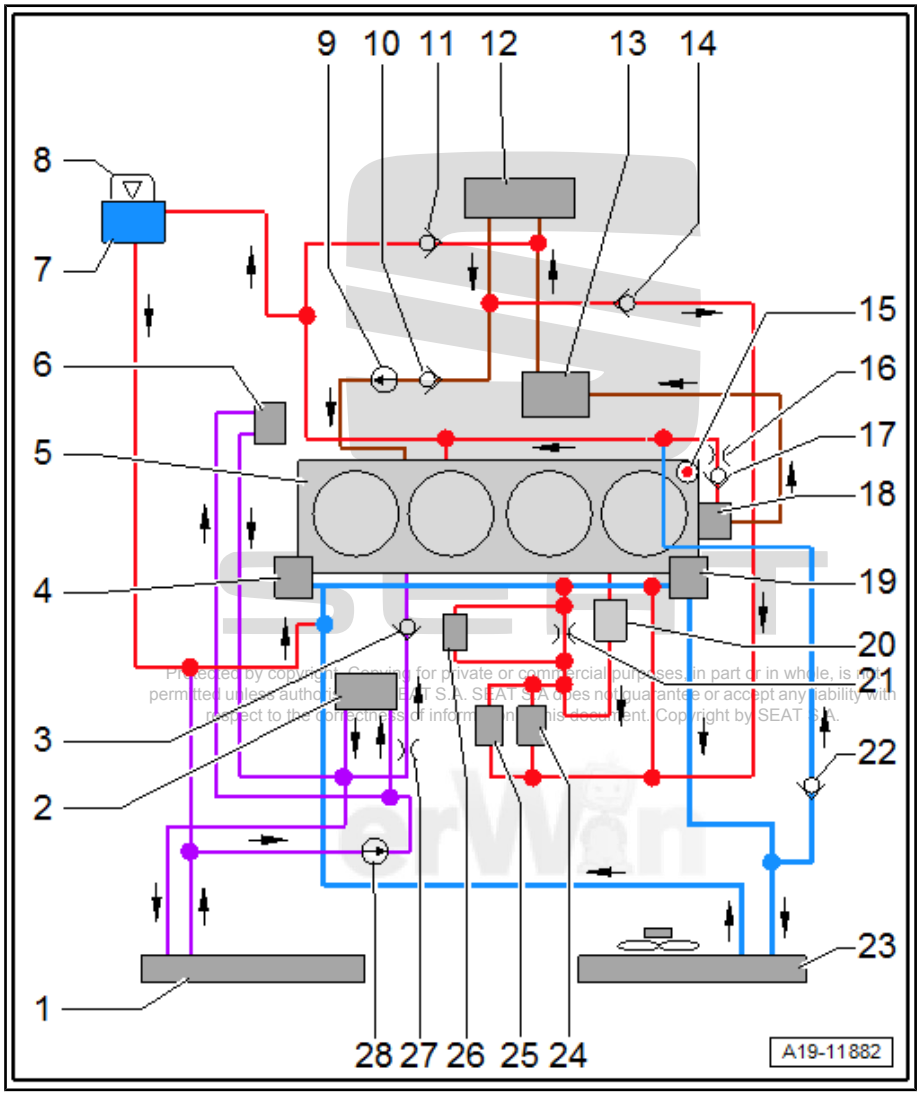
- ❑ Depending on vehicle equipment

SEAT
Reproduction or copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.
erWin

1.1.2 Schematic diagram - coolant hoses

Note

- *Blue = Large coolant circuit.*
- *Red = Small coolant circuit.*
- *Purple = charge air cooler coolant circuit.*
- *Brown = Heating circuit.*
- *Arrows show direction of coolant flow.*



1 - Radiator for charge air cooling circuit

- ❑ Assembly overview ⇒ page 303
- ❑ Removing and installing ⇒ page 317

2 - Intercooler system

- ❑ Assembly overview ⇒ page 362
- ❑ Removing and installing ⇒ page 426
- ❑ Check for leaks ⇒ page 368

3 - Non-return valve

4 - Coolant pump

- ❑ Assembly overview ⇒ page 246
- ❑ Removing and installing ⇒ page 272

5 - Cylinder head/cylinder block

6 - Injector for reduction agent - N474-

7 - Coolant expansion tank

8 - Sealing cap

- ❑ For coolant expansion tank
- ❑ Checking pressure relief valve ⇒ page 211

9 - Auxiliary pump for heating - V488-

- ❑ Assembly overview ⇒ page 250
- ❑ Removing and installing ⇒ page 257

10 - Non-return valve

11 - Non-return valve

- ❑ Depending on equipment.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

12 - Heat exchanger for heater

13 - Exhaust gas recirculation cooler

- ❑ Assembly overview ⇒ page 562
- ❑ Removing and installing ⇒ page 567
- ❑ Check for leaks ⇒ page 580

14 - Non-return valve

15 - Coolant temperature sender - G62-

- ❑ Removing and installing ⇒ page 278

16 - Throttle

17 - Non-return valve

18 - Coolant hose/pipe connection

19 - Thermostat

- ❑ Assembly overview ⇒ page 246
- ❑ Removing and installing ⇒ page 273

20 - Engine oil cooler

21 - Throttle

22 - Non-return valve

23 - Radiator

- ❑ Assembly overview ⇒ page 303
- ❑ Removing and installing ⇒ page 311

24 - Throttle valve control mechanism - J338-

- ❑ Assembly overview ⇒ page 424
- ❑ Removing and installing ⇒ page 429

25 - Exhaust gas recirculation valve 1 - GX5-

- ❑ Consisting of: Potentiometer for exhaust gas - G212- and control motor for exhaust gas - V338-
- ❑ Assembly overview ⇒ page 566
- ❑ Removing and installing ⇒ page 574

26 - External engine heater

- ❑ Depending on vehicle equipment

27 - Throttle

28 - Charge air cooling pump - V188-

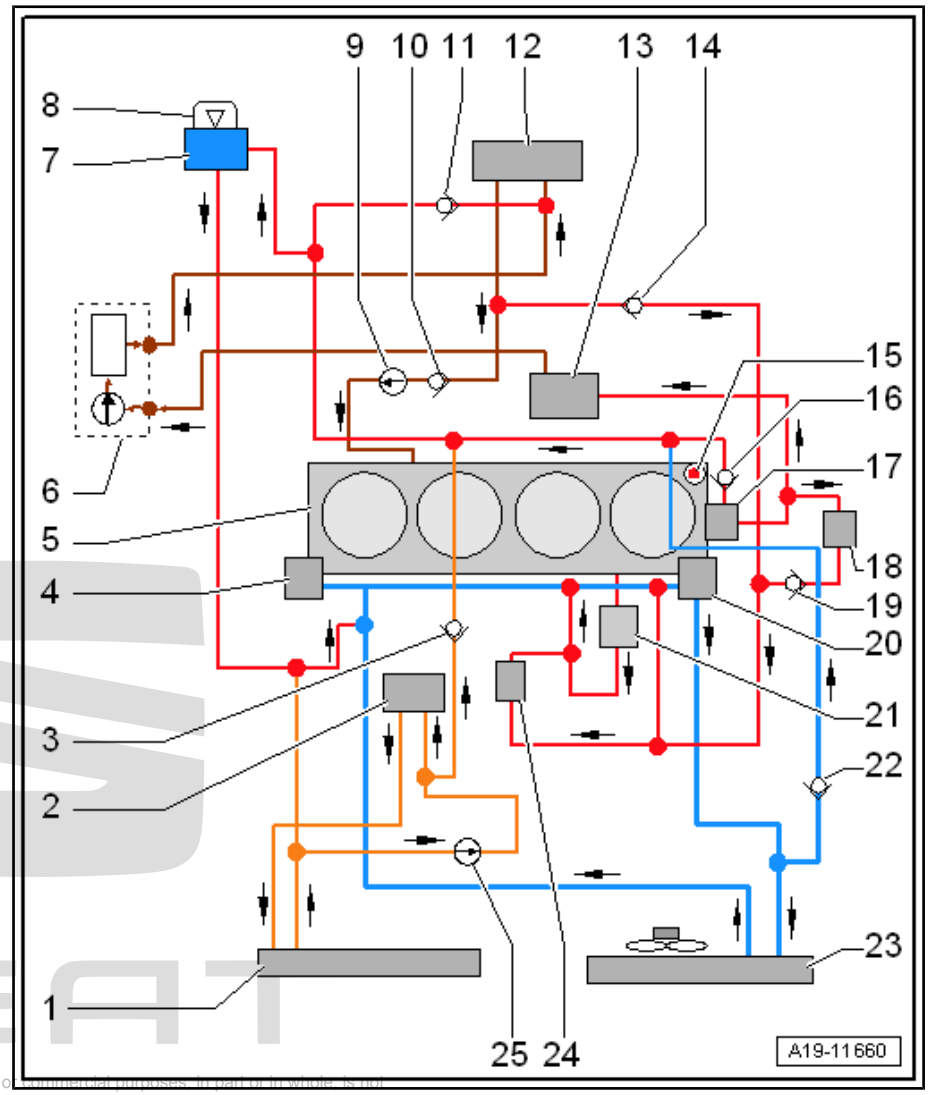
- ❑ Assembly overview ⇒ page 250
- ❑ Removing and installing ⇒ page 257

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

1.1.3 Coolant hose schematic diagram, vehicles with gear oil cooler and auxiliary heater

Note

- *Blue = large coolant circuit.*
- *Red = Small coolant circuit.*
- *Orange = Coolant circuit for charge air cooler.*
- *Brown = Heating circuit.*
- *Arrows show direction of coolant flow.*



1 - Radiator for charge air cooling circuit

2 - Intercooler system

- ❑ Check for leaks ⇒ page 368

3 - Non-return valve

4 - Coolant pump

5 - Cylinder head/cylinder block

6 - Auxiliary Heater

- ❑ Optional equipment

7 - Coolant expansion tank

8 - Sealing cap

- ❑ For coolant expansion tank
- ❑ Checking pressure relief valve ⇒ page 211

9 - Auxiliary pump for heating - V488-

- ❑ Depending on version

10 - Non-return valve

11 - Non-return valve

12 - Heat exchanger for heater

13 - Exhaust gas recirculation cooler

14 - Non-return valve

15 - Coolant temperature sender - G62-

16 - Non-return valve

17 - Coolant hose/pipe connection

18 - Gear oil cooler

- ❑ Optional equipment

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

19 - Non-return valve

20 - Thermostat

21 - Engine oil cooler

22 - Non-return valve

23 - Radiator

24 - Throttle valve control mechanism - J338-

25 - Charge air cooling pump - V188-

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

1.1.4 Coolant hose schematic diagram, vehicles with exhaust gas recirculation valve 1 - GX5-

Note

- *Blue = large coolant circuit.*
- *Red = Small coolant circuit.*
- *Purple = charge air cooler coolant circuit.*
- *Brown = Heating circuit.*
- *Arrows show direction of coolant flow.*

1 - Radiator for charge air cooling circuit

2 - Intercooler system

- ❑ Check for leaks ⇒ page 368

3 - Non-return valve

4 - Coolant pump

5 - Cylinder head/cylinder block

6 - Coolant expansion tank

7 - Sealing cap

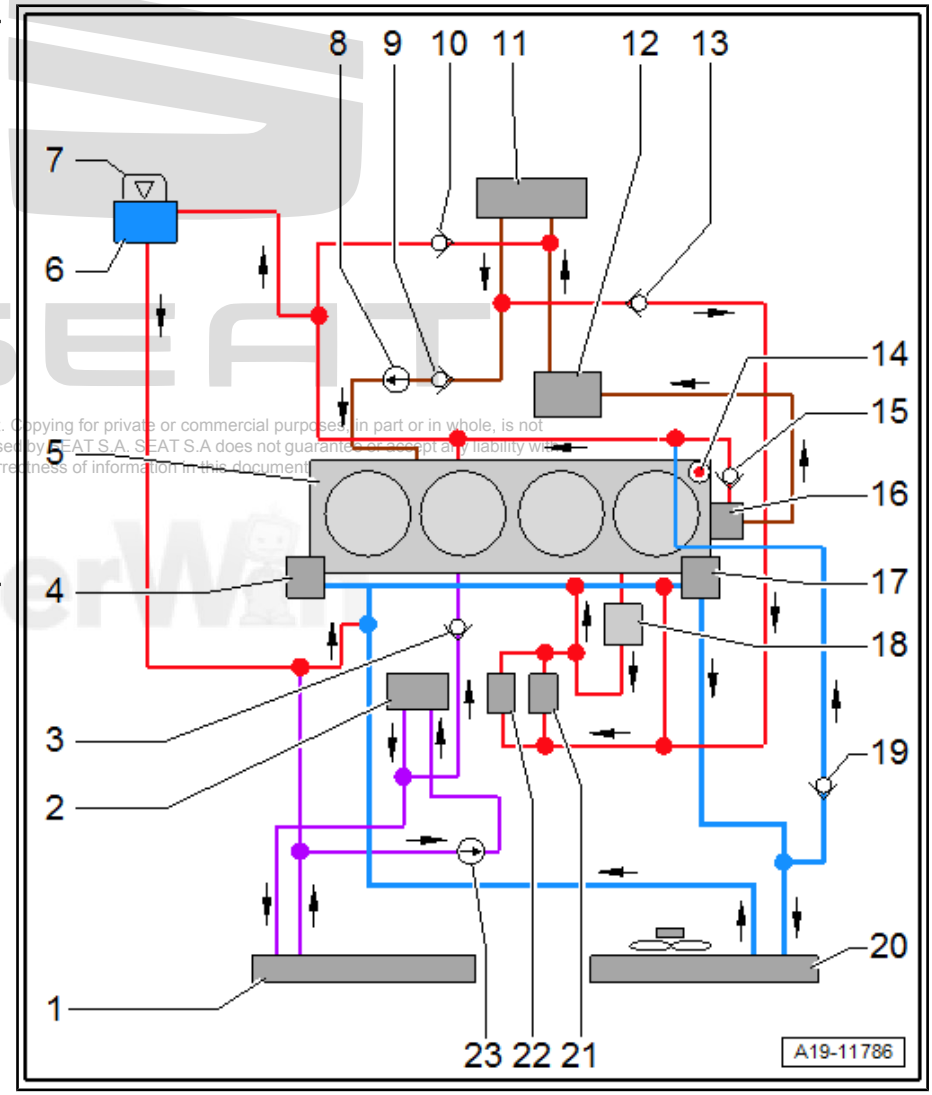
- ❑ For coolant expansion tank
- ❑ Checking pressure relief valve ⇒ page 211

8 - Auxiliary pump for heating - V488-

9 - Non-return valve

10 - Non-return valve

- ❑ Depending on vehicle equipment



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document.

11 - Heat exchanger for heater

12 - Exhaust gas recirculation cooler

13 - Non-return valve

14 - Coolant temperature sender - G62-

15 - Non-return valve

16 - Coolant hose/pipe connection

17 - Thermostat

18 - Engine oil cooler

19 - Non-return valve

20 - Radiator

21 - Throttle valve control mechanism - J338-

22 - Exhaust gas recirculation valve 1 - GX5-

23 - Charge air cooling pump - V188-

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

1.1.5 Coolant hose schematic diagram, vehicles with exhaust gas recirculation valve 1 - GX5- , gear oil cooler and auxiliary heater

Note

- *Blue = large coolant circuit.*
- *Red = Small coolant circuit.*
- *Purple = charge air cooler coolant circuit.*
- *Brown = Heating circuit.*
- *Arrows show direction of coolant flow.*

1 - Radiator for charge air cooling circuit

2 - Intercooler system

- ❑ Check for leaks ⇒ page 368

3 - Non-return valve

4 - Coolant pump

5 - Cylinder head/cylinder block

6 - Auxiliary Heater

- ❑ Optional equipment

7 - Coolant expansion tank

8 - Sealing cap

- ❑ For coolant expansion tank
- ❑ Checking pressure relief valve ⇒ page 211

9 - Auxiliary pump for heating - V488-

- ❑ Depending on version

10 - Non-return valve

11 - Non-return valve

12 - Heat exchanger for heater

13 - Exhaust gas recirculation cooler

14 - Non-return valve

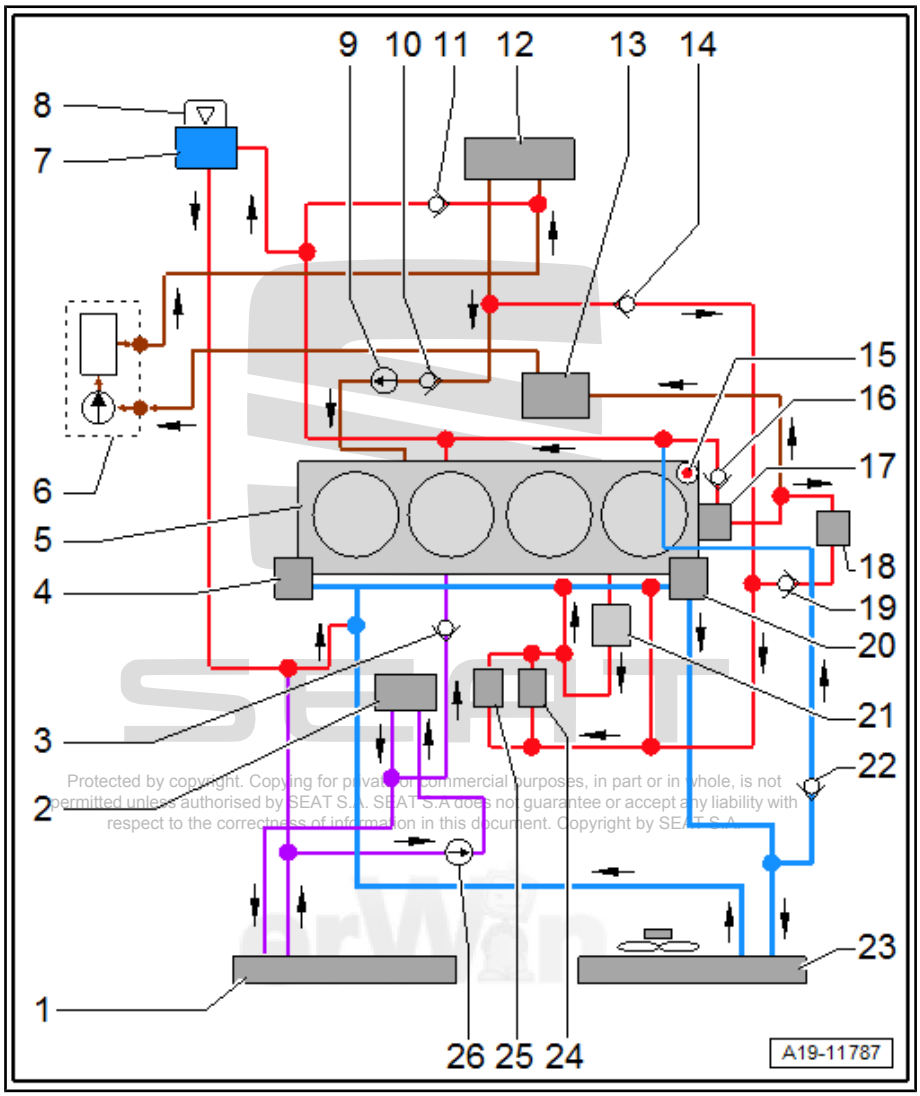
15 - Coolant temperature sender - G62-

16 - Non-return valve

17 - Coolant hose/pipe connection

18 - Gear oil cooler

- ❑ Optional equipment



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

19 - Non-return valve

20 - Thermostat

21 - Engine oil cooler

22 - Non-return valve

23 - Radiator

24 - Throttle valve control mechanism - J338-

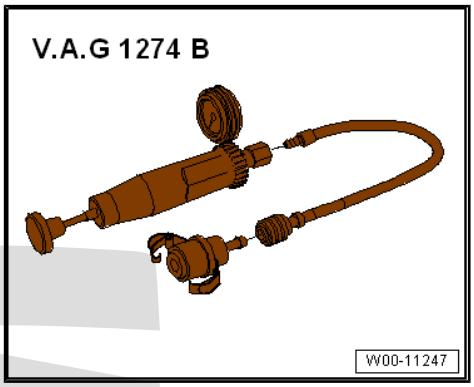
25 - Exhaust gas recirculation valve 1 - GX5-

26 - Charge air cooling pump - V188-

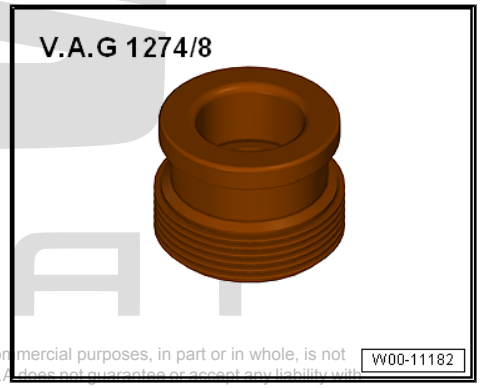
1.2 Checking cooling system for leaks

Special tools and workshop equipment required

- Cooling system tester - V.A.G 1274 B-

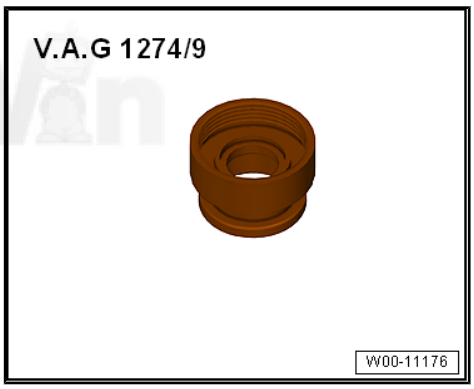


- Adapter for cooling system tester - V.A.G 1274/8-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- Adapter for cooling system tester - V.A.G 1274/9-

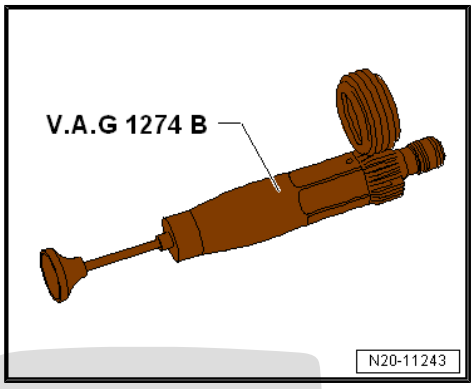


Note

To allow for an appropriate leakage test, a self test of the cooling system tester - V.A.G 1274 B- needs to be performed beforehand.

Self test of cooling system tester - V.A.G 1274 B-

– Operate cooling system tester - V.A.G 1274 B- several times.

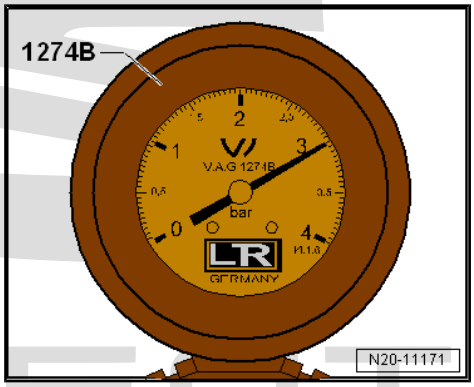


– Build up a pressure of 3.0 bar on cooling system tester .

– Observe pressure on pressure gauge of cooling system tester for 30 seconds.

If no pressure builds up or if the pressure drops again:

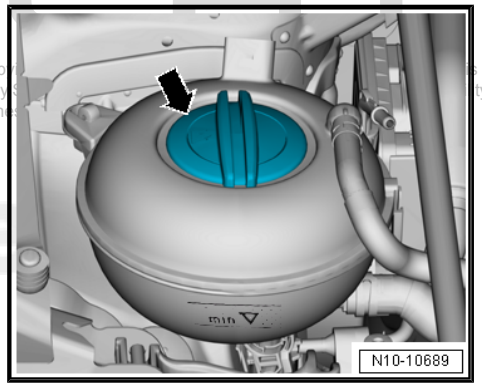
There is a leak in the cooling system tester - V.A.G 1274 B- , and it must not be used.



Checking cooling system for leaks

• Engine at operating temperature.

Protected by copyright. Copy
permitted unless authorised by
respect to the correctn
not
ty with



Danger of scalding by hot coolant

On a warm engine, the cooling system is under high pressure. Danger of scalding by steam and hot coolant.

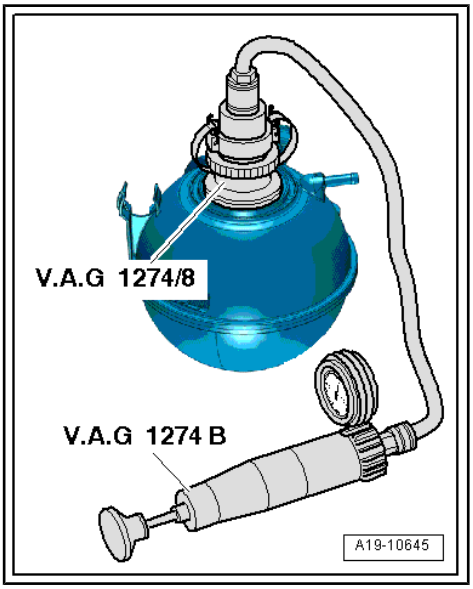
– Wear protective gloves.

– Wear safety goggles.

– Reduce excess pressure by covering cap of coolant expansion tank with cloths and opening it carefully.

– Open filler cap -arrow- on coolant expansion tank.

– Fit cooling system tester - V.A.G 1274 B- with adapter - V.A.G 1274/8- onto coolant expansion tank.
– Use hand pump on cooling system tester to create a pressure of approx. 1.5 bar.
• The pressure must not drop by more than 0.2 bar within 10 minutes.
– If the pressure drops by more than 0.2 bar, locate and rectify leaks.

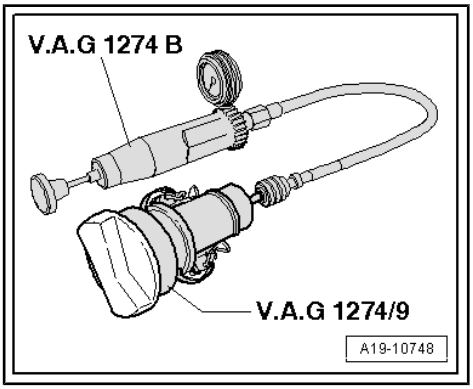


Note

The pressure drop by more than 0.2 bar within 10 minutes is caused by the coolant which cools down. The colder the engine the lower the pressure drop. If necessary, repeat the check while the engine is cold.

Check pressure relief valve in filler cap.

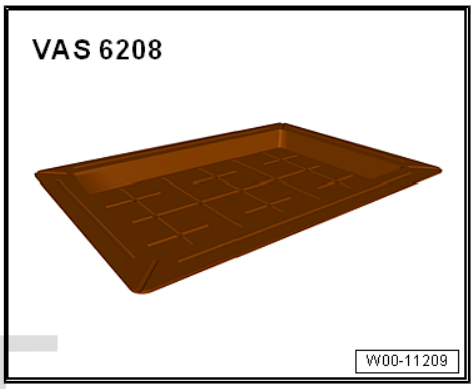
– Fit cooling system tester - V.A.G 1274 B- with adapter - V.A.G 1274/9- onto filler cap.
– Build up pressure with hand pump on cooling system tester.
• The pressure relief valve should open at a pressure of 1.6 ... 1.8 bar.
– Renew filler cap if pressure relief valve does not open as described.



1.3 Draining coolant

Special tools and workshop equipment required

♦ Drip tray for workshop hoist - VAS 6208-



♦ Hose clip pliers - VAS 6340-
♦ Safety goggles
♦ Protective gloves

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Draining off

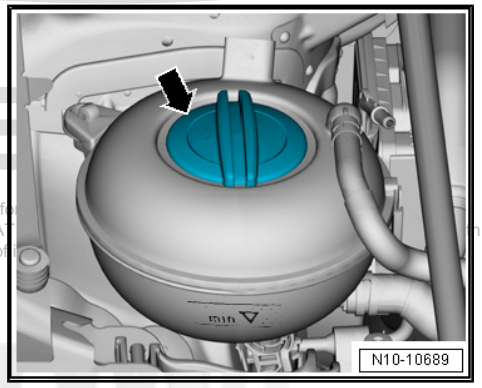
CAUTION

On a warm engine, the cooling system is under high pressure. Danger of scalding by steam and hot coolant.

Skin and other parts of the body may be scalded.

- **Wear protective gloves.**
- **Wear safety goggles.**
- **Reduce excess pressure by covering cap of coolant expansion tank with cloths and opening it carefully.**

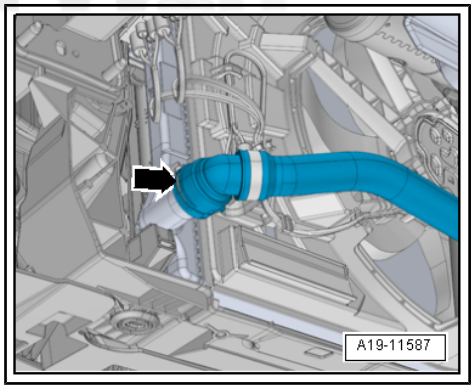
- Open filler cap -arrow- on coolant expansion tank.
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .
- Place drip tray for workshop hoist - VAS 6208- underneath.



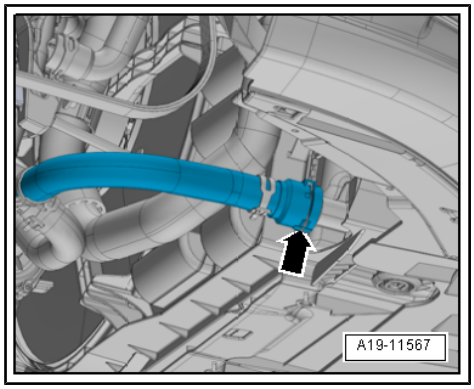
Protected by copyright. Copying for
permitted unless authorised by SEA
respect to the correctness of

Radiator, version 1:

- Lift retaining clip -arrow-, and remove lower left coolant hose from radiator.
- Drain off coolant.



- Pull out retaining clip -arrow- and remove lower right coolant hose from radiator for charge air cooling circuit.
- Drain off coolant.



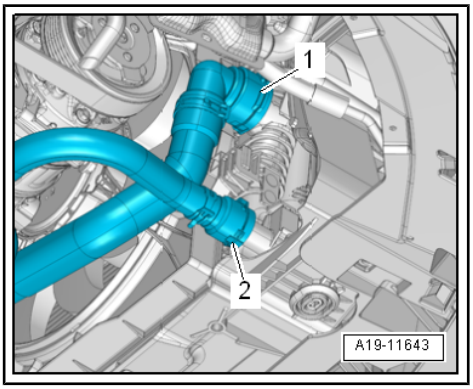
Radiator, version 2:

– Pull out retaining clip -1- and remove lower left coolant hose from radiator.

– Drain off coolant.

– Pull out retaining clip -2-, and remove lower right coolant hose from radiator for charge air cooling circuit.

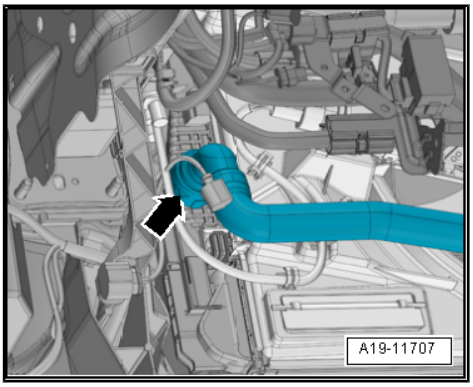
– Drain off coolant.



Radiator, version 3:

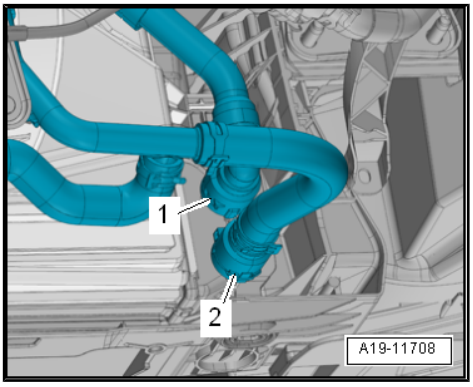
– Lift retaining clip -arrow-, and remove lower left coolant hose from radiator.

– Drain off coolant.



– Lift retaining clips -1, 2-, and remove coolant hoses from radiator for charge air cooling circuit.

– Drain off coolant.

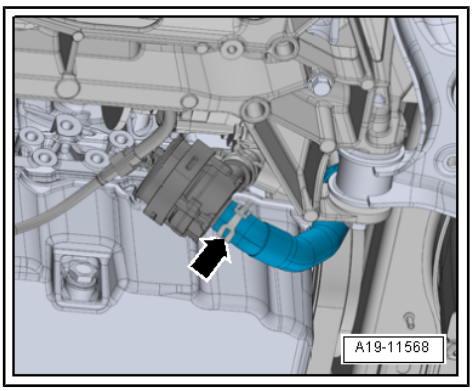


Continued for all vehicles:

– Loosen hose clip -arrow-.

– Remove lower coolant hose to auxiliary pump for heating - V488- .

– Drain off coolant.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

1.4 Filling with coolant:

⇒ “1.4.1 Filling with coolant without electric vacuum pump”, page 214

⇒ “1.4.2 Filling coolant with electric vacuum pump VAS 6096/2 ”, page 218

1.4.1 Filling with coolant without electric vacuum pump

Requirement:

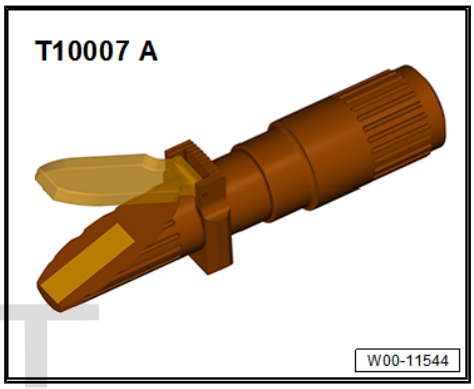
- Coolant is drained as described under ⇒ “1.3 Draining coolant”, page 211 .

Note

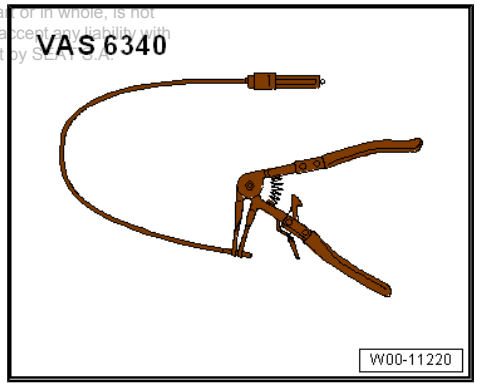
- *If the electric vacuum pump - VAS 6096/2- is available, use it to fill the cooling system ⇒ “1.4.2 Filling coolant with electric vacuum pump VAS 6096/2 ”, page 218 .*
- *A higher vacuum is achieved in the cooling system using the electric vacuum pump - VAS 6096/2- . This higher vacuum means that there is less air in the cooling system after filling. Consequently, a »shorter« bleeding routine with ⇒ Vehicle diagnostic tester is then necessary.*

Special tools and workshop equipment required

- Refractometer - T10007A-

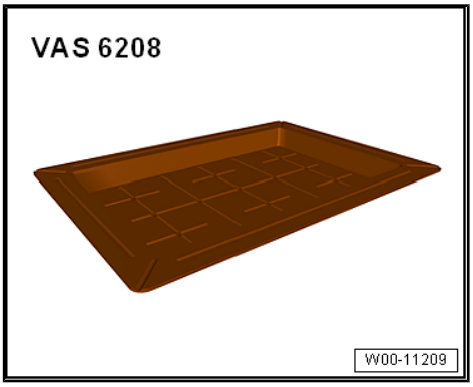


- Hose clip pliers - VAS 6340-

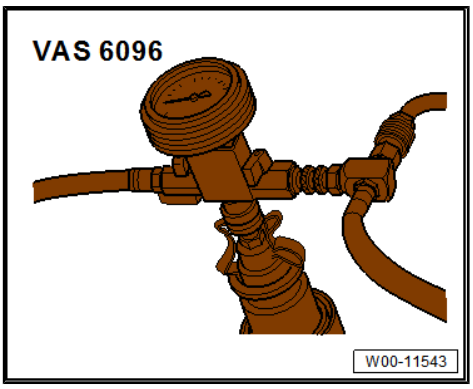


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

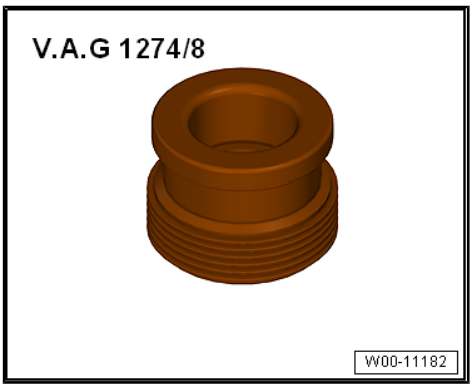
- Drip tray for workshop hoist - VAS 6208-



- Cooling system charge unit - VAS 6096-



- Adapter for cooling system tester - V.A.G 1274/8-



- Safety goggles
- Protective gloves

Filling

After renewing the components

- Cylinder head
- Heat exchanger for heater
- Radiator
- Radiator for charge air cooling circuit
- Intake manifold with charge air cooler

Only filling the cooling system is not sufficient. The cooling system must be flushed ⇒ “1.6 Flushing cooling system”, page 224 .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

CAUTION

Risk of damage to the engine due to insufficiently filled/bled cooling system.

- **After filling, the cooling system must be bled ⇒ Vehicle diagnostic tester without fail.**

Procedure

– Re-connect all coolant hoses that were pulled off.

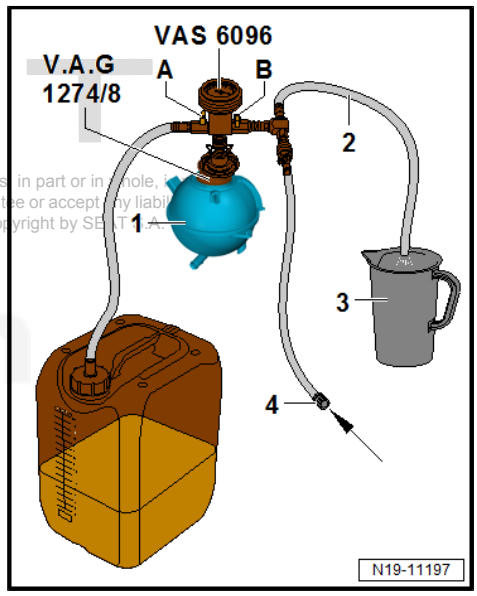
– Reconnect coolant hoses with plug-in connectors ⇒ page 306 .

– Fill coolant tank of -VAS 6096- with at least 8 litres of pre-mixed coolant in correct mixture ratio. Observe notes on coolant ⇒ page 19 .

– Screw adapter for cooling system tester - V.A.G 1274/8- onto coolant expansion tank.

– Fit cooling system charge unit - VAS 6096- on adapter - V.A.G 1274/8- .

– Feed vent hose -2- into a small container -3-.



Note

Exhaust air takes a slight quantity of coolant along with it; this should be collected.

– Close both valves -A- and -B- and turn the lever at right angles to direction of flow.

– Connect hose -4- to compressed air.

• Pressure: 6 ... 10 bar of working pressure.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Open valve -B- by setting lever in direction of flow.

• The suction-jet pump reduces pressure in the cooling system to below atmospheric pressure.

• The display instrument needle must move to the green area.

– Also briefly open valve -A- (turn lever in direction of flow to do this) so that hose on -VAS 6096- coolant reservoir fills with coolant.

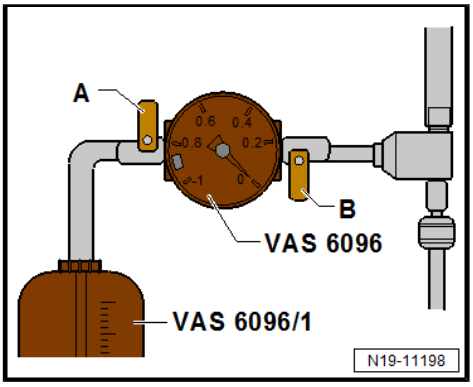
– Close the valve -A- again.

– Leave valve -B- open for 2 further minutes.

• The suction jet pump will continue generating a vacuum in the cooling system. The pointer of the indicator must remain in the green zone.

– Close valve -B-.

• The needle on the gauge must stay in the green zone. The vacuum in the cooling system is then sufficient for subsequent filling.



Note

♦ *If the needle does not reach the green zone, repeat the process.*

♦ *If the vacuum drops, check the cooling system for leaks.*

– Pull off compressed air hose.

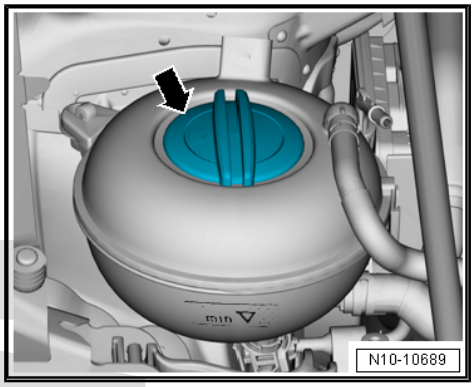
– Open valve -A-.

• Vacuum in cooling system causes coolant to be extracted from -VAS 6096- coolant reservoir and coolant system to be filled.

– Detach cooling system charge unit - VAS 6096- from coolant expansion tank.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Fill coolant up to max. mark.



– Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

– On vehicles with auxiliary heater, switch on auxiliary heater for about 30 seconds.

– Set temperature to “HI”.

– Switch off air conditioner compressor. To do this, press AC button.

• LED in button should not light up.

– Connect vehicle diagnostic tester .

– Switch on ignition, and select following menu option on ⇒ Vehicle diagnostic tester:

◆ `0001 - Engine electronics`

◆ `0001 - Engine electronics, functions`

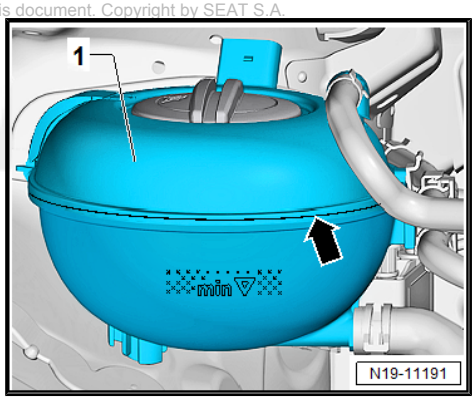
◆ `0001 - Fill coolant circuit`

– Follow instructions shown on vehicle diagnostic tester.

– Allow engine to cool down.

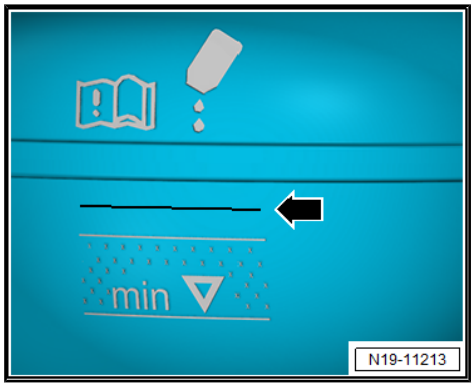
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Checking coolant level after repair work



• When the engine is at operating temperature, the coolant level must be at the »weld seam« -arrow-.

• When the engine is cold, the coolant level must be approx. 5 mm above the max. mark -arrow-.



– Top up with coolant if necessary.

Note

This excessive amount of coolant is necessary since the coolant level will decrease due to bleeding process.

1.4.2 Filling coolant with electric vacuum pump - VAS 6096/2-

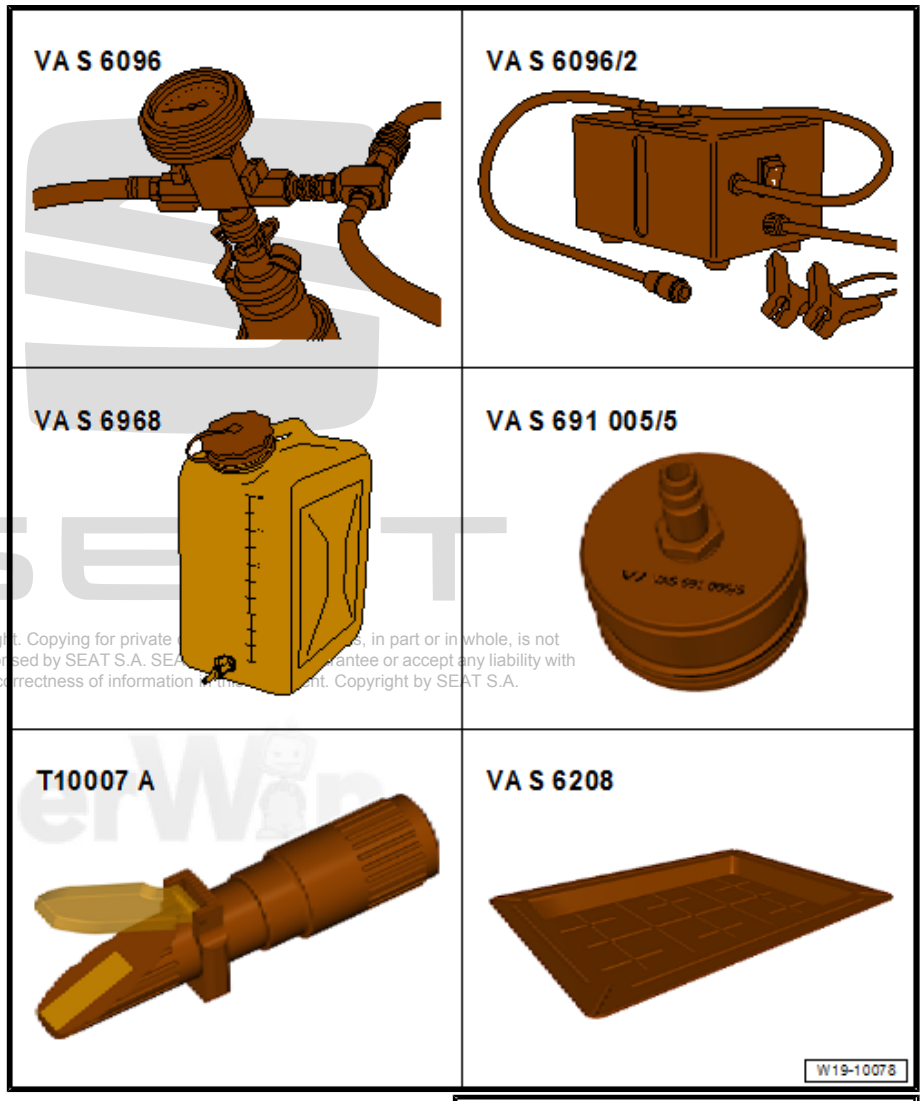
Requirement:

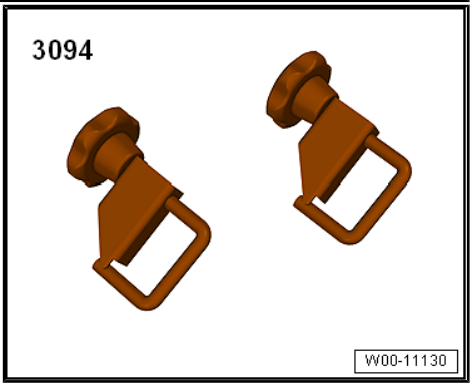
• Coolant is drained as described under ⇒ “1.3 Draining coolant”, page 211 .

Note

A higher vacuum is achieved in the cooling system using the electric vacuum pump - VAS 6096/2- . This higher vacuum means that there is less air in the cooling system after filling. Consequently, a »shorter« bleeding routine with ⇒ Vehicle diagnostic tester is then necessary.

Special tools and workshop equipment required





Protected by copyright. Copying for private ... s, in part or in whole, is not permitted unless authorised by SEAT S.A. SEA... antee or accept any liability with respect to the correctness of information ... nt. Copyright by SEAT S.A.

- Cooling system charge unit - VAS 6096-

- Electric vacuum pump - VAS 6096/2-
- Coolant reservoir - VAS 6968-
- Test adapter - VAS 691 005/5-
- Drip tray for workshop hoist - VAS 6208-
- Refractometer - T10007 A-
- Hose clamps, up to Ø 25 mm - 3094-

After renewing the components

- Cylinder head
- Heat exchanger for heater
- Radiator
- Radiator for charge air cooling circuit
- Intake manifold with charge air cooler

Only filling the cooling system is not sufficient. The cooling system must be flushed ⇒ “1.6 Flushing cooling system”, page 224

CAUTION

Risk of damage to the engine due to insufficiently filled/bled cooling system.

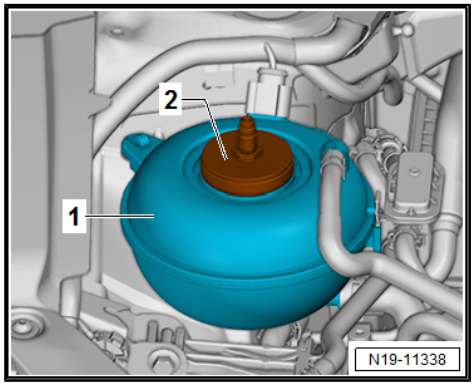
- **After filling, the cooling system must be bled ⇒ Vehicle diagnostic tester without fail.**

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted. Unauthorised distribution and any liability with regard to the correctness of information in this document. Copyright by SEAT S.A.

– Re-connect all coolant hoses that were pulled off.

– Screw test adapter - VAS 691 005/5- -2- onto coolant expansion tank -1-.

– Perform electric vacuum pump - VAS 6096/2- check ⇒ page 224 .



– Set-up coolant bowser VAS 6968 so that it is higher than the coolant expansion tank -arrows- and fill at least 10 litres of premixed coolant in the correct ratio. Observe notes on coolant ⇒ page 19 .

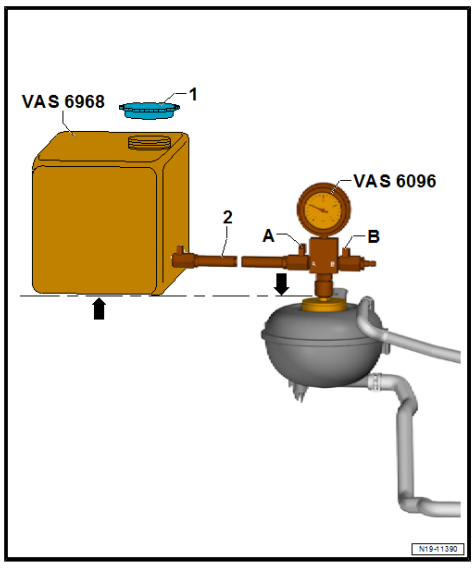
– Connect cooling system charge unit - VAS 6096- to coolant reservoir - VAS 6968- as shown.

• Wait before connecting cooling system charge unit - VAS 6096- to test adapter - VAS 691 005/5- . The filler hose must be bled first.

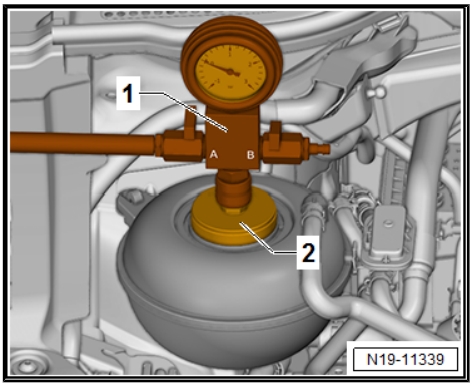
– Bleed hose -2-. This is done by briefly opening valve on coolant reservoir and valves -A- and -B- until hose -2- is filled with coolant.

– Close both valves -A- and -B- and turn the lever at right angles to direction of flow.

– Open cap -1-.

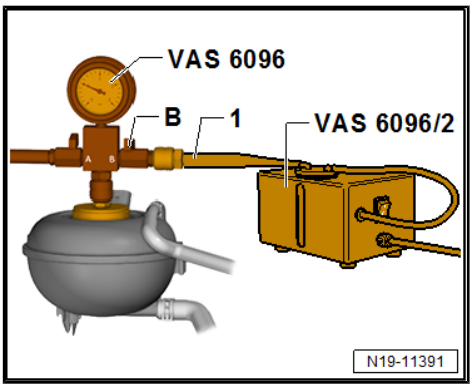


– Fit cooling system charge unit -1- on test adapter -2-.



– Fit hose -1- of electric vacuum pump - VAS 6096/2- on plug-in connector -B- of cooling system charge unit .

– Connect electric vacuum pump - VAS 6096/2- to vehicle battery and switch on. Open valve -B-.

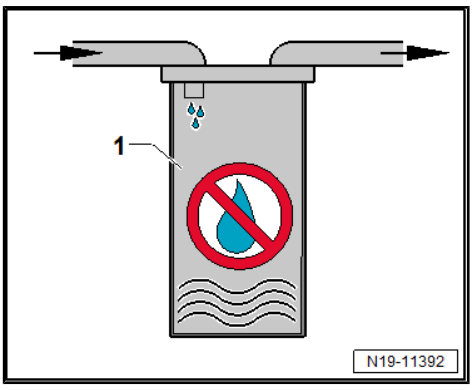


– Ensure, when generating vacuum, that water separator -1- in vacuum pump is not filled with coolant.

CAUTION

Risk of damage to electric vacuum pump from coolant being drawn in.

- **Ensure that electric vacuum pump does not draw in coolant. If necessary, interrupt procedure and purge coolant expansion tank ⇒ page 222 .**

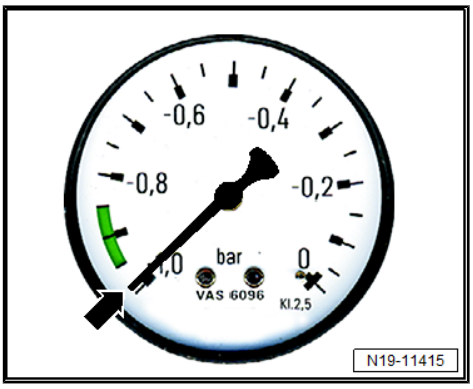


– Generate vacuum with electric vacuum pump until indicator on pressure gauge -arrow- is significantly below green area.

– Close valve -B-, and switch off electric vacuum pump - VAS 6096/2- .

– Observe pressure gauge. Needle of pressure gauge must not move.

– If conditions are met, cooling system can be filled ⇒ page 222 .

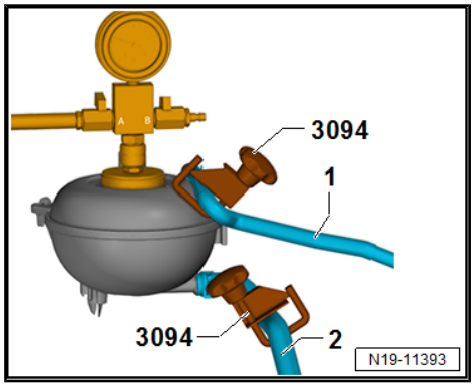


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

If water separator in electric vacuum pump fills with coolant, coolant expansion tank must be purged:

– Close shut-off valve -B- and switch off electric vacuum pump .

– Seal supply hose -2- and return hose -1- of coolant expansion tank with hose clamps up to 25 mm - 3094- .



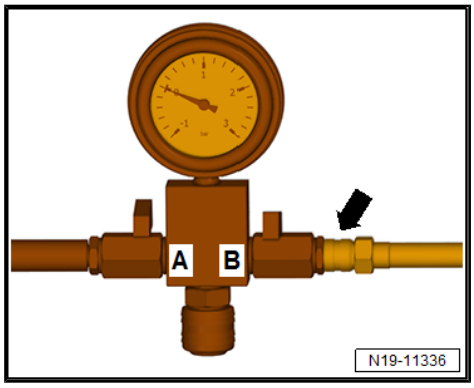
– Pull off plug-in connector -arrow- and open shut-off tap -B- so that coolant expansion tank is vented.

– Remove cooling system charge unit - VAS 6096- and test adapter - VAS 691 005/5- .

– Extract coolant from coolant expansion tank.

– Re-assembly cooling system charge unit and test adapter and remove hose clips.

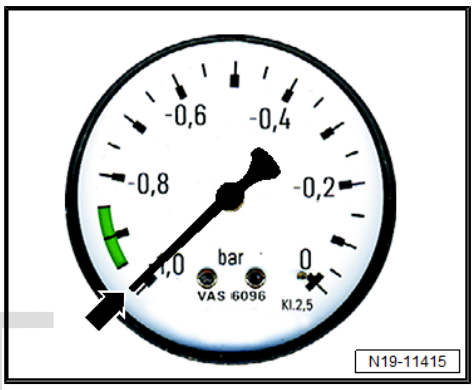
– Switch on electric vacuum pump and generate vacuum again.



Fill cooling system:

Requirement:

- Needle on pressure gauge -arrow- must clearly be below green area.

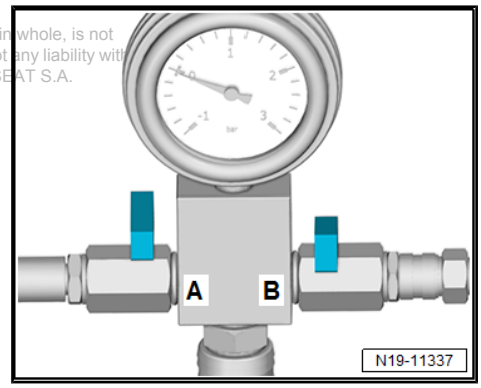


– »Slowly« open shut-off tap -A- to prevent coolant from foaming.

- Vacuum in the cooling system causes coolant to be extracted from the reservoir VAS 6968 and fill the cooling system.

– Close shut-off tap -A- after filling.

– Remove electric vacuum pump - VAS 6096/2- , cooling system charge unit - VAS 6096- and test adapter - VAS 691 005/5- from coolant expansion tank.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Fill coolant up to weld seam -arrow- and close coolant expansion tank.

– Install noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview – noise insulation .

– On vehicles with auxiliary heater, switch on auxiliary heater for about 30 seconds.

– Set temperature to “HI”.

– Switch off air conditioner compressor. To do this, press AC button.

• LED in button should not light up.

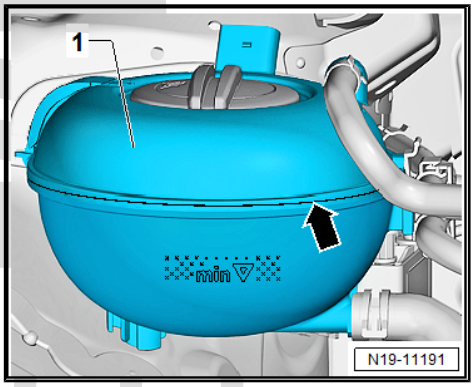
– Connect vehicle diagnostic tester .

– Switch on ignition, and select following menu option on ⇒ Vehicle diagnostic tester:

◆ `0001 - Engine electronics`

◆ `0001 - Engine electronics, functions`

◆ `0001 - Fill coolant circuit`



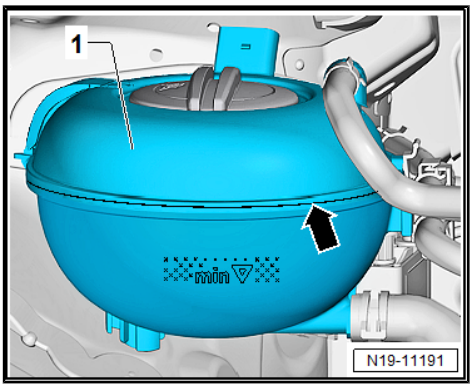
Note

Answer the question “Was the cooling system filled with the aid of electric vacuum pump?” with yes so that the »shorter« bleeding routine can be initiated.

– Follow instructions shown on vehicle diagnostic tester.

– Allow engine to cool down.

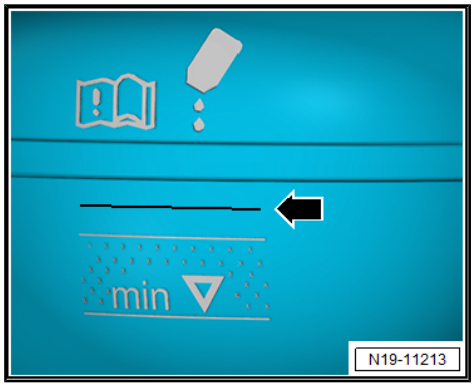
Checking coolant level after repair work



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- When the engine is at operating temperature, the coolant level must be at the »weld seam« -arrow-.
- When the engine is cold, the coolant level must be approx. 5 mm above the max. mark -arrow-.

– Top up with coolant if necessary.



Note

This excessive amount of coolant is necessary since the coolant level will decrease due to bleeding process.

1.5 Checking electric vacuum pump - VAS 6096/2-

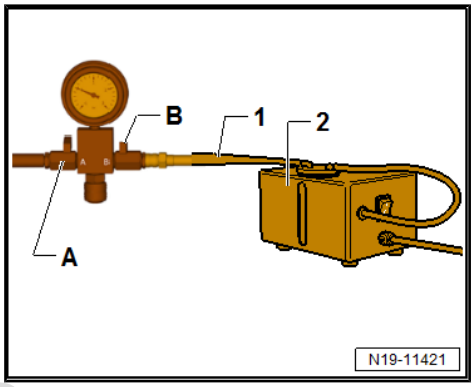
Note

In order to ensure proper filling of the cooling system, a check (self-test) must be carried out before using the cooling system charge unit - VAS 6096- or the electric vacuum pump - VAS 6096/2- .

– Fit hose -1- of electric vacuum pump - VAS 6096/2- on plug-in connector -B- of cooling system charge unit - VAS 6096- .

– Connect electric vacuum pump - VAS 6096/2- to vehicle battery and switch on.

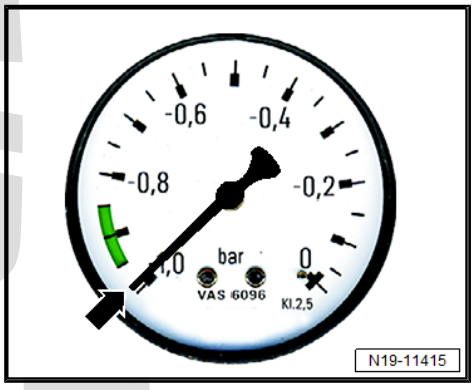
– Shut valve -A-, and open valve -B-.



– The needle of the pressure gauge -arrow- must move distinctly below the green area.

– Close valve -B-, and switch off electric vacuum pump - VAS 6096/2- .

– Observe negative pressure on pressure gauge for 10 seconds. Needle must not move.



If insufficient negative pressure builds up, or if pressure rises again:

Cooling system charge unit - VAS 6096- , pressure gauge or electric vacuum pump - VAS 6096/2- is leaking or defective and must not be used.

1.6 Flushing cooling system

The cooling system must be flushed, after the following components have been renewed:

- Cylinder head
- Heat exchanger for heater
- Radiator
- Radiator for charge air cooling circuit

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

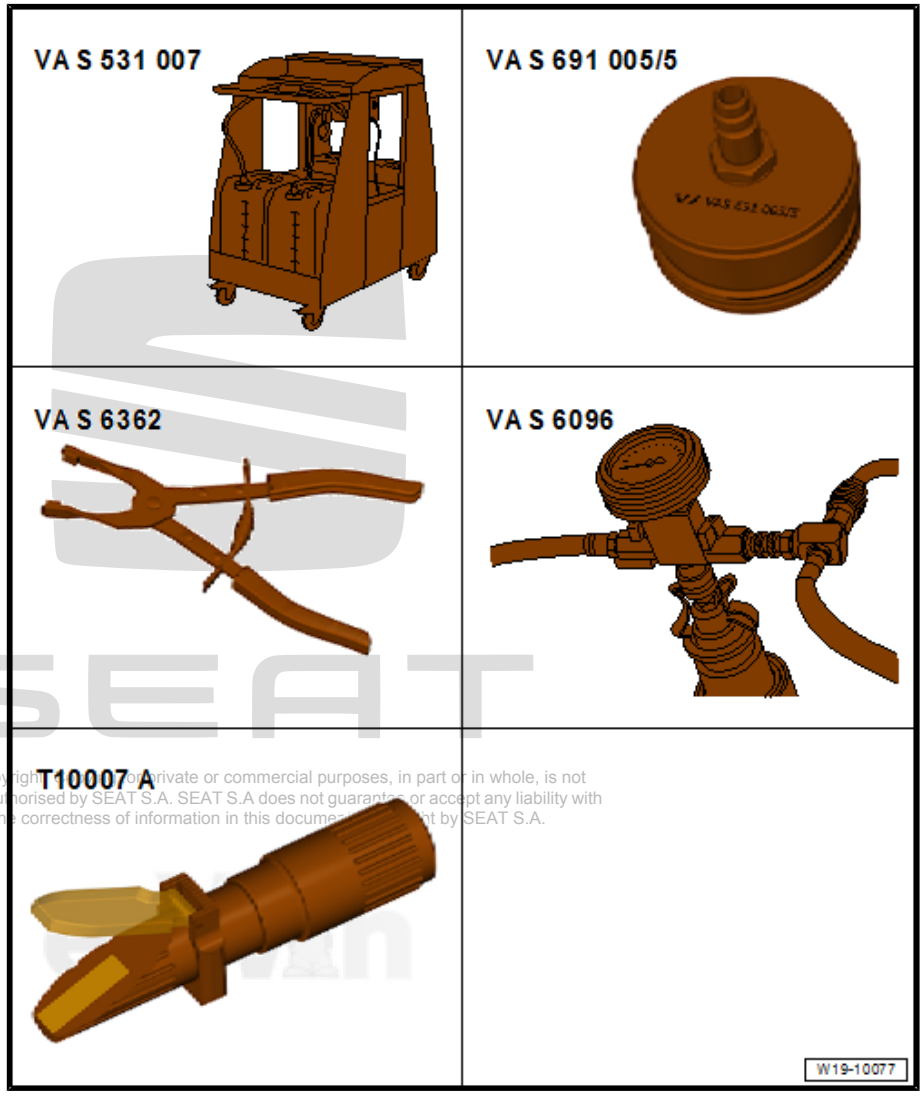
- Intake manifold with charge air cooler

When flushing, the existing coolant is replaced by new coolant. This will ensure optimum surface protection of the new components.

Note

- *The coolant must be drained before the system is flushed. Then the cooling system must be filled with distilled water.*
- *The cooling system is then flushed with approx. 12 litres of distilled water. Then, the distilled water is replaced by coolant (mixture ratio 50:50).*
- *After the coolant has been renewed, bleed the cooling system using the ⇒ Vehicle diagnostic tester.*
- *Never reuse old coolant.*
- *For a quick reference guide, refer to ⇒ "1.7 Flushing cooling system, quick reference guide", page 244 . The quick reference guide contains the basic steps of the workflow. It might be helpful to print out the guide and tick off the corresponding work steps after having performed them.*

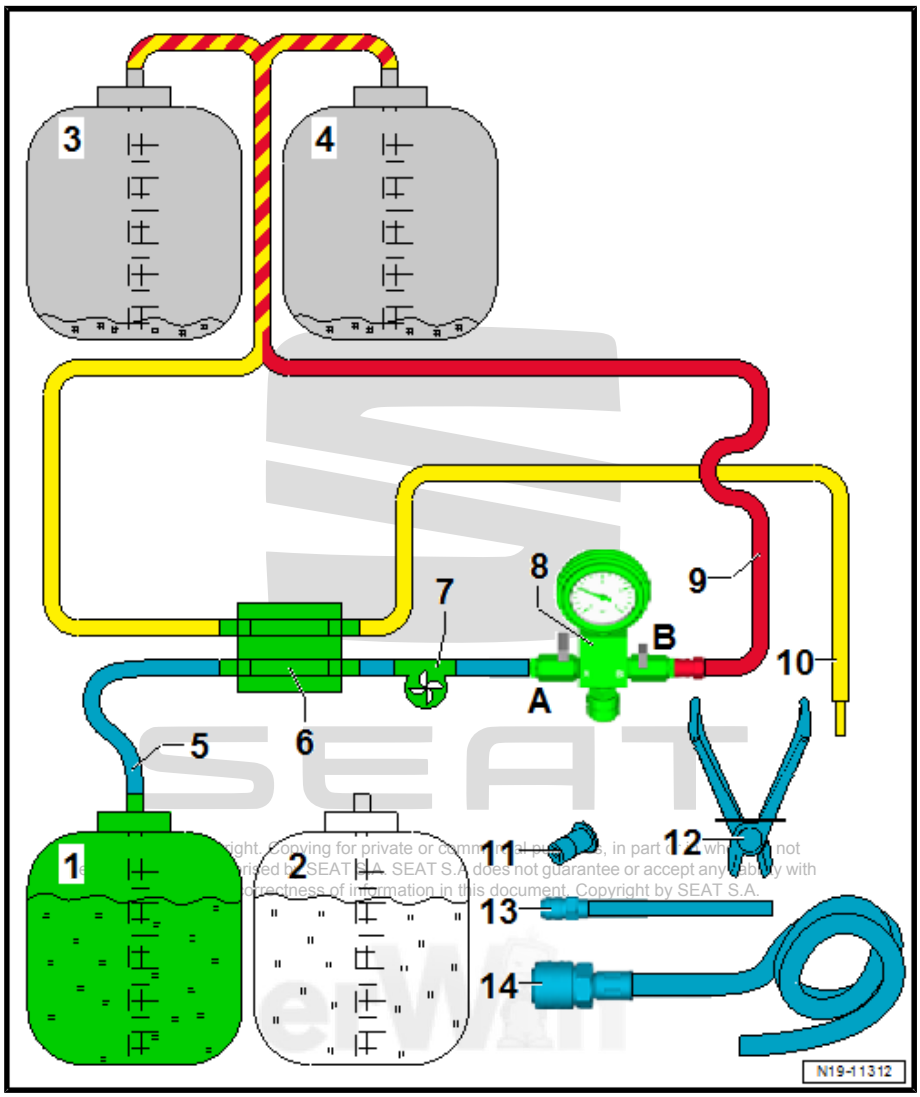
Special tools and workshop equipment required



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document by SEAT S.A.

- Coolant flushing and filling device - VAS 531 007-
- Test adapter - VAS 691 005/5-
- Hose clip pliers - VAS 6362-
- Suction-jet pump from cooling system charge unit - VAS 6096-
- Refractometer - T10007 A-
- Compressed air connection with 6 … 10 bar(g)
- Hose clamps, up to 25 mm, qty. 2

Schematic overview of coolant flushing and filling device - VAS 531 007- :



1 - Container with distilled water

- ❑ Fill with at least 20 l of distilled water

2 - Container with coolant

- ❑ Fill with at least 20 l of coolant
- ❑ Frost protection down to approx. -36 °C

3 - Empty container

- ❑ For used coolant

4 - Empty container

- ❑ For used coolant

5 - Extraction hose

- ❑ Comes from connection 2 on sight glass

6 - Window

- ❑ When opaque, clean sight class with a nylon brush

7 - Pump

- ❑ Cut-out pressure approx. 1.5 bar

8 - Valve block

- ❑ With pressure gauge and shut-off taps

9 - Drain hose

- ❑ Connected to valve block for releasing pressure

10 - Flushing hose

- ❑ Connected to breather hose of coolant expansion tank for flushing
- ❑ Comes from connection 1 on sight glass
- ❑ Seal with plugs when not in use

11 - Sealing cap

12 - Hose clamps

- ❑ 4x

13 - Cleaning adapter

- ❑ Approx. 15 cm in length

…ight. Copying for private or commercial purposes, in part or whole, is not …ised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with …rrectness of information in this document. Copyright by SEAT S.A.

- ❑ For cleaning coolant flushing and filling device after flushing
- ❑ Connected between valve block and flushing hose ⇒ Item 10 (page 226) (10)

14 - Extraction adapter

- ❑ Approx. 100 cm in length
- ❑ Connected to suction hose ⇒ Item 5 (page 226) (5) for extracting coolant

Preparing coolant flushing and filling device - VAS 531 007- :

– Fill container »1« with at least 20 l of distilled water.

– Fill container »2« with at least 20 l of coolant. Mixture ratio is 50:50 for frost protection down to approx. -36 °C.

– Empty containers »3« and »4«.

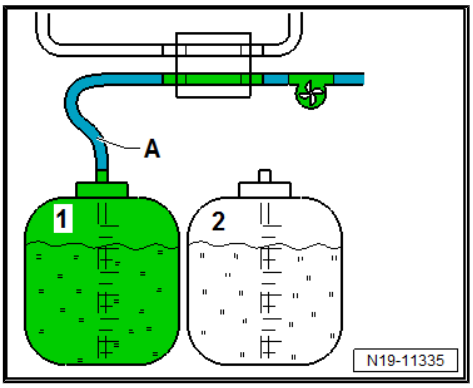
– Connect battery charger.

– Remove valve block from plug-in connector on equipment trolley.

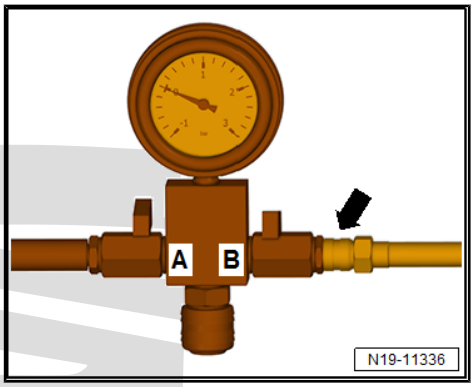
– Connect coolant flushing and filling device - VAS 531 007- to battery.

Bleeding coolant flushing and filling device - VAS 531 007- :

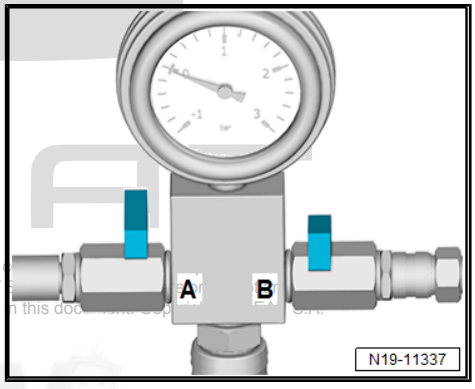
– Connect suction hose -A- to container »1« with distilled water.



– Connect drain hose -arrow- to plug-in connector -B- on valve block.



– Close shut-off taps -A- and -B-.



Note

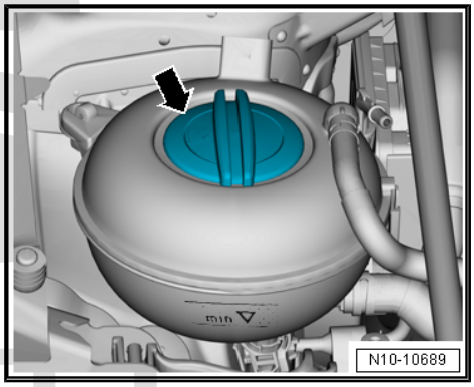
Do not fit the valve block onto the test adapter - VAS 691 005/5- .
The filler hose must be bled first.

– Switch on pump for -VAS 531 007- .
– Open cut-off tap -A-.
– Open shut-off tap -B- briefly to bleed filler hose.
– Close shut-off taps -A- and -B-.

Protected by copyright. Copying for private or
permitted unless authorised by SEAT S.A. SEAT
respect to the correctness of information

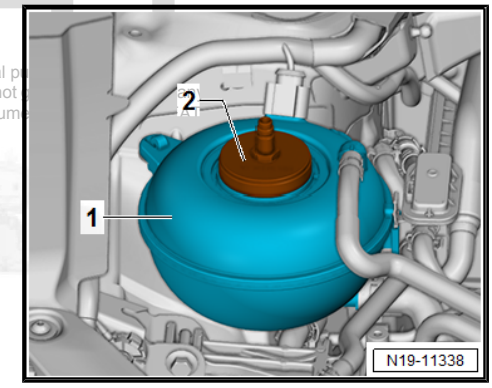
Connecting coolant flushing and filling device - VAS 531 007- :

– Open filler cap -arrow- on coolant expansion tank.

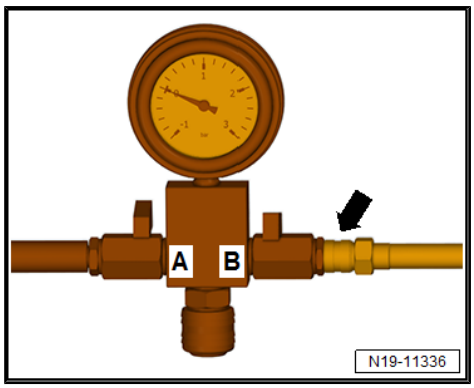


– Screw test adapter -2- (-VAS 691 005/5-) onto coolant expansion tank -1-.

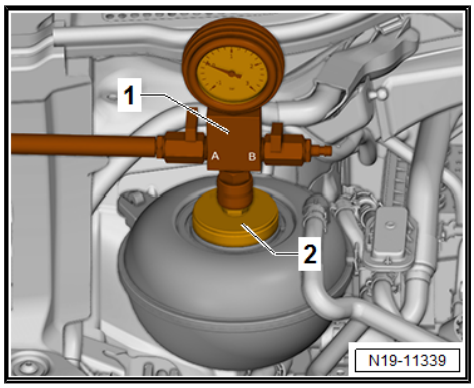
Protected by copyright. Copying for private or commercial p
permitted unless authorised by SEAT S.A. SEAT S.A does not
respect to the correctness of information in this docum



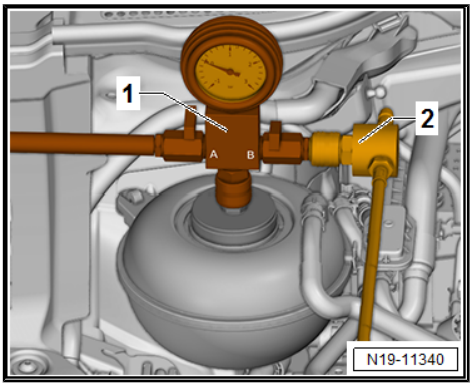
– Pull drain hose -arrow- off plug-in connector -B- on valve block.



– Fit valve block -1- onto test adapter -2-.



– Connect suction-jet pump -2- from -VAS 6096- to plug-in connector -B- on valve block -1-.

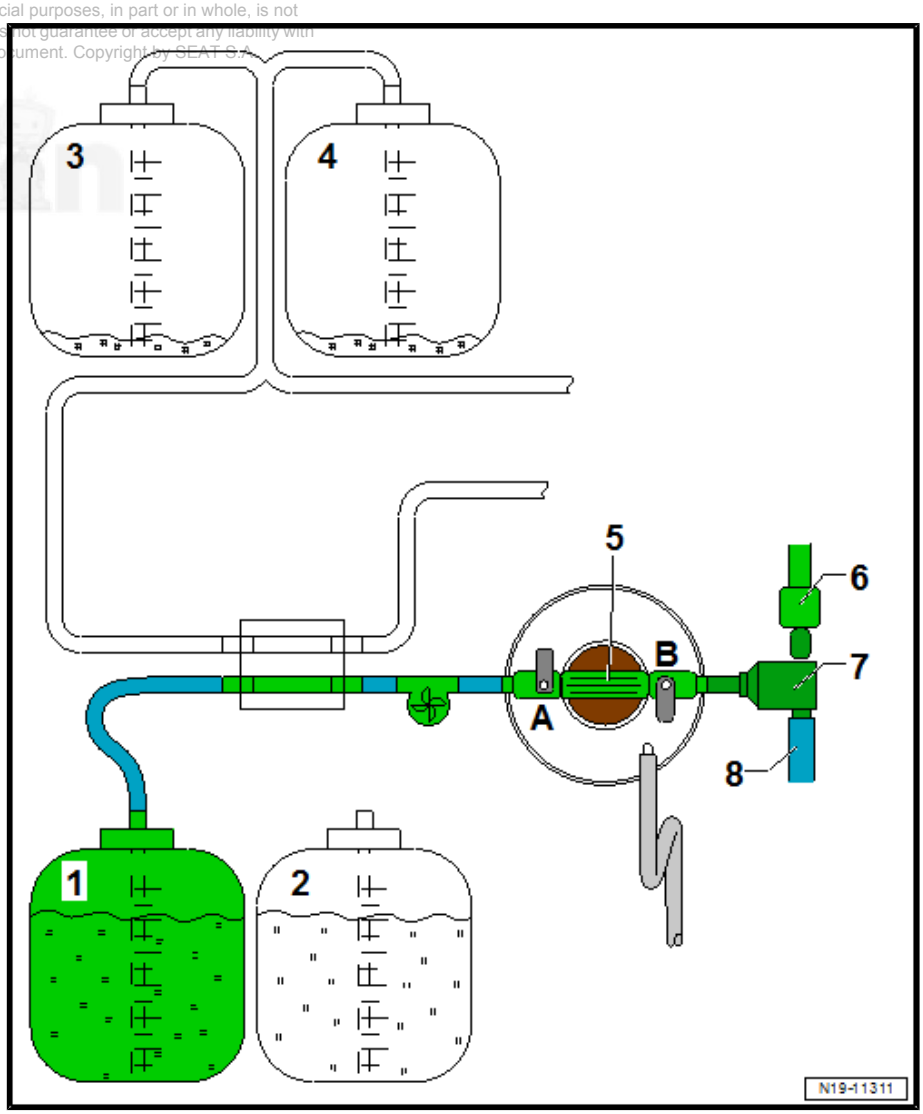


Note

Aside from the suction-jet pump, the electric vacuum pump - VAS 6096/2- can also be used to generate a vacuum. Connect electric vacuum pump and generate vacuum, see ⇒ page 221 .

Filling cooling system with distilled water:

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



– Place end of vent hose -8- of suction-jet pump into a container.
– Connect compressed air hose -6- to suction-jet pump -7-.
– Open shut-off tap -B- on valve block -5-.
• The suction-jet pump reduces pressure in the cooling system to below atmospheric pressure. The pointer of the pressure gauge must fall to at least -0.85 bar.

– Close shut-off tap -B-.

– Pull off compressed air hose -6-.

– Observe pressure gauge. The pointer of the pressure gauge must remain stationary at -0.85 bar at least. The vacuum in the cooling system is then sufficient for subsequent filling.

Note

- *If the vacuum drops, the cooling system must be checked for leaks.*
- *The vacuum that builds up depends on the pressure in the compressed air system.*

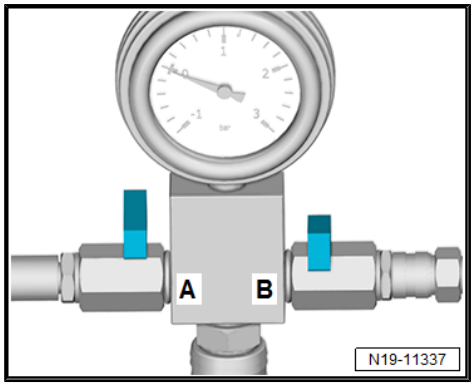
• The pump of the -VAS 531 007- must be switched on.

– Open shut-off tap -A- »slowly«.

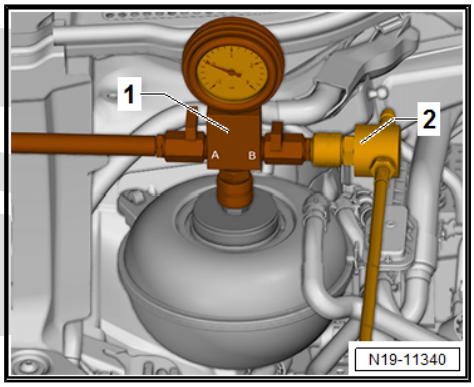
• The vacuum in the cooling system causes the distilled water to be drawn into the cooling system, and thus causes the cooling system to be filled. In addition, the pump of the -VAS 531 007- feeds distilled water into the coolant expansion tank.

• After filling, the pressure in the coolant expansion tank must be released. Proceed as follows to do this:

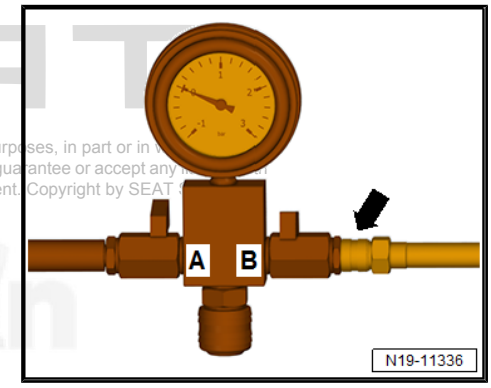
– Close shut-off tap -A- after filling.



– Remove suction-jet pump -2- from valve block -1- .



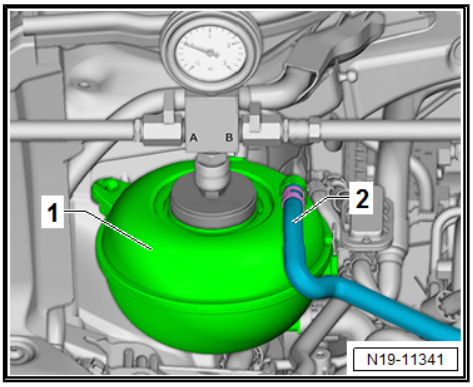
– Connect drain hose -arrow- to plug-in connector. Open shut-off tap -B-, and leave it open so that the pressure in the cooling system releases.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Flushing cooling system with distilled water:

– Remove breather hose -2- from coolant expansion tank -1- .

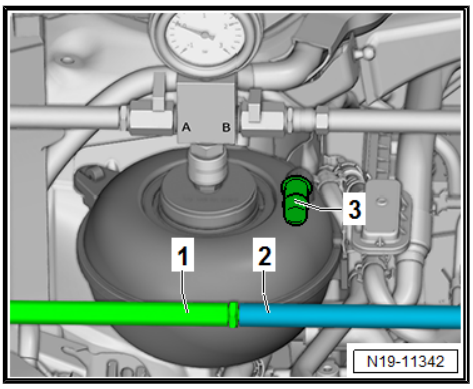


– Connect breather hose -2- from coolant expansion tank to flushing hose -1-.

– Seal connection on coolant expansion tank using plug -3-. Secure plug with a hose clip.

– Close shut-off tap -B-.

– Remove engine cover.



Vehicles with variable valve timing:

– Remove air filter housing ⇒ page 421 .

Continued for all vehicles:

The cooling system consists of the following coolant circuits:

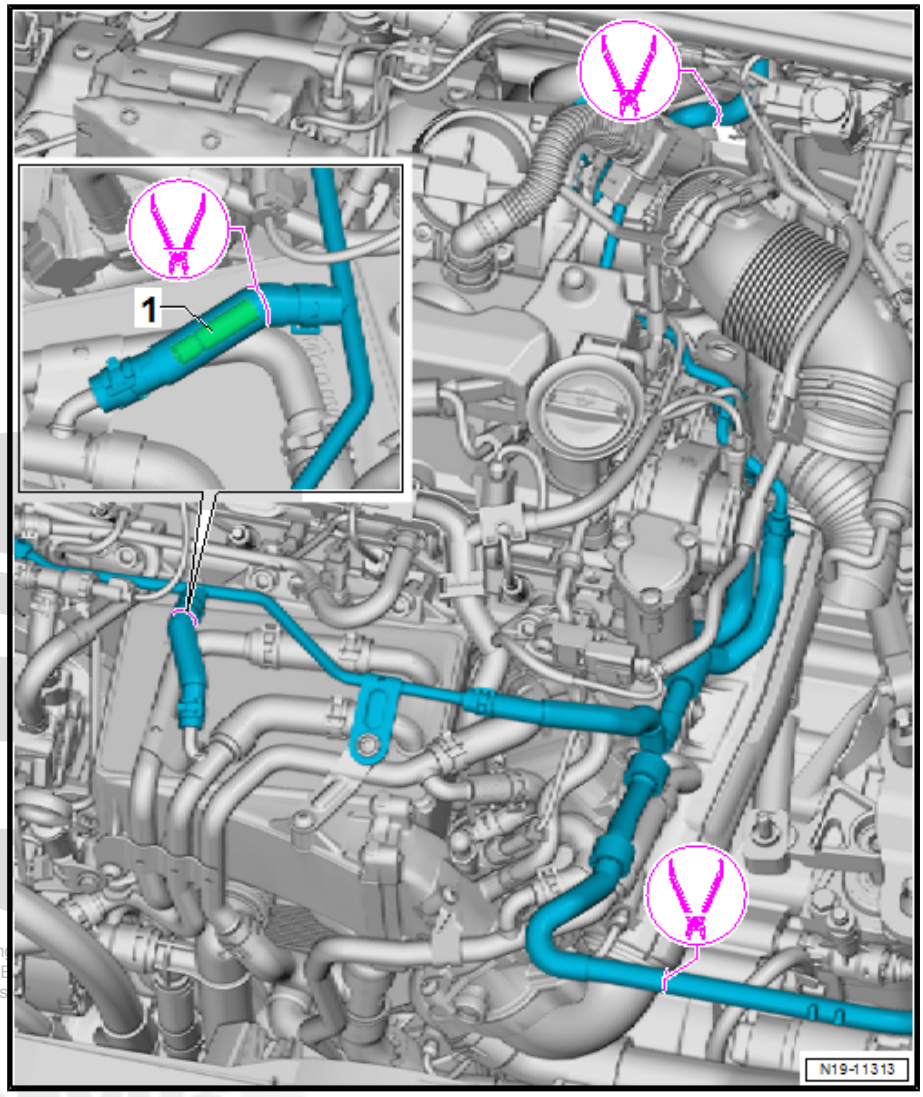
- Cylinder block and cylinder head
- Heat exchanger for heater
- Radiator
- Charge air cooler and water radiator for charge air cooling circuit

Note

- *During the procedure below, the 4 coolant circuits are flushed systematically by alternately clamping off the breather hoses.*
- *This procedure must be performed twice with distilled water. Then, the circuits are flushed twice with coolant.*
- *The indicated litre values are average values and may differ depending on the vehicle equipment. The quantity can be read on the scale of the container.*
- *The required quantity for flushing is determined by the change in colour on connection 1 of the sight glass. It takes two flushing cycles until the colour on connection 1 and 2 of the sight glass is the same.*
- *If a change in colour can be seen in the sight glass, the next coolant circuit is flushed.*

SEAT
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not allowed unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

1. Flushing cylinder block and cylinder head with distilled water:



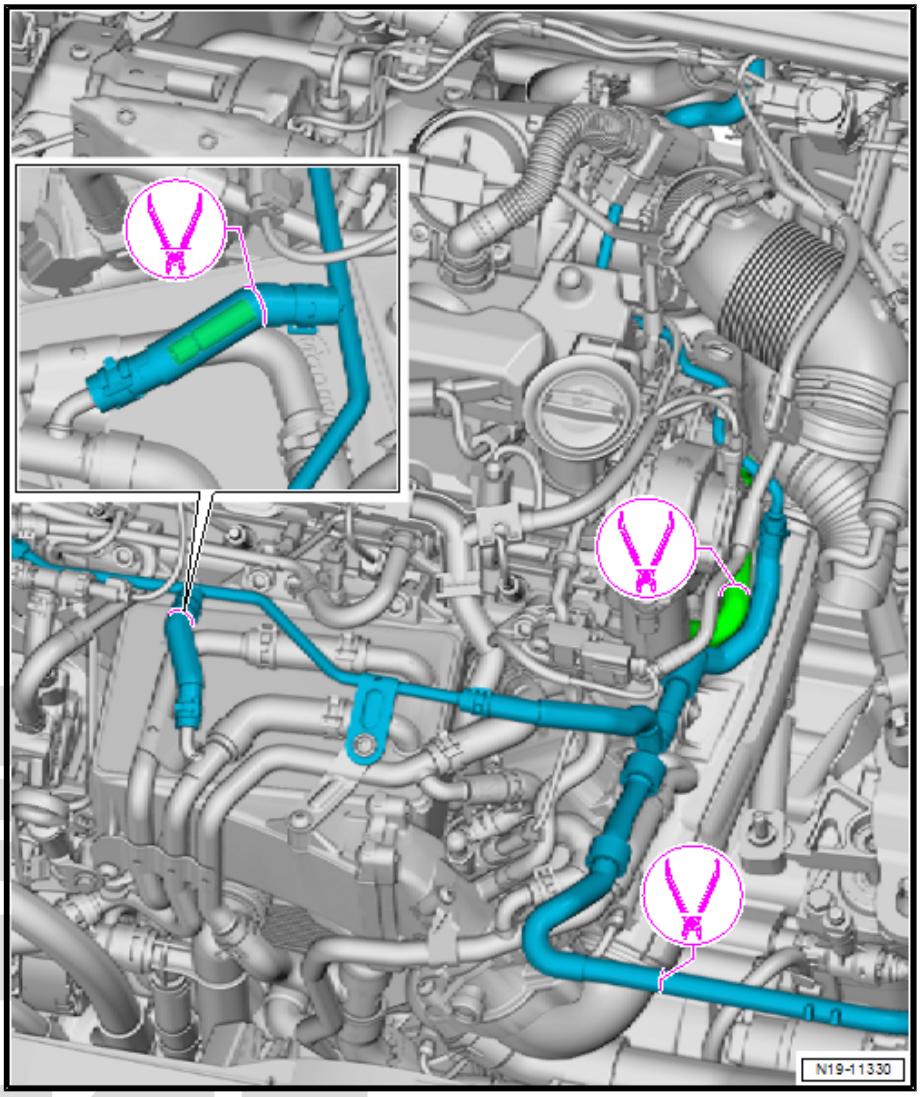
Protected by copyright. Copying
permitted unless authorised by SE
respect to the correctness

A non-return valve -1- is installed in the breather hose of the charge air cooler. Therefore, the hose must be clamped off at the positions shown.

– Use hose clamps to clamp off breather hoses at the positions shown.
– Open shut-off tap -A- on valve block. Now, distilled water is pumped through the engine.
– Observe sight glass: if coolant starts to discolour, close shut-off tap -A-.

• Required quantity of distilled water: approx. 2 to 3 l

2. Flushing heat exchanger for heater with distilled water:

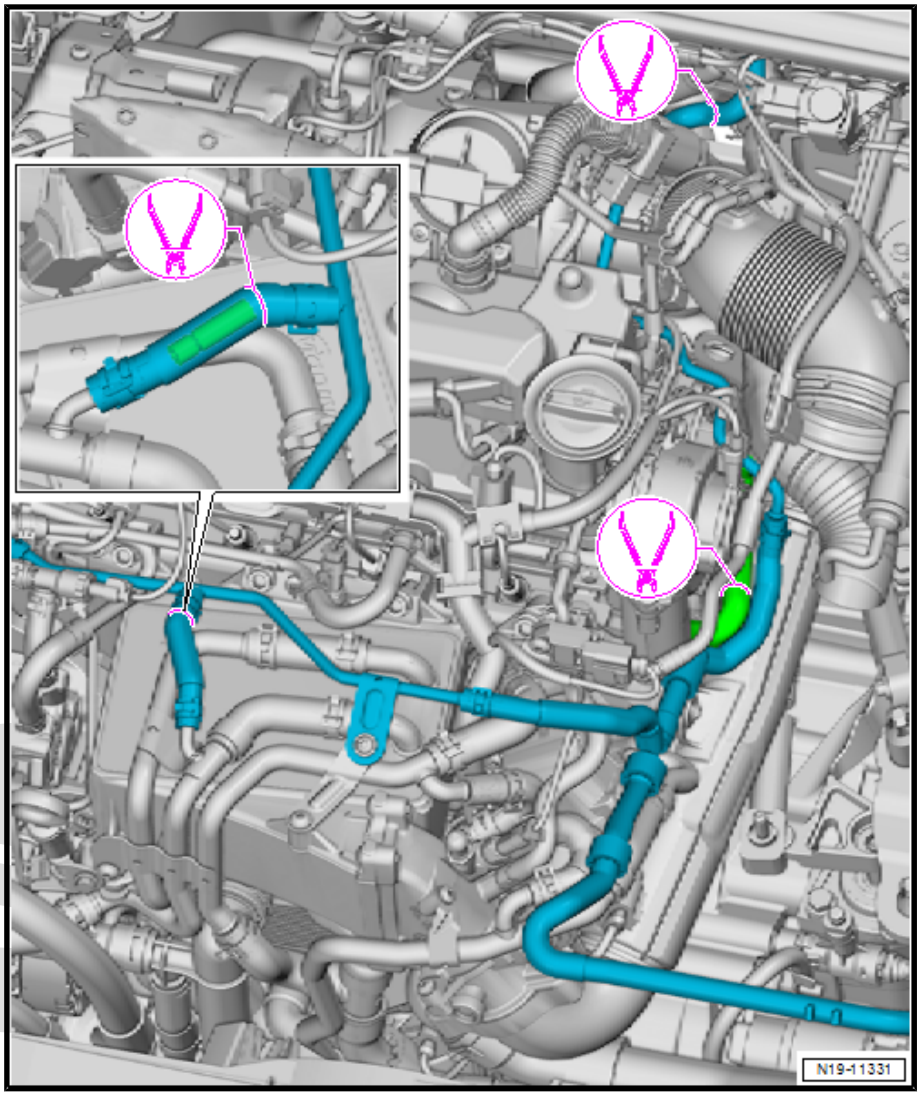


– Use hose clamps to clamp off breather hoses at the positions shown.
– Open shut-off tap -A- on valve block. Now, distilled water is pumped through the engine.
– Observe sight glass: if coolant starts to discolour, close shut-off tap -A-.

• Required quantity of distilled water: approx. 2 l

3. Flushing radiator with distilled water:

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



– Use hose clamps to clamp off breather hoses at the positions shown.

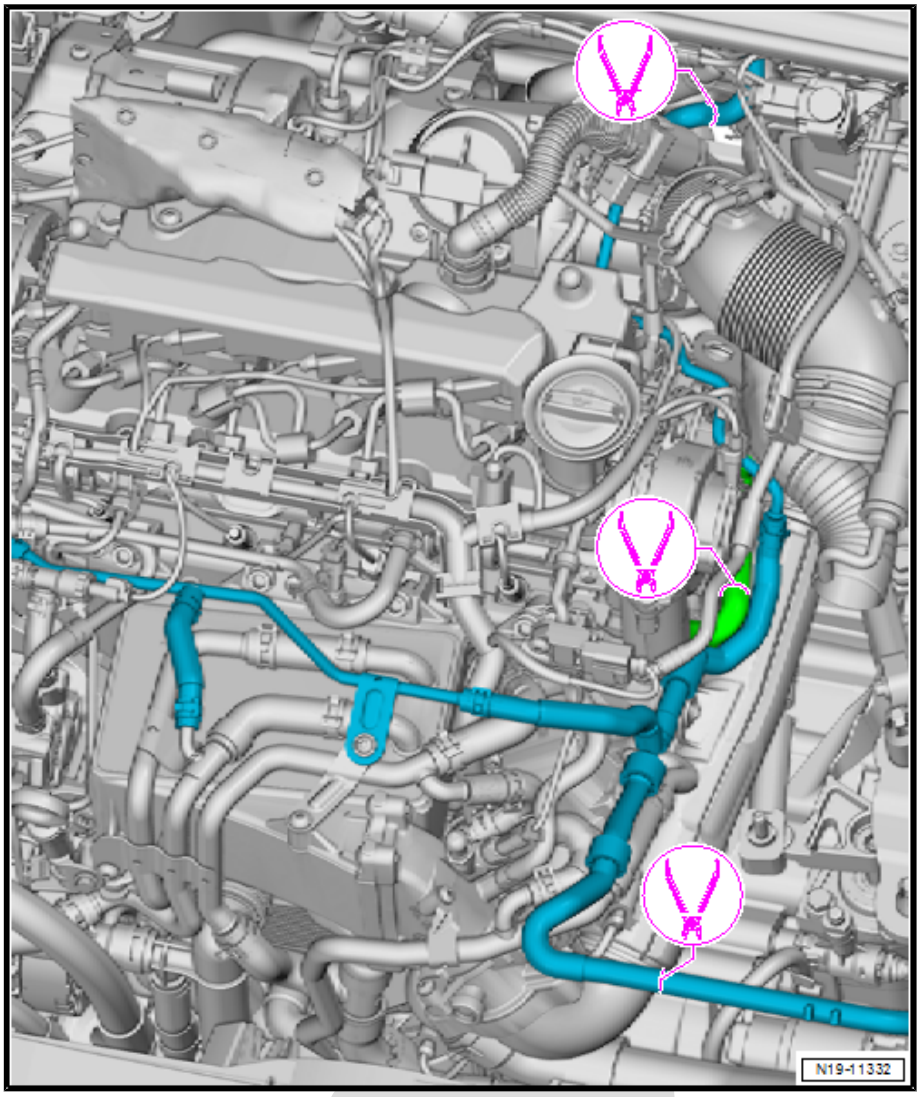
– Open shut-off tap -A- on valve block. Now, distilled water is pumped through the engine.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Observe sight glass: if coolant starts to discolour, close shut-off tap -A-.

• Required quantity of distilled water: approx. 2 l

4th Flushing charge air cooler and water radiator for charge air cooling circuit with distilled water:



– Use hose clamps to clamp off breather hoses at the positions shown.
– Open shut-off tap -A- on valve block. Now, distilled water is pumped through the engine.
– Observe sight glass: if coolant starts to discolour, close shut-off tap -A-.

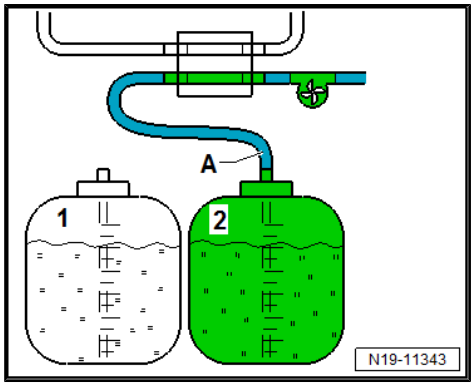
• Required quantity of distilled water: approx. 2 l

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

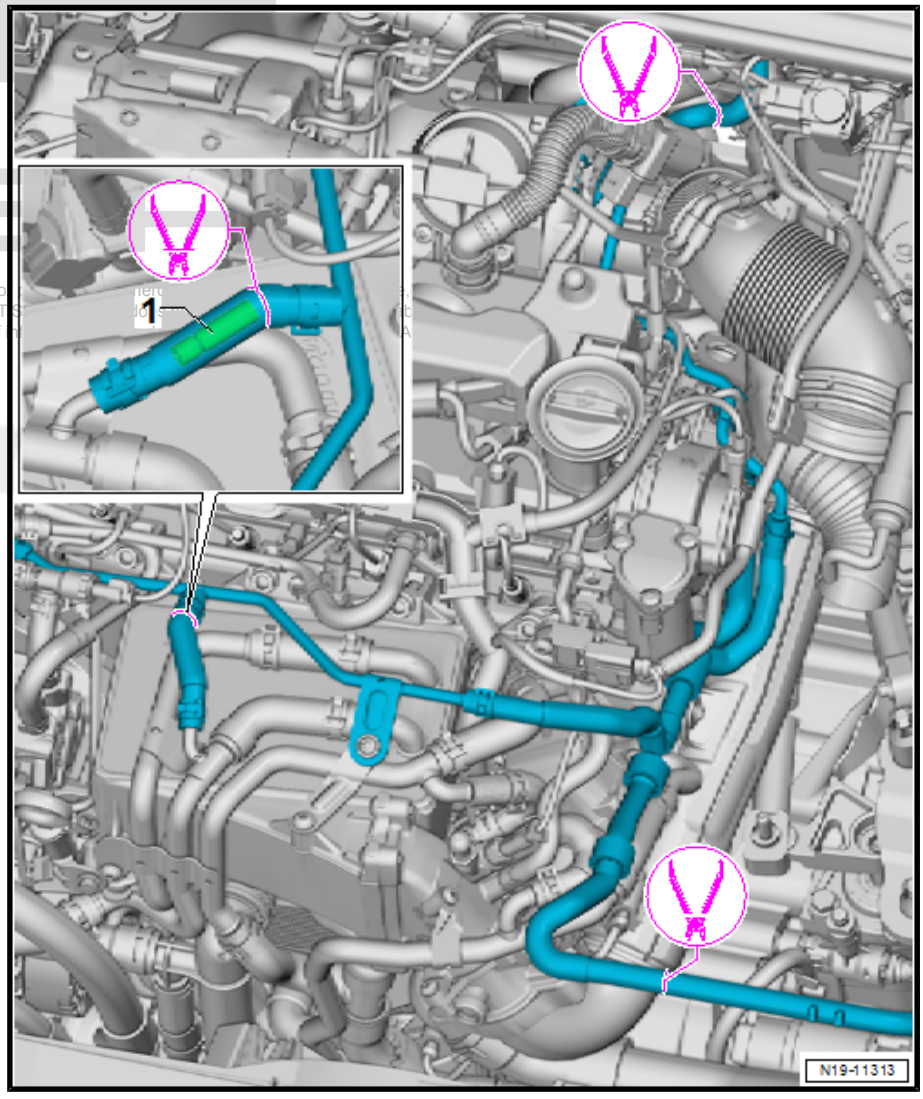
Repeat flushing cycles 1 through 4, but use only approx. 1 l of distilled water for each cycle ⇒ page 231 . Then, flush cooling system with coolant.

Flushing cooling system with coolant

– Connect suction hose -A- to container -2- for coolant.



1. Flushing cylinder block and cylinder head with coolant:



Protected by copyright. Copying for permitted unless authorised by SEAT respect to the correctness of

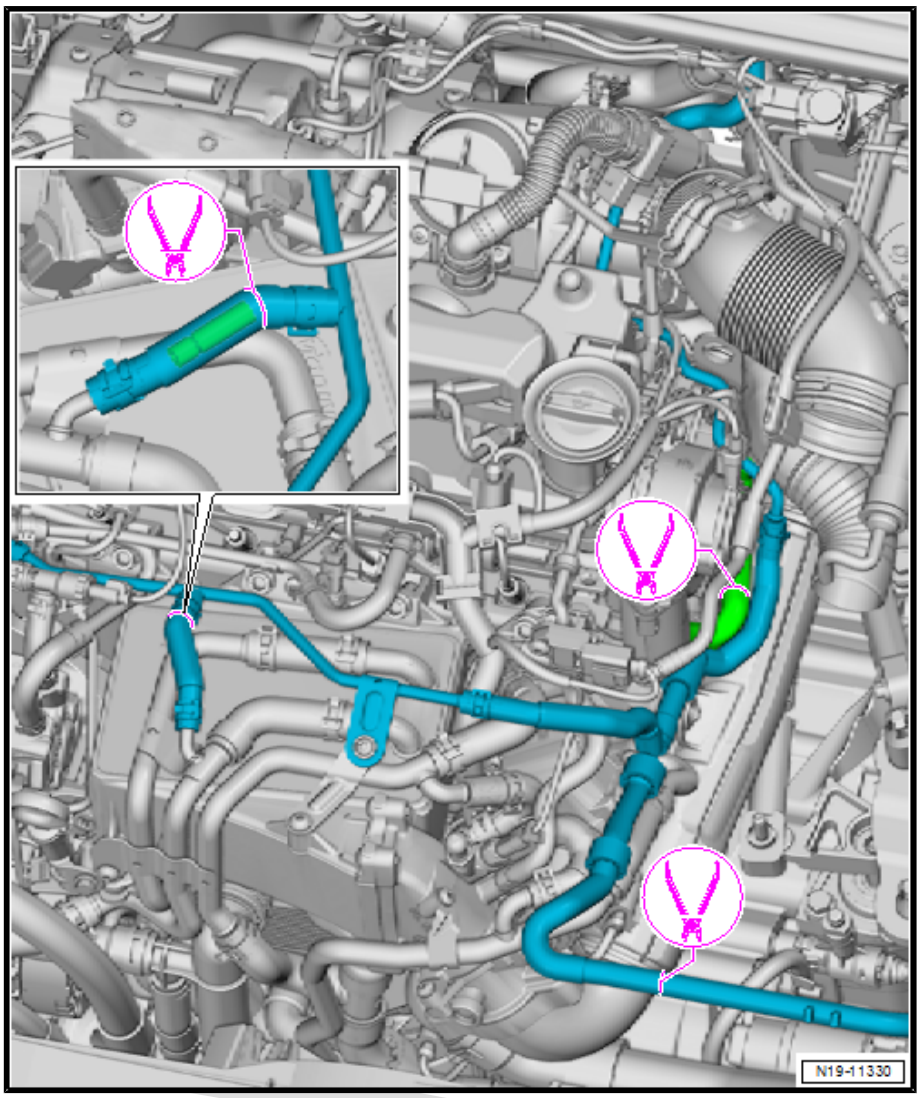
– Use hose clamps to clamp off breather hoses at the positions shown.

– Open shut-off tap -A- on valve block. Now, coolant is pumped through the engine.

– Observe sight glass: if coolant can be seen to be discharged through the sight glass, close shut-off tap -A-.

• Required quantity of coolant: approx. 2 to 3 l

2. Flushing heat exchanger for heater with coolant:



– Use hose clamps to clamp off breather hoses at the positions shown.

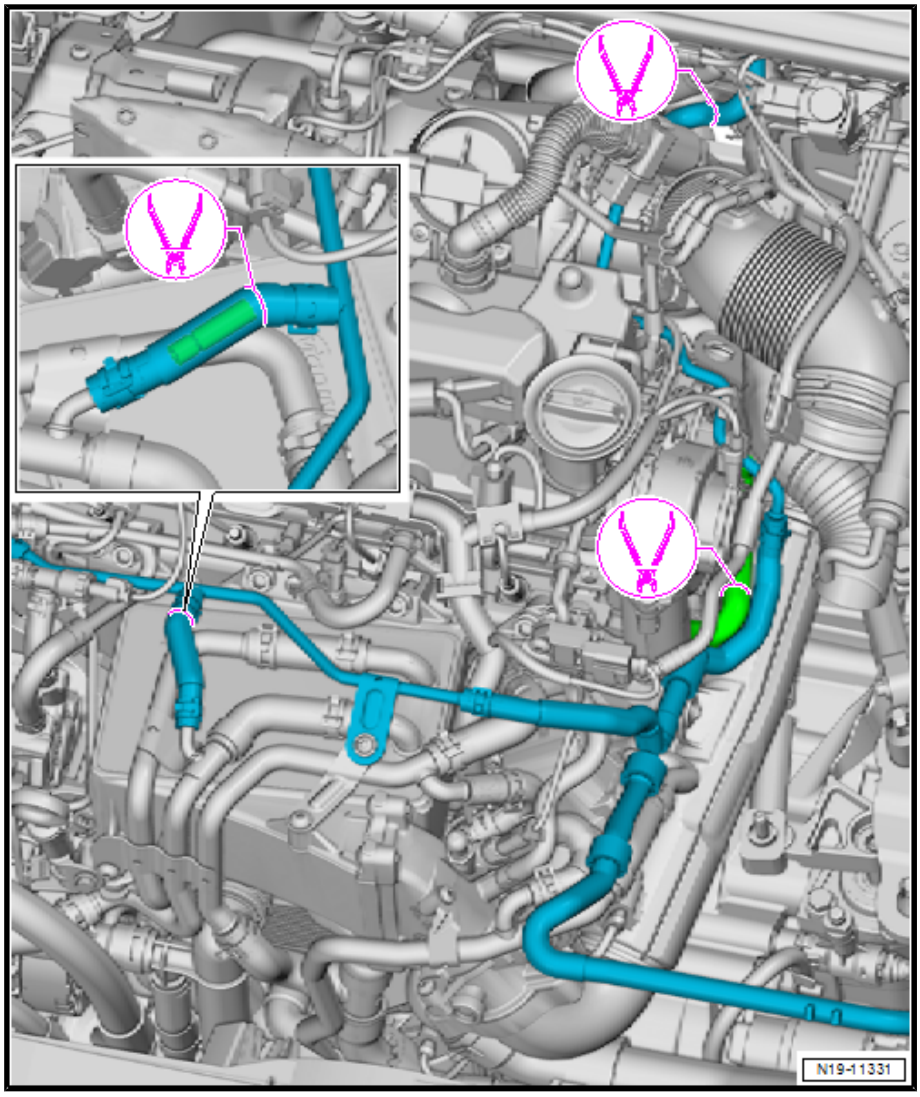
– Open shut-off tap -A- on valve block. Now, coolant is pumped through the engine.

– Observe sight glass: if coolant can be seen to be discharged through the sight glass, close shut-off tap -A-.

• Required quantity of coolant: approx. 2 l

3. Flushing radiator with coolant:

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

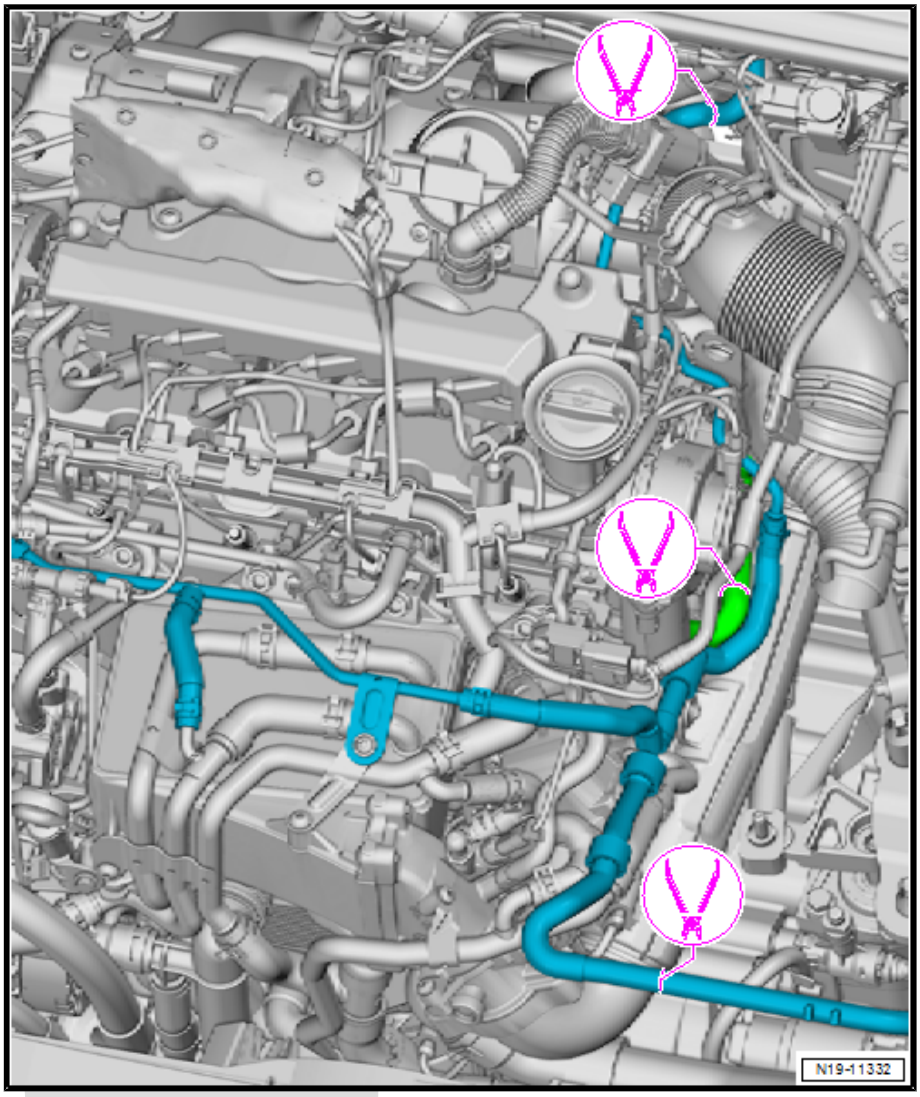


– Use hose clamps to clamp off breather hoses at the positions shown.
– Open shut-off tap -A- on valve block. Now, coolant is pumped through the engine.
– Observe sight glass: if coolant can be seen to be discharged through the sight glass, close shut-off tap -A-.

• Required quantity of coolant: approx. 2 l

4th Flushing charge air cooler and water radiator for charge air cooling circuit with coolant:

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



– Use hose clamps to clamp off breather hoses at the positions shown.

– Open shut-off tap -A- on valve block. Now, coolant is pumped through the engine.

– Observe sight glass: if coolant can be seen to be discharged through the sight glass, close shut-off tap -A-.

• Required quantity of coolant: approx. 2 l

Repeat flushing cycles 1 through 4, but use only approx. 1 l of coolant for each cycle ⇒ page 236 . Then, the flushing procedure has been completed.

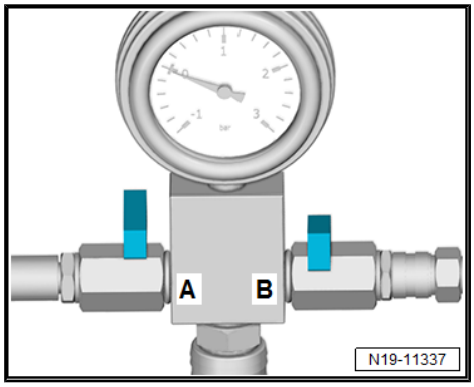
– Upon completion of flushing procedure switch off pump.

– Remove any hose clamps.

SEAT
Reproduction of this document for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.
erWin

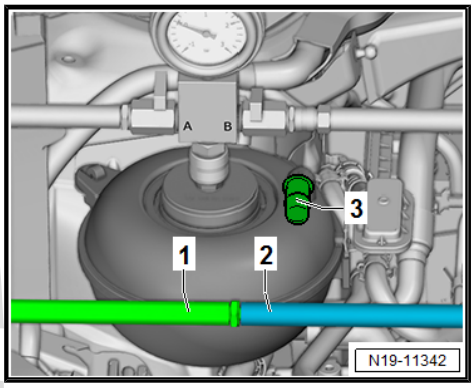
Removing coolant flushing and filling device - VAS 531 007- :

– Open shut-off tap -B-, and leave it open so that the pressure in the cooling system releases.

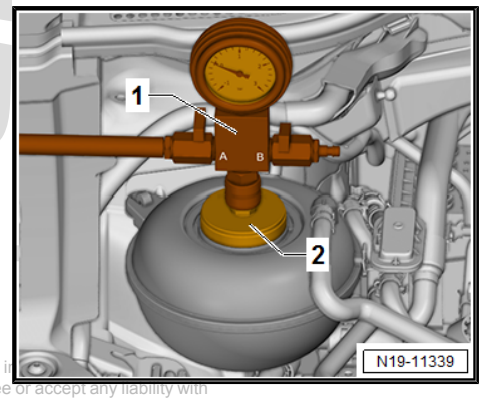


– Pull plug -3- off coolant expansion tank, and reconnect breather hose -2-.

– Use plug to seal flushing hose -1-.

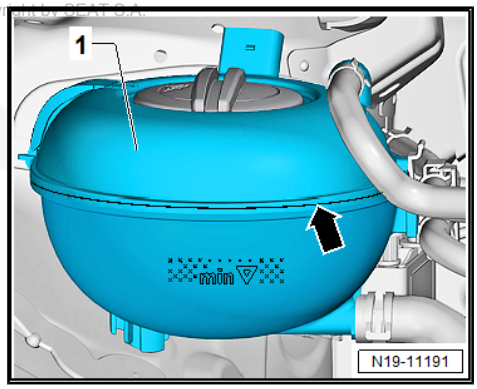


– Remove valve block -1- and test adapter -2-.



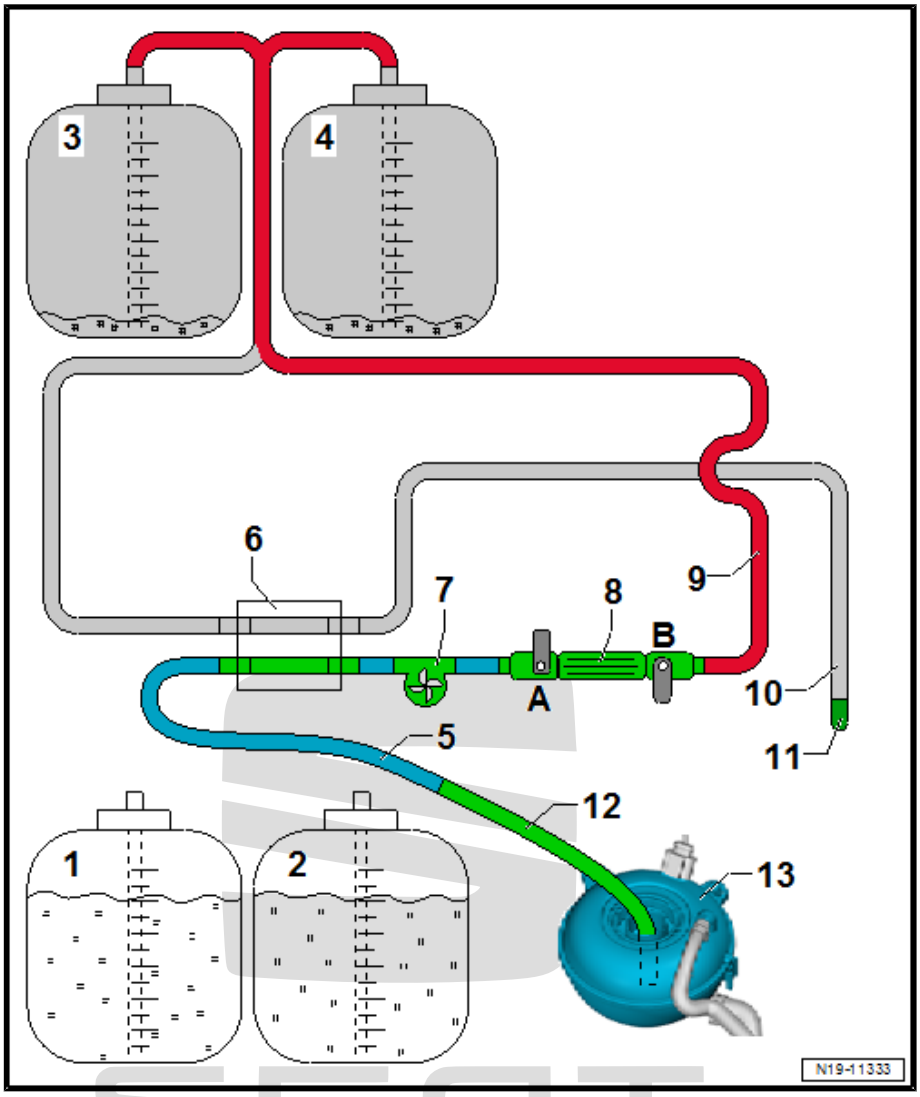
– The coolant level must be approx. at the »weld seam« -arrow-.

– Extract or fill coolant as necessary.



Extracting coolant:

Protected by copyright. Copying for private or commercial purposes, in
permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with
respect to the correctness of information in this document. Copyright by SEAT S.A.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Note

Use the extraction adapter ⇒ Item 14 (page 227) (14) for extracting the coolant.

– Detach suction hose -5- from container -2-.
– Fit extraction adapter -12- onto plug-in connector of suction hose -5-.
– Switch on pump -7-, and open shut-off taps -A- and -B- on valve block -8-.
– Use extraction adapter -12- to extract any excess coolant.
– Close shut-off taps on valve block, and switch off pump.

Bleeding cooling system:

– On vehicles with auxiliary heater, switch on auxiliary heater for about 30 seconds.
– Set temperature to “HI”.
– Switch off air conditioner compressor. To do this, press AC button.

• LED in button should not light up.

– Connect ⇒ Vehicle diagnostic tester.

– Switch on ignition, and select following menu option on ⇒ Vehicle diagnostic tester:

♦ `0001 - Engine electronics`

♦ `0001 - Engine electronics, functions`

♦ `0001 - Fill coolant circuit`

Note

The cooling system is mostly bled through flushing alone. Consequently, a »shorter« bleeding routine is then necessary. Answer the question "Was the cooling system filled with the aid of electric vacuum pump?" with yes so that the »shorter« bleeding routine can be initiated.

– Follow instructions shown on vehicle diagnostic tester.

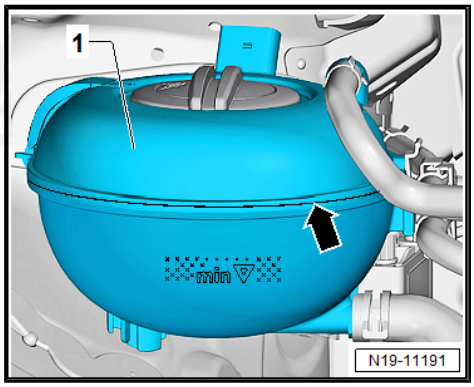
– Allow engine to cool down.

– Check coolant level and frost protection.

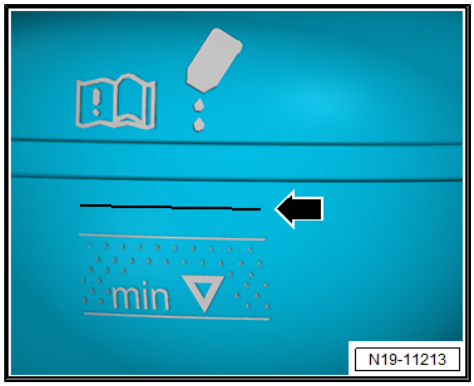
– If the frost protection is not sufficient, extract coolant from coolant expansion tank. Set correct frost protection by filling more coolant concentrate.

– After each time coolant concentrate has been filled, run engine at increased engine speed for about 2 minutes, and check frost protection again.

Data transmission, duplication or forwarding to third parties and commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



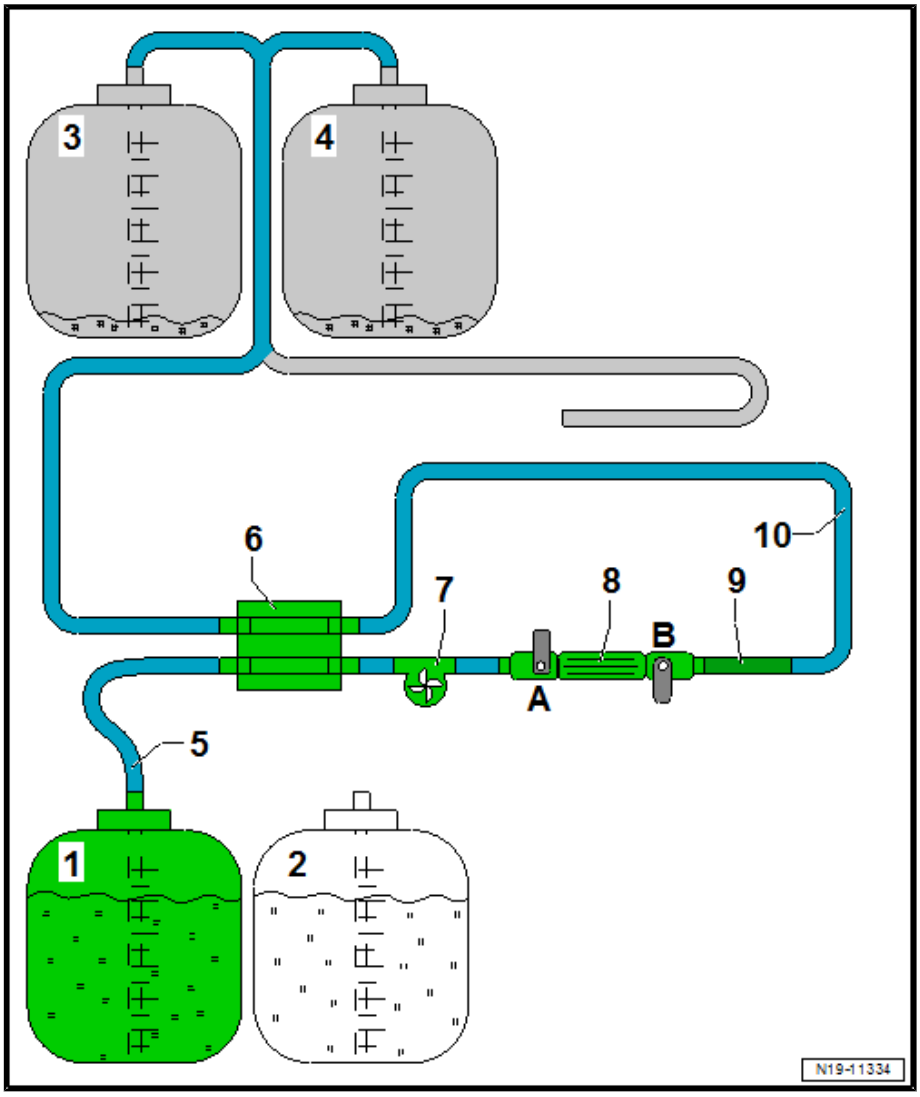
- The frost protection must be effective down to at least -25 °C, and approx. -36 °C in cold countries. The effectiveness of the frost protection may only be increased if a higher level of frost protection is required due to the climate. It may, however, be increased only to a maximum of -48°C. Otherwise, the cooling effect will be impaired.
- When the engine is at operating temperature, the coolant level must be at the »weld seam« -arrow-.
- When the engine is cold, the coolant level must be approx. 5 mm above the max. mark -arrow-.



Note

This excessive amount of coolant level is necessary since the coolant level may decrease automatically due to bleeding process.

Cleaning coolant flushing and filling device - VAS 531 007- :



Note

- *If coolant remains in the sight glass for longer periods of time, the sight glass may become opaque. Therefore, the sight glass must be flushed with distilled water after the flushing procedure has been completed.*
- *If the sight glass is opaque, clean it with a nylon brush.*
- *Use cleaning adapter ⇒ Item 13 (page 226) (13) for flushing.*

– Connect suction hose -5- to container -1- for distilled water.

– Fit flushing hose -10- onto cleaning adapter -9-. Fit cleaning adapter -9- to plug-in connector -B- on valve block -8-.

– Open shut-off valves -A- and -B- on valve block -8-.

– Switch on pump -7-, and pump distilled water through hoses until coolant has been flushed out of sight glass -6-.

– Switch off pump, and close shut-off taps.

– Remove cleaning adapter, and seal flushing hose with plug.

The reproduction, distribution and utilization of this document for commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

1.7 Flushing cooling system, quick reference guide

Note

The quick reference guide contains the basic steps of the workflow. It might be helpful to print out the guide and tick off the corresponding work steps after having performed them. For a detailed description of the necessary work steps, refer to *⇒ page 224* .

phase	Measure	Volume of flushing medium
1	Draining coolant	---
2	Fill cooling system with distilled water	---
3	Fit breather hose from coolant expansion tank to cooling flushing and charging unit	---
4	Clamp off charge air cooler hoses -1-, radiator breather hose -2- and heat exchanger -4-, flush cooling system	3 l of distilled water
5	Clamp off charge air cooler hoses -1-, radiator breather hose -2- and cylinder head -3-, flush cooling system	2 l of distilled water
6	Clamp off charge air cooler hoses -1-, cylinder head breather hose -3- and heat exchanger -4-, flush cooling system	2 l of distilled water
7	Clamp off breather hose for radiator -2-, for cylinder head -3- and heat exchanger -4-; flush cooling system	2 l of distilled water
	Repeat steps 4, 5, 6 and 7 but only pump through 1 litre of distilled water in each case	1 litre of distilled water in each case
8	Clamp off charge air cooler hoses -1-, radiator breather hose -2- and heat exchanger -4-, flush cooling system	3 l of coolant
9	Clamp off charge air cooler hoses -1-, radiator breather hose -2- and cylinder head -3-, flush cooling system	2 l of coolant
10	Clamp off charge air cooler hoses -1-, cylinder head breather hose -3- and heat exchanger -4-, flush cooling system	2 l of coolant
11	Clamp off breather hose for radiator -2-, for cylinder head -3- and heat exchanger -4-; flush cooling system	2 l of coolant
	Repeat steps 8, 9, 10 and 11 but only pump through 1 litre of coolant in each case	1 litre of coolant in each case
12	Remove all clamping pliers	---
16	Detach coolant flushing and filling device , and close coolant expansion tank	---
17	Bleed cooling system with vehicle diagnostic tester	---
18	Check coolant level and frost protection	---

Clamp off points

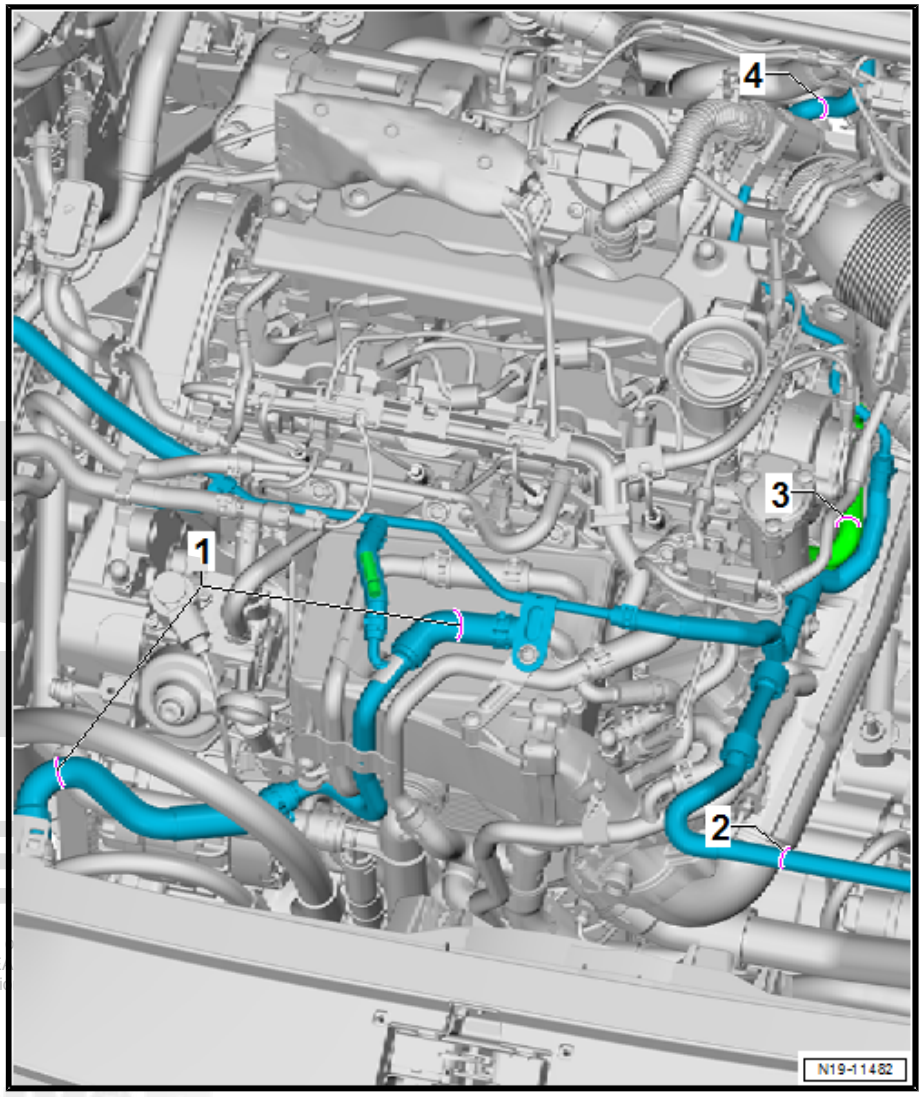
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

1 - Charge air cooler hoses

2 - Breather hose of radiator for engine coolant

3 - Breather hose for cylinder head

4 - Breather hose of heat exchanger for heater unit



Protected by copyright. Copying for private
permitted unless authorised by SEAT S.A. SE
respect to the correctness of informati

2 Coolant pump, thermostat

⇒ “2.1 Assembly overview - coolant pump, thermostat”, page 246

⇒ “2.2 Assembly overview - electric coolant pump”, page 250

⇒ “2.3 Assembly overview - coolant temperature sender”, page 256

⇒ “2.4 Removing and installing electric coolant pump”, page 257

⇒ “2.5 Removing and replacing coolant pump”, page 272

⇒ “2.6 Removing and installing thermostat”, page 273

⇒ “2.7 Testing coolant thermostat”, page 277

⇒ “2.8 Removing and installing the valve for the cylinder head coolant N489 ”, page 278

⇒ “2.9 Removing and installing coolant temperature sender G62 ”, page 278

⇒ “2.10 Removing and installing radiator outlet coolant temperature sender G83 ”, page 280

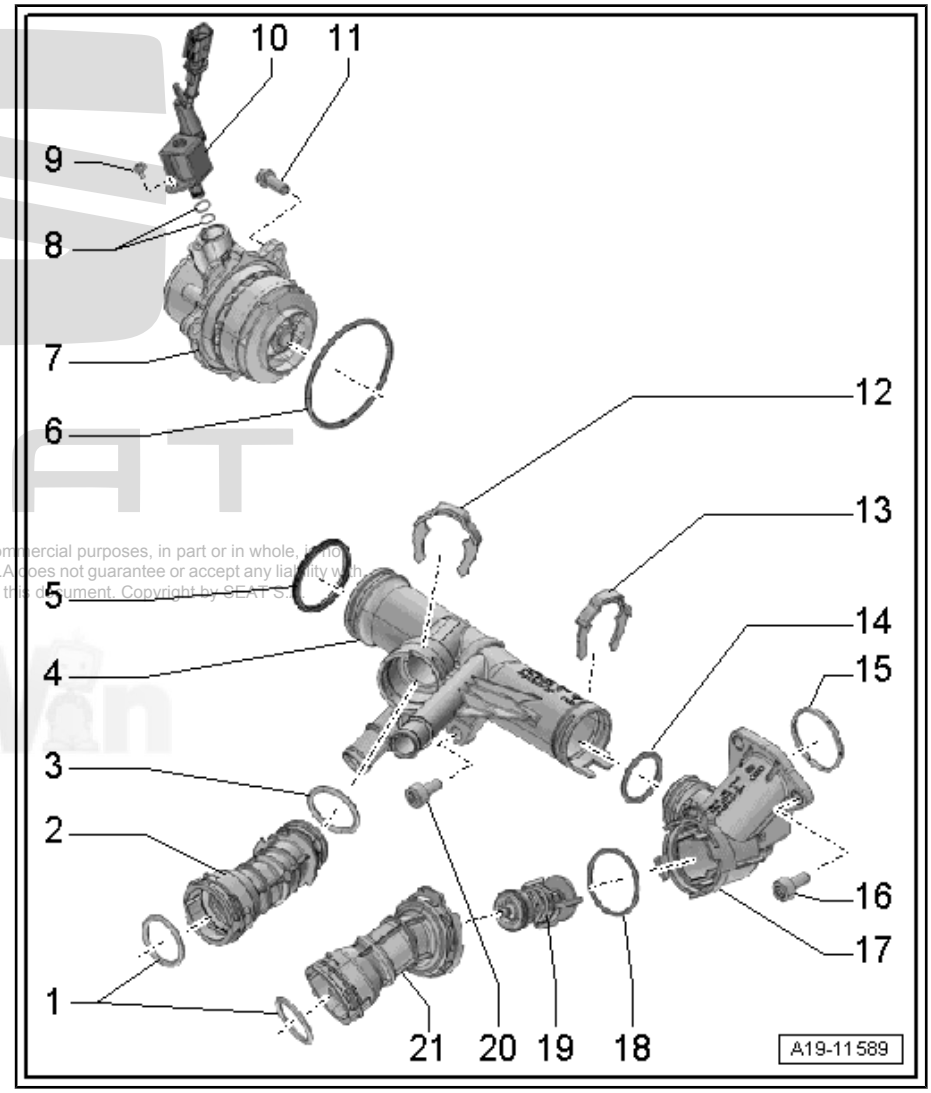
2.1 Assembly overview - coolant pump, thermostat

⇒ “2.1.1 Assembly overview - coolant pump, thermostat, type 1”, page 246

⇒ “2.1.2 Assembly overview - coolant pump, thermostat, type 2”, page 248

2.1.1 Assembly overview - coolant pump, thermostat, type 1

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



1 - O-rings
- ❑ Renew after removal
- ❑ Moisten with coolant

2 - Connection

3 - O-ring
- ❑ Renew after removal
- ❑ Moisten with coolant

4 - Front coolant pipe, bottom
- ❑ Removing and installing ⇒ page 284

5 - Radial oil seal
- ❑ Renew after removal

6 - O-ring
- ❑ Renew after removal
- ❑ Moisten with coolant

7 - Coolant pump
- ❑ Removing and installing ⇒ page 272

8 - O-rings
- ❑ Renew after removal
- ❑ Moisten with coolant

9 - Bolt
- ❑ 8 Nm

10 - Coolant valve for cylinder head - N489-
- ❑ Removing and installing ⇒ page 278

11 - Bolt
- ❑ Renew after removal
- ❑ 20 Nm +45°

12 - Retaining clip
- ❑ Check for secure seating.

13 - Retaining clip
- ❑ Check for secure seating.

14 - O-ring
- ❑ Renew after removal
- ❑ Moisten with coolant

15 - Radial oil seal
- ❑ Renew after removal

16 - Bolt
- ❑ 20 Nm

17 - Thermostat housing

18 - O-ring
- ❑ Renew after removal
- ❑ Moisten with coolant

19 - Thermostat
- ❑ Removing and installing ⇒ page 273

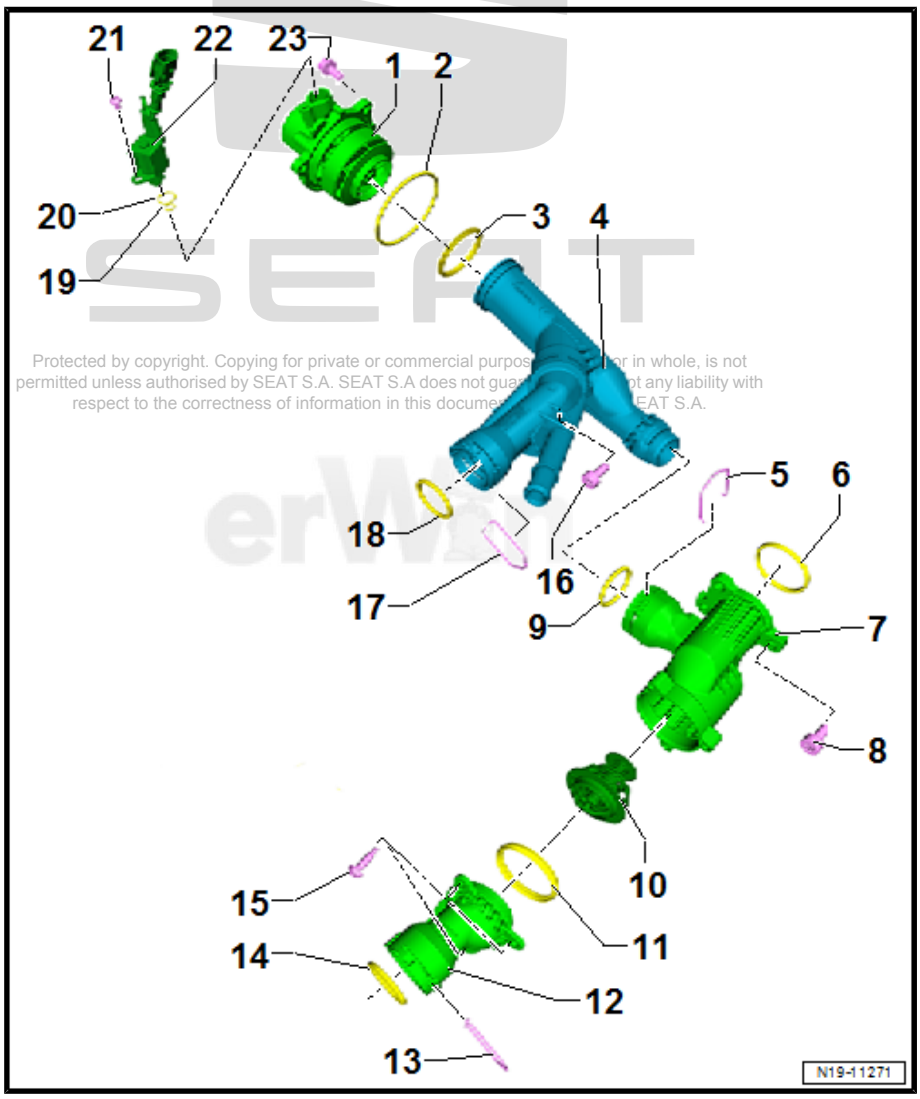
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

20 - Bolt

- ❑ 20 Nm

21 - Connection

2.1.2 Assembly overview - coolant pump, thermostat, type 2



Protected by copyright. Copying for private or commercial purpos... in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guar... any liability with respect to the correctness of information in this docume... SEAT S.A.

1 - Coolant pump

- ❑ Removing and installing ⇒ page 272

2 - O-ring

- ❑ Renew after removal
- ❑ Moisten with coolant

3 - O-ring

- ❑ Renew after removal
- ❑ Moisten with coolant

4 - Front coolant pipe, bottom

- ❑ Removing and installing ⇒ page 284

5 - Retaining clip

- ❑ Check for secure seating.

6 - Radial oil seal

- ❑ Renew after removal

7 - Thermostat housing

8 - Bolt

- ❑ 20 Nm

9 - O-ring

- ❑ Renew after removal
- ❑ Moisten with coolant

10 - Thermostat

- ❑ Removing and installing ⇒ page 275

11 - O-ring

- ❑ Renew after removal
- ❑ Moisten with coolant

12 - Connection

13 - Retaining clip

- ❑ Check for secure seating.

14 - O-ring

- ❑ Renew after removal
- ❑ Moisten with coolant

15 - Bolt

- ❑ 8 Nm

16 - Bolt

- ❑ 8 Nm

17 - Retaining clip

- ❑ Check for secure seating.

18 - O-ring

- ❑ Renew after removal
- ❑ Moisten with coolant

19 - O-ring

- ❑ Renew after removal
- ❑ Moisten with coolant

20 - O-ring

- ❑ Renew after removal
- ❑ Moisten with coolant

21 - Bolt

- ❑ 8 Nm

22 - Coolant valve for cylinder head - N489-

- ❑ Removing and installing ⇒ page 278

23 - Bolt

- ❑ Renew after removal
- ❑ 20 Nm +45°

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

2.2 Assembly overview - electric coolant pump

⇒ “2.2.1 Assembly overview - charge air cooling pump V188 and auxiliary pump for heating V488 , version 1”, page 250

⇒ “2.2.2 Assembly overview - charge air cooling pump V188 , version 2”, page 251

⇒ “2.2.3 Assembly overview - auxiliary pump for heating V488 , version 2”, page 252

⇒ “2.2.4 Assembly overview - charge air cooling pump V188 , version 3”, page 253

⇒ “2.2.5 Assembly overview - auxiliary pump for heating V488 , version 3”, page 254

⇒ “2.2.6 Assembly overview - charge air cooling pump V188 , version 4”, page 255

2.2.1 Assembly overview - charge air cooling pump - V188- and auxiliary pump for heating - V488- , version 1

1 - Charge air cooling pump - V188-

- ❑ Removing and installing ⇒ page 257

2 - Coolant hose

3 - Coolant hose

4 - Bolt

- ❑ 40 Nm

5 - Bolt

- ❑ 40 Nm

6 - Auxiliary pump for heating - V488-

- ❑ Removing and installing ⇒ page 259

7 - Coolant hose

8 - Coolant hose

9 - Bracket/bearing/support

- ❑ For auxiliary pump for heating - V488-

10 - Clips

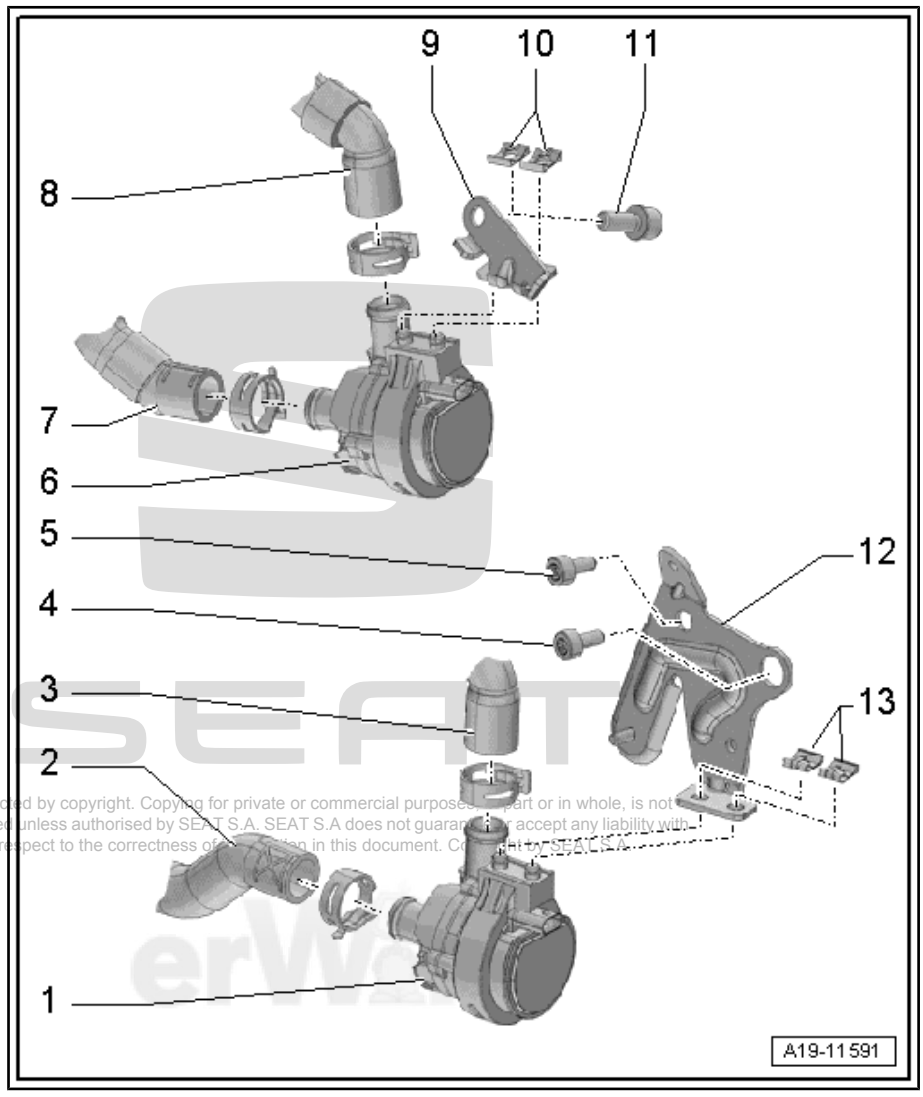
11 - Bolt

- ❑ 40 Nm

12 - Bracket/bearing/support

- ❑ For charge air cooling pump

13 - Clips



Protected by copyright. Copying for private or commercial purposes, part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

2.2.2 Assembly overview - charge air cooling pump - V188- , version 2

1 - Retaining clip

2 - Bolt

- ❑ 23 Nm

3 - Charge air cooling pump - V188-

- ❑ Removing and installing ⇒ page 257

4 - Coolant hose

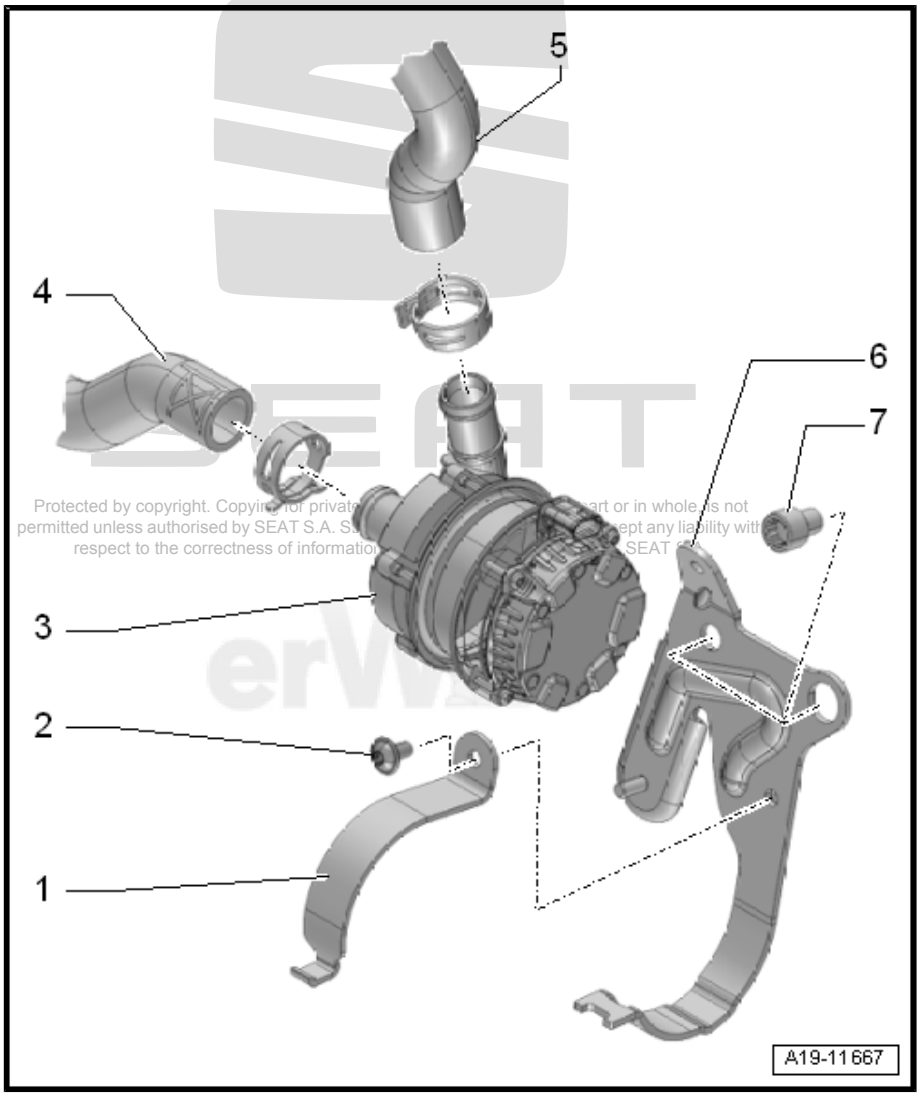
5 - Coolant hose

6 - Bracket/bearing/support

- ❑ For charge air cooling pump

7 - Bolt

- ❑ 40 Nm



Protected by copyright. Copying for private
art or in whole is not
permitted unless authorised by SEAT S.A.
ept any liability with
respect to the correctness of information
SEAT

2.2.3 Assembly overview - auxiliary pump for heating - V488- , version 2

1 - Bolt

- ❑ 1.5 Nm

2 - Sleeve

3 - Bonded rubber bush

- ❑ Ensure proper seating in bracket

4 - Bracket/bearing/support

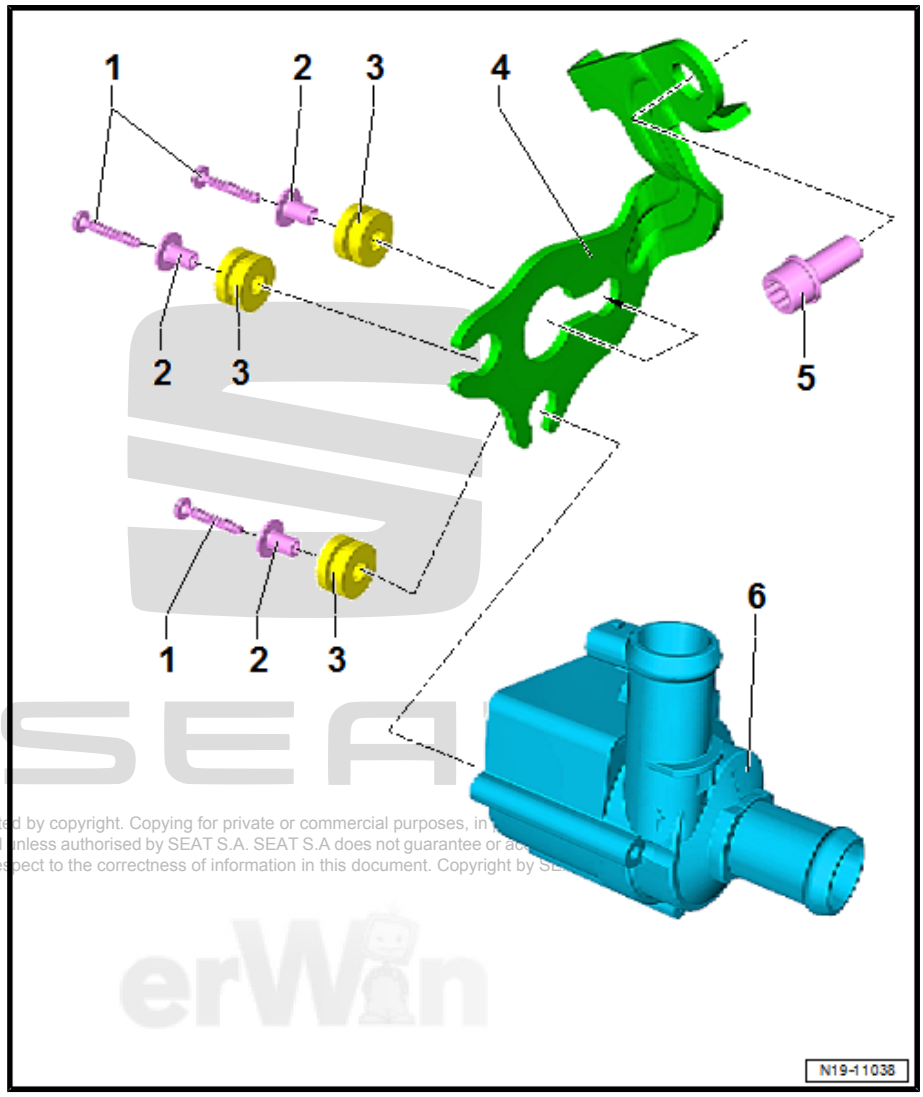
- ❑ For auxiliary pump for heating - V488-

5 - Bolt

- ❑ 40 Nm

6 - Auxiliary pump for heating - V488-

- ❑ Removing and installing ⇒ page 259



Protected by copyright. Copying for private or commercial purposes, in
permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or ac
respect to the correctness of information in this document. Copyright by SE

2.2.4 Assembly overview - charge air cooling pump - V188- , version 3

1 - Bolt
- ❑ 40 Nm

2 - Bracket/bearing/support
- ❑ For charge air cooling pump - V188-

3 - Bolt
- ❑ 23 Nm

4 - Retaining clip

5 - Charge air cooling pump - V188-
- ❑ Removing and installing ⇒ page 257

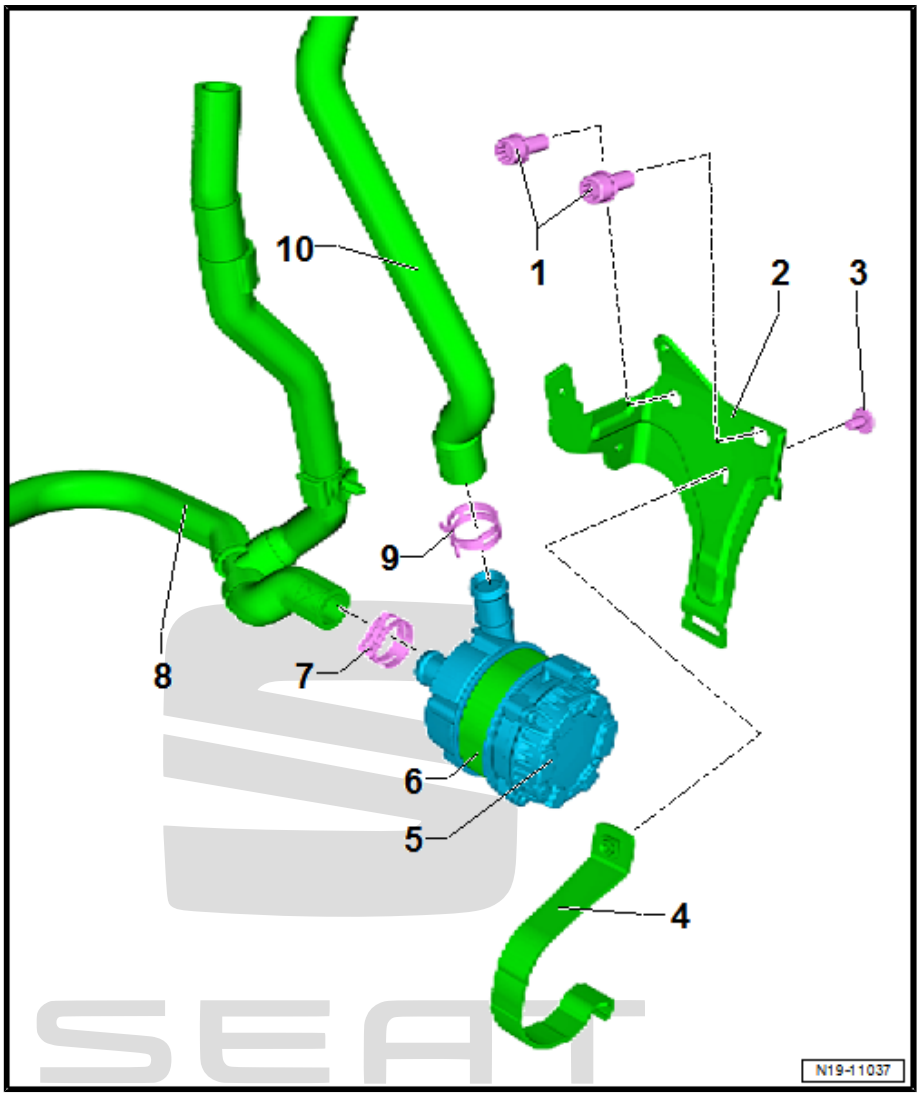
6 - Rubber mounting

7 - Spring-type clip

8 - Coolant hose

9 - Spring-type clip

10 - Coolant hose



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

2.2.5 Assembly overview - auxiliary pump for heating - V488- , version 3

1 - Bolt

- ❑ 40 Nm

2 - Bracket/bearing/support

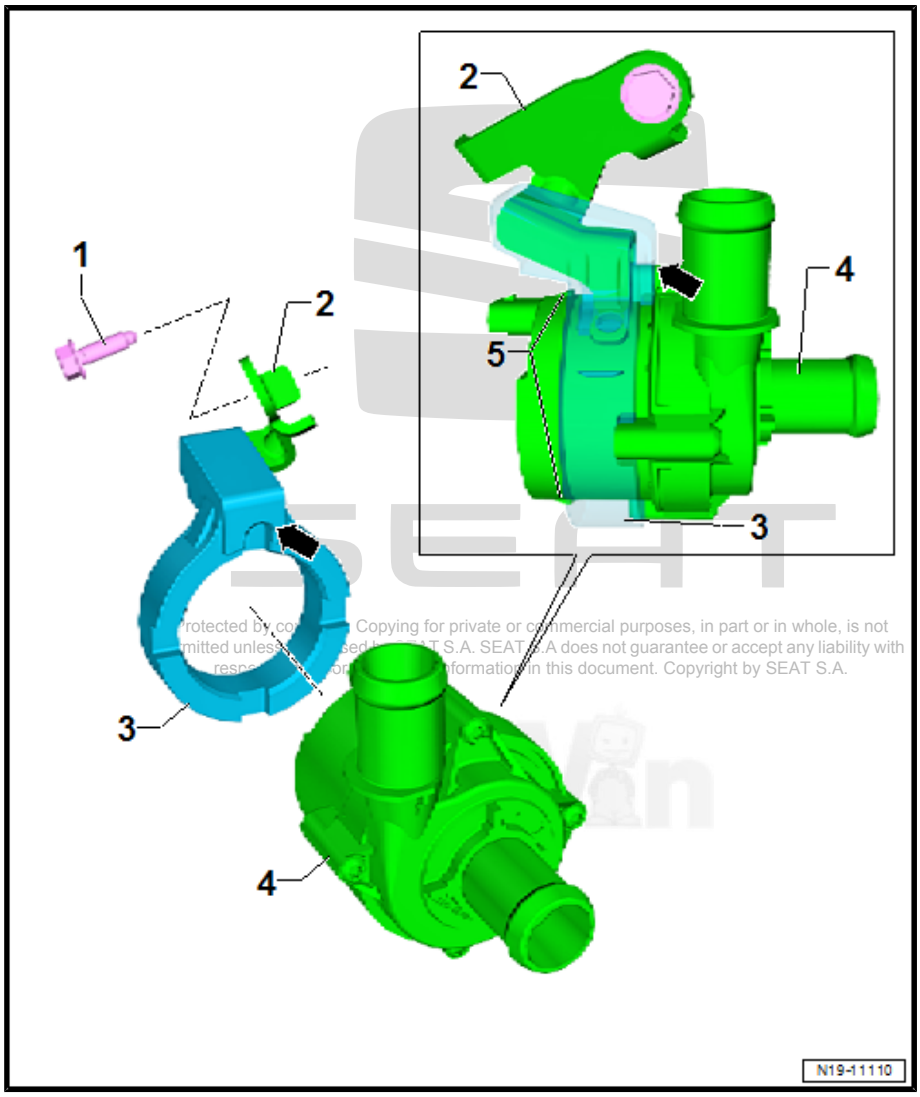
3 - Bracket/bearing/support

4 - Auxiliary pump for heating - V488-

- ❑ Removing and installing ⇒ page 259

5 - Retaining tabs

- ❑ 2x.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the information in this document. Copyright by SEAT S.A.

2.2.6 Assembly overview - charge air cooling pump - V188- , version 4

1 - Bolt
- ❑ 1.5 Nm

2 - Sleeve

3 - Rubber mounting
- ❑ Ensure proper seating in bracket

4 - Bracket/bearing/support

5 - Bolt
- ❑ 40 Nm

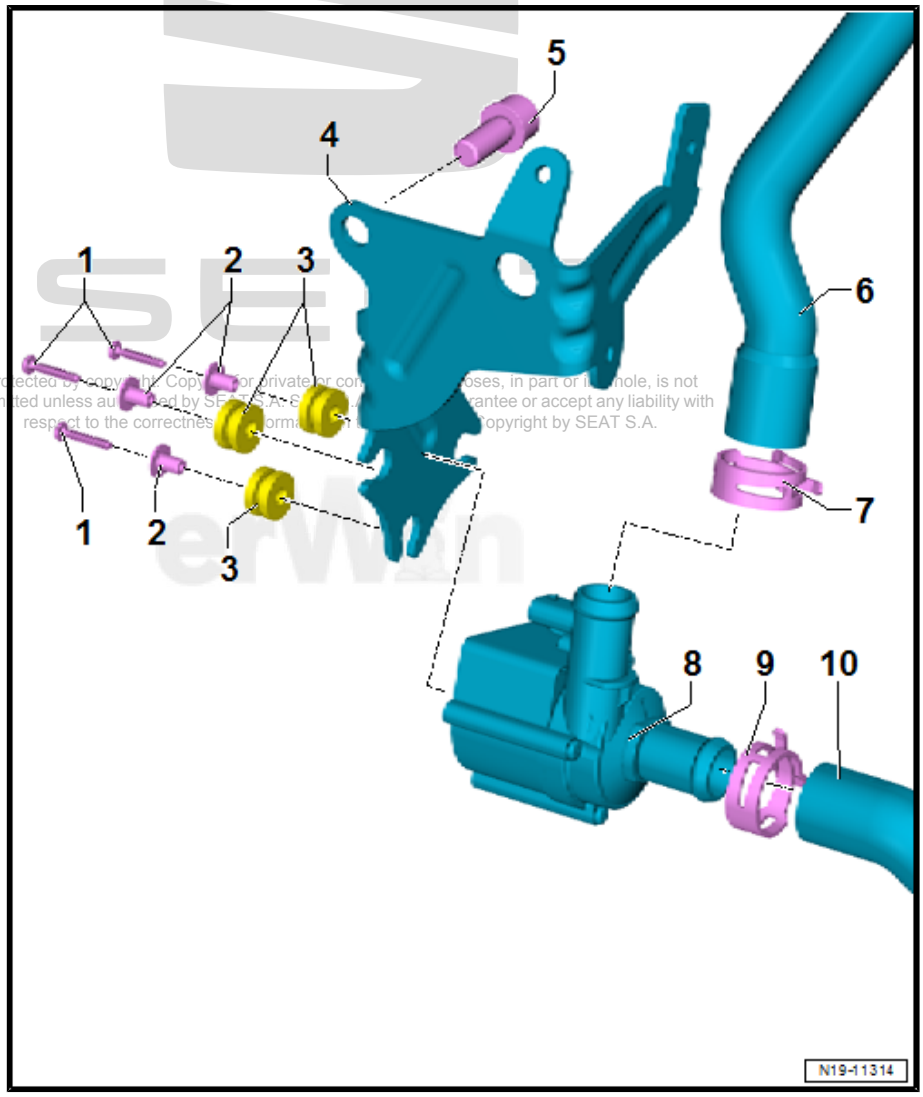
6 - Coolant hose

7 - Spring-type clip

8 - Charge air cooling pump - V188-
- ❑ Removing and installing ⇒ page 257

9 - Spring-type clip

10 - Coolant hose



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information. Copyright by SEAT S.A.

2.3 Assembly overview - coolant temperature sender

1 - Coolant temperature sender - G62-

- ❑ Removing and installing ⇒ page 278

2 - Spacer ring

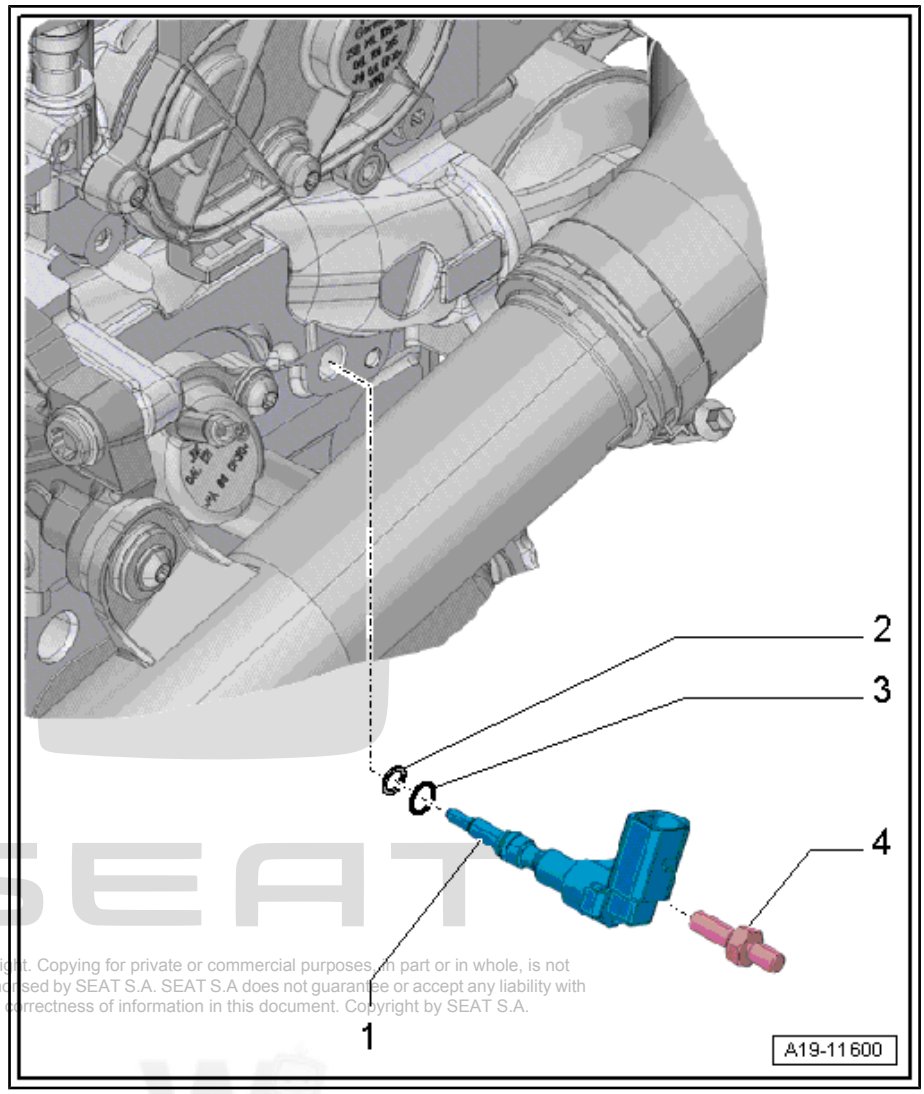
- ❑ Renew if damaged

3 - O-ring

- ❑ Renew after removal
- ❑ Moisten with coolant

4 - Centre hex stud

- ❑ 8 Nm



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

2.4 Removing and installing electric coolant pump

⇒ “2.4.1 Removing and installing charge air cooling pump V188 , versions 1 and 2”, page 257

⇒ “2.4.2 Removing and installing auxiliary pump for heating V488 , version 1”, page 259

⇒ “2.4.3 Removing and installing charge air cooling pump V188 , version 3”, page 261

⇒ “2.4.4 Removing and installing auxiliary pump for heating V488 , version 2”, page 264

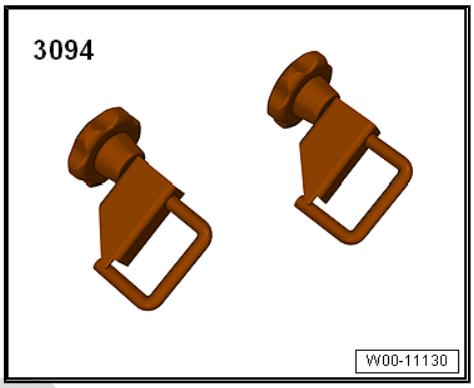
⇒ “2.4.5 Removing and installing auxiliary pump for heating V488 , version 3”, page 267

⇒ “2.4.6 Removing and installing charge air cooling pump V188 , version 4”, page 270

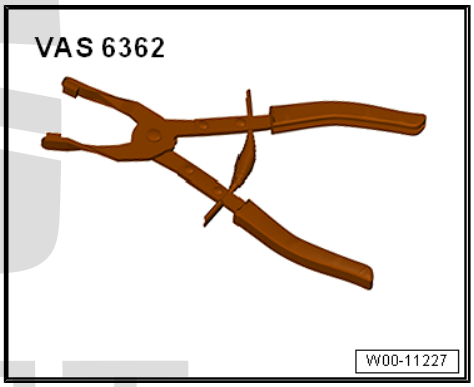
2.4.1 Removing and installing charge air cooling pump - V188- , versions 1 and 2

Special tools and workshop equipment required

- Hose clamps, up to Ø 25 mm - 3094-

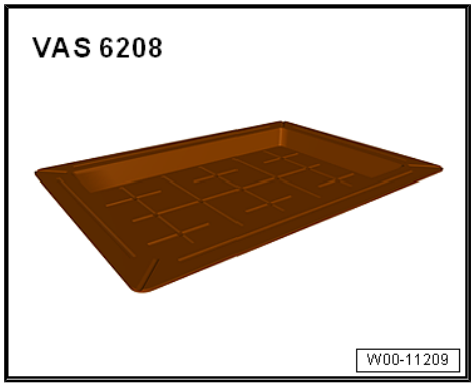


- Hose clip pliers - VAS 6362-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

♦ Drip tray for workshop hoist - VAS 6208-



Vehicles with charge air cooling pump - V188- , version 1
⇒ page 258 :

Vehicles with charge air cooling pump - V188- , version 2
⇒ page 259 :

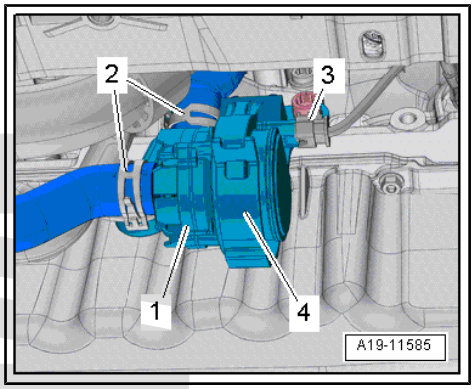
If charge air cooling pump - V188- needs to be detached from engine to free up space ⇒ page 259 :

Removing

– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

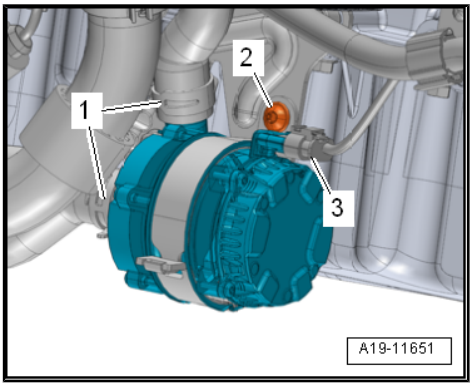
Vehicles with charge air cooling pump - V188- , version 1

– Release and unplug electrical connector -3-.
– Use cloth to catch escaping coolant.
– Place drip tray for workshop hoist - VAS 6208- underneath.
– Clamp off coolant hoses with hose clips -3094- .
– Loosen the hose clips -2-, remove the coolant hoses.
– Loosen the charge air cooling pump - V188- -item 1- from its anchoring -4-.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Vehicles with charge air cooling pump - V188- , version 2:



– Unplug the electrical connector -3-.
– Use cloth to catch escaping coolant.
– Place drip tray for workshop hoist - VAS 6208- underneath.
– Clamp off coolant hoses with hose clips -3094- .
– Loosen the hose clips -1-, remove the coolant hoses.
– Unscrew bolt -2-, open retaining tab, and remove charge air cooling pump - V188- .

If the charge air cooling pump - V188- is to be removed from the engine for spatial reasons:

– Release and pull off connector.
– Unscrew bolt for bracket.
– Lay charge air cooling pump - V188- to one side.

Installing

Install in reverse order of removal, observing the following.

Note

Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .

– Check coolant level ⇒ page 218 .

Specified torques

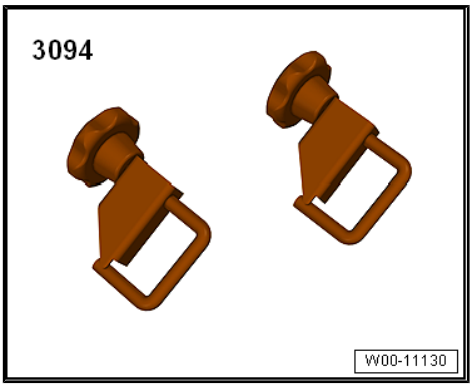
- ⇒ “2.2 Assembly overview - electric coolant pump”, page 250
- Assembly overview - Noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - Noise insulation

Copyright by SEAT S.A. Dissemination of this electronic data for commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

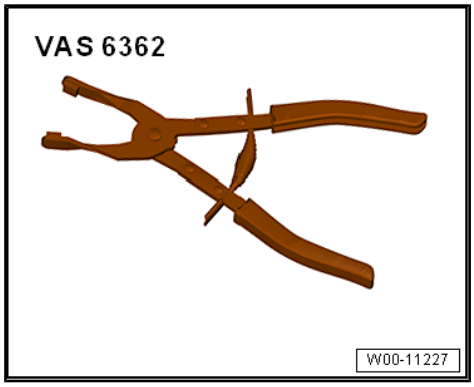
2.4.2 Removing and installing auxiliary pump for heating - V488- , version 1

Special tools and workshop equipment required

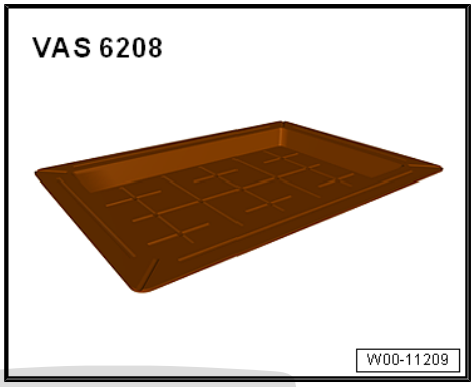
- Hose clamps, up to Ø 25 mm - 3094-



- Hose clip pliers - VAS 6362-



- Drip tray for workshop hoist - VAS 6208-



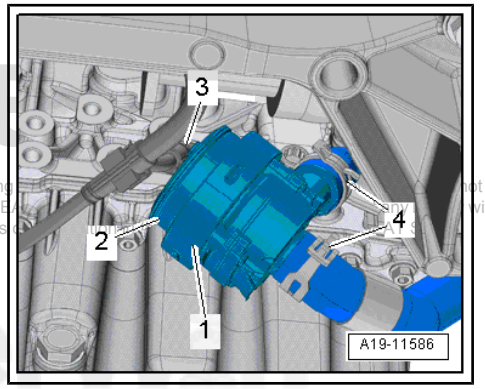
If the auxiliary pump for heating - V488- is to be removed ⇒ page 260 :

If the auxiliary pump for heating - V488- is to be detached from engine to free some space, ⇒ page 261 :

Removing

– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

If the auxiliary pump for heating - V488- is to be removed:

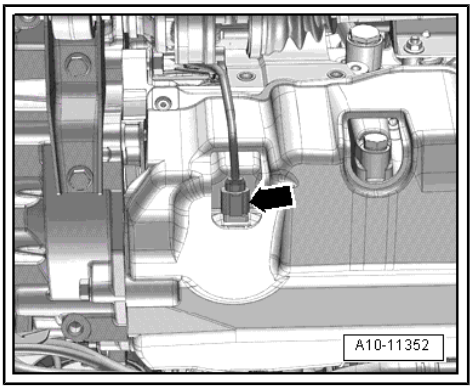


– Unplug the electrical connector -3-.
– Use cloth to catch escaping coolant.
– Place drip tray for workshop hoist - VAS 6208- underneath.
– Clamp off coolant hoses with hose clips -3094-.
– Loosen the hose clips -4-, remove the coolant hoses.
– Heating support pump - V488- -item -Detach -2- from the anchoring -1-.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. will not be held liable for any damages caused by uses of any kind which may be made of this document which do not comply with respect to the correctness of the information contained in this document.

If auxiliary pump for heating - V488- is to be removed from engine to free some space:

– Release and pull off connector -arrow- on oil level and oil temperature sensor - G266- .

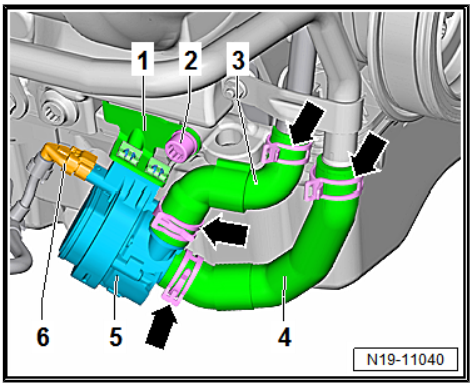


– Move clear electrical wiring harness.

– Release and unplug electrical connector -6-.

– Unscrew bolt -2-.

– Lay auxiliary pump for heating - V488- -5- to one side.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Installing

Install in reverse order of removal, observing the following.

Note

Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .

– Check coolant level ⇒ page 218 .

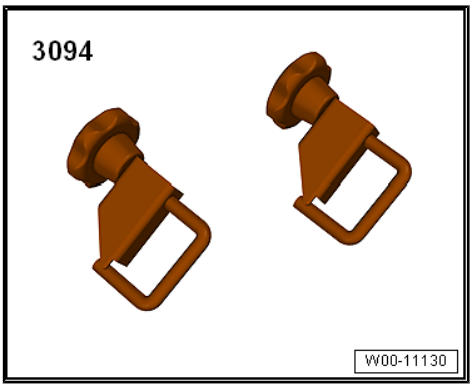
Specified torques

- ⇒ “2.2 Assembly overview - electric coolant pump”, page 250
- Assembly overview - Noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - Noise insulation

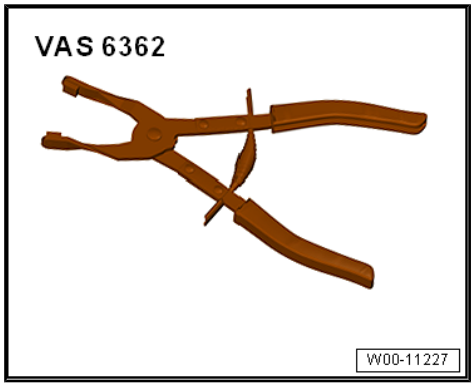
2.4.3 Removing and installing charge air cooling pump - V188- , version 3

Special tools and workshop equipment required

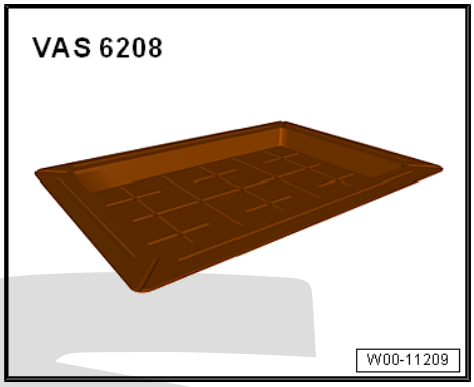
- Hose clamps, up to Ø 25 mm - 3094-



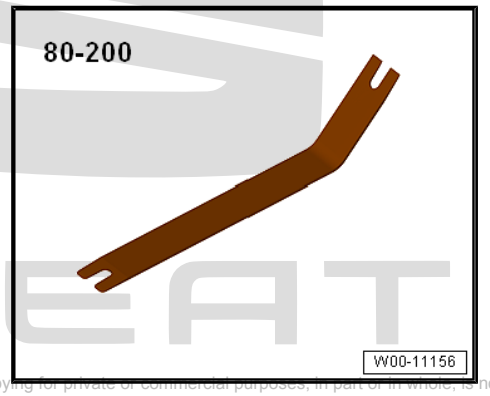
- Hose clip pliers - VAS 6362-



- Drip tray for workshop hoist - VAS 6208-



- Removal lever - 80 - 200-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with regard to the correctness of information in this document. Copyright by SEAT S.A.

If charge air cooling pump - V188- needs to be detached from engine to free up space ⇒ page 263 :

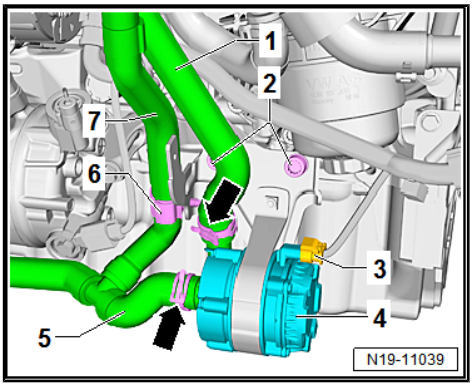
If charge air cooling pump - V188- needs to be removed ⇒ page 264 :

If charge air cooling pump - V188- is to be detached from bracket ⇒ page 264 :

Removing

– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

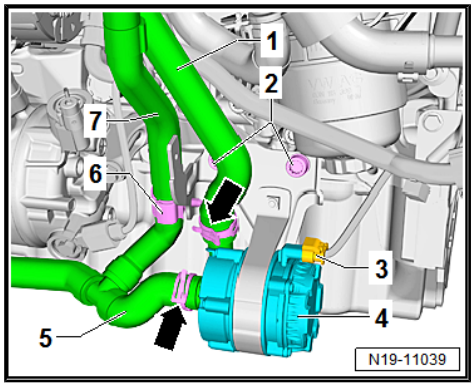
If charge air cooling pump - V188- needs to be detached from engine to free up space:



– Release and unplug electrical connector -3-.
– Use cloth to catch escaping coolant.
– Unclip wiring harness from retainer.
– Open retainer for coolant hose leading to radiator. Detach coolant hose.
– Unclip retainer -6- for coolant hose leading to water radiator for charge air cooling circuit.
– Unscrew the two bolts -2-.
– Remove charge air cooling pump - V188- together with bracket.
– Lay charge air cooling pump - V188- to one side.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

If the charge air cooling pump - V188- is to be removed:



- Place drip tray for workshop hoist - VAS 6208- underneath.
- Release and unplug electrical connector -3-.
- Use hose clamps -3094- to clamp off coolant hoses -1- and -5-.
- Release hose clips -arrows-, and remove coolant hoses.
- Unclip wiring harness from retainer.
- Open retainer for coolant hose leading to radiator. Detach coolant hose.
- Unclip retainer -6- for coolant hose leading to water radiator for charge air cooling circuit.
- Unscrew the two bolts -2-.
- Remove charge air cooling pump - V188- together with bracket.

If charge air cooling pump - V188- has to be removed from bracket:

- Unscrew bolt ⇒ Item 3 (page 253) , and open retaining arm ⇒ Item 4 (page 253) .
- Remove charge air cooling pump - V188- .

Installing

Install in reverse order of removal, observing the following.

If charge air cooling pump - V188- has been removed from bracket:

- Attach retaining arm ⇒ Item 4 (page 253) at bottom to bracket ⇒ Item 2 (page 253) .
- Remove charge air cooling pump - V188- .
- Make sure that the shoulder of the rubber retainer is seated ⇒ Item 6 (page 253) in the retaining bracket ⇒ Item 4 (page 253) .

Note

Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .

- Check coolant level ⇒ page 218 .

Specified torques

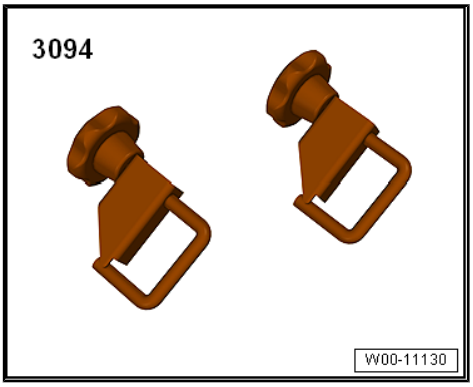
- ⇒ "2.2 Assembly overview - electric coolant pump" page 250
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation

2.4.4 Removing and installing auxiliary pump for heating - V488- , version 2

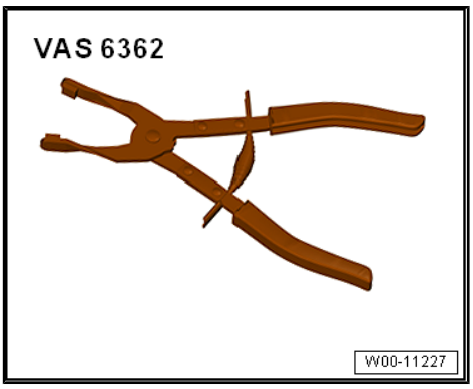
Special tools and workshop equipment required

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

♦ Hose clamps, up to Ø 25 mm - 3094-

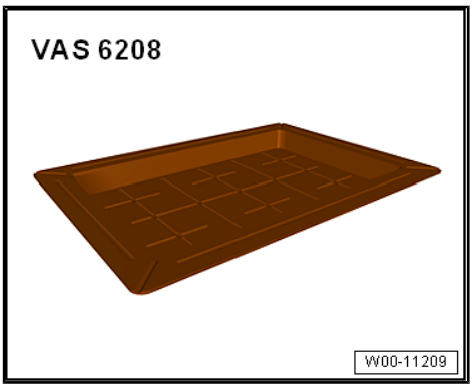


♦ Hose clip pliers - VAS 6362-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

♦ Drip tray for workshop hoist - VAS 6208-



If the auxiliary pump for heating - V488- is to be removed ⇒ page 266 **:**

If the auxiliary pump for heating - V488- is to be detached from engine to free some space, ⇒ page 266 **:**

If the auxiliary pump for heating - V488- is to be removed from bracket ⇒ page 267 **:**

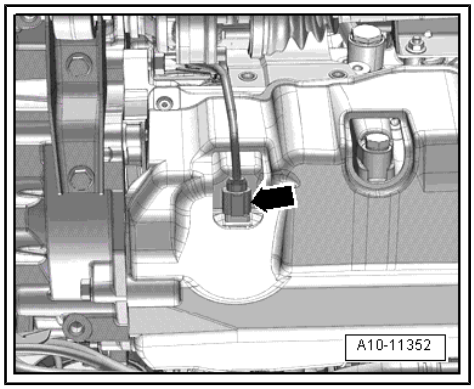
If the auxiliary pump for heating - V488- has been removed from bracket ⇒ page 267 **:**

Removing

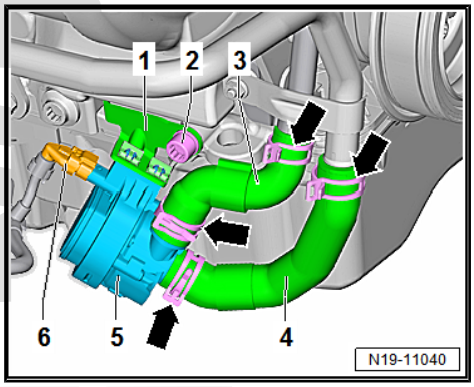
– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

If the auxiliary pump for heating - V488- is to be removed:

– Release and pull off connector -arrow- on oil level and oil temperature sensor - G266- .

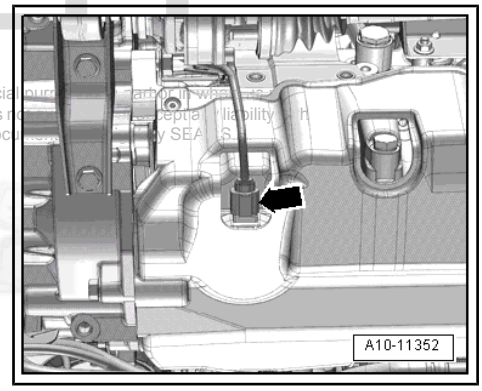


– Move clear electrical wiring harness.
– Place drip tray for workshop hoist - VAS 6208- underneath.
– Release and unplug electrical connector -6-.
– Use hose clamps -3094- to clamp off coolant hoses -3- and -4-.
– Loosen the hose clips -arrows- at the bottom of the auxiliary pump for heating - V488- , remove the coolant hoses.
– Unscrew bolt -2-.
– Remove auxiliary pump for heating - V488- -5- together with bracket -1-.



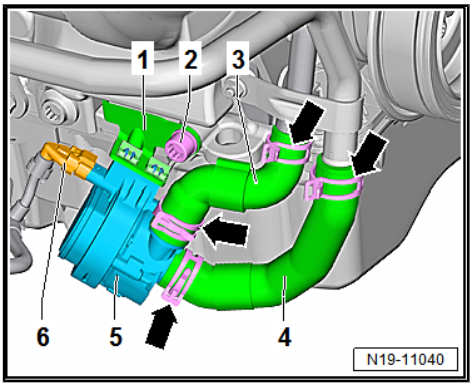
If auxiliary pump for heating - V488- is to be removed from engine to free some space:

– Release and pull off connector -arrow- on oil level and oil temperature sensor - G266- .



permitted unless authorised by SEAT S.A. SEAT S.A does

– Move clear electrical wiring harness.
– Release and unplug electrical connector -6-.
– Unscrew bolt -2-.
– Lay auxiliary pump for heating - V488- -5- to one side.



If the auxiliary pump for heating - V488- is to be removed from bracket:

– Unscrew bolts, and remove pump.

Installing

Install in reverse order of removal, observing the following.

Note

Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .

If the auxiliary pump for heating - V488- has been removed from bracket:

– Make sure that rubber the mounting proper is properly seated in bracket.
– Make sure that the spacer sleeves are properly seated in rubber mounting.
– Tighten bolts.
– Check coolant level ⇒ page 218 .

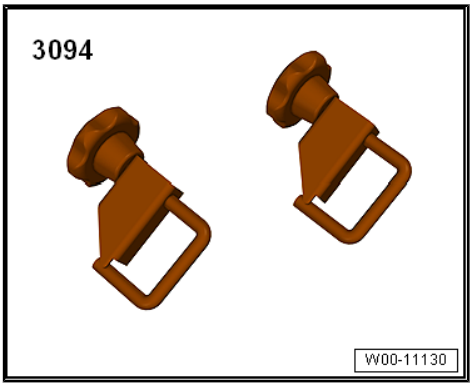
Specified torques

- ⇒ “2.2 Assembly overview - electric coolant pump”, page 250
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation

2.4.5 Removing and installing auxiliary pump for heating - V488- , version 3

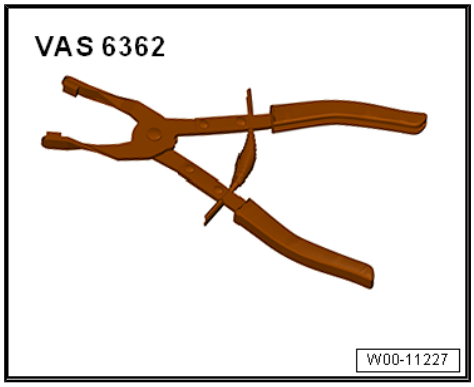
Special tools and workshop equipment required

- Hose clamps, up to Ø 25 mm - 3094-

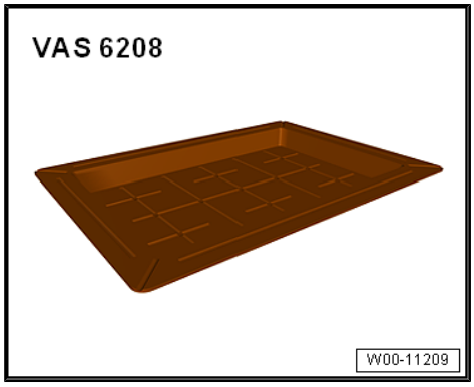


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- Hose clip pliers - VAS 6362-



- Drip tray for workshop hoist - VAS 6208-



If the auxiliary pump for heating - V488- is to be removed ⇒ page 268 :

If the auxiliary pump for heating - V488- is to be detached from engine to free some space, ⇒ page 269 :

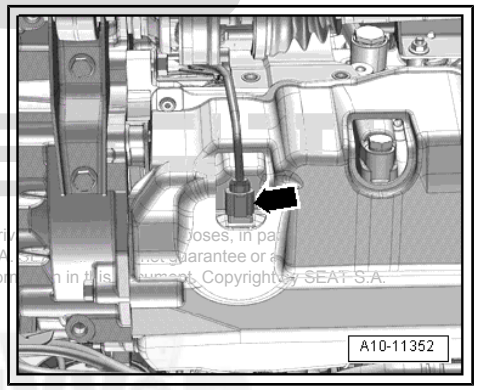
If the auxiliary pump for heating - V488- has been removed from bracket ⇒ page 270 :

Removing

– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

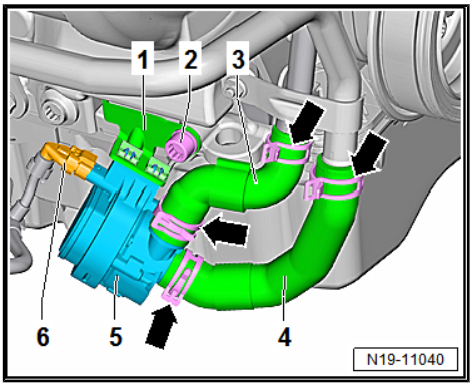
If the auxiliary pump for heating - V488- is to be removed:

– Release and pull off connector -arrow- on oil level and oil temperature sensor - G266- .

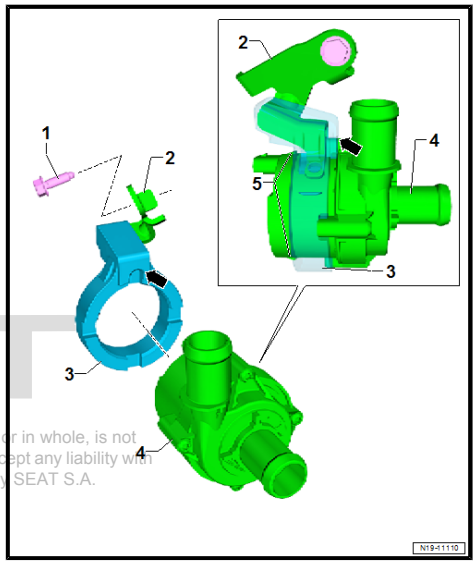


Protected by copyright. Copying for pri oses, in pa
permitted unless authorised by SEAT S.A uarantee or a
respect to the correctness of infor n in this document. Copyright © SEAT S.A.

– Move clear electrical wiring harness.
– Place drip tray for workshop hoist - VAS 6208- underneath.
– Release and unplug electrical connector -6-.
– Use cloth to catch escaping coolant.
– Use hose clamps -3094- to clamp off coolant hoses -3- and -4-.
– Loosen the hose clips -arrows- at the bottom of the auxiliary pump for heating - V488- , remove the coolant hoses.
– Unscrew bolt -2-.



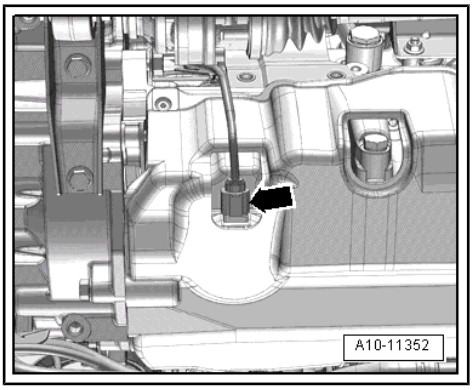
– Pull auxiliary pump for heating - V488- -4- out of bracket -3-.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

If auxiliary pump for heating - V488- is to be removed from engine to free some space:

– Release and pull off connector -arrow- on oil level and oil temperature sensor - G266- .



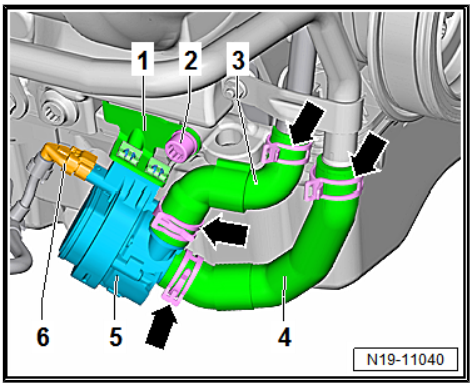
– Move clear electrical wiring harness.
– Release and unplug electrical connector -6-.
– Unscrew bolt -2-.
– Lay auxiliary pump for heating - V488- -5- to one side.

Installing

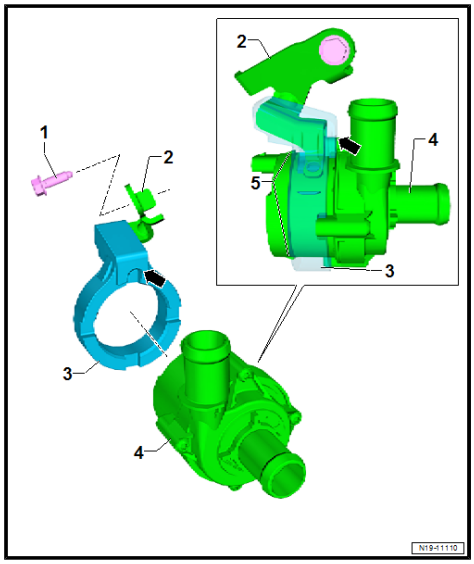
Install in reverse order of removal, observing the following.

Note

Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .



If the auxiliary pump for heating - V488- has been removed from bracket:



- Push auxiliary pump for heating - V488- into bracket -3-.
- When doing so, ensure it is fitted in the correct position.
- The projection on the pump must engage in recess -arrows- as shown in illustration.
- Push in pump until locking lugs -5- engage behind bracket -3-.
- Ensure connections are secured properly by pulling.
- Check coolant level ⇒ page 218 .

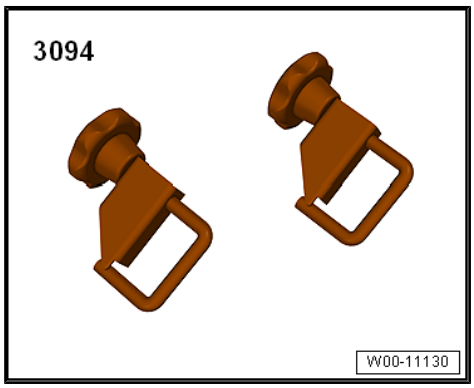
Specified torques

- ⇒ “2.2 Assembly overview - electric coolant pump”, page 250
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation

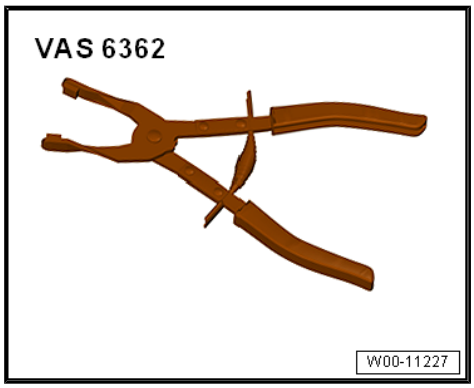
2.4.6 Removing and installing charge air cooling pump - V188- , version 4

Special tools and workshop equipment required

- Hose clamps, up to Ø 25 mm - 3094-

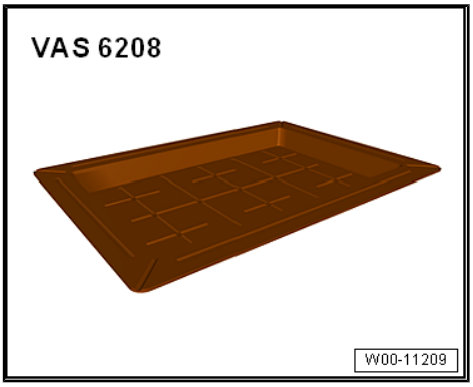


- Hose clip pliers - VAS 6362-

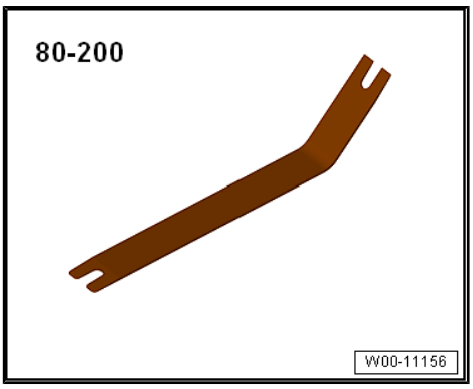


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

♦ Drip tray for workshop hoist - VAS 6208-



♦ Removal lever - 80 - 200-



If charge air cooling pump - V188- needs to be detached from engine to free up space ⇒ page 271 **:**

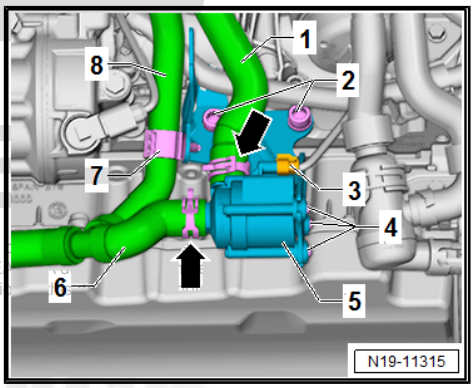
If charge air cooling pump - V188- needs to be removed ⇒ page 272 **:**

If charge air cooling pump - V188- is to be detached from bracket ⇒ page 272 **:**

Procedure:

– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .

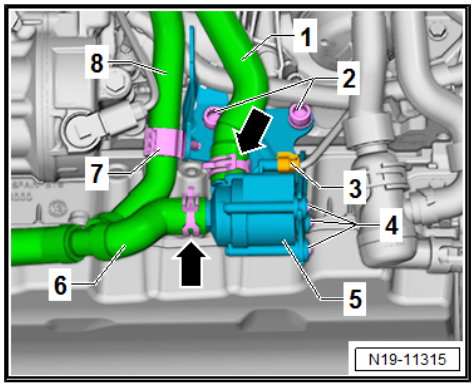
If charge air cooling pump - V188- needs to be detached from engine to free up space:



– Release and unplug electrical connector -3-.
– Unclip wiring harness from retainer.
– Open retainer for coolant hose leading to radiator. Detach coolant hose.
– Unclip retainer -7- for coolant hose leading to water radiator for charge air cooling circuit.
– Unscrew the two bolts -2-.
– Remove charge air cooling pump - V188- together with bracket.
– Lay charge air cooling pump - V188- to one side.

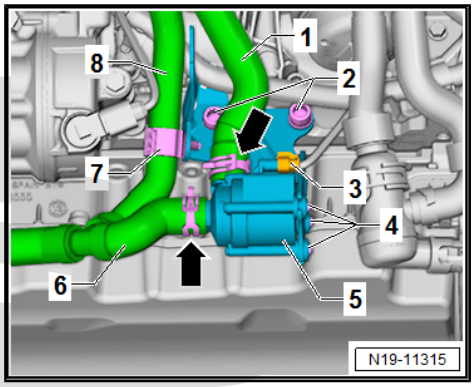
Protected by copyright. Copying for private
permitted unless authorised by SEAT S.A. SE
respect to the correctness of informati

If charge air cooling pump - V188- is to be removed together with bracket:



- Place drip tray for workshop hoist - VAS 6208- underneath.
- Release and unplug electrical connector -3-.
- Place a cloth underneath to absorb escaping coolant.
- Clamp off coolant hoses -1- and -6- with hose clamps, up to 25 mm in diameter - 3094- .
- Release hose clips -arrows-, and remove coolant hoses.
- Unclip wiring harness from retainer.
- Open retainer for coolant hose leading to radiator. Detach coolant hose.
- Unclip retainer -7- for coolant hose leading to water radiator for charge air cooling circuit.
- Unscrew the two bolts -2-.
- Remove charge air cooling pump - V188- -5- together with bracket.

If the auxiliary pump for heating - V488- is to be removed from bracket:



- Release hose clips -arrows-, and remove coolant hoses.
- Unscrew bolts -4-, and remove charge air cooling pump - V188- -5-.

Installing

Note

Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .

Installation is carried out in reverse order; noting the following:

- Make sure that rubber the mounting proper is properly seated in bracket.
- Make sure that the spacer sleeve is properly seated in rubber mounting.
- Tighten bolts.
- Check coolant level ⇒ page 218 .

Specified torques

- ⇒ “2.2 Assembly overview - electric coolant pump”, page 250
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

2.5 Removing and replacing coolant pump

Note

Checking function by pulling the regulator valve of the coolant pump with your hand is not permitted. This can cause damage to the coolant pump and lead to insufficient supply of coolant to the engine.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Removing

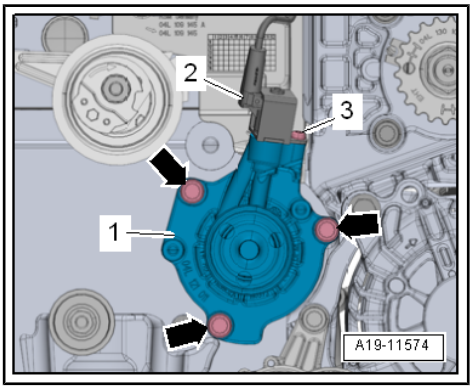
– Drain coolant ⇒ page 211 .

– Detach toothed belt from camshaft ⇒ page 141 .

– Remove toothed belt cover (bottom section) ⇒ page 129 .

– Remove bolt -3- and detach coolant valve for cylinder head - N489- -item 2-.

– Remove bolts -arrows- and detach coolant pump -1-.



Installing

Install in reverse order of removal, observing the following.

- Specified torque
  ⇒ "2.1 Assembly overview - coolant pump, thermostat", page 246

Note

Renew O-rings after removal.

– Clean and smoothen sealing surfaces for O-rings.

– Lubricate O-rings with coolant.

– Install notched belt (adjusting valve timing) ⇒ page 135 .

– Add coolant ⇒ page 214 .

2.6 Removing and installing thermostat

⇒ "2.6.1 Removing and installing thermostat, version 1", page 273

⇒ "2.6.2 Removing and installing thermostat, version 2", page 275

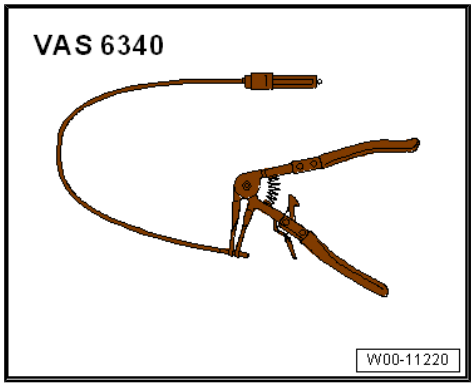
2.6.1 Removing and installing thermostat, version 1

Special tools and workshop equipment required

♦ Hose clip pliers - VAS 6362-

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

♦ Hose clip pliers - VAS 6340-



♦ Protective mat - VAS 531003-

Removing

– Note different versions ⇒ page 246 .

– Remove engine cover panel ⇒ page 56 .

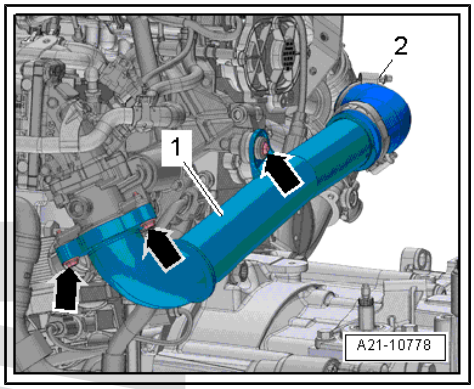
– For reasons of space, remove the air filter housing together with the intake hose ⇒ page 422 .

– Drain coolant ⇒ page 211 .

– Remove radiator cowl ⇒ page 317 .

– Unscrew bolts -arrows- of air pipe.

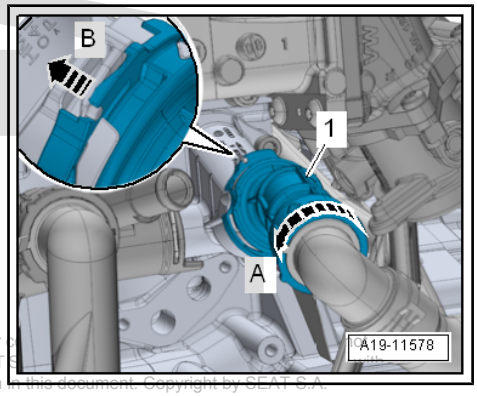
– Release screw-type clip -2- and detach air pipe -1-.



– Release catch -arrow B-.

– Turn connection -1- in direction of -arrow A- and disconnect.

– Remove thermostat.



Installing

Install in reverse order of removal, observing the following.

Note

O-ring must be renewed if removed

Protected by copyright. Copying for private or
permitted unless authorised by SEAT S.A. SEAT
respect to the correctness of information in this document. Copyright by SEAT S.A.

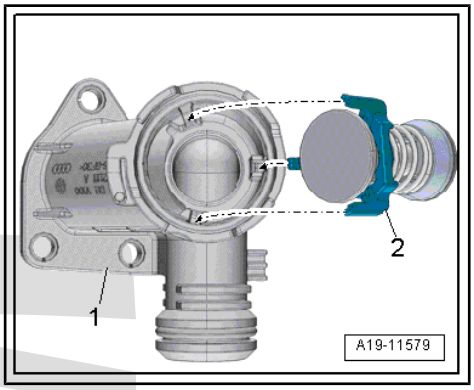
– Clean and smooth sealing surface for O-ring.

– Lubricate O-ring with coolant.

– Fit thermostat -2- into thermostat housing.

• Retaining lugs must engage in guides -arrows-.

– Add coolant ⇒ page 214 .



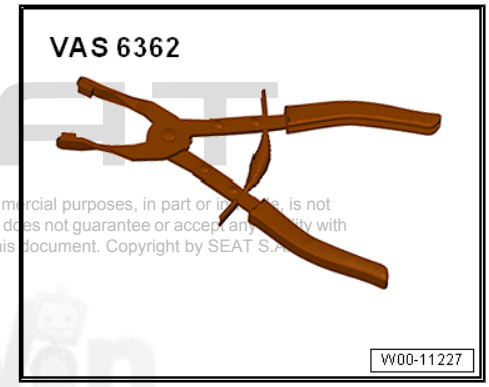
Specified torques

- ⇒ “2.1 Assembly overview - coolant pump, thermostat”, page 246
- ⇒ “2.1 Assembly overview - charge air system”, page 362
- ⇒ “4.1 Assembly overview - air filter housing”, page 420
- ⇒ “4.6 Removing and installing radiator cowl”, page 317

2.6.2 Removing and installing thermostat, version 2

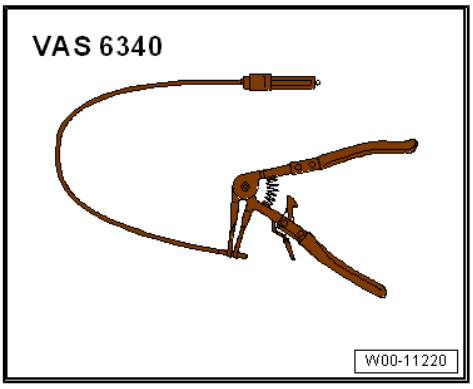
Special tools and workshop equipment required

- Hose clip pliers - VAS 6362-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- Hose clip pliers - VAS 6340-



- Protective mat - VAS 531003-

Removing

– Note different versions ⇒ page 246 .

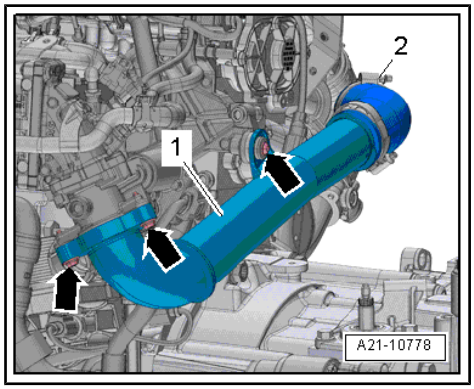
– Remove engine cover panel ⇒ page 56 .

– For reasons of space, remove the air filter housing together with the intake hose ⇒ page 422 .

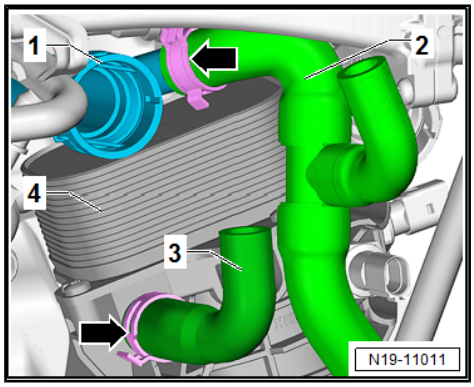
– Drain coolant ⇒ page 211 .

– Remove radiator cowl ⇒ page 317 .

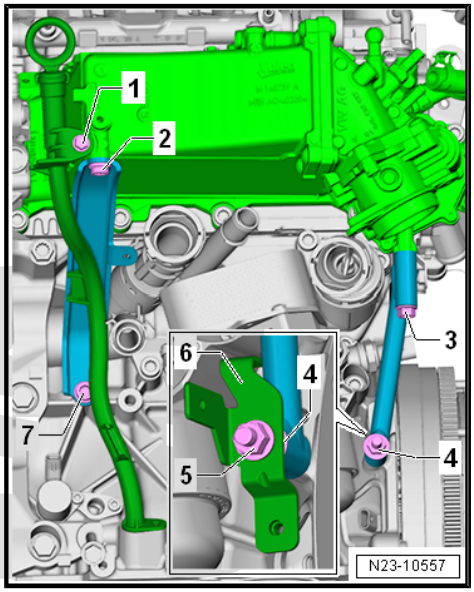
– Unscrew bolts -arrows- of air pipe.
– Release screw-type clip -2- and detach air pipe -1-.
– Remove front coolant connection ⇒ page 287 .
– Remove front coolant pipes ⇒ page 283 .



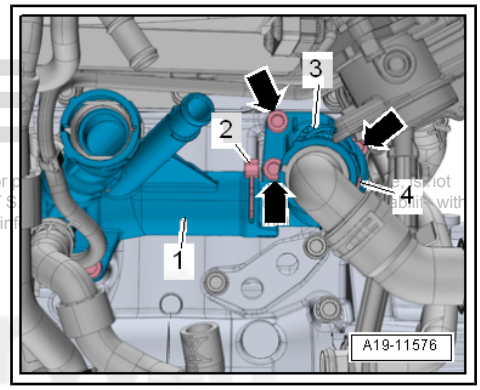
– Loosen hose clip at top -arrow-.
– Pull coolant hose -2- off thermostat housing -1-.



– Remove nut -5- and detach bracket -6- from centre hex stud -4-.
– Unscrew bolts -3- and -4-.
– Remove support, and push wiring harness to one side.

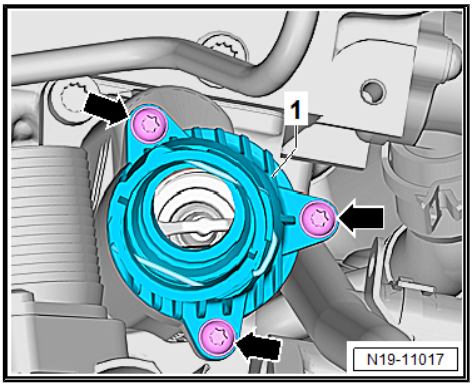


– Lift retaining clip -4- and disconnect coolant hose.



Protected by copyright. Copying for
permitted unless authorised by SEAT S
respect to the correctness of

– Remove bolts -arrows-.
– Pull off connection -1-.
– Remove thermostat.



Installing

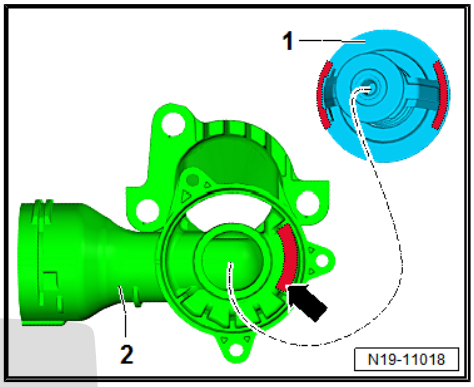
Install in reverse order of removal. During this step, observe the following:

Note

If removed, O-ring must be renewed.

– Clean and smooth sealing surface for O-ring.
– Lubricate O-ring with coolant.

– Insert thermostat -1- into thermostat housing -2-.
• The guides on the thermostat -1- must engage in the guide -arrow- on the housing -2-.



– Add coolant ⇒ page 214 .

Specified torques

- ⇒ “2.1.2 Assembly overview - coolant pump, thermostat, type 2”, page 248
- ⇒ “4.1 Assembly overview - air filter housing”, page 420
- ⇒ “5.1 Assembly overview - intake manifold”, page 424
- ⇒ “3.1 Assembly overview - coolant pipes”, page 282
- ⇒ “4.1 Assembly overview - air filter housing”, page 420
- ⇒ “4.2 Assembly overview - radiator cowl and radiator fans”, page 307

2.7 Testing coolant thermostat

– Heat removed thermostat in water bath.

Starts to open	Fully open	Opening travel
87 ± 2 °C	approx. 102 °C[1)]	At least 9 mm

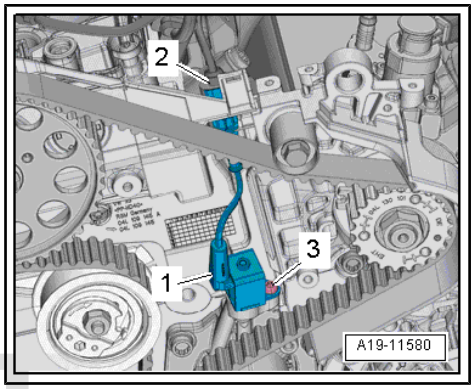
• [1)] Cannot be tested.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

2.8 Removing and installing the valve for the cylinder head coolant - N489-

Removing

– Remove toothed belt cover (top) ⇒ page 125 .



Note

Use cloth to catch escaping coolant.

– Unplug electrical connector -2- and move wiring clear.

– Remove bolt -3- and detach coolant valve for cylinder head - N489- -item 1-.

Installing

Install in reverse order of removal, observing the following.

• Specified torque ⇒ "2.1 Assembly overview - coolant pump, thermostat", page 246

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Note

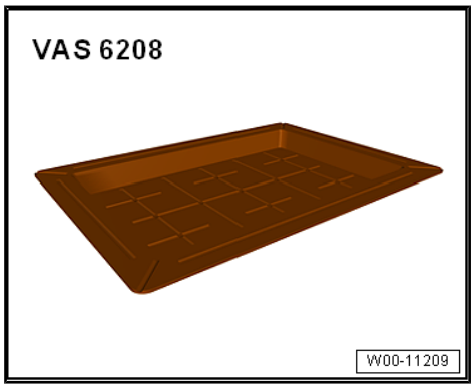
Renew O-rings after removal.

– Install toothed belt cover (top) ⇒ page 125 .

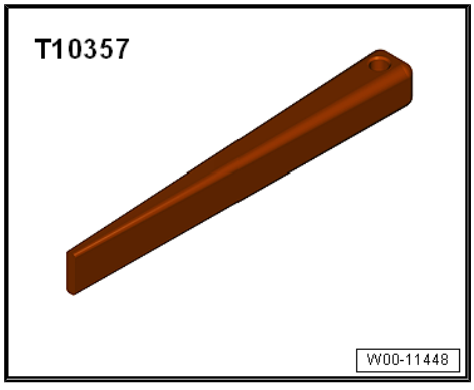
2.9 Removing and installing coolant temperature sender - G62-

Special tools and workshop equipment required

♦ Drip tray for workshop hoist - VAS 6208-



♦ Wedge - T10357-

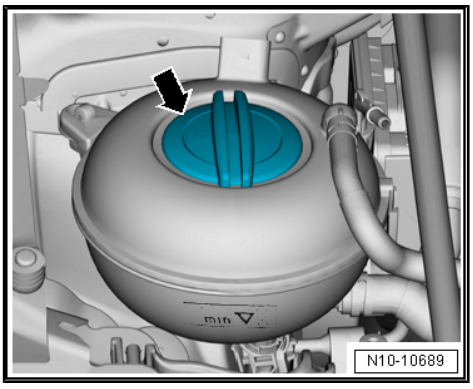


Removing

- Engine cold.

– Open filler cap -arrow- on coolant expansion tank briefly to relieve residual pressure in cooling system.

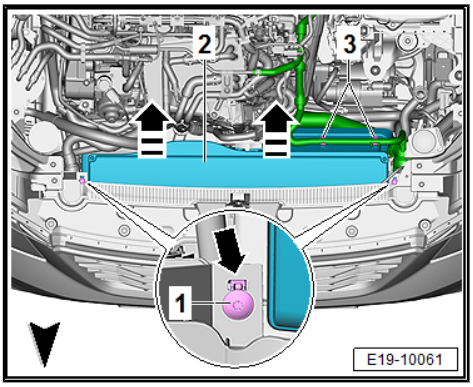
– For reasons of space, remove the air filter housing together with the intake hose ⇒ page 422 .



– Free coolant hose -3-.

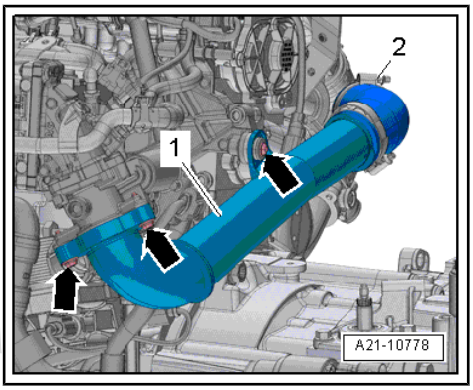
– Unscrew bolts -1-.

– Release locking lugs-arrow-, unclip air hose -2- from the front end and remove in -direction of the arrow-.



– Remove bolts -arrows-.

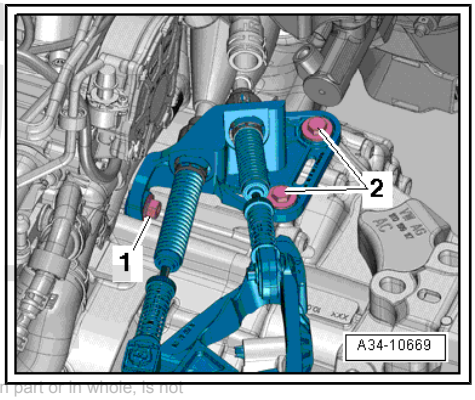
– Release screw-type clip -2- and detach air pipe -1-.



Vehicles with manual gearbox 02Q

– Undo and remove nuts -1- and bolts -2- from the cable support bracket.

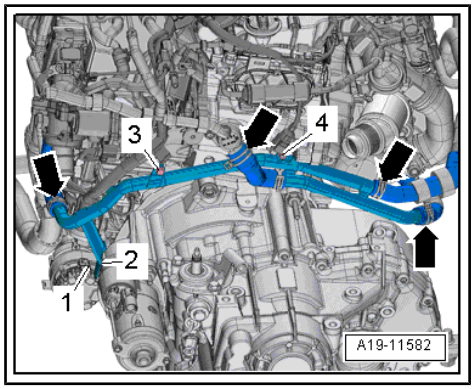
– Move the cable support bracket slightly to the left without causing damage.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Continued for all vehicles

– Unscrew nut -4- and bolt -3-.



Note

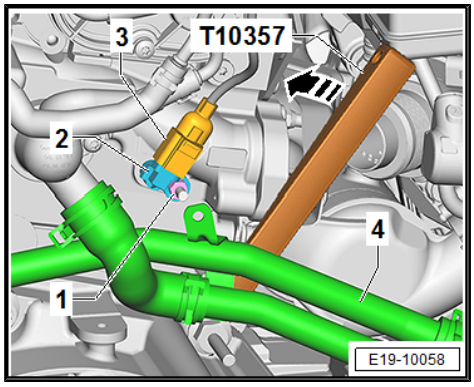
Ignore -positions 1, 2- and -arrows-.

– Place drip tray for workshop hoist - VAS 6208- underneath.

Note

Use cloth to catch escaping coolant.

– Unplug the electrical connector -3-.
– Push the wedge - T10357- between the coolant lines -4- and the cylinder head without causing damage.
– Push the coolant lines -4- somewhat to one side.
– Unscrew the stud -1-, pull off the coolant temperature sensor - G62- -2-.



Note

If an O-ring or spacer ring remains lodged in cylinder head, lift it out with a piece of wire.

Installing

Install in reverse order of removal, observing the following.

Note

- *Renew O-rings after removal.*
- *Renew spacer ring if damaged.*

– Install coolant pipes (left-side) ⇒ page 291 .
– Check coolant level ⇒ page 218 .

Specified torques

- ⇒ “1.1 Assembly overview - cylinder head”, page 100
- ⇒ “4.1 Assembly overview - air filter housing”, page 420
- ⇒ “5.1 Assembly overview - intake manifold”, page 424
- Cable support bracket ⇒ Rep. gr. 34 ; Selector mechanism; Assembly overview: selector mechanism .

2.10 Removing and installing radiator outlet coolant temperature sender - G83-

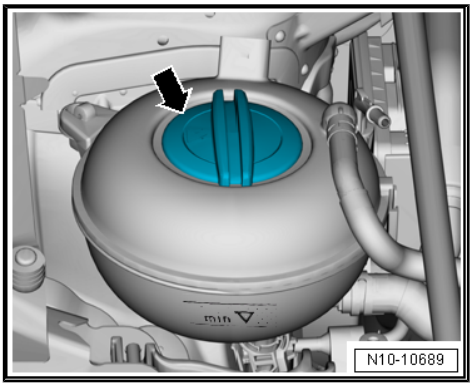
Removing

• Engine cold.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– To relieve residual pressure in cooling system, open filler cap -arrow- on coolant expansion tank briefly and then close cap again (it should click into place).

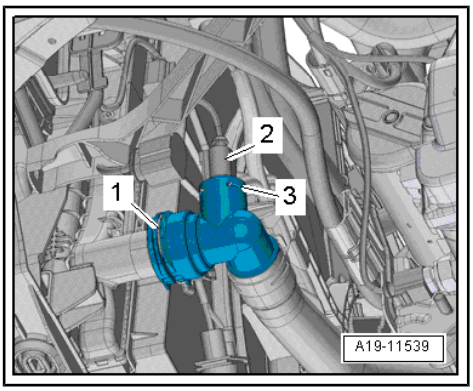
– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .



– Release and unplug electrical connector -2-.

– Place a cloth underneath to catch any escaping coolant.

– Pull off retaining clip -3- and pull radiator outlet coolant temperature sender - G83- out of connection.



Installing

Installation is carried out in reverse order; noting the following:

– Renew oil seal.

Note

Insert new coolant temperature sender - G62- immediately into union to avoid loss of coolant.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted without the prior written consent of SEAT S.A. Reproduction or transmission of information in this document. Copyright by SEAT S.A.

– Install front noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

– Check coolant level ⇒ page 218 .

3 Coolant pipes

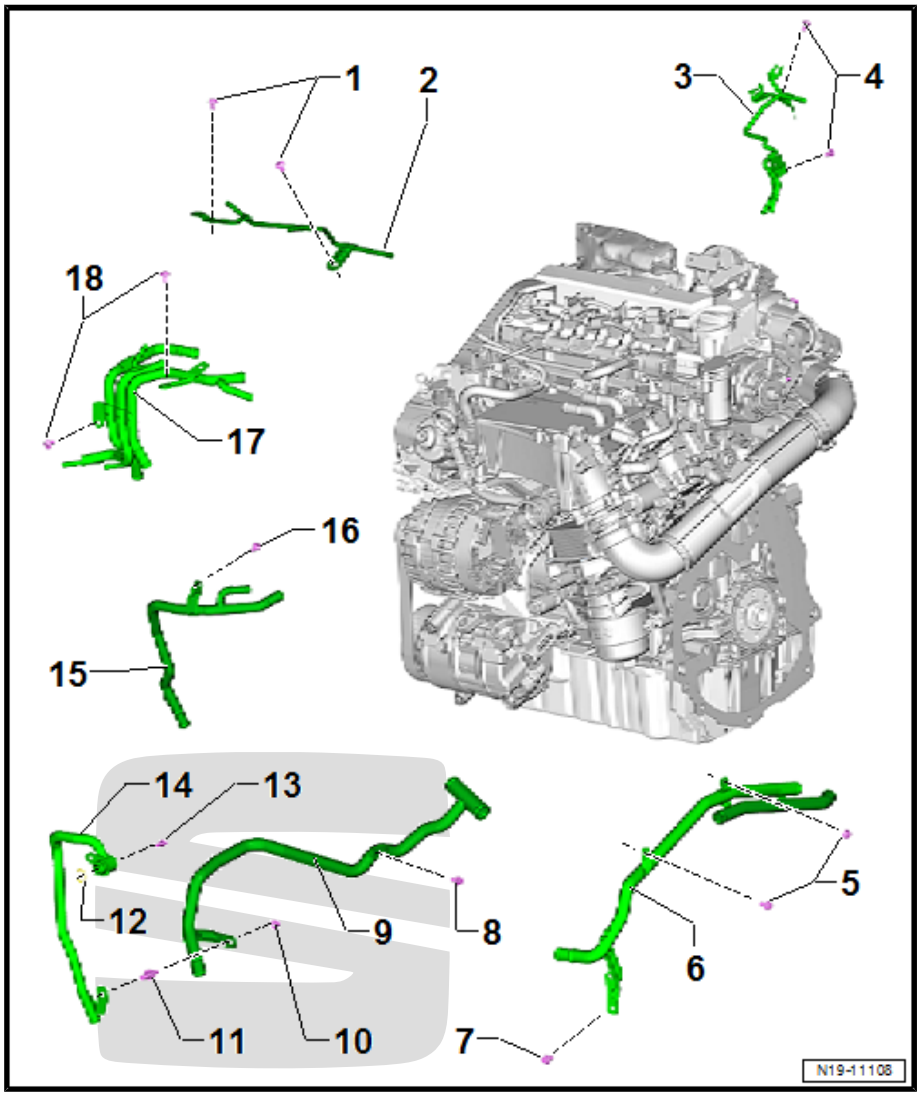
⇒ “3.1 Assembly overview - coolant pipes”, page 282

⇒ “3.2 Removing and installing coolant pipes”, page 283

3.1 Assembly overview - coolant pipes

Note

The arrow markings on coolant pipes and on ends of hoses must align.



1 - Bolt
- ❑ 10 Nm

2 - Upper front coolant pipe

3 - Coolant pipe (top rear)
- ❑ Removing and installing ⇒ page 301

4 - Bolt
- ❑ 10 Nm

5 - Bolt
- ❑ 10 Nm

6 - Coolant pipes (left-side)
- ❑ Removing and installing ⇒ page 291

7 - Bolt
- ❑ 10 Nm

8 - Bolt
- ❑ 10 Nm

9 - Rear coolant pipe
- ❑ Removing and installing ⇒ page 293

10 - Nut
- ❑ 10 Nm

11 - Centre hex stud
- ❑ 10 Nm

12 - O-ring
- ❑ Renew after removal
- ❑ Moisten with coolant

13 - Bolt
- ❑ 23 Nm

14 - Coolant pipe (rear right)
- ❑ Removing and installing ⇒ page 296

15 - Coolant pipe (front left)
- ❑ Removing and installing ⇒ page 288

16 - Bolt
- ❑ 10 Nm

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

17 - Coolant pipes (front)

❑ Removing and installing ⇒ page 283

18 - Bolt

❑ 10 Nm

3.2 Removing and installing coolant pipes

⇒ "3.2.1 Removing and installing coolant pipes (top front)", page 283

⇒ "3.2.2 Removing and installing coolant pipe (bottom front)", page 284

⇒ "3.2.3 Removing and installing front coolant connection", page 287

⇒ "3.2.4 Removing and installing coolant pipe (front left)", page 288

⇒ "3.2.5 Removing and installing coolant pipe (front right)", page 289

⇒ "3.2.6 Removing and installing coolant pipes (left-side)", page 291

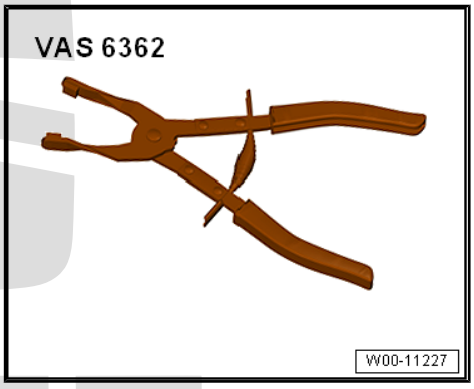
⇒ "3.2.7 Removing and installing coolant pipe (rear)", page 293

⇒ "3.2.8 Removing and installing coolant pipe (rear right)", page 296

3.2.1 Removing and installing coolant pipes (top front)

Special tools and workshop equipment required

♦ Hose clip pliers - VAS 6362-



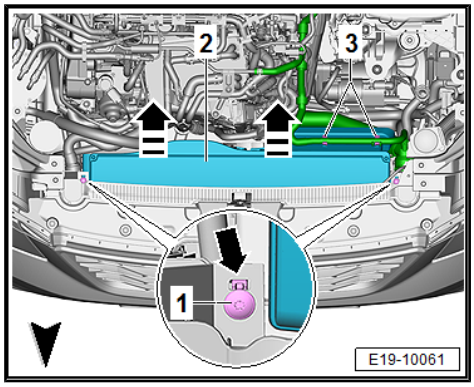
Removing

– Remove engine cover panel ⇒ page 56 .

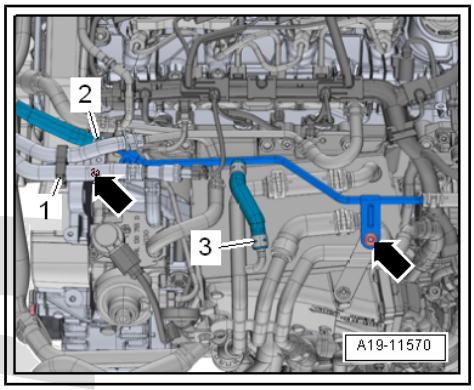
– Remove the air filter housing ⇒ page 422

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

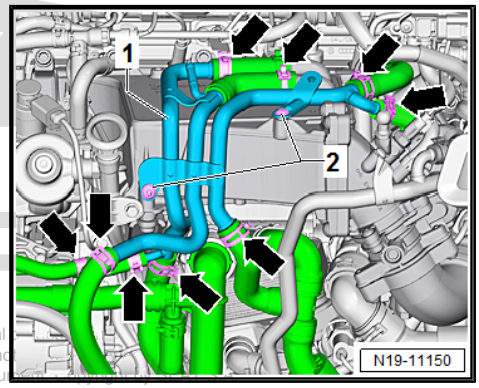
– Free coolant hose -3-.
– Unscrew bolts -1-.
– Release locking lugs-arrow-, unclip air hose -2- from the front end and remove in -direction of the arrow-.
– Drain coolant ⇒ page 211 .



– Unclip bracket -1- with fuel hoses.
– Remove bolts -arrows-.
– Loosen the hose clip -3-, remove the coolant hose.



– Unscrew bolts -2-.



Note

Depending on the version, the number of connected coolant hoses may be different.

– Release hose clips -arrows-, and remove coolant hoses.
– Remove coolant pipes -1- at top front.

Installing

Protected by copyright. Copying for private or commercial
permitted unless authorised by SEAT S.A. SEAT S.A does no
respect to the correctness of information in this docu

Install in reverse order of removal, observing the following.

Note

Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .

– Add coolant ⇒ page 214 .
– Install the air cleaner housing ⇒ page 421 .
– Install engine cover panel ⇒ page 56 .

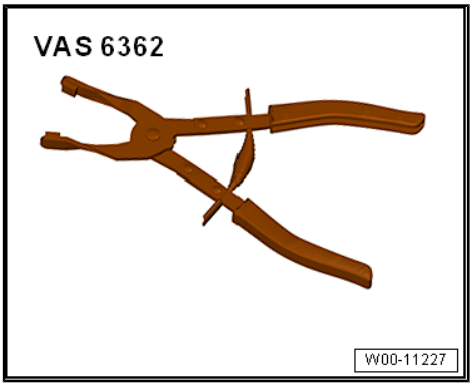
Specified torques

- ⇒ “3.1 Assembly overview - coolant pipes”, page 282
- ⇒ “4.1 Assembly overview - air filter housing”, page 420

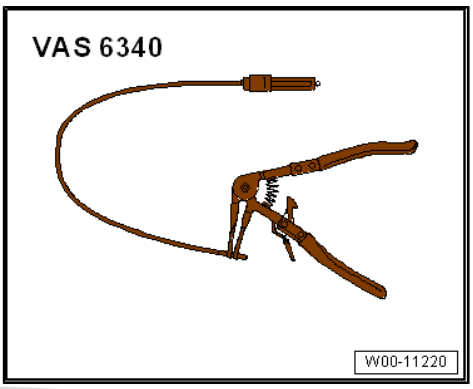
3.2.2 Removing and installing coolant pipe (bottom front)

Special tools and workshop equipment required

♦ Hose clip pliers - VAS 6362-



♦ Hose clip pliers - VAS 6340-

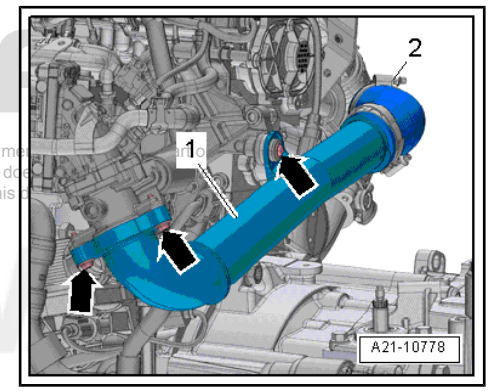


♦ Protective mat - VAS 531003-

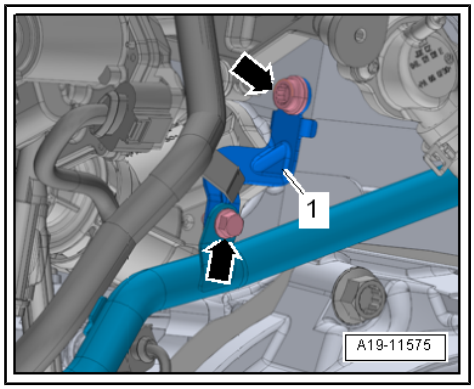
Removing

– Remove engine cover panel ⇒ page 56 .
– For reasons of space, remove the air filter housing together with the intake hose ⇒ page 422 .
– Remove radiator cowl ⇒ page 317 .
– Drain coolant ⇒ page 211 .
– Remove oil filter housing ⇒ page 192 .
– Remove bolts -arrows-.
– Release screw-type clip -2- and detach air pipe -1-.
– Remove bolts -arrows- and move bracket -1- with electrical wiring harness to one side.

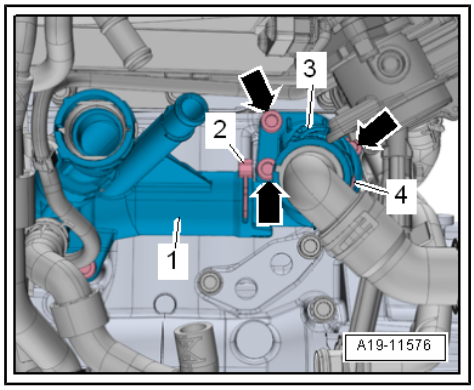
Protected by copyright. Copying for private or comm
permitted unless authorised by SEAT S.A. SEAT S.A do
respect to the correctness of information in this



– Remove throttle valve control unit - J338- ⇒ page 429

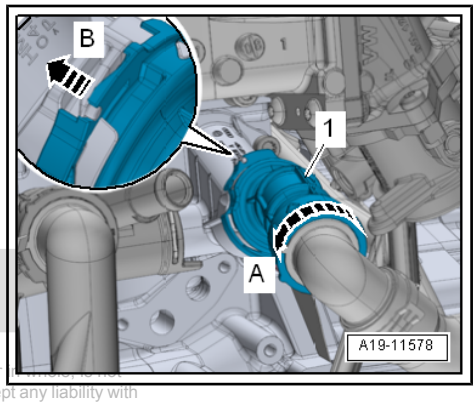


– Lift the retaining clip -4-, remove the coolant hose.



Thermostat, variant 1

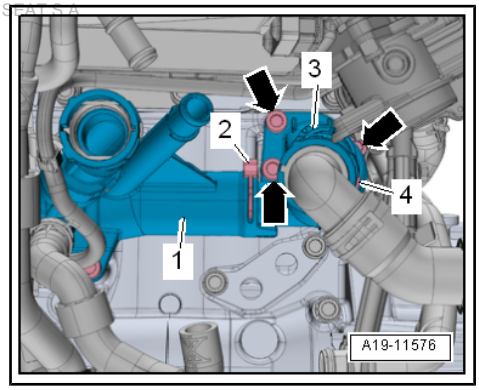
– Release catch -arrow B-.
– Turn connection -1- in direction of -arrow A- and disconnect.
– Remove thermostat housing -1-.



Protected by copyright. Copying for private or commercial purposes, in part or whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

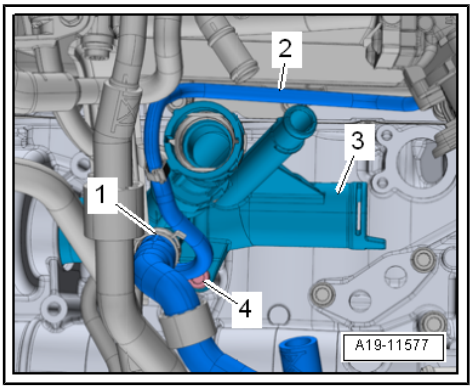
Thermostat, variant 2

– Remove bolts -arrows-.
– Pull off locking clip -2-.
– Pull thermostat housing -3- at bottom front off coolant pipe -1-, and remove it.



Continuation for all

– Release hose clip -1- and detach coolant hose.
– Unscrew bolt -4-.
– Pull off coolant pipe at bottom front -3-, and remove it.
– Do not damage vacuum line -2- while doing so.



Installing

Install in reverse order of removal, observing the following.

Note

- *Renew seals and O-rings after each removal.*
- *Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .*

– Clean and smoothen sealing surfaces for seals and O-rings.
– Lubricate seals and O-rings with coolant.
– Install oil filter housing ⇒ page 192 .
– Connect coolant hose with plug-in connector ⇒ page 306 .
– Add coolant ⇒ page 214 .

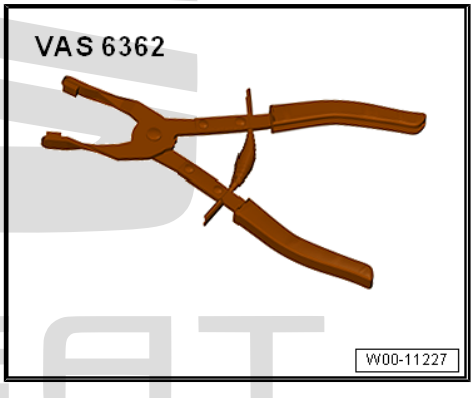
Specified torques

- ⇒ “2.1 Assembly overview - coolant pump, thermostat”, page 246
- ⇒ “5.1 Assembly overview - intake manifold”, page 424
- ⇒ “4.2 Assembly overview - radiator cowl and radiator fans”, page 307

3.2.3 Removing and installing front coolant connection

Special tools and workshop equipment required

- Hose clip pliers - VAS 6362-



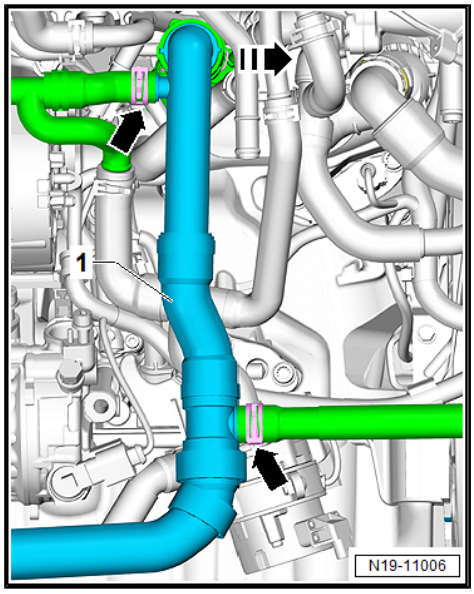
- Protective mat - VAS 531003-

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Removing

– Remove engine cover panel ⇒ page 56 .
– Drain coolant ⇒ page 211 .
– Remove radiator cowl ⇒ page 317 .

– Open clips -arrows-.
– Remove coolant hoses.
– Release retaining clip in -direction of arrow-, and pull off connecting piece -1-.



Installing

Install in reverse order of removal, observing the following.

Note

Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .

– Note coolant hoses with pretensioned spring-type clips ⇒ page 306 .
– Add coolant ⇒ page 214 .
– Install engine cover panel ⇒ page 56 .

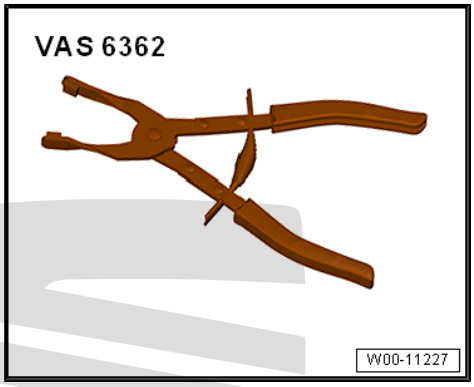
Specified torques

- ⇒ “3.1 Assembly overview - coolant pipes”, page 282
- ⇒ “4.1 Assembly overview - air filter housing”, page 420
- ⇒ “4.2 Assembly overview - radiator cowl and radiator fans”, page 307

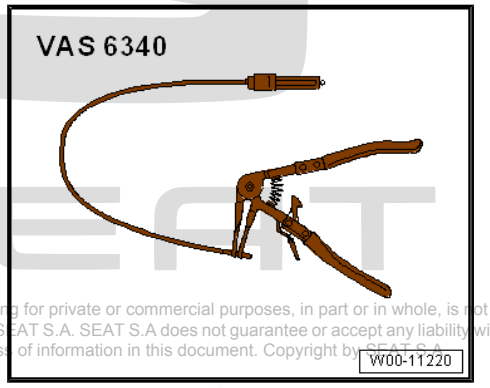
3.2.4 Removing and installing coolant pipe (front left)

Special tools and workshop equipment required

- Hose clip pliers - VAS 6362-



- Hose clip pliers - VAS 6340-

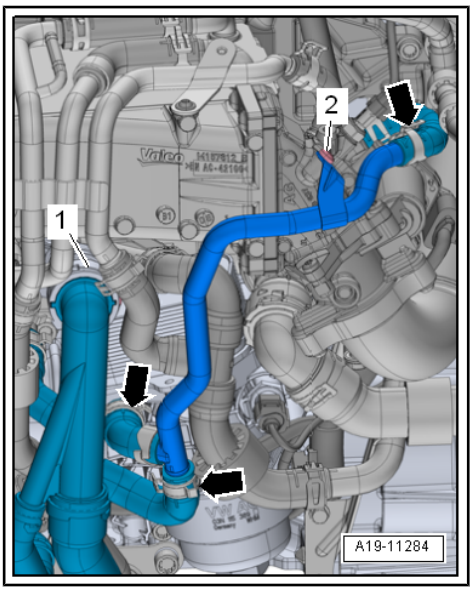


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Removing

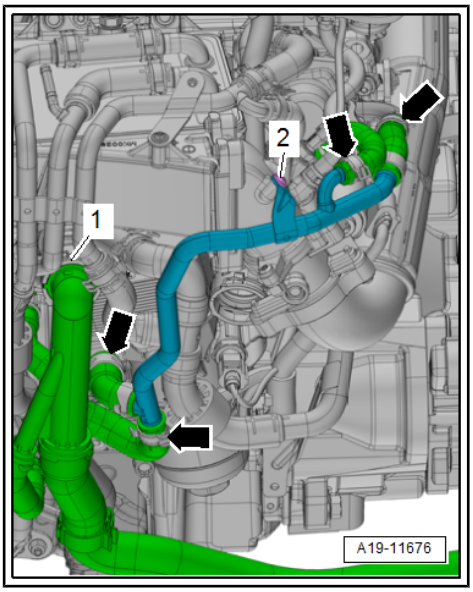
– Remove engine cover panel ⇒ page 56 .
– Remove radiator cowl ⇒ page 317 .
– Drain coolant ⇒ page 211 .

Variant 1:



– Lift the retaining clip -1-, remove the coolant connection.
– Unscrew bolt -2-.
– Release hose clips -arrows-, and remove coolant hoses.
– Detach coolant pipe (front left).

Variant 2:



– Remove air filter housing ⇒ page 422 .
– Lift the retaining clip -1-, remove the coolant connection.
– Unscrew bolt -2-.
– Release hose clips -arrows-, and remove coolant hoses.
– Detach coolant pipe (front left).

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted. Unauthorized distribution, editing or any form of commercialization is not permitted. SEAT S.A. assumes no liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Installing

Install in reverse order of removal, observing the following.

Note

Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .

– Add coolant ⇒ page 214 .
– Install engine cover panel ⇒ page 56 .

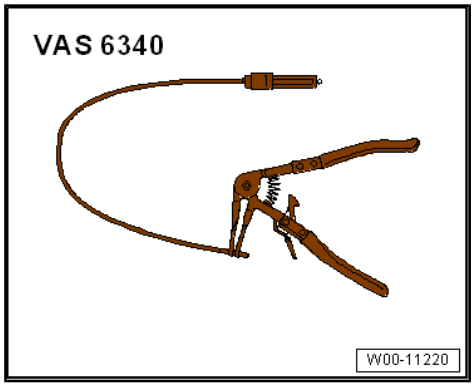
Specified torques

- ⇒ “3.1 Assembly overview - coolant pipes”, page 282
- ⇒ “4.1 Assembly overview - air filter housing”, page 420
- ⇒ “4.2 Assembly overview - radiator cowl and radiator fans”, page 307

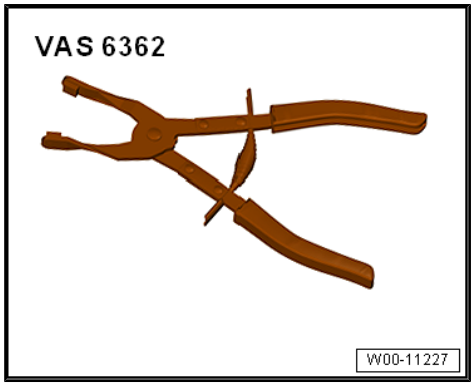
3.2.5 Removing and installing coolant pipe (front right)

Special tools and workshop equipment required

- Hose clip pliers - VAS 6340-



- Hose clip pliers - VAS 6362-



Removing

– Drain coolant ⇒ page 211 .

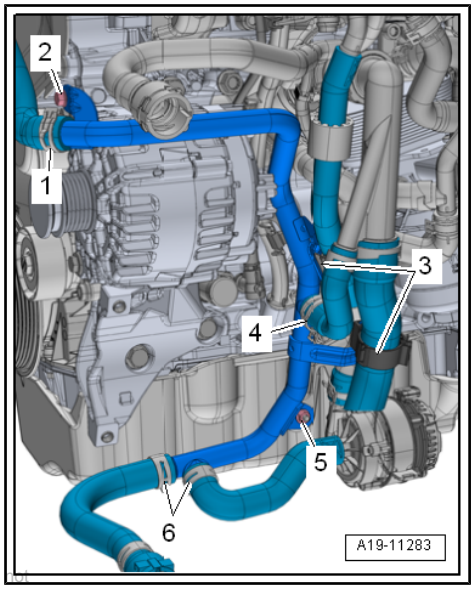
– Remove poly V-belt ⇒ page 59 .

– Remove the A/C compressor with connected refrigerant hoses from the bracket ⇒ Rep. gr. 87 ; A/C compressor; Attaching/ detaching the A/C compressor to/from the bracket and tie it up to the right.

– Release hose clips -1, 4, 6-, and detach coolant hoses.

– Unscrew nut -5- and bolt -2-.

– Move coolant hoses -3- clear and disconnect coolant pipe (front right).



Installing

Install in reverse order of removal, observing the following.

Note

Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ Electronic parts catalogue .

– Install poly V-belt ⇒ page 59 .

– Add coolant ⇒ page 214 .

Specified torques

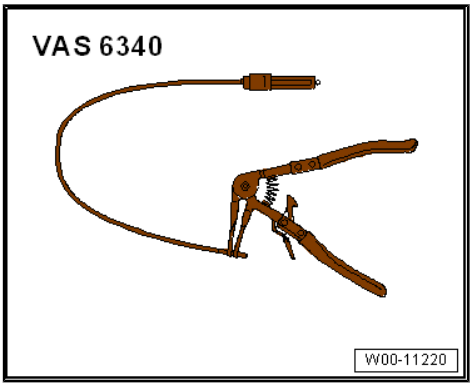
- ⇒ "3.1 Assembly overview - coolant pipes", page 282
- Assembly overview - drive unit of the air conditioner compressor ⇒ Rep. gr. 87 ; Air conditioner compressor; Assembly overview - drive unit of air conditioner compressor

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

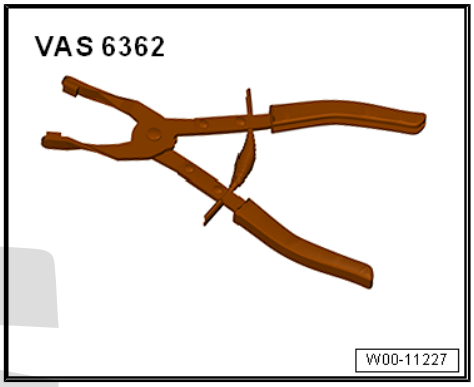
3.2.6 Removing and installing coolant pipes (left-side)

Special tools and workshop equipment required

- Hose clip pliers - VAS 6340-



- Hose clip pliers - VAS 6362-



Removing

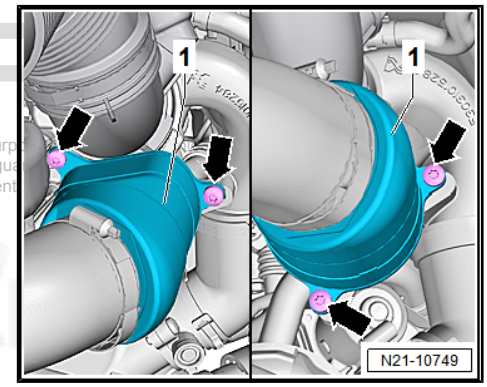
– Remove engine cover panel ⇒ page 56 .

– For reasons of space, remove the air filter housing together with the intake hose ⇒ page 422 .

– Drain coolant ⇒ page 211 .

Vehicles with water-cooled turbocharger

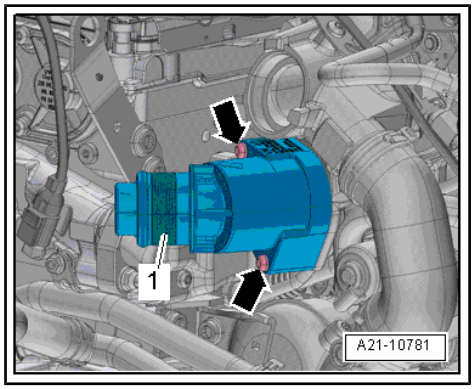
– Unscrew bolts -arrows- and detach pulsation damper -1-.



Protected by copyright. Copying for private or commercial purp
permitted unless authorised by SEAT S.A. SEAT S.A does not gua
respect to the correctness of information in this document

Continued for all vehicles

– Remove bolts -arrows-.



Vehicles with dual clutch gearbox:

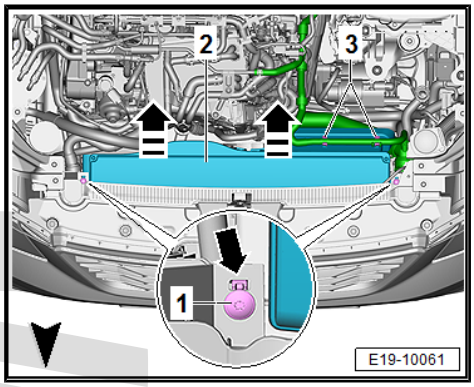
– Remove radiator cowl ⇒ page 317 .

Continuation for all other vehicles

– Free coolant hose -3-.

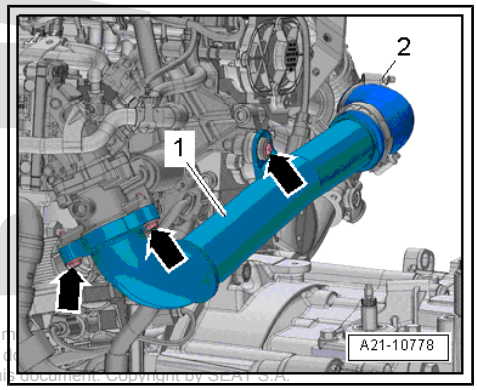
– Unscrew bolts -1-.

– Release locking lugs-arrow-, unclip air hose -2- from the front end and remove in -direction of the arrow-.



– Remove bolts -arrows-.

– Release screw-type clip -2- and detach air pipe -1-.



Note

- *There are vehicles with a coolant pipe and vehicles with two coolant pipes on the left.*
- *The number of hose clips is different.*
- *These differences depend on the installed dual clutch gearbox:*

Copyright by SEAT S.A. Except for private or commercial use, any reproduction is permitted unless authorised by SEAT S.A. SEAT S.A. disclaims all liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Vehicles without gear oil cooler:

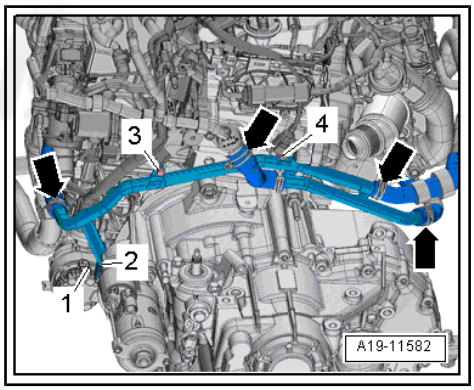
– Unbolt cable support bracket from gearbox, and push it aside slightly ⇒ Rep. gr. 34 ; Selector mechanism; Assembly overview – selector mechanism .

– Lay wiring harness -1- to one side.

– Unscrew nut -4- and bolts -2 and 3-.

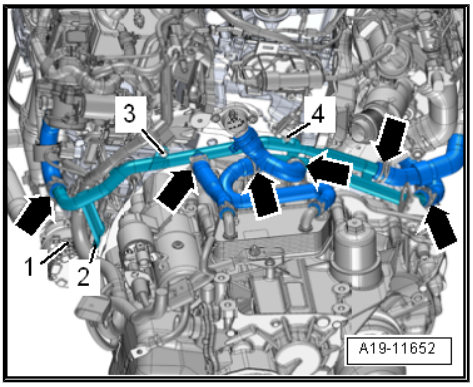
– Release hose clips -arrows-, and remove coolant hoses.

– Detach coolant pipes (left-side).



Vehicles with gear oil cooler:

- Remove selector lever cable from the gearbox ⇒ 7-gear dual clutch gearbox; Rep. gr. 34 ; Selector mechanism; removing and installing selector mechanism .
- Lay wiring harness -1- to one side.
- Unscrew nut -4- and bolts -2 and 3-.
- Release hose clips -arrows-, and remove coolant hoses.
- Detach coolant pipes (left-side).

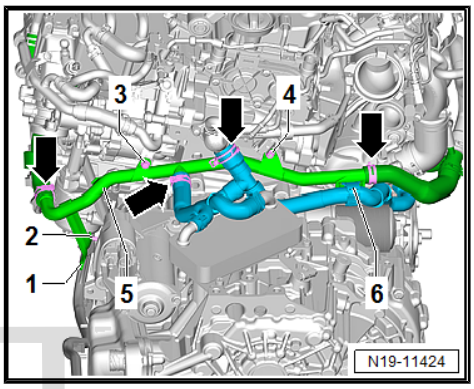


Vehicles with one coolant pipe (left side):

- Lay wiring harness -1- to one side.
- Unscrew nut -4- and bolts -2- and -3-.
- Unclip coolant hose -6- on coolant pipe -5-.
- Release hose clips -arrows-, and remove coolant hoses.
- Detach coolant pipes (left-side).

Vehicles with dual clutch gearbox:

- Pull out left coolant pipe towards front.
- Guide out coolant pipe between exhaust manifold and gear oil filter.



Installing

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Install in reverse order of removal, observing the following.

Note

Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .

- Note coolant hoses with pretensioned spring-type clips ⇒ page 306 .
- Add coolant ⇒ page 214 .

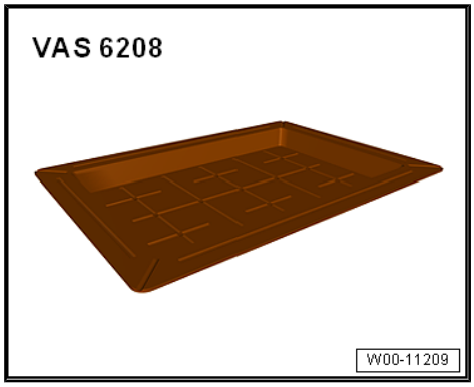
Specified torques

- ⇒ “3.1 Assembly overview - coolant pipes”, page 282
- ⇒ “4.1 Assembly overview - air filter housing”, page 420
- ⇒ “5.1 Assembly overview - intake manifold”, page 424
- ⇒ Rep. gr. 34 ; Selector mechanism; Assembly overview - selector mechanism

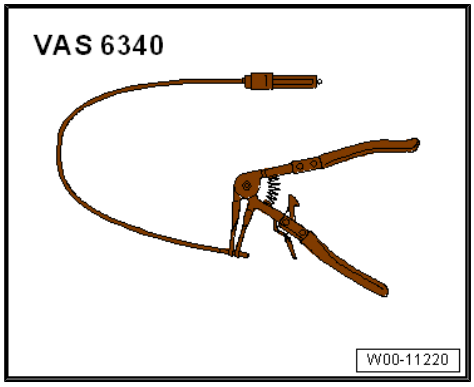
3.2.7 Removing and installing coolant pipe (rear)

Special tools and workshop equipment required

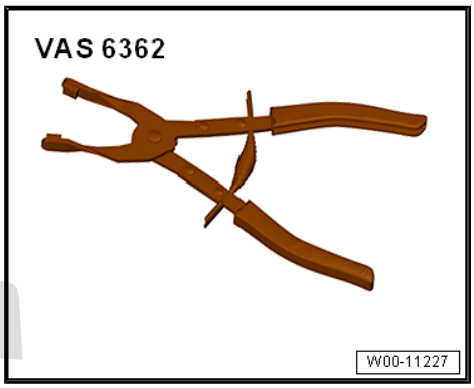
- Drip tray for workshop hoist - VAS 6208-



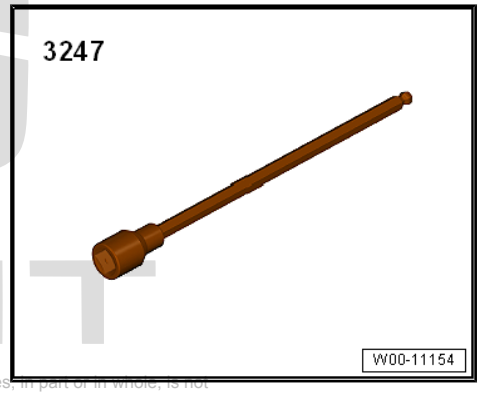
- Hose clip pliers - VAS 6340-



- Hose clip pliers - VAS 6362-



- Hexagon key extension, 8 mm - 3247-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Removing

– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

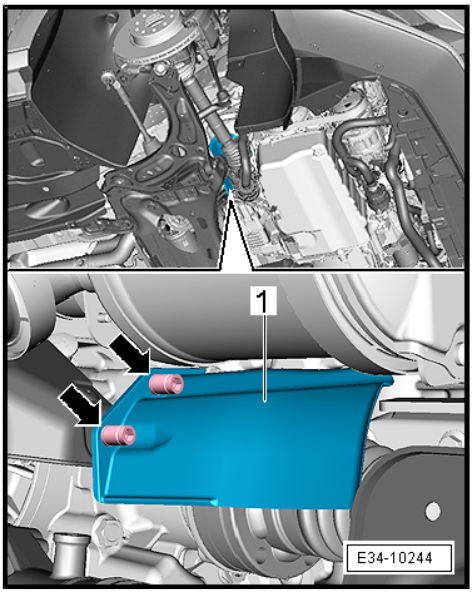
– If fitted, remove front centre underbody cover behind subframe ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cover; Overview of fitting locations - trims .

– If fitted, remove heat shield for right drive shaft ⇒ Running gear, shafts, steering; Rep. gr. 40 ; Drive shaft; Removing and installing heat shield .

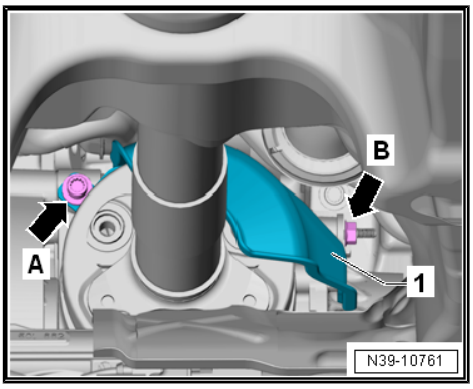
Vehicles with all-wheel drive

– Remove front exhaust pipe ⇒ page 489 .

– Remove bolts -arrows- and detach heat shield -1-.



– Remove bolts -arrows- and detach heat shield -1-.



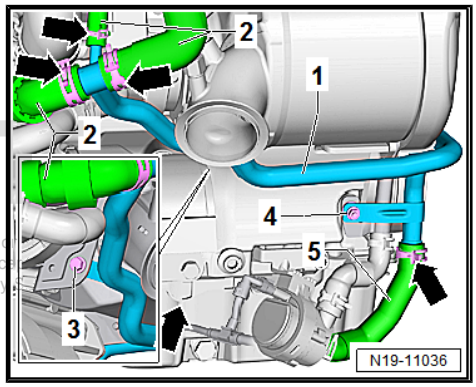
Vehicles with water-cooled turbocharger

– Place drip tray for workshop hoist - VAS 6208- underneath.

– Release hose clip -arrows-, remove coolant hose -5-, and drain off coolant.

– Release hose clips -arrows- and detach coolant hoses -2-.

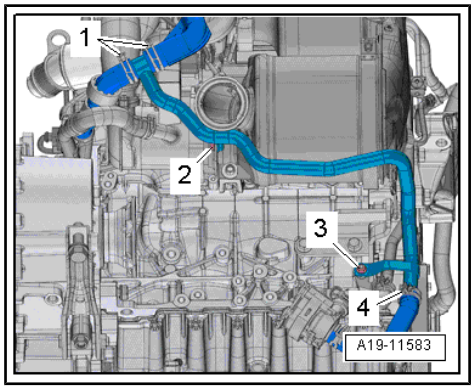
– Unscrew nut -4- and bolt -3-, and remove rear coolant pipe -1-.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Continued for all vehicles

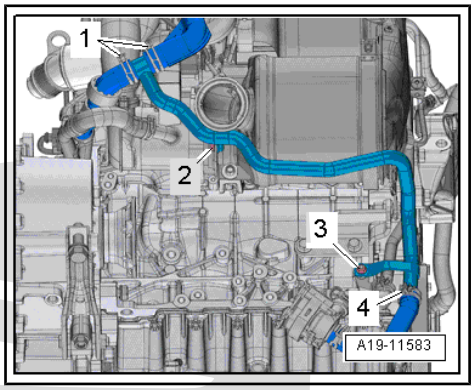
– Place drip tray for workshop hoist - VAS 6208- underneath.
– Loosen the hose clip -4-, remove the coolant hose, drain the coolant.
– Loosen the hose clips -1-, remove the coolant hoses.
– Remove nut -3- and bolt -2- and detach coolant pipe (rear).



Installing

Install in reverse order of removal, observing the following.

– Tighten bolt -2- and then nut -3-



Note

Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .

– Note coolant hoses with pretensioned spring-type clips ⇒ page 306 .
– Add coolant ⇒ page 214 .

Specified torques

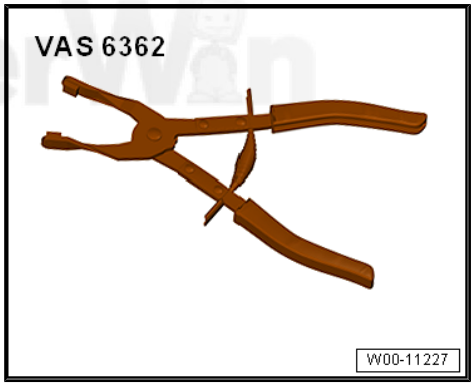
- ⇒ “3.1 Assembly overview - coolant pipes”, page 282
- Assembly overview - Noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - Noise insulation .
- ⇒ Rep. gr. 39 ; Drive shaft; Removing and installing drive shaft

3.2.8 Removing and installing coolant pipe (rear right)

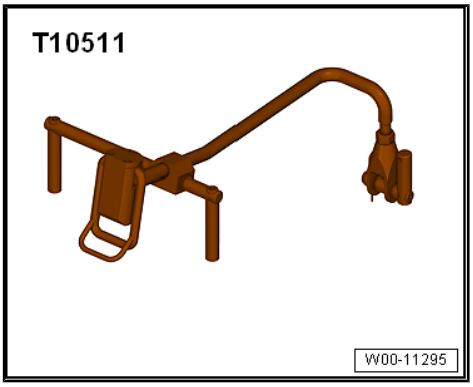
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Special tools and workshop equipment required

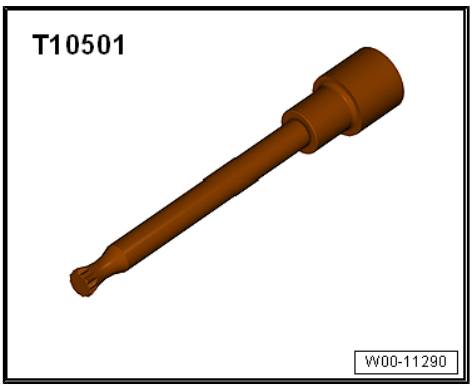
- Hose clip pliers - VAS 6362-



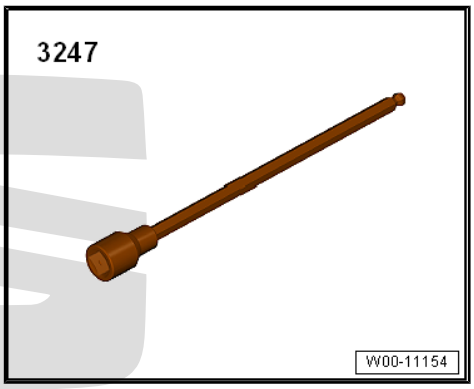
- Assembly tool - T10511-



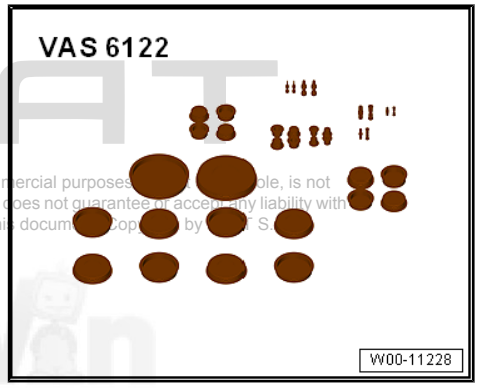
- Socket insert XZN 10 - T10501-



- Hexagon key extension, 8 mm - 3247-



- Engine bung set - VAS 6122-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Removing

Note

Attach all heat-shielding sleeves in the same places when installing.

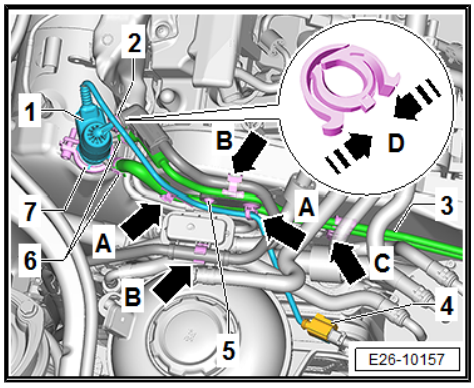
- Remove engine cover panel ⇒ page 56 .
- Drain coolant ⇒ page 211 .
- Remove front exhaust pipe ⇒ page 489 .
- Remove rear coolant pipe ⇒ page 293 .
- Remove coolant pipes (left-side) ⇒ page 291 .
- Remove connecting piece on turbocharger ⇒ page 360 .

Vehicles with SCR system

CAUTION

Safety risk due to escaping reducing agent.

- **To prevent large amounts of reducing agent from escaping when the metering line is opened, wait until the reducing agent has been drawn back automatically ⇒ page 3 .**



- Unclip the reducing agent line from the fastenings -arrows B-.
- Release and pull off the reducing agent line -2- by pressing together the securing clamps of the line in -the direction of the arrows D-.
- Pull back the supply line for reducing agent -2-
- Release and pull off the electrical connectors -4- from the reducing agent injector - N474- .
- Unclip the electrical connecting lead from the fastenings -arrows A-.
- Unclip the coolant lines -arrow C-.
- Unscrew bolt -5-.
- Loosen the clamp -7-.

Note

Item -6- can be disregarded.

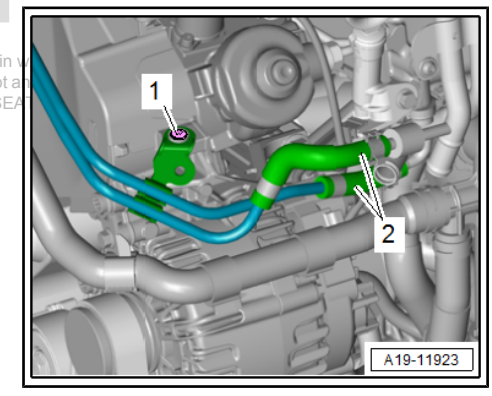
- Unscrew bolt -1- on bracket for coolant lines.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

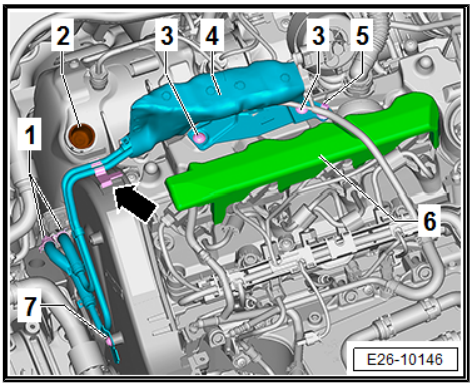
Note

Item -2- can be disregarded.

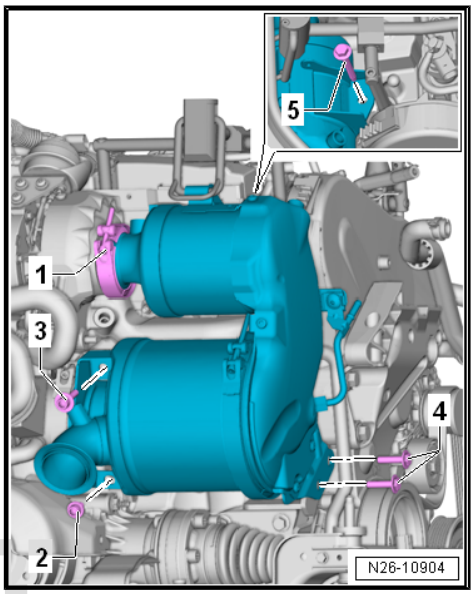
- Remove injector for reducing agent - N474- from the emission control module with the connected hoses and place on the right side.



Continued for all vehicles:



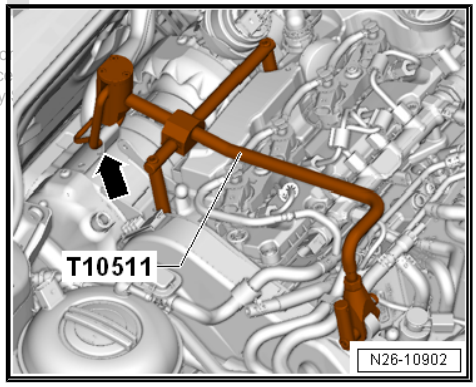
- Release and pull off connectors on plenum chamber bulkhead ⇒ page 387 . Detach cables from retainers, and place them above engine.
- Close off all open lines and connections with clean stoppers from the -2- stopper set for engine - VAS 6122- .
- Remove noise insulation -6-.
- Loosen and remove the wiring harness from the clip -5-.
- Remove bolts -3 and 7-.
- Release hose clips -1- and detach hoses.
- Free pipes -arrow-, remove them together with the differential pressure sensor - G505- and push to one side.



- Bend up and remove the clamp -1- of the emission control module.
- Unscrew bolt -5-.

Note

The feet of assembly tool - T10511- are supported on the bolt heads of the cylinder head cover.



- Fit assembly tool - T10511- as shown.
- Attach retaining bracket -arrow- in lifting shackle of emission control module.

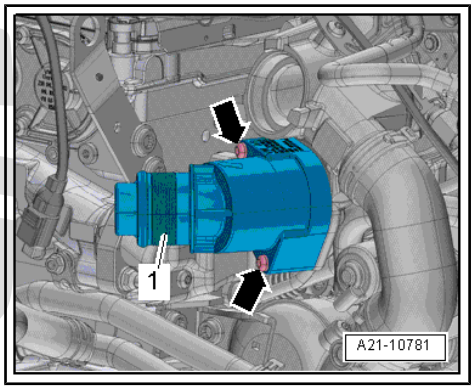
Vehicles with all-wheel drive

- Unbolt drive shaft (right-side) from bevel box ⇒ Rep. gr. 40 ; Drive shaft; Assembly overview - drive shaft .

Protected by copyright. Copies for private or commercial purposes, in part or in whole, are not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Continued for all vehicles:

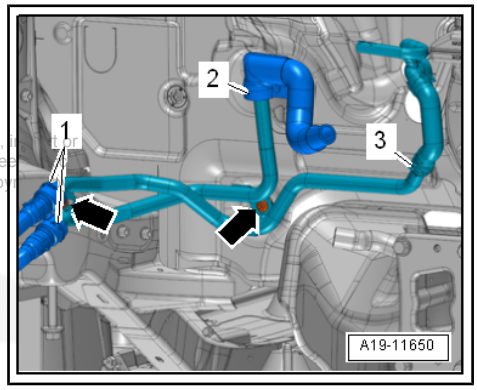
– Unscrew bolts -arrows- and remove resonator -1-.



Vehicles with auxiliary heater

– Remove nuts -arrows- and move coolant pipes slightly to the side.

Protected by copyright. Copying for private or commercial purposes, permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee respect to the correctness of information in this document. Copy



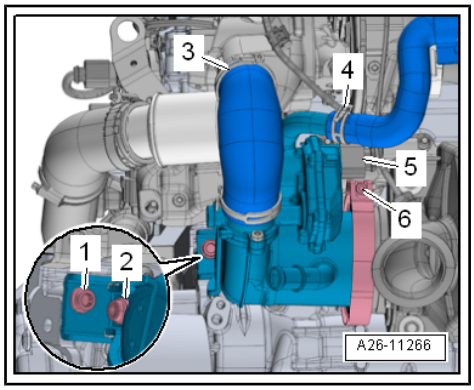
Continued for all vehicles:

– Push heat insulation sleeve to one side and unplug electrical connector -5-.

– Loosen the hose clip -3-, remove the air intake hose.

– Loosen the hose clip -4-, remove the coolant hose.

– Remove bolt -1- and loosen bolt -2-.

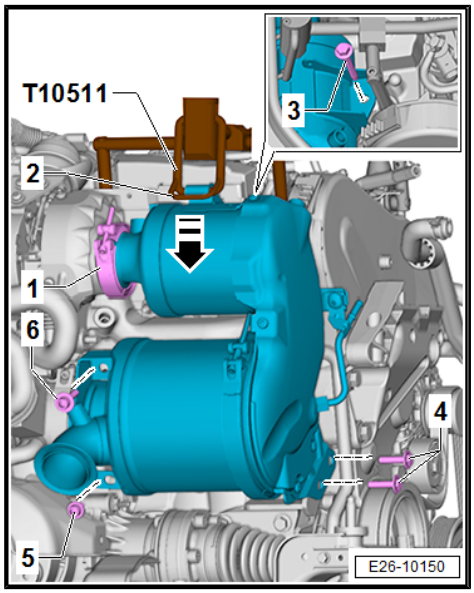


– Unscrew bolts -4-.

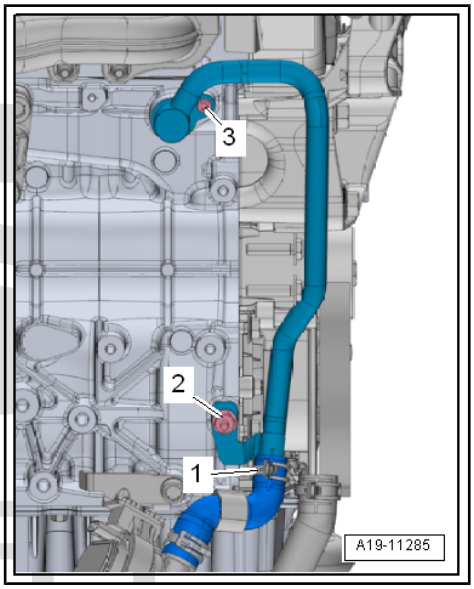
– Unscrew the bolts -5 and 6- with the XZN 10 - T10501- .

– Pull down mechanism -2- of assembly tool - T10511- in -direction of arrow- to release the retaining bracket of the transportation shackle of the emission control module.

– Push the emission control module and the cooler for exhaust recirculation towards the back.



– Release hose clip -1- and detach coolant hose.
– Remove centre hex stud -2- and bolt -3- and take off coolant pipe (rear right).



Installing

Install in reverse order of removal, observing the following.

Note

Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .

– If removed, O-ring must be renewed.
– Note coolant hoses with pretensioned spring-type clips ⇒ page 306 .
– Install emission control module ⇒ page 506 .
– Install exhaust gas recirculation cooler ⇒ page 567 .
– Install front exhaust pipe ⇒ page 489 .
– Install coolant pipe (rear) ⇒ page 293 .
– Install coolant pipes (left-side) ⇒ page 291 .
– Install engine cover panel ⇒ page 56 .
– Add coolant ⇒ page 214 .

Image copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

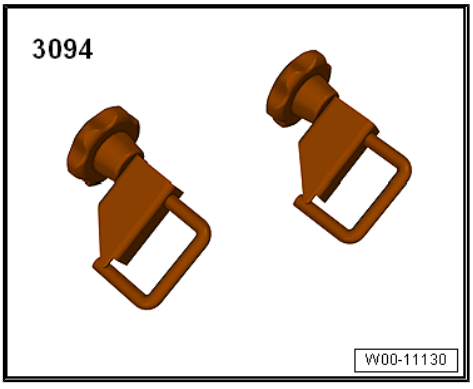
Specified torques

- ⇒ “2.1 Assembly overview - emission control”, page 500
- ⇒ “5.1 Assembly overview - exhaust gas recirculation”, page 562
- ⇒ “4.1 Assembly overview - exhaust gas temperature regulation”, page 548
- ⇒ “3.1 Assembly overview - coolant pipes”, page 282
- ⇒ “1.1 Assembly overview - silencers”, page 473
- ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Assembly overview - drive shaft .
- ⇒ Auxiliary heater, supplementary heater; Rep. gr. 82 ; Coolant circuit with auxiliary heater

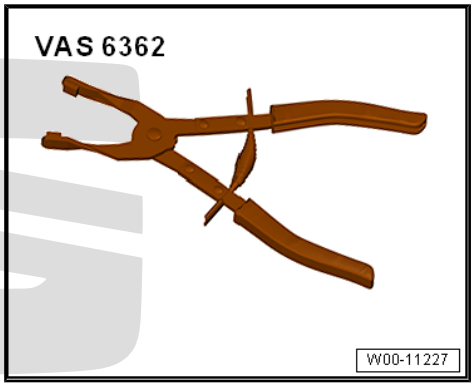
3.2.9 Removing and installing the upper rear left coolant pipe

Special tools and workshop equipment required

- Hose clamps, up to Ø 25 mm - 3094-

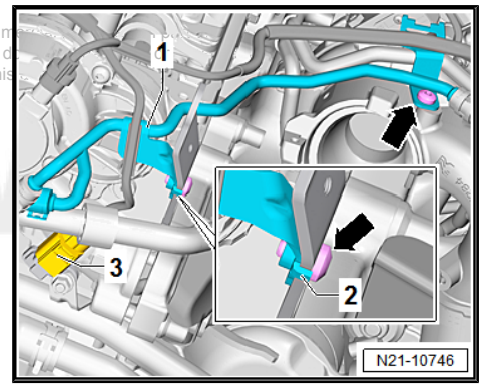


- Hose clip pliers - VAS 6362-



Removing

– Remove engine cover panel ⇒ page 56 .
– Remove connecting piece on turbocharger ⇒ page 360 .
– Remove bolts -arrows-.
– Unplug the electrical connector -3-.
– Detach coolant hoses with clamps up to 25 mm - 3094- .
– Release the hose clamps and remove the coolant hoses.



Protected by copyright. Copying for private or comm
permitted unless authorised by SEAT S.A. SEAT S.A d
respect to the correctness of information in this

Note

Use cloth to catch escaping coolant.

– Removing the coolant line -1-

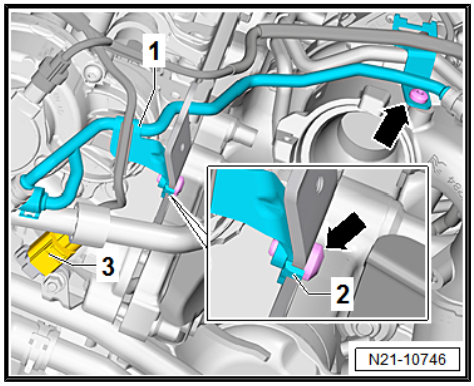
Installing

Install in reverse order of removal, observing the following.

Note

Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .

– When installing the line -1-, make sure that the guide -2- is correctly positioned in the bracket.



Specified torques

- ⇒ “3.1 Assembly overview - coolant pipes”, page 282
- ⇒ “1.1 Assembly overview - turbocharger”, page 326

4 Radiator, radiator fans

⇒ “4.1 Assembly overview - radiator, radiator fan”, page 303

⇒ “4.2 Assembly overview - radiator cowl and radiator fans”, page 307

⇒ “4.3 Assembly overview - radiator blind”, page 309

⇒ “4.4 Removing and positioning radiator”, page 311

⇒ “4.5 Removing and installing cooler for charge air cooling circuit”, page 312

⇒ “4.6 Removing and installing radiator cowl”, page 317

⇒ “4.7 Removing and installing radiator fan”, page 319

⇒ “4.8 Removing and installing radiator blind”, page 320

⇒ “4.9 Removing and installing radiator blind control motor V544”, page 322

4.1 Assembly overview - radiator, radiator fan

⇒ “4.1.1 Assembly overview - radiator, radiator fan, version 1”, page 303

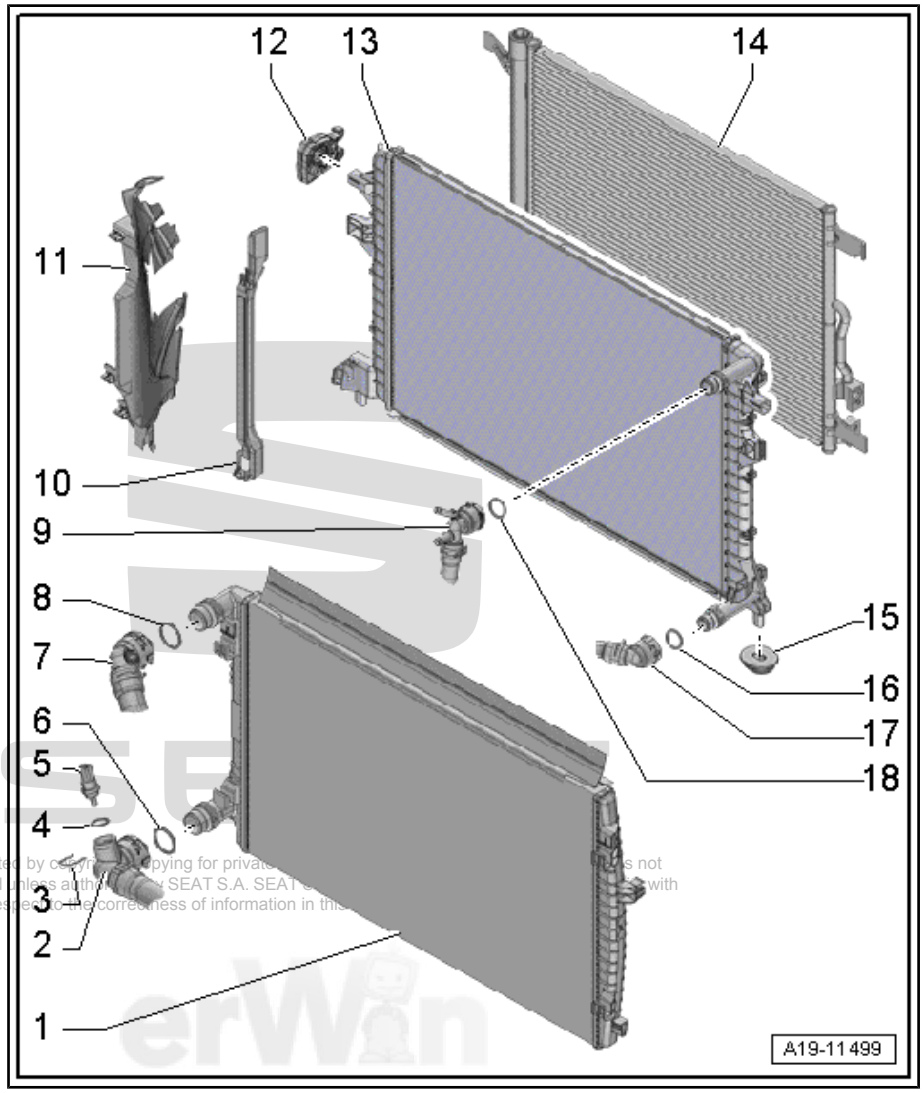
⇒ “4.1.2 Assembly overview - radiator, radiator fan, version 2”, page 305

⇒ “4.1.3 Plug-in connectors of coolant hoses”, page 306

⇒ “4.1.4 Coolant hoses with pretensioned spring-type clips”, page 306

4.1.1 Assembly overview - radiator, radiator fan, version 1

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



1 - Radiator

- ❑ Removing and installing ⇒ page 311

2 - Coolant hose

- ❑ Pull out retaining clip to remove
- ❑ Connect ⇒ page 306

3 - Retaining clip

4 - O-ring

- ❑ Renew if damaged
- ❑ Moisten with coolant

5 - Radiator outlet coolant temperature sender - G83-

- ❑ Removing and installing ⇒ page 280

6 - O-ring

- ❑ Renew if damaged
- ❑ Moisten with coolant

7 - Coolant hose

- ❑ Pull out retaining clip to remove
- ❑ Connect ⇒ page 306

8 - O-ring

- ❑ Renew if damaged
- ❑ Moisten with coolant

9 - Coolant hose

- ❑ Pull out retaining clip to remove
- ❑ Connect ⇒ page 306

10 - Air duct

11 - Air duct

12 - Rubber mounting

- ❑ For radiator

13 - Radiator for charge air cooling circuit

- ❑ Removing and installing ⇒ “4.4 Removing and positioning radiator”, page 311

14 - Condenser

- ❑ Removing and installing ⇒ Heating, air conditioning; Rep. gr. 87 ; Refrigerant circuit; Removing and installing condenser .

15 - Rubber mounting

- ❑ For radiator

16 - O-ring

- ❑ Renew if damaged
- ❑ Moisten with coolant

17 - Coolant hose

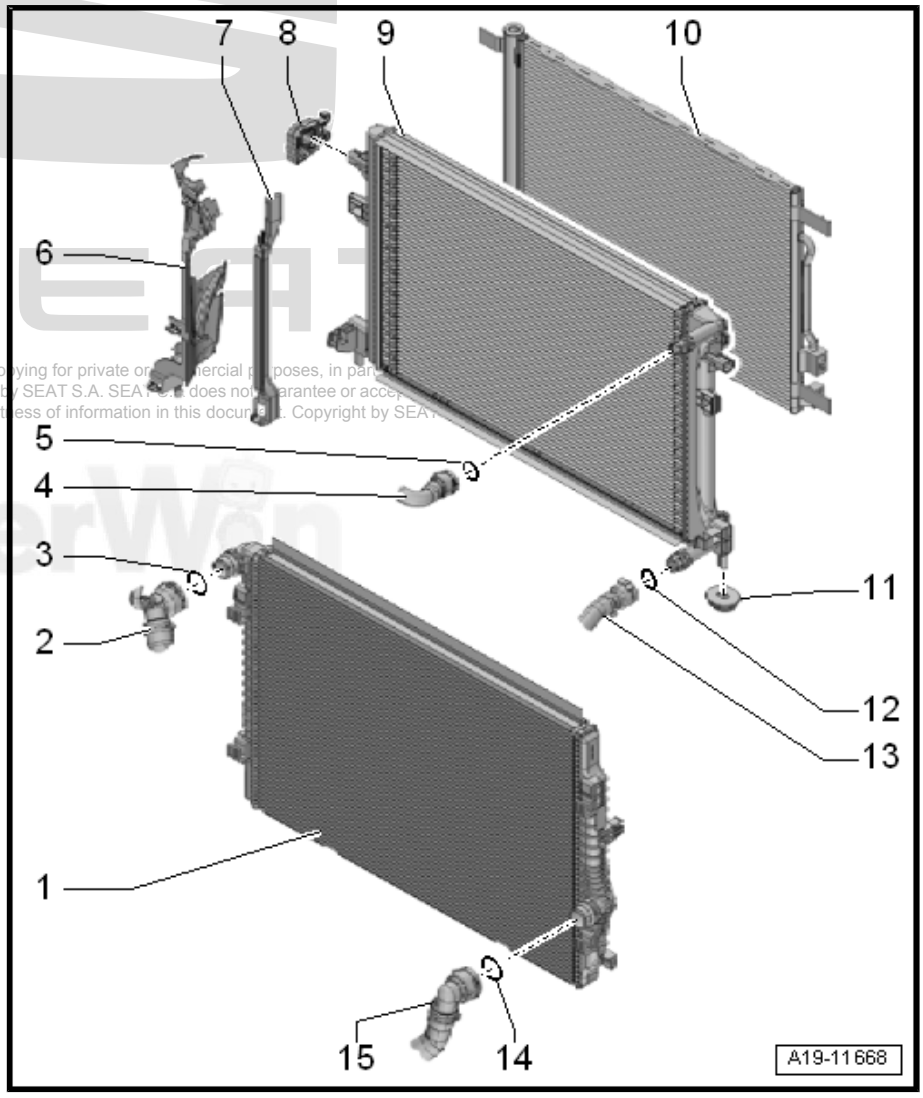
- ❑ Pull out retaining clip to remove
- ❑ Connect ⇒ page 306

18 - O-ring

- ❑ Renew if damaged

❑ Moisten with coolant

4.1.2 Assembly overview - radiator, radiator fan, version 2



1 - Radiator
- ❑ Removing and installing ⇒ page 311

2 - Coolant hose
- ❑ Pull out retaining clip to remove
- ❑ Connect ⇒ page 306

3 - O-ring
- ❑ Renew if damaged
- ❑ Moisten with coolant

4 - Coolant hose
- ❑ Pull out retaining clip to remove
- ❑ Connect ⇒ page 306

5 - O-ring
- ❑ Renew if damaged
- ❑ Moisten with coolant

6 - Air duct

7 - Air duct

8 - Rubber mounting
- ❑ For radiator

9 - Radiator for charge air cooling circuit
- ❑ Removing and installing ⇒ “4.4 Removing and positioning radiator”, page 311

10 - Condenser
- ❑ Removing and installing ⇒ Heating, air conditioning; Rep. gr. 87 ; Refrigerant circuit; Removing and installing condenser .

11 - Rubber mounting
- ❑ For radiator

12 - O-ring
- ❑ Renew if damaged
- ❑ Moisten with coolant

13 - Coolant hose
- ❑ Pull out retaining clip to remove
- ❑ Connect ⇒ page 306

14 - O-ring
- ❑ Renew if damaged
- ❑ Moisten with coolant

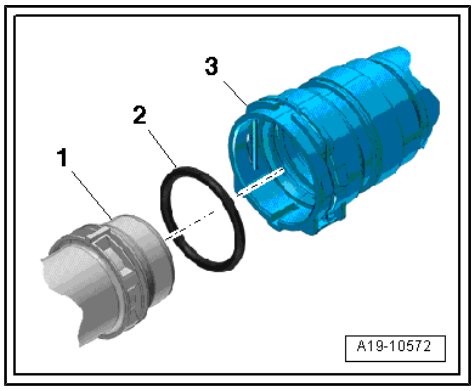
15 - Coolant hose
- ❑ Pull out retaining clip to remove

Protected by copyright. Copying for private or commercial purposes, in part, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

❑ Connect ⇒ page 306

4.1.3 Plug-in connectors of coolant hoses

Connecting coolant hose with plug-in connector to radiator

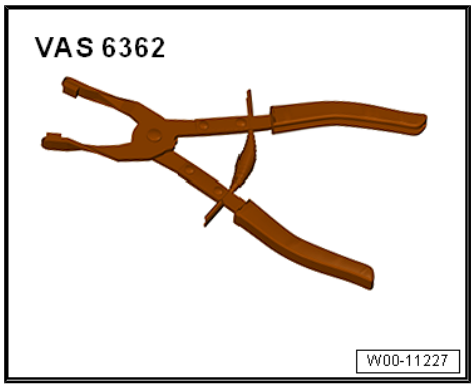


– Moisten a new O ring -2- with coolant and fit it in the coolant hose -3-.
– Push coolant hose into connection -1- until it audibly engages.
– Press coolant hose in again and then pull to check that plug-in connector is correctly engaged.

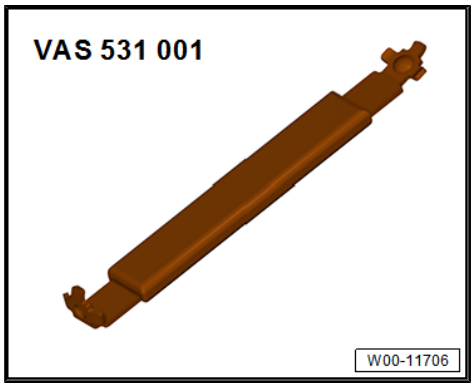
4.1.4 Coolant hoses with pretensioned spring-type clips

Special tools and workshop equipment required

♦ Hose clip pliers - VAS 6362-



♦ Release tool - VAS 531 001-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Open clip:

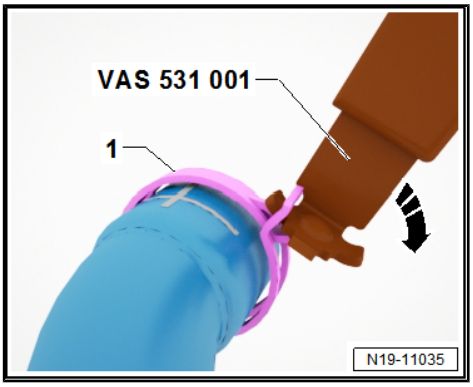
– Press together spring-type clips using hose clip pliers until clip engages.
– The clip is now open and coolant hose can be pulled off.
– It is not possible to detach clip from coolant hose.

Close clip:

– Install coolant hose.

– Release pretensioned spring-type clips as follows: Insert release tool - VAS 531 001- into spring-type clip as shown -1-. Release catch.

– Depending on available space, use appropriate release hook.



4.2 Assembly overview - radiator cowl and radiator fans

⇒ "4.2.1 Assembly overview - radiator cowl with one radiator fan", page 307

⇒ "4.2.2 Assembly overview - radiator cowl with two radiator fans", page 308

4.2.1 Assembly overview - radiator cowl with one radiator fan

1 - Bolt

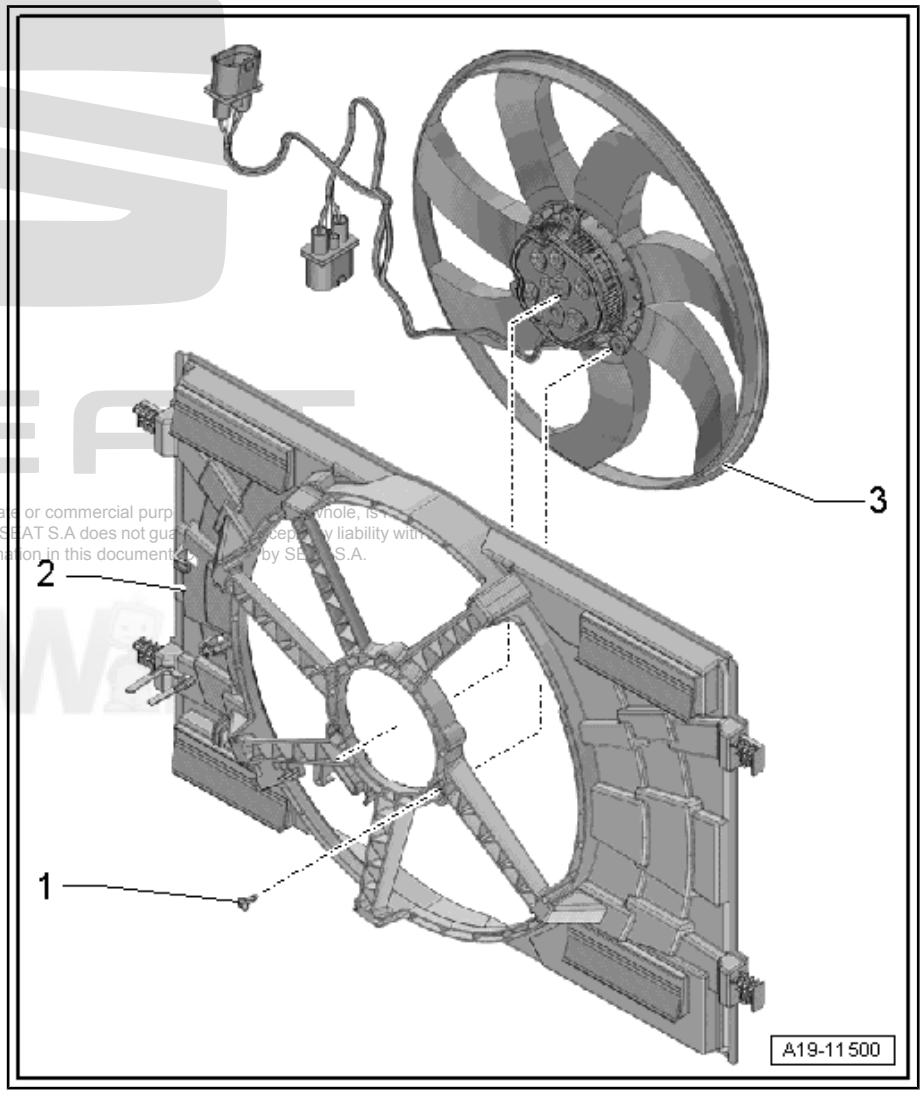
❑ 5 Nm

2 - Fan shroud

❑ Removing and installing ⇒ page 317

3 - Refrigerant fan - V7-

❑ Removing and installing ⇒ page 319



Protected by copyright. Copying for private or commercial purp whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not gua ccept any liability with respect to the correctness of information in this document by SEAT S.A.

4.2.2 Assembly overview - radiator cowl with two radiator fans

Radiator cowl and radiator fans

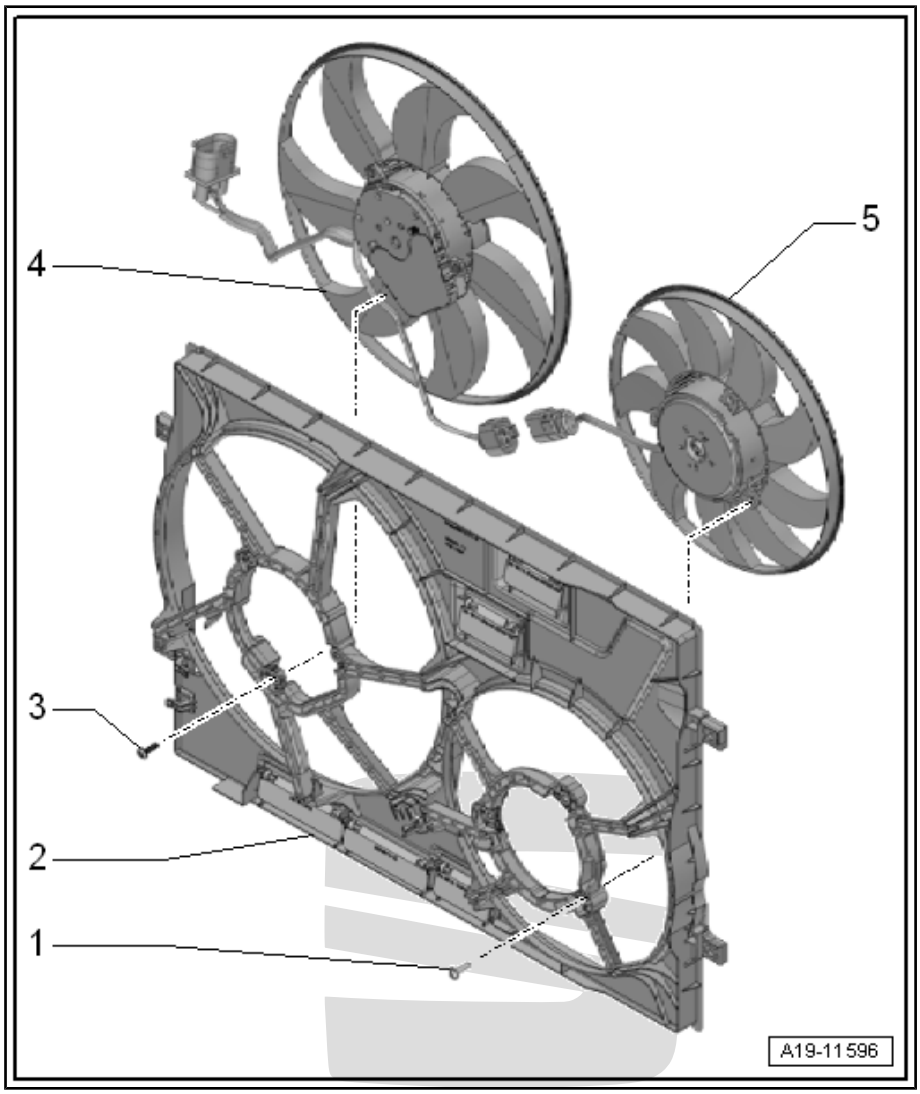
1 - Bolt
- ❑ 5 Nm

2 - Fan shroud
- ❑ Removing and installing ⇒ page 317

3 - Bolt
- ❑ 5 Nm

4 - Refrigerant fan - V7-
- ❑ Removing and installing ⇒ page 319

5 - Radiator fan 2 - V177-
- ❑ Removing and installing ⇒ page 319



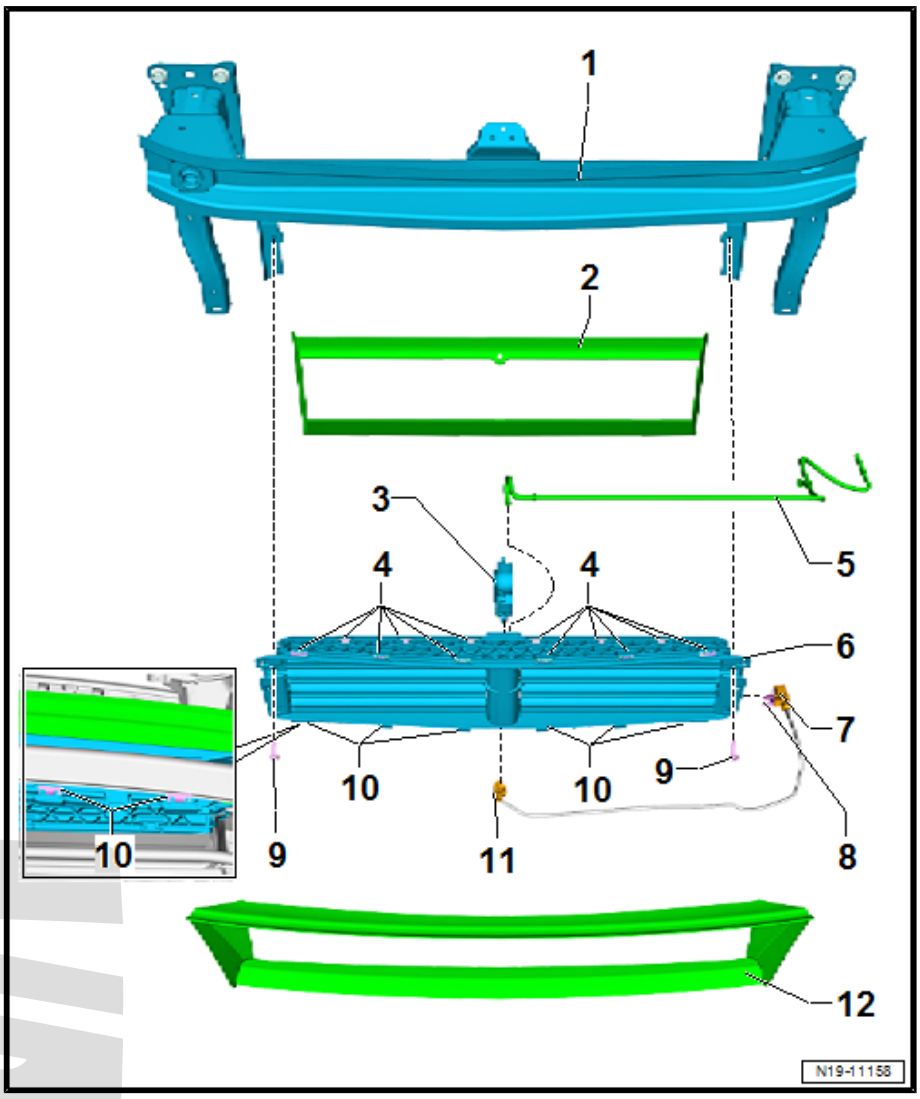
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

4.3 Assembly overview - radiator blind

⇒ “4.3.1 Assembly overview - radiator blind”, page 309

⇒ “4.3.2 Assembly overview - components of radiator blind”, page 310

4.3.1 Assembly overview - radiator blind



1 - Front cross member

- ❑ Assembly overview ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carriers; Assembly overview - Lock carriers

2 - Rear fairing

3 - Cooler shutter servomotor - V544-

- ❑ Removing and installing ⇒ page 322

4 - Retaining tabs

- ❑ For seals

5 - Ambient temperature sensor - G17-

- ❑ Fitting location ⇒ Item 12 (page 310)
- ❑ Clipped into front wind deflector
- ❑ ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

6 - Radiator blind

- ❑ Removing and installing ⇒ page 320

7 - Connection

- ❑ For radiator blind control motor - V544-
- ❑ Secured to lock carrier.
- ❑ ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

8 - Bracket/bearing/support

- ❑ For securing connector contact to lock carrier ⇒ Item 7 (page 309)

9 - Bolt

- ❑ 2x.
- ❑ 8 Nm

10 - Wiring harness

- ❑ For radiator blind control motor - V544-
- ❑ ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ ⇒ Fig. ““Routing cables/lines on radiator blind”“ , page 310

11 - Retaining tabs

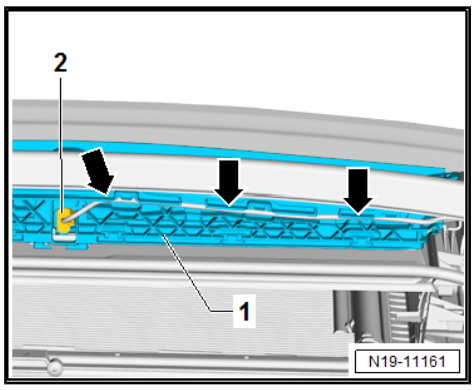
- ❑ For seals

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness or completeness of this document. Copyright by SEAT S.A.

12 - Front fairing

Routing cables/lines on radiator blind

– Wiring harness -2- for radiator blind control motor - V544- is clipped into frame of radiator blind -1- -arrows-.



4.3.2 Assembly overview - components of radiator blind

1 - Connecting link

2 - Bolt

3 - Cooler shutter servomotor - V544-
- ❑ Removing and installing ⇒ page 322

4 - Flaps
- ❑ Note arrangement ⇒ page 311

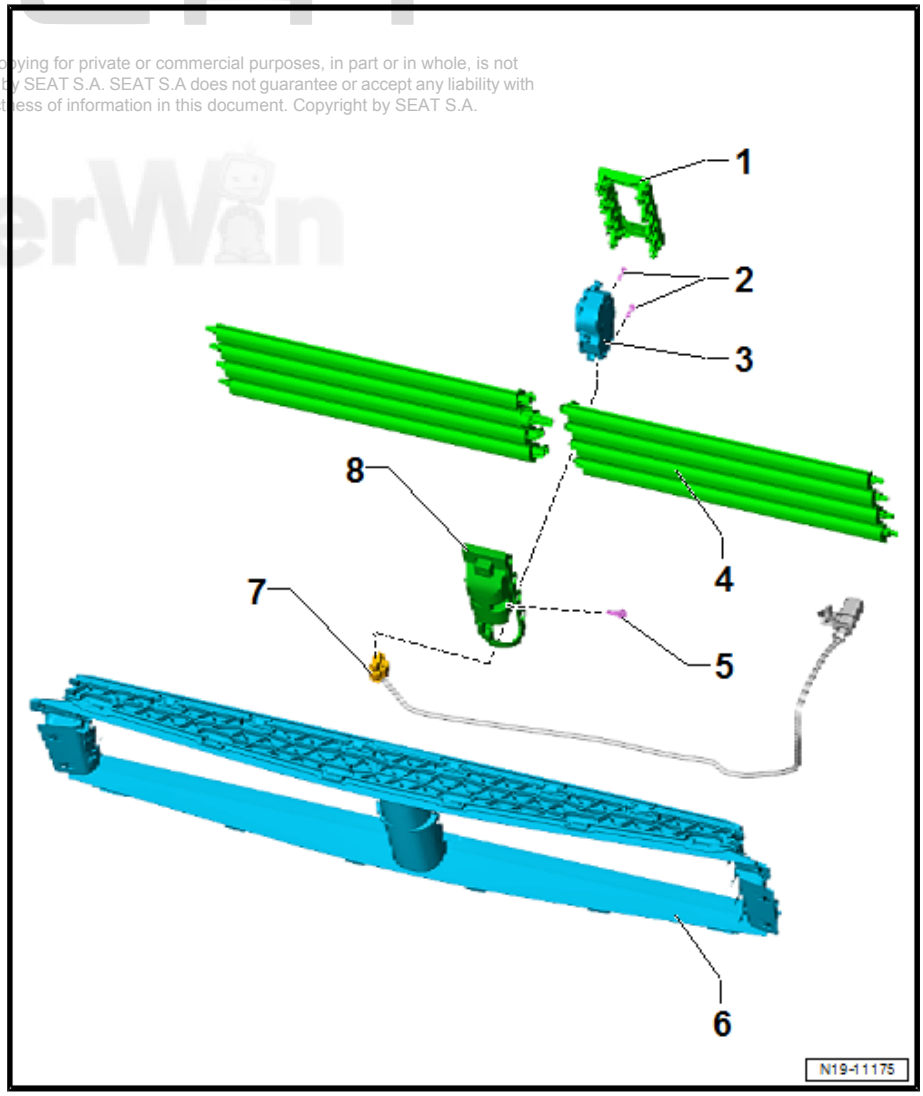
5 - Bolt

6 - Rack

7 - Wiring harness

8 - Engine mounting

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with regard to the correctness of information in this document. Copyright by SEAT S.A.

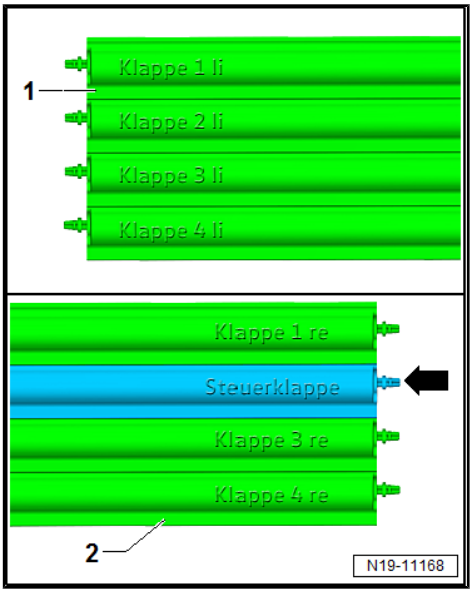


Arrangement of louvres

1 - Flap 1, left

2 - Flap 1, right

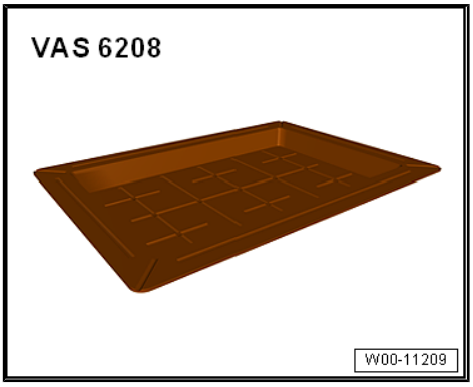
Flecha - Control flap



4.4 Removing and positioning radiator

Special tools and workshop equipment required

♦ Drip tray for workshop hoist - VAS 6208-

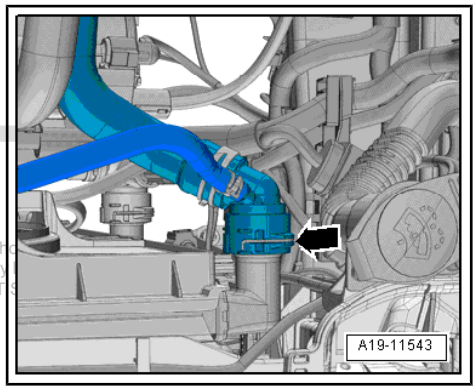


Removing

– Remove air filter housing ⇒ page 422 .

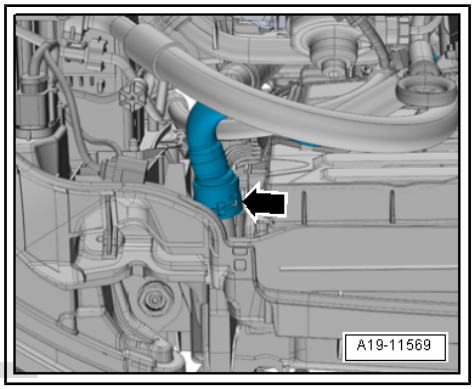
– Drain coolant ⇒ page 211 .

– Lift the retaining clip -arrow-, remove the coolant hose at the top left from the radiator.

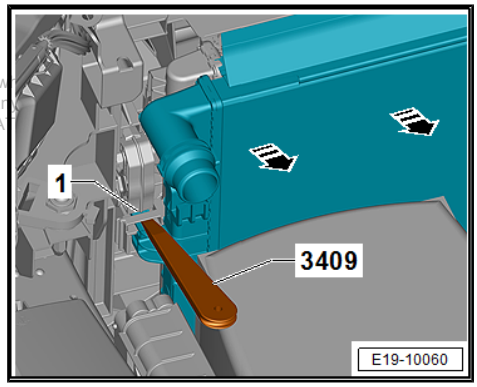


Protected by copyright. Copying for private or commercial purposes, in part or in wh
permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any
respect to the correctness of information in this document. Copyright by SEAT

– Lift retaining clip slightly -arrow- and separate coolant hose (top right) from water radiator for charge air cooling circuit.
– Remove radiator cowl ⇒ page 317 .



– Use the removal wedge to press both sides of locking tab -1- away from the engine compartment - 3409- and push the radiator -in the direction of the arrow-.
– Pull radiator out of mountings at bottom.
– Remove radiator from water radiator for charge air cooling circuit.
– Remove radiator (top section).



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

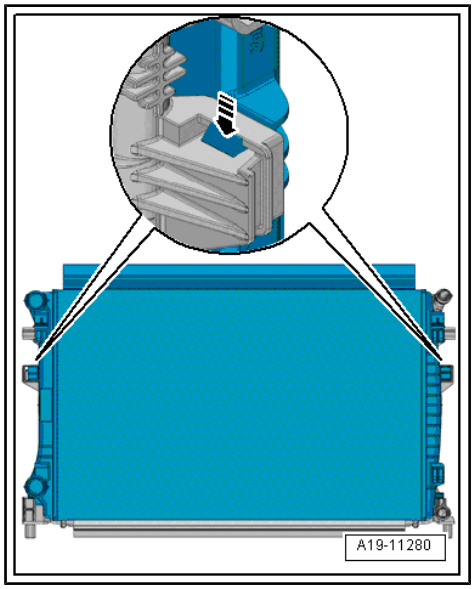
Installing

Install in reverse order of removal, observing the following.

Note

- *If there are minor dents in the fins, refer to respective instructions ⇒ page 18 .*
- *Renew O-rings after removal.*

– Engage radiator in charge air cooler. Ensure proper engagement by pulling.
– Install radiator cowl ⇒ page 317 .
– Connect coolant hose with plug-in connector ⇒ page 306 .



NOTICE

If a new radiator has been installed, the cooling system must be flushed and the coolant must be renewed to ensure optimum surface protection ⇒ "1.6 Flushing cooling system", page 224 .

If the existing intake manifold has been installed:

– Add coolant ⇒ page 214 .

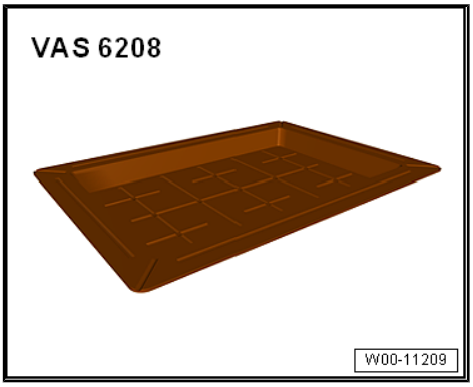
Specified torques

- ⇒ "4.1 Assembly overview - radiator, radiator fan", page 303
- ⇒ "4.1 Assembly overview - air filter housing", page 420

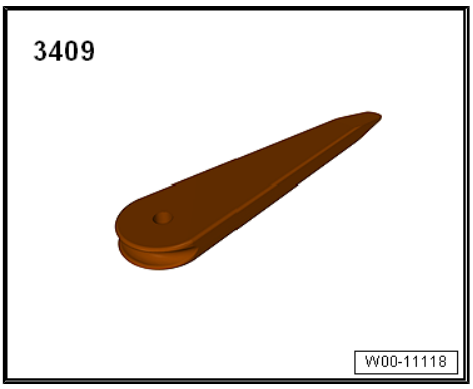
4.5 Removing and installing cooler for charge air cooling circuit

Special tools and workshop equipment required

♦ Drip tray for workshop hoist - VAS 6208-



♦ Removal wedge - 3409-

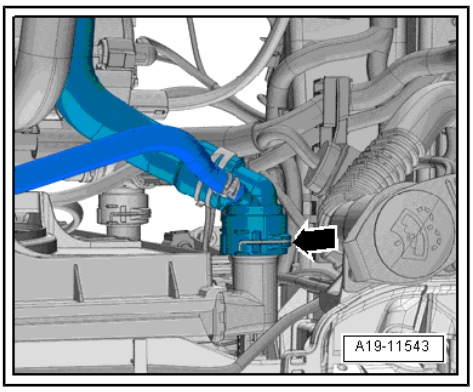


Removing

– Remove air filter housing ⇒ page 422 .

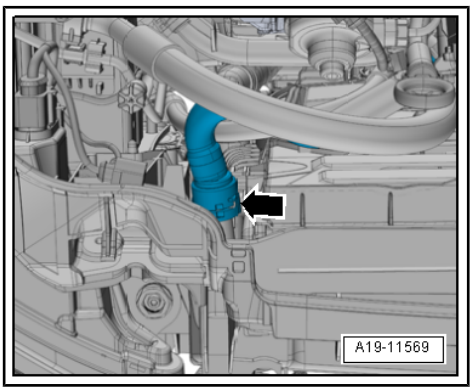
– Drain coolant ⇒ page 211 .

– Lift the retaining clip -arrow-, remove the coolant hose at the top left from the radiator.



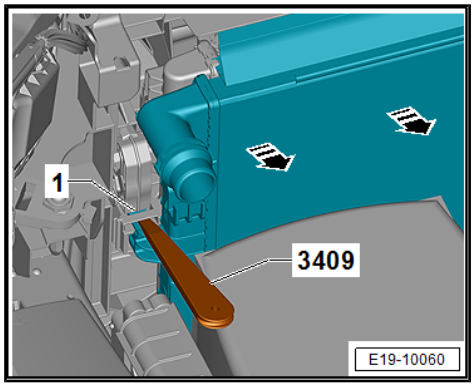
– Lift retaining clip -arrow-, and remove upper right coolant hose from water radiator for charge air cooling circuit.

– Remove radiator cowl ⇒ page 317 .



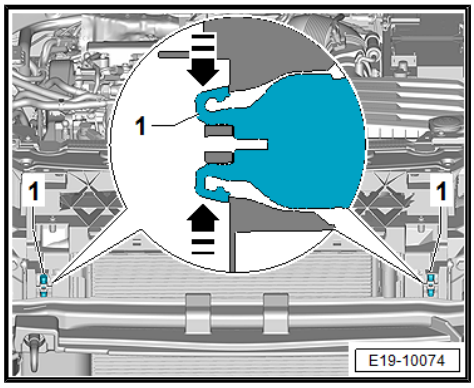
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Use the removal wedge to press both sides of locking tab -1- away from the engine compartment - 3409- and push the radiator -in the direction of the arrow-.
– Pull radiator out of mountings at bottom.
– Remove radiator from water radiator for charge air cooling circuit.
– Remove water radiator upwards.
– Remove front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper; Removing and installing front bumper cover .



Vehicles with coolant bearing support, clipped in

– Release catches -arrows- of radiator mounting -1- on left and right, or pinch them off using side cutters.

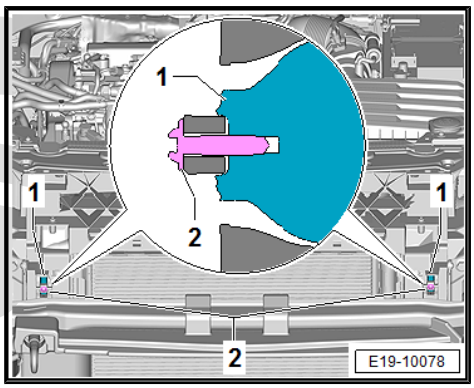


Note

The radiator mount support is reused during installation. It will then be bolted to lock carrier. Screws ⇒ Electronic parts catalogue .

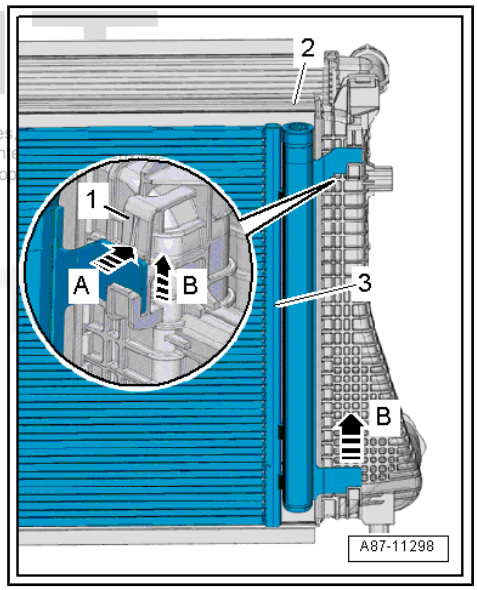
Vehicles with screwed on radiator mount support

– Unscrew the screws -2- left and right of the radiator mount -1-.



Continued for all vehicles

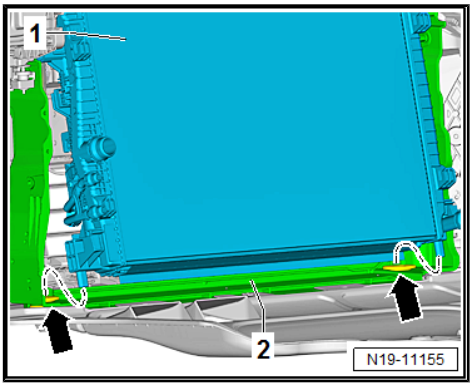
– Swivel radiator on the top edge a little towards the engine.
– Lift the radiator from the lower supports and press backwards.
– Press catches -1- on both sides in -direction of arrow A- to release them.
– Pull condenser -3- upwards in -direction of arrow B-, and detach it out of the charge air cooler -2-.
– Secure condenser fixed to lock carrier.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Co

– Remove radiator for charge-air cooler -1- at bottom from the radiator mountings -arrows-.

– Remove radiator for charge-air cooler -1-.



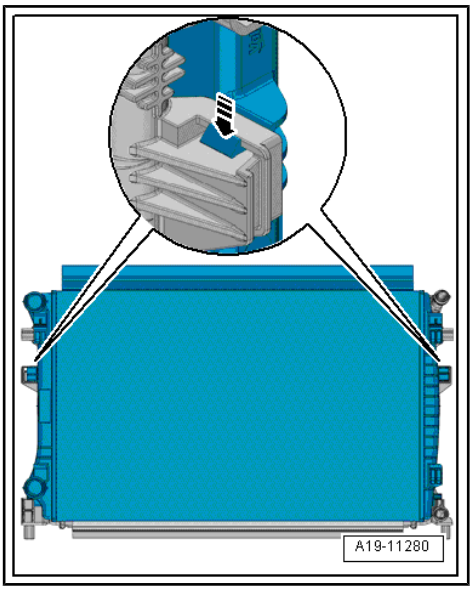
Installing

Install in reverse order of removal, observing the following.

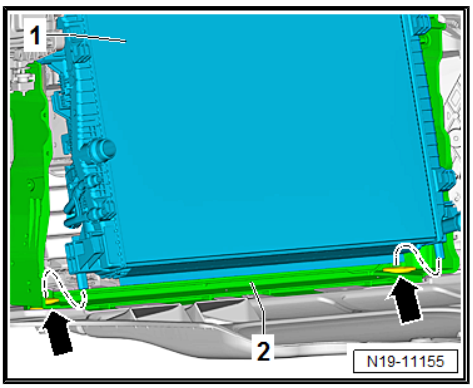
Note

- *If there are minor dents in the fins, refer to respective instructions ⇒ page 18 .*
- *Renew O-rings after removal.*

– Engage radiator in charge air cooler. Ensure proper engagement by pulling.

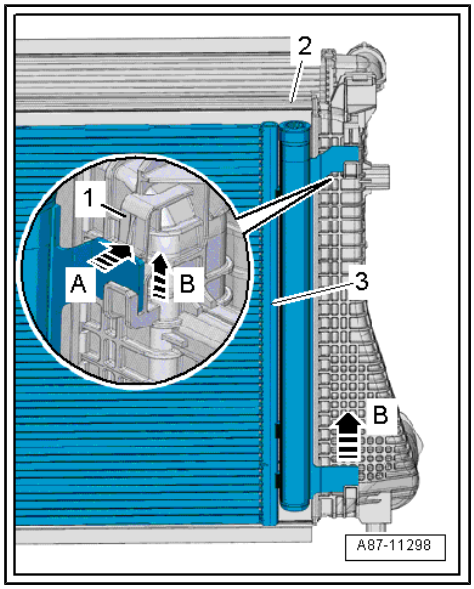


– Insert radiator module -1- at bottom into radiator mountings -arrows-.



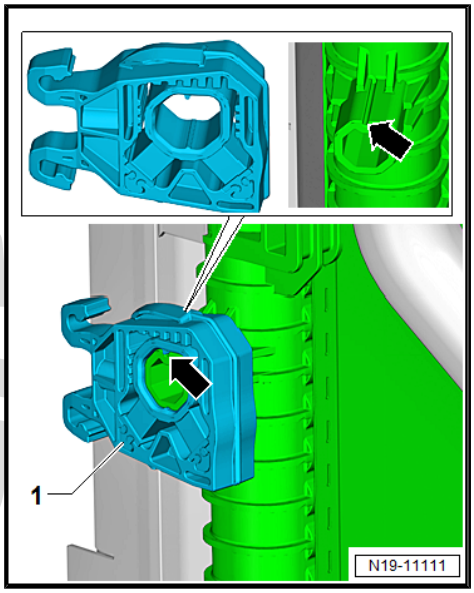
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Place the condenser -3- in the installation position.

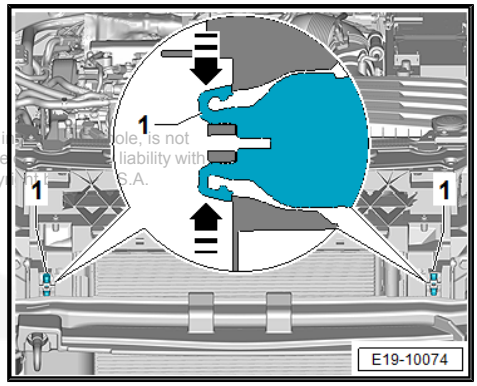


Installation position of the radiator mount support

– Fit radiator mountings -1- on left and right onto radiator. When doing so, note the installation position -arrow-.



– Attach cooler for charge air coolant circuit to the lock carrier. Pay attention to the right positions of the radiator mount support -1- in the lock carrier.

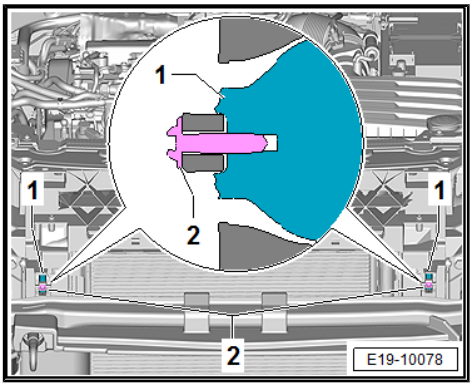


Protected by copyright. Copying for private or commercial purposes, ... ole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee ... liability with respect to the correctness of information in this document. Copy ... S.A.

Vehicles with screwed on radiator mount support

– Tighten radiator mount support with pinched off latch to the lock carrier. Screws -2- ⇒ Electronic spare parts catalogue .

• Specified torque: 5 Nm



Continued for all vehicles

– Install the front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper; Remove and install front bumper cover .

– Install radiator cowl ⇒ page 317 .

– Connect coolant hose with plug-in connector ⇒ page 306 .

NOTICE

If a new radiator has been installed, the cooling system must be flushed and the coolant must be renewed to ensure optimum surface protection ⇒ "1.6 Flushing cooling system", page 224 .

If the existing intake manifold has been installed:

– Add coolant ⇒ page 214 .

Specified torques

♦ ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper; Removing and installing bumper cover

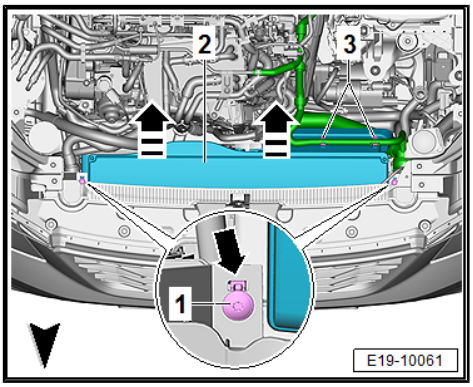
♦ ⇒ "4.1 Assembly overview - radiator, radiator fan", page 303

♦ ⇒ "4.1 Assembly overview - air filter housing", page 420

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness and completeness of this document's contents.

4.6 Removing and installing radiator cowl

Removing



– Remove air filter housing ⇒ page 422 .

– Free coolant hose -3-.

– Unscrew bolts -1-.

– Release locking lugs-arrow-, unclip air hose -2- from the front end and remove in -direction of the arrow-.

– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

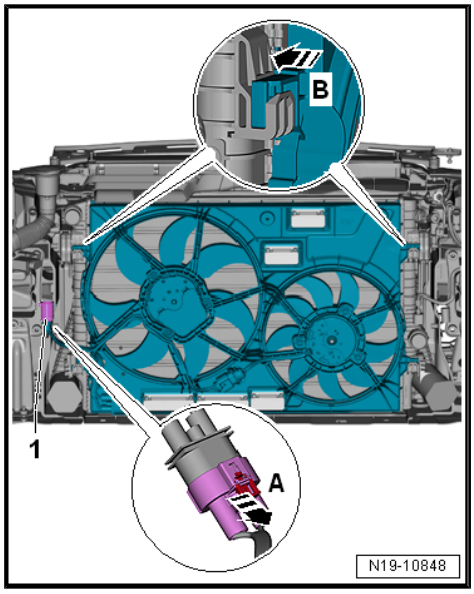
CAUTION

Danger of injury; the radiator fans can run at any time.

♦ **Unplug electrical connectors before starting to work in the area of radiator cowl.**

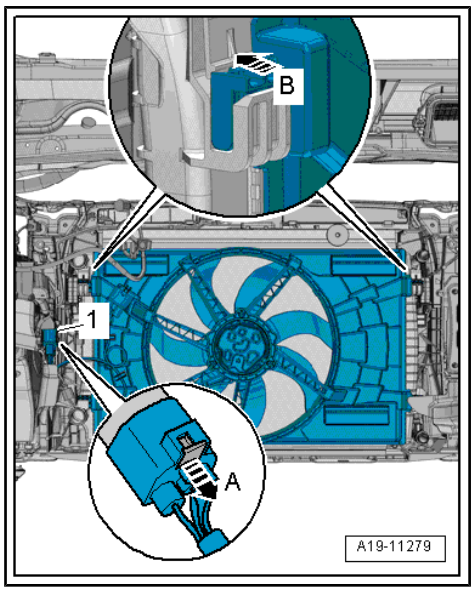
Radiator cowls with two radiator fans:

- Unplug electrical connector -1- for radiator fan.
- To do this, push locking tab in -direction of arrow A-, and press release mechanism.
- Simultaneously press locking tabs on left and right of radiator fan cowling -arrow B-.
- Pull radiator fan cowling upwards and remove from radiator.
- Take out radiator cowl from underneath.



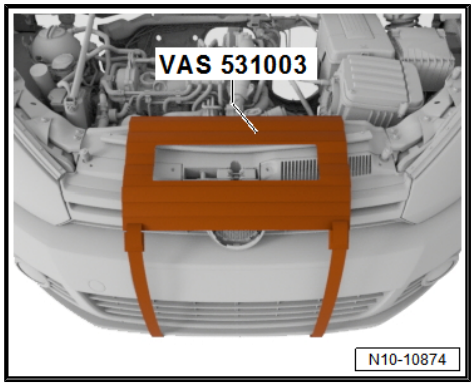
Radiator fan cowling with one radiator fan:

- Release and pull off connector -1- on radiator fan.
- To do this, push securing mechanism towards rear -arrow A- and press down release mechanism.
- Press locking tabs on left and right of radiator fan cowling -arrow B-.
- Pull radiator fan cowling upwards and remove from radiator.
- Take out radiator cowl from underneath.



Note

- *To avoid damage to the radiator after the cowling is removed, use protective mat - VAS 531003- .*
- *Install protective mat - VAS 531003- to vehicle as shown in illustration.*



Installing

Install in reverse order of removal, observing the following.

Specified torques

- ⇒ “4.1 Assembly overview - air filter housing”, page 420
- Assembly overview - Noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - Noise insulation

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

4.7 Removing and installing radiator fan

⇒ “4.7.1 Removing and installing radiator fan V7 ”, page 319

⇒ “4.7.2 Removing and installing radiator fan 2 V177 ”, page 319

⇒ “4.7.3 Removing and installing radiator fan V7 , vehicles with one radiator fan”, page 320

4.7.1 Removing and installing radiator fan - V7-

Removing

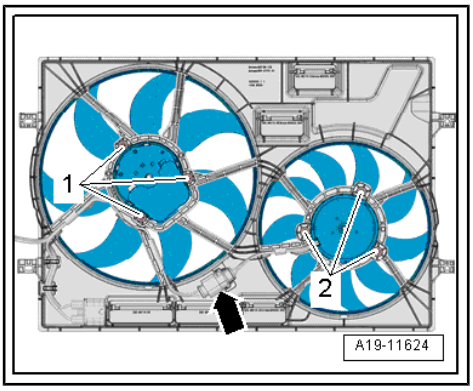
Note

Attach cable ties in all the same places when installing.

– Remove radiator cowl ⇒ page 317 .

– Disconnect electrical connector -arrow-.

– Unscrew bolts -1- and remove radiator fan - V7- .



Installing

Install in reverse order of removal, observing the following.

– Install radiator cowl ⇒ page 317 .

• Tightening torques
⇒ “4.2 Assembly overview - radiator cowl and radiator fans”, page 307 .

4.7.2 Removing and installing radiator fan 2 - V177-

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Removing

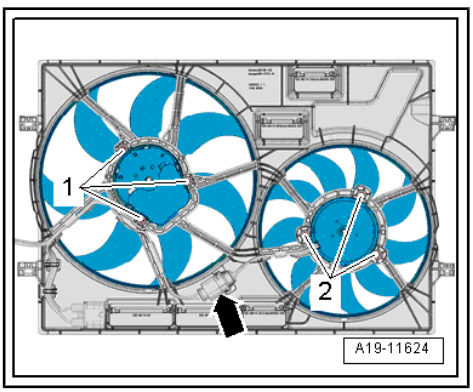
Note

Attach cable ties in all the same places when installing.

– Remove radiator cowl ⇒ page 317 .

– Disconnect electrical connector -arrow-.

– Unscrew bolts -2- and remove radiator fan - V177- .



Installing

Install in reverse order of removal, observing the following.

– Install radiator cowl ⇒ page 317 .

Specified torques

◆ ⇒ page 307

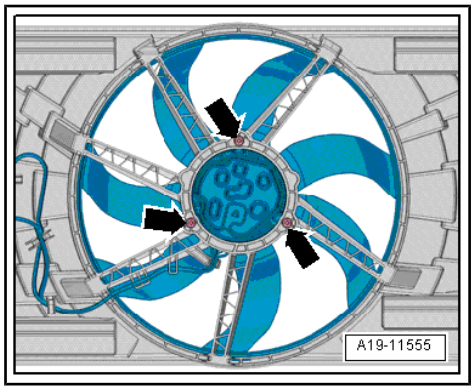
4.7.3 Removing and installing radiator fan - V7- , vehicles with one radiator fan

Removing

Note

Fit cable ties in the same place when installing.

– Remove radiator cowl with radiator fan ⇒ page 317 .
– Detach electrical connector.
– Unscrew bolts -arrows- and remove radiator fan - V7- .



Installing

Install in reverse order of removal, observing the following.

– Install radiator cowl ⇒ page 317 .

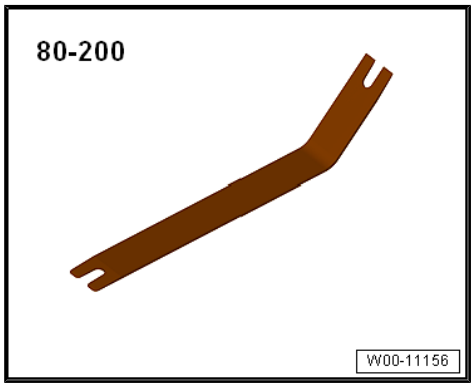
Specified torques

♦ ⇒ “4.2 Assembly overview - radiator cowl and radiator fans”, page 307

4.8 Removing and installing radiator blind

Special tools and workshop equipment required

♦ Removal lever - 80 - 200-



♦ Removal wedge - 3409-

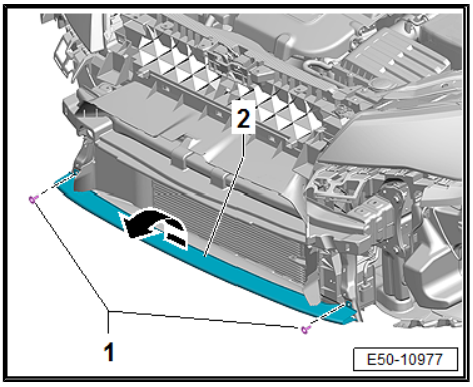
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Removing

– Remove noise insulation ⇒ Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .

– Remove front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Front bumper; Removing and installing bumper cover .

– Unscrew the bolts -1- and remove the pedestrian protective strip -2- in -the direction of the arrow-.

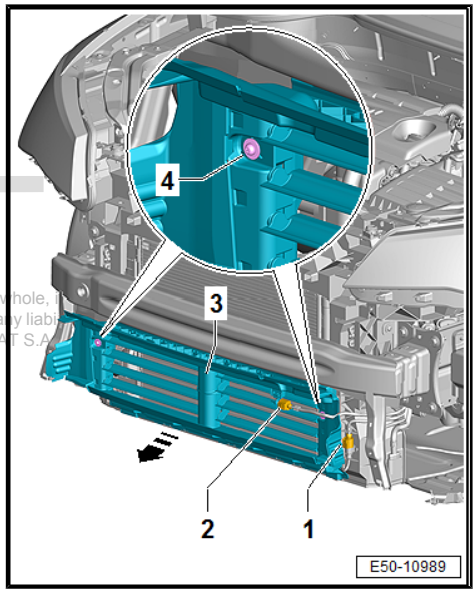


– Unplug the external temperature sensors -2-.

– Break the plug connection -1- of the radiator blind.

– Unscrew bolts -4-.

– Remove radiator blind -3- in -the direction of the arrow-.



Installing

Installation is in the reverse sequence of removal. Please observe the following.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

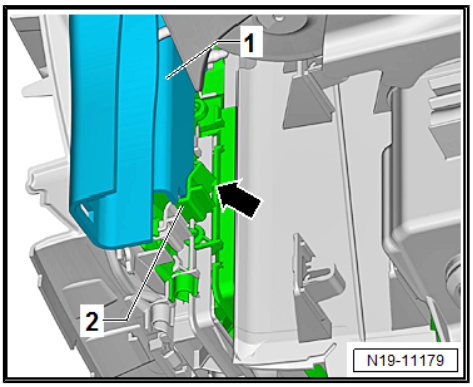
– Make sure that the guides of radiator blind -2- are properly seated on bumper carrier -1- -arrow-.

– After replacing radiator blind, a basic setting must be performed.

– Use ⇒ Vehicle diagnostic tester.

– Erase event memory ⇒ Vehicle diagnostic tester.

– Connect vehicle diagnostic tester and follow path to basic setting.



`0001 - Engine electronics, functions`

`0001 - Basic setting`

`0001 - Radiator blind control motor adaption - V544`

Specified torques

♦ ⇒ “4.3 Assembly overview - radiator blind”, page 309

♦ ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Assembly overview - Lock carrier

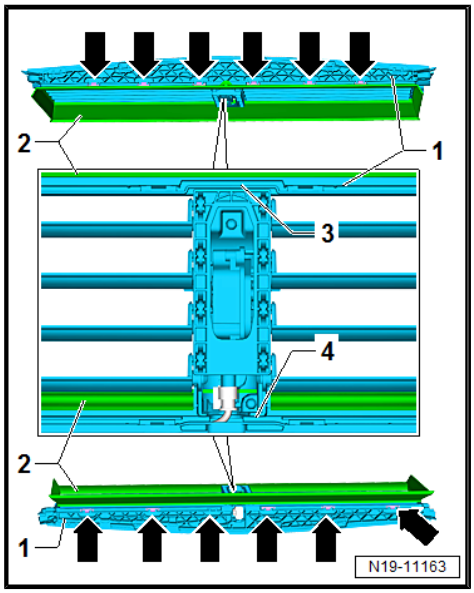
4.9 Removing and installing radiator blind control motor - V544-

Removing

– Remove radiator blind ⇒ page 320 .

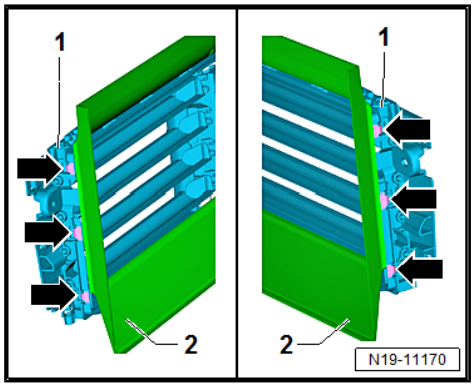
– Unclip seal -2- at top and bottom on retaining tabs -arrows-.

– Pull seal -2- off radiator blind -1-.



– Unclip seal -2- on left and right on retaining tabs -arrows-.

– Remove seal -2- from radiator blind -1-.

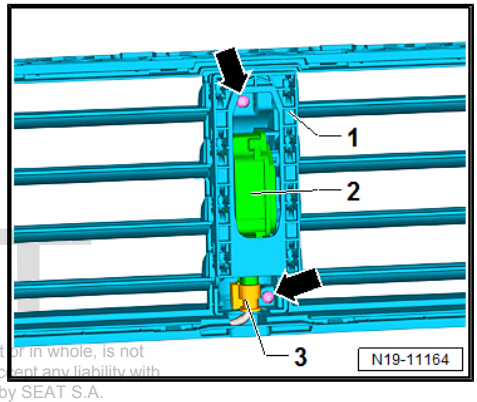


– Set flaps of radiator blind to open position as shown in illustration.

– To do this, move connecting piece -1-.

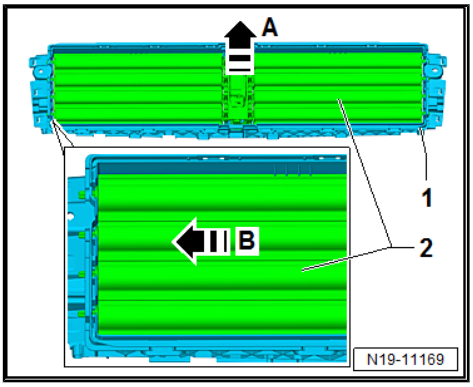
– Release and unplug electrical connector -3-.

– Remove bolts -arrows-.

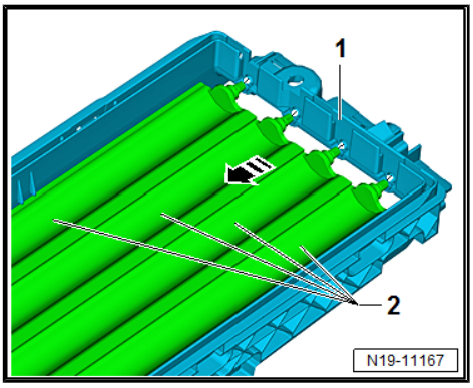


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

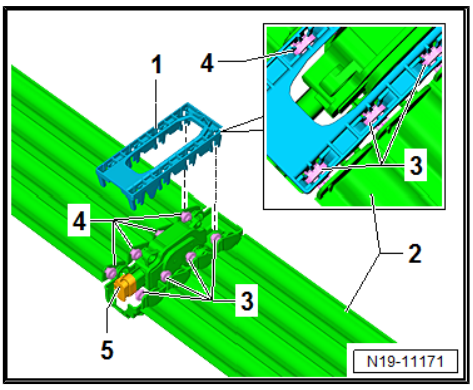
– Lift radiator blind control motor - V544- together with flaps upwards out of motor mounting ⇒ Item 3 (page 310) .
– Push radiator blind control motor - V544- with flaps -2- as far to the left as possible -arrow B-.



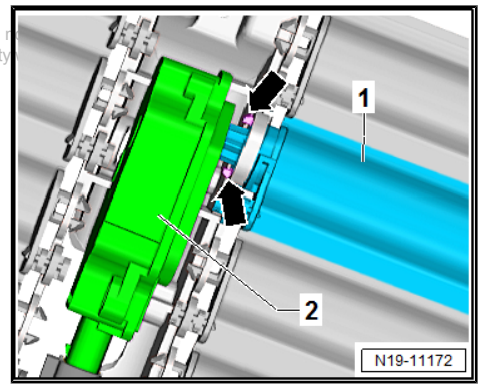
– Lever flaps -2- on right side out of frame -1-.



– Mark installation position of connecting piece -1-.
– Use connector contact -5- as a reference.
– Lever connecting piece -1- off guide rollers -3- and -4- of flaps -2-.

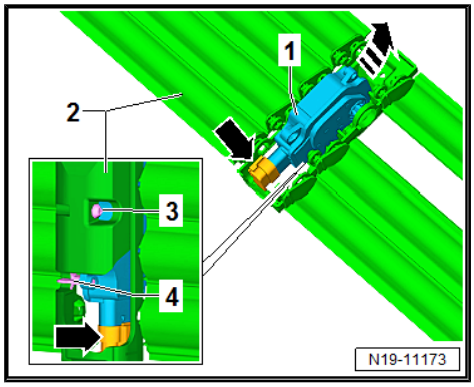


– Pull control flap -1- off radiator blind control motor - V544- -2-.
– To do this, release retaining clips -arrows-.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

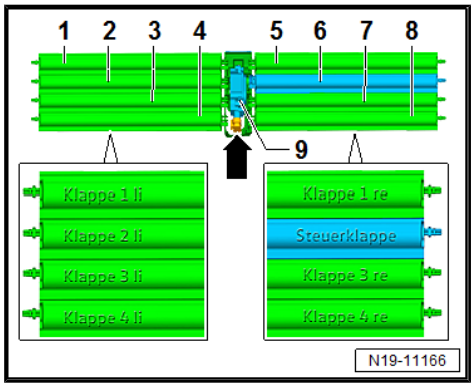
– If fitted, unscrew bolt -3-.
– Carefully swing radiator blind control motor - V544- upwards in -direction of arrow-.
– Pull radiator blind control motor - V544- off pin -4-.
– If necessary, release flaps on motor mounting, and remove them ⇒ Item 8 (page 310) .



Installing

Installation is in the reverse sequence of removal. Please observe the following.

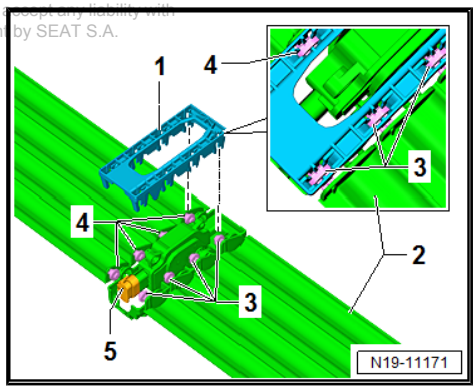
– Insert flaps -1- through -8- as shown in illustration, and engage them.
– Insert control flap -6-, and engage it.
– Note position of connector contact -arrow- when installing. The connector contact must face downwards.
– Note arrangement of flaps. The flaps are located on top of one another.
– The upper flaps rest on the flaps located below them.



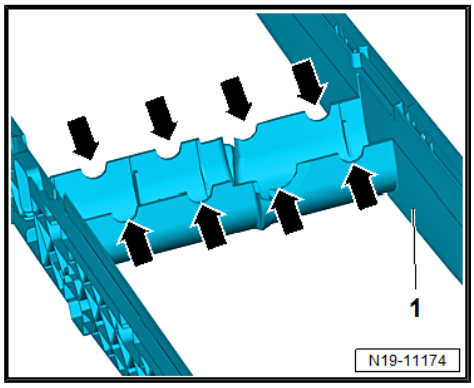
Serial	Left flaps	Serial	Right flaps
1	Flap 1, left	5	Flap 1, right
2	Flap 2, left	6	Control flap
3	Flap 3, left	7	Flap 3, right
4	Flap 4, left	8	Flap 4, right

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

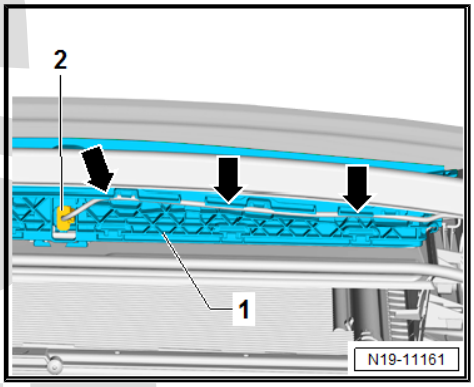
– Fit connecting piece -1- in correct installation position.
– Use the marking made beforehand or the connector contact -arrow- as a reference.
– Make sure that the connecting piece is properly seated on guide rollers.
– Insert flaps with radiator blind control motor - V544- into frame.
– Bolt on radiator blind control motor - V544- , and connect connector.



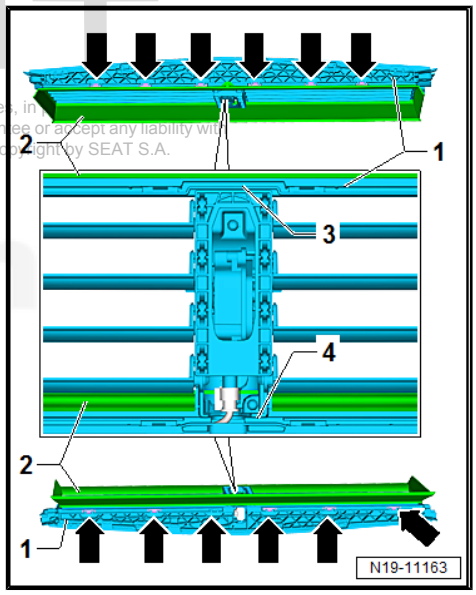
– Insert radiator blind control motor - V544- with flaps into frame -1-.
– Make sure that the flaps of radiator blind control motor - V544- are properly seated in mountings -arrows-.



– Connect the electric connector -2-.
– Clip in wiring harness -arrows-.



– Fit seal -2- to frame of radiator blind -1-.
– Note the position of installation on recesses -3- and -4-.
– Clip in seal -2-.
– After replacing radiator blind control motor - V544- , a basic setting must be performed.
– Use ⇒ Vehicle diagnostic tester.
– Erase event memory ⇒ Vehicle diagnostic tester.
– Connect vehicle diagnostic tester and follow path to basic setting.



Protected by copyright. Copying for private or commercial purposes, in
permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with
respect to the correctness of information in this document. Copyright by SEAT S.A.

`0001 - Engine electronics, functions`

`0001 - Basic setting`

`0001 - Radiator blind control motor adaption - V544`

21 – Turbocharging/supercharging

1 Turbocharger

⇒ “1.1 Assembly overview - turbocharger”, page 326

⇒ “1.2 Removing and installing turbocharger”, page 333

⇒ “1.3 Renewing vacuum unit for turbocharger”, page 355

⇒ “1.4 Removing and installing connection for turbocharger”, page 360

1.1 Assembly overview - turbocharger

⇒ “1.1.1 Assembly overview - turbocharger”, page 326

⇒ “1.1.2 Assembly overview - turbocharger, vehicles with water-cooled turbocharger”, page 328

⇒ “1.1.3 Assembly overview - turbocharger, vehicles with particulate filter or catalytic converter”, page 330

1.1.1 Assembly overview - turbocharger

1 - Banjo bolt
- ❑ 30 Nm

2 - Oil supply pipe
- ❑ Make sure it does not have any interruptions.
- ❑ Before installing, fill turbocharger with engine oil at oil supply line connection.

3 - Bolt
- ❑ 12 Nm

4 - Connection nut
- ❑ 22 Nm

5 - Exhaust gas temperature sender 1 - G235-
- ❑ Assembly overview ⇒ page 548
- ❑ Removing and installing ⇒ page 551

6 - Bolt
- ❑ Specified torque and sequence ⇒ page 503 .

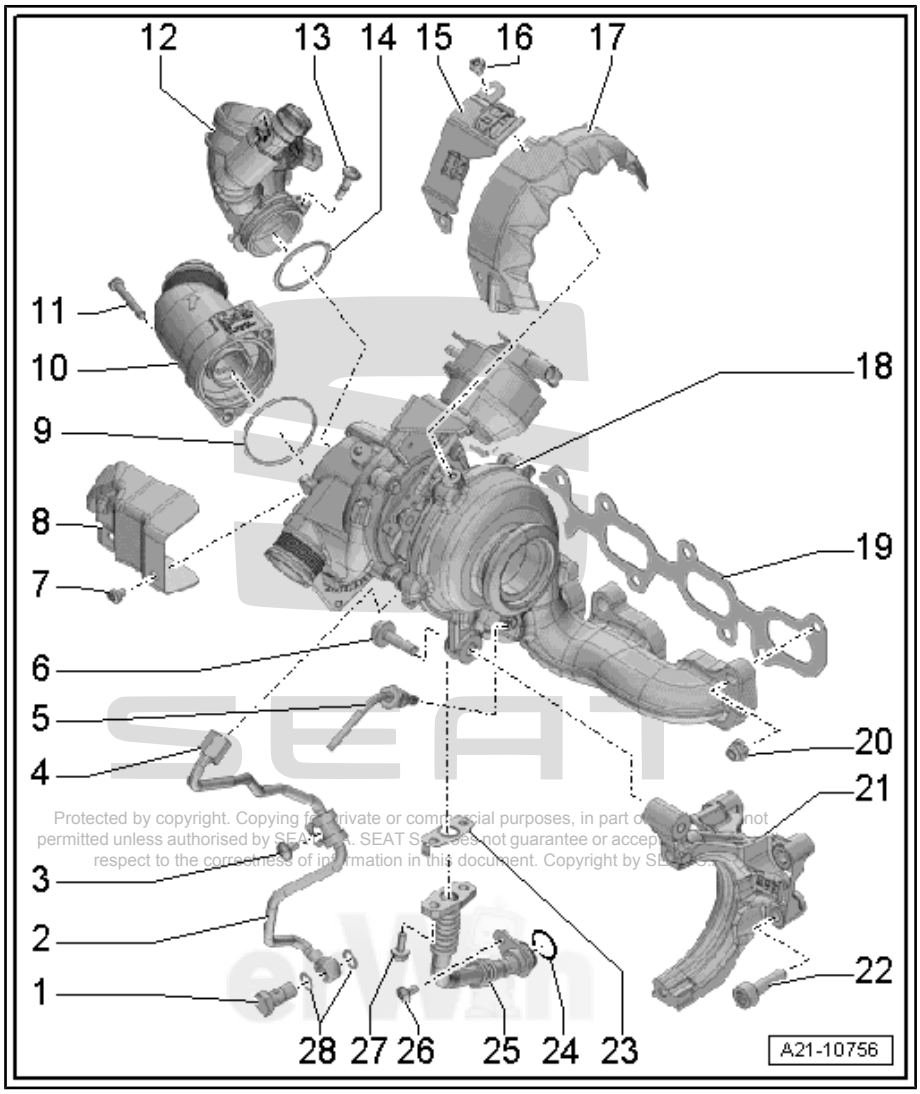
7 - Bolt
- ❑ 8 Nm

8 - Heat shield

9 - O-ring
- ❑ Renew after removal

10 - Pulsation damper

11 - Bolt
- ❑ 8 Nm



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

12 - Connection

13 - Bolt

- ❑ 8 Nm

14 - O-ring

- ❑ Renew after removal

15 - Support bracket

- ❑ For electrical wiring

16 - Bolt

- ❑ 8 Nm

17 - Heat shield

18 - Turbocharger

- ❑ Removing and installing ⇒ page 333

19 - Gasket

- ❑ Renew after removal

20 - Nut

- ❑ Renew after removal
- ❑ Specified torque and sequence ⇒ page 328 .
- ❑ Stud in cylinder head: 14 Nm

21 - Support bracket

- ❑ For emission control module

22 - Bolt

- ❑ Specified torque and sequence ⇒ page 503 .

23 - Gasket

- ❑ Renew after removal

24 - O-ring

- ❑ Renew after removal
- ❑ Lubricate lightly with engine oil

25 - Oil return line

26 - Bolt

- ❑ 10 Nm

27 - Ribbed bolt

- ❑ 14 Nm

28 - Seals

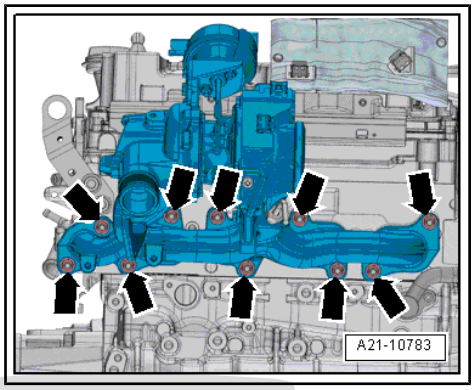
- ❑ Renew after removal

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Turbocharger - specified torque and tightening sequence

– Tighten bolts in stages in the sequence given:

Stage	Nuts	Specified torque
1st	-arrows-	Tighten to 11 Nm in diagonal sequence, working from centre outwards
2nd	-arrows-	Tighten to 22 Nm in diagonal sequence, working from centre outwards
3rd	-arrows-	Tighten to 22 Nm in diagonal sequence, working from centre outwards • This procedure has been specified in order to compensate for the settling of the components.



1.1.2 Assembly overview - turbocharger, vehicles with water-cooled turbocharger

1 - Bolt
- ❑ 8 Nm

2 - Heat shield

3 - Bolt
- ❑ 8 Nm

4 - Coolant pipe

5 - Gasket
- ❑ Renew after removal

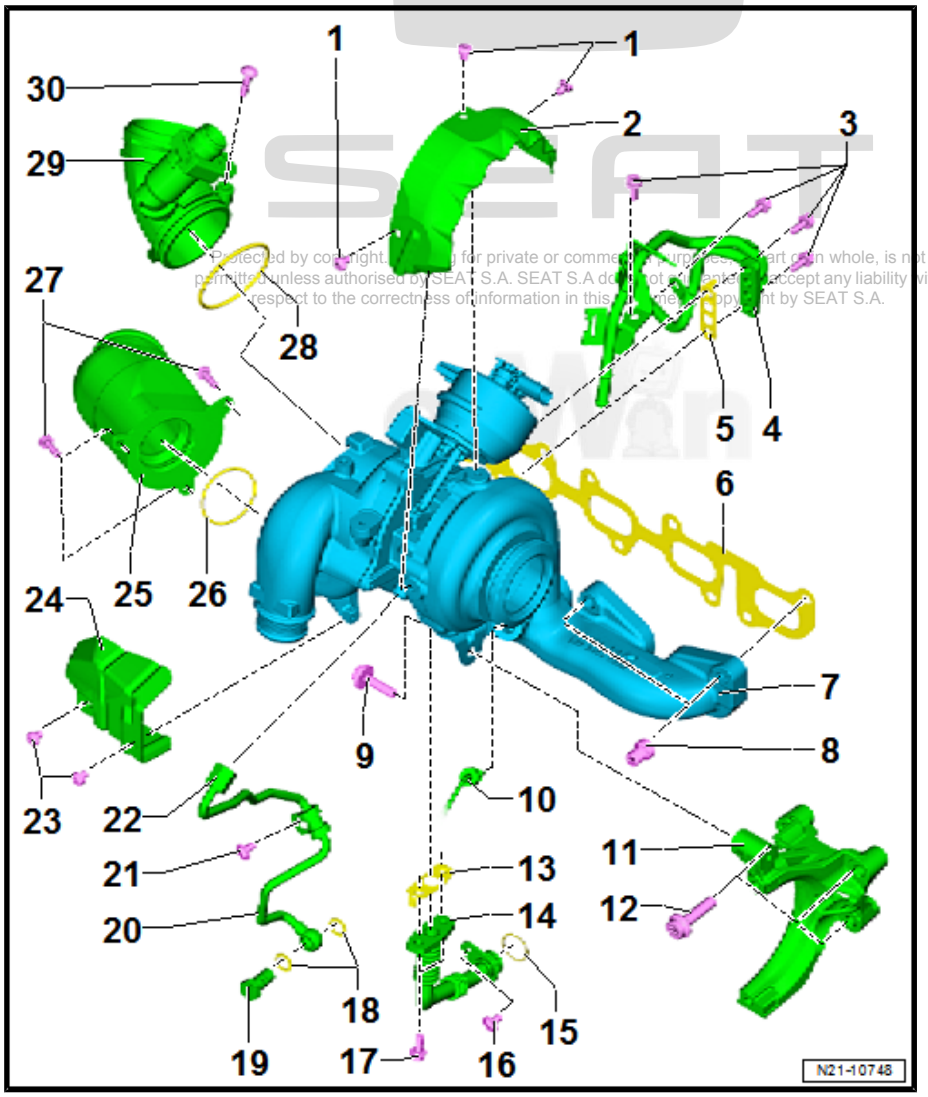
6 - Gasket
- ❑ Renew after removal

7 - Turbocharger
- ❑ Removing and installing ⇒ page 346
- ❑ Removing and installing vacuum unit ⇒ page 355

8 - Nut
- ❑ Renew after removal
- ❑ Specified torque and tightening sequence: ⇒ page 330
- ❑ Stud in cylinder head: 14 Nm

9 - Bolt
- ❑ Specified torque and tightening sequence: ⇒ page 330

10 - Exhaust gas temperature sender 1 - G235-
- ❑ Assembly overview ⇒ page 548
- ❑ Removing and installing ⇒ page 548
- ❑ 45 Nm



Protected by copyright. Copying for private or commercial purposes, part of it or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee and accepts no liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

11 - Bracket/bearing/support

- ❑ For emission control module

12 - Bolt

Specified torque and tightening sequence: ⇒ page 503

13 - Gasket

- ❑ Renew after removal

14 - Oil return line

15 - O-ring

- ❑ Renew after removal
- ❑ Lubricate lightly with engine oil

16 - Bolt

- ❑ 10 Nm

17 - Ribbed bolt

- ❑ 14 Nm

18 - Seals

- ❑ Renew after removal

19 - Banjo bolt

- ❑ 25 Nm

20 - Oil supply pipe

- ❑ Make sure it does not have any interruptions.
- ❑ Before installing, fill turbocharger with engine oil at oil supply line connection.

21 - Bolt

- ❑ 12 Nm

22 - Connection nut

- ❑ 22 Nm

23 - Bolt

- ❑ 8 Nm

24 - Heat shield

25 - Pulsation damper

26 - O-ring

- ❑ Renew after removal

27 - Bolt

- ❑ 8 Nm

28 - Radial oil seal

- ❑ Renew after removal

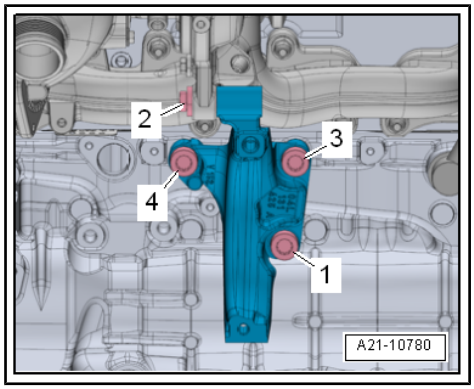
29 - Connection

30 - Bolt

- ❑ 8 Nm

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Bracket for emission control module - specified torques and tightening sequence

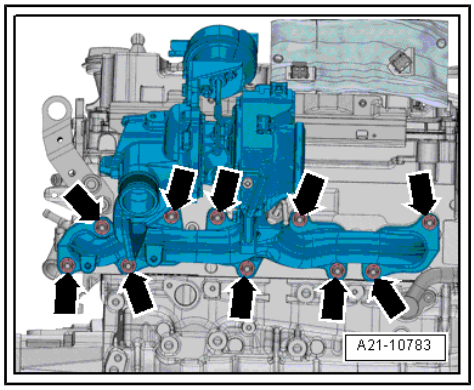


– Fit bracket in correct installation position.

– Tighten bolts in stages in the sequence given:

Stage	Bolts	Specified torque
1	-1, 2, 3, 4-	Screw in by hand as far as stop
2	-2-	20 Nm
3	-1-	40 Nm
4	-3, 4-	40 Nm

Turbocharger - specified torque and tightening sequence

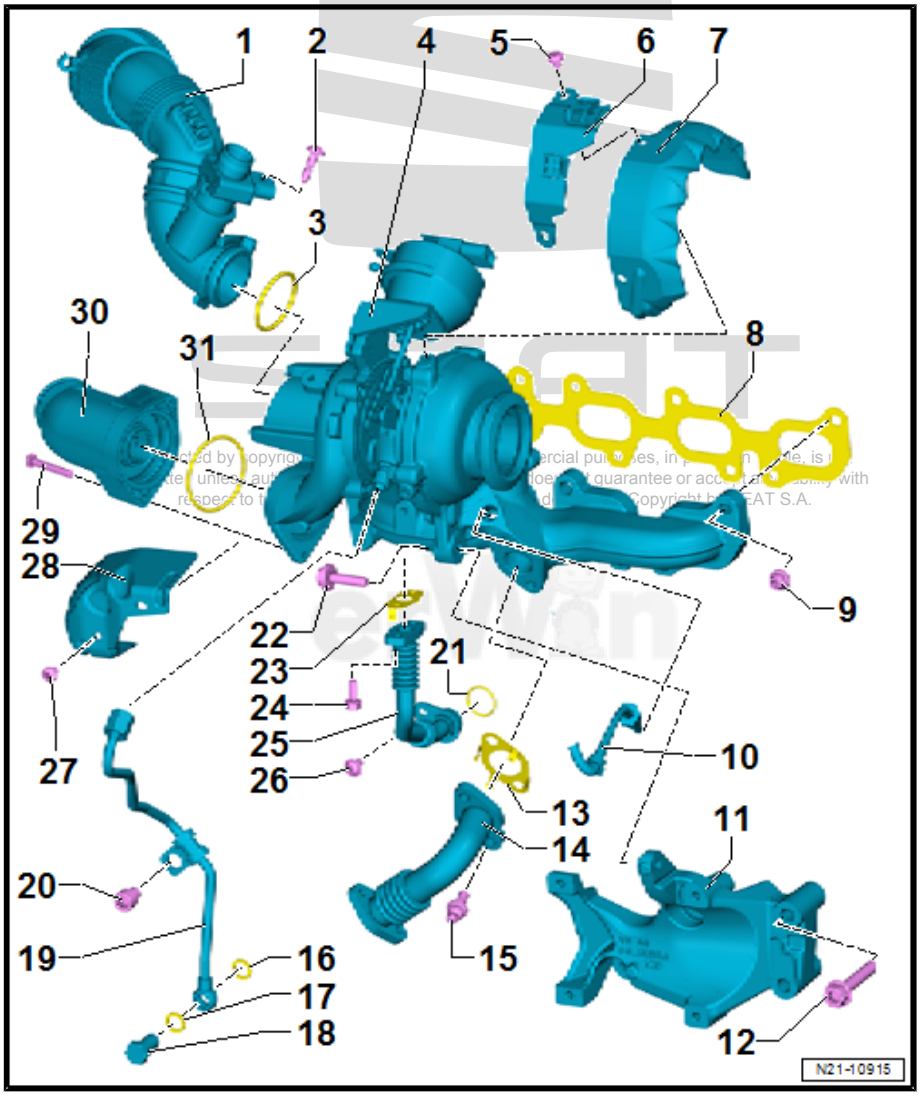


– Tighten bolts in stages in the sequence given:

Stage	Bolts	Specified torque
1	-arrows-	Tighten to 11 Nm in diagonal sequence, working from centre outwards
2	-arrows-	Tighten to 22 Nm in diagonal sequence, working from centre outwards
3	-arrows-	Tighten to 22 Nm in diagonal sequence, working from centre outwards • This procedure has been specified in order to compensate for the settling of the components.

1.1.3 Assembly overview - turbocharger, vehicles with particulate filter or catalytic converter

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



1 - Connection

- ❑ Removing and installing ⇒ page 360

2 - Bolt

- ❑ 8 Nm

3 - O-ring

- ❑ Renew after removal

4 - Turbocharger

- ❑ Removing and installing ⇒ page 333

5 - Bolt

- ❑ 8 Nm

6 - Support bracket

7 - Heat shield

8 - Gasket

- ❑ Renew after removal

9 - Nut

- ❑ Renew after removal
- ❑ Specified torque and sequence ⇒ page 332 .
- ❑ Stud in cylinder head: 14 Nm

10 - Exhaust gas temperature sender 1 - G235-

- ❑ Assembly overview ⇒ page 548
- ❑ Removing and installing ⇒ page 551

11 - Support bracket

- ❑ For exhaust gas recirculation cooler
- ❑ Specified torque and sequence ⇒ page 566 .

12 - Bolt

- ❑ Specified torque and sequence ⇒ page 566 .

13 - Gasket

- ❑ Renew after removal

14 - Connection pipe

- ❑ To exhaust gas recirculation cooler

15 - Nut

- ❑ Renew after removal
- ❑ 20 Nm

16 - Radial oil seal

- ❑ Renew after removal

17 - Radial oil seal

- ❑ Renew after removal

18 - Banjo bolt

- ❑ 25 Nm

19 - Oil supply pipe

- ❑ Make sure it does not have any interruptions.
- ❑ Before installing, fill turbocharger with engine oil at oil supply line connection.
- ❑ Union nut, 22 Nm

20 - Bolt

- ❑ 16 Nm

21 - O-ring

- ❑ Renew after removal
- ❑ Lubricate lightly with engine oil

22 - Bolt

- ❑ Specified torque and sequence ⇒ page 566 .

23 - Gasket

- ❑ Renew after removal

24 - Bolt

- ❑ 14 Nm

25 - Oil return line

26 - Bolt

- ❑ 10 Nm

27 - Bolt

- ❑ 8 Nm

28 - Heat shield

29 - Bolt

- ❑ 15 Nm

30 - Pulsation damper

31 - Radial oil seal

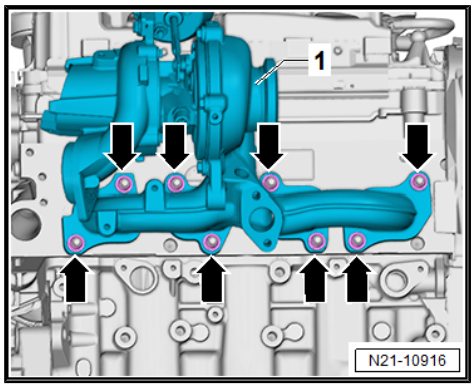
- ❑ Renew after removal

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with regard to the correctness of information in this document. Copyright by SEAT S.A.

Turbocharger - specified torque and tightening sequence

– Tighten bolts in stages in the sequence given:

Stage	Nuts	Specified torque
1st	-arrows-	Tighten to 11 Nm in diagonal sequence, working from centre outwards
2nd	-arrows-	Tighten to 22 Nm in diagonal sequence, working from centre outwards
3rd	-arrows-	Tighten to 22 Nm in diagonal sequence, working from centre outwards • This procedure has been specified in order to compensate for the settling of the components.



1.2 Removing and installing turbocharger

⇒ “1.2.1 Removing and installing turbocharger”, page 333

⇒ “1.2.2 Removing and installing turbocharger, vehicles with particulate filter or catalytic converter”, page 342

⇒ “1.2.3 Removing and installing turbocharger, water-cooled turbocharger”, page 346

1.2.1 Removing and installing turbocharger

NOTICE

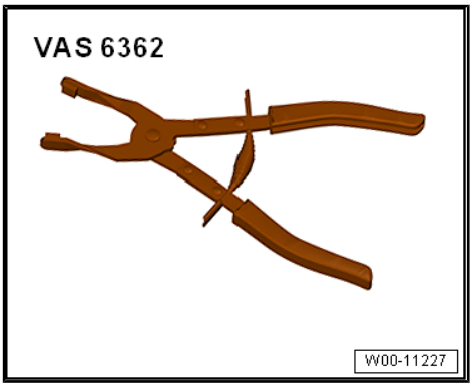
If the turbocharger has suffered mechanical damage (e.g. damaged compressor wheel), it is not sufficient merely to fit a new turbocharger. The following work must be performed in order to avoid further damage:

- **Check air cleaner housing, air filter element and air hoses for dirt and foreign particles.**
- **Check the whole charge air path and charge air cooler for foreign objects.**
- **If foreign objects are discovered in the charge air system, clean the charge air path and, if necessary, renew the charge air cooler.**

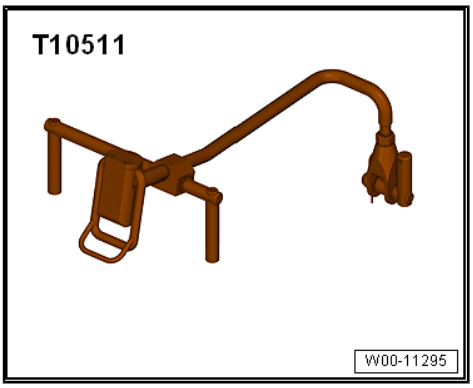
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Special tools and workshop equipment required

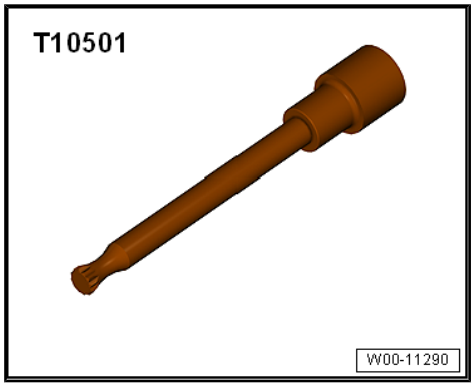
- Hose clip pliers - VAS 6362-



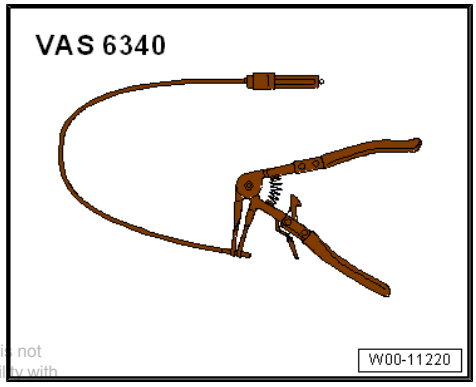
- Assembly tool - T10511-



- Socket insert XZN 10 - T10501-

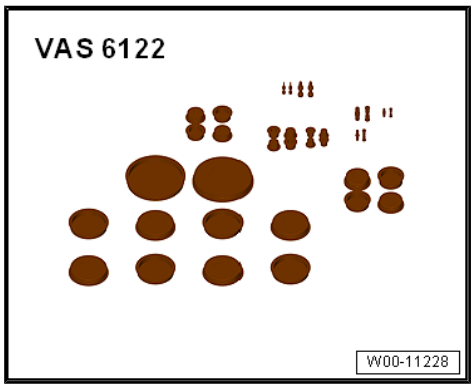


- Hose clip pliers - VAS 6340-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- Engine plug set - VAS 6122-



Removing

Note

Attach all heat-shielding sleeves in the same places when installing.

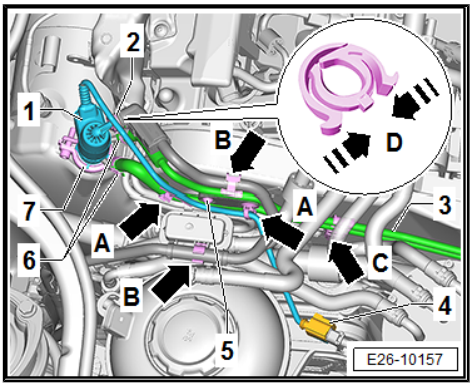
– Remove engine cover panel ⇒ page 56 .
– Drain coolant ⇒ page 211 .
– Remove front exhaust pipe ⇒ page 489 .
– Remove coolant pipes (left-side) ⇒ page 291 .
– Remove rear coolant pipe ⇒ page 293 .

Vehicles with SCR system

CAUTION

Safety risk due to escaping reducing agent.

- **To prevent large amounts of reducing agent from escaping when the metering line is opened, wait until the reducing agent has been drawn back automatically ⇒ page 3 .**



- Unclip the reducing agent line from the fastenings -arrows B-.
- Release and pull off the reducing agent line -2- by pressing together the securing clamps of the line in -the direction of the arrows D-.
- Pull back the supply line for reducing agent -2-
- Release and pull off the electrical connectors -4- from the reducing agent injector - N474- .
- Unclip the electrical connecting lead from the fastenings -arrows A-.
- Unclip the coolant lines -arrow C-.
- Unscrew bolt -5-.
- Loosen the clamp -7-.

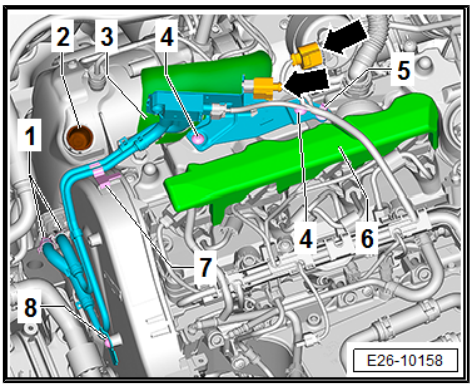
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Note

Item -6- can be disregarded.

- Remove injector for reducing agent - N474- from the emission control module with the connected hoses and place on the right side.

Continued for all vehicles



- Loosen and remove the wiring harness from the clip -5-.
- Open heat insulation sleeve -3-.
- Disconnect connectors -arrows-.
- Remove bolts -4- and -8-.
- Lay pipes -7- to one side and unclip from toothed belt guard.
- Release hose clips -1- and detach hoses.
- Remove hose lines with difference pressure sender - G505- .
- Move clear connectors and wires on plenum chamber bulkhead.
- Release and pull off connectors on plenum chamber bulkhead ⇒ page 387 . Detach cables from retainers, and place them above engine.

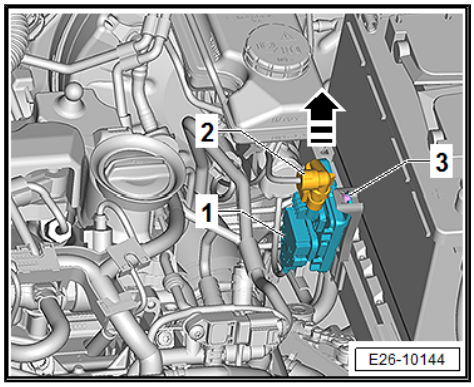
Vehicles with SCR system

– Disconnect connector -2- at NOx sender control unit - J583- .

– Release the latch -3- and pull out the control unit for the NOx sensor - J583- -1- out of its bracket in -the direction of the arrow-.

– Unclip wiring harness from brake fluid reservoir.

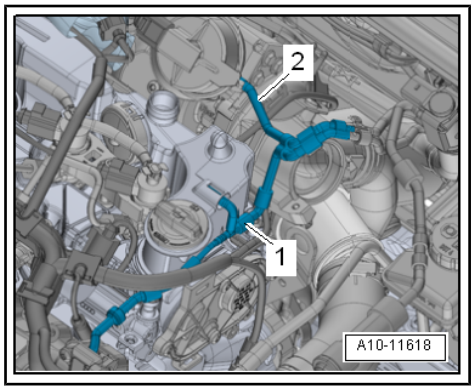
– Free the electrical connecting lead from the fastenings and lay to the right side.



Continued for all vehicles

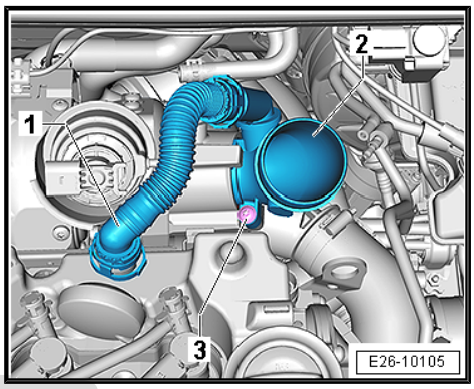
– Detach vacuum hose -2- from vacuum unit of turbocharger.

– Move clear electrical connectors and wires on turbocharger.

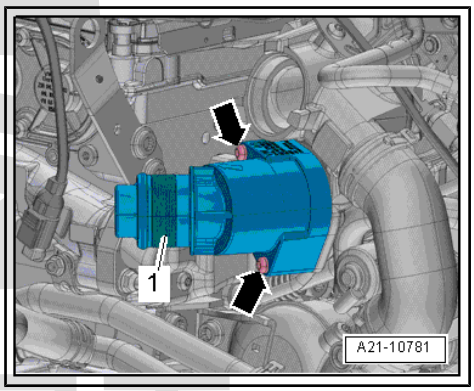


– Press release tabs on crankcase breather hose -1- and disconnect hose from cylinder head cover.

– Unscrew bolt -3-, swing air pipe with inlet connection -2- to rear and pull off from turbocharger.



– Unscrew bolts -arrows- and remove resonator -1-.

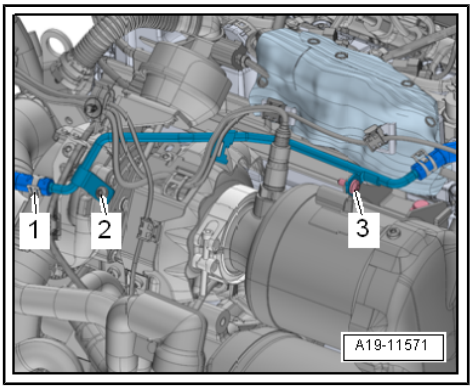


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Vehicles with water pipe above emission control module:

– Release hose clip -1- and detach coolant hose.

– Loosen bolt -2-, remove bolt -3- and pivot coolant pipe clear to one side.



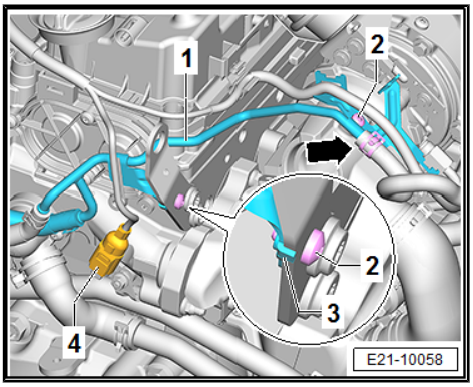
Continued for all vehicles

– Remove coolant pipe -1- on turbocharger and on engine.

– To do this, break the electrical plug connection -4- and free the electrical connecting lead from the fastenings.

– Bend up the clamp -arrow- and take the coolant hose out of the coolant pipe -1-.

– Unscrew the bolts -2- and take out the pipe.



Vehicles with auxiliary heater:

– Remove coolant lines from bulkhead ⇒ Auxiliary heater; Rep. gr. 82 ; Coolant circuit with auxiliary heater; Removing and installing coolant pipes for auxiliary heater .

Right-hand drive models

– Remove emission control module ⇒ page 506 .

Vehicles with all-wheel drive

– Remove exhaust gas recirculation cooler ⇒ page 567 .

Models with front-wheel drive

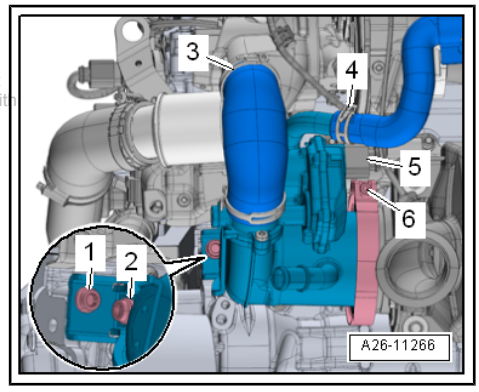
– Push heat insulation sleeve to one side and unplug electrical connector -5-.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Loosen the hose clip -3-, remove the air intake hose.

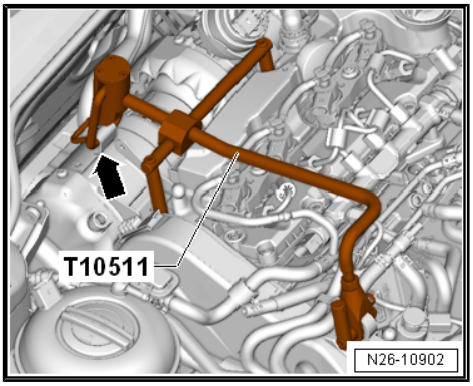
– Loosen the hose clip -4-, remove the coolant hose.

– Unscrew bolt -1- using bit XZN 10 - T10501- and loosen bolt -2-.



– Fit assembly tool - T10511- as shown.

– Attach retaining bracket -arrow- in lifting shackle of emission control module.



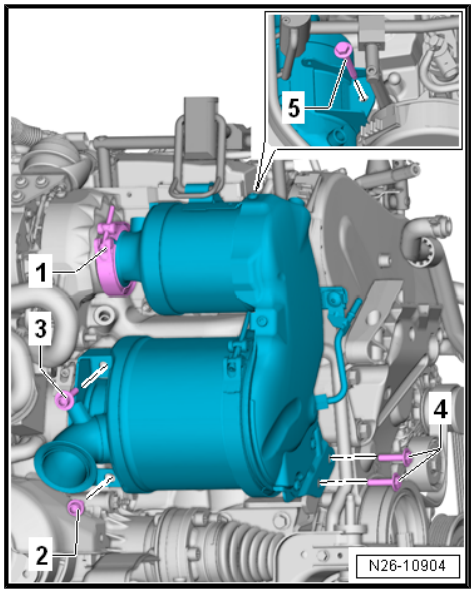
Continued for all vehicles

– Bend up and remove the clamp -1- of the emission control module.

– Unscrew bolt -5-.

Note

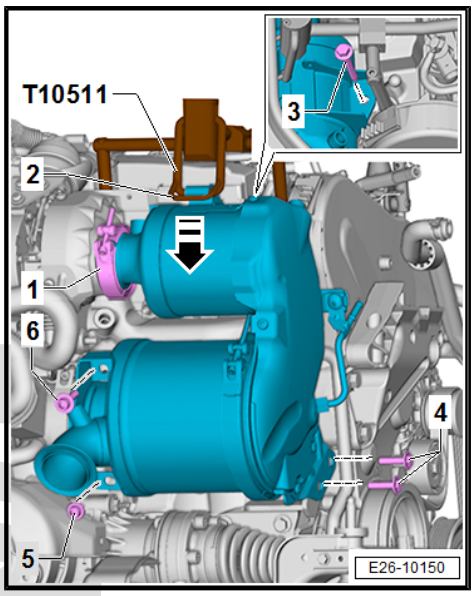
The feet of assembly tool - T10511- are supported on the bolt heads of the cylinder head cover.



– Unscrew bolts -4-.

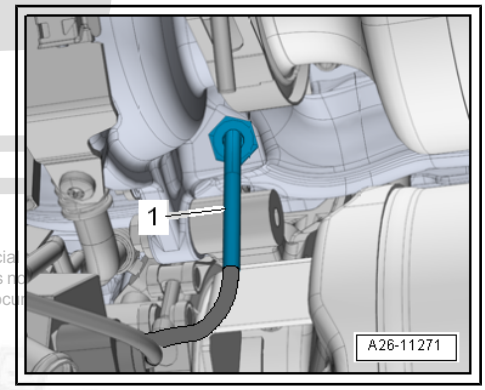
– Remove bolts -5, 6- using the XZN 10 - T10501- .

– Pull down mechanism -2- of assembly tool - T10511- in -direction of arrow- to release the retaining bracket of the transportation shackle of the emission control module.



– When removing the emission control module, bear the wire of the exhaust gas temperature sensor 1 - G235- -1- in mind.

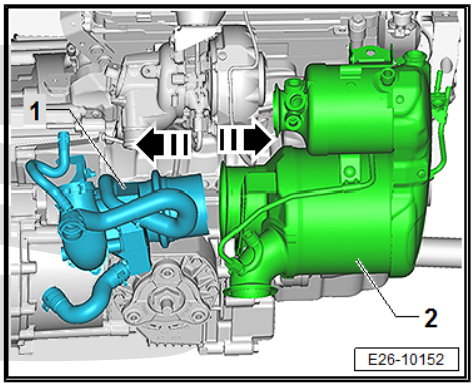
– Use suitable workshop equipment to protect it from being damaged.



Protected by copyright. Copying for private or commercia
permitted unless authorised by SEAT S.A. SEAT S.A does n
respect to the correctness of information in this docu

Models with front-wheel drive

– Press back exhaust gas circulation cooler -1-, separate from emission control module -2- in -direction of arrow- and set both of them aside so that there is no risk of damage.



Vehicles with all-wheel drive

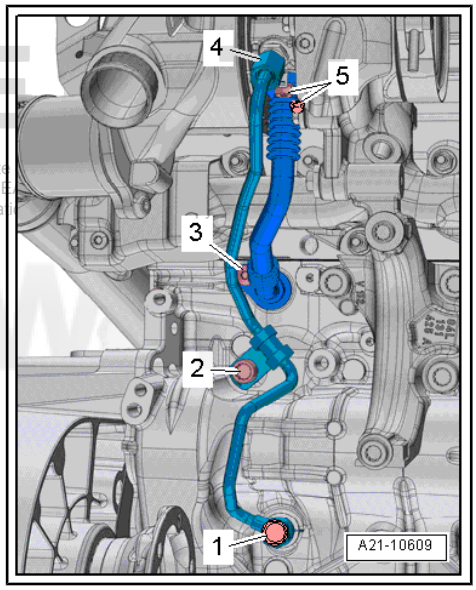
– Push emission control module towards rear.

Continued for all vehicles

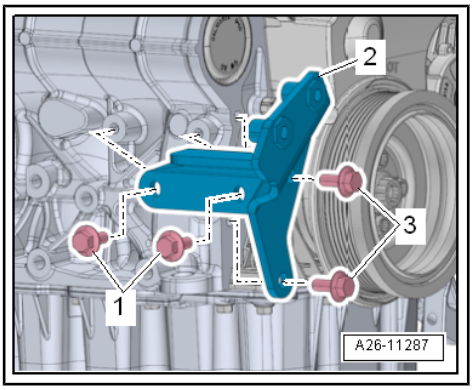
– Unscrew bolt -2- and union nut -4-.

– Unscrew bolts -3 and 5- and detach oil return line.

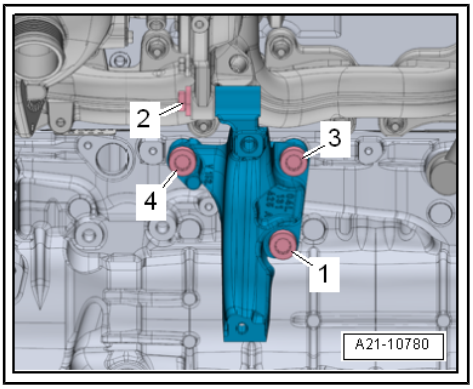
Protected by copyright. Copying for private
permitted unless authorised by SEAT S.A. SE
respect to the correctness of informa



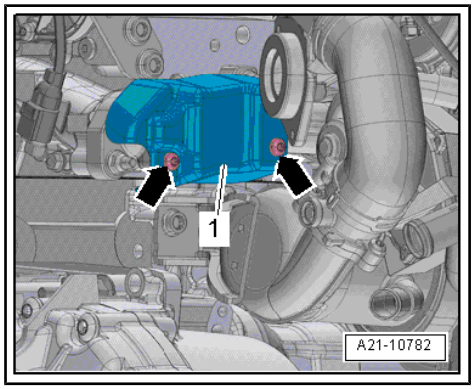
– Unscrew bolts -1, 3-; remove the bracket -2- for the exhaust cleaning module.



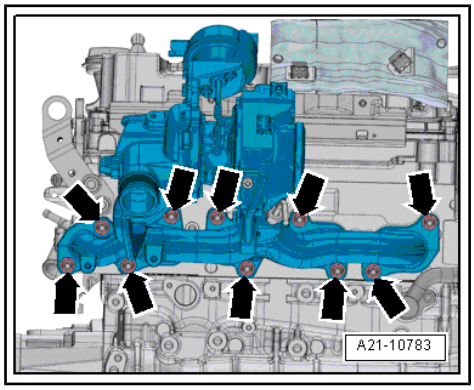
– Unscrew bolts -1 ...4-, remove diesel particle filter bracket.



– Remove bolts -arrows- and detach heat shield -1-.



– Unscrew nuts -arrows-, pull turbocharger with exhaust manifold off cylinder head and remove it upwards.



Installing

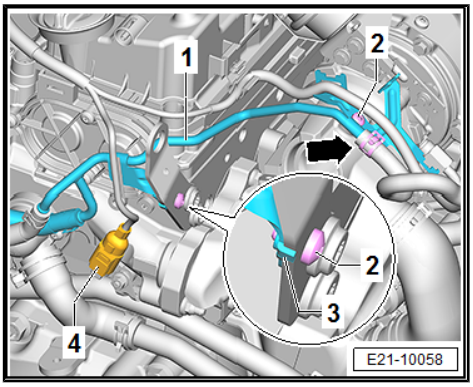
Install in reverse order of removal, observing the following.

Note

- *Replace gaskets, seals, O-rings and self-locking nuts after removal.*
- *Charge the turbocharger with engine oil using the connection sleeve of the oil supply pipe.*
- *Hose unions and air intake pipes/hoses must be free of oil and grease when installing.*
- *Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .*
- *After installing turbocharger, run engine for about 1 minute at idling speed to ensure that oil is supplied to turbocharger. Do not rev engine immediately.*

SEAT
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.
erWin

– When installing coolant pipe -1-, make sure that guide -3- is properly seated in bracket.
– Observe electrical connections and routing ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
– Install emission control module ⇒ page 506 .
– Install coolant pipes (left-side) ⇒ page 291 .
– Install coolant pipe (rear) ⇒ page 293 .
– Install front exhaust pipe ⇒ page 489 .
– Connect vacuum hose ⇒ page 390 .
– Install engine cover panel ⇒ page 56 .



Note

- *After new components have been installed (engine/short engine, cylinder head, camshaft housing or turbocharger), the oil pressure control must be set to max. pressure for approx. 1000 km if the function is available in the engine control unit. This will compensate for the increased friction during run-in of new components, and a better transport of wear-related particles is guaranteed. To do this, connect vehicle diagnostic tester, switch on ignition, and select the following menu options:*
- `0001 - Engine electronics`
- `0001 - Engine electronics, functions`
- `0001 - Adaptation`
- `Oil pressure for entry in the engine`

Note

Depending on the vehicle, the engine and the firmware version of the vehicle diagnostic and service information system , the specified path may vary slightly.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Specified torques

- ⇒ “1.1 Assembly overview - turbocharger”, page 326
- ⇒ Fig. ““Bracket for emission control module - specified torques and tightening sequence”“ , page 503
- ⇒ “2.1 Assembly overview - emission control”, page 500
- ⇒ “5.1 Assembly overview - exhaust gas recirculation”, page 562
- ⇒ “4.1 Assembly overview - exhaust gas temperature regulation”, page 548
- ⇒ “1.1 Assembly overview - silencers”, page 473
- ⇒ “3.1 Assembly overview - coolant pipes”, page 282
- ⇒ “2.1 Assembly overview - toothed belt cover”, page 123
- ⇒ “3.9 Assembly overview - injector for reducing agent N474 ”, page 540

- ⇒ “4.1 Assembly overview - air filter housing”, page 420
- ⇒ “5.1 Assembly overview - intake manifold”, page 424
- ⇒ “1.2 Assembly overview - cylinder head cover”, page 102

1.2.2 Removing and installing turbocharger, vehicles with particulate filter or catalytic converter

Depending on national emission thresholds an uncontrolled particle filter or catalytic converter is fitted with this engine.

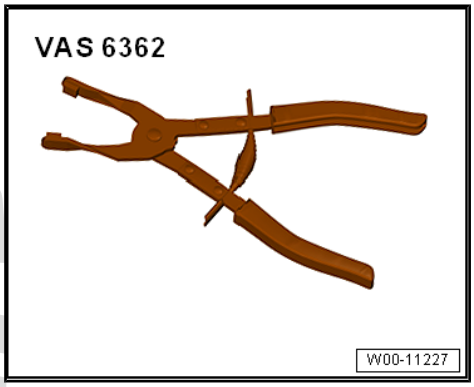
NOTICE

If the turbocharger has suffered mechanical damage (e.g. damaged compressor wheel), it is not sufficient merely to fit a new turbocharger. The following work must be performed in order to avoid further damage:

- **Check air cleaner housing, air filter element and air hoses for dirt and foreign particles.**
- **Check the whole charge air path and charge air cooler for foreign objects.**
- **If foreign objects are discovered in the charge air system, clean the charge air path and, if necessary, renew the charge air cooler.**

Special tools and workshop equipment required

- Hose clip pliers - VAS 6362-



- Socket insert XZN 10 - T10501-

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Removing

Note

Attach all heat-shielding sleeves in the same places when installing.

NOTICE

Avoid impairing function through contamination or soiling.

♦ ⇒ "3.1 Rules for cleanliness", page 17

– Remove engine cover panel ⇒ page 56 .

– Drain coolant ⇒ page 211 .

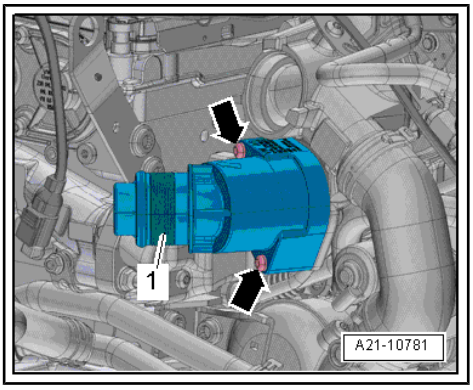
– Remove front exhaust pipe ⇒ page 489 .

– Remove rear coolant pipe ⇒ page 293 .

– On vehicles with auxiliary heater, remove coolant lines from plenum chamber bulkhead ⇒ Auxiliary heater; Rep. gr. 82 ; Coolant circuit with auxiliary/supplementary heaters; Removing and installing coolant pipes for auxiliary/supplementary heaters .

– Remove connecting piece on turbocharger ⇒ page 360 .

– Unscrew bolts -arrows- and remove resonator -1-.



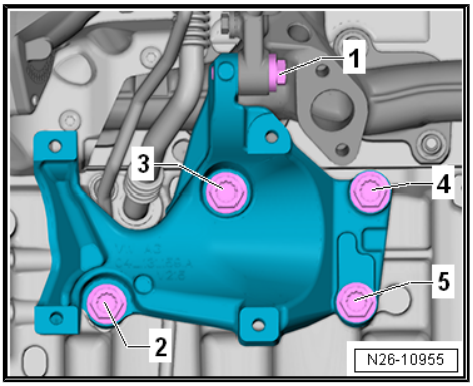
– Disconnect electrical plug-in connector of the exhaust gas temperature sender 1 - G235- .

– Remove catalytic converter or particulate filter ⇒ page 504 .

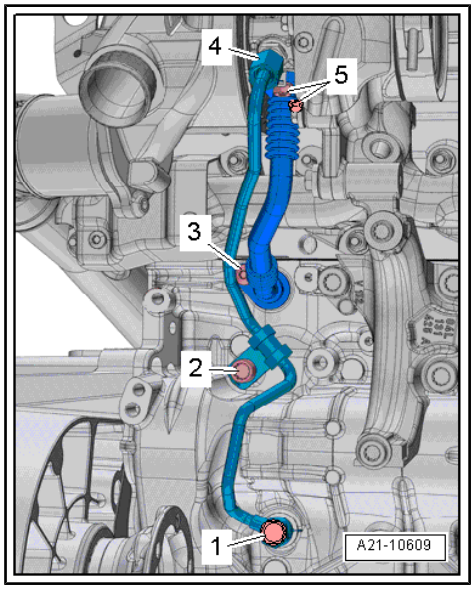
– Remove exhaust gas recirculation cooler ⇒ page 567 .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

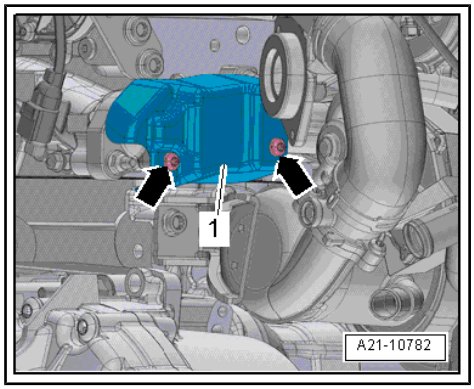
– Unscrew bolts -1 ... 5- and remove bracket for exhaust gas recirculation cooler.



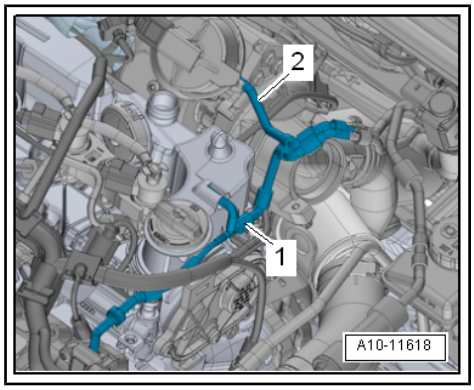
– Unscrew bolt -2- and union nut -4-.
– Unscrew bolts -3 and 5- and detach oil return line.



– Remove bolts -arrows- and detach heat shield -1-.

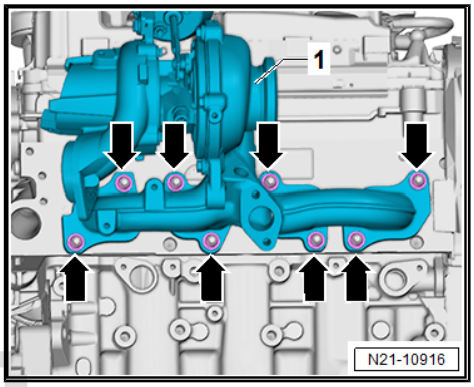


– Detach vacuum hose -2- from vacuum unit of turbocharger.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Unscrew nuts -arrows-, pull turbocharger with exhaust manifold off cylinder head and remove it upwards.



Installing

Installation is carried out in reverse order; noting the following:

Note

- *Replace gaskets, seals, O-rings and self-locking nuts after removal.*
- *Charge the turbocharger with engine oil using the connection sleeve of the oil supply pipe.*
- *Hose unions and air intake pipes/hoses must be free of oil and grease when installing.*
- *Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ Electronic parts catalogue .*
- *After installing turbocharger, run engine for about 1 minute at idling speed to ensure that oil is supplied to turbocharger. Do not rev engine immediately.*

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by the copyright owner. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Observe electrical connections and routing ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

– Install coolant pipe (rear) ⇒ page 293 .

– Install bracket for exhaust gas recirculation cooler ⇒ page 566 .

– Install exhaust gas recirculation cooler ⇒ page 567 .

– Install catalytic converter ⇒ page 504 .

– Install front exhaust pipe ⇒ page 489 .

– Connect vacuum hose ⇒ page 390 .

– Install engine cover panel ⇒ page 56 .

Note

- *After new components have been installed (engine/short engine, cylinder head, camshaft housing or turbocharger), the oil pressure control must be set to max. pressure for approx. 1000 km if the function is available in the engine control unit. This will compensate for the increased friction during run-in of new components, and a better transport of wear-related particles is guaranteed. To do this, connect vehicle diagnostic tester, switch on ignition, and select the following menu options:*
- `0001 - Engine electronics`
- `0001 - Engine electronics, functions`
- `0001 - Adaptation`
- `Oil pressure for entry in the engine`

Note

Depending on the vehicle, the engine and the firmware version of the vehicle diagnostic and service information system , the specified path may vary slightly.

Specified torques

- ⇒ “1.1 Assembly overview - turbocharger”, page 326
- ⇒ “2.1 Assembly overview - emission control”, page 500

1.2.3 Removing and installing turbocharger, water-cooled turbocharger

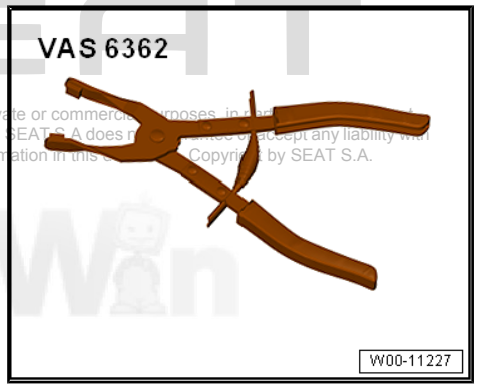
CAUTION

If the turbocharger has suffered mechanical damage (e.g. damaged compressor wheel), it is not sufficient merely to fit a new turbocharger. The following work must be performed in order to avoid further damage:

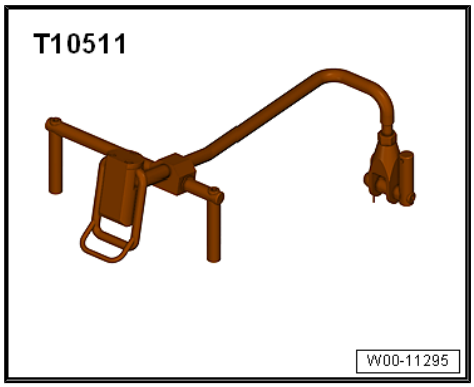
- **Check air cleaner housing, air filter element and air hoses for dirt and foreign particles.**
- **Check the whole charge air path and charge air cooler for foreign objects.**
- **If foreign objects are discovered in the charge air system, clean the charge air path and, if necessary, renew the charge air cooler.**

Special tools and workshop equipment required

- Hose clip pliers - VAS 6362-

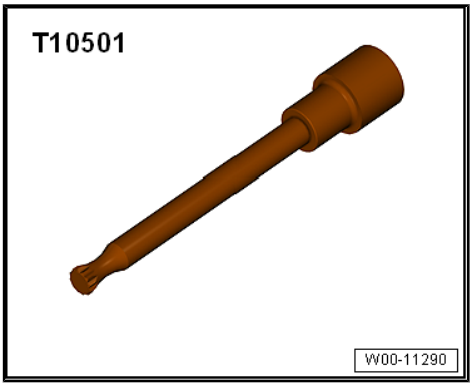


- Assembly tool - T10511-

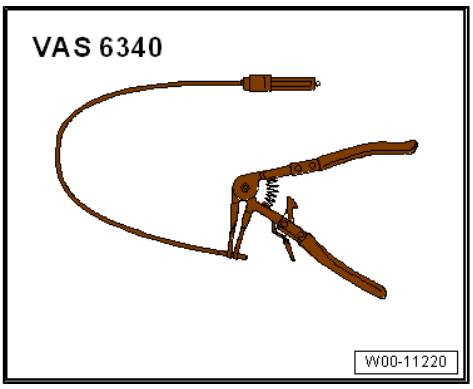


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

♦ Socket insert XZN 10 - T10501-



♦ Hose clip pliers - VAS 6340-

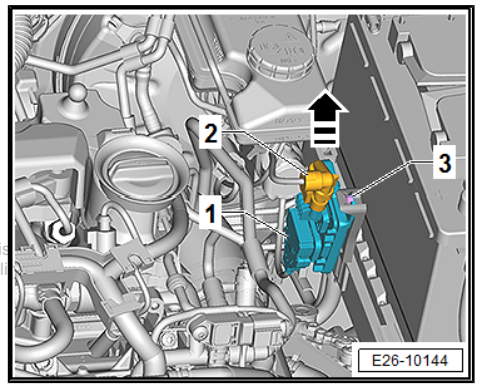


Removing

Note

Attach all heat-shielding sleeves in the same places when installing.

– Remove engine cover panel ⇒ page 56 .
– For reasons of space, remove the air filter housing together with the intake hose ⇒ page 422 .
– Disconnect connector -2- at NOx sender control unit - J583- .
– Release the latch -3- and pull out the control unit for the NOx sensor - J583- -1- out of its bracket in -the direction of the arrow-.



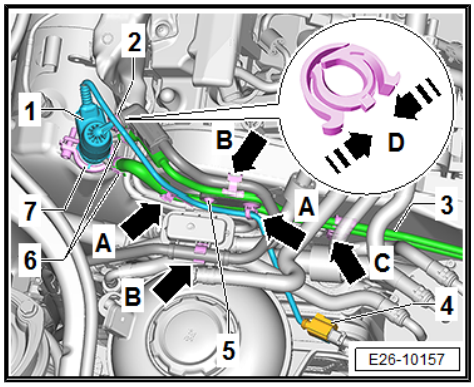
– Unclip wiring harness from brake fluid reservoir.
– Free the electrical connecting lead from the fastenings and lay to the right side.
– Remove battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray .
– Drain coolant ⇒ page 211 .
– Remove front exhaust pipe ⇒ page 489 .
– Remove rear coolant pipe ⇒ page 293 .

Vehicles with auxiliary heater

– On vehicles with auxiliary heater, remove coolant lines from plenum chamber bulkhead ⇒ Auxiliary heater; Rep. gr. 82 ; Coolant circuit with auxiliary/supplementary heaters; Removing and installing coolant pipes for auxiliary/supplementary heaters .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Continued for all vehicles



– Remove coolant pipes (left-side) ⇒ page 291 .

– Unclip the reducing agent line from the fastenings -arrows B-.

CAUTION

Safety risk due to escaping reducing agent.

- **To prevent large amounts of reducing agent from escaping when the metering line is opened, wait until the reducing agent has been drawn back automatically ⇒ page 3 .**

– Release and pull off the reducing agent line -2- by pressing together the securing clamps of the line in -the direction of the arrows D-.

– Pull back the supply line for reducing agent -2-

– Release and pull off the electrical connectors -4- from the reducing agent injector - N474- .

– Unclip the electrical connecting lead from the fastenings -arrows A-.

– Unclip the coolant lines -arrow C-.

– Unscrew bolt -5-.

– Loosen the clamp -7-.

Note

Item -6- can be disregarded.

– Remove injector for reducing agent - N474- from the emission control module with the connected hoses and place on the right side.

– Close off all open lines and connections with clean stoppers from the stopper set for engine - VAS 6122- -2-.

– Loosen and remove the wiring harness from the clip -5-.

– Open heat insulation sleeve -3-.

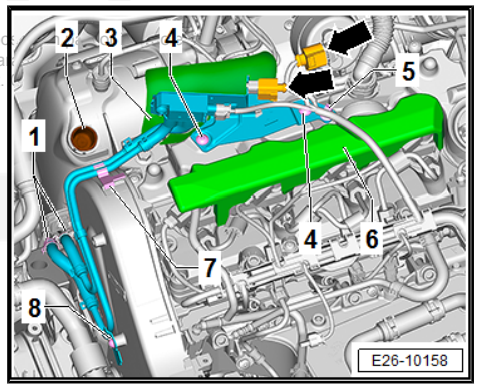
– Disconnect connectors -arrows-.

– Remove bolts -4- and -8-.

– Lay pipes -7- to one side and unclip from toothed belt guard.

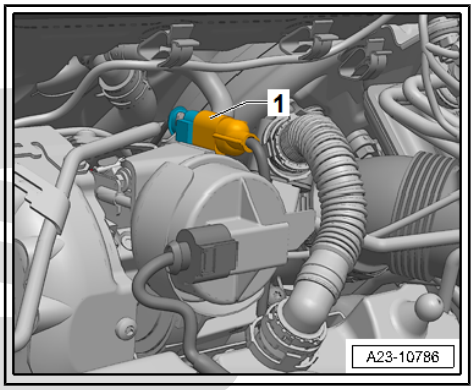
– Release hose clips -1- and detach hoses.

– Remove hose lines with difference pressure sender - G505- .

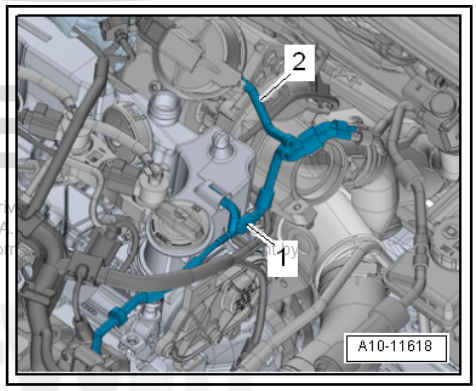


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document.

– Take the electrical connector of exhaust gas temperature sender 1 - G235- -1- from the bracket.
– Release and pull off connector.
– Lay bare wiring harness.
– Move clear connectors and wires on plenum chamber bulkhead.
– Release and pull off connectors on plenum chamber bulkhead ⇒ page 387 .

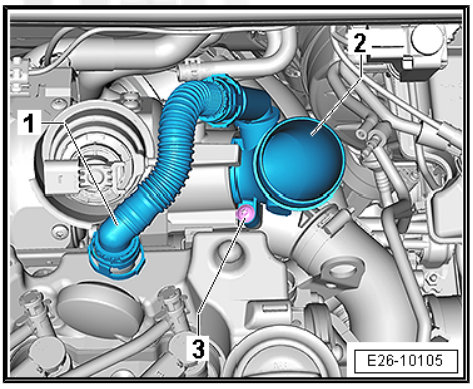


– Detach vacuum hose -2- from vacuum unit of turbocharger.

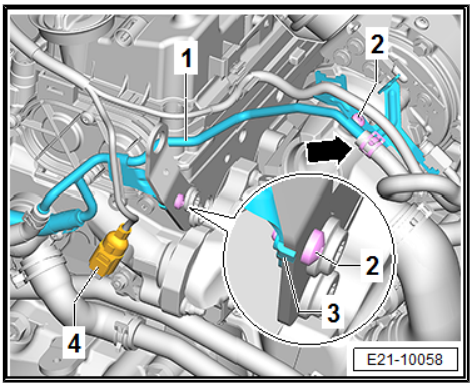


Protected by copyright. Copying for pri
permitted unless authorised by SEAT S.A
respect to the correctness of infor

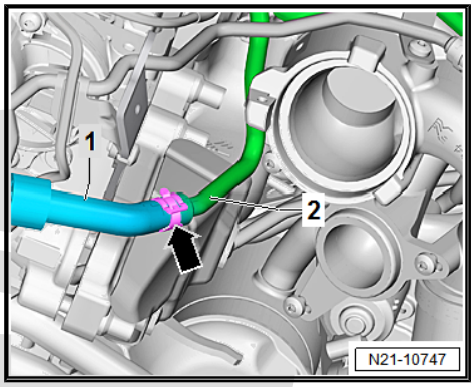
– Press release tabs on crankcase breather hose -1- and disconnect hose from cylinder head cover.
– Unscrew bolt -3-, swing air pipe with inlet connection -2- to rear and pull off from turbocharger.



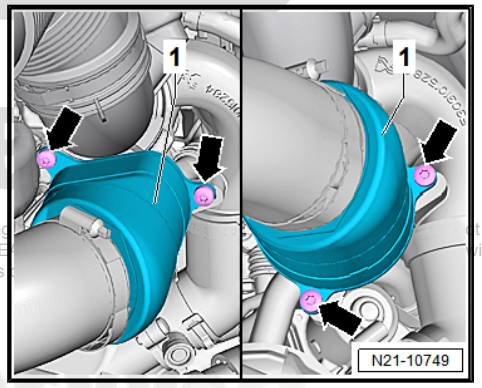
– Remove coolant pipe -1- on turbocharger and on engine.
– To do this, break the electrical plug connection -4- and free the electrical connecting lead from the fastenings.
– Bend up the clamp -arrow- and take the coolant hose out of the coolant pipe -1-.
– Unscrew the bolts -2- and take out the pipe.



– Open clamp -arrow-, and pull coolant hose -1- off coolant pipe -2-.

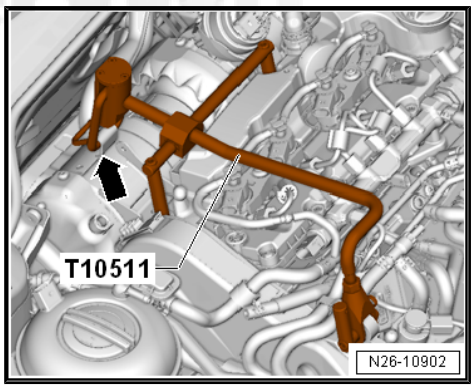


– Remove bolts -arrows- for turbocharger.
– Take off pulsation damper -1-.

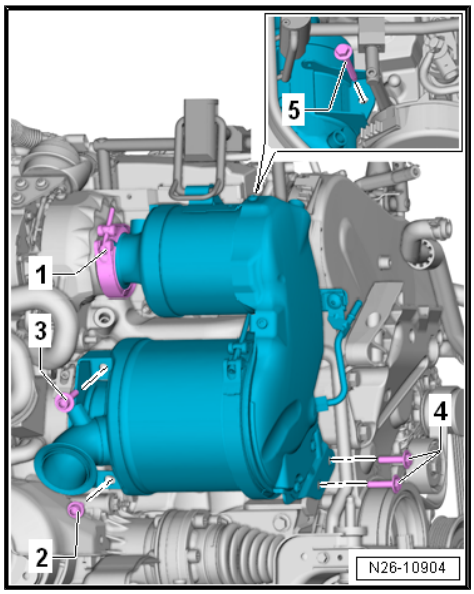


Protected by copyright. Copying
permitted unless authorised by SE
respect to the correctness

– Fit assembly tool - T10511- as shown.
– Attach retaining bracket -arrow- in lifting shackle of emission control module.



– Bend up and remove the clamp -1- of the emission control module.
– Unscrew bolt -5-.



Note

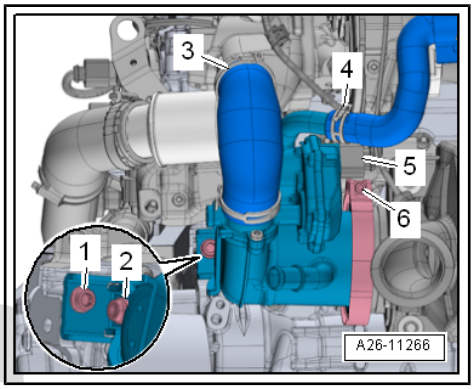
The feet of assembly tool - T10511- are supported on the bolt heads of the cylinder head cover.

Vehicles with all-wheel drive

– Remove exhaust gas recirculation cooler ⇒ page 567 .

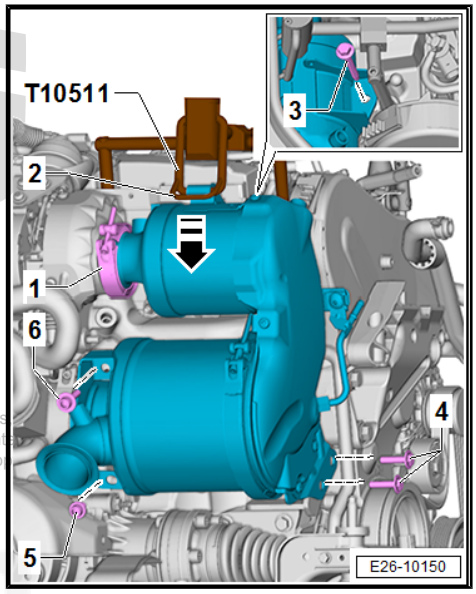
Models with front-wheel drive

- Push heat insulation sleeve to one side and unplug electrical connector -5-.
- Loosen the hose clip -3-, remove the air intake hose.
- Loosen the hose clip -4-, remove the coolant hose.
- Unscrew bolt -1- using bit XZN 10 - T10501- and loosen bolt -2-.



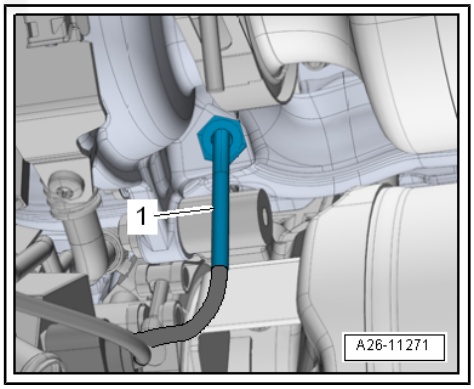
Continued for all vehicles

- Unscrew bolts -4-.
- Remove bolts -5, 6- using the XZN 10 - T10501- .
- Pull down mechanism -2- of assembly tool - T10511- in -direction of arrow- to release the retaining bracket of the transportation shackle of the emission control module.



Protected by copyright. Copying for private or commercial purposes permitted unless authorised by SEAT S.A. SEAT S.A does not guarant respect to the correctness of information in this document. Co

- When removing the emission control module, bear the wire of the exhaust gas temperature sensor 1 - G235- -1- in mind.
- Use suitable workshop equipment to protect it from being damaged.

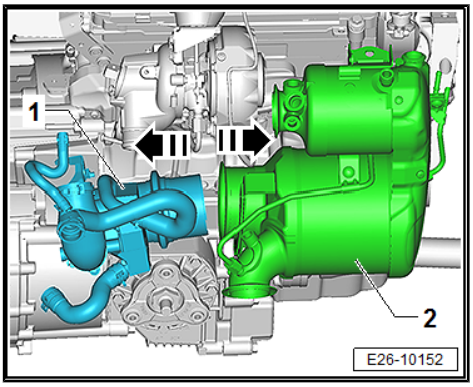


Models with front-wheel drive

- Press back exhaust gas circulation cooler -1-, separate from emission control module -2- in -direction of arrow- and set both of them aside so that there is no risk of damage.

Vehicles with all-wheel drive

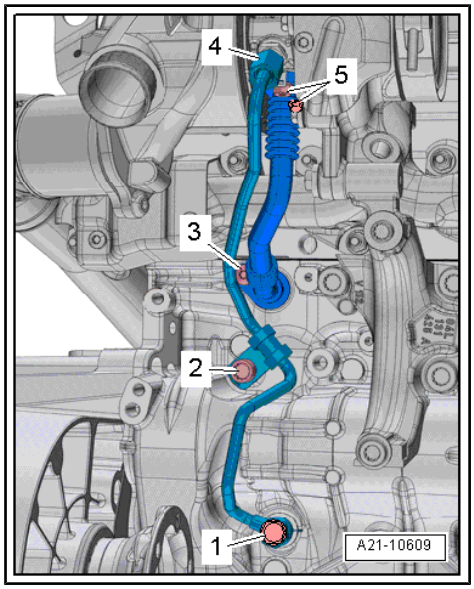
- Press the exhaust gas purification model backwards. Take care not to damage it.



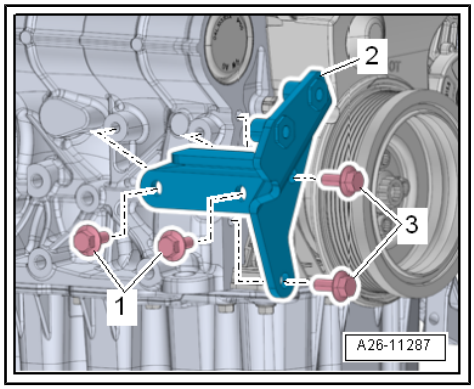
Continued for all vehicles

– Unscrew bolt -2- and union nut -4-.

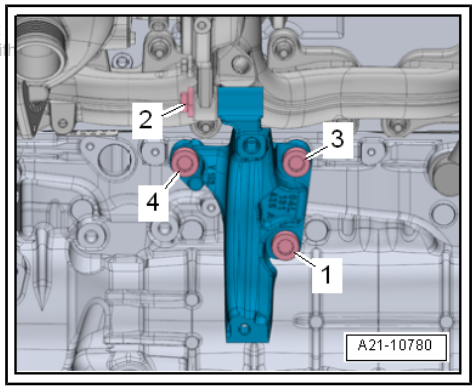
– Unscrew bolts -3 and 5- and detach oil return line.



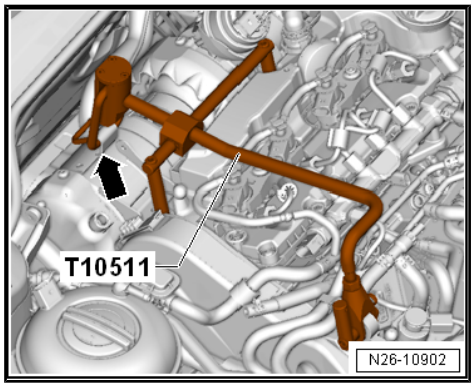
– Unscrew bolts -1, 3-; remove the bracket -2- for the exhaust cleaning module.



– Unscrew bolts -1 ...4-, remove diesel particle filter bracket.

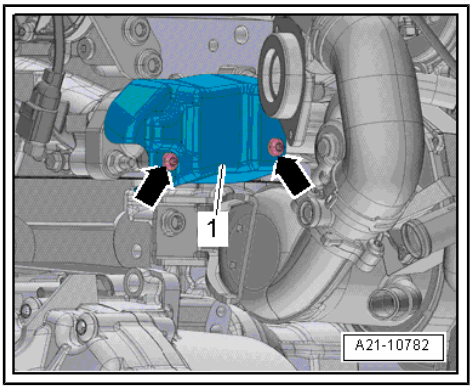


– Remove assembly tool - T10511- .

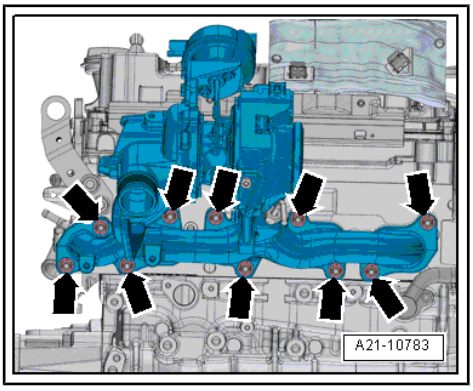


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Remove bolts -arrows- and detach heat shield -1-.



– Unscrew nuts -arrows-, pull turbocharger with exhaust manifold off cylinder head and remove it upwards.



Installing

Install in reverse order of removal, observing the following.

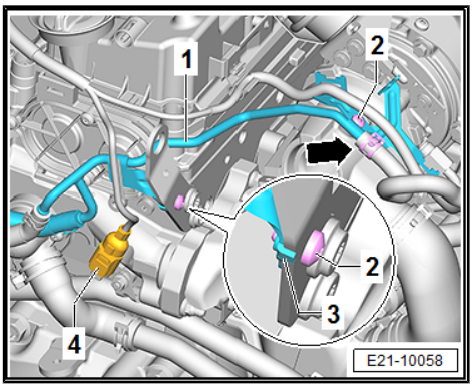
Note

- *Replace gaskets, seals, O-rings and self-locking nuts after removal.*
- *Charge the turbocharger with engine oil using the connection sleeve of the oil supply pipe.*
- *Hose unions and air intake pipes/hoses must be free of oil and grease when installing.*
- *Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .*
- *After installing turbocharger, run engine for about 1 minute at idling speed to ensure that oil is supplied to turbocharger. Do not rev engine immediately.*

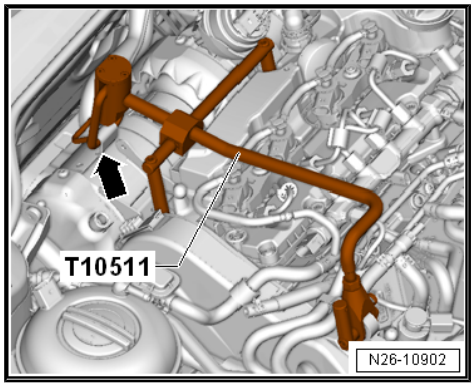
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– When installing coolant pipe -1-, make sure that guide -3- is properly seated in bracket.

– Observe electrical connections and routing ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.



– Fit assembly tool - T10511- as shown.
– Attach retaining bracket -arrow- in lifting shackle of emission control module.
– Install emission control module ⇒ page 506 .
– Install coolant pipes (left-side) ⇒ page 291 .
– Install coolant pipe (rear) ⇒ page 293 .
– Install front exhaust pipe ⇒ page 489 .
– Connect vacuum hose ⇒ page 390 .
– Install engine cover panel ⇒ page 56 .



Note

After new components have been installed (engine/short engine, cylinder head, camshaft housing or turbocharger) the oil pressure control must be set to max. pressure for approx. 1,000 km. This will compensate for the increased friction during run-in of new components, and a better transport of wear-related particles is guaranteed. To do this, connect vehicle diagnostic and service information system , switch on ignition and select the following menu item: `Oil pressure for entry in the engine`.

Note

Depending on the vehicle, the engine and the firmware version of the vehicle diagnostic and service information system , the specified path may vary slightly.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Specified torques

- ⇒ “1.1 Assembly overview - turbocharger”, page 326
- ⇒ Fig. ““Bracket for emission control module - specified torques and tightening sequence”“ , page 503
- ⇒ “2.1 Assembly overview - emission control”, page 500
- ⇒ “5.1 Assembly overview - exhaust gas recirculation”, page 562
- ⇒ “4.1 Assembly overview - exhaust gas temperature regulation”, page 548
- ⇒ “1.1 Assembly overview - silencers”, page 473
- ⇒ “3.1 Assembly overview - coolant pipes”, page 282
- ⇒ “2.1 Assembly overview - toothed belt cover”, page 123
- ⇒ “3.9 Assembly overview - injector for reducing agent N474 ”, page 540
- ⇒ “4.1 Assembly overview - air filter housing”, page 420
- ⇒ “5.1 Assembly overview - intake manifold”, page 424
- ⇒ “1.2 Assembly overview - cylinder head cover”, page 102

1.3 Renewing vacuum unit for turbocharger

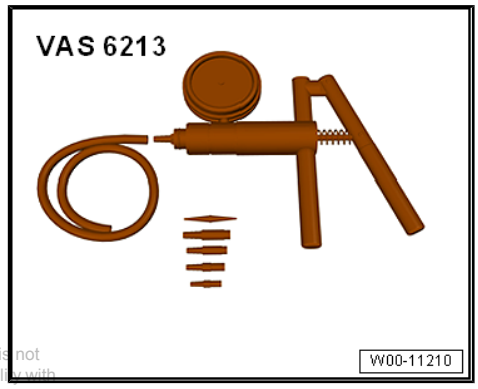
⇒ "1.3.1 Renewing vacuum unit for turbocharger, versions 1 and 2", page 355

⇒ "1.3.2 Renewing vacuum unit for turbocharger, version 3", page 359

1.3.1 Renewing vacuum unit for turbocharger, versions 1 and 2

Special tools and workshop equipment required

- Hand vacuum pump - VAS 6213-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- Vehicle diagnosis tester

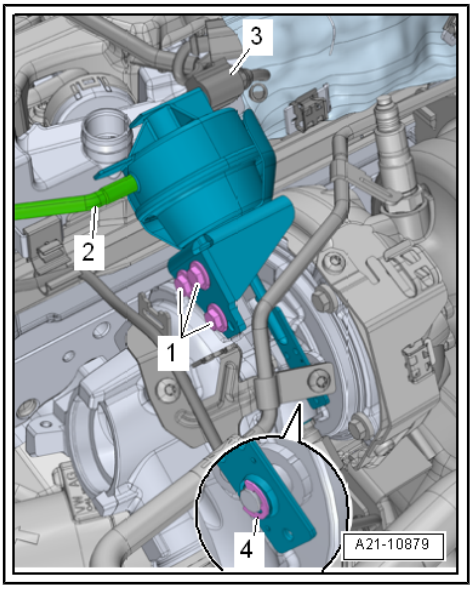
Removing

– Remove engine cover panel ⇒ page 56 .

Variant 1:

– Disconnect electrical connector -3- at position sender for charge pressure positioner - G581- .

– Detach vacuum hose -2- from vacuum unit of turbocharger.



Note

When removing and installing the circlip, do not apply too much force on the lever linkage. The turbocharger may be damaged when the circlip is pushed down, e.g using a large screwdriver.

– Remove circlip -4-.

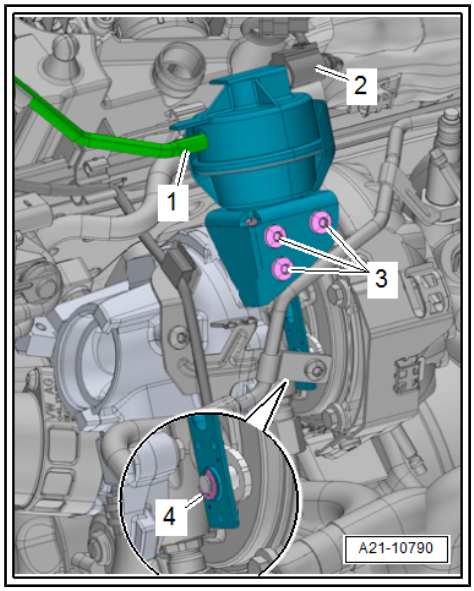
– Remove bolts -1- for vacuum unit.

– Disengage control rod at adjusting lever and detach vacuum unit with position sender for charge pressure positioner - G581- .

Variant 2:

– Disconnect electrical connector -2- at position sender for charge pressure positioner - G581- .

– Detach vacuum hose -1- from vacuum unit of turbocharger.



Note

When removing and installing the circlip, do not apply too much force on the lever linkage. The turbocharger may be damaged when the circlip is pushed down, e.g using a large screwdriver.

– Remove circlip -4-.

– Remove bolts -3- for vacuum unit.

– Disengage control rod at adjusting lever and detach vacuum unit with position sender for charge pressure positioner - G581- .

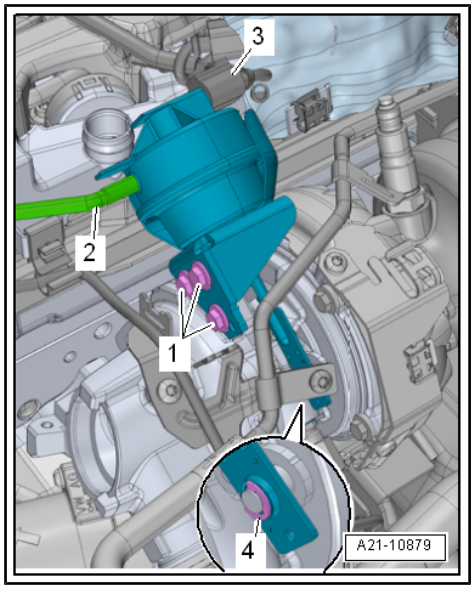
Installing

– Use new bolts and a new circlip from the repair kit.

Variant 1:

– Attach control rod to adjusting lever.

– Fit vacuum unit, and screw in bolts -1- to stop by hand.



Note

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

When removing and installing the circlip, do not apply too much force on the lever linkage. The turbocharger may be damaged when the circlip is pushed down, e.g using a large screwdriver.

– Install circlip -4-.

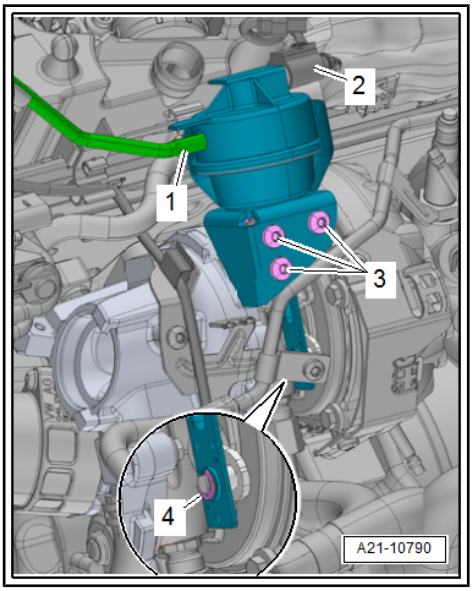
– Disconnect electrical connector -3- at position sender for charge pressure positioner - G581- .

– Tighten the bolts -1- to 10 Nm.

Variant 2:

– Attach control rod to adjusting lever.

– Fit vacuum unit, and screw in bolts -3- to stop by hand.



Note

When removing and installing the circlip, do not apply too much force on the lever linkage. The turbocharger may be damaged when the circlip is pushed down, e.g using a large screwdriver.

– Install circlip -4-.

– Disconnect electrical connector -2- at position sender for charge pressure positioner - G581- .

– Tighten the bolts -3- to 10 Nm.

Continued for all versions:

– Connect vehicle diagnostic tester.

– Start engine, and clear event memory ⇒ Vehicle diagnostic tester.

– Carry out basic setting of vacuum unit.

– Follow the path below to perform basic setting:

`Self-diagnosis-capable systems`

`0001 - Engine electronics, functions`

`0001 - Basic setting`

`Adaptation of turbocharger`

Specified torque

Bolts	Specified torque
Bolts -1, 3-	10 Nm

Adjust control rod for vacuum unit:

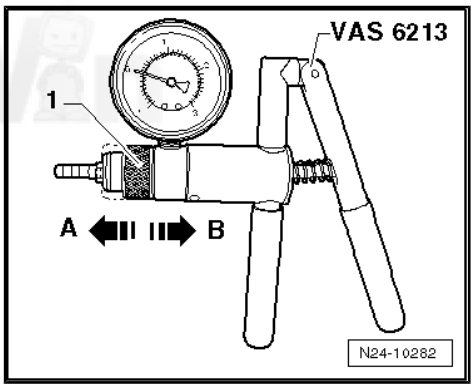
– To do this, measure the raw voltage.

– Use ⇒ Vehicle diagnostic tester.

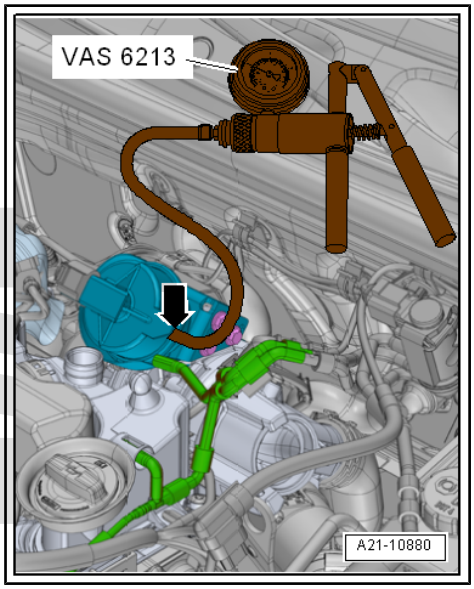
– Read voltage value in `self-diagnosis`.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Move slide ring -1- on hand vacuum pump - VAS 6213- to position -A- for “vacuum”.



– Connect hand vacuum pump - VAS 6213- to vacuum unit -arrow-.



NOTICE

Risk of damage to vacuum unit on account of excessive vacuum.

♦ **The negative pressure must never exceed 800 mbar.**

Adjusting voltage value

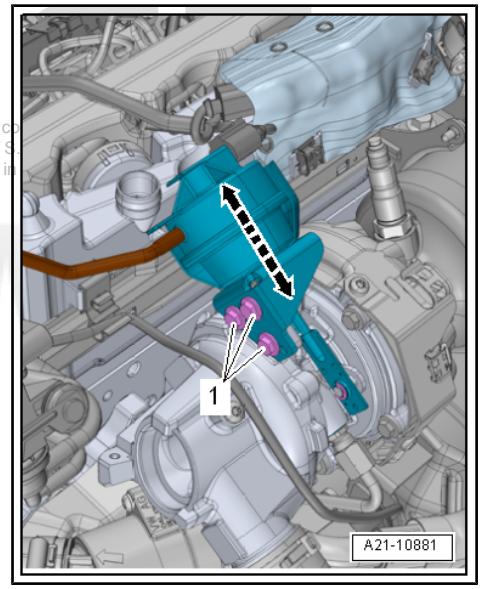
– Operate hand vacuum pump - VAS 6213- until a negative pressure of -650 to -700 mbar is indicated on pressure gauge.

Variant 1:

– Move vacuum unit in -direction of arrow-, until a voltage value ⇒ Vehicle diagnostic tester of 0.75 ± 0.02 Volt is indicated on the.

– Tighten the bolts -1- to 10 Nm.

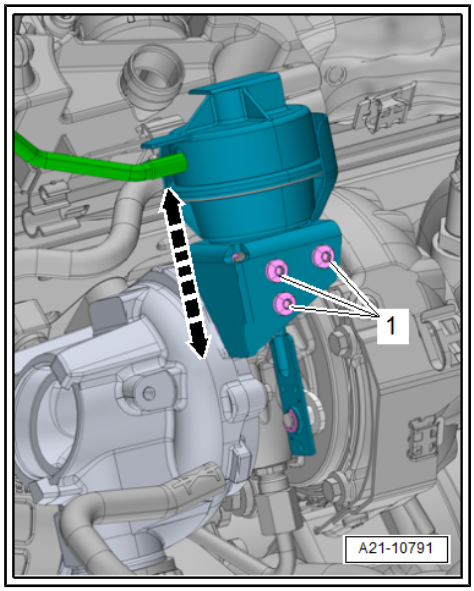
Protected by copyright. Copying for private or co
permitted unless authorised by SEAT S.A. SEAT S
respect to the correctness of information in



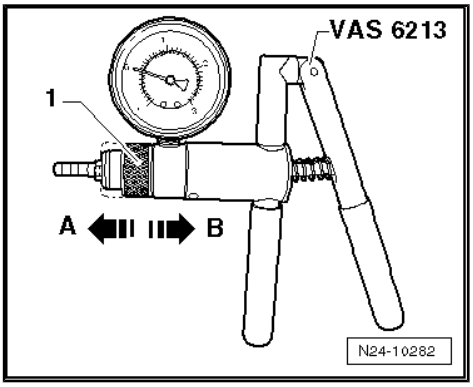
Variant 2:

– Move vacuum unit in -direction of arrow-, until a voltage value ⇒ Vehicle diagnostic tester of 0.75 ± 0.02 Volt is indicated on the.

– Tighten the bolts -1- to 10 Nm.



– Move adjuster ring -1- on hand vacuum pump - VAS 6213- to position -B- to vent vacuum in vacuum unit to ambient pressure.



Checking voltage value

– Move slide ring -1- on hand vacuum pump - VAS 6213- to position -A- for “vacuum”.

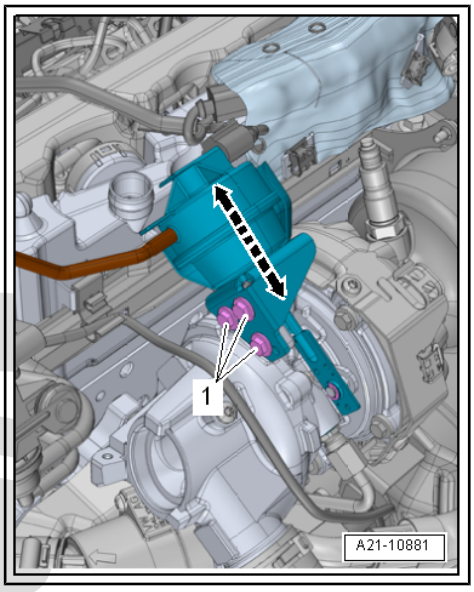
– Operate hand vacuum pump - VAS 6213- until a vacuum between -650 ... 700 mbar is displayed on pressure gauge.

– A voltage value of 0.75 ± 0.02 Volt must be indicated on the ⇒ Vehicle diagnostic tester.

Voltage value is not correct

Note

The illustration shows the version 1.



– Loosen bolt -1-

– Adjust voltage value ⇒ page 358 .

Voltage value in good condition

– Seal bolts with sealing paint from repair kit.

– Install engine cover panel ⇒ page 56 .

– Start engine, and clear event memory ⇒ Vehicle diagnostic tester.

Specified torque

Bolts	Specified torque
Bolts -1-	10 Nm

1.3.2 Renewing vacuum unit for turbocharger, version 3

Note

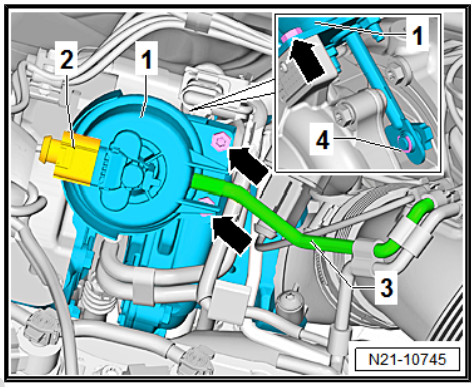
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Before removing the vacuum unit for turbocharger make sure whether a repair kit is available ⇒ Electronic parts catalogue . Otherwise the entire turbocharger must be replaced.

Removing

– Remove engine cover panel ⇒ page 56 .

– Release and unplug electrical connector -2- from position sender for charge pressure positioner - G581- .
– Pull vacuum hose -3- off turbocharger vacuum unit -1-.
– Unscrew bolts -arrows- for vacuum unit.

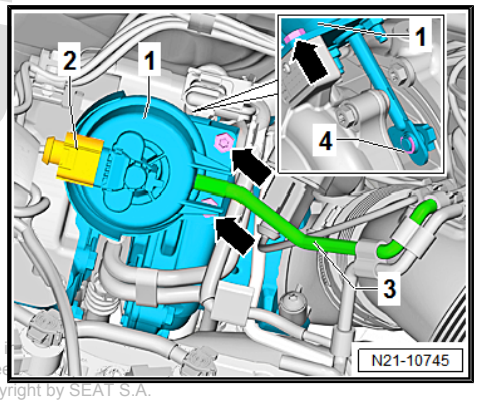


Note

When removing and installing the circlip, do not apply too much force on the lever linkage. The turbocharger may be damaged when the circlip is pushed down, e.g using a large screwdriver.

– Remove circlip -4-.
– Disengage control rod at adjusting lever and detach vacuum unit with position sender for charge pressure positioner - G581- .

Installing



– Use new bolts and a new circlip from the repair kit.
– Attach control rod to adjusting lever.
– Install circlip -4-.

Note

When removing and installing the circlip, do not apply too much force on the lever linkage. The turbocharger may be damaged when the circlip is pushed down, e.g using a large screwdriver.

Published by copyright law for private or commercial purposes, it is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Fit vacuum unit, and screw in bolts -arrows- to stop by hand.
– Disconnect electrical connector -2- at position sender for charge pressure positioner - G581- .
– Connect vacuum hose -3-.
– Seal bolts with sealing paint from repair kit.
– Install engine cover panel ⇒ page 56 .
– Connect vehicle diagnostic tester .
– Start engine, and clear event memory ⇒ Vehicle diagnostic tester.
– Follow the path below to perform basic setting:

`Self-diagnosis-capable systems`

`0001 - Engine electronics, functions`

`0001 - Basic setting`

`Adaptation of turbocharger`

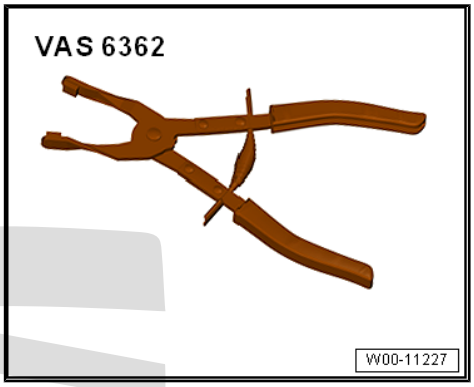
Specified torque

Bolts	Specified torque
Bolts	10 Nm

1.4 Removing and installing connection for turbocharger

Special tools and workshop equipment required

- Hose clip pliers - VAS 6362-

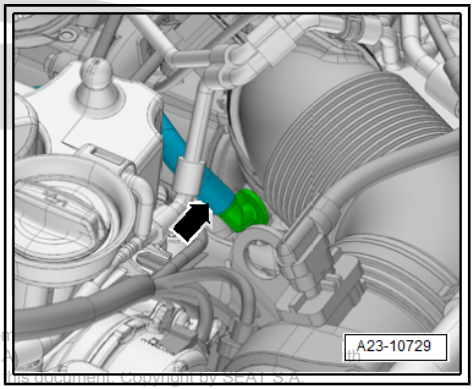


Removing

– If fitted: pull off and free the vacuum hose -arrow-.

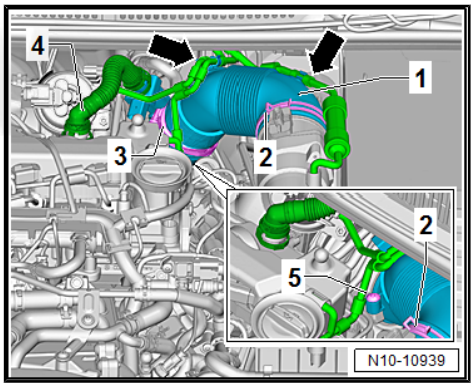
NOTICE

Depending on the vehicle version and country-specific modifications, crankcase breather hoses which cannot be removed from the cylinder head cover without being damaged may be installed. This type of crankcase breather hose must only be disconnected at the connecting piece for the air hose.



Protected by copyright. Copying for private or co
permitted unless authorised by SEAT S.A. SEAT S.
respect to the correctness of information in

– Remove hose -4- for crankcase breather system from air hose.
– To do this, press release mechanism.
– Move clear vacuum hoses at air pipe -arrows-.
– Loosen the hose clip -2-, remove the air intake pipe from the mass air flow sensor - G70- .
– Unscrew bolt -5-.
– Turn air pipe with connecting piece towards rear.
– Turn it towards rear until guides on connecting piece are detached from locking mechanism.
– Pull air pipe with connecting piece of turbocharger.



Installing

Install in reverse order of removal, observing the following.

– Loosen screw-type clip between connection and air intake hose -3-.
– Pull off air intake hose.
– Fit connecting piece in such a way that the guides are positioned in front of the locking mechanism.
– Push in connecting piece, and turn it towards front to stop.
– Connect air intake hose to connection.
– Tighten screw-type clip -3-.

Further assembly in reverse order of removal.

Specified torques

- ⇒ “1.1 Assembly overview - turbocharger”, page 326

2 Charge air system

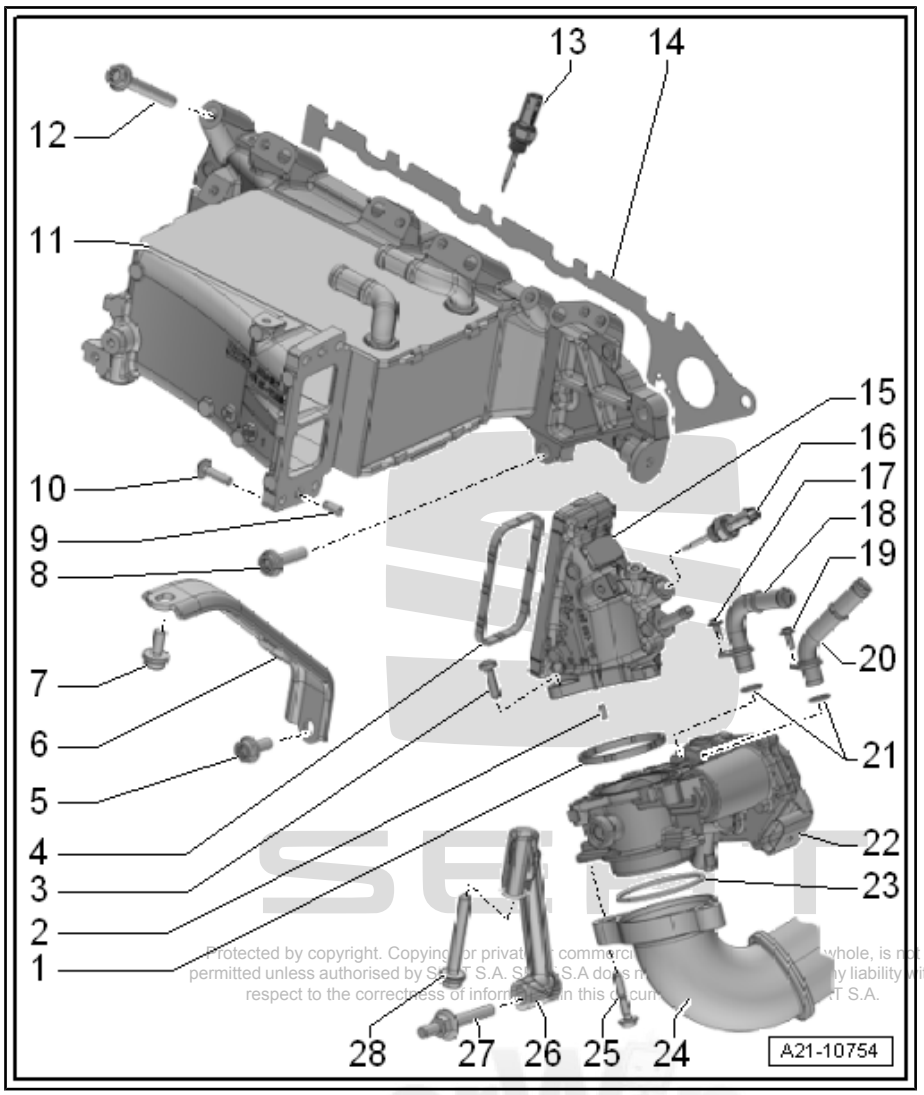
⇒ “2.1 Assembly overview - charge air system”, page 362

⇒ “2.2 Removing and installing charge pressure sender G31 ”, page 364

⇒ “2.3 Checking charge air system for leaks”, page 364

⇒ “2.5 Checking charge air cooler for leaks”, page 368

2.1 Assembly overview - charge air system



1 - Radial oil seal

- ❑ Renew after removal

2 - Dowel pin

3 - Bolt

- ❑ 8 Nm

4 - Gasket

- ❑ Renew after removal

5 - Bolt

- ❑ Specified torque and sequence ⇒ page 426 .

6 - Bracket/bearing/support

- ❑ For intake manifold.

7 - Bolt

- ❑ Specified torque and sequence ⇒ page 426 .

8 - Bolt

- ❑ Renew after removal
- ❑ Specified torque and sequence ⇒ page 425 .

9 - Dowel pin

10 - Bolt

- ❑ 8 Nm

11 - Intake manifold with charge air cooler

- ❑ Intake manifold and charge air cooler are combined as one unit
- ❑ Removing and installing ⇒ page 426
- ❑ Check for leaks ⇒ page 368

12 - Bolt

- ❑ Renew after removal
- ❑ Specified torque and sequence ⇒ page 425 .

13 - Charge air temperature sender after charge air cooler - G811-

- ❑ Removing and installing ⇒ page 449
- ❑ 22 Nm

14 - Gasket

- ❑ Renew after removal

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not make any warranty or assume any liability with respect to the correctness of information in this document. © SEAT S.A.

15 - Connection

- ❑ for throttle valve control unit - J338-

16 - Charge air temperature sender before charge air cooler - G810-

- ❑ Removing and installing ⇒ page 449
- ❑ 22 Nm

17 - Bolt

- ❑ 10 Nm

18 - Coolant pipe

19 - Bolt

- ❑ 10 Nm

20 - Coolant pipe

21 - O-rings

- ❑ Renew after removal

22 - Throttle valve control mechanism - J338-

- ❑ With throttle valve potentiometer - G69-
- ❑ Removing and installing ⇒ page 429

23 - O-ring

- ❑ Renew after removal

24 - Air intake pipe

25 - Bolt

- ❑ 8 Nm

26 - Bracket/bearing/support

- ❑ for throttle valve control unit - J338-

27 - Bolt

- ❑ Specified torque and sequence ⇒ page 426 .

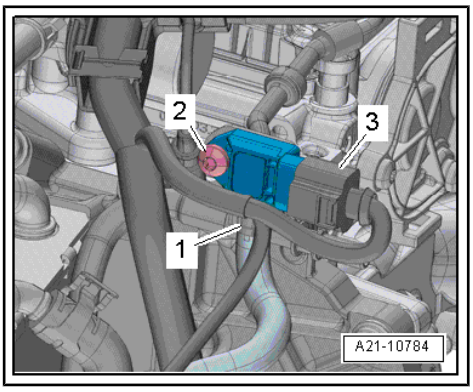
28 - Bolt

- ❑ Specified torque and sequence ⇒ page 426 .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

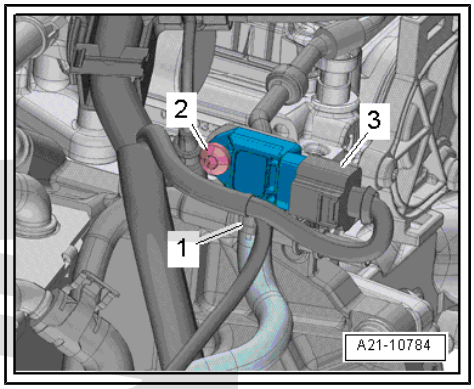
Charge pressure sender - G31- - specified torque

– Tighten bolt -2- to a torque of 9 Nm.



2.2 Removing and installing charge pressure sender - G31-

Removing



– Remove engine cover panel ⇒ page 56 .

– Unplug the electrical connector -3-.

– Before disconnecting hose from charge pressure sender - G31- , spray hose with suitable release agent.

NOTICE

Avoid irreparable damage to charge pressure sensor caused by the connection breaking off.

♦ **Carefully disconnect hose from connection, taking care to keep hose straight.**

– Unscrew bolts -2- and remove charge pressure sender - G31- .

Installing

Install in reverse order of removal, observing the following.

– Install engine cover panel ⇒ page 56 .

Specified torques

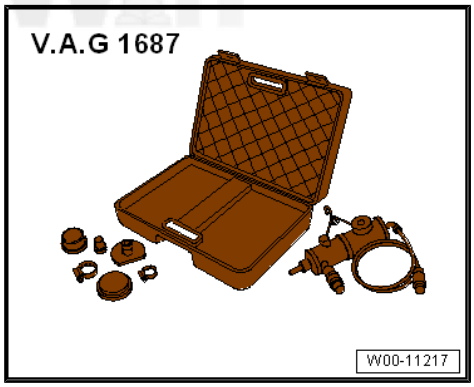
♦ ⇒ Fig. “” Charge pressure sender -G31- - specified torque”“, page 363

Reproduction or copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

2.3 Checking charge air system for leaks

Special tools and workshop equipment required

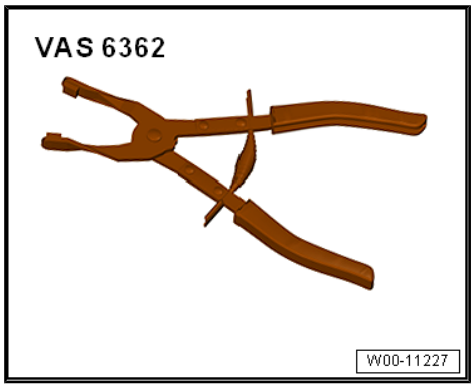
♦ Charge air system tester - V.A.G 1687-



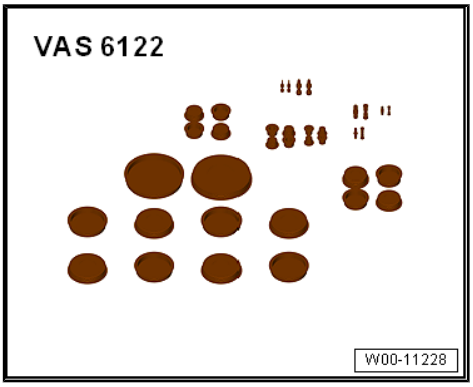
♦ Adapters - V.A.G 1687/11-

♦ Adapters - V.A.G 1687/15-

♦ Hose clip pliers - VAS 6362-



♦ Engine bung set - VAS 6122-

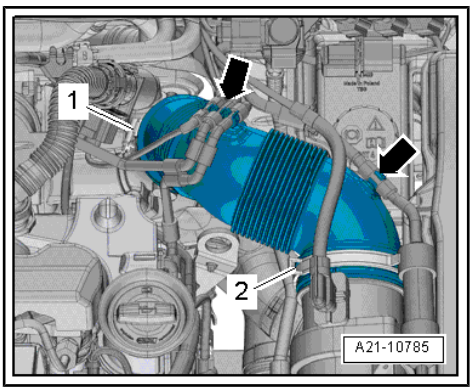


Procedure

– Remove engine cover panel ⇒ page 56 .

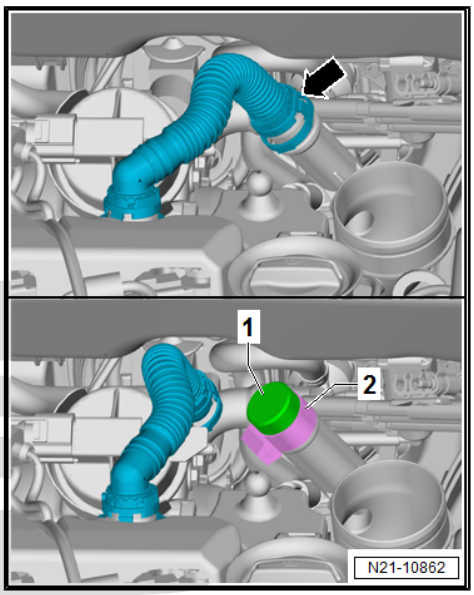
– Free vacuum hoses -arrows-.

– Loosen hose clips -1 and 2- , and remove air pipe.



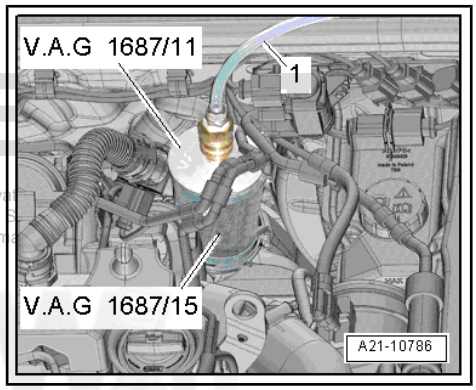
– Pull off crankcase breather hose-arrow-.

– Seal connection with a bung -1- from engine bung set . Secure plug with a hose clip -2-.



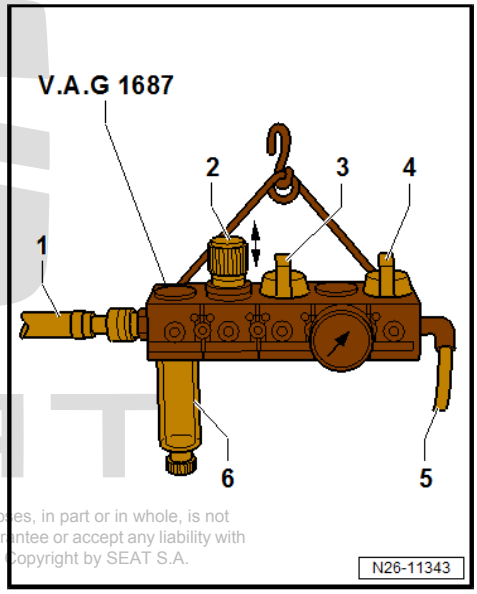
– Connect the adapter - V.A.G 1687/11- with -V.A.G 1687/15- to the exhaust gas turbocharger.

– Connect charge air system tester - V.A.G 1687- to adapter.



Protected by copyright. Copying for priva
permitted unless authorised by SEAT S.A. S
respect to the correctness of inform

Prepare charge air system tester - V.A.G 1687- as follows:



– Pull pressure control valve -2- upwards, unscrew it completely, and close valves -3- and -4-.

– Using a commercially available connection piece, connect charge air system tester - V.A.G 1687- to compressed air -1-.

Note

If there is water in the inspection glass, -6- drain it via the drain plug.

– Open valve -3-.

– Adjust pressure to 0.5 bar with pressure regulating valve -2-.

– Open valve -4- and wait until test circuit is full. If necessary readjust pressure to 0.5 bar.

– Check charge air system for leaks.

♦ By listening

♦ With your finger

♦ Using commercially available leak detector spray

♦ Using ultrasonic tester - V.A.G 1842 S-

ected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with the correctness of information in this document. Copyright by SEAT S.A.

Note

♦ *A small amount of air escapes through the valves and enters the engine and the exhaust gas recirculation cooler. Therefore a holding pressure test is not possible.*

♦ *How to use the ultrasonic tester - V.A.G 1842 S- ⇒ operating instructions .*

♦ *Release pressure in test circuit by detaching hose coupling from adapter before removing adapter.*

Assembling

Installation is in the reverse sequence of removal.

Specified torques

♦ ⇒ “4.1 Assembly overview - air filter housing”, page 420

2.4 Removing and installing air intake pipe

⇒ “2.4.1 Removing and installing air pipe, vehicles with non-water-cooled turbocharger”, page 366

⇒ “2.4.2 Removing and installing air pipe, vehicles with water-cooled turbocharger”, page 367

2.4.1 Removing and installing air pipe, vehicles with non-water-cooled turbocharger

Special tools and workshop equipment required

♦ Torx screw insert T 30 - T10405-

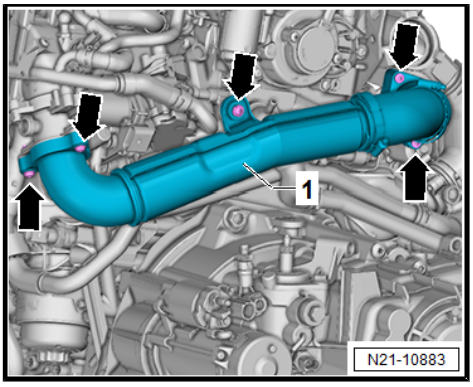
Removing

– Remove engine cover panel ⇒ page 56 .

– For reasons of space, remove the air filter housing together with the intake hose ⇒ page 422 .

– Remove bolts -arrows-.

– Remove air pipe -1-.



Installing

Installation is carried out in reverse order; noting the following:

Specified torques

♦ ⇒ “2.1 Assembly overview - charge air system”, page 362

♦ ⇒ “1.1 Assembly overview - turbocharger”, page 326

♦ ⇒ “4.1 Assembly overview - air filter housing”, page 420

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

2.4.2 Removing and installing air pipe, vehicles with water-cooled turbocharger

Special tools and workshop equipment required

♦ Torx screw insert T 30 - T10405-

- Socket wrench - T10347-

Removing

– Remove engine cover panel ⇒ page 56 .

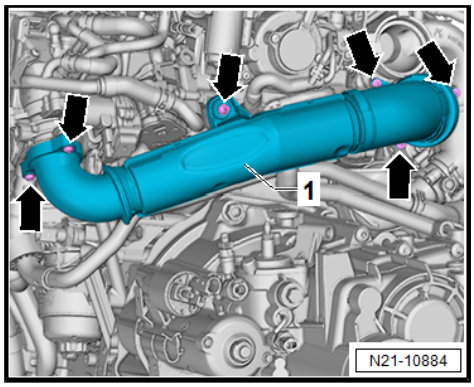
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– For reasons of space, remove the air filter housing together with the intake hose ⇒ page 422 .

– Remove connection for turbocharger ⇒ page 360 .

– Remove bolts -arrows-.

– Remove air pipe -1-.



Installing

Installation is carried out in reverse order; noting the following:

Specified torques

- ⇒ “2.1 Assembly overview - charge air system”, page 362
- ⇒ “1.1 Assembly overview - turbocharger”, page 326
- ⇒ “4.1 Assembly overview - air filter housing”, page 420

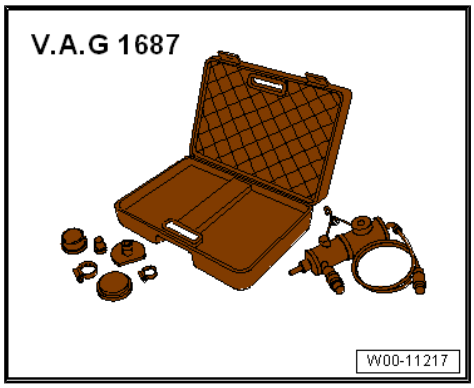
2.5 Checking charge air cooler for leaks

Note

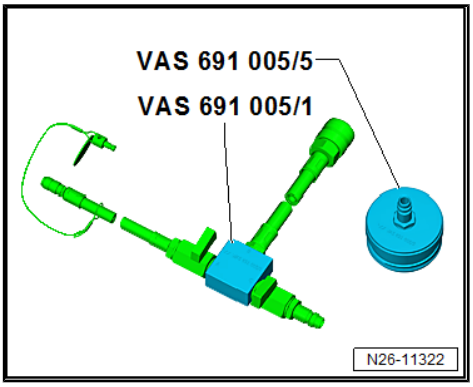
A pressure of 0.5 bar is applied to the air side of the charge air cooler. While doing this, the pressure in the cooling system is measured.

Special tools and workshop equipment required

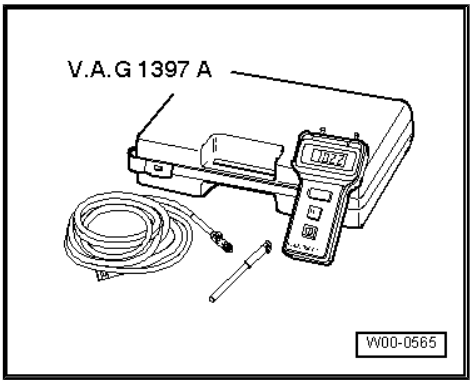
- Charge air system tester - V.A.G 1687-



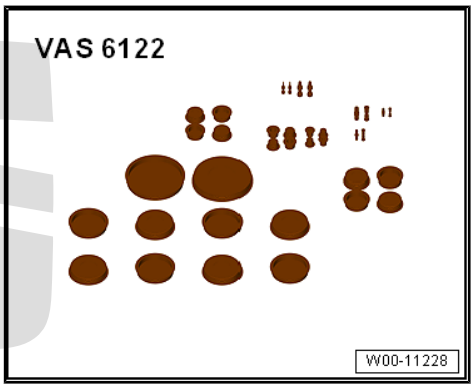
- Y-branch - VAS 691 005/1-



- Test adapter - VAS 691 005/5-
- Turbocharger tester - V.A.G 1397A-



- Engine bung set - VAS 6122-



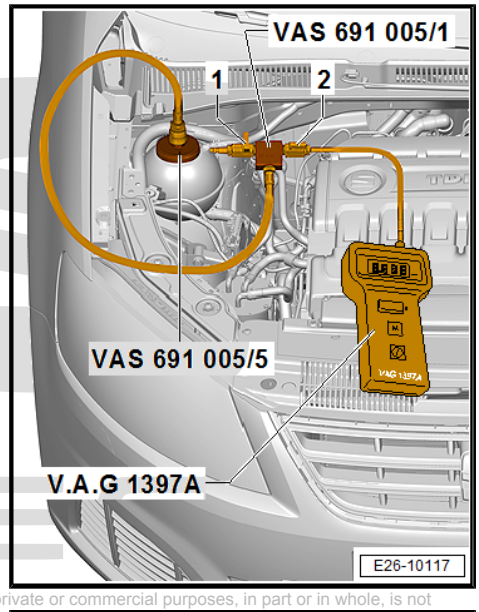
Test prerequisite

- Coolant temperature at least 40 °C.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Connecting turbocharger tester - V.A.G 1397A- :

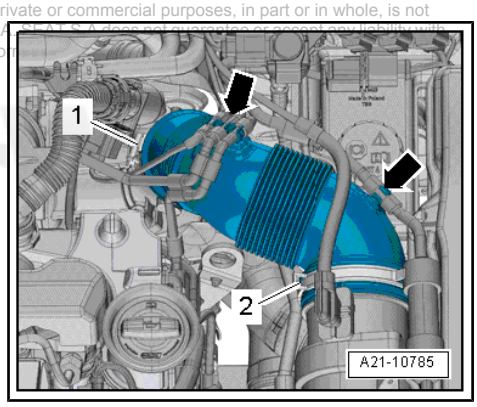
- Screw adapter - VAS 691 005/5- onto coolant expansion tank.
- Fit Y-branch - VAS 691 005/1- onto adapter - VAS 691 005/5- .
- Close valve -1- for connection »C«, and open valve -2- for connection »A«.
- Connect hose from connection »A« of Y-branch to connection »II« of turbocharger tester - V.A.G 1397A- .
- Set turbocharger tester - V.A.G 1397A- to switch position »II« (gauge pressure measurement), and switch it on. The setting »II« must be visible.



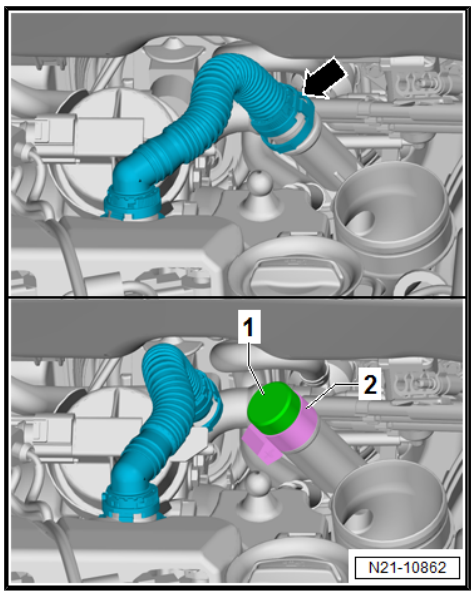
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information

Connecting charge air system tester - V.A.G 1687- :

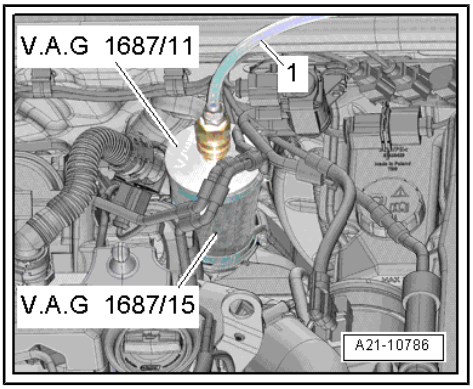
- Remove engine cover.
- Free vacuum hoses -arrows-.
- Loosen hose clips -1 and 2- , and remove air pipe.



- Pull off crankcase breather hose-arrow-.
- Seal connection with a bung -1- from engine bung set . Secure plug with a hose clip -2-.

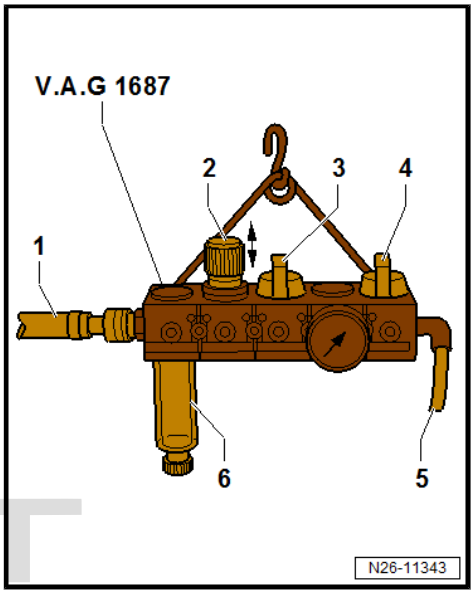


– Connect the adapter - V.A.G 1687/11- with -V.A.G 1687/15- to the exhaust gas turbocharger. Secure hose with hose clips.
– Connect charge air system tester - V.A.G 1687- to adapter.



Prepare charge air system tester - V.A.G 1687- as follows:

– Pull pressure control valve -2- upwards, unscrew it completely, and close valves -3- and -4-.
– Using a commercially available connection piece, connect charge air system tester - V.A.G 1687- to compressed air -1-.



Note

If there is water in the inspection glass, -6- drain it via the drain plug.

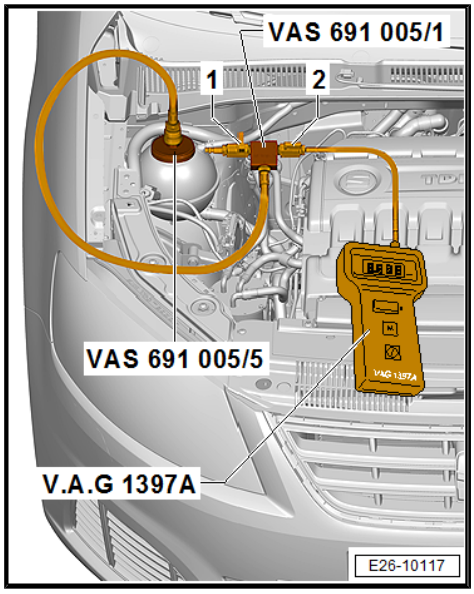
– Open valve -3-.
– Adjust pressure to 0.5 bar with pressure regulating valve -2-.
– Open valve -4- and wait until test circuit is full. If necessary readjust pressure to 0.5 bar.

Note

A small amount of air escapes through the valves and enters the engine and the exhaust gas recirculation cooler. Therefore a holding pressure test is not possible.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with ... Copyright by SEAT S.A.

Reading turbocharger tester - V.A.G 1397A- :



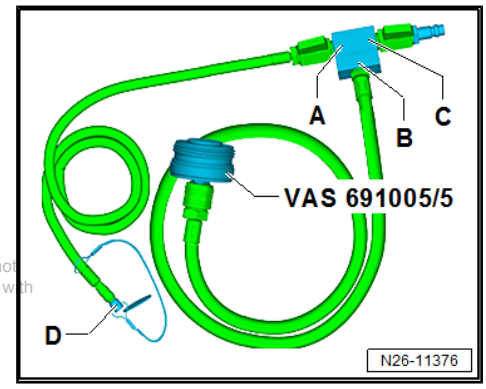
- Observe the turbocharger device for around 5 minutes.
- The pressure indicated by the turbocharger tester must not rise more than 0.051 bar.

– If the pressure on the turbocharger tester rises above 0.051 bar continuously, compressed air is leaking from the intake side into the cooling system. The charge air cooler has a leak. Renew charge air cooler.

Note

- *Subsequent warming of the coolant can cause a slight pressure increase of 0.051 bar. This slight increase does not indicate a leak.*
- *A vacuum can develop due to the cooling of the coolant. A vacuum is indicated by a »minus« symbol on the turbocharger tester . »Negative« values do not indicate a leak.*
- *If uncertainty remains, repeat the test. To do this, briefly open shut-off tap -1- to equalise pressure in the cooling system. If the charge air cooler has a leak, the pressure must rise steadily during every test.*

Cleaning Y-branch - VAS 691 005/1- :



Note

After the leakage test has been completed, the Y-branch - VAS 691 005/1- must be cleaned and any moisture which may have entered must be removed.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Insert cleaning nozzle -D- into hose on connection -A- of Y-branch .

– Fit test adapter - VAS 691 005/5- onto hose of connection -B-.

– Fit compressed air hose to connection -C-.

– Open the shut-off taps and clean the hose with compressed air for approx. 15 seconds.

23 – Mixture preparation - injection

1 Injection system

⇒ “1.1 Schematic overview - fuel system”, page 373

⇒ “1.2 Fitting location overview - injection system”, page 376

⇒ “1.3 Filling and bleeding fuel system”, page 388

⇒ “1.4 Checking fuel system for leaks”, page 388

1.1 Schematic overview - fuel system

⇒ “1.1.1 Schematic overview - fuel system, version 1”, page 373

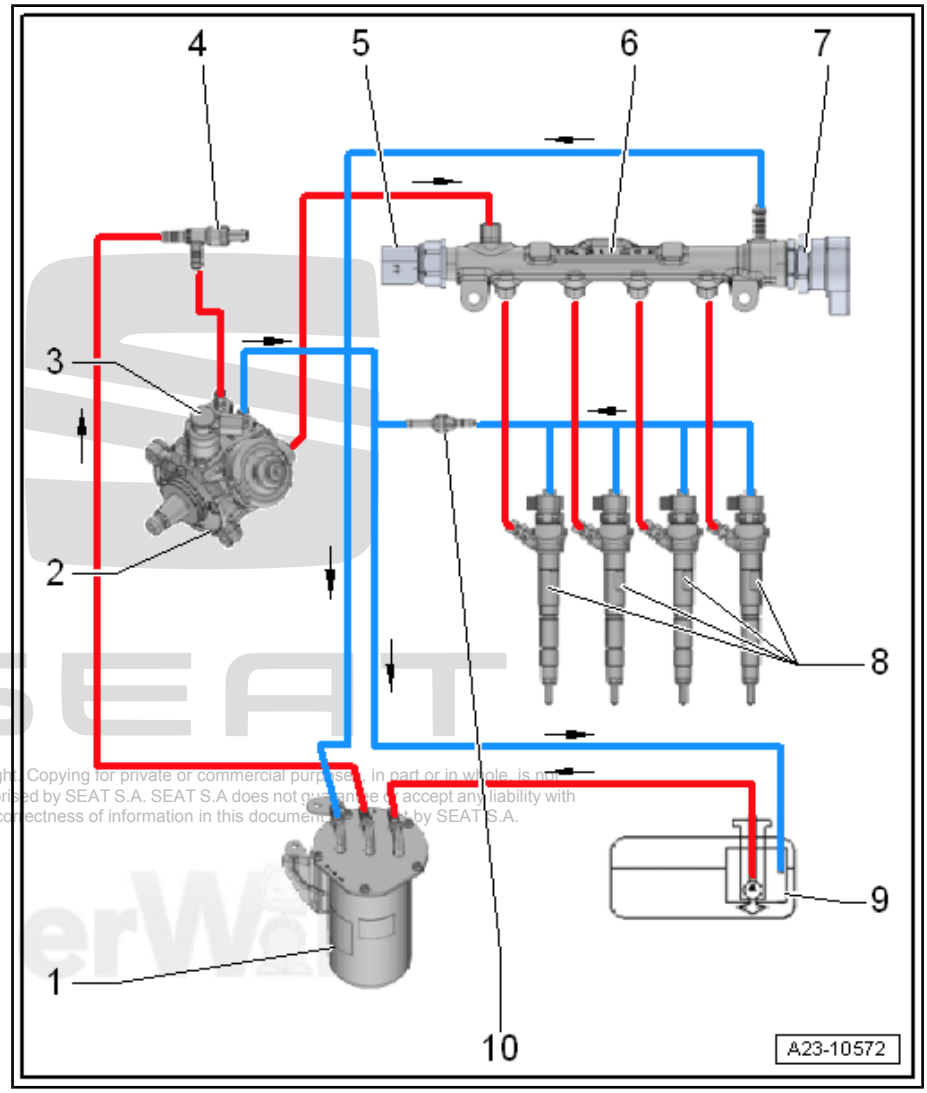
⇒ “1.1.2 Schematic overview - fuel system, version 2”, page 375

1.1.1 Schematic overview - fuel system, version 1

Note

- *Note that various fuel filters require the fuel lines be connected to them in different ways.*
- *Red = fuel supply*
- *Blue = fuel return line*
- *Arrows show direction of fuel flow.*

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



1 - Fuel filter

- ❑ Assembly overview ⇒ Rep. gr. 20 ; Fuel filter; Assembly overview - fuel filter

2 - High-pressure pump

- ❑ Assembly overview ⇒ page 461

3 - Fuel metering valve - N290-

4 - Fuel temperature sender - G81-

5 - Fuel pressure sensor - G247-

- ❑ Assembly overview ⇒ page 396

6 - Fuel distributor

- ❑ Assembly overview ⇒ page 396

7 - Fuel pressure regulating valve - N276-

- ❑ Assembly overview ⇒ page 396

8 - Injectors

- ❑ Assembly overview ⇒ page 394

9 - Fuel tank

- ❑ With the fuel pump (pressurisation pump) - G6-
- ❑ Assembly overview ⇒ Rep. gr. 20 ; Fuel tank; Assembly overview - fuel tank

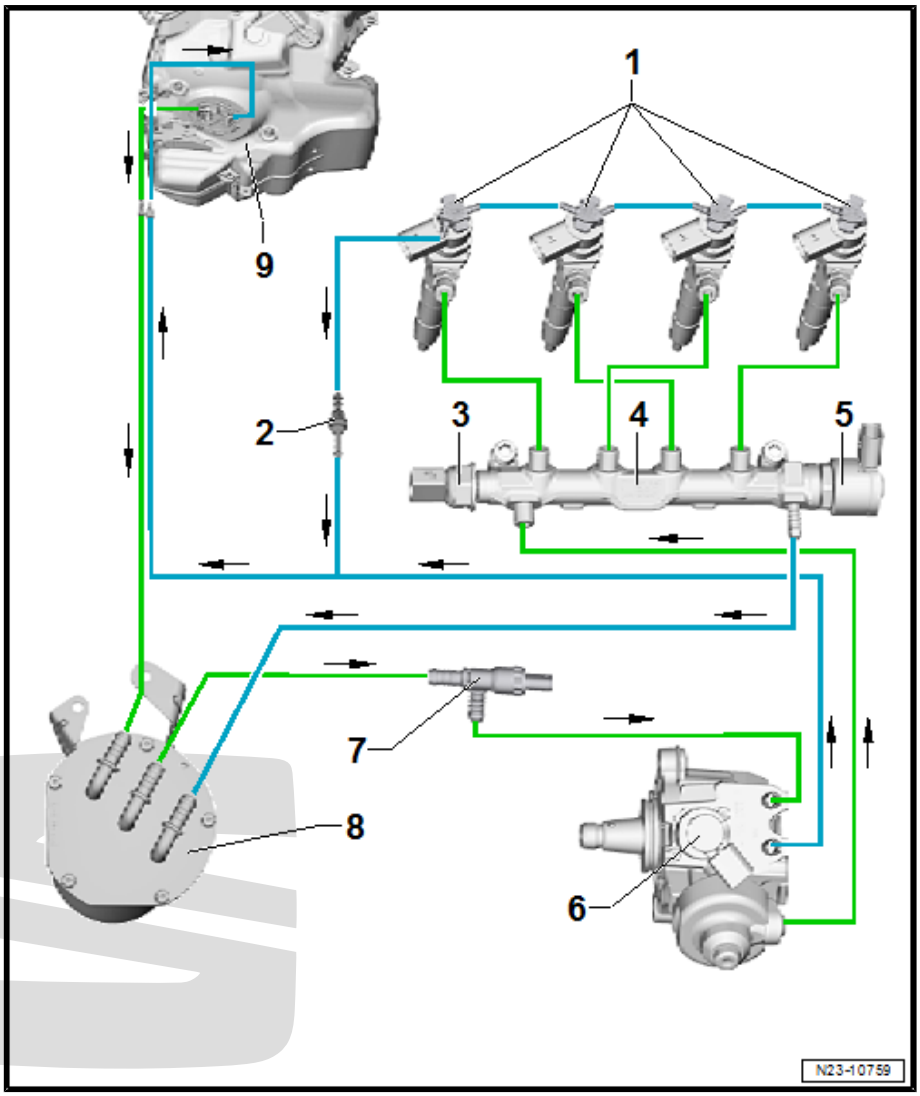
10 - Throttle

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document copied by SEAT S.A.

1.1.2 Schematic overview - fuel system, version 2

Note

- *Note that various fuel filters require the fuel lines be connected to them in different ways.*
- *Green = fuel supply*
- *Blue = fuel return line*
- *Arrows show direction of fuel flow.*



1 - Injectors

- ❑ Assembly overview ⇒ page 394
- ❑ Removing and installing ⇒ page 408

2 - Throttle

3 - Fuel pressure sensor - G247-

- ❑ Assembly overview ⇒ page 396
- ❑ Removing and installing ⇒ page 439

4 - High-pressure accumulator (Common Rail)

- ❑ Assembly overview ⇒ page 396
- ❑ Removing and installing ⇒ page 416

5 - Fuel pressure regulating valve - N276-

- ❑ Assembly overview ⇒ page 396
- ❑ Removing and installing ⇒ page 432

6 - High-pressure pump

- ❑ Assembly overview ⇒ page 461
- ❑ Fuel metering valve - N290-
- ❑ Removing and installing ⇒ page 462

7 - Fuel temperature sender - G81-

- ❑ Removing and installing ⇒ page 449

8 - Fuel filter

- ❑ ⇒ Rep. gr. 20 ; Fuel filter; Assembly overview - fuel filter

9 - Fuel tank

- ❑ With the fuel pump (pressurisation pump) - G6-
- ❑ ⇒ Rep. gr. 20 ; Fuel tank; Assembly overview - fuel tank

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

1.2 Fitting location overview - injection system

⇒ “1.2.1 Fitting location overview - engine compartment”, page 376

⇒ “1.2.2 Overview of fitting locations - engine compartment, vehicles with control unit for NOx sender GX30 ”, page 378

⇒ “1.2.3 Overview of fitting locations on engine (from above)”, page 381

⇒ “1.2.4 Fitting location overview - front view of engine”, page 384

⇒ “1.2.5 Fitting location overview - rear view of engine, vehicles without selective catalytic reduction”, page 385

⇒ “1.2.6 Fitting location overview - rear view of engine, vehicles with selective catalytic reduction”, page 386

⇒ “1.2.7 Fitting location overview - electrical connectors”, page 387

1.2.1 Fitting location overview - engine compartment

1 - Coolant valve for cylinder head - N489-

- ❑ Fitting location ⇒ page 378

2 - Injectors

- ♦ Cylinder 1 injector - N30-
- ♦ Cylinder 2 injector - N31-
- ♦ Cylinder 3 injector - N32-
- ♦ Cylinder 4 injector - N33-
- ❑ Assembly overview ⇒ page 394

3 - Pressure differential sender - G505-

- ❑ If installed or not depends upon the exhaust emission regulations
- ❑ Assembly overview ⇒ page 466

4 - Exhaust gas pressure sensor 1 - G450-

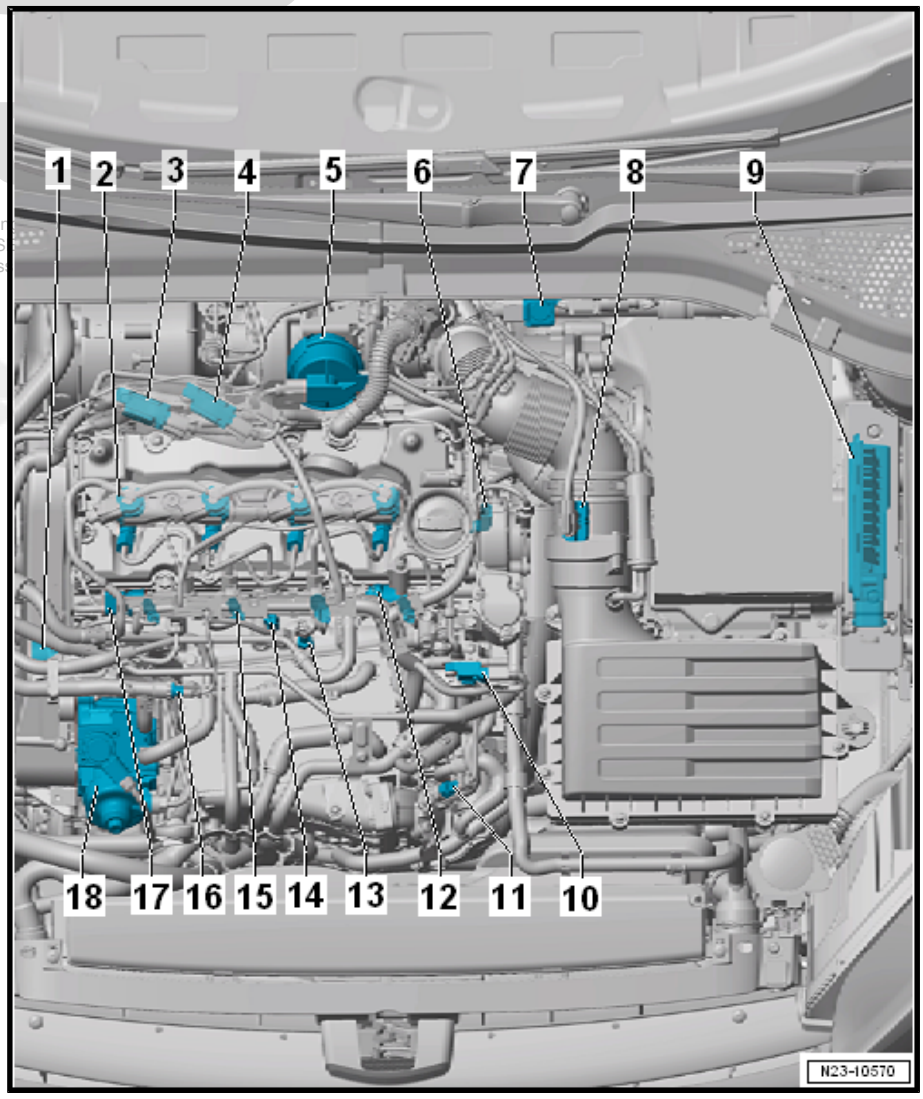
- ❑ Depending on vehicle
- ❑ Assembly overview ⇒ page 466

5 - Position sender for charge pressure positioner - G581-

6 - Coolant temperature sender - G62-

- ❑ Assembly overview ⇒ page 256

7 - Charge pressure control solenoid valve - N75-



- ❑ Electrical connector for charge pressure control solenoid valve - N75- ⇒ page 387

Protected by copyright. Copyright and use authorized by SEAT with respect to the correctness

8 - Air mass meter - G70-

- ❑ Fitting location ⇒ page 387
- ❑ Assembly overview ⇒ page 420
- ❑ With intake air temperature sender - G42-

9 - Engine (motor) control unit - J623-

- ❑ Removing and installing ⇒ page 456

10 - Charge air pressure sender - G31-

- ❑ Assembly overview ⇒ page 362

11 - Charge air temperature sender before charge air cooler - G810-

- ❑ Assembly overview ⇒ page 424

12 - Fuel pressure regulating valve - N276-

- ❑ Assembly overview ⇒ page 396

13 - Charge air temperature sender after charge air cooler - G811-

- ❑ Assembly overview ⇒ page 424

14 - Hall sender - G40-

- ❑ Camshaft position sensor
- ❑ Assembly overview ⇒ page 581

15 - Glow plugs

- ♦ Glow plug 1 - Q10-
- ♦ Glow plug 2 - Q11-
- ♦ Glow plug 3 - Q12-
- ♦ Glow plug 4 - Q13-
  - ❑ Depending on the vehicle model, there is a combustion chamber pressure sender integrated in the glow plug
- ♦ Glow plug 1 - Q10- with cylinder 1 combustion chamber pressure sender - G677-
- ♦ Glow plug 2 - Q11- with cylinder 2 combustion chamber pressure sender - G678-
- ♦ Glow plug 3 - Q12- with cylinder 3 combustion chamber pressure sender - G679-
- ♦ Glow plug 4 - Q13- with cylinder 4 combustion chamber pressure sender - G680-
  - ❑ Assembly overview ⇒ page 581

16 - Fuel temperature sender

- ❑ Different types of senders may be installed depending on the vehicle model.
- ♦ Fuel temperature sender - G81-
- ♦ Temperature and pressure sender for low-pressure fuel system - GX20-
  - ❑ ⇒ “6.10 Removing and installing fuel temperature sender G81 ”, page 449
  - ❑ ⇒ “6.12 Removing and installing temperature and pressure sender for low-pressure fuel system GX20 ”, page 453

17 - Fuel pressure sensor - G247-

- ❑ Assembly overview ⇒ page 396

18 - High-pressure pump

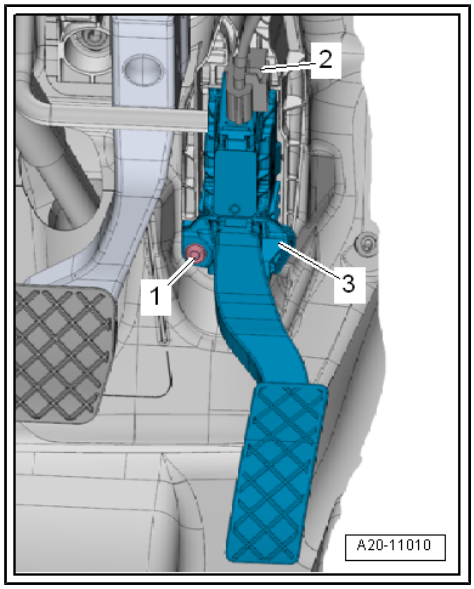
- ❑ With fuel metering valve - N290- (do not open)
- ❑ Assembly overview ⇒ page 461

SEAT
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Accelerator position sender - G79- and accelerator position sender 2 - G185-

- in the accelerator pedal module

2 - Electrical connector for accelerator pedal module



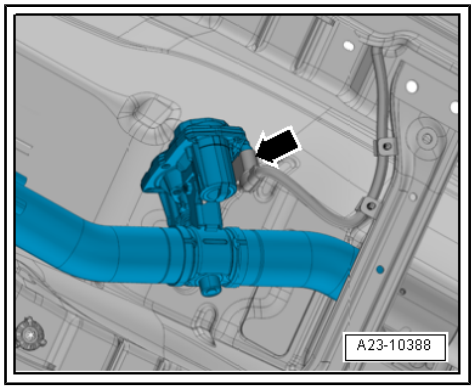
Note

The accelerator position sender - G79- and accelerator position sender 2 - G185- are integrated in the accelerator pedal module and cannot be renewed individually.

Fitting location of exhaust flap control unit - J883-

- In front exhaust pipe

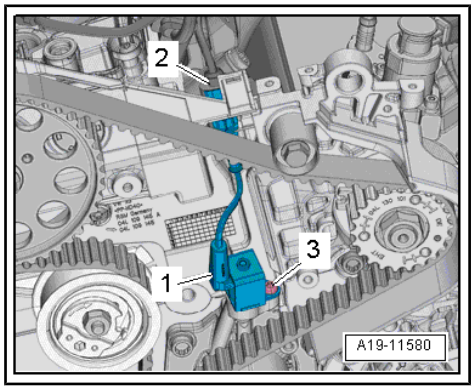
Removing and installing ⇒ page 518 .



Fitting location of coolant valve for cylinder head - N489-

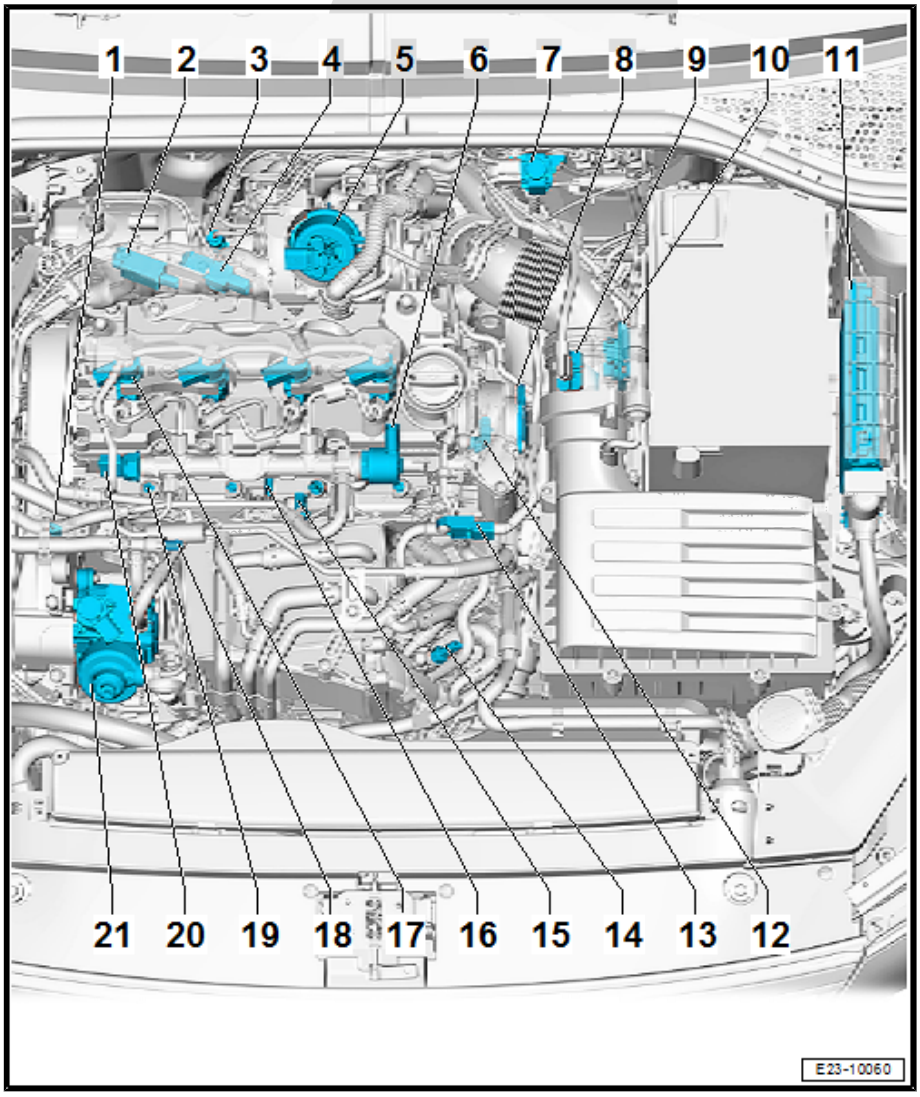
- -Item 1- at top of coolant pump

Removing and installing ⇒ page 278 .



1.2.2 Overview of fitting locations - engine compartment, vehicles with control unit for NOx sender - GX30-

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



1 - Coolant valve for cylinder head - N489-

- ❑ Fitting location ⇒ page 378

2 - Pressure differential sender - G505-

- ❑ If installed or not depends upon the exhaust emission regulations
- ❑ ⇒ page 466

3 - NOx sender - G295-

- ❑ Is comprised in control unit for NOx sender - GX30- together with control unit for NOx sender - J583-
- ❑ Removing and installing ⇒ page 451

4 - Exhaust gas pressure sensor 1 - G450-

- ❑ Depending on vehicle
- ❑ ⇒ page 466

5 - Position sender for charge pressure positioner - G581-

6 - Fuel pressure regulating valve - N276-

- ❑ ⇒ page 396

7 - Charge pressure control solenoid valve - N75-

- ❑ Electrical connector for charge pressure control solenoid valve - N75- ⇒ page 387

8 - Camshaft control valve 1 - N205-

- ❑ ⇒ page 145

9 - Air mass meter - G70-

- ❑ With intake air temperature sender - G42-
- ❑ Fitting location ⇒ page 387
- ❑ ⇒ page 420

10 - NOx sender control unit - J583-

- ❑ Is comprised in control unit for NOx sender - GX30- together with NOx sender - G295-
- ❑ Removing and installing ⇒ page 451

11 - Engine (motor) control unit - J623-

- ❑ Removing and installing ⇒ page 456

12 - Coolant temperature sender - G62-

- ❑ ⇒ page 256

13 - Charge air pressure sender - G31-

- ❑ ⇒ page 362

14 - Charge air temperature sender before charge air cooler - G810-

- ❑ ⇒ page 424

15 - Charge air temperature sender after charge air cooler - G811-

- ❑ ⇒ page 424

16 - Hall sender - G40-

- ❑ Camshaft position sensor
- ❑ ⇒ page 581

17 - Injectors

- ♦ Injector, cylinder 1 - N30-
- ♦ Injector, cylinder 2 - N31-
- ♦ Injector, cylinder 3 - N32-
- ♦ Injector, cylinder 4 - N33-
  - ❑ ⇒ page 394

18 - Fuel temperature sender

- ❑ Different types of senders may be installed depending on the vehicle model.
- ♦ Fuel temperature sender - G81-
- ♦ Temperature and pressure sender for low-pressure fuel system - GX20-
  - ❑ ⇒ “6.10 Removing and installing fuel temperature sender G81 ”, page 449
  - ❑ ⇒ “6.12 Removing and installing temperature and pressure sender for low-pressure fuel system GX20 ”, page 453

19 - Glow plugs

- ♦ Glow plug 1 - Q10-
- ♦ Glow plug 2 - Q11-
- ♦ Glow plug 3 - Q12-
- ♦ Glow plug 4 - Q13-
  - ❑ Depending on the vehicle model, there is a combustion chamber pressure sender integrated in the glow plug
- ♦ Glow plug 1 - Q10- with cylinder 1 combustion chamber pressure sender - G677-
- ♦ Glow plug 2 - Q11- with cylinder 2 combustion chamber pressure sender - G678-
- ♦ Glow plug 3 - Q12- with cylinder 3 combustion chamber pressure sender - G679-
- ♦ Glow plug 4 - Q13- with cylinder 4 combustion chamber pressure sender - G680-
  - ❑ Assembly overview ⇒ page 581

20 - Fuel pressure sensor - G247-

- ❑ ⇒ page 396

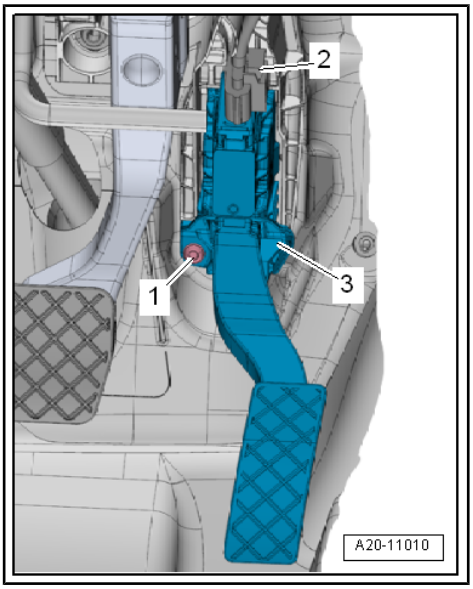
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

21 - High-pressure pump

- ❑ With fuel metering valve - N290- (do not open)
- ❑ ⇒ page 461

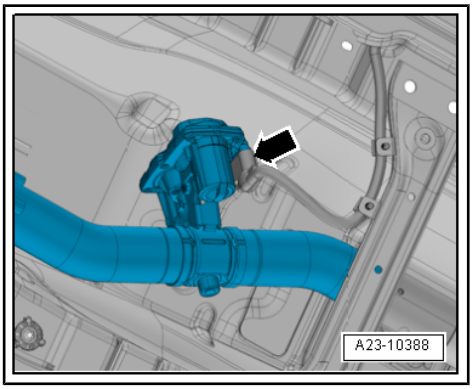
Accelerator position sender - G79- and accelerator position sender 2 - G185-

- The accelerator position sender - G79- and accelerator position sender 2 - G185- are located in the accelerator pedal module - GX2-
- Assembly overview ⇒ Fuel supply - diesel engines; Rep. gr. 20 ; Accelerator mechanism; Assembly overview - accelerator pedal module
- ⇒ Fuel supply - diesel engines; Rep. gr. 20 ; Accelerator mechanism; Removing and installing accelerator pedal module GX2



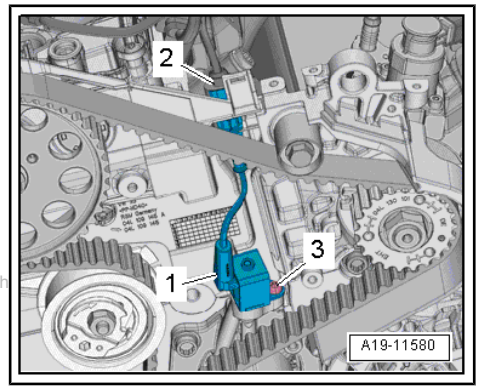
Fitting location of exhaust flap control unit - J883-

- Assembly overview ⇒ page 488
- Removing and installing ⇒ page 518



Fitting location of coolant valve for cylinder head - N489-

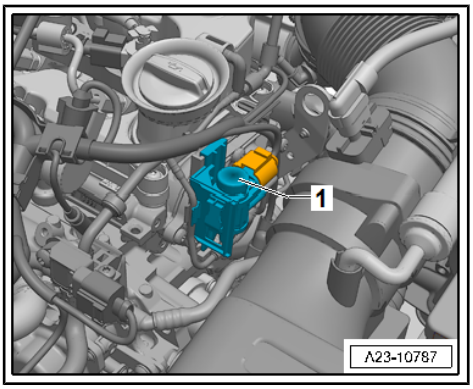
- Assembly overview ⇒ page 246
- Removing and installing ⇒ page 278 .



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Exhaust gas recirculation cooler changeover valve - N345- -1-

- Assembly overview ⇒ page 564
- Not fitted on all vehicles



1.2.3 Overview of fitting locations on engine (from above)

1 - Pressure differential sender - G505-

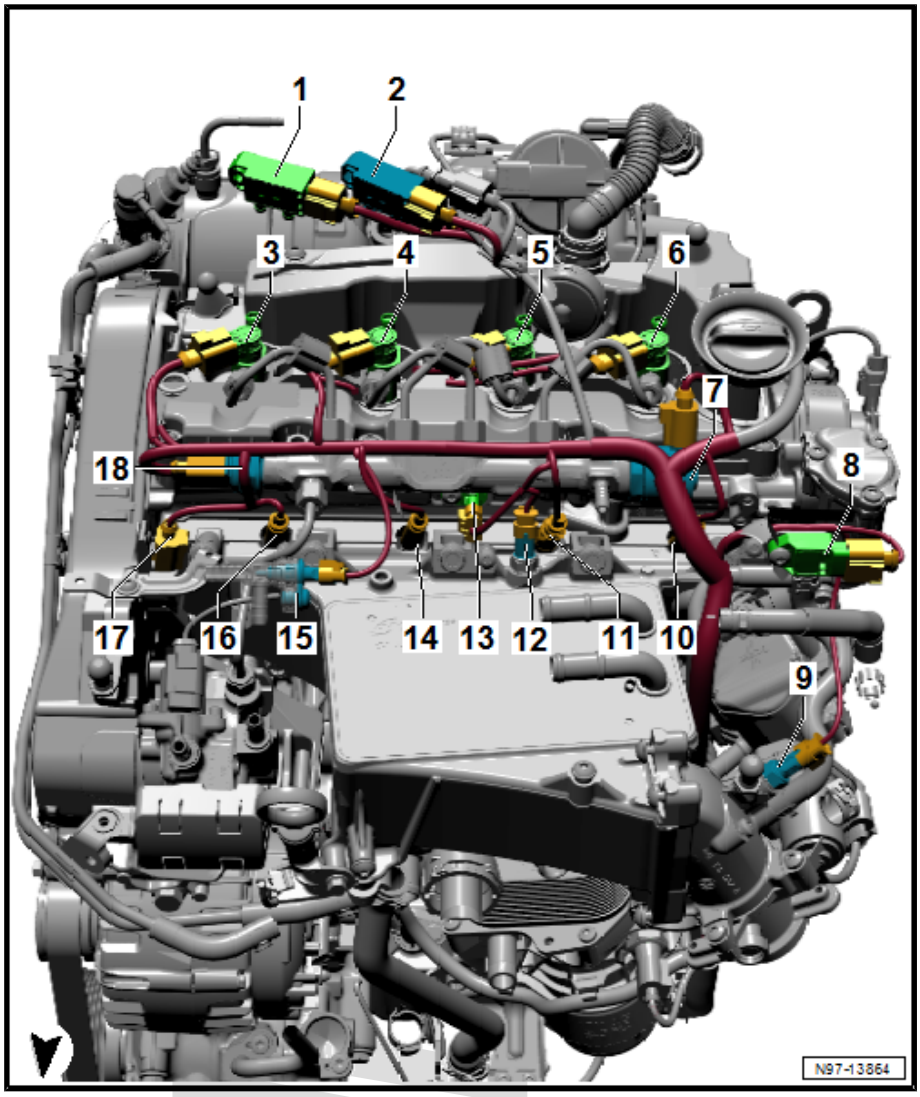
- ❑ If installed or not depends upon the exhaust emission regulations
- ❑ Assembly overview ⇒ page 466

2 - Exhaust gas pressure sensor 1 - G450-

- ❑ Depending on vehicle
- ❑ Assembly overview ⇒ page 466

3 - Injector, cylinder 1 - N30-

- ❑ ⇒ “3.1 Assembly overview - injectors”, page 394
- ❑ ⇒ “3.3 Adapting correction values for injectors”, page 397
- ❑ ⇒ “3.4 Testing injectors”, page 397
- ❑ ⇒ “3.5 Checking return flow rate of injectors with engine running”, page 397
- ❑ ⇒ “3.6 Checking return flow rate of injectors at starter speed”, page 402
- ❑ ⇒ “3.7 Testing jammed-open injectors”, page 406
- ❑ ⇒ “3.8 Removing and installing injectors”, page 408



4 - Injector, cylinder 2 - N31-

- ❑ ⇒ “3.1 Assembly overview - injectors”, page 394
- ❑ ⇒ “3.3 Adapting correction values for injectors”, page 397
- ❑ ⇒ “3.4 Testing injectors”, page 397
- ❑ ⇒ “3.5 Checking return flow rate of injectors with engine running”, page 397
- ❑ ⇒ “3.6 Checking return flow rate of injectors at starter speed”, page 402
- ❑ ⇒ “3.7 Testing jammed-open injectors”, page 406
- ❑ ⇒ “3.8 Removing and installing injectors”, page 408

5 - Injector, cylinder 3 - N32-

- ❑ ⇒ “3.1 Assembly overview - injectors”, page 394
- ❑ ⇒ “3.3 Adapting correction values for injectors”, page 397
- ❑ ⇒ “3.4 Testing injectors”, page 397
- ❑ ⇒ “3.5 Checking return flow rate of injectors with engine running”, page 397
- ❑ ⇒ “3.6 Checking return flow rate of injectors at starter speed”, page 402
- ❑ ⇒ “3.7 Testing jammed-open injectors”, page 406
- ❑ ⇒ “3.8 Removing and installing injectors”, page 408

6 - Injector, cylinder 4 - N33-

- ❑ ⇒ “3.1 Assembly overview - injectors”, page 394
- ❑ ⇒ “3.3 Adapting correction values for injectors”, page 397
- ❑ ⇒ “3.4 Testing injectors”, page 397

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- ⇒ “3.5 Checking return flow rate of injectors with engine running”, page 397
- ⇒ “3.6 Checking return flow rate of injectors at starter speed”, page 402
- ⇒ “3.7 Testing jammed-open injectors”, page 406
- ⇒ “3.8 Removing and installing injectors”, page 408

7 - Fuel pressure regulating valve - N276-

- Assembly overview ⇒ page 396

8 - Charge air pressure sender - G31-

- Assembly overview ⇒ page 362

9 - Charge air temperature sender before charge air cooler - G810-

- Assembly overview ⇒ page 424

10 - Glow plug

- Glow plug 4 - Q13-
- Depending on the vehicle model, there is a combustion chamber pressure sender integrated in the glow plug
- Cylinder 4 combustion chamber pressure sender - G680-
- Assembly overview ⇒ page 581

11 - Glow plug

- Glow plug 3 - Q12-
- Depending on the vehicle model, there is a combustion chamber pressure sender integrated in the glow plug
- Cylinder 3 combustion chamber pressure sender - G679-
- Assembly overview ⇒ page 581

12 - Charge air temperature sender after charge air cooler - G811-

- Assembly overview ⇒ page 424

13 - Hall sender - G40-

- Camshaft position sensor
- Assembly overview ⇒ page 581

14 - Glow plug

- Glow plug 2 - Q11-
- Depending on the vehicle model, there is a combustion chamber pressure sender integrated in the glow plug
- Cylinder 2 combustion chamber pressure sender - G678-
- Assembly overview ⇒ page 581

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

15 - Fuel temperature sender

- Different types of senders may be installed depending on the vehicle model.

◆ Fuel temperature sender - G81-

◆ Temperature and pressure sender for low-pressure fuel system - GX20-

- ⇒ “6.10 Removing and installing fuel temperature sender G81 ”, page 449
- ⇒ “6.12 Removing and installing temperature and pressure sender for low-pressure fuel system GX20 ”, page 453

16 - Glow plug

- Glow plug 1 - Q10-
- Depending on the vehicle model, there is a combustion chamber pressure sender integrated in the glow plug
- Cylinder 1 combustion chamber pressure sender - G677-
- Assembly overview ⇒ page 581

17 - Coolant valve for cylinder head - N489-

- Fitting location ⇒ page 378

18 - Fuel pressure sensor - G247-

- ❑ Assembly overview ⇒ page 396

1.2.4 Fitting location overview - front view of engine

1 - Valve for oil pressure control - N428-

- ❑ Removing and installing ⇒ page 194

2 - Exhaust gas recirculation valve 1 - GX5-

- ❑ Depending on vehicle
- ❑ Consisting of: Potentiometer for exhaust gas - G212- and control motor for exhaust gas - V338-
- ❑ Removing and installing ⇒ page 574
- ❑ Assembly overview ⇒ page 562

3 - Camshaft control valve 1 - N205-

- ❑ Depending on vehicle
- ❑ Assembly overview ⇒ page 145

4 - Throttle valve control mechanism - J338-

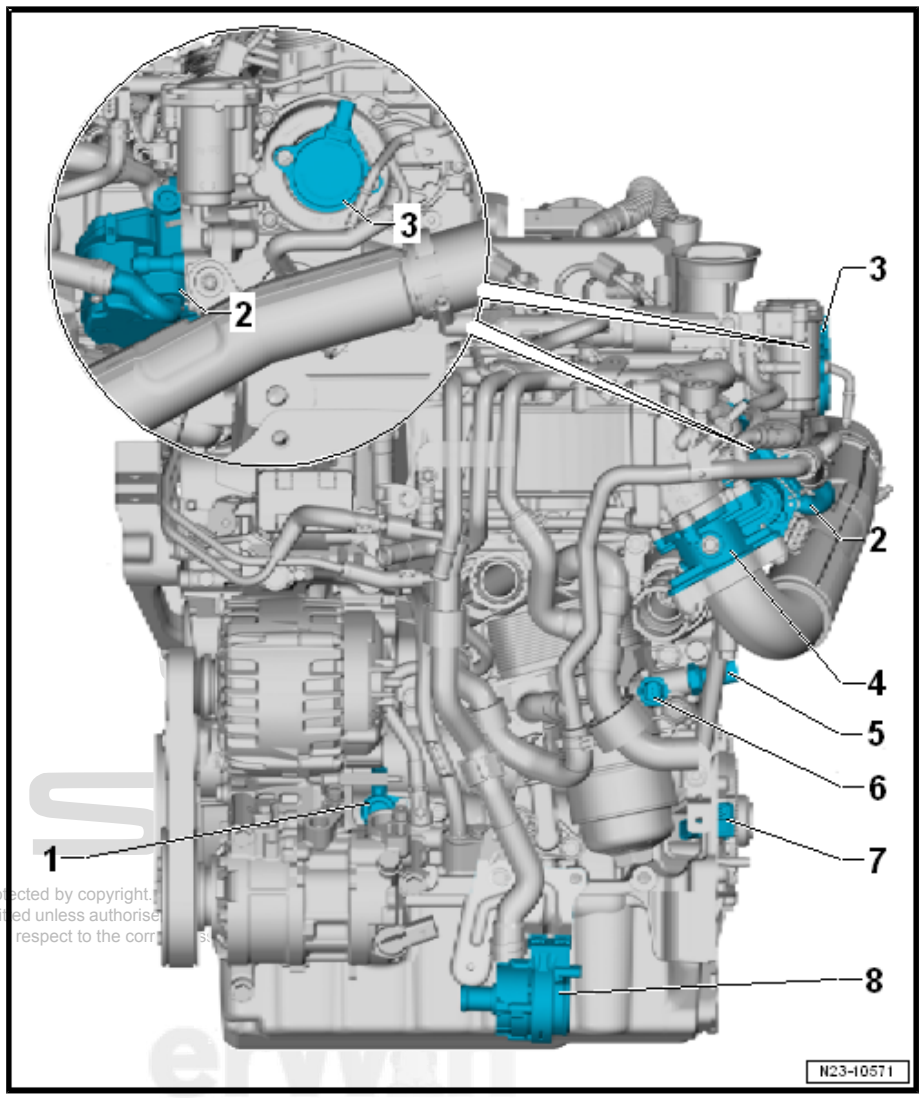
- ❑ With throttle valve potentiometer - G69-
- ❑ Assembly overview ⇒ page 424

5 - Oil pressure switch for reduced oil pressure - F378-

- ❑ Assembly overview ⇒ page 187

6 - Oil pressure switch - F1-

- ❑ Assembly overview ⇒ page 187



Protected by copyright. permitted unless authorised respect to the corr

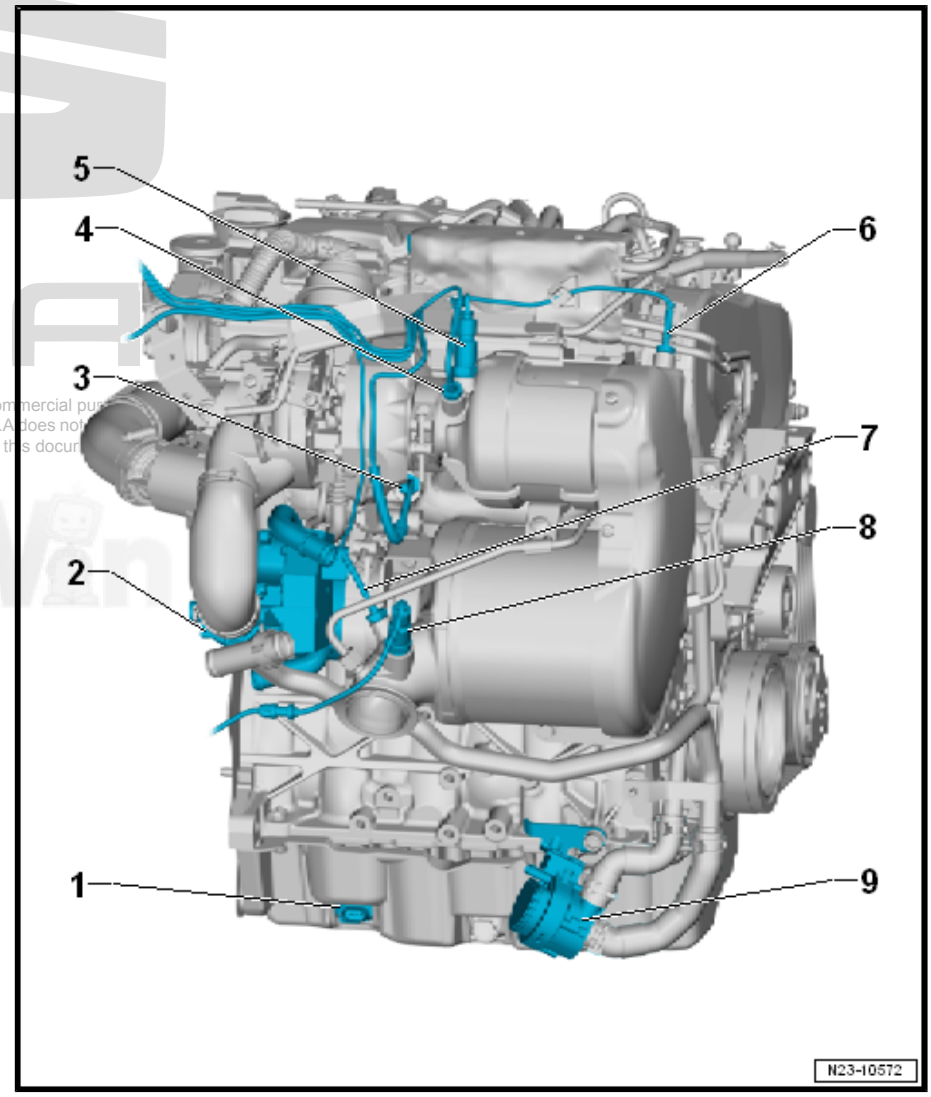
7 - Engine speed sensor - G28-

- ❑ Assembly overview ⇒ page 581

8 - Charge air cooling pump - V188-

- ❑ Assembly overview ⇒ page 250

1.2.5 Fitting location overview - rear view of engine, vehicles without selective catalytic reduction



1 - Oil level/oil temperature sensor - G266-

- ❑ Assembly overview ⇒ page 166

2 - Exhaust gas recirculation valve 2 - GX6-

- ❑ Consisting of: Potentiometer 2 for exhaust gas - V339- and control motor 2 for exhaust gas - G466-
- ❑ Assembly overview ⇒ page 562

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document.

3 - Exhaust gas temperature sender 1 - G235-

- ❑ Assembly overview ⇒ page 466

4 - Exhaust gas temperature sender 2 - G448-

- ❑ Depending on vehicle
- ❑ Assembly overview ⇒ page 466
- ❑ Electrical connector of the exhaust gas temperature sender 2 - G448- ⇒ page 387

5 - Lambda probe 1 before catalytic converter - GX10-

Comprising: lambda probe - G39- with lambda probe heating - Z19- .

- ❑ Assembly overview ⇒ page 466

6 - Exhaust gas temperature sender 3 - G495-

- ❑ Assembly overview ⇒ page 466

7 - Exhaust gas temperature sender 4 - G648-

- ❑ Assembly overview ⇒ page 466

8 - Lambda probe 1 after catalytic converter - GX7-

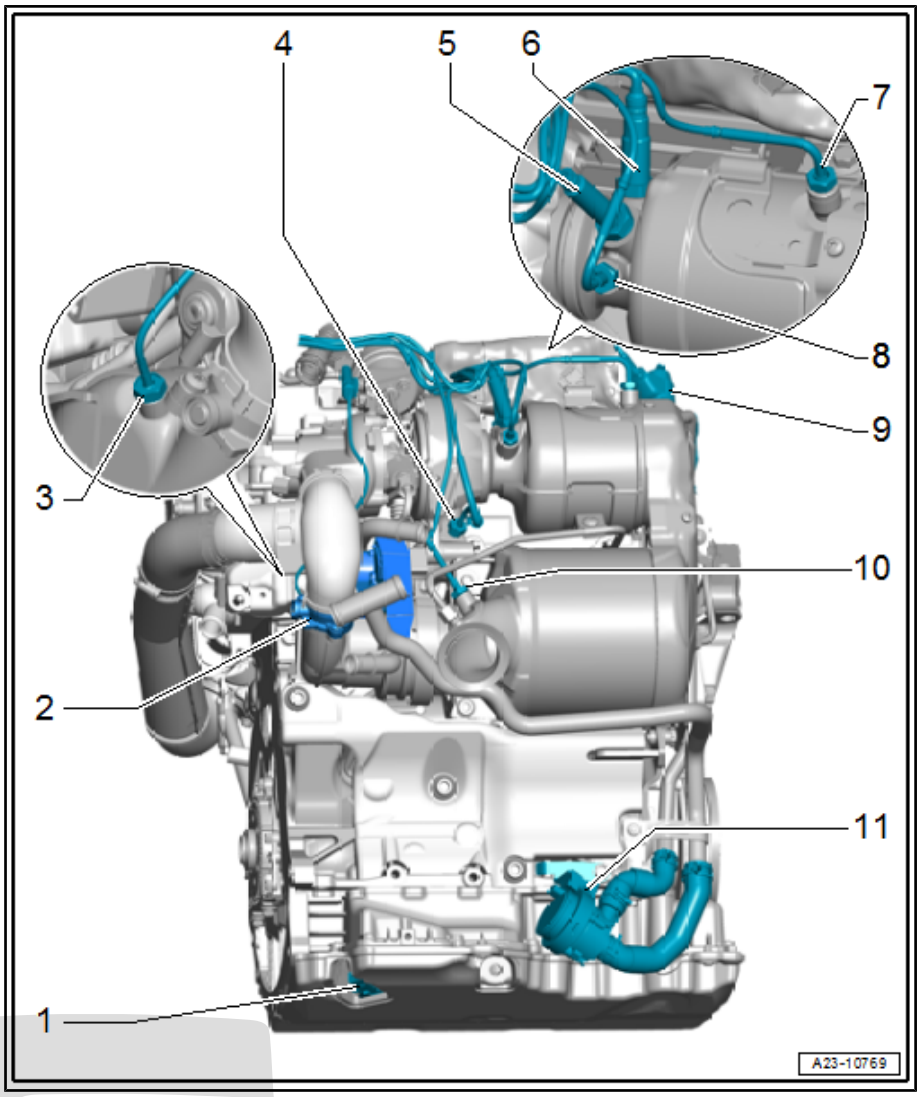
Consisting of: Lambda probe after catalytic converter - G130- and Heater for lambda probe 1, after catalytic converter - Z29-

- ❑ Does not apply for all vehicles
- ❑ Assembly overview ⇒ page 466
- ❑ Electrical connector for lambda probe 1 after catalytic converter - GX7- ⇒ page 387 .

9 - Auxiliary pump for heating - V488-

- ❑ Assembly overview ⇒ page 246

1.2.6 Fitting location overview - rear view of engine, vehicles with selective catalytic reduction



1 - Oil level/oil temperature sensor - G266-

- ❑ Assembly overview ⇒ page 166

2 - Exhaust gas recirculation valve 2 - GX6-

- ❑ Consisting of: Potentiometer 2 for exhaust gas - V339- and control motor 2 for exhaust gas - G466-
- ❑ Assembly overview ⇒ page 562

3 - Exhaust gas recirculation temperature sensor - G98-

- ❑ Depending on vehicle
- ❑ Removing and installing ⇒ page 577
- ❑ 45 Nm

4 - Exhaust gas temperature sender 1 - G235-

- ❑ Assembly overview ⇒ page 466

5 - NOx sender control unit - GX30-

- ❑ Comprising: NOx sender - G295- with control unit for NOx sender - J583-
- ❑ Assembly overview ⇒ page 466
- ❑ Removing and installing ⇒ page 451

6 - Lambda probe 1 before catalytic converter - GX10-

Comprising: lambda probe - G39- with lambda probe heating - Z19- .

- ❑ Assembly overview ⇒ page 466
- ❑ Electrical connector for Lambda probe - G39- ⇒ page 387

7 - Exhaust gas temperature sender 3 - G495-

- ❑ Assembly overview ⇒ page 466
- ❑ Electrical connector of the exhaust gas temperature sender 3 - G495- ⇒ page 387

8 - Exhaust gas temperature sender 2 - G448-

- ❑ Assembly overview ⇒ page 466
- ❑ Electrical connector of the exhaust gas temperature sender 2 - G448- ⇒ page 387

9 - Injector for reduction agent - N474-

- ❑ Removing and installing ⇒ page 537

10 - Exhaust gas temperature sender 4 - G648-

- ❑ Does not apply for all vehicles
- ❑ Assembly overview ⇒ page 466

Copyright SEAT S.A. Copies for non-commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the information in this document. Copyright by SEAT S.A.

❑ Electrical connector of the exhaust gas temperature sender 4 - G648- ⇒ page 387

11 - Auxiliary pump for heating - V488-

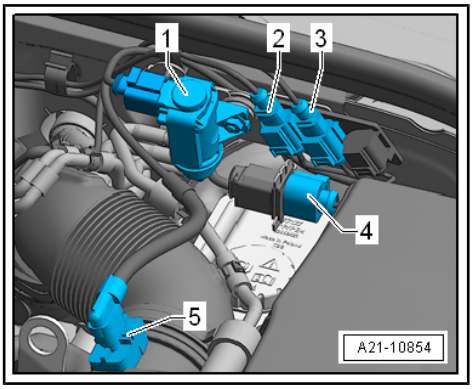
❑ Assembly overview ⇒ page 250

1.2.7 Fitting location overview - electrical connectors

⇒ Fig. ""Version 1"" , page 387

⇒ Fig. ""Version 2"" , page 387

Version 1



1 - Charge pressure control solenoid valve - N75-

2 - Exhaust gas temperature sender 4 - G648-

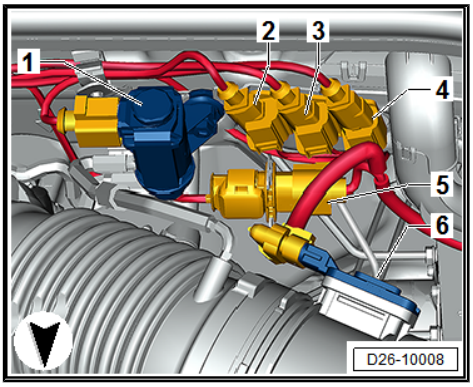
3 - Exhaust gas temperature sender 3 - G495-

4 - Lambda probe 1 before catalytic converter - GX10-

5 - Air mass meter - G70-

Protected by Copyright. Copying for private or commercial purposes is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the accuracy of information in this document. Copyright by SEAT S.A.

Version 2



1 - Charge pressure control solenoid valve - N75-

2 - Exhaust gas temperature sender 4 - G648-

3 - Exhaust gas temperature sender 3 - G495-

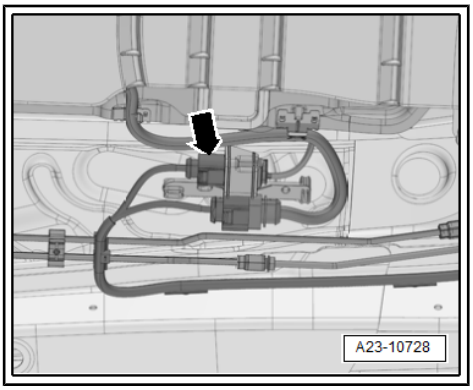
4 - Exhaust gas temperature sender 2 - G448-

5 - Lambda probe 1 before catalytic converter - GX10-

6 - Air mass meter - G70-

Fitting location of connector for Lambda probe 1 after catalytic converter - GX7-

- Beneath the left-hand central element of the powertrain guard -arrow-



1.3 Filling and bleeding fuel system

NOTICE

The high-pressure pump has very close tolerances and must not be allowed to run without fuel. To prevent this and to enable the engine to start quickly after parts have been renewed, it is important to observe the following:

- **If components of the fuel system between the fuel tank and the high-pressure pump have been removed or renewed, the fuel system must be filled and bled before the engine is started for the first time.**

Special tools and workshop equipment required

- Vehicle diagnosis tester

Proceed as follows to fill high-pressure pump with fuel:

- The vehicle must be fuelled up.

– Connect vehicle diagnostic tester .

– Switch on ignition and select the following menu item in the vehicle diagnostic and service information system :

- `Self-diagnosis-capable systems`
- `0001 - Engine electronics, functions`
- `0001 - Activate fuel pump`
- `Bleeding fuel system`

- The fuel pump starts running.
- The fuel pump must run for approx. 3 minutes to ensure that the high-pressure pump is filled with sufficient fuel.

– Start the engine after filling the fuel system.

– Allow engine to run at average revs for a few minutes and then turn off.

– Check fuel system for leaks.

– Erase entry in event memory using vehicle diagnostic tester .

– Then test drive the vehicle, accelerating to full throttle at least once.

– Then inspect high-pressure section of fuel system again for leaks.

Note

If there is any air left in the fuel system, the engine may switch to the backup mode ('emergency running' mode) during the road test. Switch off the engine and erase the event memory. Then continue road test.

– Erase entry in event memory using vehicle diagnostic tester .

1.4 Checking fuel system for leaks

– Start engine and run at idling speed for a few minutes. Do not press the accelerator at this time and then shut off the engine again (fuel system bleeds itself).

– Check fuel system for leaks .

SEAT
The reproduction of this document for commercial purposes, in part or in whole, is not permitted without prior authorization by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.
erWin

– If leaks are found although the connections have been tightened to the correct torque, the relevant component must be renewed.
– Then test drive the vehicle, accelerating to full throttle at least once.
– Then inspect high-pressure section of fuel system again for leaks.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

2 Vacuum system

⇒ “2.1 Schematic diagram - vacuum system”, page 390

⇒ “2.2 Removing and installing vacuum line”, page 391

⇒ “2.3 Checking vacuum system”, page 393

2.1 Schematic diagram - vacuum system

1 - Vacuum line

- ❑ Installation position ⇒ page 390
- ❑ Removing and installing ⇒ page 391

2 - Non-return valve

- ❑ Observe installation position

3 - Cylinder head cover:

- ❑ With vacuum reservoir

4 - Vacuum unit

- ❑ For charge pressure regulation
- ❑ On turbocharger.

5 - Control pipe for vacuum

- ❑ From charge pressure control solenoid valve - N75- to vacuum unit on turbocharger

6 - Charge pressure control solenoid valve - N75-

7 - To brake servo

8 - Non-return valve

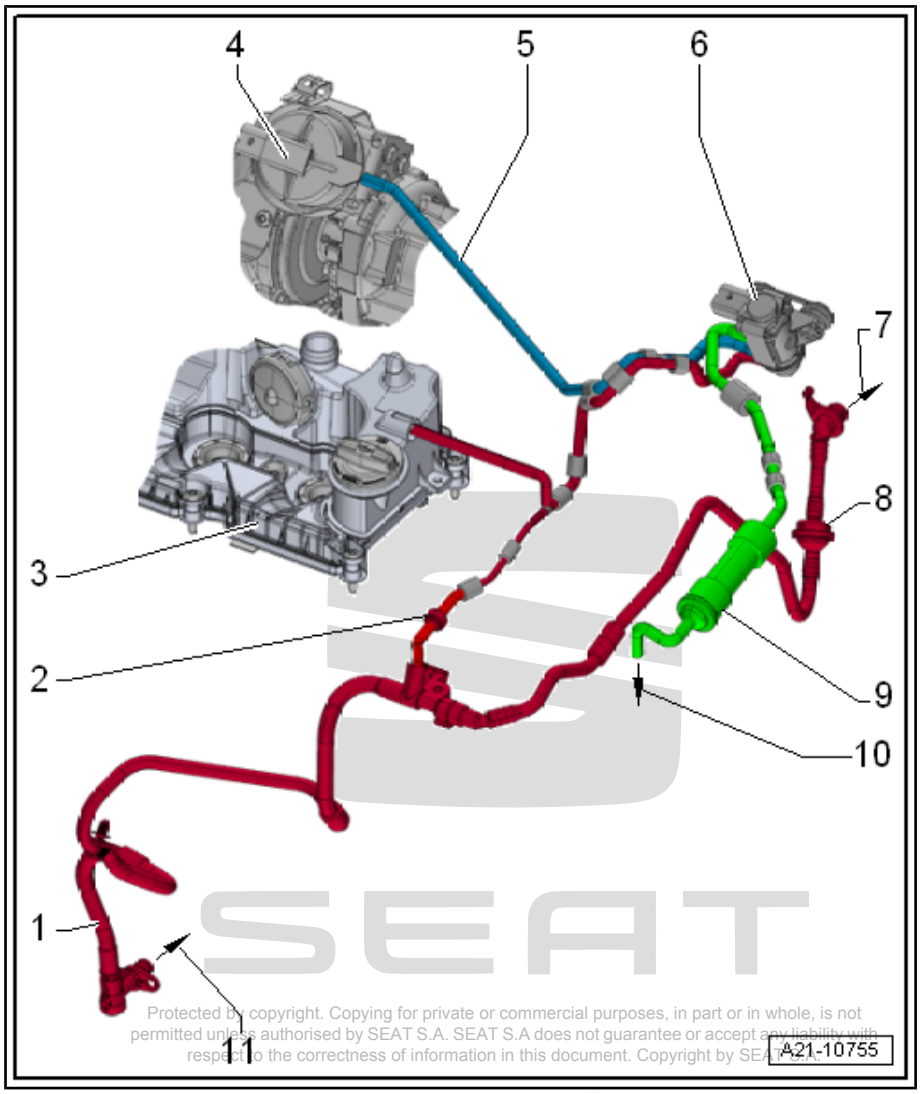
- ❑ Observe installation position

9 - Vent pipe

10 - To air filter housing

11 - To vacuum pump

- ❑ To the oil pump ⇒ page 166

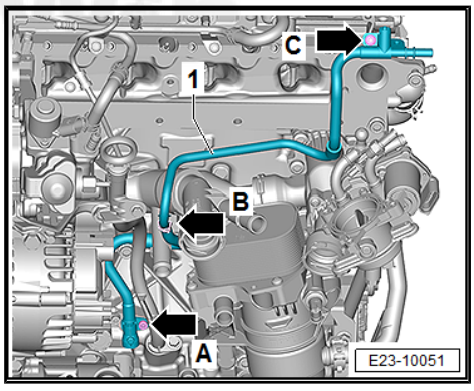


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Installation position of vacuum line

A - Bolt, 8 Nm

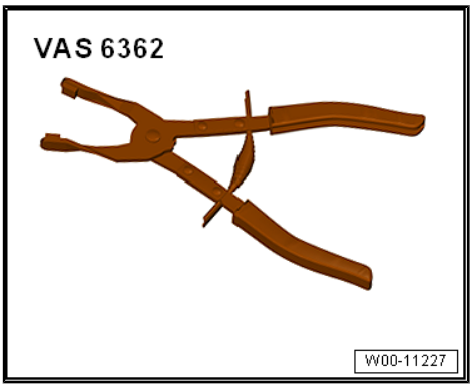
B - Support bracket



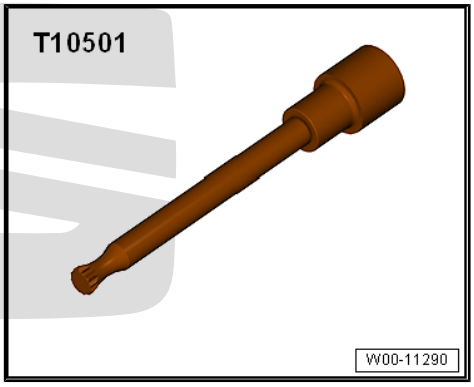
2.2 Removing and installing vacuum line

Special tools and workshop equipment required

- Hose clip pliers - VAS 6362-

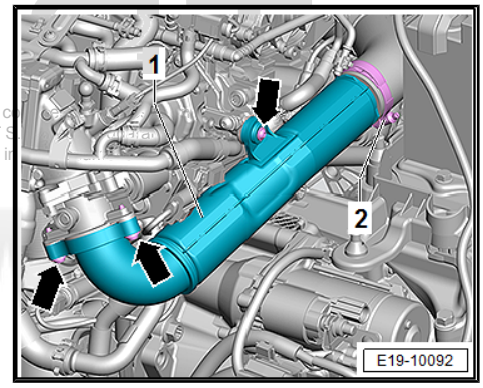


- Socket insert XZN 10 - T10501-

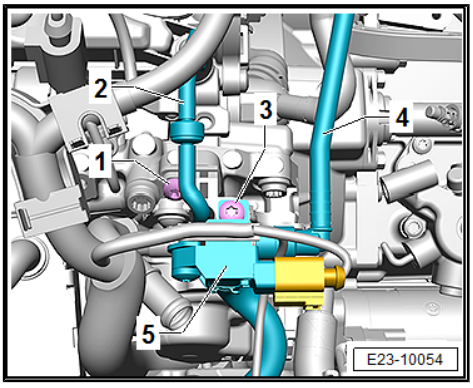


Removing

– Remove radiator cowl ⇒ page 317 .
– Remove coolant pipes (top front) ⇒ page 283 .
– Remove bolts -arrows-.
– Release screw-type clip -2- and detach air pipe -1-.

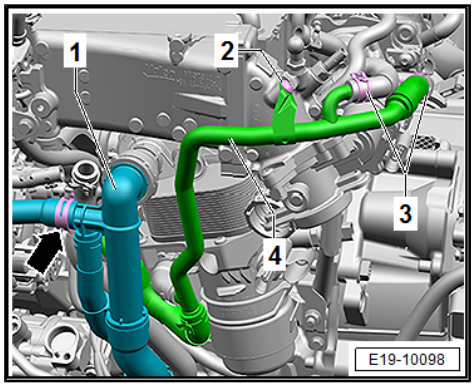


– Remove the vacuum hose -4- by releasing the catch.
– Unplug vacuum hose -2-.
– Unscrew bolts -1- and -3-.
– Slide the charge pressure sender - G31- -5- to one side.

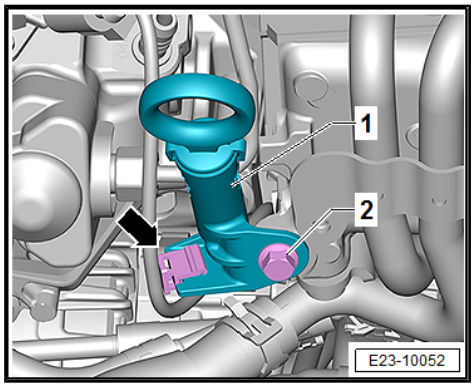


Copyright. Copying for private or c permitted unless authorised by SEAT S.A. SEAT S respect to the correctness of information in

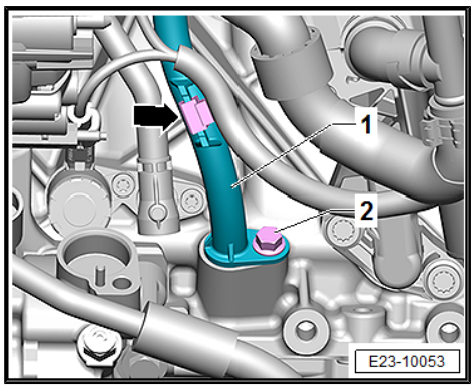
– Loosen the hose clips -3-, remove the coolant hoses.
– Unscrew the bolt -2- and place the front left coolant tube to one side.
– Release the retaining clip, and pull off the seal connections -1-.
– Loosen hose clip -arrow- and remove coolant hose.



– Unclip the electrical connecting lead of the guide tube for oil dipstick -arrow-.
– Remove the bolt -2- of the dipstick guide tube -1-.
– Disconnecting the charge air cooling pump - V188- from engine to gain space ⇒ page 263 .



– Unclip the electrical connecting lead of the guide tube for oil dipstick -arrow-.
– Unscrew the bolt -2- and remove the dipstick guide tube -1-.

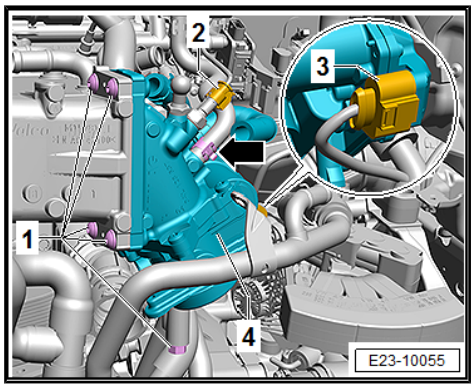


– Disconnect electrical connectors:

2 - For charge air temperature sender before charge air cooler - G810-

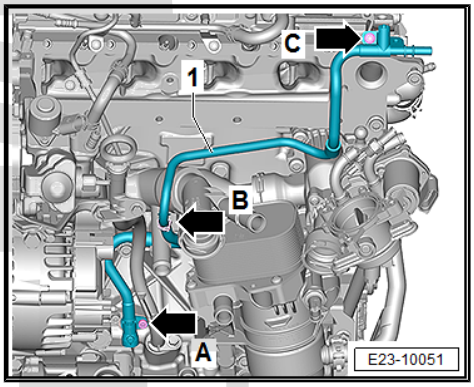
3 - for throttle valve control unit - J338-

– Loosen hose clip -arrow- and remove the air hose.
– Unscrew the bolts -1- and remove the seal connections -4- with the throttle valve module - J338- .



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Remove bolt -A- from the vacuum hose -1-.
– Unclip the vacuum hose -B- and remove.



Installing

Install in reverse order of removal, observing the following.

Note

- *O-ring must be renewed if removed*
- *Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .*

– Install engine cover panel ⇒ page 56 .
– Add coolant ⇒ page 214 .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

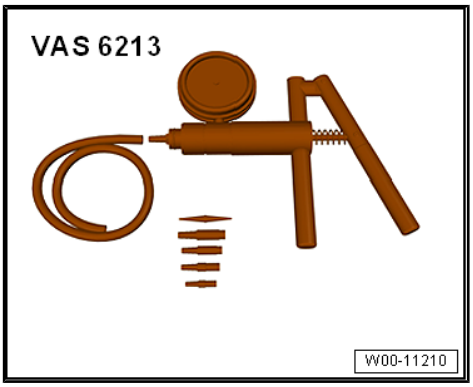
Specified torques

- ⇒ “3.1 Assembly overview - coolant pipes”, page 282
- ⇒ “2.1 Schematic diagram - vacuum system”, page 390
- ⇒ “1.1 Assembly overview - sump, oil pump”, page 166
- ⇒ “5.1 Assembly overview - intake manifold”, page 424

2.3 Checking vacuum system

Special tools and workshop equipment required

- Hand vacuum pump - VAS 6213-



Procedure

– Check all vacuum lines in the complete vacuum system for:
- Cracks
- Traces of animal bites
- Kinked or crushed lines
- Lines porous or leaking

– Check vacuum line to solenoid valve and from solenoid valve to corresponding component.
– If an entry is stored in the event memory, check all vacuum lines leading to the corresponding component and also check the remaining vacuum lines leading to other components.
– If it is not possible to build up a vacuum with the hand vacuum pump - VAS 6213- or if the vacuum pressure drops again immediately, check the hand vacuum pump and connecting hoses for leaks.

3 Injectors and high-pressure accumulator (fuel rail)

⇒ “3.1 Assembly overview - injectors”, page 394

⇒ “3.2 Assembly overview - high-pressure accumulator (fuel rail)”, page 396

⇒ “3.3 Adapting correction values for injectors”, page 397

⇒ “3.4 Testing injectors”, page 397

⇒ “3.5 Checking return flow rate of injectors with engine running”, page 397

⇒ “3.6 Checking return flow rate of injectors at starter speed”, page 402

⇒ “3.7 Testing jammed-open injectors”, page 406

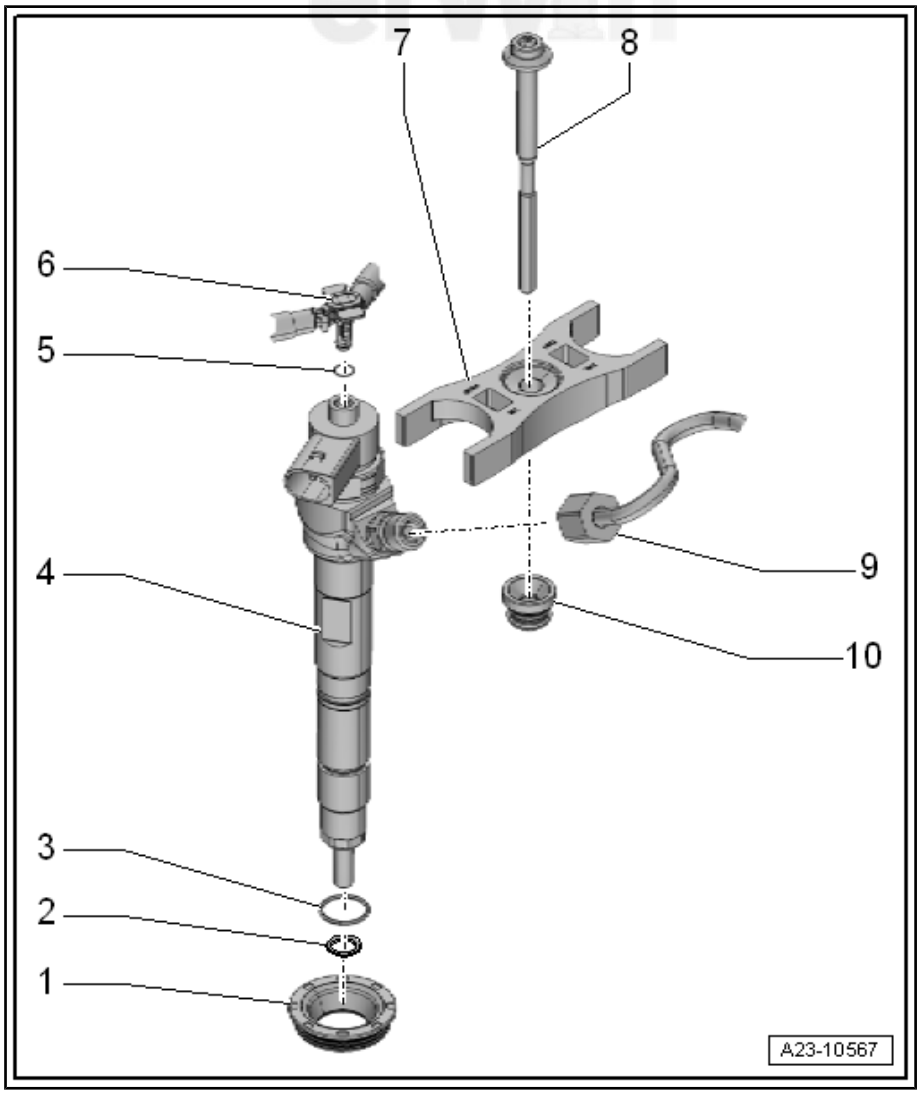
⇒ “3.8 Removing and installing injectors”, page 408

⇒ “3.9 Removing and installing high-pressure pipes”, page 413

⇒ “3.10 Removing and installing fuel rail (rail)”, page 416

Reproduction or copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

3.1 Assembly overview - injectors



1 - Radial oil seal

- ❑ In cylinder head cover
- ❑ Renew after removal ⇒ page 115

2 - Copper washer

- ❑ Renew after removal

3 - O-ring

- ❑ Renew after removal

4 - Injector

- ❑ If they are to be reinstalled, the injectors and high-pressure lines must always be reinstalled on the same cylinder.
- ❑ Removing and installing ⇒ page 408

5 - O-ring

- ❑ Renew after removal

6 - Fuel return

- ❑ To fuel tank
- ❑ Must not be kinked, damaged or clogged
- ❑ Do not dismantle
- ❑ Fill and bleed fuel system after renewing ⇒ page 388

7 - Clamping piece

- ❑ Installation position ⇒ Fig. ““Installation position clamping piece, variant 1”“ , page 395

- ❑ Installation position
  ⇒ Fig. ""Installation position of clamping piece, version 2 for engine codes CXXA, CXXB, DDYA, DDYB, and DGTB"" , page 395

8 - Bolt

- ❑ Renew after removal
- ❑ 8 Nm +270°

9 - High-pressure pipe

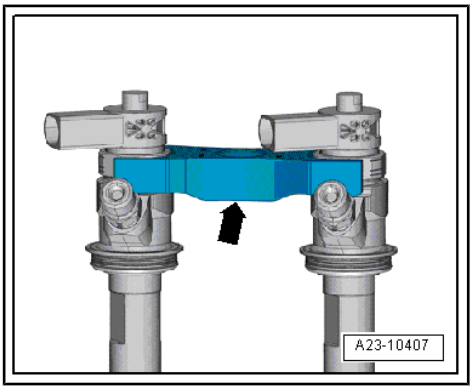
- ❑ Between high-pressure reservoir and injectors
- ❑ Observe all instructions for installing high-pressure pipes
  ⇒ "3.9.2 Installing high-pressure pipe", page 414
- ❑ Install so that component is not stressed.
- ❑ Install vibration damper ⇒ page 416 .
- ❑ 28 Nm

10 - Sleeve

- ❑ In cylinder head cover
- ❑ Renew if damaged

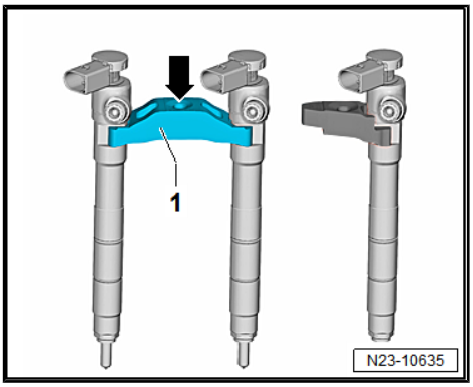
Installation position clamping piece, variant 1

- Each clamping piece secures two injectors.
- The bulge -arrow- of the clamping piece should point downwards.



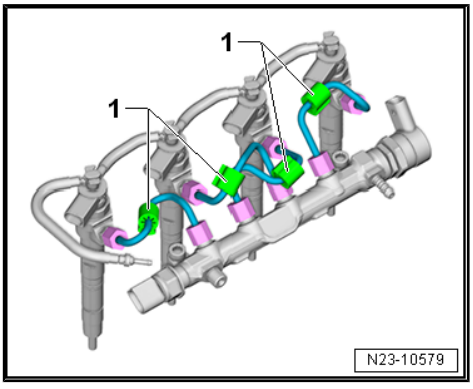
Installation position of clamping piece, version 2 for engine codes CXXA, CXXB, DDYA, DDYB, and DGTB

- Each clamping piece secures two injectors.
- The -arrow- faces towards the thick part of clamping piece -1-.
- Thick part faces upwards.



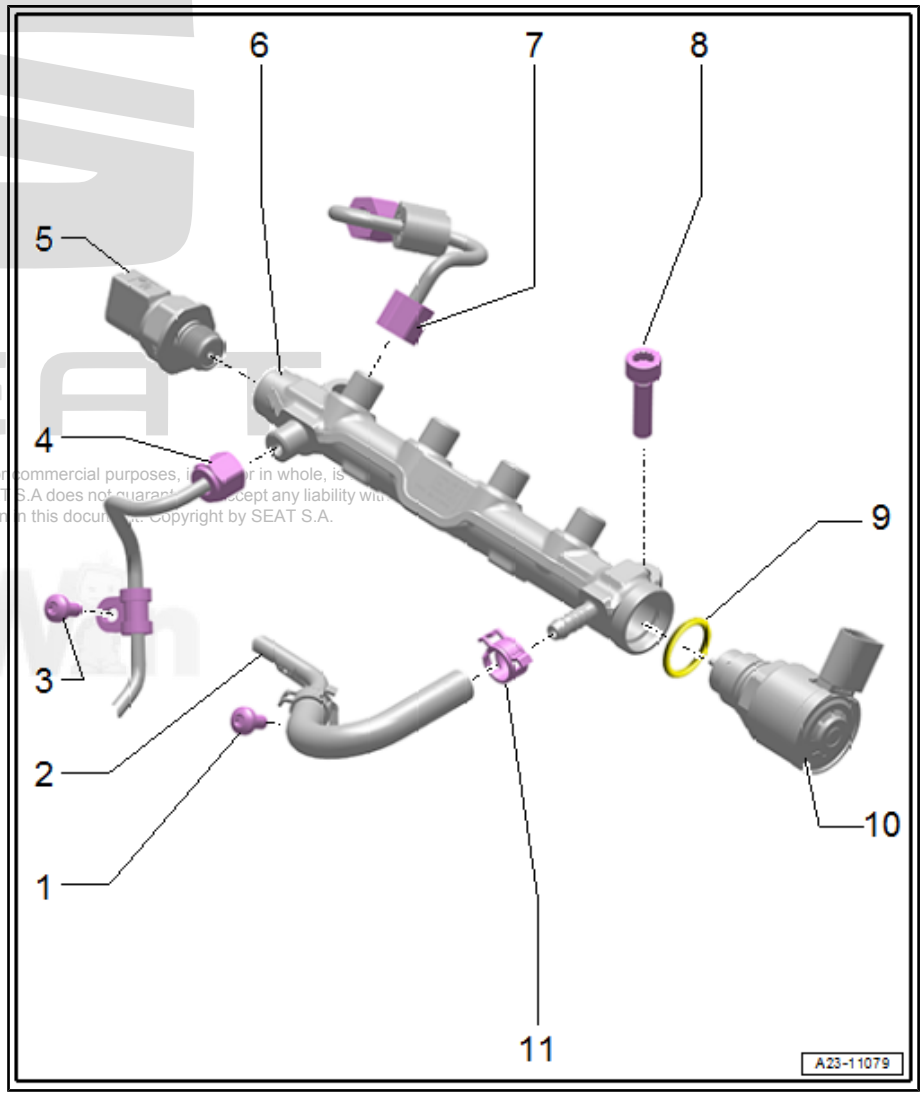
Fit vibration damper in the high-pressure lines

– Fit vibration damper -1- in the high-pressure lines.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

3.2 Assembly overview - high-pressure accumulator (fuel rail)



1 - Bolt
- ❑ 8 Nm

2 - Fuel return hose

3 - Bolt
- ❑ 8 Nm

4 - High-pressure pipe
- ❑ Between high-pressure reservoir and injectors
- ❑ Observe all instructions for installing high-pressure pipes ⇒ “3.9.2 Installing high-pressure pipe”, page 414
- ❑ 28 Nm

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

5 - Fuel pressure sensor - G247-
- ❑ Removing and installing ⇒ page 439
- ❑ Can be re-used ⇒ page 440
- ❑ 100 Nm

6 - High-pressure accumulator (Common Rail)
- ❑ Removing and installing ⇒ page 416

7 - High-pressure pipe
- ❑ Between high-pressure reservoir and injectors
- ❑ Observe all instructions for installing high-pressure pipes ⇒ “3.9.2 Installing high-pressure pipe”, page 414
- ❑ Attach the vibration dampers ⇒ page 395
- ❑ 28 Nm

8 - Bolt
- ❑ 20 Nm

9 - O-ring
- ❑ Renew after removal

10 - Fuel pressure regulating valve - N276-
- ❑ Removing and installing ⇒ page 432
- ❑ Renew after removal
- ❑ 80 Nm
- ❑ After renewing, adapt learnt values using vehicle diagnostic tester

11 - Spring-type clip
- ❑ Renew after removal

3.3 Adapting correction values for injectors

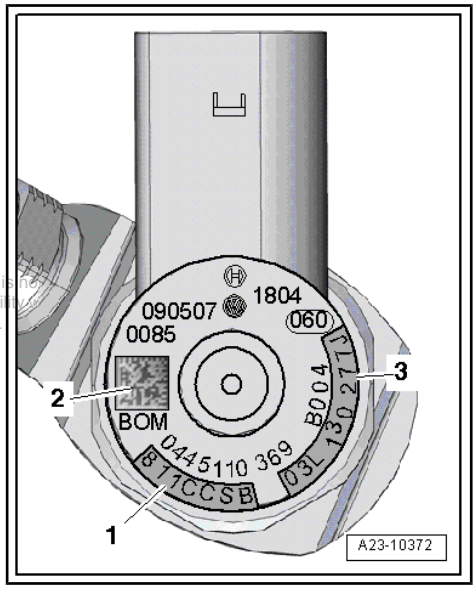
- The “Injector delivery calibration values” function serves to correct the injection rates for each cylinder of a common rail system individually across the entire operating range.
- The 7-digit adaption values are marked on each injector. The values may consist of letters and/or numbers.

Injector (view from above)

1 - Adaption value (checksum; details in illustration are only an example)

2 - DATA Matrix Code

3 - Part number



- After renewing an injector, the adaptation value must be written into the engine control unit.
- After renewing the engine control unit, the “adaptation values for the injectors” must be transferred to the new engine control unit.
- Also check that the injector delivery calibration values are correctly entered for all other injectors. Do NOT attempt to re-enter these values if the correct values are already stored in the engine control unit.
- The adaption procedure is described in the “Guided Fault Finding”/“Guided Functions” ⇒ Vehicle diagnostic tester.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

3.4 Testing injectors

There are 3 different methods for testing the injectors.

- ⇒ “3.3 Adapting correction values for injectors”, page 397
- ⇒ “3.5 Checking return flow rate of injectors with engine running”, page 397
- ⇒ “3.6 Checking return flow rate of injectors at starter speed”, page 402

3.5 Checking return flow rate of injectors with engine running

Allocation injection system ⇒ page 6

⇒ “3.5.1 With the engine running, check the return quantity of the injector, vehicles with Bosch injector system”, page 397

⇒ “3.5.2 With the engine running, check the return quantity of the injector, vehicles with Delphi injector system”, page 400

3.5.1 With the engine running, check the return quantity of the injector, vehicles with Bosch injector system

A - Checking return flow rate of all injectors

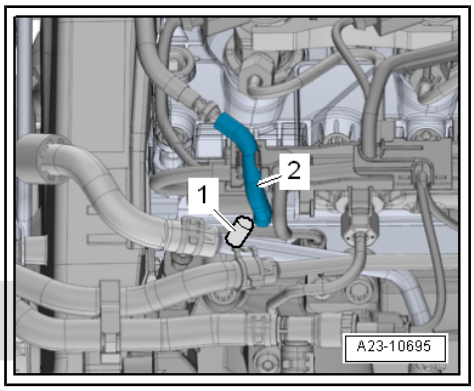
Special tools and workshop equipment required

♦ Measuring container, fuel-resistant

Procedure

– Remove engine cover panel ⇒ page 56 .

– Disconnect hose connection -2- at fuel return line.



NOTICE

Risk of malfunction due to soiling.

♦ ⇒ “3.1 Rules for cleanliness”, page 17 .

– Close the return connection with a suitable blind plug -1- and secure with a securing clip.

– Hold end of fuel return hose -2- (lengthen if necessary) in a measuring container to measure the total return flow rate.

– Start engine and allow to idle for 2 minutes.

• Specified value after 2 minutes: 0 ml to 50 ml

– If reading matches specification: increase engine speed to between 2,000 and 2,500 rpm for approx. 2 minutes. Then, check return flow rate again.

• Specified amount in 2 minutes: less than 250 ml

If specification is exceeded, this indicates that one or more injectors are defective. Checking return flow rate of each individual injector.

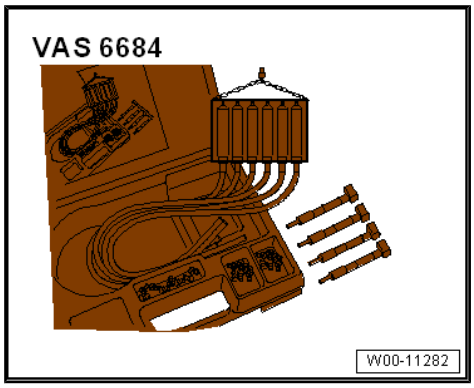
B - Checking return flow rate of individual injectors

Special tools and workshop equipment required

♦ Hose clamps, up to Ø 25 mm - 3094-

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

♦ Adapter C6 from return flow meter - VAS 6684-



Procedure

Note

Each injector normally has a relatively low return flow rate. If the return flow rate at one injector is relatively high compared to the other injectors, that injector is probably defective.

NOTICE

Risk of malfunction due to soiling.

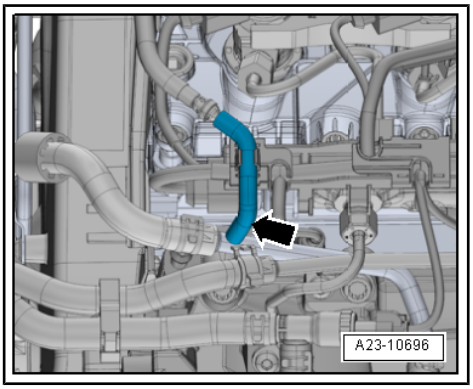
- ⇒ “3.1 Rules for cleanliness”, page 17 .

– Clean all return line connections (e.g. with standard commercially available cold cleaning solvent) before removing them.

– Dry all cleaned parts.

– Clamp off fuel return hose -arrow- using hose clamp up to 25 mm - 3094- .

– Remove the sound insulation.

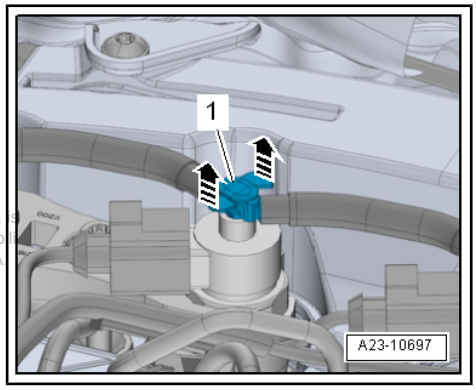


Note

Ensure cleanliness. No dirt must be allowed to enter the disconnected fuel return lines or the open connections on the injectors.

– Unlock the middle section of the connections of the return line in -direction of arrow-.

– Pull release tabs upwards -arrows- and pull return line connections off injectors.



Continued for all vehicles

– Fit adapter C6 from return flow meter - VAS 6684- firmly onto return line connections of all 4 injectors.

– Connect hose lines of return flow meter - VAS 6684- to adapters.

– Start engine and allow to idle for several minutes.

NOTICE

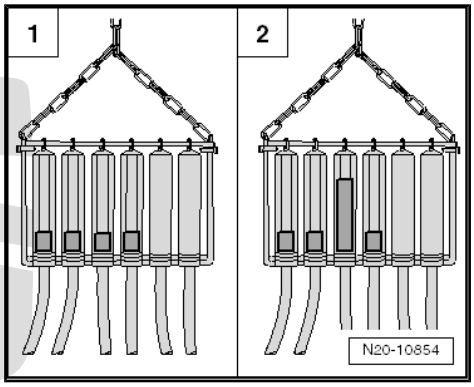
Avoid damage to injectors after return lines have been pulled off.

- **Do not add any gas during the inspection The engine must always be idling.**

– When the engine is at operating temperature and running at idling speed, the return flow rates at each of the 4 return lines must not differ by more than a small amount (example -1-).

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– If one injector has a significantly higher return flow rate than the others (example -2-), Replace the relevant injector ⇒ page 408 .



Installing fuel return lines

– Carefully press connections of return lines onto injectors. You should hear them click into place. Then press the release pin downwards carefully.

– Install engine cover panel ⇒ page 56 .

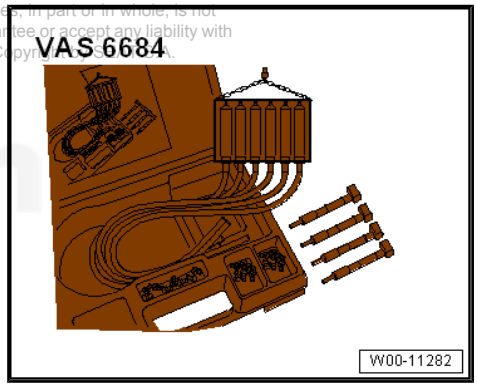
– Check fuel system for leaks ⇒ page 388 .

3.5.2 With the engine running, check the return quantity of the injector, vehicles with Delphi injector system

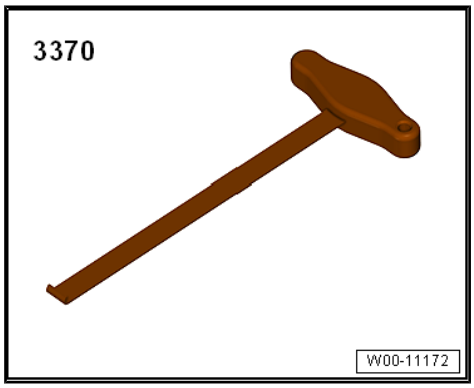
Special tools and workshop equipment required

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright SEAT S.A.

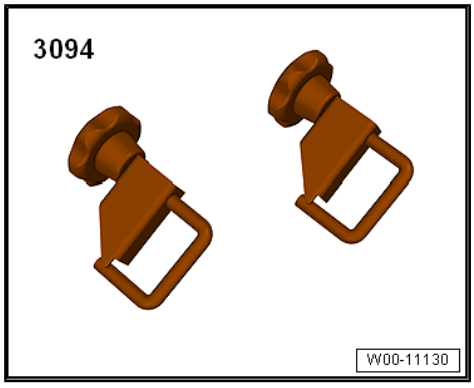
♦ Return flow meter - VAS 6684-



♦ Front-end hook - 3370-



♦ Hose clamps, up to Ø 25 mm - 3094-



– Remove engine cover panel ⇒ page 56 .

Note

Each injector normally has a relatively low return flow rate. If the return flow rate at one injector is relatively high compared to the other injectors, that injector is probably defective.

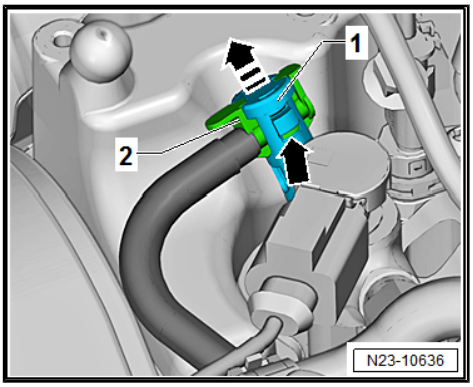
– Clean all return line connections (e.g. with standard commercially available cold cleaning solvent) before removing them.

– Dry all cleaned parts.

Note

Never lever out the injectors with a screwdriver, and never attempt to support a screwdriver on the solenoid valves.

– Fit front end hook - 3370- into recess at bottom -arrow-, and release centre piece of return line connections in -direction of arrow-.



Note

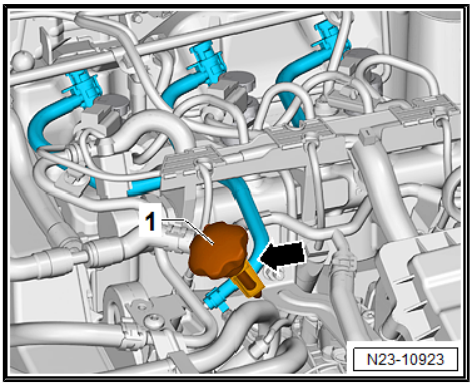
Ensure cleanliness. No dirt must be allowed to enter the disconnected fuel return lines or the open connections on the injectors.

– Carefully pull of the return line connectors on the two lugs of the injector.

– Clamp the return line at the point indicated -arrow- with a hose clamp up to 25 mm - 3094- -1-.

– Push the hoses of the return quantity measuring device - VAS 6684- directly onto the return line connectors of the injector without an adapter.

– Start engine.

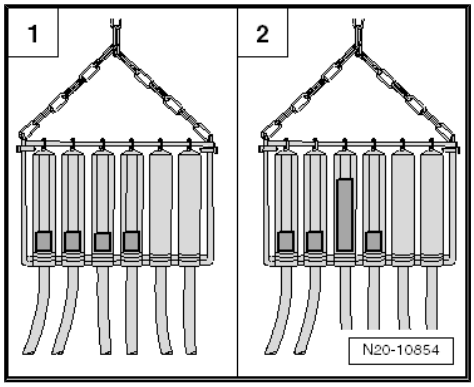


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Speed.	Duration of measurement	Threshold value (max.) per injector	Corresponds to scale VAS 6684
Idling speed	4 minute	25 ml	Between the second and third scal division from the top
2500 rpm	2 minute	35 ml	Measuring cylinder completely filled

– When the engine is at operating temperature and running at idling speed, the return flow rates at each of the 4 return lines must not differ by more than a small amount (example -1-).

– If the injector has a considerably increased return quantity in comparison with example -2-, the injector must be replaced ⇒ page 408 .



Installing fuel return lines

– Check the return line connections for damage. If one or more fastening lugs are damaged, the return line must be renewed.

– Carefully press connections of return lines onto injectors. You should hear them click into place. Then press the central element downwards.

– Install engine cover panel ⇒ page 56 .

3.6 Checking return flow rate of injectors at starter speed

Allocation injection system ⇒ page 6

⇒ “3.6.1 With the cranking speed check the return quantity of the injector, vehicles with Bosch injector system”, page 402

⇒ “3.6.2 With the cranking speed check the return quantity of the injector, vehicles with Delphi injector system”, page 404

3.6.1 With the cranking speed check the return quantity of the injector, vehicles with Bosch injector system

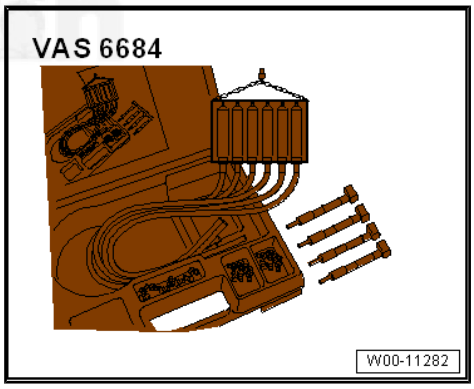
Note

If the engine cannot be started, the return flow rate of the injectors can also be checked at starter motor speed.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Special tools and workshop equipment required

♦ Adapter C6 from return flow meter - VAS 6684-



Procedure

Note

Each injector normally has a relatively low return flow rate. If the return flow rate at one injector is relatively high (compared to the other injectors), that injector is probably defective.

– Remove engine cover panel ⇒ page 56 .

NOTICE

Risk of malfunction due to soiling.

♦ ⇒ "3.1 Rules for cleanliness", page 17 .

– Clean all return line connections (with commercial cleaning solution etc.) before removing.

– Dry all components after cleaning.

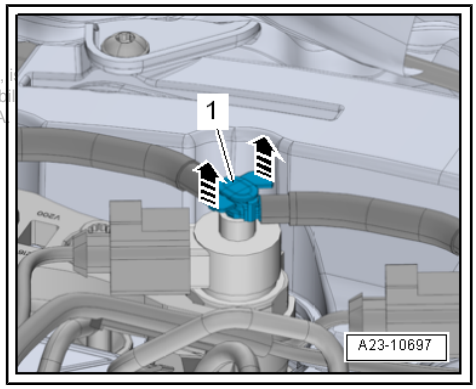
– Remove the sound insulation.

Note

Adhere strictly to rules of cleanliness. No dirt must be allowed to get into the disconnected fuel return lines or the open connections on the injectors.

– Unlock the middle section of the connections of the return line in -direction of arrow-.

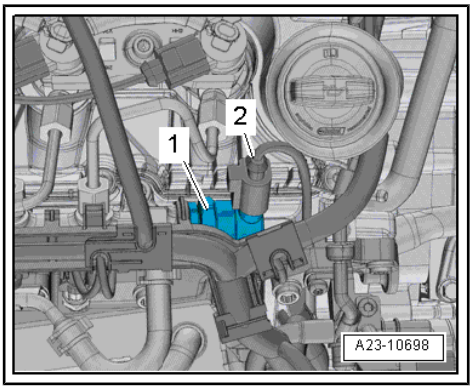
– Pull release tabs upwards -arrows- and pull return line connections off injectors.



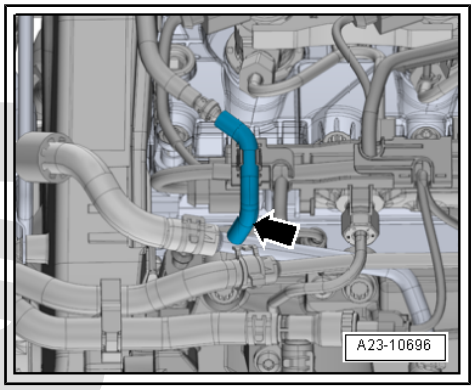
– Unplug electrical connector -2- from the fuel pressure regulating valve - N276- -item 1-.

Note

This prevents the fuel from being injected during the attempt at starting.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



– Clamp off fuel return hose -arrow- using hose clamp up to 25 mm - 3094- .
– Clean and blow out adapter from return flow meter - VAS 6684- .
– Fit adapter C6 firmly onto return line connections of all 4 injectors.
– Connect hose lines of return flow meter - VAS 6684- to adapters.
– Operate starter three times. Allow 20 seconds to elapse after every start attempt, in order to avoid the starter from overheating.
• Specification of return flow rate: 0 ml
– If fuel comes out of an injector, that injector must be renewed.
– Re-attach electrical connector of fuel pressure regulating valve - N276- .

Installing fuel return lines

– Press return line connections onto injectors until they engage audibly.
– Then push down the bar on both sides.
– Check fuel system for leaks ⇒ page 388 .
– Install engine cover panel ⇒ page 56 .
– Erase entry in event memory using vehicle diagnostic tester .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

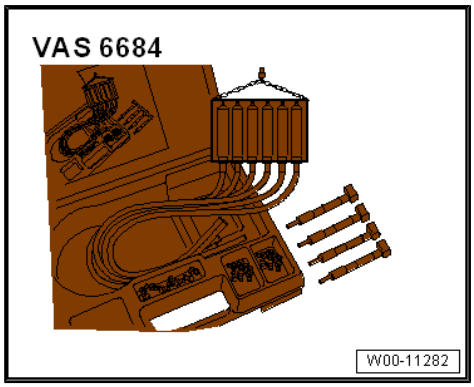
3.6.2 With the cranking speed check the return quantity of the injector, vehicles with Delphi injector system

Note

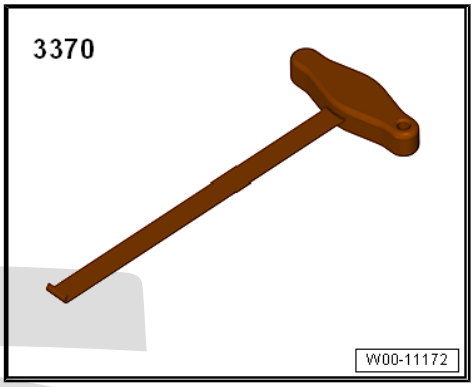
If the engine cannot be started, the return flow rate of the injectors can also be checked at starter motor speed.

Special tools and workshop equipment required

◆ Return flow meter - VAS 6684-



♦ Hook for front end injector - 3370- variant 1 for engine code DDYA



Procedure

Note

Each injector normally has a relatively low return flow rate. If the return flow rate at one injector is relatively high compared to the return flow rate of the other injectors, that injector is probably defective.

– Remove engine cover panel ⇒ page 56 .

NOTICE

Risk of malfunction due to soiling.

or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

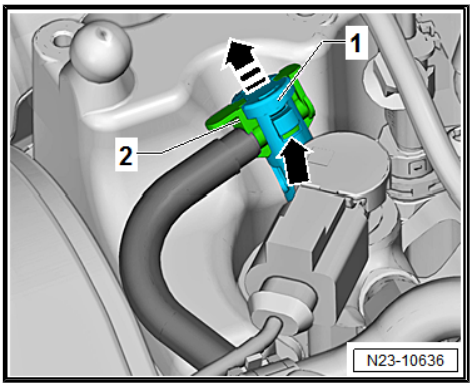
♦ ⇒ "3.1 Rules for cleanliness", page 17 .

– Clean all return line connections (e.g. with standard commercially available cold cleaning solvent) before removing them.
– Dry all cleaned parts.
– Detach noise insulation.

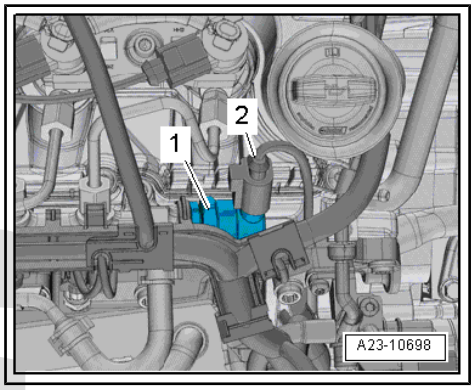
Note

Adhere strictly to rules of cleanliness. No dirt must be allowed to get into the disconnected fuel return lines or the open connections on the injectors.

– Fit front end hook - 3370- into lowest recess -arrow-.
– Unlock the middle section of the connections of the return line in -direction of arrow-.
– Pull release tabs upwards -arrows- and pull return line connections off injectors.



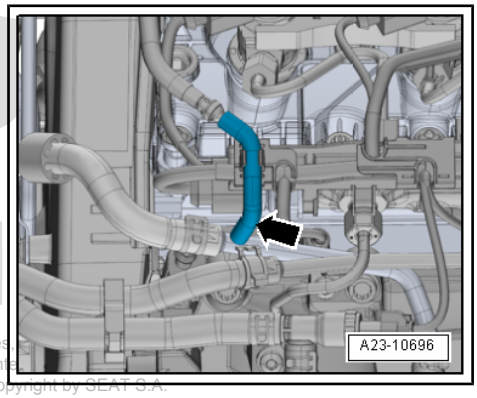
– Unplug electrical connector -2- on fuel pressure regulating valve - N276- -item 1-.



Note

This prevents the fuel from being injected during the attempt at starting.

– Clamp off fuel return hose -arrow- using hose clamp up to 25 mm - 3094- .



– Clean and blow out the hoses of the return quantity measurement device - VAS 6684- .

– Firmly push the hoses directly onto the return line connections of all 4 injectors.

– Operate starter three times. Allow 20 seconds to elapse after every start attempt, in order to avoid the starter from overheating.

• Specification of return flow rate: 0 ml

– If fuel comes out of an injector, that injector must be renewed.

– Re-attach electrical connector of fuel pressure regulating valve - N276- .

Protected by copyright. Copying for private or commercial purposes, permitted unless authorised by SEAT S.A. SEAT S.A does not guarant... Copyright by SEAT S.A.

Installing fuel return lines

– Press return line connections onto injectors until they engage audibly.

– Then push down the bar on both sides.

– Check fuel system for leaks ⇒ page 388 .

– Install engine cover panel ⇒ page 56 .

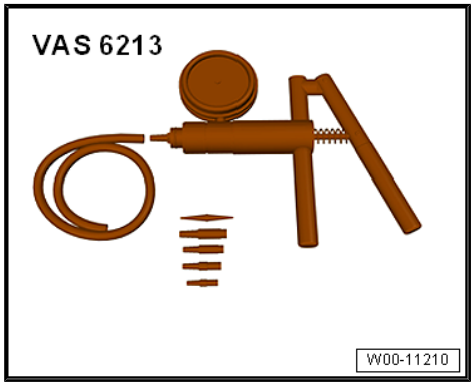
– Erase entry in event memory using vehicle diagnostic tester .

3.7 Testing jammed-open injectors

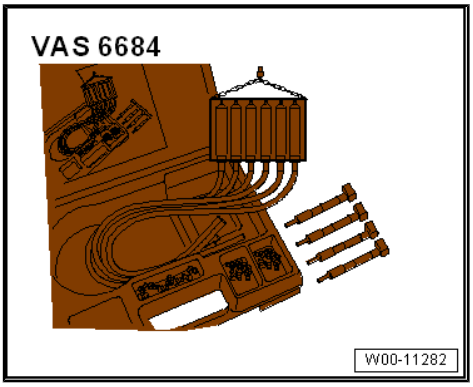
Special tools and workshop equipment required

♦ Vehicle diagnosis tester

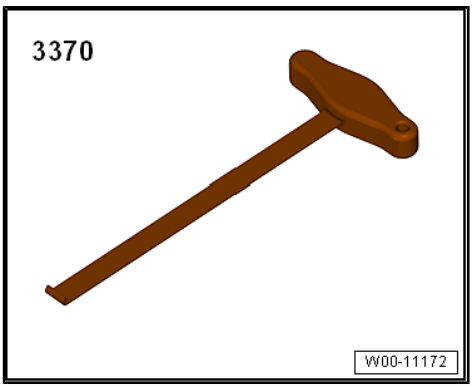
♦ Hand vacuum pump - VAS 6213-



- Adapter C6 from return flow meter - VAS 6684-



- Front end hook - 3370- for engine codes CXXA, CXXB, DDYA, DDYB, DGTE



Procedure

– Delete entry in event memory using the Vehicle diagnostic and service information system .

– Remove engine cover panel ⇒ page 56 .

NOTICE

Risk of malfunction due to soiling.

- **⇒ "3.1 Rules for cleanliness", page 17 .**

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Clean all connections (e.g. with commercial cleaning solution) before removing.

Note

- *Make sure all parts are clean; no dirt must be allowed to enter the fuel system.*
- *Check one cylinder after another.*

– Dry all cleaned parts.

Start with cylinder 1.

– Detach noise insulation.

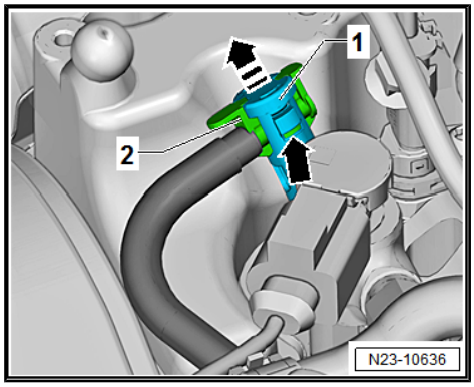
Note

Make sure that everything is clean. No dirt must be allowed to enter the removed return lines or into the open connections on the injectors.

Vehicles with engine codes CXXA, CXXB, DDYA, DDYB, DGTE

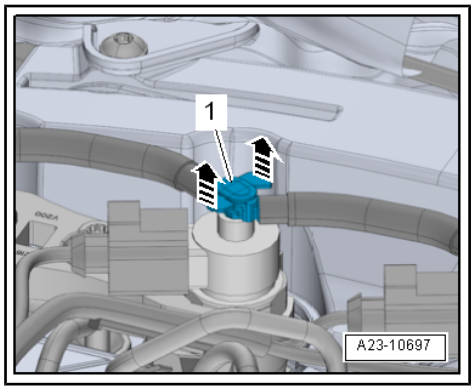
– Fit front end hook - 3370- into lowest recess -arrow-.

– Unlock the middle section of the connections of the return line in -direction of arrow-.



Vehicles with other engine codes:

– Pull release tabs upwards -arrows- and pull return line connections off injectors.



Continued for all vehicles

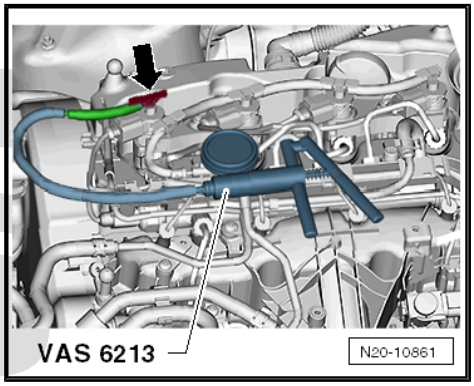
– Clean the return flow meter - VAS 6684- and blow out with compressed air.

– Connect adapter to return line connection of injector to be tested after adapter has been cleaned.

Sin adaptador - For engine codes CXXA, CXXB, DDYA, DDYB, DGTE

Adaptador C6 - For all other engine codes

– Generate a vacuum of -500 mbar using the hand vacuum pump - VAS 6213- .



If the vacuum reading remains the same for 30 seconds, the injector is OK.

If injectors are defective, the pressure drops to 0 bar within 2 to 3 seconds.

Repeat check is necessary, observe pressure loss at hand-operated vacuum pump - VAS 6213- .

– Renew faulty injectors ⇒ page 408 .

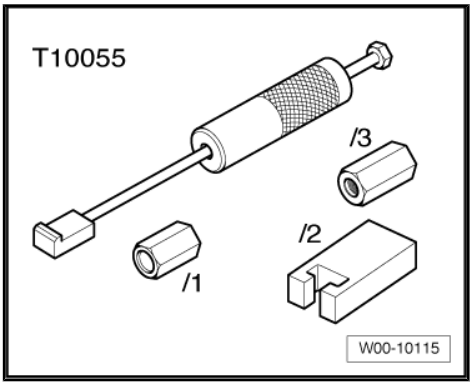
– Install engine cover panel ⇒ page 56 .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

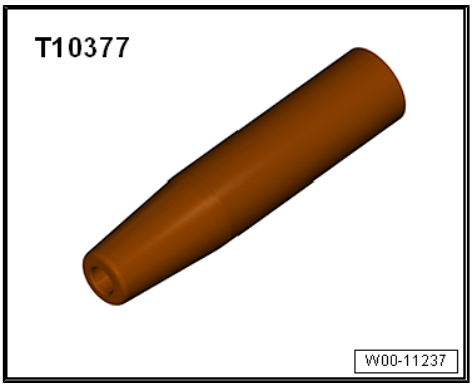
3.8 Removing and installing injectors

Special tools and workshop equipment required

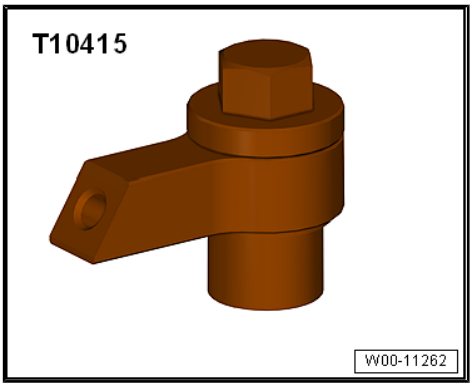
- Puller - T10055-



- Assembly sleeve - T10377-

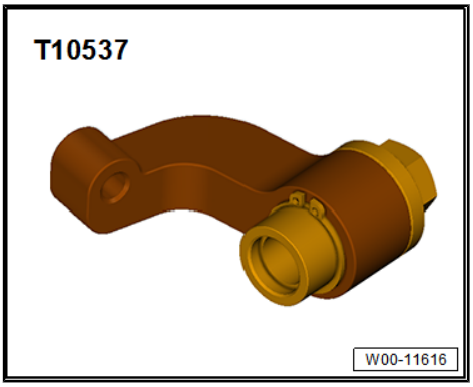


- Puller - T10415- for other engine codes

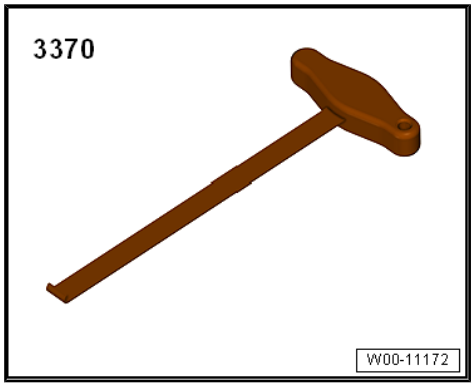


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- Puller - T10537- for injectors, version 1 for engine codes CXXA, CXXB, DDYA, DDYB, DGTE



- Front end hook - 3370- for injectors, version 1 for engine codes CXXA, CXXB, DDYA, DDYB, DGTE



Removing

– Remove engine cover panel ⇒ page 56 .

– Remove the sound insulation.

NOTICE

Risk of malfunction due to soiling.

- ⇒ "3.1 Rules for cleanliness", page 17 .

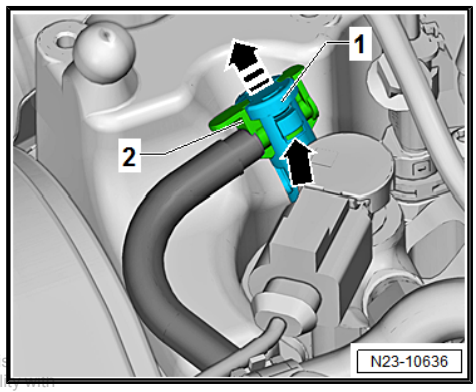
Injectors, version 1:

Note

Version 1 of injectors for engine codes CXXA, CXXB, DDYA, DDYB, DGTE.

– Fit front end hook - 3370- into lowest recess -arrow-.

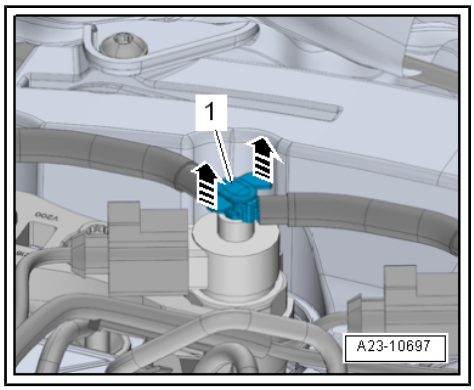
– Unlock the middle section of the connections of the return line in -direction of arrow-.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

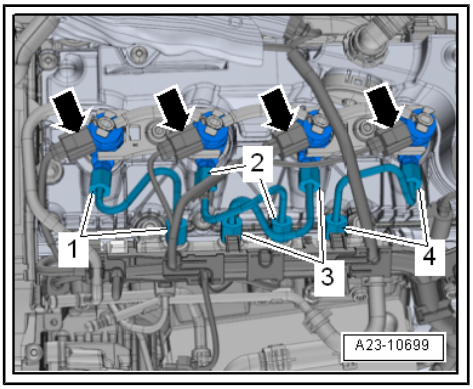
Injectors, version 2:

– Pull release tabs upwards -arrows- and pull return line connections off injectors.



Continued for all vehicles

– Unplug electrical connectors -arrows- at injectors.



Note

One clamping piece always secures two injectors and can only be removed if both injectors are »pulled«.

NOTICE

When releasing high-pressure line, counterhold high-pressure connection using an open-ended spanner. Leaks occur if high-pressure connection is released.

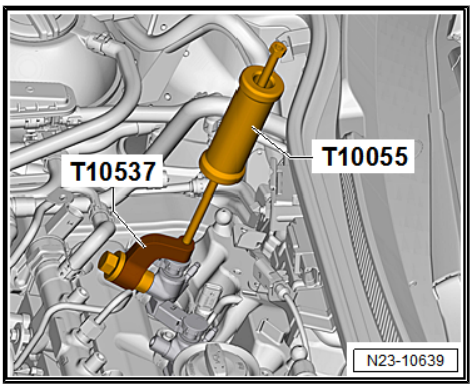
– Unscrew union nuts on corresponding high-pressure lines (-1 … 4-) and remove corresponding high-pressure lines.

– Seal off open lines and connections with clean plugs.

• Correct sequence when removing injectors: First the injector on cylinder “2”, then on cylinder “1” or cylinder “4” and then on cylinder “3”.

– Unscrew bolt for clamping piece ⇒ Item 8 (page 395) .

Injectors, version 1:



Note

Version 1 of injectors for engine codes CXXA, CXXB, DDYA, DDYB, DGTE.

– Unscrew bolt for clamping piece ⇒ Item 8 (page 395) .

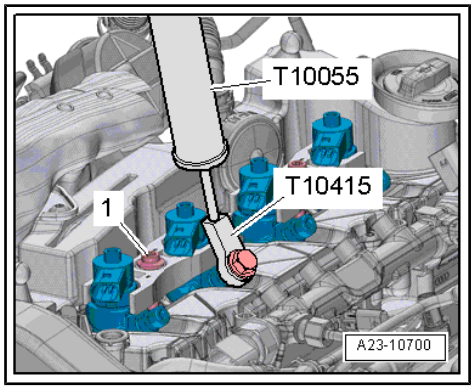
– Apply puller - T10055- with puller - T10537- as shown in illustration, and pull out injectors upwards.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Injectors, version 2:

– Unscrew bolt -1-.

– Apply puller - T10055- with puller - T10415- as shown in illustration, and pull out injectors upwards.



Continued for all vehicles

– Remove clamping piece before removing injectors.

Note

To avoid damaging the sealing lip, rotate the injector while pulling it out.

– Place removed injectors on a clean cloth.

Installing

NOTICE

Danger of damage to sealing surface of injector.

- **To remove carbon deposits from the injector sealing surface, clean the injector shaft in the cylinder head with cleaning set - VAS 6811- . Refer to ⇒ operating manual for information on how to use it.**

Installing new injectors

When installing new injectors, the following components must be renewed:

- Copper seal
- Renew O-ring for injector bore.
- O-ring for fuel return line connection

– Observe all instructions for installing high-pressure pipes ⇒ “3.9.2 Installing high-pressure pipe”, page 414 .

Installing used injectors

When re-installing used injectors, the following components must be renewed:

- Copper seal
- Renew O-ring for injector bore.
- O-ring for fuel return line connection

– Spray tip of injector with a rust removal spray. Wait approx. 5 minutes and wipe off soot particles and oil with a cloth.

– To remove the old copper seal from the injector, clamp the seal carefully in a vice

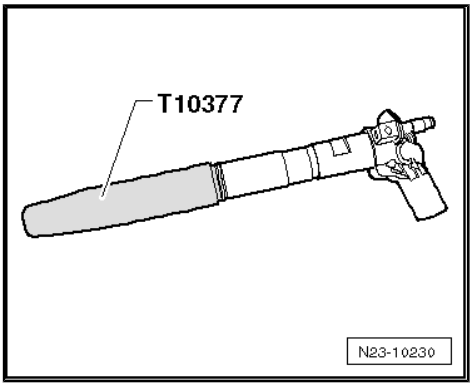
– so that it is just held between the jaws without turning.

– Then carefully pull and twist the injector out of the copper seal by hand.

– Remove deposits under copper seal.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Renew seal for injector. Use assembly sleeve - T10377- to do this.



Continued (same procedure for used and new injectors):

– Coat injector O-rings with assembly oil, engine oil or diesel fuel.

– Install injectors.

– Tighten union nut on high-pressure lines and tighten by hand. Check for tension-free seating.

After renewing one or more injectors:

- Write adaption of correction values for new injectors in engine control unit ⇒ page 397 .
- Reset learnt value of fuel pressure regulating valve - N276- .
- `01 - Engine electronics`
- `01 - Engine electronics, functions`
- `01 - Reset adaptation values of engine ctrl. module`
- `Selection - Reset learnt values of dosing unit and pressure regulating valve`

– Filling and bleeding fuel system ⇒ page 388

– Install engine cover panel ⇒ page 56 .

Specified torques

- ⇒ “3.1 Assembly overview - injectors”, page 394

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with [illegible] Copyright by SEAT S.A.

3.9 Removing and installing high-pressure pipes

⇒ “3.9.1 Removing high-pressure pipe between high-pressure reservoir (fuel rail) and high-pressure pump”, page 413

⇒ “3.9.2 Installing high-pressure pipe”, page 414

3.9.1 Removing high-pressure pipe between high-pressure reservoir (fuel rail) and high-pressure pump

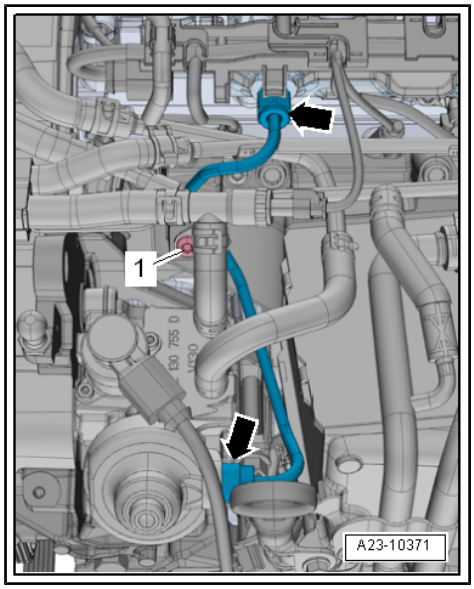
Removing

– Remove engine cover panel ⇒ page 56 .

– Clean fuel line and head of line using cold cleaning solvent and dry using compressed air.

– Unscrew bolt -1-.

– Unscrew union nuts -arrows- and detach high-pressure pipe.



NOTICE

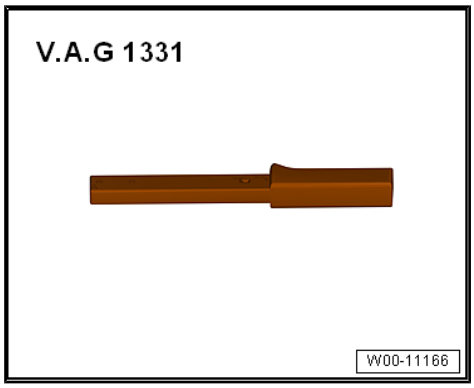
Risk of malfunction due to soiling.

♦ ⇒ “3.1 Rules for cleanliness”, page 17 .

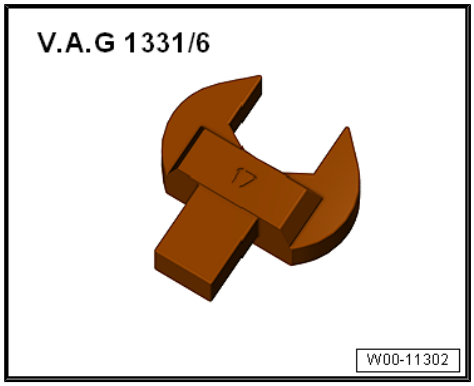
3.9.2 Installing high-pressure pipe

Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1331-

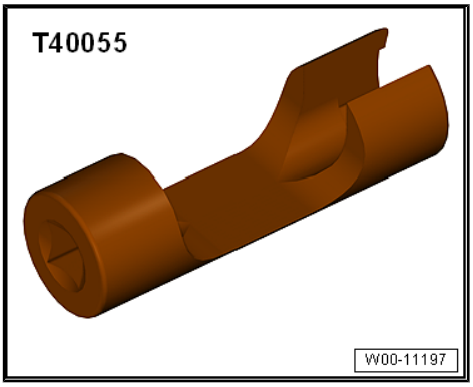


♦ Open end spanner insert, AF 17 - V.A.G 1331/6-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- Socket insert - T40055-



Procedure

Note

- *Clean fuel line and head of line using cold cleaning solvent and dry it using compressed air prior to removing.*
- *Observe cylinder specific markings when reusing high-pressure lines.*
- *The high-pressure pipes can be re-used after performing the following checks:*
- *Check taper seal of respective high-pressure line for deformation and cracks.*
- *The line hole must not be deformed, constricted or damaged.*
- *Corroded pipes must not be used again.*

NOTICE

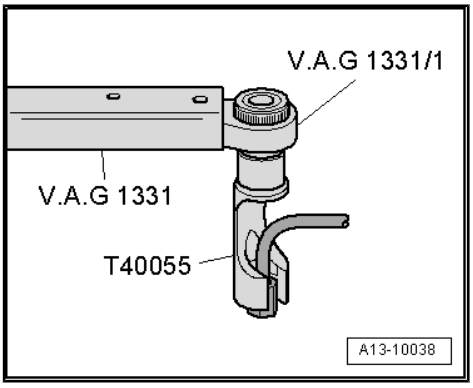
Risk of malfunction due to soiling.

- **Refer to information on:**
  ⇒ “3.1 Rules for cleanliness”, page 17

Risk of high-pressure pipe breaking if it is under tension.

- **To ensure the injector lines are fitted free of stress, loosen high-pressure accumulator and, if necessary, move it slightly. Never bend the pipes or subject them to tension.**

– Use a vacuum-type cleaner to remove dirt from taper seat on high-pressure accumulator.
– Hand-tighten union nuts on high-pressure pipes (ensure that pipes are not under tension).
– Use torque wrench - V.A.G 1331- with open end spanner insert, AF 17 mm - V.A.G 1331/6- or socket - T40055- for tightening high-pressure lines.
– Fit vibration dampers to high-pressure lines as shown in illustration ⇒ page 416 .



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

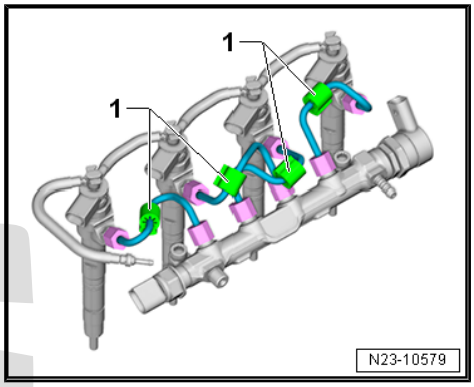
Positioning of the vibration dampers

– Check fuel system for leaks ⇒ page 388 .

– Install engine cover panel ⇒ page 56 .

Specified torques

- ⇒ “3.1 Assembly overview - injectors”, page 394
- ⇒ “3.2 Assembly overview - high-pressure accumulator (fuel rail)”, page 396



3.10 Removing and installing fuel rail (rail)

Removing

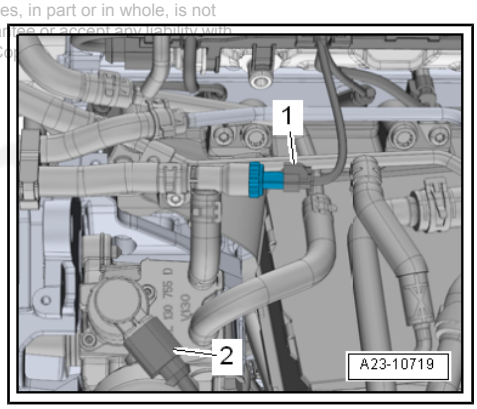
NOTICE

Risk of malfunction due to soiling.

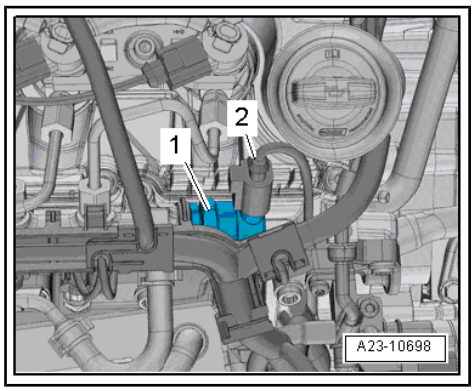
- ⇒ “3.1 Rules for cleanliness”, page 17

– Remove high-pressure pipe between high-pressure reservoir (rail) and high-pressure pump ⇒ page 413 .

– Release and pull off connector -1- on fuel temperature sender - G81- .

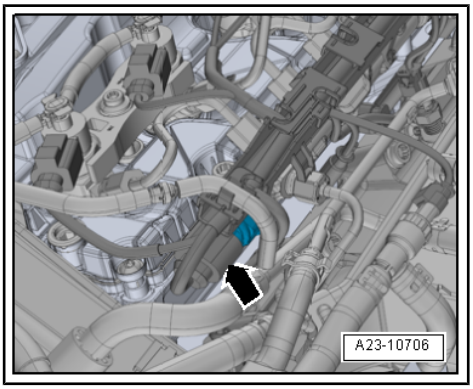


– Release and pull off connector -2- on fuel pressure regulating valve - N276- .

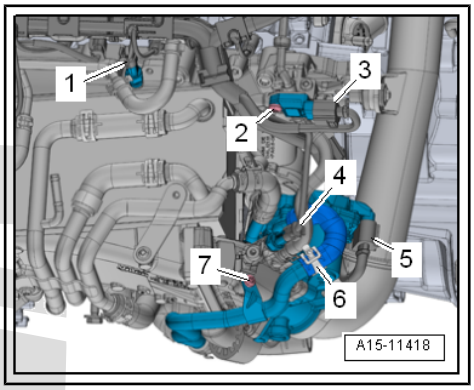


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Co

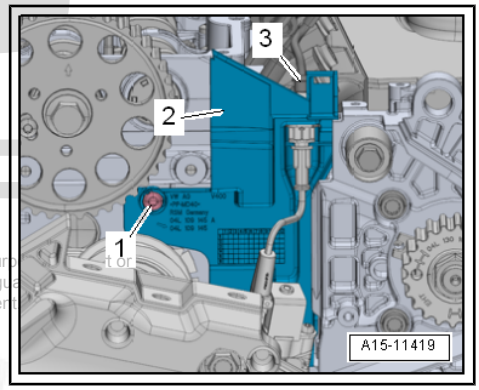
– Release and pull off connector -arrow- on fuel pressure sender - G247- .



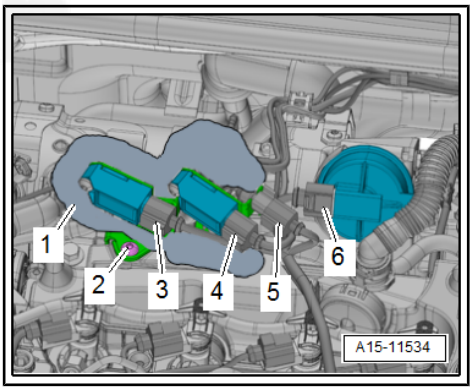
– Release and pull off connector -1- on charge air temperature sender after charge air cooler - G811- .



– Release and pull off connector -3- for coolant pump.

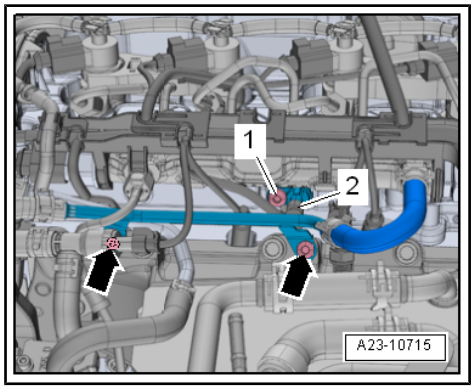


– Open heat insulation sleeve -1-.
– Release and pull off connectors -3- and -6-.
– If fitted, release and pull off connectors -4- and -5-.
– Lay wiring harness to one side.

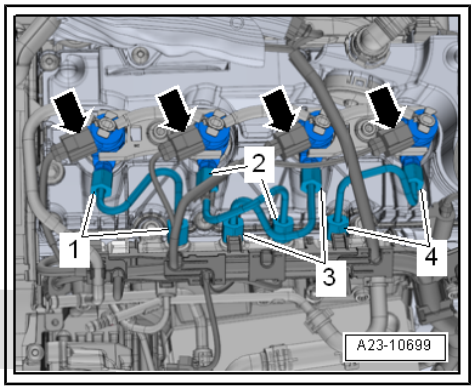


Protected by copyright. Copying for private or commercial purp
permitted unless authorised by SEAT S.A. SEAT S.A does not gu
respect to the correctness of information in this documen

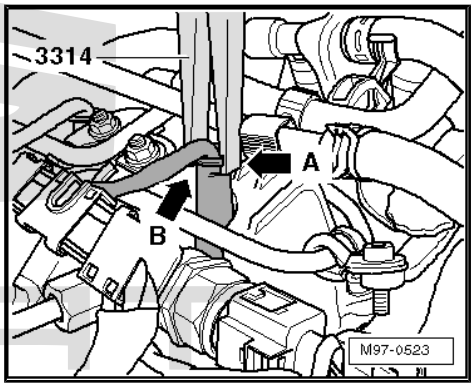
– Unscrew bolts -arrows-, and pull back lines.
– Release and pull off connector -2- on Hall sender - G40- .



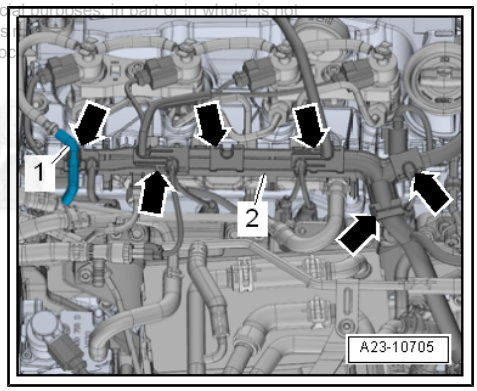
– Release and pull off connectors -arrows- on injectors.



– Disconnect connectors on glow plugs.



– Move clear fuel return hose -1-.
– Open retaining clips -arrows-, and unclip and detach wiring duct -2-.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not respect to the correctness of information in this doc

– Disconnect electrical connectors:

1 - For fuel pressure sender - G247-

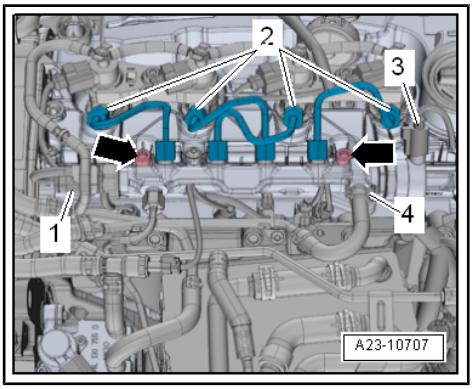
3 - For fuel pressure regulating valve - N276-

– Loosen the hose clip -4-, remove the fuel return hose.

– Remove union nuts -2- for high-pressure pipes.

– Detach high-pressure pipe and set it down on a clean cloth.

– Remove bolts -arrows- and detach high-pressure reservoir.



Installing

Install in reverse order of removal, observing the following.

– Observe all instructions for installing high-pressure pipes ⇒ “3.9.2 Installing high-pressure pipe”, page 414 .

Specified torques

- ⇒ “3.1 Assembly overview - injectors”, page 394
- ⇒ “3.2 Assembly overview - high-pressure accumulator (fuel rail)”, page 396

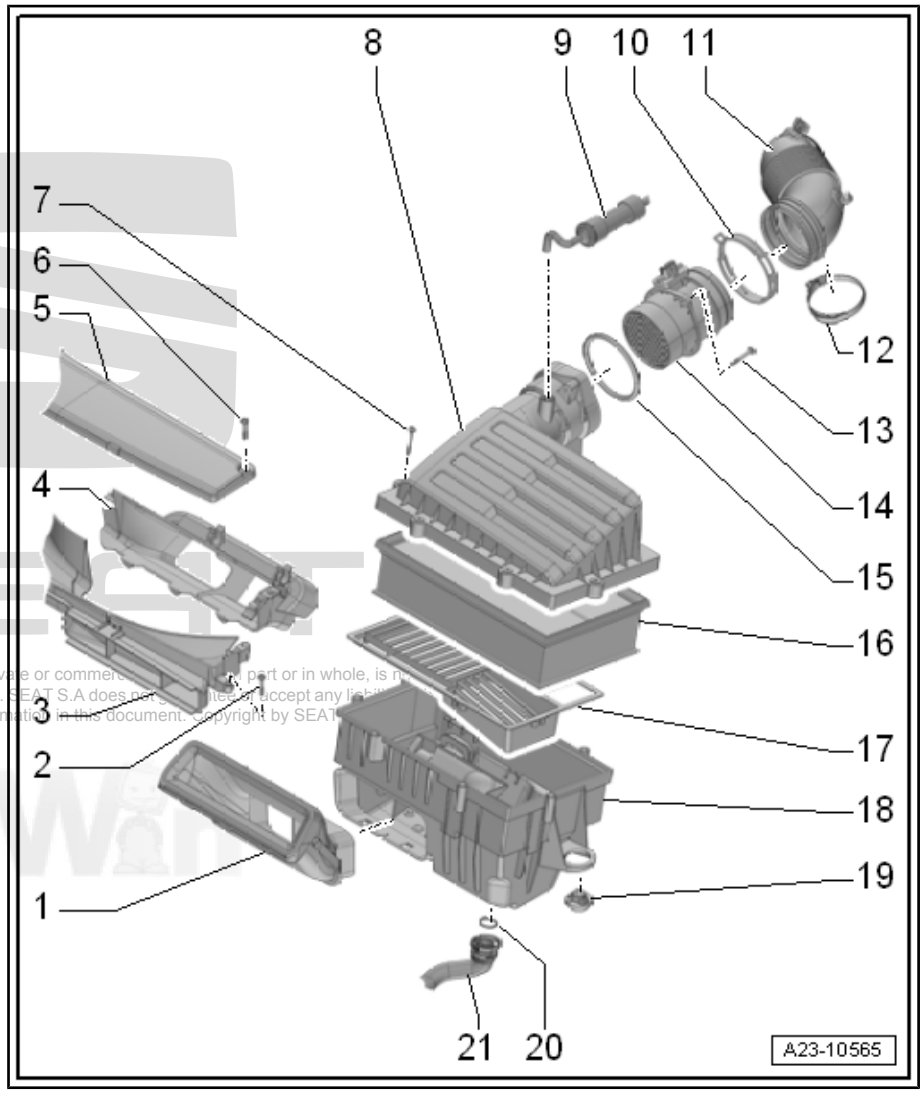
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

4 Air filter

⇒ “4.1 Assembly overview - air filter housing”, page 420

⇒ “4.2 Removing and installing air filter housing”, page 421

4.1 Assembly overview - air filter housing



1 - Air duct
- ❑ On air cleaner (bottom section)

2 - Bolt
- ❑ 2 Nm

3 - Lower part of air duct
- ❑ On lock carrier

4 - Upper part for air duct
- ❑ On lock carrier

5 - Cover
- ❑ for air duct

6 - Bolt
- ❑ 2 Nm

7 - Bolt
- ❑ 1.5 Nm

8 - Air filter top section
- ❑ Clean out dirt, leaves and salt deposits

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

9 - Breather hose
- ❑ From charge pressure control solenoid valve - N75-

10 - Spring-type clip

11 - Air intake hose

12 - Screw-type clamp
- ❑ Installing ⇒ page 421

13 - Bolt
- ❑ 1.5 Nm

14 - Air mass meter - G70-
- ❑ Removing and installing ⇒ page 440

15 - O-ring
- ❑ Renew if damaged

16 - Air filter element
- ❑ Use genuine air filter element ⇒ Electronic parts catalogue
- ❑ Replacement interval ⇒ maintenance tables
- ❑ Removing and installing; Ateca ⇒ Maintenance ; Booklet KH1 .
- ❑ Removing and installing; Leon ⇒ Maintenance ; Booklet 501 .

17 - Cartridge
- ❑ For lower part of air filter

18 - Air cleaner (bottom section)

- ❑ Clean out dirt, leaves and salt deposits

19 - Rubber buffer

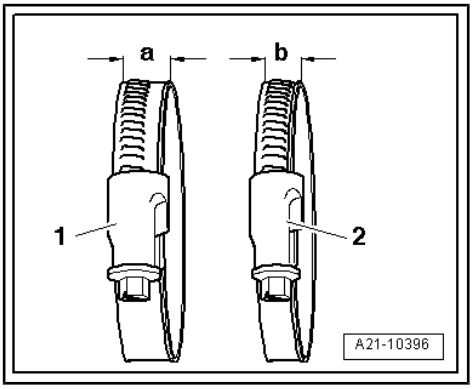
20 - O-ring

- ❑ Renew if damaged

21 - Water drain hose

- ❑ With valve
- ❑ clean

Install air ducts with screw-type clips



Note

- *Hose unions and air intake pipes/hoses must be free of oil and grease when installing.*
- *Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .*
- *Spray the worm screws of the used hose clips with penetrating spray before installing.*

Specified torques

1 - Hose clip -a- = 13 mm wide: 5.5 Nm

2 - Hose clip -b- = 9 mm wide: 3 Nm

4.2 Removing and installing air filter housing

Special tools and workshop equipment required

- Hose clip pliers - VAS 6362-

SEAT
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Removing

Remove air filter housing ⇒ page 422 .

For reasons of space, remove the air filter housing together with the intake hose ⇒ page 422 .

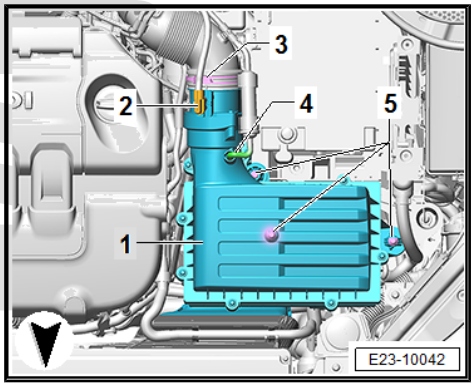
Remove the air filter housing

– Unplug electrical connector -2- for air mass meter - G70- .

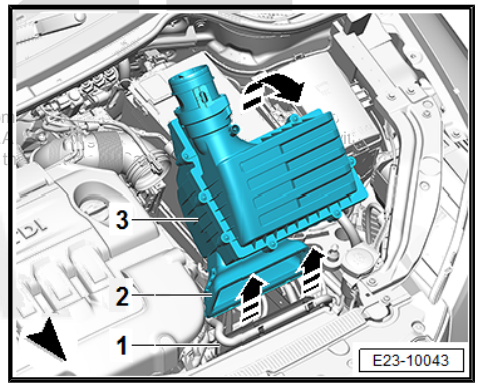
– Disconnect vacuum hose -4-.

– Loosen the hose clip -3-, remove the air intake hose.

– Pull up the air filter cleaning -1- and remove from both of the retaining pins -5- of the battery tray.



– Remove air filter housing -3- in -direction of arrow-. To do this, separate air pipe -2- from upper part of the air duct -1-.



Protected by copyright. Copying for private or com
permitted unless authorised by SEAT S.A. SEAT S.A
respect to the correctness of information in t

For reasons of space, remove air filter housing together with air intake hose.

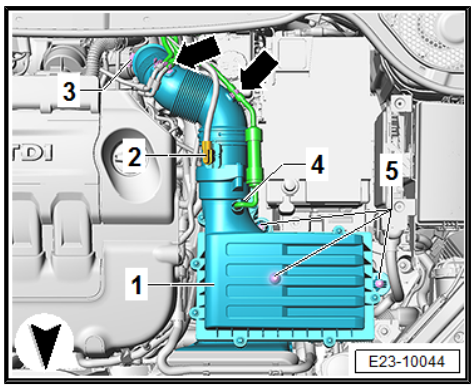
– Unplug electrical connector -2- for air mass meter - G70- .

– Free vacuum hose -arrows- at air intake hose.

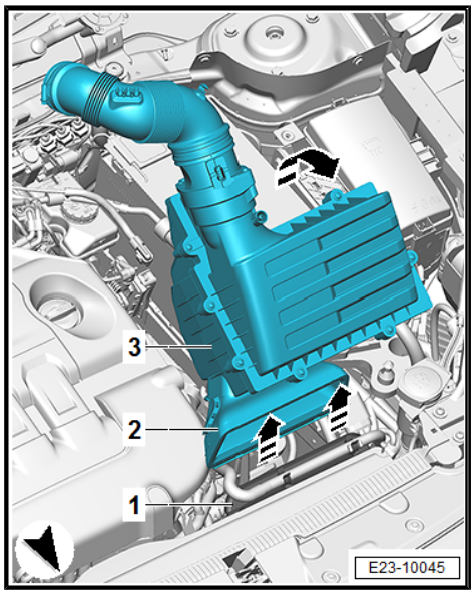
– Disconnect vacuum hose -4-.

– Loosen hose clip -3- and detach air intake hose from connection.

– Pull up the air filter cleaning -1- and remove from both of the retaining pins -5- of the battery tray.



– Remove air filter housing -3- in -direction of arrow-. To do this, separate air pipe -2- from upper part of the air duct -1-.



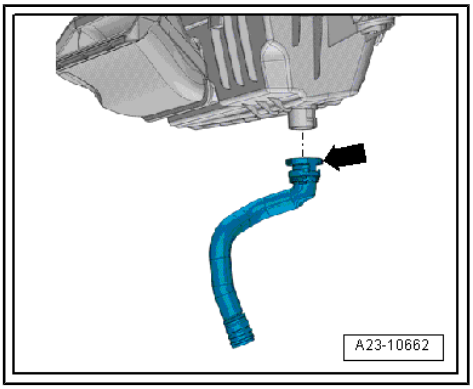
Installing

Install in reverse order of removal, observing the following.

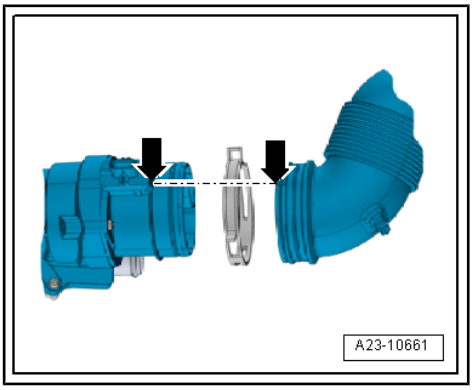
Note

- *Hose unions and air intake pipes/hoses must be free of oil and grease when installing.*
- *Use a silicone-free lubricant to install the air hose.*
- *Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .*

– Disconnect water drain hose -arrow-.
– Clean dirt and leaves out of connection on air cleaner (bottom section) and hose.



– When fitting air intake hose on air filter housing, pay attention to installation markings -arrows-.
– Fit air cleaner housing on battery tray and press on so that it engages audibly.
– Press air cleaner housing on again and then pull to check that housing is correctly engaged.



Specified torques

♦ ⇒ “4.1 Assembly overview - air filter housing”, page 420

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

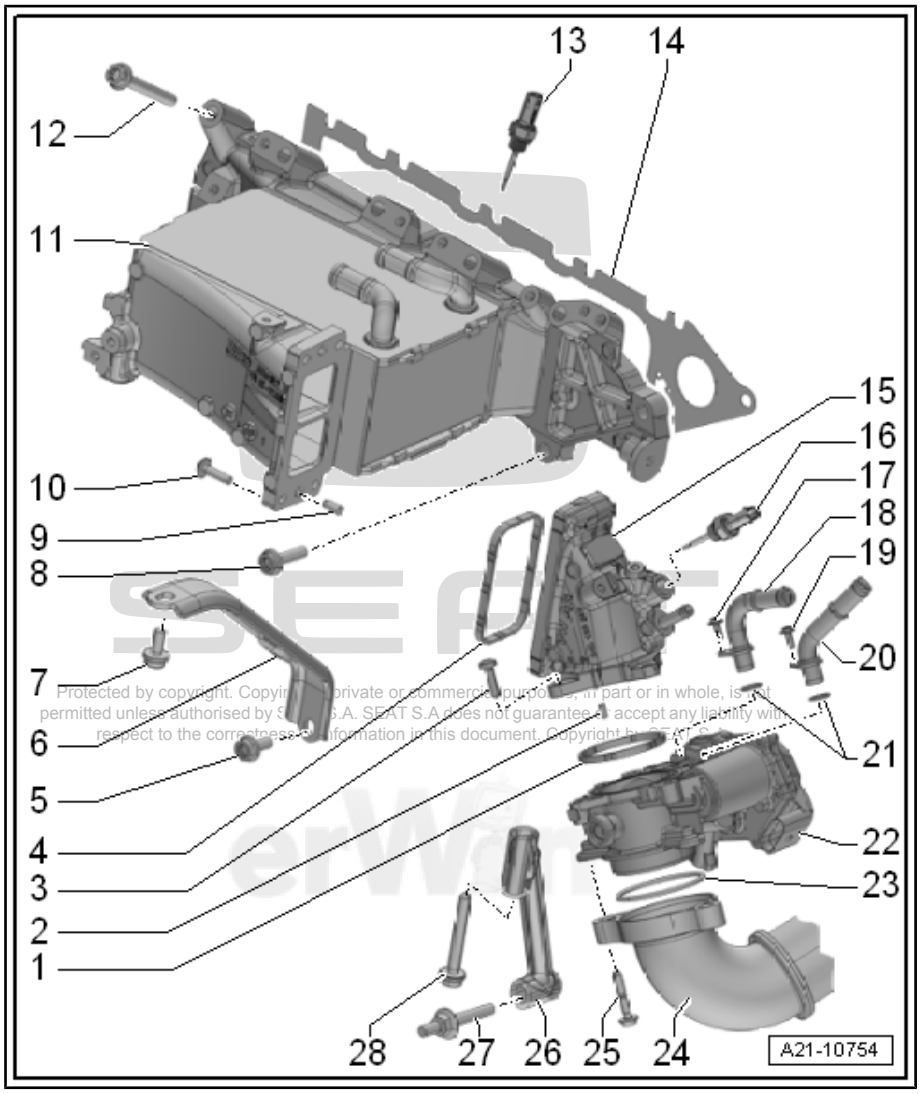
5 Intake manifold

⇒ “5.1 Assembly overview - intake manifold”, page 424

⇒ “5.2 Removing and installing intake manifold”, page 426

⇒ “5.3 Removing and installing throttle valve module J338 ”, page 429

5.1 Assembly overview - intake manifold



1 - Radial oil seal

- ❑ Renew after removal

2 - Dowel pin

3 - Bolt

- ❑ 8 Nm

4 - Gasket

- ❑ Renew after removal

5 - Bolt

- ❑ Specified torque and sequence ⇒ page 426 .

6 - Bracket/bearing/support

- ❑ For intake manifold.

7 - Bolt

- ❑ Specified torque and sequence ⇒ page 426 .

8 - Bolt

- ❑ Renew after removal
- ❑ Specified torque and sequence ⇒ page 425 .

9 - Dowel pin

10 - Bolt

- ❑ 8 Nm

11 - Intake manifold with charge air cooler

- ❑ Intake manifold and charge air cooler are combined as one unit
- ❑ Removing and installing ⇒ page 426

12 - Bolt

- ❑ Renew after removal
- ❑ Specified torque and sequence ⇒ page 425 .

13 - Charge air temperature sender after charge air cooler - G811-

- ❑ Removing and installing ⇒ page 449
- ❑ 22 Nm

14 - Gasket

- ❑ Renew after removal

15 - Connection

- ❑ for throttle valve control unit - J338-

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

16 - Charge air temperature sender before charge air cooler - G810-

- ❑ Removing and installing ⇒ page 449
- ❑ 22 Nm

17 - Bolt

- ❑ 10 Nm

18 - Coolant pipe

19 - Bolt

- ❑ 10 Nm

20 - Coolant pipe

21 - O-rings

- ❑ Renew after removal

22 - Throttle valve control mechanism - J338-

- ❑ With throttle valve potentiometer - G69-
- ❑ Removing and installing ⇒ page 429

23 - O-ring

- ❑ Renew after removal

24 - Air intake pipe

25 - Bolt

- ❑ 8 Nm

26 - Bracket/bearing/support

- ❑ for throttle valve control unit - J338-

27 - Bolt

- ❑ Specified torque and sequence ⇒ page 426 .

28 - Bolt

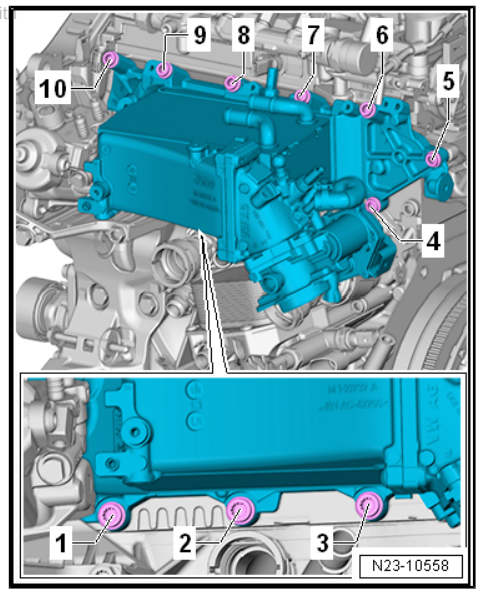
- ❑ Specified torque and sequence ⇒ page 426 .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Intake manifold with charge air cooler - specified torque and sequence

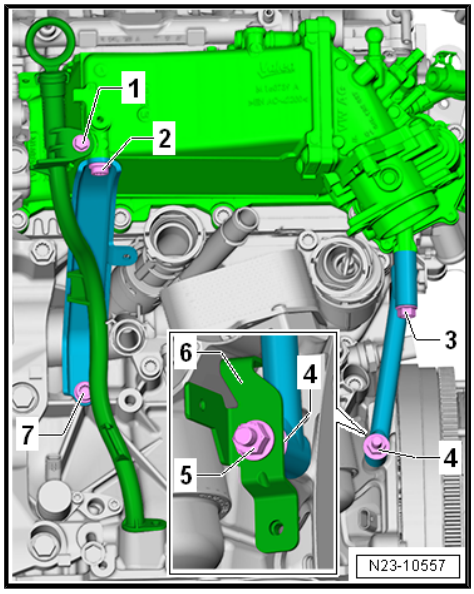
– Tighten bolts in stages:

Stage	Bolts	Specified torque
1st	-1 ... 10-	Screw in by hand as far as stop
2nd	-1 ... 10-	Tighten to 20 Nm
3rd	-1 ... 10-	Turn 90° further



Bracket for intake manifold and bracket for throttle valve module - specified torque and tightening sequence

– Tighten bolts in stages:



NOTICE

When installing the brackets for intake manifold and throttle valve module always ensure they are free of stress and not installed at an angle.

Stage	Bolt/nut	Specified torque
1st	-2, 3, 4, 7-	Screw in as far as stop and tighten by hand.
2nd	-2, 3, 4, 7-	Tighten to 20 Nm
3rd	-5-	Tighten to 10 Nm
4th	-1-	Tighten to 10 Nm

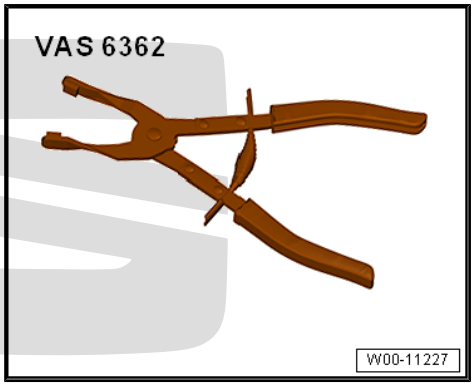
5.2 Removing and installing intake manifold

Note

Intake manifold and charge air cooler are combined as one unit.

Special tools and workshop equipment required

♦ Hose clip pliers - VAS 6362-



♦ Socket insert XZN 10 - T10501-

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee and accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

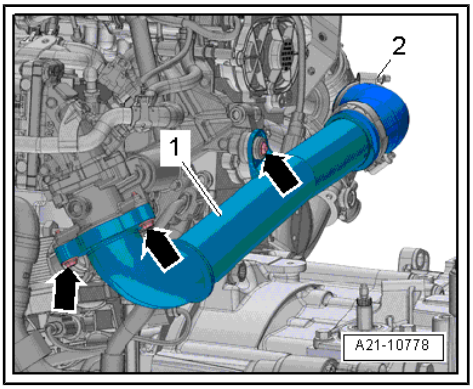
♦ Protective mat - VAS 531003-

Removing

– Remove coolant pipes (top front) ⇒ page 283 .

– Remove high-pressure pipe ⇒ page 413 .

– Remove bolts -arrows-.
– Release screw-type clip -2- and detach air pipe -1-.



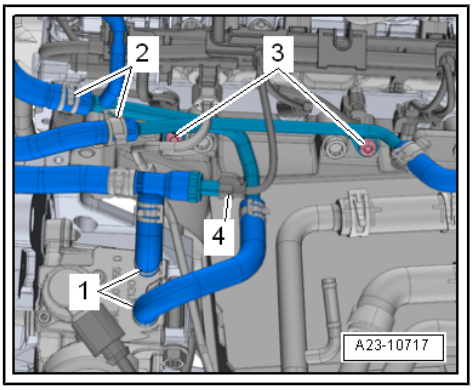
– Unplug the electrical connector -4-.

NOTICE

Avoid impairing function through contamination or soiling.

♦ ⇒ “3.1 Rules for cleanliness”, page 17

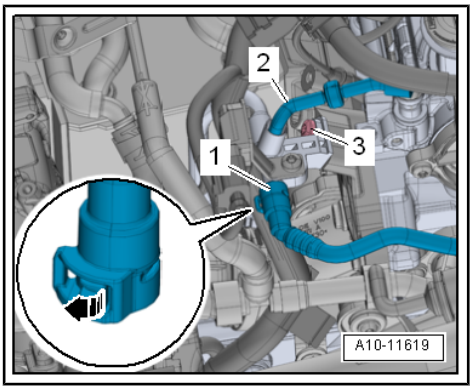
– Loosen the hose clips -1, 2-, remove the fuel hoses.
– Remove bolts -3- and move fuel lines to rear.



– Release the fastener -arrow-, remove the vacuum hose -1-.
– Remove bolt -3-; disconnect the vacuum hose -2-

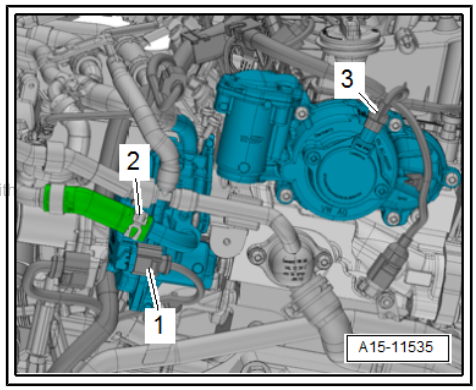
Note

The installation position of the components may vary depending on version.



Vehicles with variable valve timing

– Unplug the electrical connector -1-.
– Loosen clamp -2-.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Continued for all vehicles

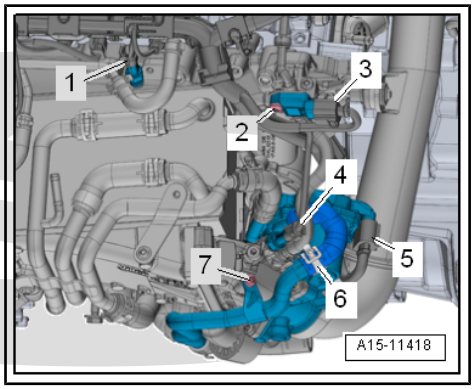
– Unplug electrical connectors and move clear:

1 - For charge air temperature sender after charge air cooler - G811-

3 - For charge pressure sender - G31-

4 - For charge air temperature sender before charge air cooler - G810-

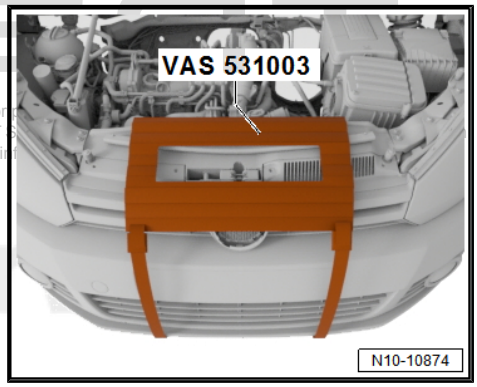
5 - for throttle valve control unit - J338-



– Unscrew and remove the bolts -2, 7-, remove the coolant hose -6-.

– Remove radiator cowl ⇒ page 317 .

– Install protective mat - VAS 531003- to vehicle as shown in illustration.



Vehicles with exhaust valve 1 - GX5- :

– Remove throttle valve control unit - J338- ⇒ page 429

Protected by copyright. Copying for
permitted unless authorised by SEAT
respect to the correctness of

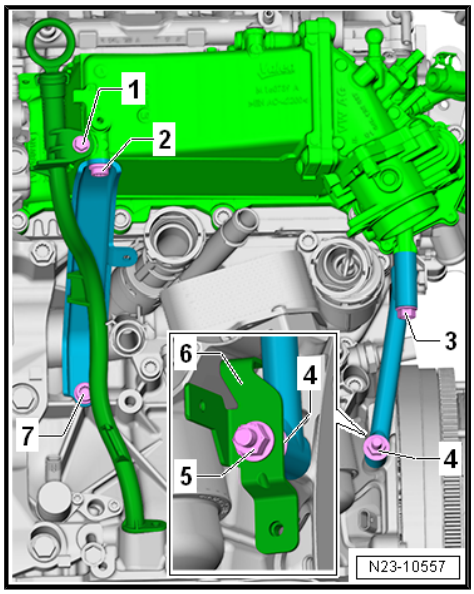
Continued for all vehicles

– Remove bolt -1- for dipstick guide tube.

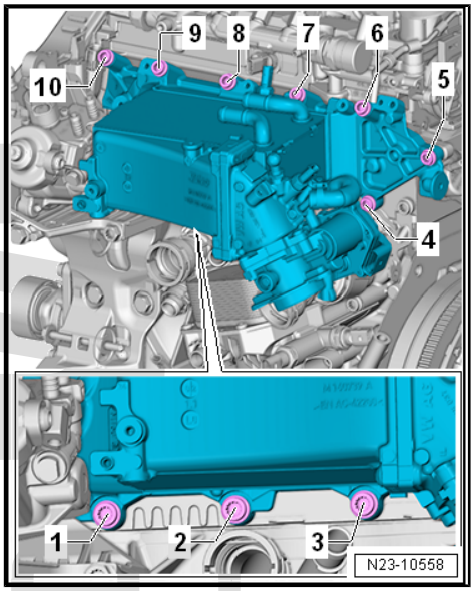
– Remove nut -5- and detach bracket -6- from centre hex stud -4-.

– Loosen bolts -4 and 7-.

– Remove bolts -2, 3- for bracket for intake manifold.



– Unscrew bolts -10 ... 1- using bit XZN 10 - T10501- and remove intake manifold with charge air cooler.



Installing

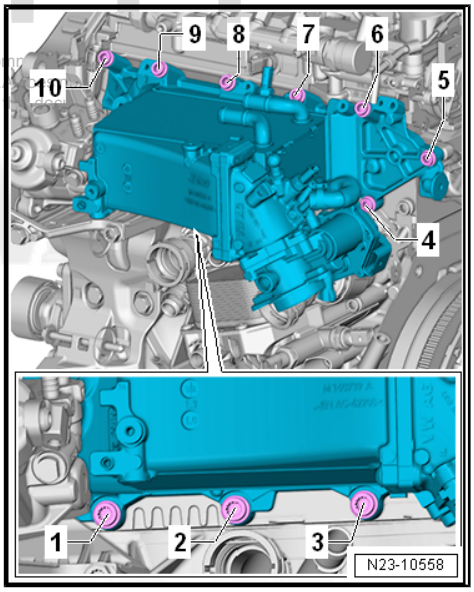
– Fit new gasket onto dowel pins on cylinder head.

NOTICE

Do not damage sealing surface of intake manifold by guiding it against dowel pins.

– Fit intake manifold onto dowel pins on cylinder head.

– Tighten bolts 1 ... 10 to specified torque observing correct tightening sequence.



Protected by copyright. Copying for private or comp
permitted unless authorised by SEAT S.A. SEAT S.
respect to the correctness of information in

Remaining installation sequence carried out in reverse sequence, note the following:

Note

Seal must be renewed if removed

– Install the air cleaner housing ⇒ page 421 .

– Install high-pressure pipe ⇒ page 414 .

– Install coolant pipes (top front) ⇒ page 283 .

NOTICE

If a new intake manifold has been installed, the cooling system must be flushed and the coolant must be renewed to ensure optimum surface protection
⇒ “1.6 Flushing cooling system”, page 224 .

If the existing intake manifold has been installed:

– Add coolant ⇒ page 214 .

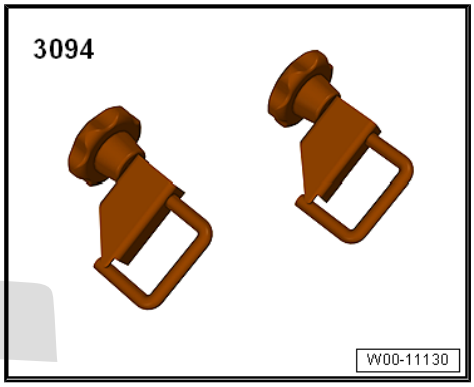
Specified torques

- Intake manifold with charge air cooler - specified torque and sequence ⇒ page 425
- Install air ducts with screw-type clips ⇒ page 421
- ⇒ “5.1 Assembly overview - intake manifold”, page 424
- ⇒ “1.1 Assembly overview - sump, oil pump”, page 166

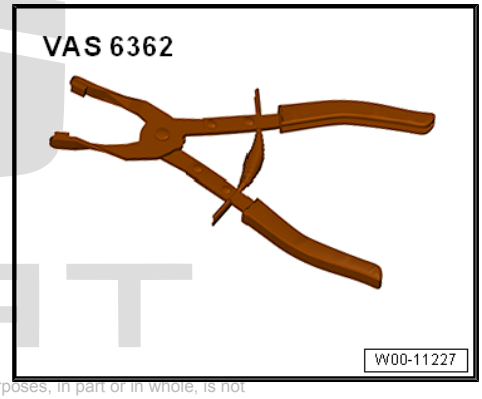
5.3 Removing and installing throttle valve module - J338-

Special tools and workshop equipment required

♦ Hose clamps, up to Ø 25 mm - 3094-



♦ Hose clip pliers - VAS 6362-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Removing

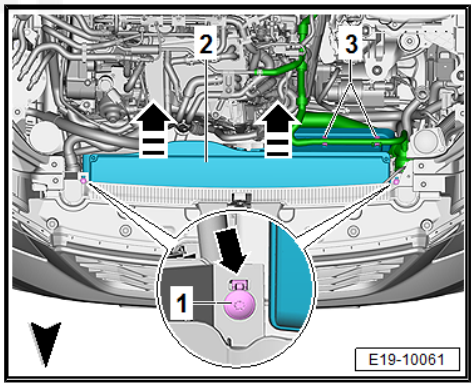
– Remove engine cover panel ⇒ page 56 .

– For reasons of space, remove air filter housing together with air intake hose ⇒ page 422 .

– Free coolant hose -3-.

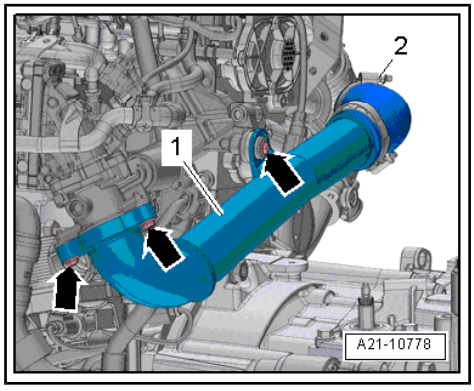
– Unscrew bolts -1-.

– Release locking lugs-arrow-, unclip air hose -2- from the front end and remove in -direction of the arrow-.



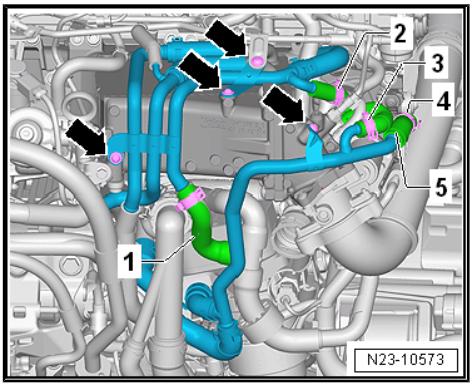
– Remove bolts -arrows-.

– Release screw-type clip -2- and detach air pipe -1-.



– Remove bolts -arrows-.

– Clamp off coolant hoses -1- and -5- using hose clamps for hoses up to 25 mm - 3094- .



Note

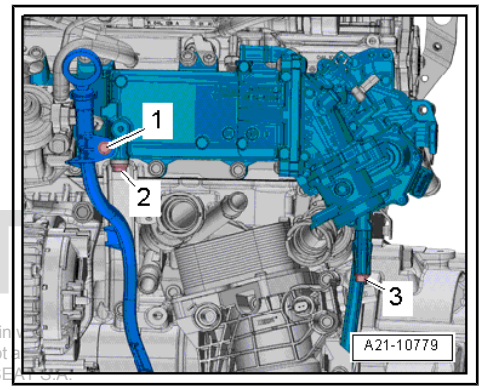
- *Place a cloth underneath to absorb escaping coolant.*
- *Depending on the version, the number of connected coolant hoses may be different.*

– Loosen the hose clips -2, 3, 4- and remove the coolant hoses.

– Unscrew bolt -3-.

Note

-Ignore positions 1 and 2-.

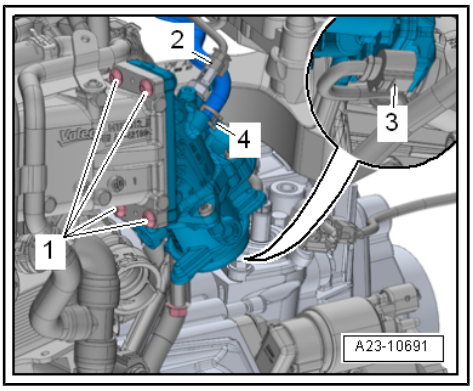


Protected by copyright. Copying for private or commercial purposes, in part or in
permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept
respect to the correctness of information in this document. Copyright by SE

– Disconnect electrical connectors:

2 - For charge air temperature sender before charge air cooler - G810-

3 - for throttle valve control unit - J338-



– Loosen the hose clip -4-, remove the air intake hose.

– Remove bolts -1- and detach connection with throttle valve module - J338- .

Installing

Install in reverse order of removal, observing the following.

Note

Renew seals and O-ring after each removal.

– When fitting connection with throttle valve module - J338- , pay attention to dowel pins.

– Install coolant pipes (top front) ⇒ page 282 .

– Install the air cleaner housing ⇒ page 421 .

– Install engine cover panel ⇒ page 56 .

Specified torques

- ⇒ “5.1 Assembly overview - intake manifold”, page 424

6 Senders and sensors

⇒ “6.1 Removing and installing fuel pressure regulating valve N276 ”, page 432

⇒ “6.2 Checking fuel pressure regulating valve N276 ”, page 438

⇒ “6.3 Removing and installing fuel pressure sender G247 ”, page 439

⇒ “6.4 Removing and installing air mass meter G70 ”, page 440

⇒ “6.5 Removing and installing pressure differential sender G505 ”, page 442

⇒ “6.6 Removing and installing exhaust pressure sensor 1 G450 ”, page 446

⇒ “6.7 Removing and installing NOx sender 2 G687 ”, page 447

⇒ “6.8 Removing and installing charge air temperature sender before charge air cooler G810 ”, page 449

⇒ “6.9 Removing and installing charge air temperature sender after charge air cooler G811 ”, page 449

⇒ “6.10 Removing and installing fuel temperature sender G81 ”, page 449

⇒ “6.11 Removing and installing control unit for NOx sender GX30 ”, page 451

⇒ “6.12 Removing and installing temperature and pressure sender for low-pressure fuel system GX20 ”, page 453

6.1 Removing and installing fuel pressure regulating valve - N276-

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

⇒ “6.1.1 Versions of fuel pressure regulating valve N276 ”, page 432

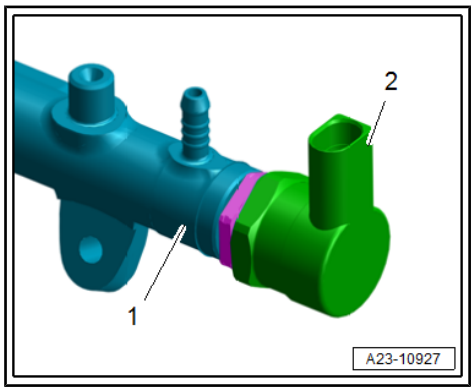
⇒ “6.1.2 Removing and installing fuel pressure regulating valve, version 1”, page 433

⇒ “6.1.3 Removing and installing fuel pressure regulating valve N276 , version 2”, page 436

6.1.1 Versions of fuel pressure regulating valve - N276-

Different versions of the fuel pressure regulating valve are installed:

– Check which version is installed before removing and installing.

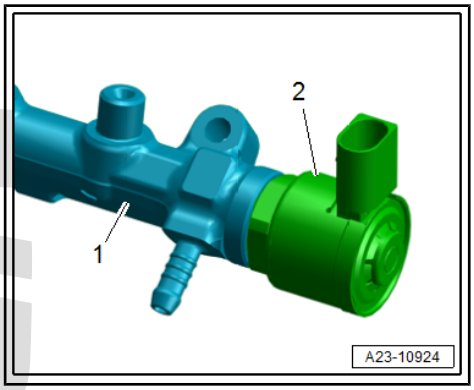


Version 1

– Removing and installing, version 1 ⇒ page 433 .

Version 2

– Removing and installing, version 2 ⇒ page 436 .

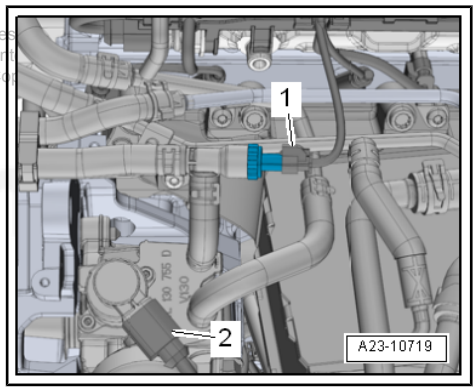


6.1.2 Removing and installing fuel pressure regulating valve, version 1

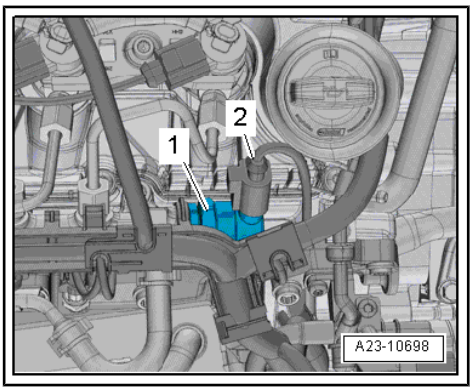
Removing

– Remove engine cover panel ⇒ page 56 .

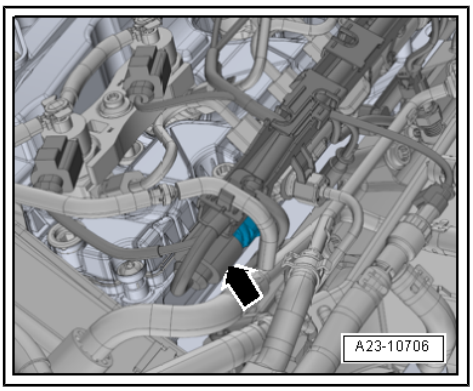
– Release and pull off connector -1- on fuel temperature sender - G81- .



– Release and pull off connector -2- on fuel pressure regulating valve - N276- .

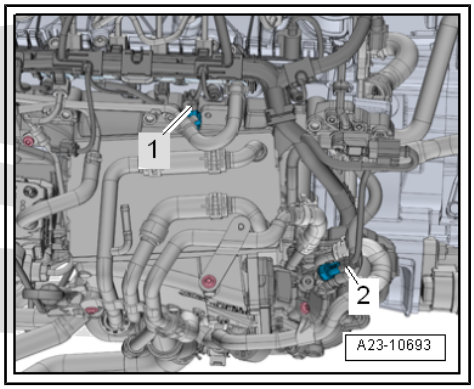


– Release and pull off connector -arrow- on fuel pressure sender - G247- .



Protected by copyright. Copying for private or commercial purposes, permitted unless authorised by SEAT S.A. SEAT S.A does not guarant respect to the correctness of information in this document. Co

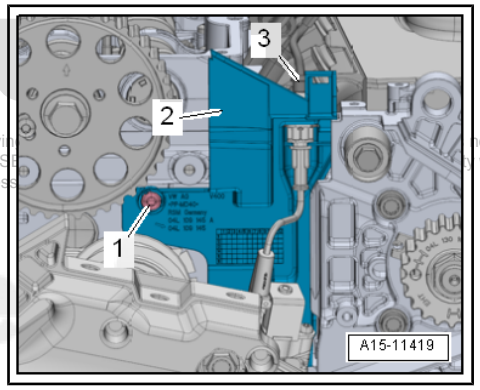
– Release and pull off connector -1- on charge air temperature sender after charge air cooler - G811- .



Note

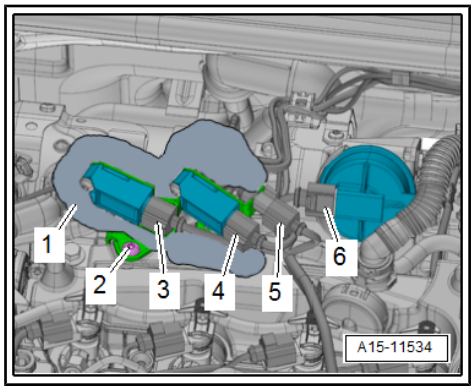
Item -2- can be disregarded.

– Release and pull off connector -3- for coolant pump.

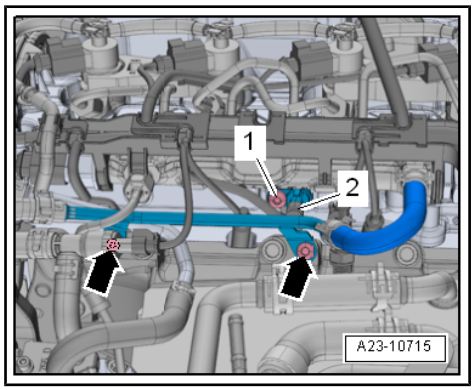


Protected by copyright. Copyi
permitted unless authorised by S
respect to the correctness

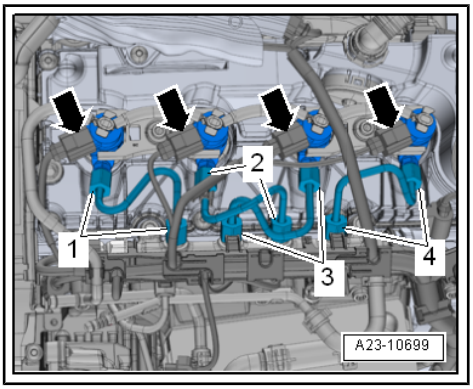
– Open heat insulation sleeve -1-.
– Release and pull off connectors -3- and -6-.
– If fitted, release and pull off connectors -4- and -5-.
– Lay wiring harness to one side.



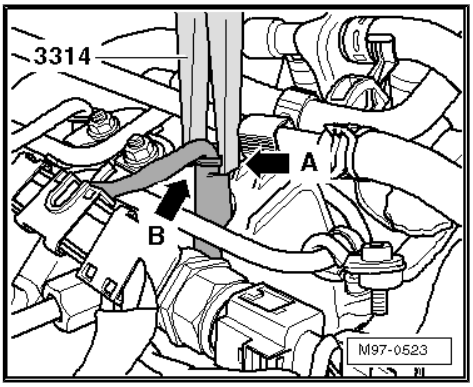
– Unscrew bolts -arrows-, and pull back lines.
– Release and pull off connector -2- on Hall sender - G40- .



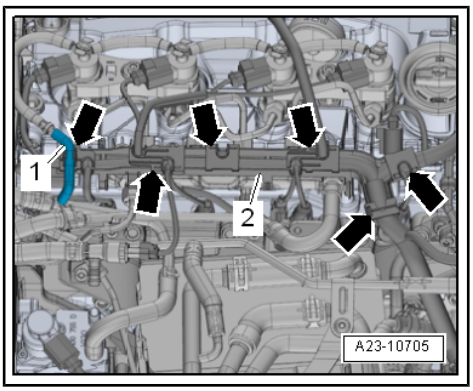
– Remove caps on injectors.
– Release and pull off connectors -arrows- on injectors.



– Disconnect connectors on glow plugs.



– Move clear fuel return hose -1-, and disconnect it.
– Open retaining clips -arrows-, and unclip and detach wiring duct -2-.
– Before removal, clean area around thread for fuel pressure regulating valve - N276- using e.g. commercial cleaning solution.
• Make sure no dirt gets into opening in high-pressure reservoir.
• No cleaning agent is to get into the connector, clean carefully.
– Dry fuel pressure regulating valve - N276- .



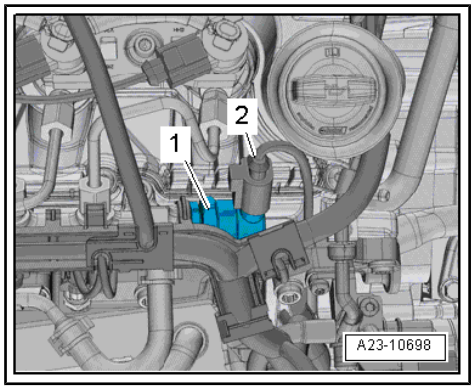
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Unplug the electrical connector -2-.

– Loosen union nut -1- (counterhold at hexagon flats on high-pressure reservoir). Then unscrew and remove by hand.

– Use suction device to extract dirt from high-pressure accumulator bore (threads and sealing surface). Do not use tools or other instruments for this purpose.

– Seal off open connection in high-pressure reservoir with clean plug.



Installing

Note

- *Fuel pressure regulating valve - N276- must always be renewed after it has been removed.*
- *The beginning of the thread and the deformable sealing lip of the fuel pressure regulating valve - N276- must be coated with diesel fuel.*

– Tighten union nut by hand.

– Align the new regulating valve so that connecting line is free of tension after connector is attached.

– Hold regulating valve in this position with an open-end spanner on housing hexagon or use pliers (e.g. water pump pliers).

– Use a suitable torque wrench with an open-ended wrench insert (AF 30) to tighten the union nut.

– Filling and bleeding fuel system ⇒ page 388

– Install engine cover panel ⇒ page 56 .

– After replacement, the learnt values must be reset ⇒ Vehicle diagnostic tester.

- `Self-diagnosis-capable systems`
- `0001 - Engine electronics`
- `0001 - Engine electronics, functions`
- `0001 - Reset adaptation values of engine ctrl. module`
- `Reset learnt values of the metering unit and the pressure control valve`

Specified torques

- ⇒ “3.2 Assembly overview - high-pressure accumulator (fuel rail)”, page 396

6.1.3 Removing and installing fuel pressure regulating valve - N276- , version 2

Special tools and workshop equipment required

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

♦ Open end spanner insert, AF 30 - T10553-

♦ Torque wrench - V.A.G 1332-

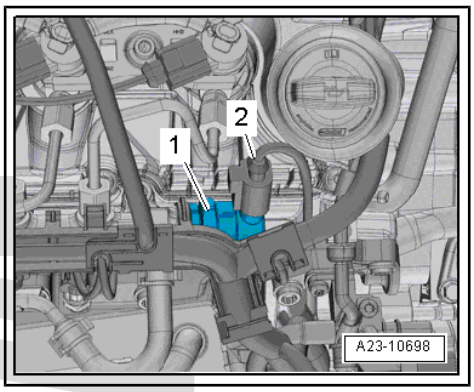
Removing

– Remove engine cover panel ⇒ page 56 .

– Release and unplug electrical connector -2-.

– Removing high-pressure accumulator (rail) ⇒ page 416 .

– Do not loosen fuel pressure regulating valve - N276- -1- on fuel rail in installed condition.



Note

Clamp fuel rail in a vice to remove pressure regulating valve. Use protective jaw covers for the vice. Position the fuel rail in such a way that no force is exerted on the threaded connections for the high-pressure lines or the retaining tabs for securing the fuel rail to the cylinder head.

– Clamp high-pressure accumulator in a vice with protective jaws.

– Loosen fuel pressure regulating valve - N276- -1- fuel rail.

– Before removal, clean area around thread for fuel pressure regulating valve - N276- using e.g. commercial cleaning solution.

• Make sure no dirt gets into opening in high-pressure reservoir.

• No cleaning agent is to get into the connector, clean carefully.

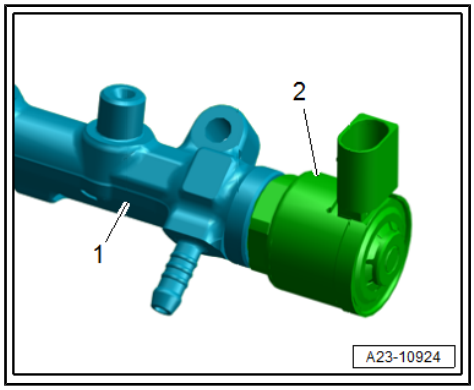
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Unbolt fuel pressure regulating valve - N276- -2- from fuel rail -1-.

– Dry fuel pressure regulating valve - N276- .

– Use suction device to extract dirt from high-pressure accumulator bore (threads and sealing surface). Do not use tools or other instruments for this purpose.

– Seal off open connection in high-pressure reservoir with clean plug.



Installing

Note

♦ *Fuel pressure regulating valve - N276- must always be renewed after it has been removed.*

♦ *The beginning of the thread and the deformable sealing lip of the fuel pressure regulating valve - N276- must be coated with diesel fuel.*

– Screw in fuel pressure regulating valve - N276- , and tighten it by hand.

– Install high-pressure accumulator (rail) ⇒ page 416 .

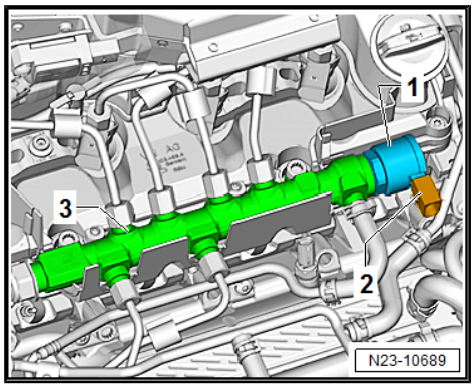
– Align fuel pressure regulating valve - N276- -1- using suitable workshop equipment.

– Turn valve in such a way that the connector can be connected to connection -2- free of tension.

– The installation position of connection -2- may differ.

– Filling and bleeding fuel system ⇒ page 388

– Install engine cover panel ⇒ page 56 .



Specified torques

♦ ⇒ “3.2 Assembly overview - high-pressure accumulator (fuel rail)”, page 396

6.2 Checking fuel pressure regulating valve - N276-

Special tools and workshop equipment required

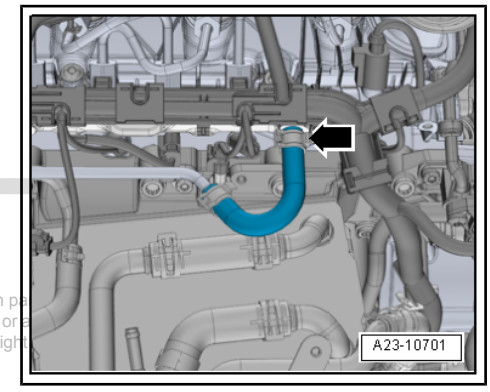
♦ Measuring container, fuel-resistant

Procedure

– Remove engine cover panel ⇒ page 56 .

– Loosen the hose clip -arrow-, remove the fuel return hose from the high-pressure reservoir.

– Seal open return line connection with a blanking plug.



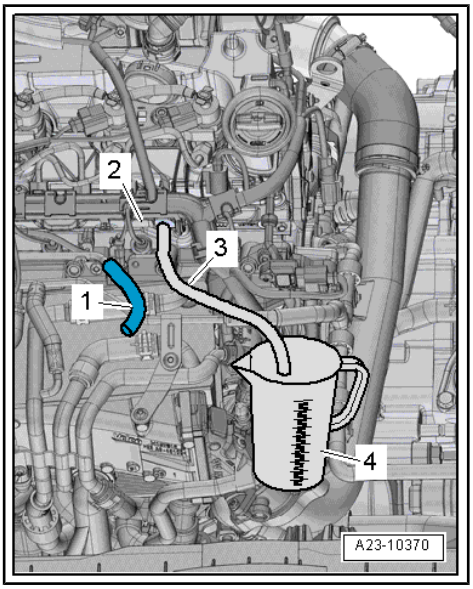
NOTICE

Avoid impairing function through contamination or soiling.

♦ ⇒ “3.1 Rules for cleanliness”, page 17

Protected by copyright. Copying for private or commercial purposes, in p
permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or a
respect to the correctness of information in this document. Copyright

– Connect test hose -2- to return line connection of high-pressure reservoir -3-.



1) Checking while engine is running

– Start engine and run at idling speed.

- Engine codes CXXA, CXXB, DDYA, DDYB, DGTE: return flow rate 0 ml in 30 seconds. Droplets are allowed
- All other engine codes, specified value in 30 seconds over 75 ml.

If the specification is not attained, the fuel pressure regulating valve - N276- is defective.

2) Checking while engine is running

Specification has been attained during first test.

Increase engine speed ≥ 2000 rpm.

- Specification: return volume 0 ml
- Droplets are allowed
- If reading does not match specification. The fuel pressure regulating valve - N 276- is defective.

3) If it is no longer possible to start engine

Carry out check at starter speed.

- Specification: return volume 0 ml
- Droplets are allowed
- If the specification is not attained, the fuel pressure regulating valve - N 276- is defective.

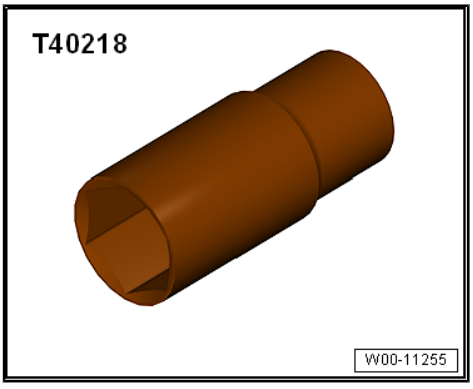
– Install engine cover panel ⇒ page 56 .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

6.3 Removing and installing fuel pressure sender - G247-

Special tools and workshop equipment required

♦ Socket, 27 mm - T40218-



Removing

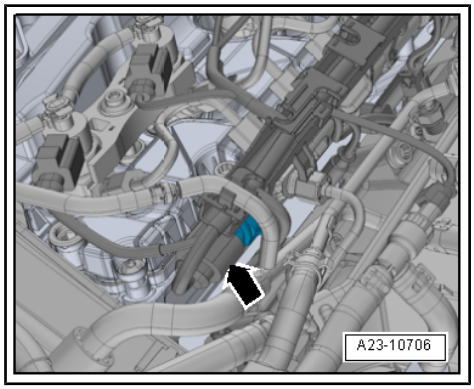
– Remove engine cover panel ⇒ page 56 .

– Before removal, clean area around thread for fuel pressure sender - G247- using e.g. commercial cleaning solution.

- Make sure no dirt gets into opening in high-pressure reservoir.
- No cleaning agent is to get into the connector, clean carefully.

– Dry fuel pressure sender - G247- .

– Disconnect electrical connector -arrow-.



– Unscrew fuel pressure sensor - G247- using socket, 27 mm - T40218- .

– Use suction device to extract dirt from high-pressure accumulator bore (threads and sealing surface). Do not use tools or other instruments for this purpose.

– Seal off opening in high-pressure reservoir with a plug.

Installing

Note

- *Make sure that sealing surfaces (deformable sealing lip) and threads on new fuel pressure sender - G247- are undamaged. If inspection of fuel pressure sender - G247- shows that it is OK, it can be used again.*
- *Also check sealing surface on the borehole of the high-pressure reservoir.*
- *The beginning of the thread and the deformable sealing lip of the fuel pressure sender - G247- must be coated with diesel fuel.*

– Tighten fuel pressure sender - G247- by hand.

– Then tighten fuel pressure sensor - G247- to specified torque.

– Filling and bleeding fuel system ⇒ page 388

– Install engine cover panel ⇒ page 56 .

Specified torques

- ⇒ “3.2 Assembly overview - high-pressure accumulator (fuel rail)”, page 396

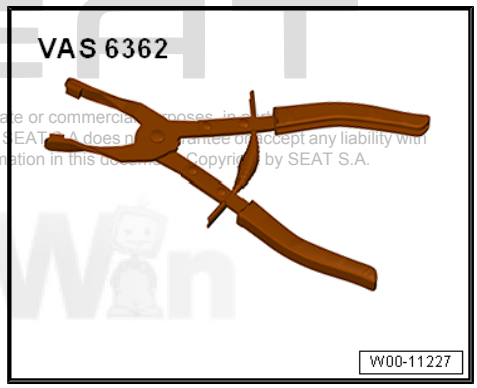
6.4 Removing and installing air mass meter - G70-

Note

The air mass meter - G70- and the intake air temperature sender - G42- are integrated in one housing.

Special tools and workshop equipment required

- Hose clip pliers - VAS 6362-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

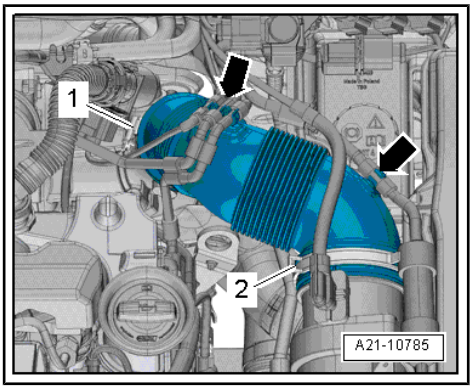
Removing

– Remove engine cover panel ⇒ page 56 .

– Free vacuum hoses -arrows-.

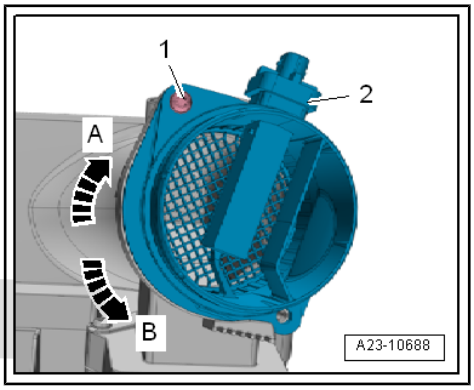
– Release and pull off connector.

– Loosen hose clips -1 and 2- , and remove air pipe.



– Unscrew bolt -1-.

– Turn the air mass measurer - G70- -item 2- in -the direction of arrow B- and take it off.



Installing

To ensure the proper function of the air mass meter - G70- it is important to observe the following instructions.

Note

- *If the air filter element is very dirty or wet, particles of dirt or water may reach the air mass meter and falsify the measured air mass value. This would lead to loss of power, since a smaller injection quantity is calculated.*
- *Always use genuine part for air filter element.*
- *Always renew seal if damaged (air leaks in intake system).*
- *Use a silicone-free lubricant to install the air hose and seal.*
- *Hose unions and air intake pipes/hoses must be free of oil and grease when installing.*
- *Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .*

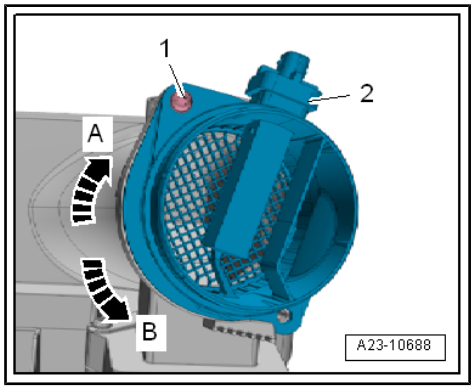
– Check for salt residue, dirt and leaves in air mass meter and air intake hose (engine intake side).

– Check intake channel for contamination as far as air filter element. If contamination is found, remove salt residue, dirt or leaves from air filter housing.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Attach the air mass measurer - G70- for installation at -item 2- and turn it in -the direction of arrow A-.

– Install engine cover panel ⇒ page 56 .



Specified torques

- ⇒ “4.1 Assembly overview - air filter housing”, page 420
- ⇒ “2.1 Assembly overview - charge air system”, page 362

If air mass meter - G70- was renewed, reset learnt values in engine control unit using vehicle diagnostic tester:

- `Self-diagnosis-capable systems`
- `0001 - Engine electronics`
- `0001 - Engine electronics, functions`
- `0001 - Reset adaptation values of engine ctrl. module`
- `Option: 6 - Resetting after replacing the air mass meter`

6.5 Removing and installing pressure differential sender - G505-

⇒ “6.5.1 Removing and installing pressure differential sender G505 , version 1”, page 442

⇒ “6.5.2 Removing and installing pressure differential sender G505 , version 2”, page 444

⇒ “6.5.3 Removing and installing pressure differential sender G505 , version 3”, page 445

6.5.1 Removing and installing pressure differential sender - G505- , version 1

If the pressure differential sender - G505- is to be removed ⇒ page 443 :

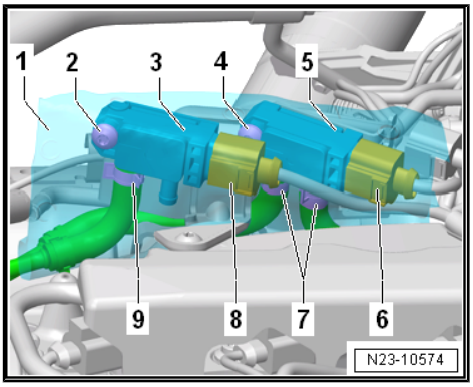
If the pressure differential sender - G505- and the pressure sensor 1 for exhaust - G450- are to be removed from the cylinder head cover ⇒ page 443 :

Note

Pressure differential sender - G505- determines charge status of particulate filter.

Copyright by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

If the pressure differential sender - G505- needs to be removed:



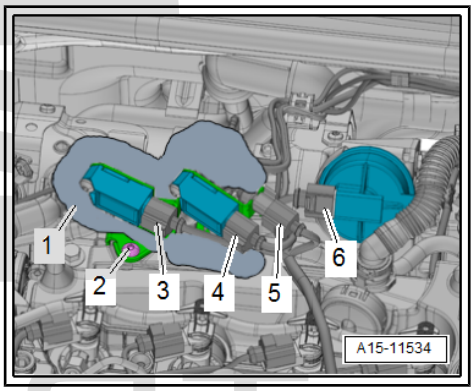
- Remove engine cover panel ⇒ page 56 .
- Open heat insulation sleeve -1-.
- Release and unplug electrical connector -8-.
- Unscrew bolt -2- and remove pressure differential sender - G505- -3- from bracket.
- Before disconnecting hose from pressure differential sender - G505- , spray hose with suitable release agent.
- Release the hose clamp -9-.

NOTICE

Avoid irreparable damage to pressure differential sender caused by the connection breaking off.

- **Pull the hoses carefully and straight of the connection stubs.**

If the pressure differential sender - G505- and the exhaust gas pressure sensor 1 - G450- need to be removed from the cylinder head cover:



- Remove engine cover panel ⇒ page 56 .
- Open heat insulation sleeve -1-.
- Release and pull off connectors -3- and -4-.
- Release and pull off electrical connector -5-, then detach it from retainer.
- Open heat insulation sleeve of electrical connector -6-.
- Release and unplug electrical connector -6-.
- Move clear electrical wiring harness.
- Unscrew bolt -2-.
- Lay pressure differential sender - G505- together with bracket to one side.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Installing

Installation is carried out in reverse order; noting the following:

Note

- *Before installing, blow out control lines of pressure differential sender - G505- to particulate filter with compressed air towards particulate filter (blocked or iced up due to condensation).*
- *Make sure that hose is securely fitted and that there are no leaks.*
- *Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ Electronic parts catalogue .*

- Install engine cover panel ⇒ page 56 .

Specified torques

Component	Specified torque
Bolt for securing bracket to cylinder head	8 Nm

- ⇒ “9.1 Assembly overview - Lambda probe”, page 466
- ⇒ “2.1 Assembly overview - emission control”, page 500

6.5.2 Removing and installing pressure differential sender - G505- , version 2

If the pressure differential sender - G505- is to be removed ⇒ page 444 :

If the pressure differential sender - G505- is to be removed from the cylinder head cover, ⇒ page 445 .

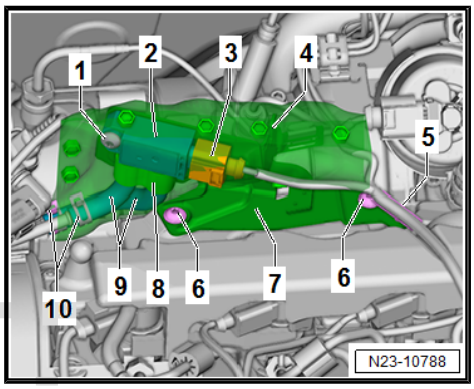
Note

Pressure differential sender - G505- determines charge status of particulate filter.

– Remove engine cover panel ⇒ page 56 .

If the pressure differential sender - G505- needs to be removed:

– Open heat insulation sleeve -4-.
– Release and unplug electrical connector -3-.
– Unscrew bolt -1-, and remove pressure differential sender - G505- -2- from bracket.
– Release bracket -8- on back of bracket -7- to remove.
– Before disconnecting hose from pressure differential sender - G505- , spray hose with suitable release agent.
– Release hose clips -10-.
– Pull hoses -9- off pipes.



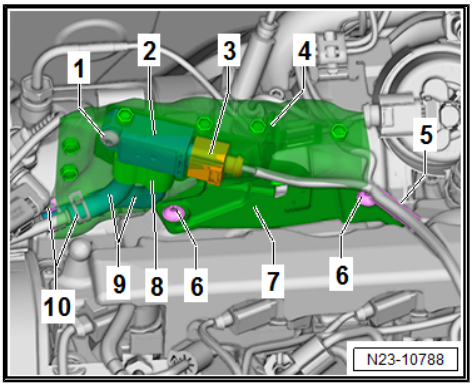
CAUTION

Avoid irreparable damage to pressure differential sender caused by the connection breaking off.

- **Carefully disconnect hose from connection, taking care to keep hose straight.**

es, in part or in whole, is not
antee or accept any liability with
Copyright by SEAT S.A.

If the pressure differential sender - G505- needs to be removed from the cylinder head cover:



– Open heat insulation sleeve -1-.
– Release and unplug electrical connector -3-.
– Unclip wiring harness -5-, and move it to one side.
– Unscrew bolts -6-.
– Lay aside pressure differential sender - G505- together with bracket -7-.

Installing

Installation is carried out in reverse order; noting the following:

Note

- *Before installing, blow out control lines of pressure differential sender - G505- to particulate filter with compressed air towards particulate filter (blocked or iced up due to condensation).*
- *Make sure that hose is securely fitted and that there are no leaks.*
- *Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ Electronic parts catalogue .*

– Install engine cover panel ⇒ page 56 .
– An adaptation must be performed after renewing pressure differential sender - G505- and/or particulate filter.
– Use ⇒ Vehicle diagnostic tester.

- `Self-diagnosis-capable systems`
- `0001 - Engine electronics`
- `0001 - Engine electronics, functions`
- `0001 - Reset adaptation values of engine ctrl. module`

Specified torques

Component	Specified torque
Bolt for securing bracket to cylinder head	8 Nm

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

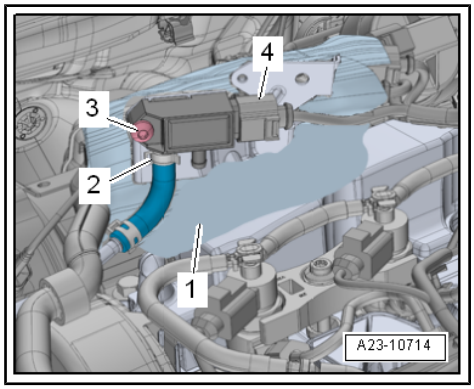
- ⇒ “9.1 Assembly overview - Lambda probe”, page 466
- ⇒ “2.1 Assembly overview - emission control”, page 500

6.5.3 Removing and installing pressure differential sender - G505- , version 3

Note

Differential pressure sensor - G505- determines charge status of particulate filter.

Removing



– Remove engine cover panel ⇒ page 56 .
– Open heat insulation sleeve -1-.
– Unplug the electrical connector -4-.
– Remove bolt -3- and detach pressure differential sender - G505- from bracket.
– Before disconnecting hose from pressure differential sender - G505- , spray hose with suitable release agent.
– Loosen clamp -2-.

CAUTION

Irreparable damage to pressure differential sender can be caused if the connection breaks off.

- **Carefully disconnect hose from connection, taking care to keep hose straight.**

Installing

Install in reverse order of removal, observing the following.

Note

- *Before installing, blow out control lines of pressure differential sender - G505- to particulate filter with compressed air towards particulate filter (blocked or iced up due to condensation).*
- *Make sure that hose is securely fitted and that there are no leaks.*
- *Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ Electronic parts catalogue .*

– Install engine cover panel ⇒ page 56 .
– An adaptation must be performed after renewing pressure differential sender - G505- and/or particulate filter.
– This will cause the learnt values to be reset.
– Perform adaption. Use vehicle diagnostic tester

Specified torques

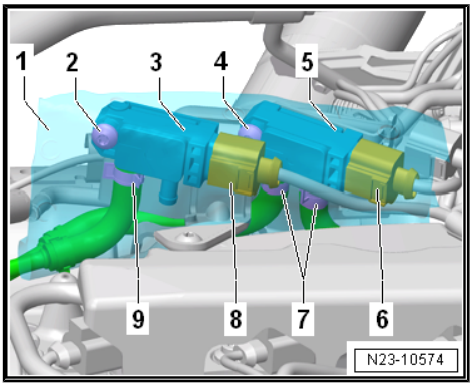
- ⇒ “9.1 Assembly overview - Lambda probe”, page 466
- ⇒ “2.1 Assembly overview - emission control”, page 500

6.6 Removing and installing exhaust pressure sensor 1 - G450-

Removing

– Remove engine cover panel ⇒ page 56 .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted. Unauthorized use may violate copyright laws. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



– Open heat insulation sleeve -1-.
– Unplug the electrical connector -8-.
– Unscrew bolt -2- and slightly push pressure differential sender - G505- -3- to one side.
– Unplug the electrical connector -6-.
– Unscrew bolt -4-.
– Before pulling hoses off exhaust gas pressure sensor 1 - G450- -5-, spray them with solvent.
– Loosen clamps -7-.

NOTICE

Irreparable damage to pressure differential sender can be caused if the connection breaks off.

- **Carefully disconnect hose from connection, taking care to keep hose straight.**

Installing

Install in reverse order of removal, observing the following.

Note

- *Before installing, blow out control lines for exhaust gas pressure sensor 1 - G450- towards particulate filter with compressed air (hoses can become obstructed or may ice up due to condensation).*
- *Make sure that hose is securely fitted and that there are no leaks.*
- *Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ Electronic parts catalogue .*

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Install engine cover panel ⇒ page 56 .
– After renewing pressure differential sender -G450- reset learnt values ⇒ Vehicle diagnostic tester.
– Perform adaption. Use vehicle diagnostic tester

- `Self-diagnosis-capable systems`
- `0001 - Engine electronics`
- `0001 - Engine electronics, functions`
- `0001 - Reset adaptation values of engine ctrl. module`

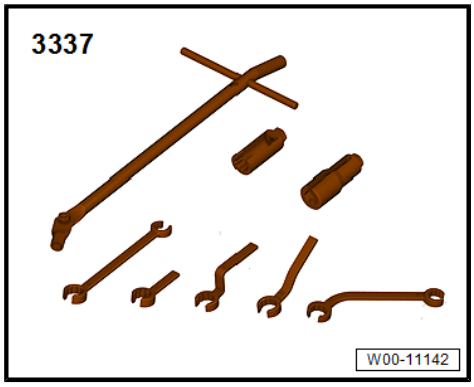
Specified torques

- Assembly overview - Lambda probe ⇒ “9.1 Assembly overview - Lambda probe”, page 466 .
- Assembly overview - emission control ⇒ “2.1 Assembly overview - emission control”, page 500

6.7 Removing and installing NOx sender 2 - G687-

Special tools and workshop equipment required

♦ Lambda probe open ring spanner - 3337-



♦ Torque wrench - VAS 5820-

♦ Ring spanner insert AF 22

Removing

The NOx sender 2 - G687- is fitted on the front exhaust pipe behind the exhaust flap control unit - J883- . The control unit for NOx sender 2 - J881- is fitted on the underbody on the left side.

The control unit for NOx sender 2 - J881- and the NOx sender 2 - G687- are comprised in one component.

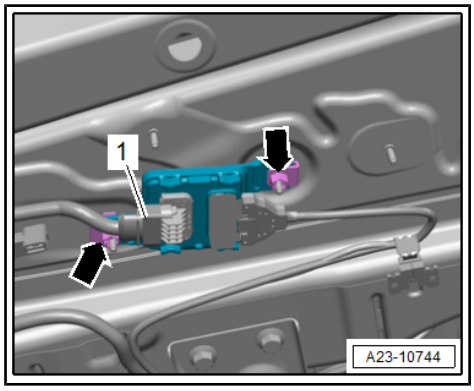
– Detach underbody cladding at centre left on inside, and lower it ⇒ General body repair, exterior; Rep. gr. 66 ; Underbody cladding; Removing and installing underbody cladding .

– Release and unplug electrical connector -1-.

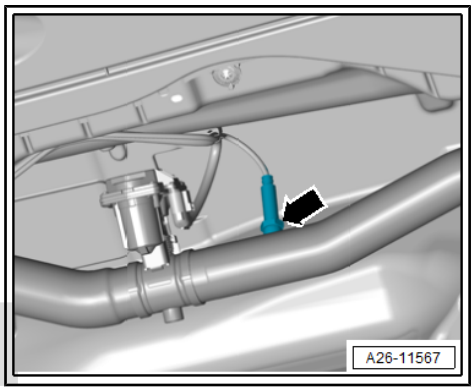
– Lay wiring harness to one side.

– Unscrew nuts -arrows-. The nuts will be damaged irreparably during removal.

– Remove control unit for NOx sender , and lay it to one side.



– Unscrew NOx sender 2 - G687- -arrow-.



Installing

Installation is carried out in reverse order; noting the following:

– Renew nuts after removal. For allocation, refer to ⇒ Electronic Parts Catalogue

– Push nuts onto sides of control unit for NOx sender until they can be heard to engage.

– Make sure that nuts are properly seated in guide.

– Slide control unit for NOx sender together with nuts onto studs until it rests against bracket.

Specified torques

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

♦

♦ ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim

6.8 Removing and installing charge air temperature sender before charge air cooler - G810-

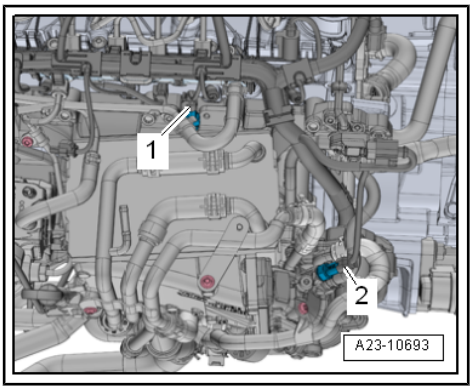
Removing

– Remove engine cover panel ⇒ page 56 .

– Release and pull off respective connector -2-.

– Unscrew charge air temperature sender before charge air cooler - G810- .

– Unscrew relevant charge air temperature sender.



Installing

Install in reverse order of removal, observing the following.

– Install engine cover panel ⇒ page 56 .

Specified torques

♦ ⇒ “5.1 Assembly overview - intake manifold”, page 424

6.9 Removing and installing charge air temperature sender after charge air cooler - G811-

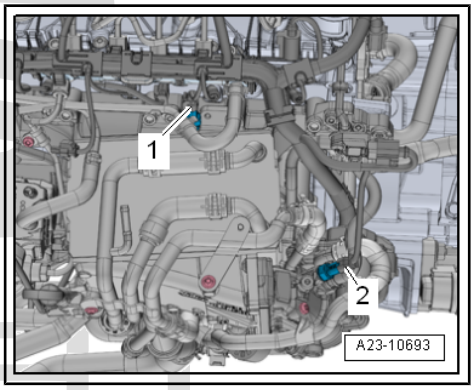
Removing

– Remove engine cover panel ⇒ page 56 .

– Release and unplug electrical connector -1-.

– Unscrew charge air temperature sender after charge air cooler - G811- .

– Unscrew relevant charge air temperature sender.



Installing

Install in reverse order of removal, observing the following.

– Install engine cover panel ⇒ page 56 .

Specified torques

♦ ⇒ “5.1 Assembly overview - intake manifold”, page 424

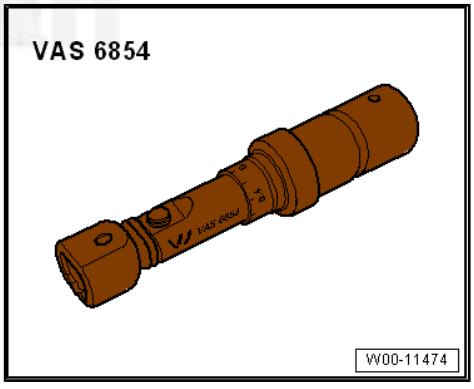
6.10 Removing and installing fuel temperature sender - G81-

Reproduction, copy or use for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

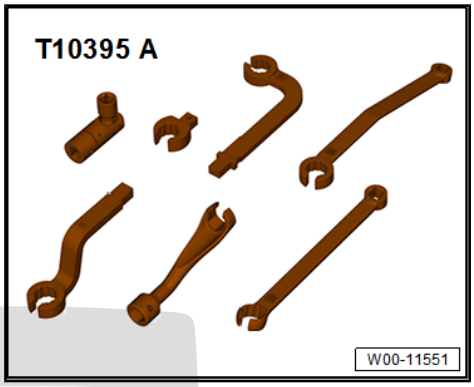
Removing

Special tools and workshop equipment required

♦ Torque wrench - VAS 6854-



- Insert tool 17 mm - T10395/3- or insert tool 17 mm - T10395/11-



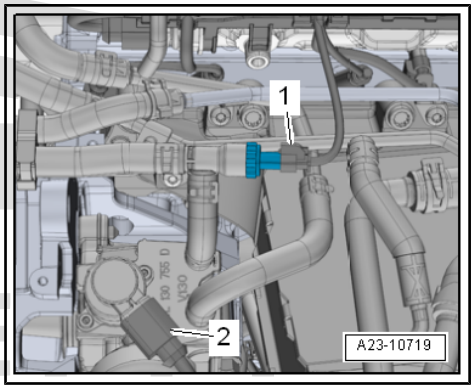
Removing

– Remove engine cover panel ⇒ page 56 .

– Release and unplug electrical connector -1-.

CAUTION

The fuel system is pressurised.
Danger of injury caused by fuel spray.
- **Wear safety goggles.**
- **Wear protective gloves.**
- **Release pressure: place clean cloth around connection and carefully open connection.**



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Remove fuel temperature sender - G81- .

– Collect escaping fuel with a cleaning cloth.

Note

Item -2- can be disregarded.

Installing

Install in reverse order of removal, observing the following.

– Replace the seal -3-.

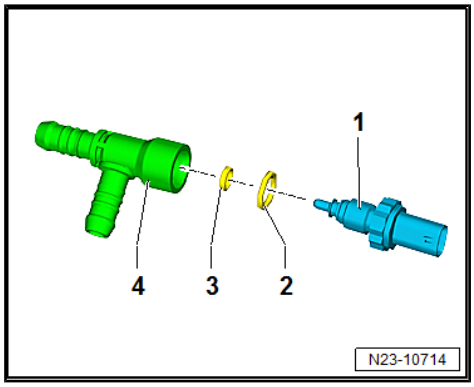
– Make sure that seal -2- is firmly seated.

– Screw fuel temperature sender - G81- -1- into adapter -4-.

– Check fuel system for leaks ⇒ page 388 .

– Install engine cover panel ⇒ page 56 .

Specified torque

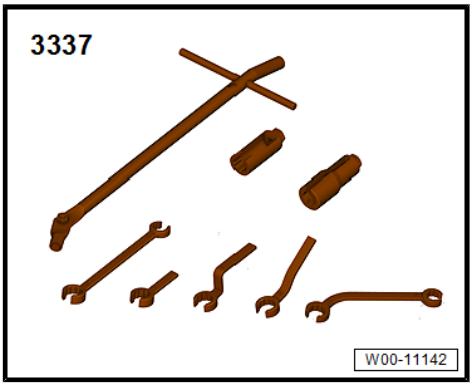


Component	Specified torque
Fuel temperature sender - G81-	2 Nm

6.11 Removing and installing control unit for NOx sender - GX30-

Special tools and workshop equipment required

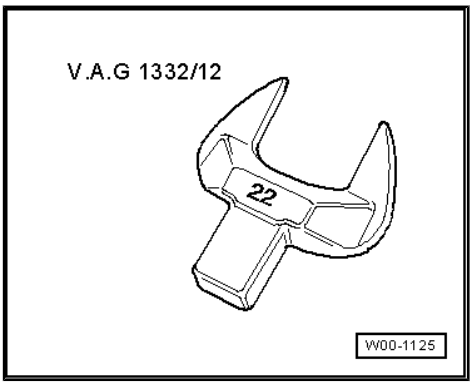
- Wrench kit - 3337/7-



- Torque wrench - V.A.G 1332-

SEAT
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- e/c 22 wrench - VAG 1332/12-



Comprising: NOx sender - G295- with control unit for NOx sender - J583-

Removing

– Remove engine cover panel ⇒ page 56 .

Possible removal scenarios:

Remove NOx sender - G295- on emission control module ⇒ page 452 .

Detach control unit for NOx sender - J583- and wiring harness from bracket to free some space ⇒ page 452 .

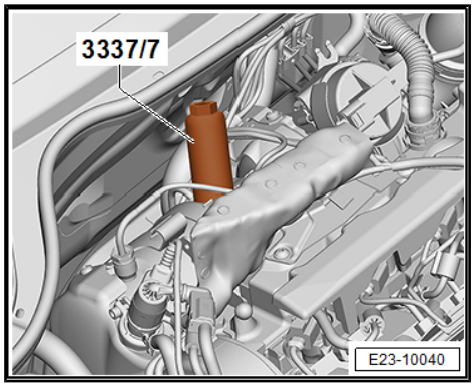
Remove NOx sender - G295- and control unit for NOx sender - J583- ⇒ page 452 .

Remove bracket for control unit for NOx sensor - J583- ⇒ page 452 .

Remove the NOx sender - G295- for space reasons on the emission control module:

– Detach wiring harness for NOx sender - G295- from retainers on plenum chamber bulkhead.

– Unscrew NOx sensor - G295- with the spanner set - 3337/7- .



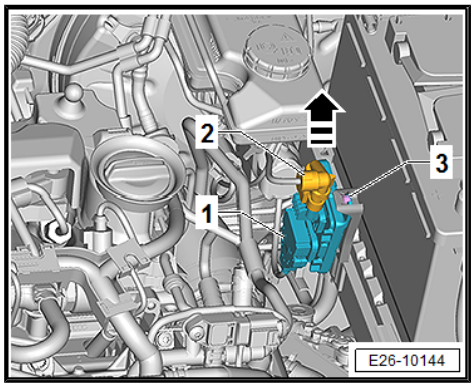
– Remove NOx sender - G295- on emission control module.

Remove the NOx sender control unit - J583- and the wiring harness from the bracket for reasons of space:

– For reasons of space, remove the air filter housing together with the intake hose ⇒ page 422 .

– Unplug the electrical connector -2-.

– Release the latching lug -3- of the bracket for the control unit for NOx sender - J583- -1-.



– Remove control unit for NOx sender - J583- .

– Unclip wiring harness from brake fluid reservoir.

– Lay control unit for NOx sender - J583- -1- to one side.

Disconnect control unit for NOx sender - GX30- :

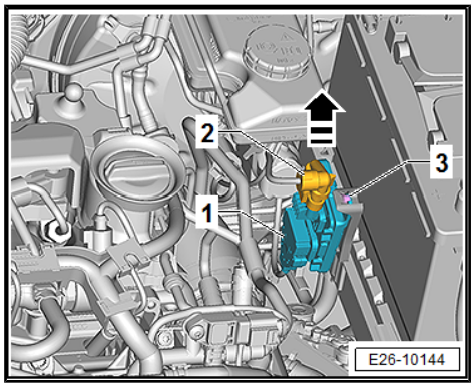
– Remove control unit for NOx sensor - J583- from bracket ⇒ page 452 .

– Unscrew NOx sender - G295- -arrow- on emission control module ⇒ page 452 .

Removing bracket of the control unit for NOx sensor - J583- :

– For reasons of space, remove the air filter housing together with the intake hose ⇒ page 422 .

– Release the latching lug -3- of the bracket for the control unit for NOx sender - J583- -1-.



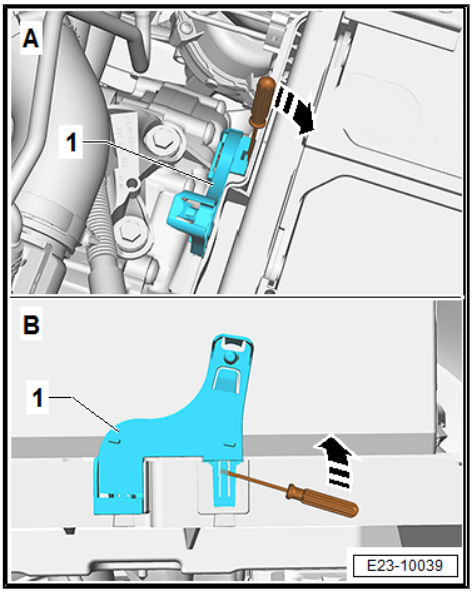
– Remove control unit for NOx sender - J583- -arrow-.

– Lay control unit for NOx sender - J583- -1- to one side.

For personal use only. Any other use, whether private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Using a small screwdriver, release locking lugs of bracket for control unit for NOx sender - J583- -1- on battery tray in sequence -A and B- as shown in illustration.

– Pull the bracket for the control unit for the NOx sender - J583- -1- upwards from the battery tray.



Installing

Install in reverse order of removal, observing the following.

– Install the NOx sensor - G295- and tighten with the spanner set - 3337/7- , the spanner size 22 - VAG 1332/12- and the torque wrench - VAG 1332- .

– Install the air cleaner housing ⇒ page 421 .

– Install engine cover panel ⇒ page 56 .

Specified torques

♦ ⇒ “9.1.2 Assembly overview - Lambda sensor; vehicles with selective catalytic reduction”, page 468

♦ ⇒ “9.1 Assembly overview - Lambda probe”, page 466

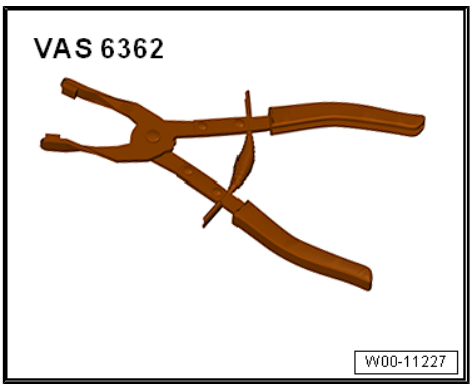
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

6.12 Removing and installing temperature and pressure sender for low-pressure fuel system - GX20-

Removing

Special tools and workshop equipment required

♦ Hose clip pliers - VAS 6362-



– Remove engine cover panel ⇒ page 56 .

– Lay out cloths in the area of high-pressure pump to catch escaping fuel.

Risk of injury due to highly-pressurised fuel.

The fuel system is pressurised. Injury possible due to fuel which may spurt out.

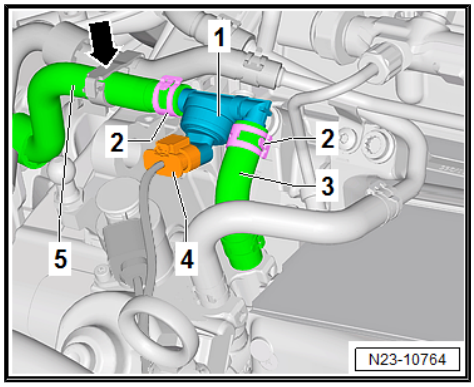
Before opening the fuel system:

– Wear safety goggles.

– Wear protective gloves.

– Release pressure: place clean cloth around connection and carefully open connection.

– Unclip fuel line -5- from bracket -arrow-.
– Release push-fit connector -4- and pull off.
– Loosen clip -2-.
– Pull off fuel lines -3- and -5-.



Installing

Installation is carried out in reverse order; noting the following:

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

7 Engine (motor) control unit

⇒ "7.1 Removing and installing engine control unit J623 ", page 455

⇒ "7.2 Removing and installing engine control unit J623 with protective housing", page 456

7.1 Removing and installing engine control unit - J623-

Special tools and workshop equipment required

- Vehicle diagnosis tester

Removing

– If the engine control unit is to be renewed, switch on ignition and select the following menu items in the Vehicle diagnostic and service information system :

- `0001 - Engine electronics`
- `0001 - Engine electronics, functions`
- `0001 - Renew engine control unit`

– Switch off ignition and remove key.

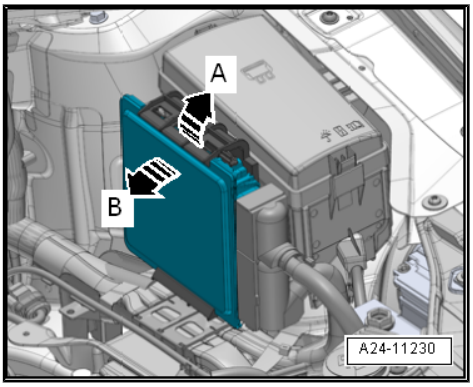
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Note

If the engine control unit comes into contact with the positive battery terminal, permanent damage to the engine control unit will be the consequence. For this reason, the battery always needs to be disconnected prior to removing the engine control unit from its bracket ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

– Release retainer -arrow A- and take out engine control unit - J623- -arrow B-.

– Release and unplug connectors for engine control unit - J623- .



Installing

Install in reverse order of removal, observing the following.

– Insert engine control unit - J623- bottom edge first into bracket -arrow A- and lock at top edge.

• Lugs on engine control unit must engage in notches at top and bottom of bracket -arrows B-.

– Connect vehicle battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

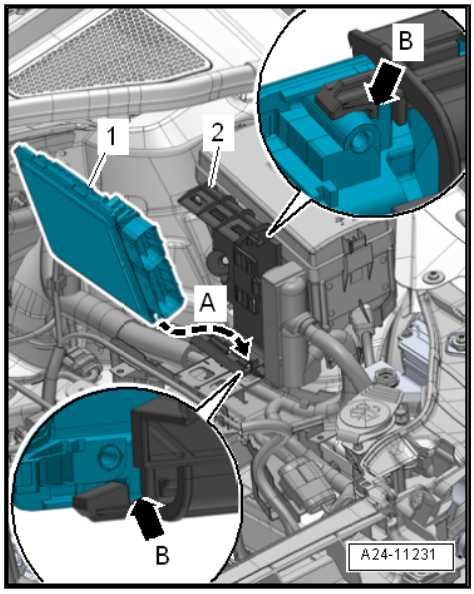
After installing a new engine control unit, the following operation must be performed:

– Switch on the ignition and, in the vehicle diagnostics tester , select the following menu items:

♦ `0001 - Engine electronics`

♦ `0001 - Engine electronics, functions`

♦ `0001 - Renew engine control unit`



7.2 Removing and installing engine control unit - J623- with protective housing

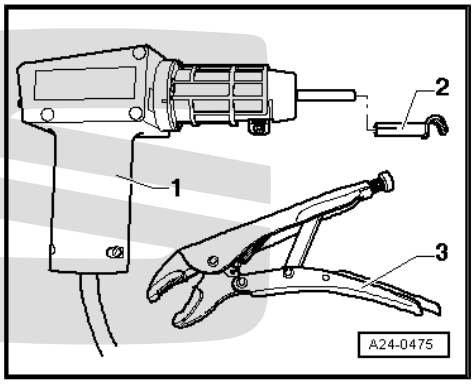
⇒ “7.2.1 Removing and installing engine control unit J623 with metal locking plate”, page 456

⇒ “7.2.2 Removing and installing engine control unit J623 with protective housing”, page 459

7.2.1 Removing and installing engine control unit - J623- with metal locking plate

Special tools and workshop equipment required

♦ Hot air blower - VAS 1978/14A- -item 1- with nozzle attachment -2- from wiring harness repair set - VAS 1978 B-



♦ Small grinder (commercially available)

♦ Vehicle diagnosis tester

Removing

– If the engine control unit - J623- is renewed, the adaption values must be read out and stored before the engine control unit - J623- is removed.

– Connect ⇒ Vehicle diagnostic tester.

♦ `0001 - Engine electronics`

♦ `0001 - Engine electronics, functions`

♦ `0001 - Renew engine control unit`

– Save adaption values in a file.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

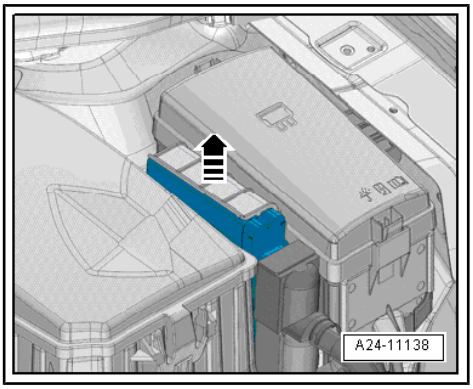
– After you have saved the adaptation value file, switch off ignition, Remove the ignition key.

• If the learnt values for the injector can no longer be read out from the old (defective) engine control unit, these learnt values must be manually input into the new engine control unit and learned.

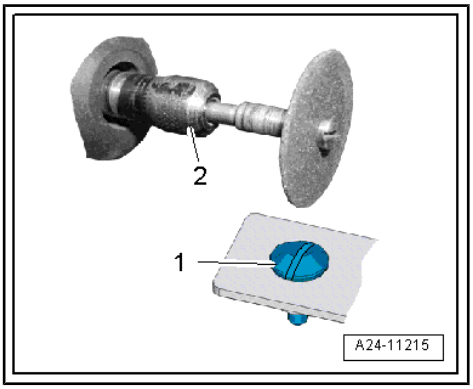
Note

If the engine control unit comes into contact with the positive battery terminal, permanent damage to the engine control unit will be the consequence. For this reason, the battery always needs to be disconnected prior to removing the engine control unit from its bracket ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

– Release retaining clip -arrow- and take out engine control unit - J623- .



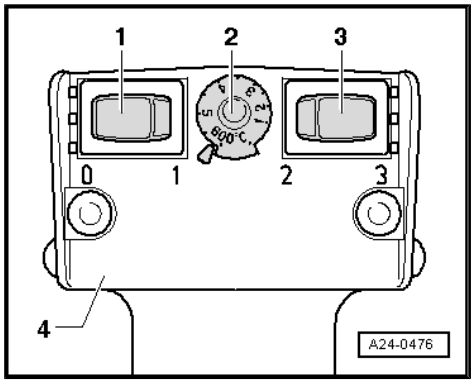
– Make groove (for a screwdriver) in head of shear bolt -1- using a small grinder -2-.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Note

The shear-head bolt threads are coated with locking compound. To unscrew these bolts, the threads must therefore be heated with the hot air blower.

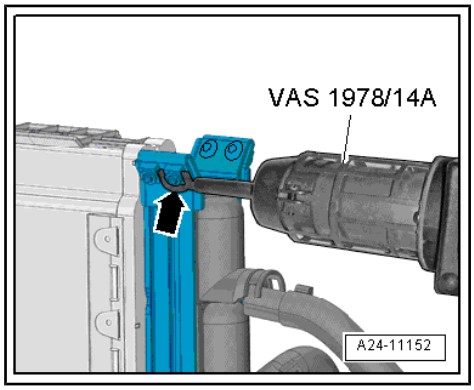


– Set hot air blower as shown in illustration. Set potentiometer for temperature setting -2- to maximum heating output and 2-stage switch for air volume -3- to position 3.

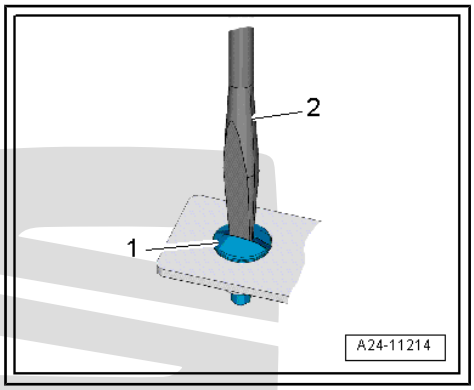
WARNING

Avoid burns from hot air blower.

- **Heating the thread of the locking plate also heats up the shear bolts and parts of the metal housing. Ensure to only heat up the thread and no surrounding components. These should be covered if necessary.**



– Hold hot air blower - VAS 1978/14A- with nozzle attachment -arrow- to thread. Heat shear bolts for approx. 20 to 30 seconds.



– Unscrew shear bolt -1- using screwdriver -2-.

– Detach metal locking plate from connectors for engine control unit - J623- .

– Release and detach connectors.

Installing

Install in reverse order of removal, observing the following.

– The metal locking plate must always be re-fitted on the engine control unit - J623- .

– Clean threaded holes for shear bolts to remove any residue from locking fluid. This can be done using a thread tap.

– Always use new shear bolts.

After installing a new engine control unit, the following operation must be performed:

– Switch on ignition and select the following menu items in the vehicle diagnostic and service information system :

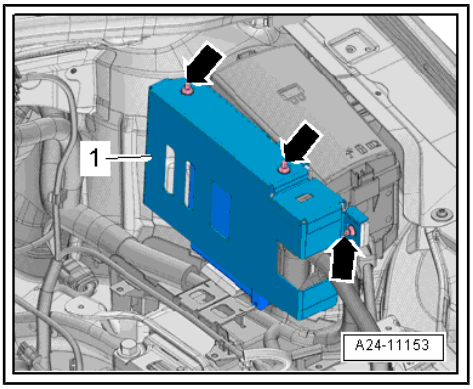
- `0001 - Engine electronics`
- `0001 - Engine electronics, functions`
- `0001 - Renew engine control unit`

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

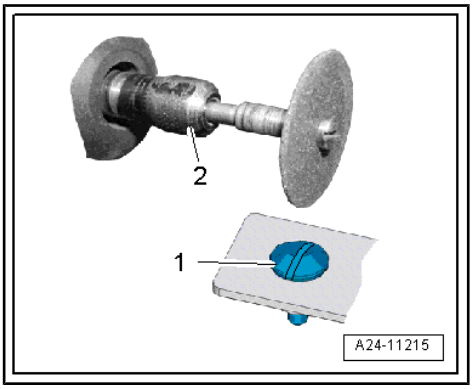
7.2.2 Removing and installing engine control unit - J623- with protective housing

Removing

To remove protective housing -1-, unscrew shear bolts -arrows- as follows:



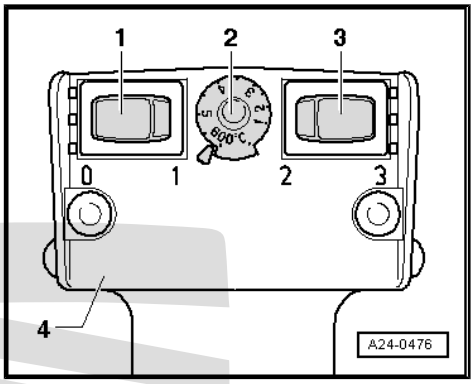
– Make groove (for a screwdriver) in head of shear bolt -1- using a small grinder -2-.



Note

The shear-head bolt threads are coated with locking compound. To unscrew these bolts, the threads must therefore be heated with the hot air blower.

– Set hot air blower as shown in illustration. Set potentiometer for temperature setting -2- to maximum heating output and 2-stage switch for air volume -3- to position 3.



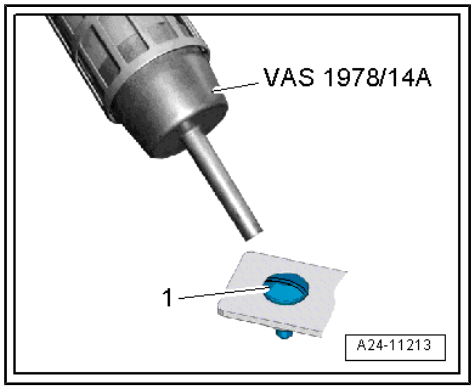
WARNING

Avoid burns from hot air blower.

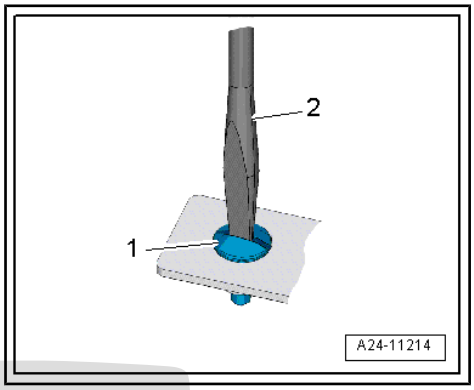
- **Heating the thread of the locking plate also heats up the shear bolts and parts of the metal housing. Ensure to only heat up the thread and no surrounding components. Cover surrounding components if necessary.**

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Heat head of shear bolt -1- for approx. 20 to 30 seconds.



– Unscrew shear bolt -1- using screwdriver -2-.

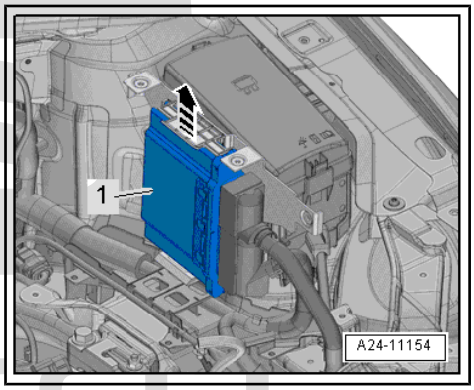


Note

If the engine control unit comes into contact with the positive battery terminal, permanent damage to the engine control unit will be the consequence. For this reason, the battery always needs to be disconnected prior to removing the engine control unit from its bracket ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

– Release fastener -arrow- and detach engine control unit -1-.

– Release and unplug connectors for engine control unit - J623- .



Installing

Install in reverse order of removal, observing the following.

– Make sure you fit protective housing back on engine control unit - J623- .

– Clean threaded holes for shear bolts to remove any residue from locking fluid. This can be done using a thread tap.

– Always use new shear bolts.

After installing a new engine control unit, the following operation must be performed:

– Switch on ignition and select the following menu items in the vehicle diagnostic and service information system :

- `0001 - Engine electronics`
- `0001 - Engine electronics, functions`
- `0001 - Renew engine control unit`

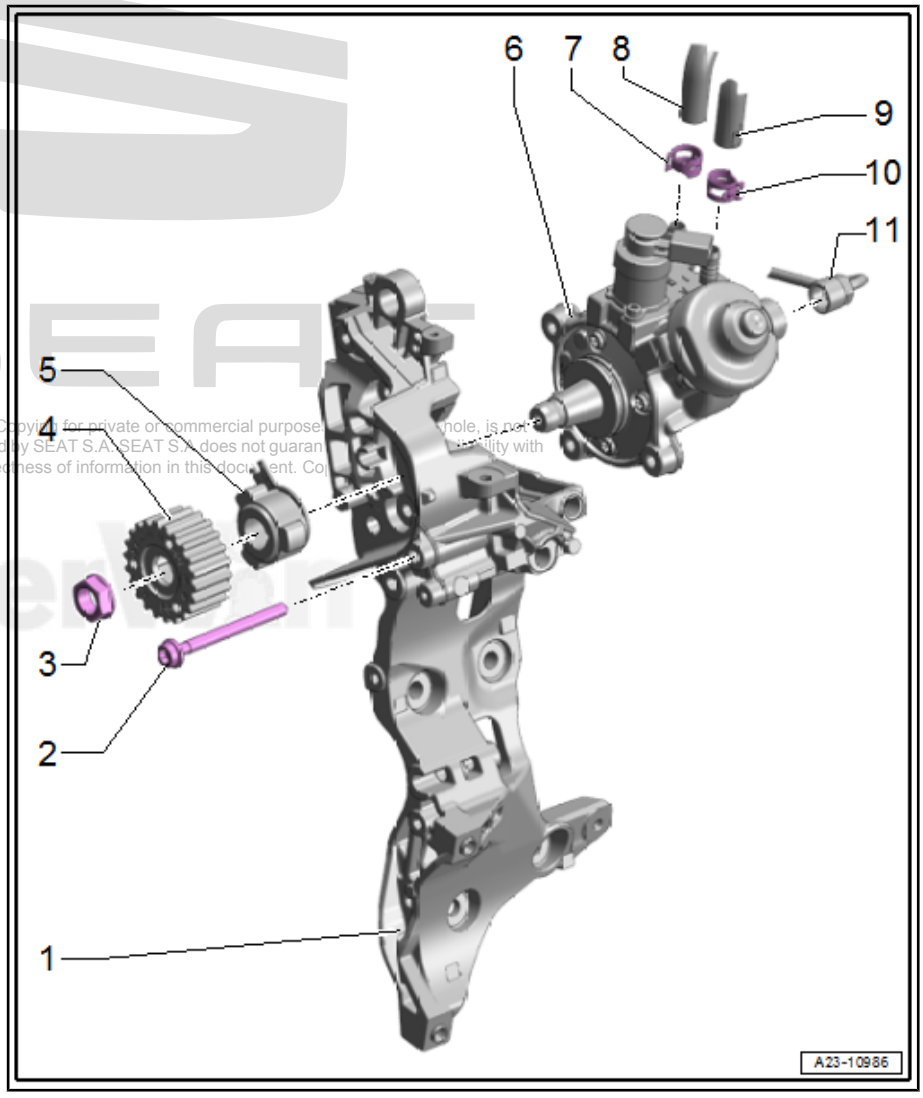
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

8 High-pressure pump

⇒ “8.1 Assembly overview - high-pressure pump”, page 461

⇒ “8.2 Removing and installing high-pressure pump”, page 462

8.1 Assembly overview - high-pressure pump



1 - Bracket for ancillary mechanical units

- ❑ Removing and installing ⇒ page 62

2 - Bolt

- ❑ 3x.
- ❑ Different lengths
- ❑ Renew after removal
- ❑ Specified torque:

♦ Short bolt, 20 Nm + 45°

♦ Long bolt, 20 Nm + 180°

3 - Nut

- ❑ Use counterholder - T10051- to loosen and tighten.
- ❑ 95 Nm

4 - High-pressure pump sprocket

5 - Hub

- ❑ To remove, use puller - T10489-

6 - High-pressure pump

- ❑ With fuel metering valve - N290- (do not open)
- ❑ Removing and installing ⇒ page 462
- ❑ After replacement, re-adapt the learnt values in “Guided Functions” vehicle diagnostics tester

7 - Spring-type clip

- ❑ Renew after removal

8 - Fuel hose

- ❑ On engine codes CXXA, CXXB, DDYA, DDYB, DGTE as discharge line
- ❑ All other engine codes: As an inlet line

9 - Spring-type clip

- ❑ Renew after removal

10 - Fuel hose

- ❑ On engine codes CXXA, CXXB, DDYA, DDYB, DGTE as supply line
- ❑ All other engine codes: As a return line

11 - High-pressure pipe

- ❑ Between high-pressure reservoir (rail) and high-pressure pump
- ❑ Removing ⇒ page 413

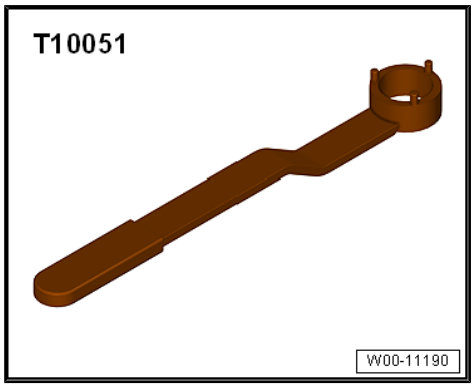
Protected by copyright. Copying for private or commercial purposes, in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee with respect to the correctness of information in this document. Copyright by SEAT S.A.

❑ Observe all instructions for installing high-pressure pipes
⇒ “3.9.2 Installing high-pressure pipe”, page 414

8.2 Removing and installing high-pressure pump

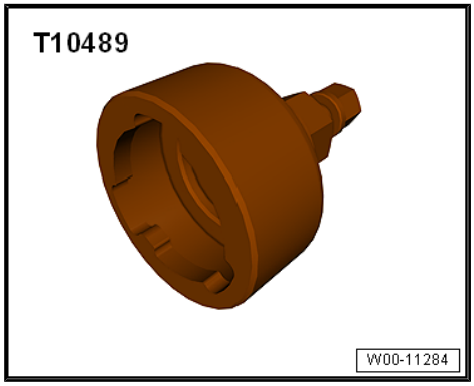
Special tools and workshop equipment required

♦ Counterhold - T10051-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

♦ Puller - T10489-



♦ Dowel pin -T10492-

Removing

NOTICE

Avoid impairing function through contamination or soiling.

- ⇒ "3.1 Rules for cleanliness", page 17

Avoid irreparable damage to high-pressure pump caused by running the pump dry.

- **If the high-pressure pump has been removed or renewed, it is important to fill and bleed the fuel system before the engine is started for the first time ⇒ page 388 .**

– Detach toothed belt from camshaft ⇒ page 141 .

– Remove high-pressure pipe between high-pressure reservoir (rail) and high-pressure pump ⇒ page 413 .

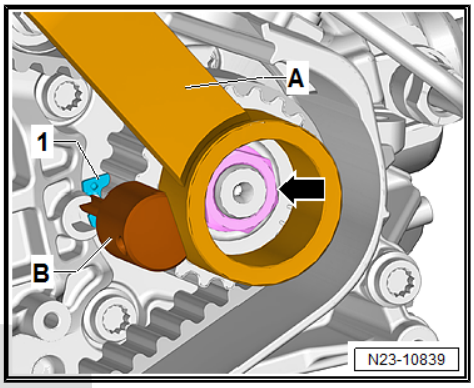
– Apply counterhold tool - T10051- -A- to high-pressure pump sprocket.

– Hand-tighten nut -arrow-.

– Detach dowel pin -T10492- -B-, slowly turn high-pressure pump shaft to a position in which it is not under tension.

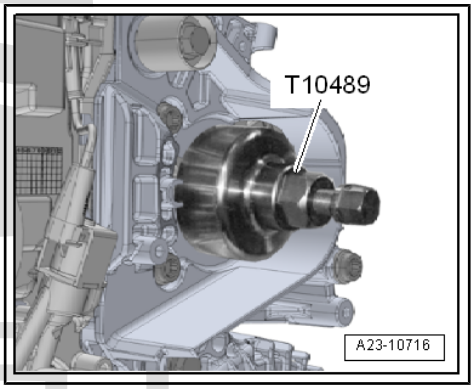
– Remove nut -arrow- and detach counterhold tool - T10051- -A-.

– Detach high-pressure pump sprocket.



– Engage puller -T10489- at hub of high-pressure pump by turning it clockwise.

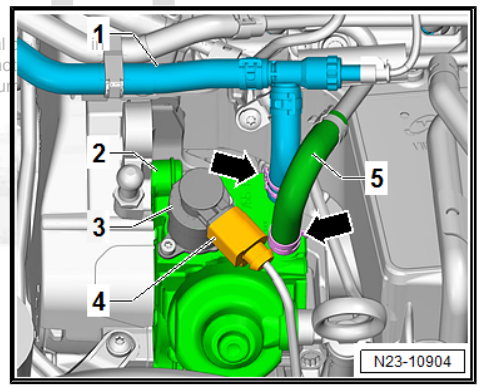
– Detach hub of high-pressure pump.



– Detach fuel hoses -1- and -5- from high-pressure pump -2-.

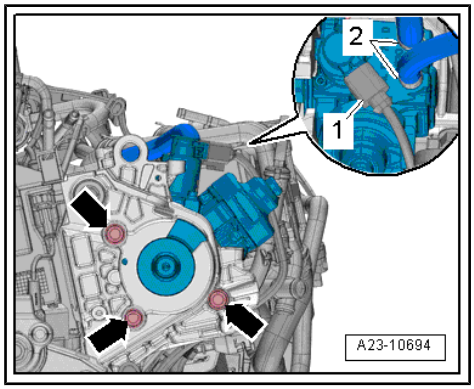
– To do this, open clamps -arrows-.

– Release and pull off electrical connector -4- on fuel metering valve - N290- -3-.



Protected by copyright. Copying for private or commercial
unless authorised by SEAT S.A. SEAT S.A does no
respect to the correctness of information in this docu

– Remove bolts -arrows-.
– Carefully take out high-pressure pump.



Installing

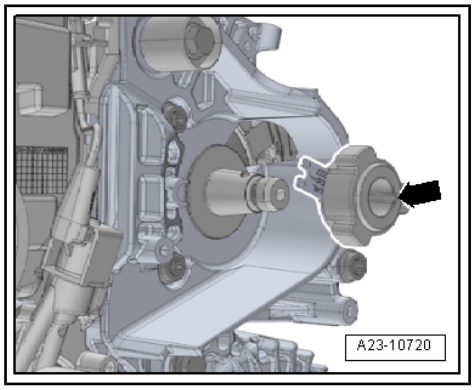
Install in reverse order of removal, observing the following.

– Apply hub -arrow- to high-pressure pump shaft.

• The parallel key on the high-pressure pump shaft must engage in the groove in the hub.

– Place high-pressure pump sprocket on hub.

• Contact surface between counterhold tool and toothed belt sprocket must be free of oil.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Screw nut -arrow- onto thread of high-pressure pump shaft.

– Apply counterhold tool - T10051- -A- to toothed belt sprocket and hand-tighten nut -arrow-.

– Turn high-pressure pump sprocket with counter-hold - T10051- until it can be locked in position with locking pin - T10492- -B-.

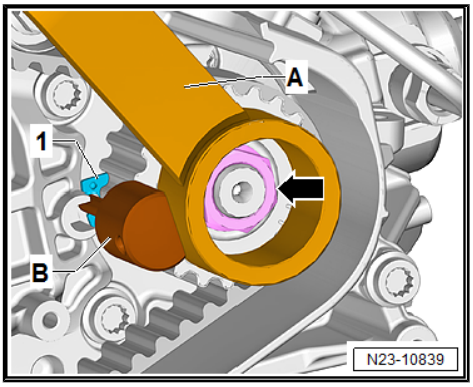
– To do this, insert locking pin - T10492- -B- into fork -2- of hub and into hole -1- behind it in ancillary bracket.

– Loosen nut -arrow- again.

• It should just be possible to turn high-pressure pump toothed belt pulley without axial movement.

– Install toothed belt ⇒ page 135 .

– Install high-pressure pipe ⇒ page 414 .



NOTICE

Risk of damage to high-pressure pump when running dry.

- **If the high-pressure pump has been removed or renewed, it is important to fill and bleed the fuel system before the engine is started for the first time ⇒ page 388 .**

– After renewing high-pressure pump, re-adapt learnt values. Use vehicle diagnostic tester

- `0001 - Engine electronics`
- `0001 - Engine electronics, functions`
- `0001 - Reset adaptation values of engine ctrl. module`

Specified torques

- ⇒ “8.1 Assembly overview - high-pressure pump”, page 461

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

9 Lambda probe

⇒ “9.1 Assembly overview - Lambda probe”, page 466

⇒ “9.2 Removing and installing Lambda probe”, page 469

9.1 Assembly overview - Lambda probe

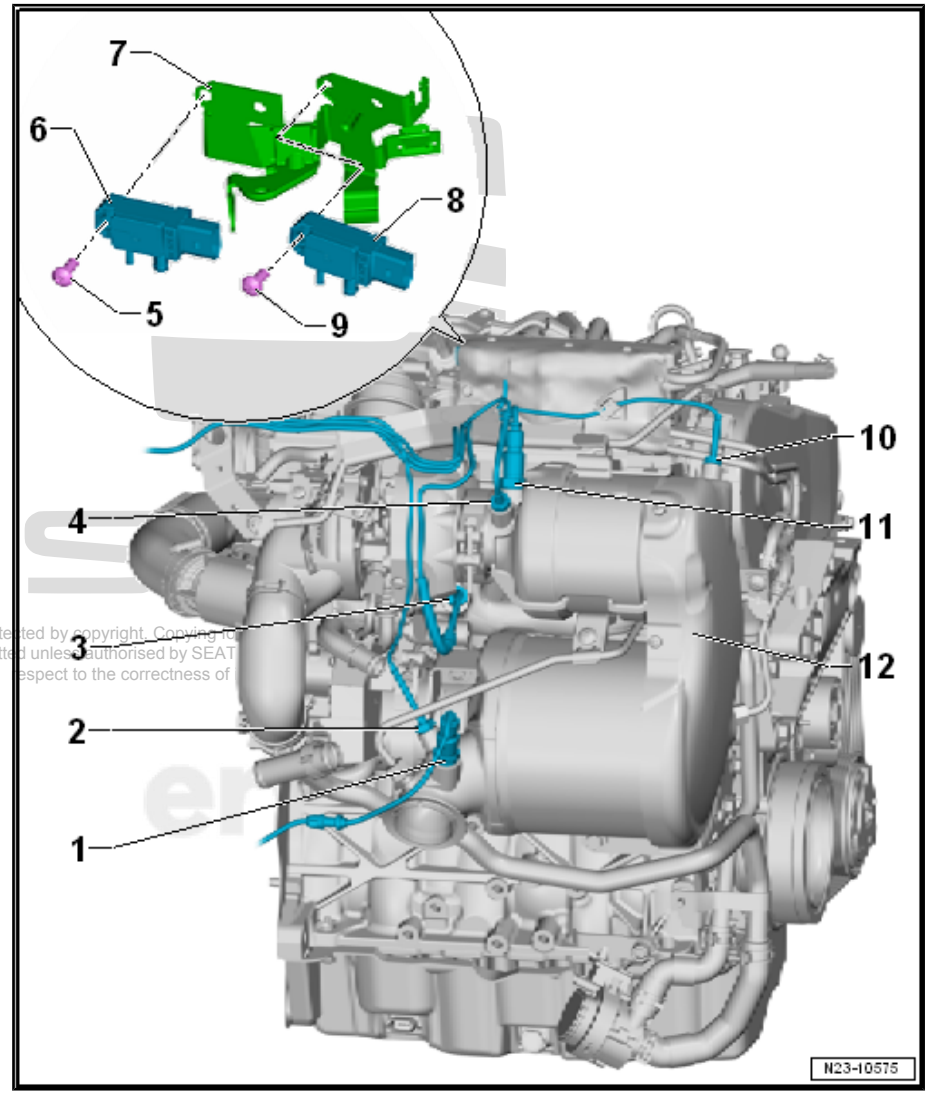
Note

Observe safety precautions
⇒ “1.6 Safety precautions when working on exhaust system”, page 4 .

⇒ “9.1.1 Assembly overview - Lambda sensor; vehicles without selective catalytic reduction”, page 466

⇒ “9.1.2 Assembly overview - Lambda sensor; vehicles with selective catalytic reduction”, page 468

9.1.1 Assembly overview - Lambda sensor; vehicles without selective catalytic reduction



1 - Lambda probe 1 after catalytic converter - GX7-

- ❑ Consisting of:
- ♦ Lambda probes after the catalytic converter - G130-
- ♦ Lambda probe 1 heater after catalytic converter - Z29-
  - ❑ If present
  - ❑ Removing and installing ⇒ page 469
  - ❑ Follow installation instructions
  - ❑ 52 Nm

2 - Exhaust gas temperature sender 4 - G648-

- ❑ If present
- ❑ Removing and installing ⇒ page 548

3 - Exhaust gas temperature sender 1 - G235-

- ❑ Removing and installing ⇒ page 548

4 - Exhaust gas temperature sender 2 - G448-

- ❑ If present
- ❑ Removing and installing ⇒ page 548

5 - Bolt

- ❑ 8 Nm

6 - Pressure differential sender - G505-

- ❑ Removing and installing ⇒ page 442

Protected by copyright. Copying for permitted unless authorised by SEAT respect to the correctness of

7 - Bracket/bearing/support

- ❑ For pressure differential sender

8 - Exhaust gas pressure sensor 1 - G450-

- ❑ If present
- ❑ Removing and installing ⇒ page 446

9 - Bolt

- ❑ 8 Nm

10 - Exhaust gas temperature sender 3 - G495-

- ❑ Removing and installing ⇒ page 548

11 - Lambda probe 1 before catalytic converter - GX10-

- ❑ Consisting of:

- ♦ Lambda probe - G39-
- ♦ Lambda probe heater - Z19-

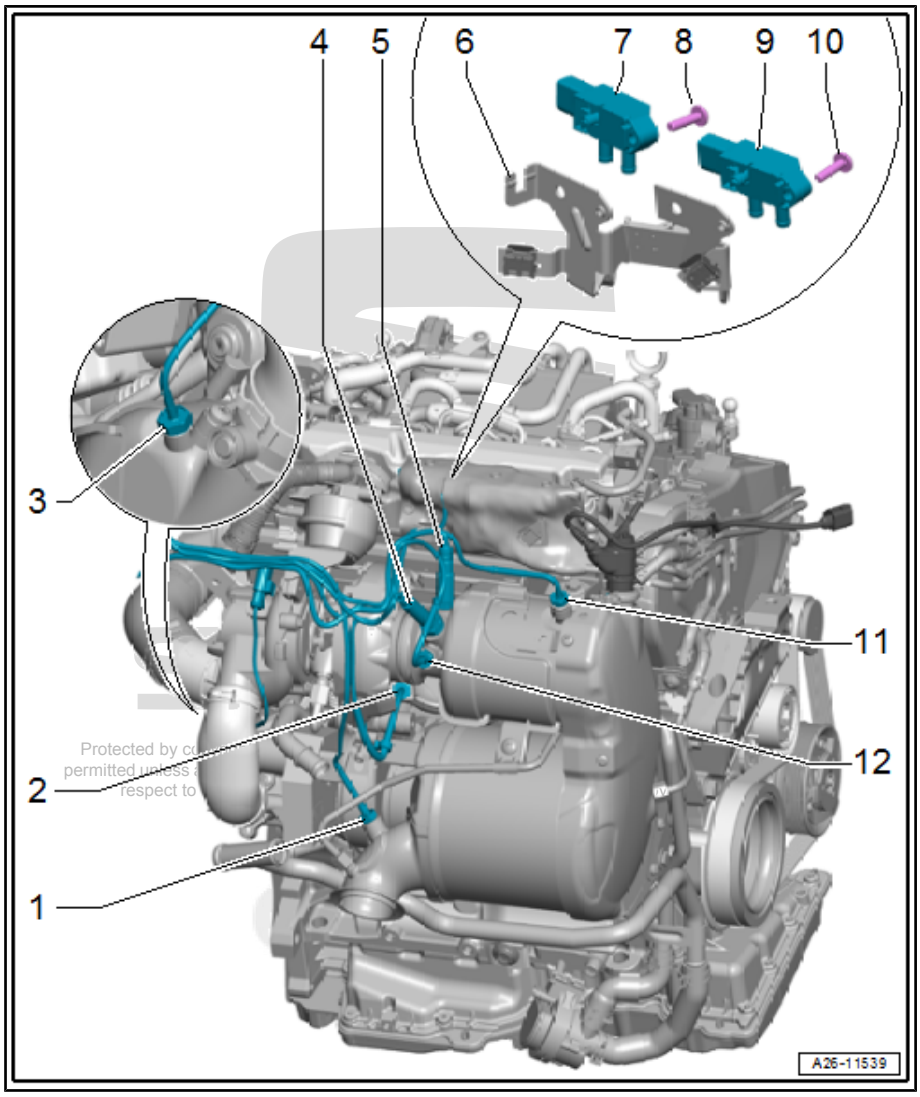
- ❑ Removing and installing ⇒ page 469
- ❑ 55 Nm

12 - Emission control module

- ❑ Assembly overview ⇒ page 500

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

9.1.2 Assembly overview - Lambda sensor; vehicles with selective catalytic reduction



1 - Exhaust gas temperature sender 4 - G648-

- ❑ Removing and installing ⇒ page 548

2 - Exhaust gas temperature sender 1 - G235-

- ❑ Removing and installing ⇒ page 548

3 - Exhaust gas recirculation temperature sensor - G98-

- ❑ Removing and installing ⇒ page 577
- ❑ 45 Nm

4 - NOx sender control unit - GX30-

- ❑ Comprising: NOx sender - G295- and control unit for NOx sender - J583-
- ❑ Removing and installing ⇒ page 451
- ❑ 52 Nm

5 - Lambda probe 1 before catalytic converter - GX10-

- ❑ With Lambda probe - G39-
- ❑ With Lambda probe heater - Z19- .
- ❑ Removing and installing ⇒ page 469
- ❑ 52 Nm

6 - Support bracket

- ❑ For pressure differential sender

7 - Exhaust gas pressure sensor 1 - G450-

- ❑ If present
- ❑ Removing and installing ⇒ page 446

8 - Bolt

- ❑ 8 Nm

9 - Pressure differential sender - G505-

- ❑ Removing and installing ⇒ page 442

10 - Bolt

- ❑ 8 Nm

11 - Exhaust gas temperature sender 3 - G495-

- ❑ Removing and installing ⇒ page 548

12 - Exhaust gas temperature sender 2 - G448-

- ❑ Removing and installing ⇒ page 548

9.2 Removing and installing Lambda probe

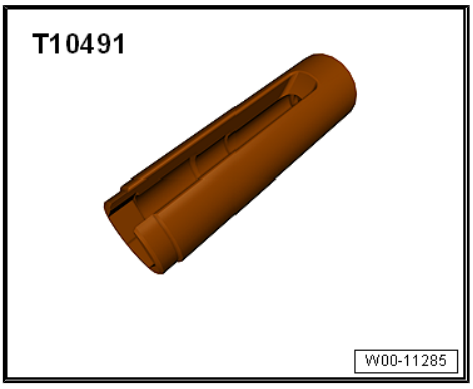
⇒ “9.2.1 Removing and installing Lambda probe 1 before catalytic converter GX10 ”, page 469

⇒ “9.2.2 Removing and installing Lambda probe 1 after catalytic converter GX7 ”, page 470

9.2.1 Removing and installing Lambda probe 1 before catalytic converter - GX10-

Special tools and workshop equipment required

- Socket, SW 22 - T10491-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- Torque wrench - V.A.G 1332-

Comprising: lambda probe - G39- with lambda probe heating - Z19- .

Removing

Fitting location
⇒ “9.1.1 Assembly overview - Lambda sensor; vehicles without selective catalytic reduction”, page 466 .

Fitting location
⇒ “9.1.2 Assembly overview - Lambda sensor; vehicles with selective catalytic reduction”, page 468 .

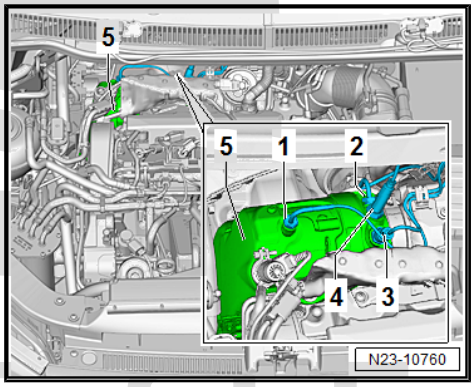
– Remove engine cover panel ⇒ page 56 .

– Remove connector for lambda sensor 1 before catalytic converter - GX10- from retainer, release it, and pull it off ⇒ page 387 .

– Move electrical wiring clear.

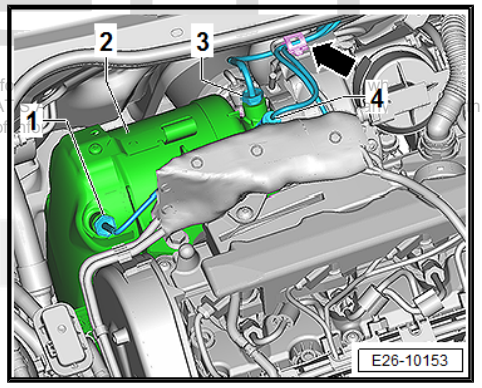
Vehicles with SCR system:

– Unscrew Lambda probe 1 before catalytic converter - GX10--3-.



Vehicles without SCR system:

– Unscrew Lambda probe 1 before catalytic converter - GX10--4-.



Protected by copyright. Copying f
permitted unless authorised by SEA
respect to the correctness of

Installing

Install in reverse order of removal, observing the following.

Note

- *New Lambda sensors are coated with an assembly paste. The paste must not get into the slots on the lambda sensor body.*
- *In the case of a used lambda sensor grease only the thread with high-temperature paste. This paste must not get into the slots on the probe body. For high-temperature paste refer to ⇒ Electronic parts catalogue*
- *When re-installing the electric wire of the lambda sensor, it is important that these are connected to the same locations. The lambda sensor cable must be prevented from touching the exhaust pipe.*

– Install engine cover panel ⇒ page 56 .

- Adaptation is necessary after renewing the lambda probe.
- This will cause the learnt values to be reset.
- Carry out adaptation with the vehicle diagnostic, testing and information system .
- `Self-diagnosis-capable systems`
- `0001 - Engine electronics`
- `0001 - Engine electronics, functions`
- `0001 - Reset adaptation values of engine ctrl. module`

– Follow instructions shown on vehicle diagnostic tester .

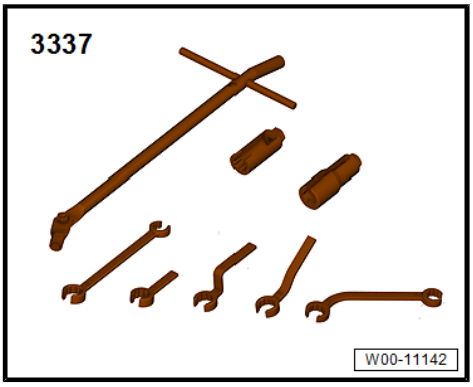
Specified torques

- ⇒ “9.1 Assembly overview - Lambda probe”, page 466

9.2.2 Removing and installing Lambda probe 1 after catalytic converter - GX7-

Special tools and workshop equipment required

♦ Wrench kit - 3337-



♦ Torque wrench - V.A.G 1332-

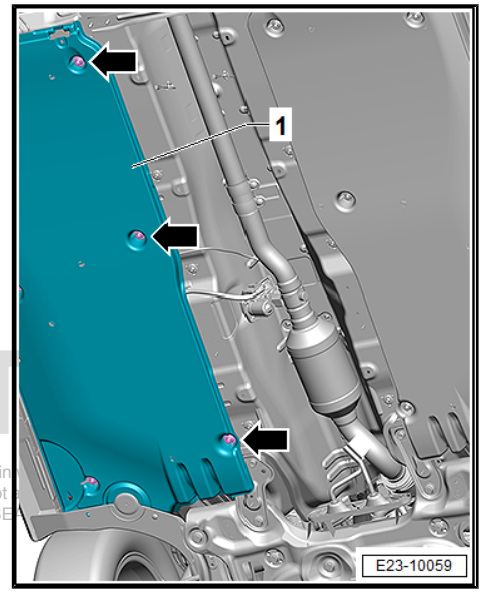
Consisting of: Lambda probe after catalytic converter - G130- and Heater for lambda probe 1, after catalytic converter - Z29-

Removing

– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

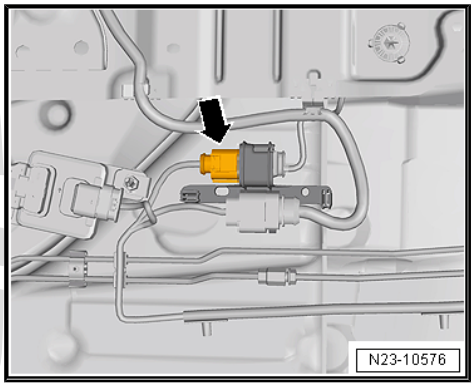
– Remove central, bottom noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Under-floor cladding; Assembly overview - Under-floor cladding

– Unscrew the three plastic nuts -arrows- from the left underbody cover and pull the cover slightly downwards.



Protected by copyright. Copying for private or commercial purposes, in part or in
permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept
respect to the correctness of information in this document. Copyright by SE

– Take the electrical plug connection -arrow- for lambda sensor 1 after catalytic converter - GX7- out of the bracket, release and pull off.



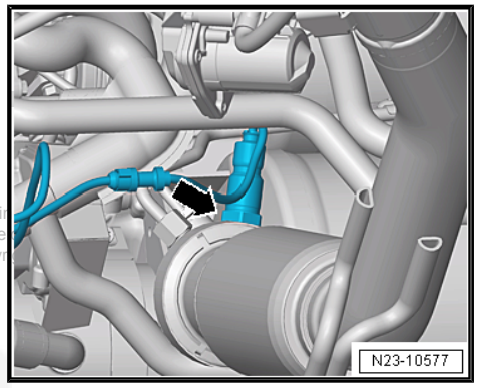
Vehicles with all-wheel drive

– Remove front exhaust pipe ⇒ page 489 .

Continued for all vehicles

– Move electrical wiring clear.

– Unscrew lambda probe 1 after catalytic converter - GX7- -arrow- using a suitable tool from lambda probe open ring spanner set - 3337- .



Installing

Protected by copyright. Copying for private or commercial purposes, in
permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee
document. Copyr

Install in reverse order of removal, observing the following.

Note

- *New Lambda sensors are coated with an assembly paste. The paste must not get into the slots on the lambda sensor body.*
- *In the case of a used lambda sensor grease only the thread with high-temperature paste. This paste must not get into the slots on the probe body. For high-temperature paste refer to ⇒ Electronic parts catalogue*
- *When re-installing the electric wire of the lambda sensor, it is important that these are connected to the same locations. The lambda sensor cable must be prevented from touching the exhaust pipe.*

- Adaptation is necessary after renewing the lambda probe.
- This will cause the learnt values to be reset.
- Carry out adaptation with the vehicle diagnostic, testing and information system .
- `Self-diagnosis-capable systems`
- `0001 - Engine electronics`
- `0001 - Engine electronics, functions`
- `0001 - Reset adaptation values of engine ctrl. module`

– Follow instructions shown on vehicle diagnostic tester .

Specified torques

- ⇒ “9.1 Assembly overview - Lambda probe”, page 466
- ⇒ “1.1 Assembly overview - silencers”, page 473
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Assembly overview - underbody trim panels
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation

26 – Exhaust system

1 Exhaust pipes/silencers

⇒ “1.1 Assembly overview - silencers”, page 473

⇒ “1.2 Assembly overview - front exhaust pipe”, page 488

⇒ “1.3 Removing and installing front exhaust pipe”, page 489

⇒ “1.4 Separating exhaust pipes, silencers”, page 491

⇒ “1.5 Removing and installing central exhaust pipe”, page 493

⇒ “1.6 Removing and installing rear silencer”, page 494

⇒ “1.7 Aligning exhaust system free of stress”, page 497

⇒ “1.8 Check exhaust system for leaks”, page 497

⇒ “1.9 Installation position of clamp”, page 498

⇒ “1.10 Aligning tailpipes”, page 499

The reproduction, distribution and copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

1.1 Assembly overview - silencers

⇒ “1.1.1 Assembly overview - noise silencer, vehicles semi-rigid axle, Ateca, Leon”, page 473

⇒ “1.1.2 Assembly overview - noise silencer, vehicles semi-rigid axle, Ateca ”, page 475

⇒ “1.1.3 Assembly overview - noise silencer, vehicles semi-rigid axle, Ateca”, page 476

⇒ “1.1.4 Assembly overview – silencers, vehicles with multi-link suspension, Ateca ”, page 478

⇒ “1.1.5 Assembly overview - silencers, vehicles with multi-link rear axle, Leon”, page 480

⇒ “1.1.6 Assembly overview – silencers, vehicles with multi-link suspension, Leon Estate”, page 482

⇒ “1.1.7 Assembly overview - noise silencer, vehicle with four wheel drive and multi-link axle, Leon ST”, page 484

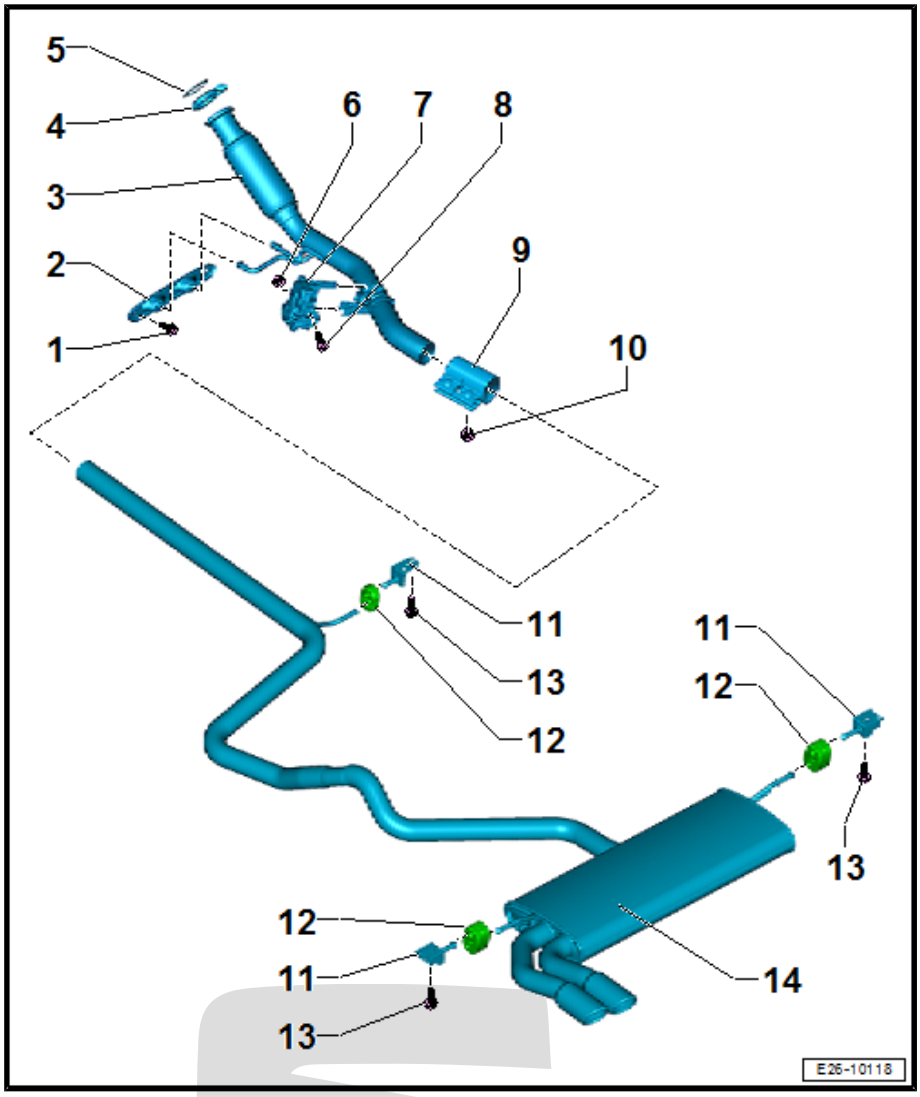
⇒ “1.1.8 Assembly overview - noise silencer, vehicles semi-rigid axle, Leon ST”, page 486

⇒ “1.1.8 Assembly overview - noise silencer, vehicles semi-rigid axle, Leon ST”, page 486

1.1.1 Assembly overview - noise silencer, vehicles semi-rigid axle, Ateca, Leon

Note

- *Observe safety precautions*
  ⇒ “1.6 Safety precautions when working on exhaust system”, page 4 .
- *Original equipment as single assembly together with rear silencer; to be renewed individually in event of repair*



1 - Bolt
- ❑ 20 Nm

2 - Bracket/bearing/support
- ❑ Renew if damaged

3 - Front exhaust pipe
- ❑ Removing and installing ⇒ page 489
- ❑ Aligning exhaust system free of stress ⇒ page 497

4 - Screw-type clamp
- ❑ Renew after removal
- ❑ Installation position ⇒ page 482
- ❑ 7 Nm

5 - Gasket
- ❑ Renew after removal
- ❑ Note installation position ⇒ page 482

6 - Nut
- ❑ 9 Nm

7 - Exhaust flap control unit - J883-
- ❑ Removing and installing ⇒ page 518

8 - Bolt
- ❑ 9 Nm

9 - Tension sleeve
- ❑ Align exhaust system so it is free of stress before tightening clamp ⇒ page 497
- ❑ Installation position ⇒ “1.9 Installation position of clamp”, page 498
- ❑ Specified torque ⇒ “1.9 Installation position of clamp”, page 498
- ❑ Tighten threaded connections evenly.

10 - Nut
- ❑ Specified torque ⇒ “1.9 Installation position of clamp”, page 498

11 - Support bracket
- ❑ Renew if damaged

12 - Mounting
- ❑ Renew if damaged

13 - Bolt
- ❑ 20 Nm

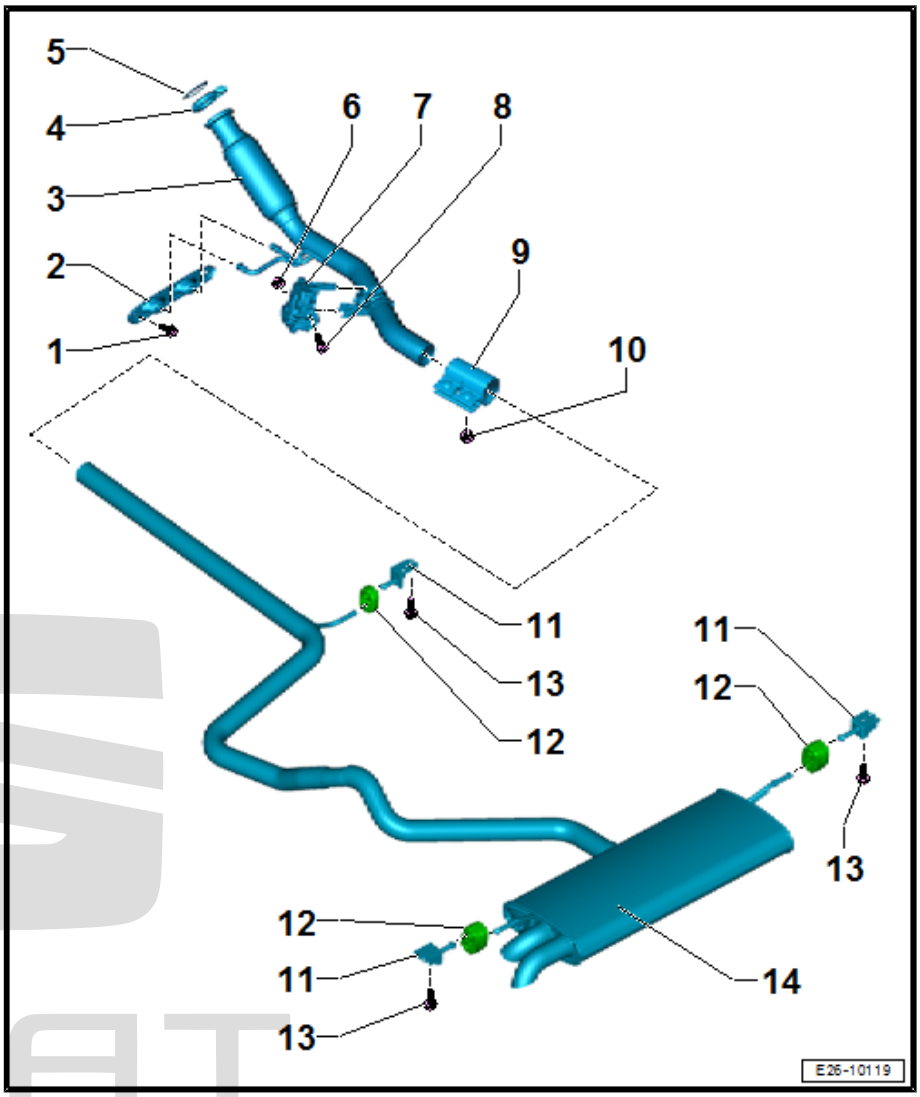
14 - Rear silencer
- ❑ Aligning exhaust system free of stress ⇒ page 497
- ❑ Removing and installing ⇒ page 494
- ❑ Different versions of exhaust gas end hose, depending on the design

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

1.1.2 Assembly overview - noise silencer, vehicles semi-rigid axle, Ateca

Note

- *Observe safety precautions ⇒ "1.6 Safety precautions when working on exhaust system", page 4 .*
- *Original equipment as single assembly together with rear silencer; to be renewed individually in event of repair*



1 - Bolt
- ❑ 20 Nm

2 - Bracket/bearing/support
- ❑ Renew if damaged

3 - Front exhaust pipe
- ❑ Removing and installing ⇒ page 489
- ❑ Aligning exhaust system free of stress ⇒ page 497

4 - Screw-type clamp
- ❑ Renew after removal
- ❑ Installation position ⇒ page 476
- ❑ 7 Nm

5 - Gasket
- ❑ Renew after removal
- ❑ Note installation position ⇒ page 476

6 - Nut
- ❑ 9 Nm

7 - Exhaust flap control unit - J883-
- ❑ Removing and installing ⇒ page 518

8 - Bolt
- ❑ 9 Nm

9 - Tension sleeve
- ❑ Align exhaust system so it is free of stress before tightening clamp ⇒ page 497
- ❑ Installation position ⇒ "1.9 Installation position of clamp", page 498
- ❑ Specified torque ⇒ "1.9 Installation position of clamp", page 498
- ❑ Tighten threaded connections evenly.

10 - Nut
- ❑ Specified torque ⇒ "1.9 Installation position of clamp", page 498

11 - Support bracket
- ❑ Renew if damaged

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

12 - Mounting

- ❑ Renew if damaged

13 - Bolt

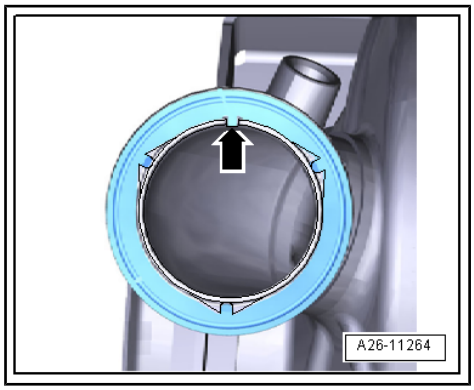
- ❑ 20 Nm

14 - Rear silencer

- ❑ Aligning exhaust system free of stress ⇒ page 497
- ❑ Removing and installing ⇒ page 494
- ❑ Different versions of exhaust gas end hose, depending on the design

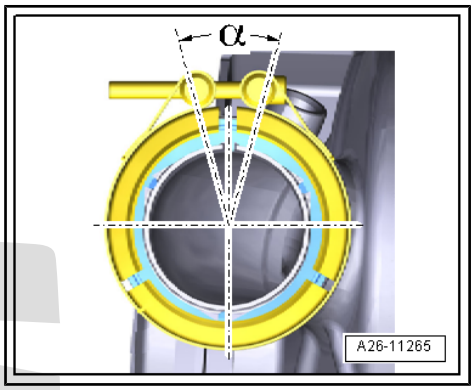
Installation position of gasket between emission control module and front exhaust pipe

- Square tab on seal -arrow- must fit into groove on diesel particulate filter.



Installation position of screw-type clip for front exhaust pipe

- Angle -α- = 0 ± 30°

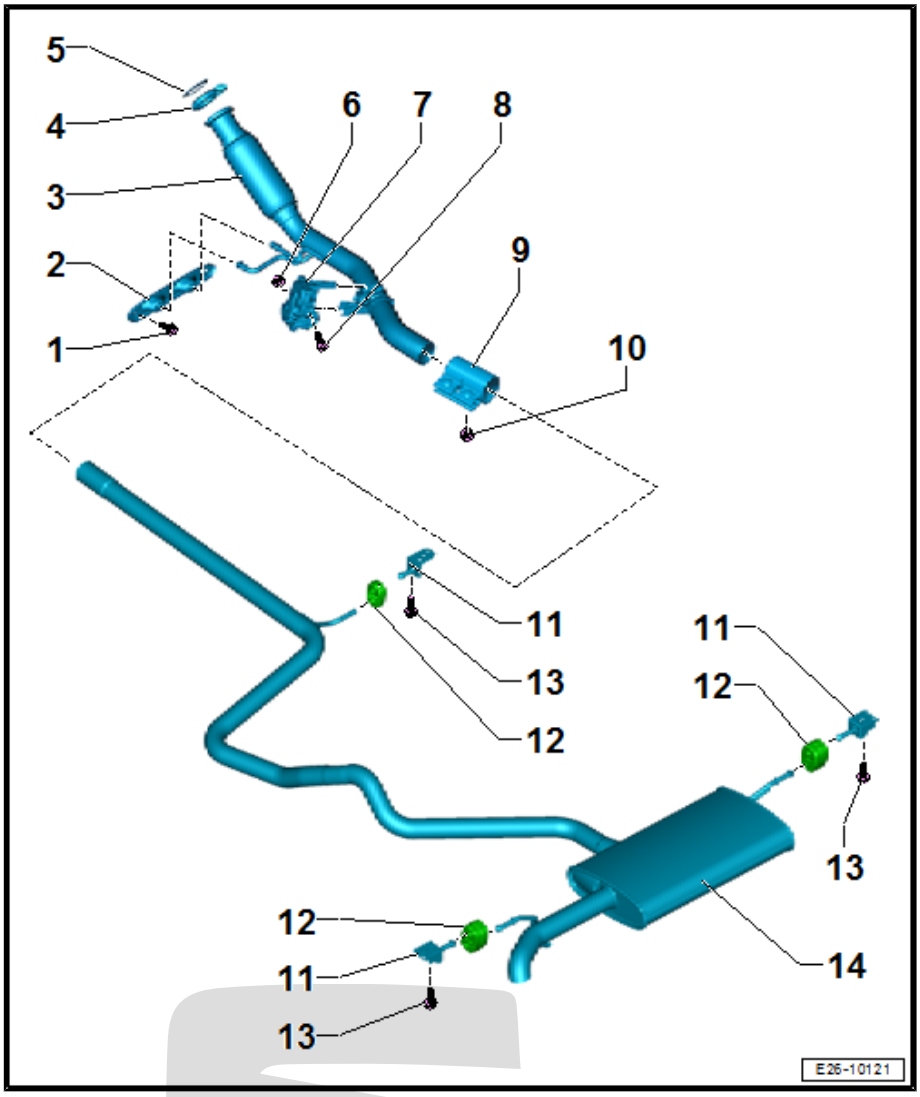


1.1.3 Assembly overview - noise silencer, vehicles semi-rigid axle, Ateca

Note

- *Observe safety precautions ⇒ "1.6 Safety precautions when working on exhaust system", page 4 .*
- *Original equipment as single assembly together with rear silencer; to be renewed individually in event of repair*

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



1 - Bolt
- ❑ 20 Nm

2 - Bracket/bearing/support
- ❑ Renew if damaged

3 - Front exhaust pipe
- ❑ Removing and installing ⇒ page 489
- ❑ Aligning exhaust system free of stress ⇒ page 497

4 - Screw-type clamp
- ❑ Renew after removal
- ❑ Installation position ⇒ page 478
- ❑ 7 Nm

5 - Gasket
- ❑ Renew after removal
- ❑ Note installation position ⇒ page 478

6 - Nut
- ❑ 9 Nm

7 - Exhaust flap control unit - J883-
- ❑ Removing and installing ⇒ page 518

8 - Bolt
- ❑ 9 Nm

9 - Tension sleeve
- ❑ Align exhaust system so it is free of stress before tightening clamp ⇒ page 497
- ❑ Installation position ⇒ “1.9 Installation position of clamp”, page 498
- ❑ Specified torque ⇒ “1.9 Installation position of clamp”, page 498
- ❑ Tighten threaded connections evenly.

10 - Nut
- ❑ Specified torque ⇒ “1.9 Installation position of clamp”, page 498

11 - Support bracket
- ❑ Renew if damaged

12 - Mounting
- ❑ Renew if damaged

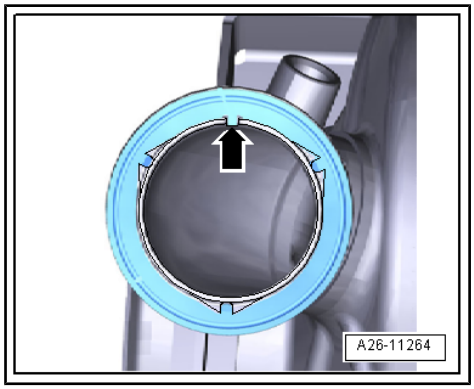
13 - Bolt
- ❑ 20 Nm

14 - Rear silencer
- ❑ Aligning exhaust system free of stress
- ❑ Removing and installing ⇒ page 494
- ❑ Different versions of exhaust gas end hose, depending on the design

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

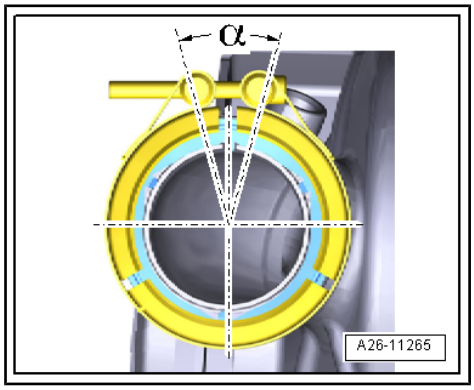
Installation position of gasket between emission control module and front exhaust pipe

- Square tab on seal -arrow- must fit into groove on diesel particulate filter.



Installation position of screw-type clip for front exhaust pipe

- Angle -α- = 0 ± 30°

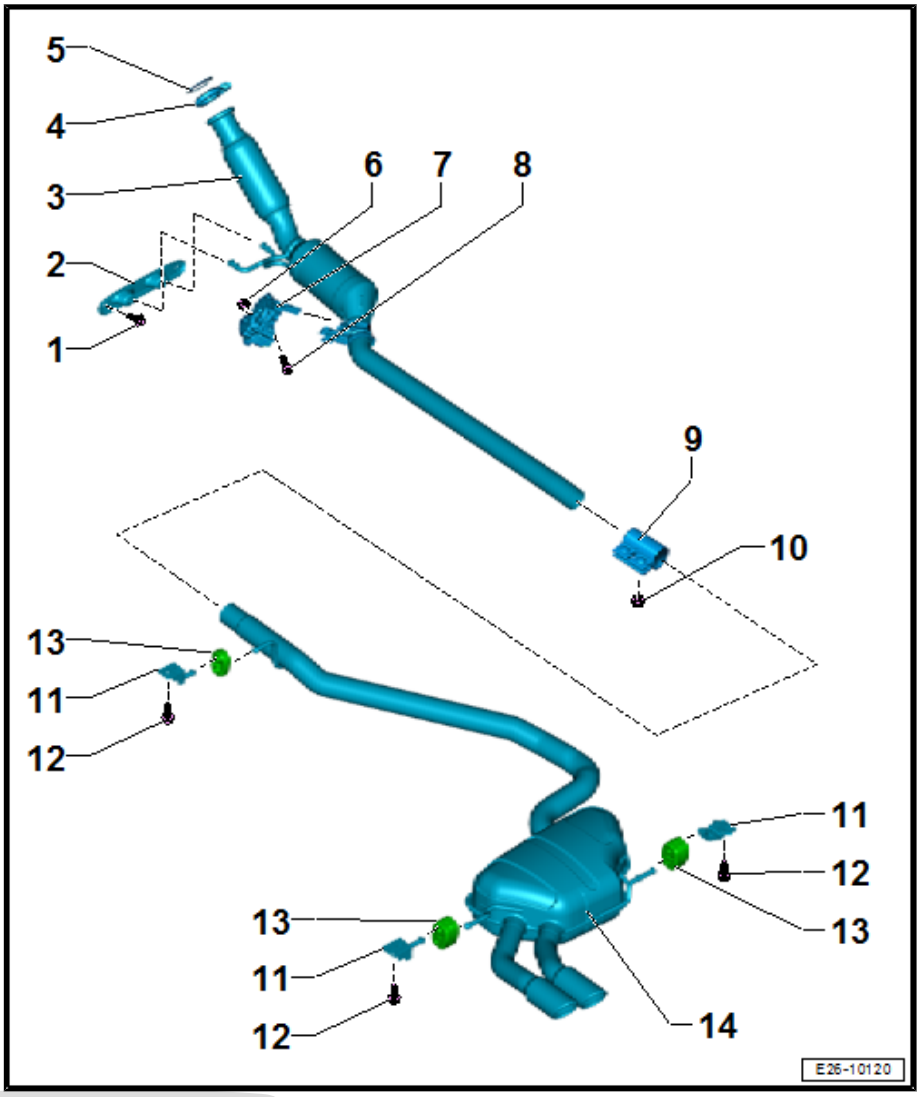


1.1.4 Assembly overview – silencers, vehicles with multi-link suspension, Ateca

Note

- *Observe safety precautions*
  ⇒ "1.6 Safety precautions when working on exhaust system", page 4 .
- *Original equipment as single assembly together with rear silencer; to be renewed individually in event of repair*

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



1 - Bolt
- ❑ 20 Nm

2 - Bracket/bearing/support
- ❑ Renew if damaged

3 - Front exhaust pipe
- ❑ Removing and installing ⇒ page 489
- ❑ Aligning exhaust system free of stress ⇒ page 497

4 - Screw-type clamp
- ❑ Renew after removal
- ❑ Installation position ⇒ page 480
- ❑ 7 Nm

5 - Gasket
- ❑ Renew after removal
- ❑ Note installation position ⇒ page 480

6 - Nut
- ❑ 9 Nm

7 - Exhaust flap control unit - J883-
- ❑ Removing and installing ⇒ page 518

8 - Bolt
- ❑ 9 Nm

9 - Tension sleeve
- ❑ Align exhaust system so it is free of stress before tightening clamp ⇒ page 497
- ❑ Installation position ⇒ “1.9 Installation position of clamp”, page 498
- ❑ Specified torque ⇒ “1.9 Installation position of clamp”, page 498
- ❑ Tighten threaded connections evenly.

10 - Nut
- ❑ Specified torque ⇒ “1.9 Installation position of clamp”, page 498

11 - Bracket/bearing/support
- ❑ Renew if damaged
- ❑ Aligning mounting ⇒ page 480

12 - Bolt
- ❑ 20 Nm

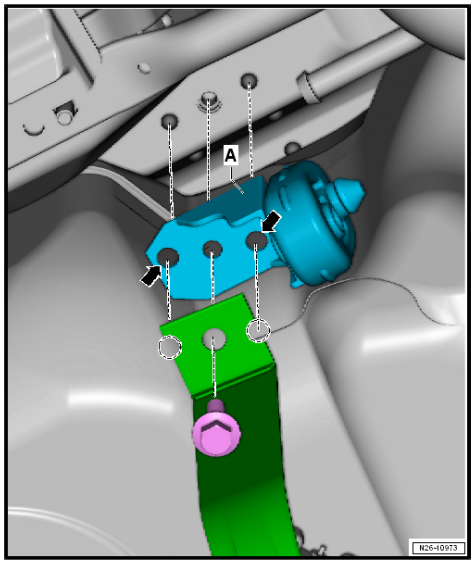
13 - Mounting
- ❑ Renew if damaged

14 - Rear silencer
- ❑ Aligning exhaust system free of stress
- ❑ Removing and installing ⇒ page 495
- ❑ Different versions of exhaust gas end hose, depending on the design

SEAT
Copyright by SEAT. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

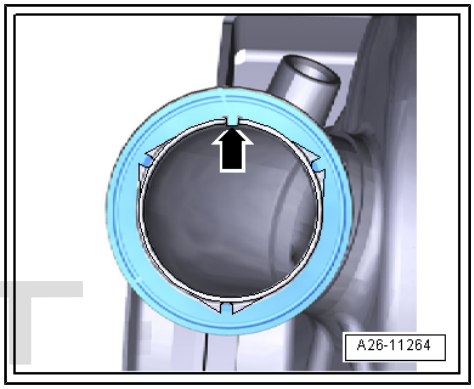
Aligning mounting

– Pre-tighten bolt.
– Align mounting at elongated hole as necessary.
– Centre holes -arrows- of mounting -A- using blunt end of commercially available 8 mm drill bit.
– Then, tighten bolt to specified torque.
– Proceed in the same way with the remaining mountings.

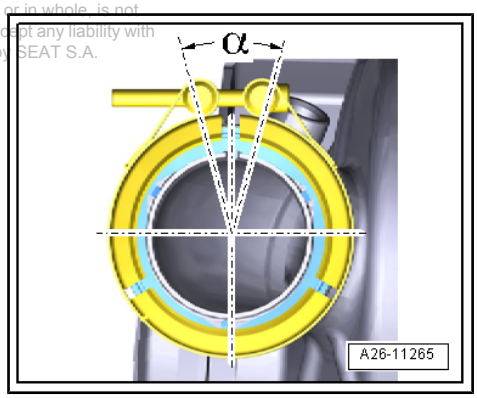


Installation position of gasket between emission control module and front exhaust pipe

• Square tab on seal -arrow- must fit into groove on diesel particulate filter.



Installation position of screw-type clip for front exhaust pipe

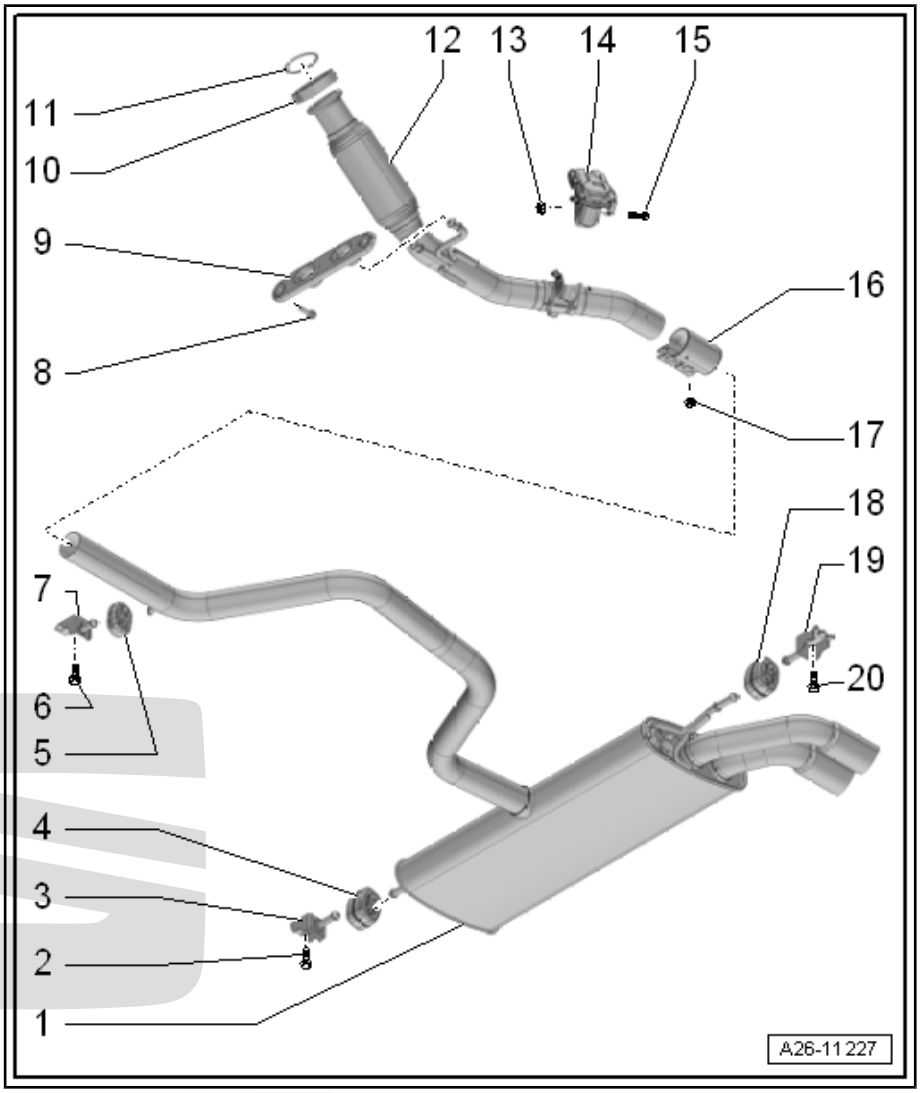


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

1.1.5 Assembly overview - silencers, vehicles with multi-link rear axle, Leon

Note

- *Observe safety precautions*
  ⇒ “1.6 Safety precautions when working on exhaust system”, page 4 .
- *Original equipment as single assembly together with rear silencer; to be renewed individually in event of repair*



1 - Rear silencer

- ❑ Aligning exhaust system free of stress ⇒ page 497
- ❑ Removing and installing ⇒ page 494
- ❑ Different versions of exhaust gas end hose, depending on the design

2 - Bolt

- ❑ 20 Nm

3 - Mounting

- ❑ Renew if damaged

4 - Mounting

- ❑ Renew if damaged

5 - Mounting

- ❑ Renew if damaged

6 - Bolt

- ❑ 20 Nm

7 - Mounting

- ❑ Renew if damaged

8 - Bolt

- ❑ 20 Nm

9 - Support bracket

- ❑ Renew if damaged

10 - Screw-type clamp

- ❑ Renew after removal
- ❑ Installation position ⇒ page 482
- ❑ 7 Nm

11 - Gasket

- ❑ Renew after removal
- ❑ Note installation position ⇒ page 482

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

12 - Front exhaust pipe

- ❑ Removing and installing ⇒ page 489
- ❑ Aligning exhaust system free of stress ⇒ page 497

13 - Nut

- ❑ 9 Nm

14 - Exhaust flap control unit - J883-

- ❑ Removing and installing ⇒ page 518

15 - Bolt

- ❑ 10 Nm

16 - Tension sleeve

- ❑ Align exhaust system so it is free of stress before tightening clamp ⇒ page 497
- ❑ Installation position ⇒ “1.9 Installation position of clamp”, page 498

17 - Nut

- ❑ Specified torque ⇒ “1.9 Installation position of clamp”, page 498

18 - Mounting

- ❑ Renew if damaged

19 - Mounting

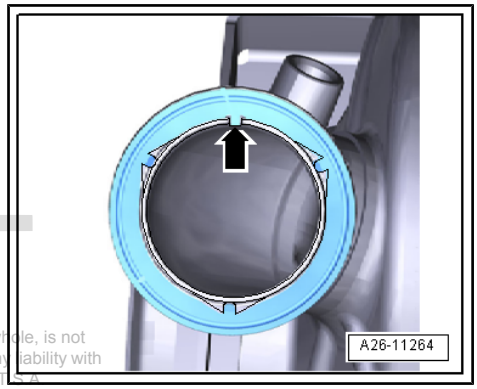
- ❑ Renew if damaged

20 - Bolt

- ❑ 20 Nm

Installation position of gasket between emission control module and front exhaust pipe

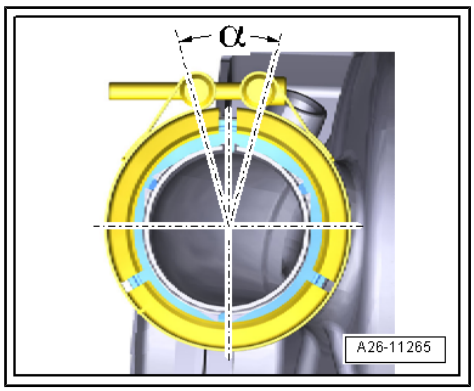
- Square tab on seal -arrow- must fit into groove on diesel particulate filter.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Installation position of screw-type clip for front exhaust pipe

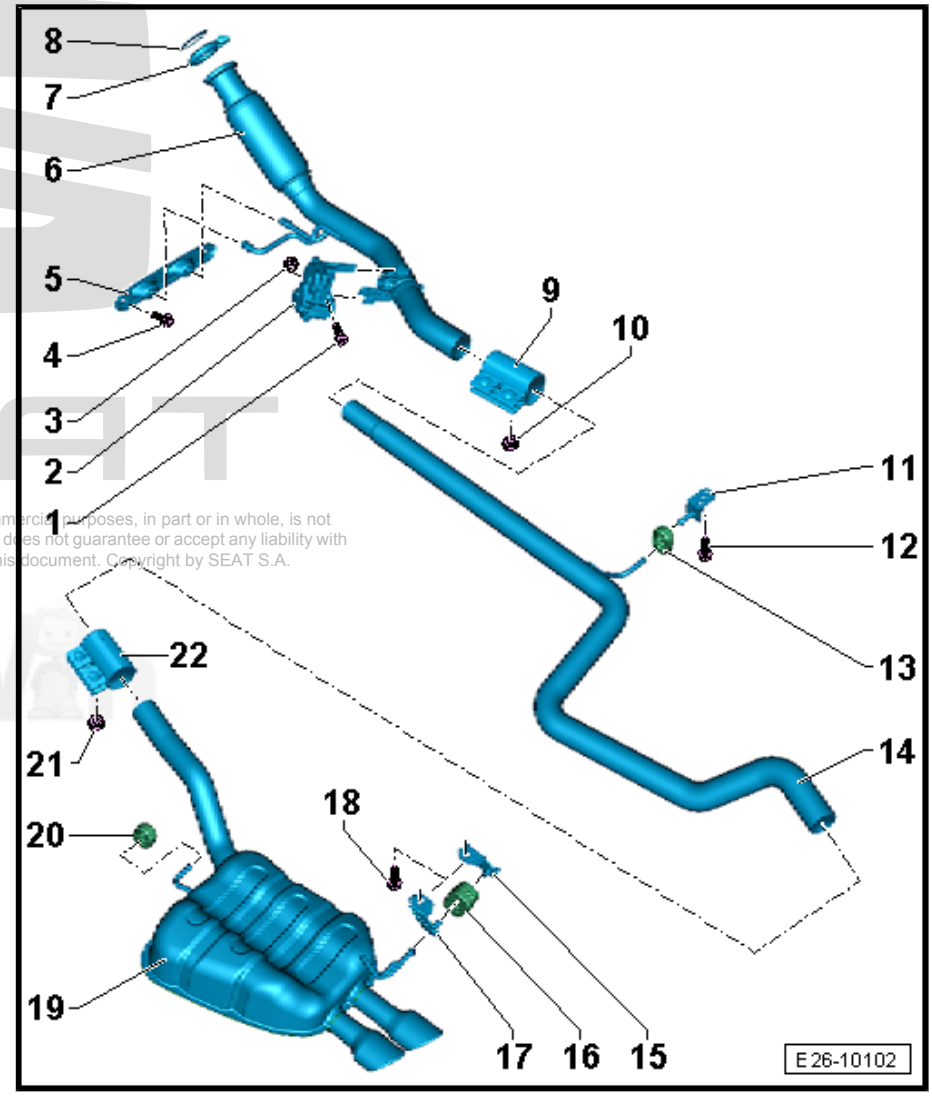
- Angle -α- = 0 ± 30°



1.1.6 Assembly overview – silencers, vehicles with multi-link suspension, Leon Estate

Note

- *Observe safety precautions*
  ⇒ "1.6 Safety precautions when working on exhaust system", page 4 .
- *Original equipment as single assembly together with rear silencer; to be renewed individually in event of repair*



1 - Bolt

2 - Exhaust flap control unit - J883-

- ❑ Removing and installing ⇒ page 518

3 - Nut

- ❑ 9 Nm

4 - Bolt

- ❑ 23 Nm

5 - Support bracket

- ❑ Renew if damaged

6 - Front exhaust pipe

- ❑ Removing and installing ⇒ page 489
- ❑ Aligning exhaust system free of stress ⇒ page 497

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

7 - Screw-type clamp

- ❑ Renew after removal
- ❑ Installation position ⇒ page 486
- ❑ 7 Nm

8 - Gasket

- ❑ Renew after removal
- ❑ Note installation position ⇒ page 482

9 - Tension sleeve

- ❑ Align exhaust system free of tension before tightening ⇒ page 497 .
- ❑ Installation position ⇒ “1.9 Installation position of clamp”, page 498
- ❑ Tighten threaded connections evenly.

10 - Nut

- ❑ Specified torque ⇒ “1.9 Installation position of clamp”, page 498

11 - Anchorage

- ❑ Renew if damaged
- ❑ Aligning mounting ⇒ page 480

12 - Bolt

- ❑ 23 Nm

13 - Mounting

- ❑ Renew if damaged

14 - Exhaust pipe

- ❑ Mounting unit with rear silencer
- ❑ With removable connection for easier removal ⇒ page 491

15 - Mounting

- ❑ Renew if damaged

16 - Mounting

- ❑ Renew if damaged

17 - Mounting

- ❑ Renew if damaged

18 - Bolt

- ❑ 23 Nm

19 - Rear silencer

- ❑ Aligning exhaust system free of stress ⇒ page 497
- ❑ Removing and installing ⇒ page 494
- ❑ Different versions of exhaust gas end hose, depending on the design

20 - Mounting

- ❑ Renew if damaged

21 - Nut

- ❑ Specified torque ⇒ “1.9 Installation position of clamp”, page 498

22 - Tension sleeve

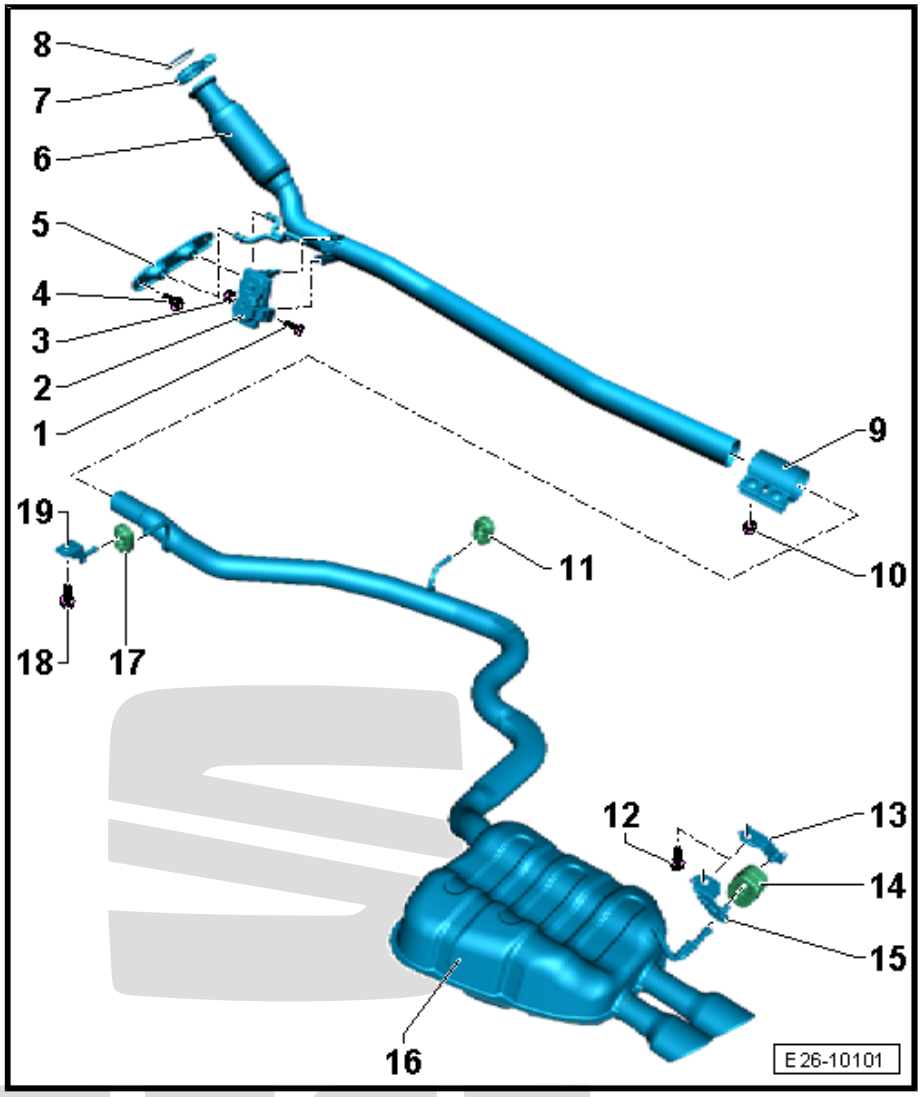
- ❑ Align exhaust system free of tension before tightening ⇒ page 497 .
- ❑ Installation position ⇒ “1.9 Installation position of clamp”, page 498
- ❑ Tighten threaded connections evenly.

1.1.7 Assembly overview - noise silencer, vehicle with four wheel drive and multi-link axle, Leon ST

Note

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- *Observe safety precautions ⇒ “1.6 Safety precautions when working on exhaust system”, page 4 .*
- *Original equipment as single assembly together with rear silencer; to be renewed individually in event of repair*



1 - Bolt

2 - Exhaust flap control unit - J883-

- ❑ Removing and installing ⇒ page 518

3 - Nut

- ❑ 9 Nm

4 - Bolt

- ❑ 23 Nm

5 - Support bracket

- ❑ Renew if damaged

6 - Front exhaust pipe

- ❑ Removing and installing ⇒ page 489
- ❑ Aligning exhaust system free of stress ⇒ page 497

7 - Screw-type clamp

- ❑ Renew after removal
- ❑ Installation position ⇒ page 486
- ❑ 7 Nm

8 - Gasket

- ❑ Renew after removal
- ❑ Note installation position ⇒ page 486

9 - Tension sleeve

- ❑ Align exhaust system free of tension before tightening ⇒ page 497 .
- ❑ Installation position ⇒ “1.9 Installation position of clamp”, page 498
- ❑ Tighten threaded connections evenly.

10 - Nut

- ❑ Specified torque ⇒ “1.9 Installation position of clamp”, page 498

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

11 - Mounting

- ❑ Renew if damaged

12 - Bolt

- ❑ 23 Nm

13 - Mounting

- ❑ Renew if damaged

14 - Mounting

- ❑ Renew if damaged

15 - Mounting

- ❑ Renew if damaged

16 - Rear silencer

- ❑ Aligning exhaust system free of stress ⇒ page 497
- ❑ Removing and installing ⇒ page 494
- ❑ Different versions of exhaust gas end hose, depending on the design

17 - Mounting

❑ Renew if damaged

18 - Bolt

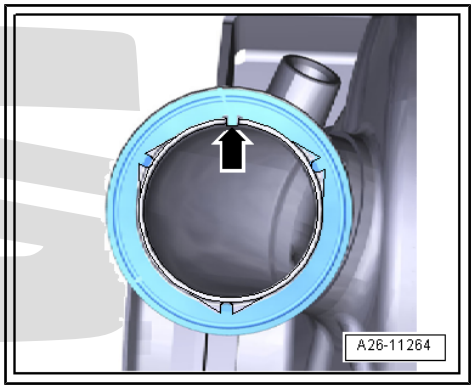
❑ 23 Nm

19 - Anchorage

❑ Renew if damaged

Installation position of screw-type clip for front exhaust pipe

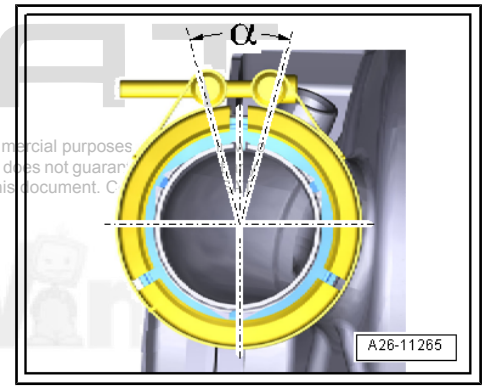
- Square tab on seal -arrow- must fit into groove on diesel particulate filter.



Installation position of screw-type clip for front exhaust pipe

– Fit the clamp at the angle shown.

- Angle -α- = approx. 50°.
- Bolt connection facing towards right
- Nuts facing upwards



Protected by copyright. Copying for private or commercial purposes, permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee respect to the correctness of information in this document.

1.1.8 Assembly overview - noise silencer, vehicles semi-rigid axle, Leon ST

Note

- *Observe safety precautions*
  ⇒ "1.6 Safety precautions when working on exhaust system", page 4 .
- *Original equipment as single assembly together with rear silencer; to be renewed individually in event of repair*

1 - Silencers, vehicles with 1.6 l engine

- ❑ Aligning exhaust system free of stress ⇒ page 497
- ❑ Separating exhaust pipes from silencers ⇒ page 491

2 - Mounting

- ❑ Renew if damaged

3 - Mounting

- ❑ Renew if damaged

4 - Bolt

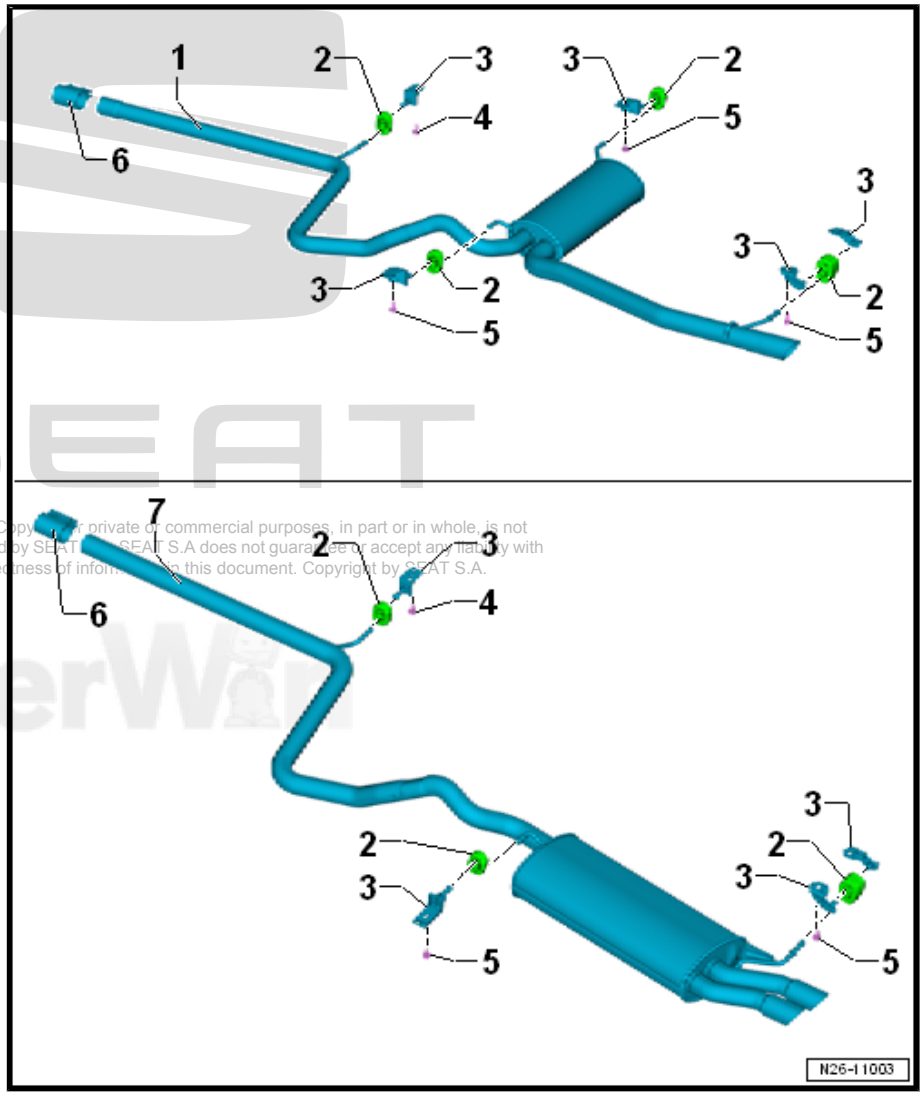
- ❑ Aligning mounting ⇒ page 487
- ❑ 20 Nm

5 - Bolt

- ❑ 20 Nm

6 - Tension sleeve

- ❑ Align exhaust system so it is free of stress before tightening clamp ⇒ page 497
- ❑ Tighten threaded connections evenly.
- ❑ Installation position ⇒ “1.9 Installation position of clamp”, page 498
- ❑ Specified torque ⇒ “1.9 Installation position of clamp”, page 498



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

7 - Silencers, vehicles with 2.0 l engine

- ❑ Aligning exhaust system free of stress ⇒ page 497
- ❑ Separating exhaust pipes from silencers ⇒ page 491

Aligning mounting

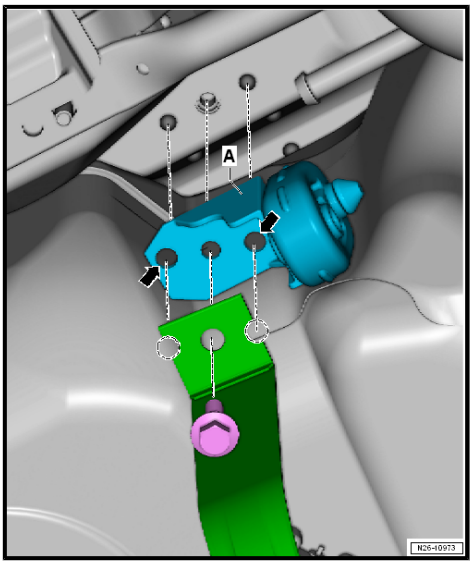
– Pre-tighten bolt.

– Arrange hanger over the long hole bore

– Centre holes -arrows- of mounting -A- using blunt end of commercially available 8 mm drill bit.

– Then tighten to specified torque.

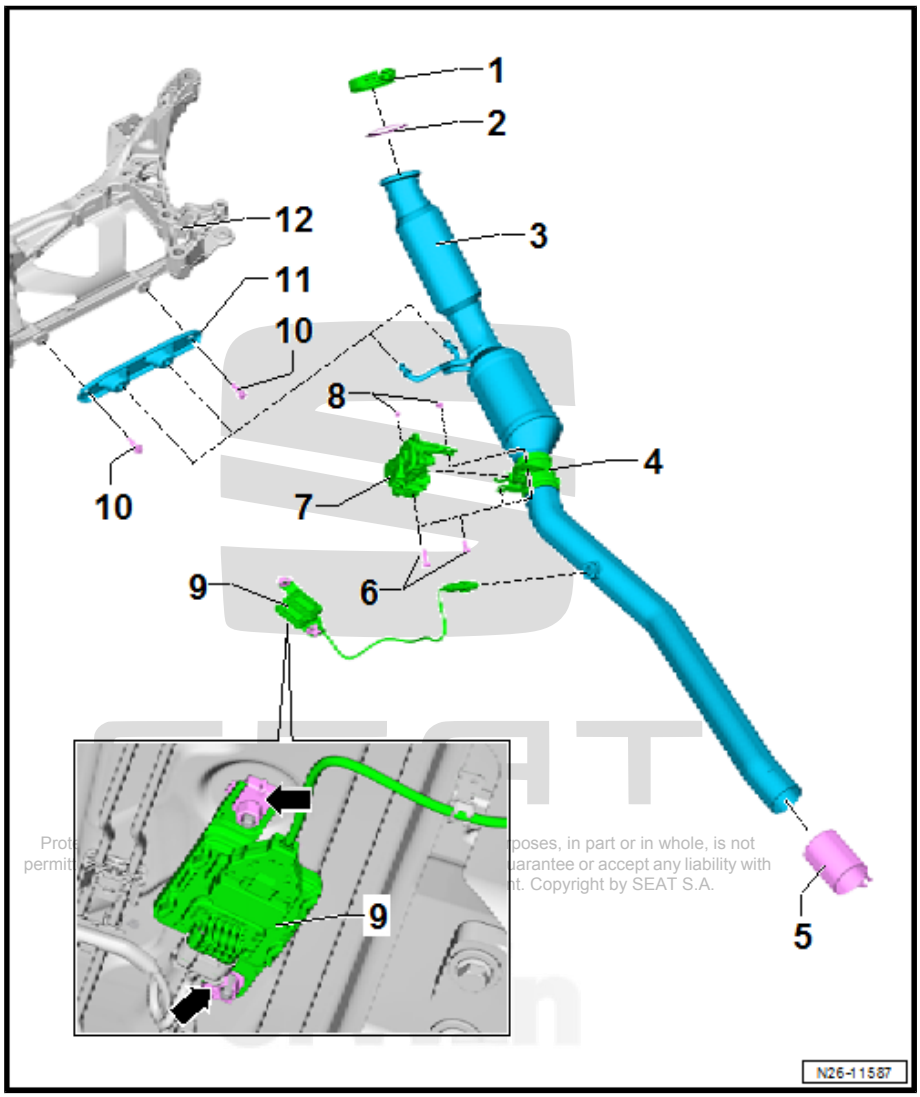
– Proceed in the same way with the remaining mountings.



1.2 Assembly overview - front exhaust pipe

⇒ “1.2.1 Assembly overview - front exhaust pipe, vehicles with NOx sender 2 G687 ”, page 488

1.2.1 Assembly overview - front exhaust pipe, vehicles with NOx sender 2 - G687-



1 - Screw-type clamp

- ❑ Renew after removal
- ❑ Observe installation position. Clamp should not be in contact with components.
- ❑ 7 Nm
- ❑ For allocation, refer to ⇒ Electronic Parts Catalogue

2 - Gasket

- ❑ Renew after removal
- ❑ Note installation position ⇒ page 489

3 - Front exhaust pipe

- ❑ Removing and installing ⇒ page 489

4 - Exhaust flap

- ❑ Not fitted on all vehicles

5 - Tension sleeve

- ❑ Align exhaust system so it is free of stress before tightening clamp ⇒ page 497
- ❑ Installation position ⇒ “1.9 Installation position of clamp”, page 498
- ❑ Specified torque ⇒ “1.9 Installation position of clamp”, page 498
- ❑ Tighten threaded connections evenly.

6 - Bolt

- ❑ 10 Nm
- ❑ Not fitted on all vehicles

7 - Exhaust flap control unit - J883-

- ❑ Removing and installing ⇒ page 518
- ❑ Not fitted on all vehicles

8 - Nut

- ❑ Not fitted on all vehicles

9 - NOx sender 2 - G687- / control unit for NOx sender 2 - J881-

- ❑ Removing and installing ⇒ page 447
- ❑ Not fitted on all vehicles
- ❑ Renew bracket -arrows- after each removal
- ❑ NOx sender 2 - G687- to front exhaust pipe: 52 Nm

Prot… permit… …poses, in part or in whole, is not …uarantee or accept any liability with …t. Copyright by SEAT S.A.

10 - Bolt

❑ 20 Nm

11 - Support bracket

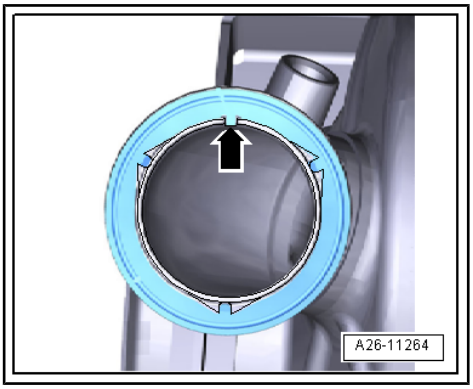
❑ Renew if damaged

12 - Sub-frame

❑ ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Assembly overview - subframe .

Installation position of gasket between emission control module and front exhaust pipe

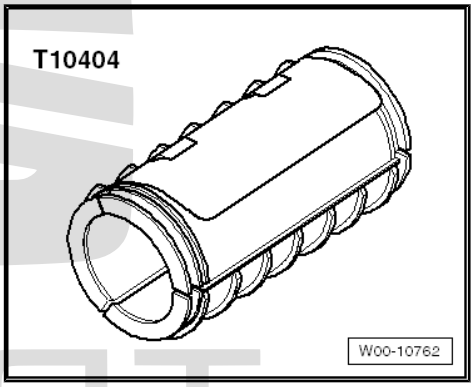
- The square tab on seal -arrow- is not fitted in all vehicles.
- If fitted, the square tab on seal -arrow- must sit in the groove on emission control module.



1.3 Removing and installing front exhaust pipe

Special tools and workshop equipment required

♦ Transport lock - T10404-



Removing

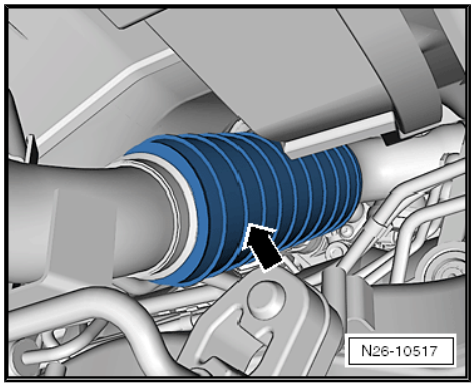
– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

– Remove central, bottom noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Under-floor cladding; Assembly overview - Under-floor cladding

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Note

- *The flexible joint in the front exhaust pipe must not be bent more than 10° - otherwise it can be damaged.*
- *To re-install the front exhaust pipe, fit the transport lock - T10404- -arrow- on damping element on the front section of the exhaust pipe.*



Models with front-wheel drive

– Remove front tunnel cross-piece ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cladding; Assembly overview – underbody cladding .

Vehicles with NOx sender 2 - G687- :

– Unscrew NOx sender 2 - G687- from front exhaust pipe. ⇒ page 448

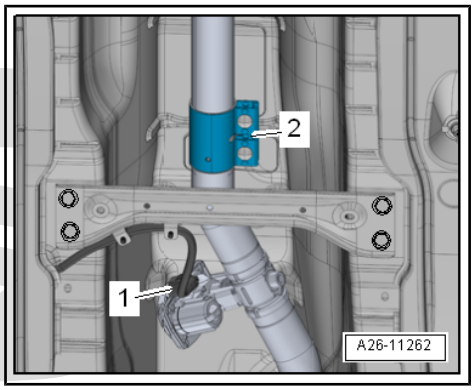
Vehicles with exhaust flap control unit - J883- :

– If fitted, remove heat insulation sleeve from connector.

– Unplug the electrical connector -1-.

Continued for all vehicles

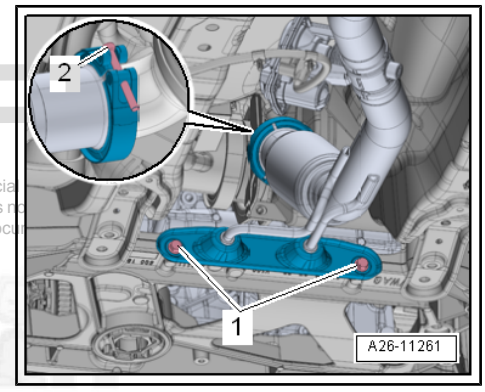
– Loosen clamp -2- and press to rear.



– Unscrew bolts -1-.

– Slacken bolt -2- and remove clip.

– Detach front exhaust pipe.



Installing

Install in reverse order of removal, observing the following.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document.

Note

Renew gaskets and seals after each removal.

– Note installation position of screw-type clip for front exhaust pipe. Clip must not be in contact with components.

– Observe installation position of gasket between emission control module and front exhaust pipe ⇒ page 489 .

– Align exhaust system free of stress ⇒ page 497 .

Specified torques

- ⇒ “1.1 Assembly overview - silencers”, page 473
- Assembly overview - Noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - Noise insulation .
- Assembly overview - Under-floor cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Under-floor cladding; Assembly overview - Under-floor cladding

1.4 Separating exhaust pipes, silencers

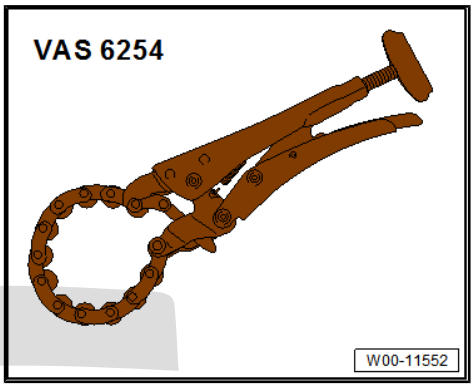
⇒ “1.4.1 Disconnecting exhaust pipes/silencers, Ateca, Leon”, page 491

⇒ “1.4.2 Disconnecting exhaust pipes, silencers, Leon ST”, page 492

1.4.1 Disconnecting exhaust pipes/silencers, Ateca, Leon

Special tools and workshop equipment required

- Chain-type pipe cutter - VAS 6254-



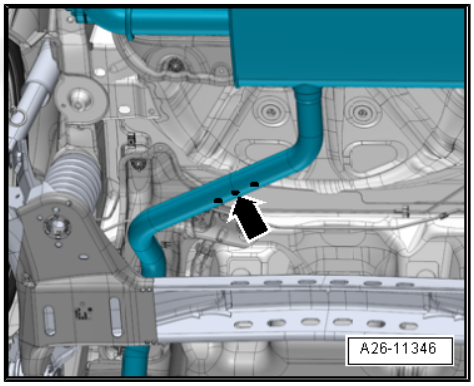
Note

- *Observe safety precautions ⇒ “1.6 Safety precautions when working on exhaust system”, page 4 .*
- *Original equipment as single assembly together with rear silencer; to be renewed individually in event of repair*
- *The connecting pipe can be cut through at the cutting point in order to renew the centre and rear silencers separately.*
- *The cutting point is marked on the exhaust tube.*
- *The cutting point is located in the area of the rear axle.*

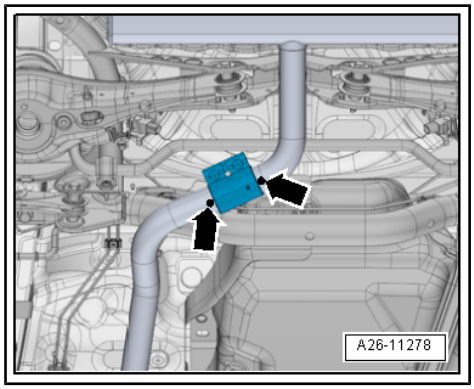
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Procedure

– Cut the exhaust pipe at a right angle, along the cut line -arrow- with the chain pipe cutter - VAS 6254- or the pneumatic sabre saw - V.A.G 1523B- .



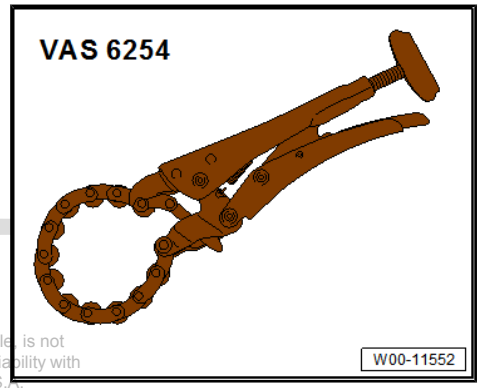
– Position clamp centrally at side marks -arrows- when installing.
– Note installation position of clamp ⇒ page 473 .
– Checking exhaust system for leaks ⇒ page 497 .
– Align exhaust system free of stress ⇒ page 497 .
– Align tailpipes ⇒ page 499 .



1.4.2 Disconnecting exhaust pipes, silencers, Leon ST

Special tools and workshop equipment required

♦ Chain-type pipe cutter - VAS 6254-



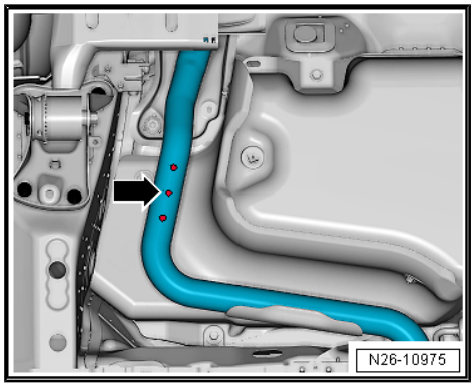
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Note

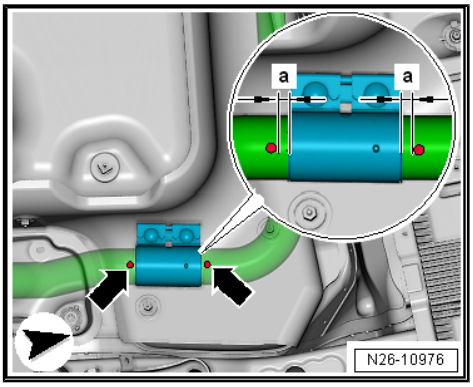
♦ *Observe safety precautions ⇒ "1.6 Safety precautions when working on exhaust system", page 4 .*
♦ *Original equipment as single assembly together with rear silencer; to be renewed individually in event of repair*
♦ *The connecting pipe can be cut through at the cutting point in order to renew the centre and rear silencers separately.*
♦ *The cutting point is marked on the exhaust tube.*
♦ *The cutting point is located in the area of the rear axle.*

Procedure

– Cut through exhaust pipe at right angles at separating point -arrow- using chain pipe cutter - VAS 6254- .



– When installing, position clamp centrally (-dimension a-) between side marks -arrows-.
– Fit clamp at rear.
– Align exhaust system free of stress ⇒ “1.7 Aligning exhaust system free of stress”, page 497 .



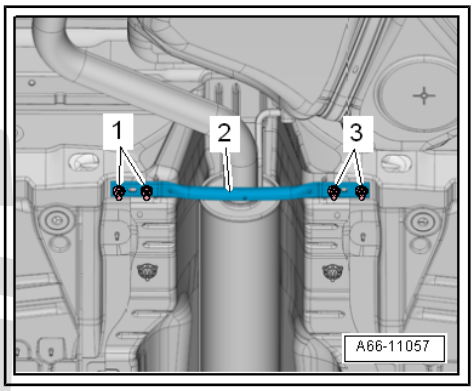
1.5 Removing and installing central exhaust pipe

Note

- *Original equipment as single assembly together with rear silencer; to be renewed individually in event of repair*
- *Follow the cutting line ⇒ page 491 .*

Removing

– Detach tunnel cross-piece (rear) -2-.

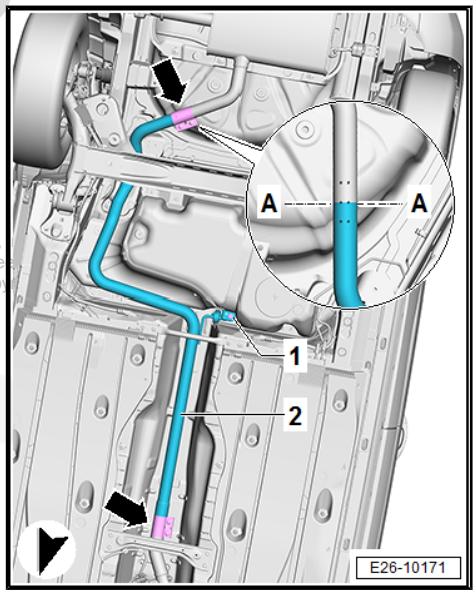


Vehicles without clamping sleeve

– Cut the exhaust pipe at a right angle, along the cut line ⇒ page 491 .

Vehicles with clamping sleeve

– Unscrew bolt -1-.
– Unfasten clamps -arrows-.
– Remove central pipe -2-.



Installing

Install in reverse order of removal, observing the following.

– Note installation position of the clamping sleeve ⇒ Item 9 (page 479) , ⇒ page 473 .
– Align exhaust system free of stress ⇒ page 497 .

Specified torques

- ⇒ “1.1 Assembly overview - silencers”, page 473
- Assembly overview - Under-floor cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Under-floor cladding; Assembly overview - Under-floor cladding

Protected by copyright. Copying for private or commercial purposes, permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee respect to the correctness of information in this document. Copy

1.6 Removing and installing rear silencer

⇒ "1.6.1 Removing and installing rear silencer, vehicles with, multi-link axle, front-wheel drive", page 494

⇒ "1.6.2 Removing and installing rear silencer, vehicles with, multi-link axle, four-wheel drive, Ateca", page 495

⇒ "1.6.3 Removing and installing rear silencer, vehicles with, multi-link axle, four-wheel drive, Ateca ST", page 496

1.6.1 Removing and installing rear silencer, vehicles with, multi-link axle, front-wheel drive

Special tools and workshop equipment required

- Engine and gearbox jack - VAS 6931-

Note

- *Original equipment as single assembly together with rear silencer; to be renewed individually in event of repair*
- *Follow the cutting line ⇒ page 491 .*

Removing

– If installed, remove rear left under-floor cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Under-floor cladding; Assembly overview - Under-floor cladding .

Vehicles without clamping sleeve

– Cut the exhaust pipe at a right angle, along the cut line ⇒ page 491 .

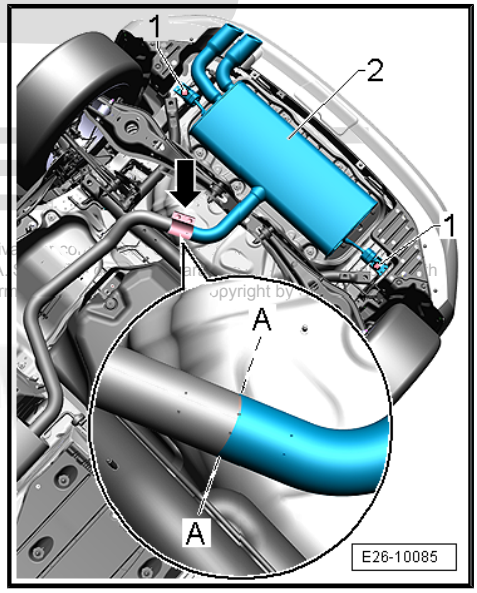
DANGER

Risk of accident caused by weight of rear silencer.

- **A second mechanic is required for removal of the rear silencer.**

Copyright by SEAT S.A. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this Repair Manual. Copyright by SEAT S.A.

– Remove bolt -1- on both sides.



Note

Ignore -arrow-.

– Remove silencer -2-.

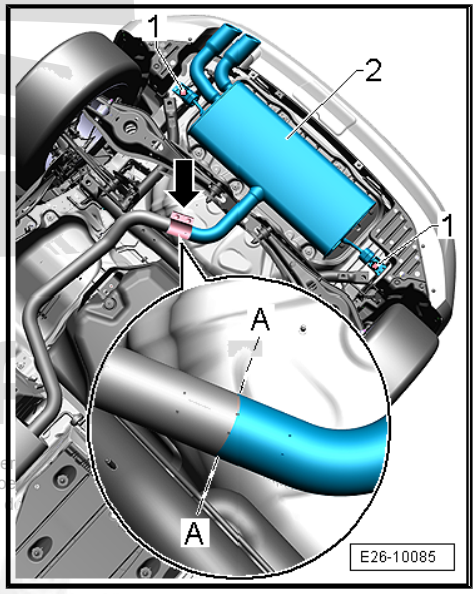
Vehicles with clamping sleeve

– Loosen clamp -arrow-, and push it to rear.

DANGER

Risk of accident caused by weight of rear silencer.

- **A second mechanic is required for removal of the rear silencer.**



– Remove bolt -1- on both sides.

– Remove silencer -2-.

Installing

Install in reverse order of removal, observing the following.

– Align exhaust system free of stress ⇒ page 497.

Specified torques

- ⇒ “1.1 Assembly overview - silencers”, page 473
- Assembly overview - Under-floor cladding ⇒ General body repairs, exterior; Rep. gr. 66 ; Under-floor cladding; Assembly overview - Under-floor cladding

1.6.2 Removing and installing rear silencer, vehicles with, multi-link axle, four-wheel drive, Ateca

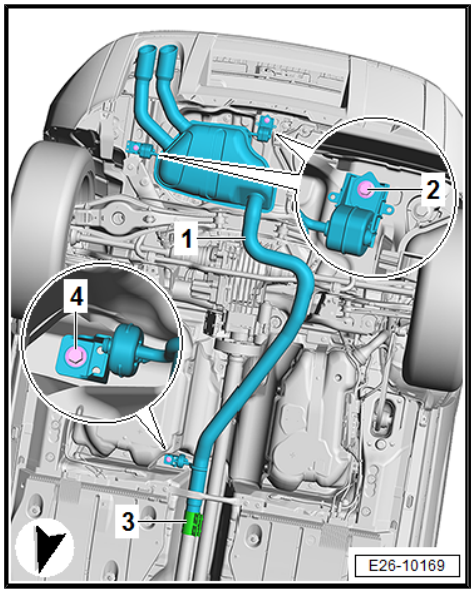
Special tools and workshop equipment required

- Engine and gearbox jack - VAS 6931-

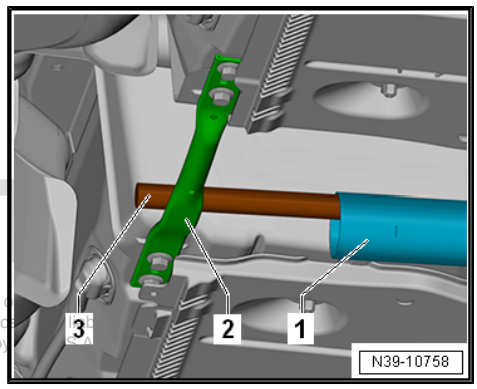
Protected by copyright. Copying for private or commer
permitted unless authorised by SEAT S.A. SEAT S.A do
respect to the correctness of information in this

Removing

– Loosen and move clamp -3-.
– Place engine and gearbox jack - VAS 6931- under silencers.
– Hold silencer with engine and gearbox jack - VAS 6931- .
– Unscrew bolt -4-.
– Remove bolt -2- on both sides.



– A hose and assembly lever -3- in the front exhaust pipe -1- and tunnel cross-piece-2-.
– Remove rear silencer -1-.



Installing

Install in reverse order of removal, observing the following.

– Align exhaust system free of stress ⇒ page 497 .

Specified torques

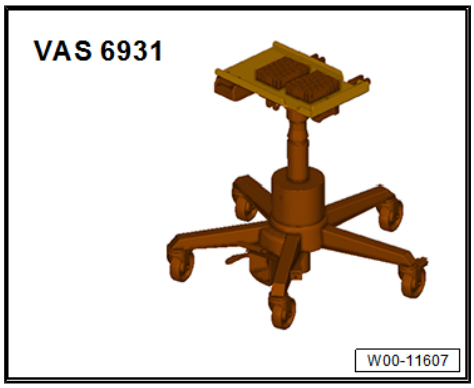
◆ ⇒ “1.1.4 Assembly overview – silencers, vehicles with multi-link suspension, Ateca”, page 478

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

1.6.3 Removing and installing rear silencer, vehicles with, multi-link axle, four-wheel drive, Ateca ST

Special tools and workshop equipment required

◆ Engine and gearbox jack - VAS 6931-



Note

◆ *Original equipment as single assembly together with rear silencer; to be renewed individually in event of repair*
◆ *Follow the cutting line ⇒ page 491 .*

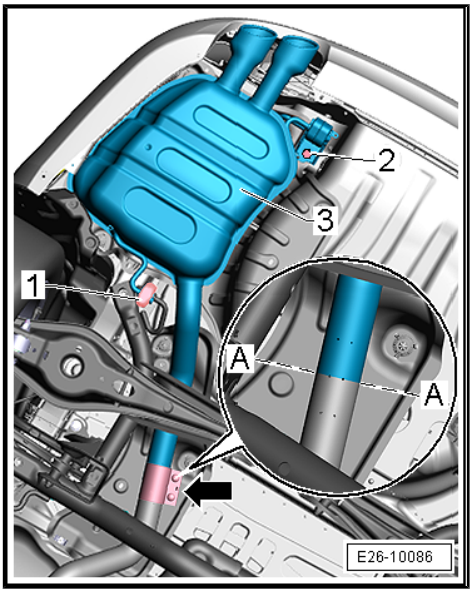
Removing

– Detach mounting -1- from the silencer.

– Loosen clamp -arrow-, and push it to rear.

– Hold silencer with engine and gearbox jack - VAS 6931- .

– Unscrew bolt -2- from the body. Remove silencer -3-.



Installing

Installation is carried out in reverse order; noting the following:

– Align exhaust system free of stress ⇒ page 497 .

Specified torques

◆ ⇒ “1.1.6 Assembly overview – silencers, vehicles with multi-link suspension, Leon Estate”, page 482

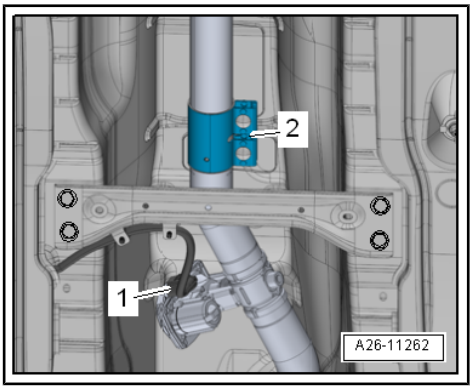
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

1.7 Aligning exhaust system free of stress

Procedure

• The exhaust system must be aligned when it is cool.

– Loosen bolt connections for clamp -2-.

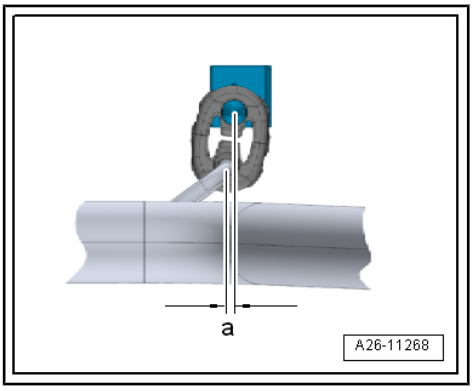


– Push exhaust system towards front of vehicle until preloading at mounting for exhaust pipe -a- = 5 mm.

– Note installation position of clamp ⇒ page 498 .

– Evenly tighten bolted connections of clamp.

Specified torques
⇒ “1.1 Assembly overview - silencers”, page 473



1.8 Check exhaust system for leaks

– Start engine and run at idling speed.

– Plug tailpipes during leak test (e.g. with cloth or plugs).

– Listen for noise at the connection points of cylinder head/exhaust manifold, turbocharger/front exhaust pipe etc. to locate any leaks.

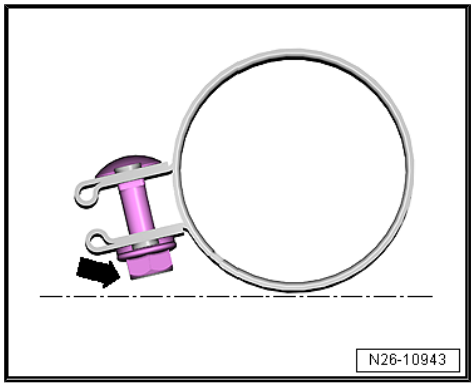
– Rectify any leaks that are found.

1.9 Installation position of clamp

Installation position of the clamping sleeve, front-wheel drive

– Fit clamp in position shown.

- Bolt connections facing towards right
- Bolt -arrow- must not protrude beyond lower edge of clamp.

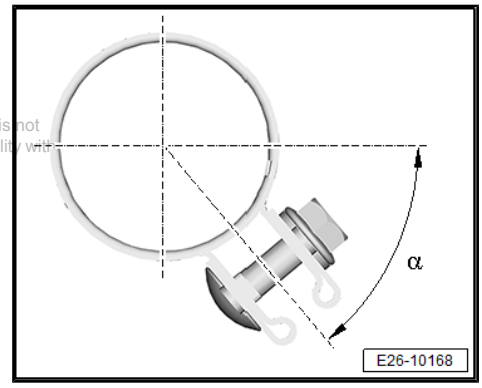


Installation position of the clamping sleeve, all-wheel drive

– Fit the clamp at the angle shown.

- Angle -α- = about 50°+20°.
- Bolt connection facing towards right
- Nuts facing upwards

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



Installation dimension for vehicles with marking on the exhaust pipe

1 - Tension sleeve

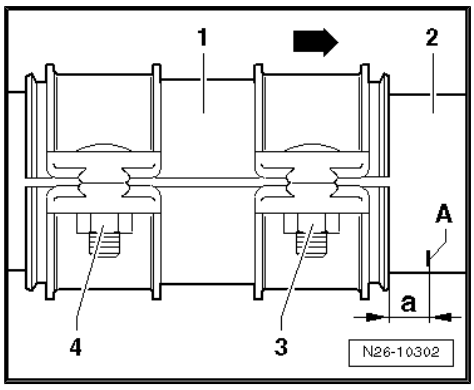
2 - Exhaust pipe

a - Installation dimension

A - Marking on exhaust system

Installation dimension -a- for clamp:

a - 8.5 mm

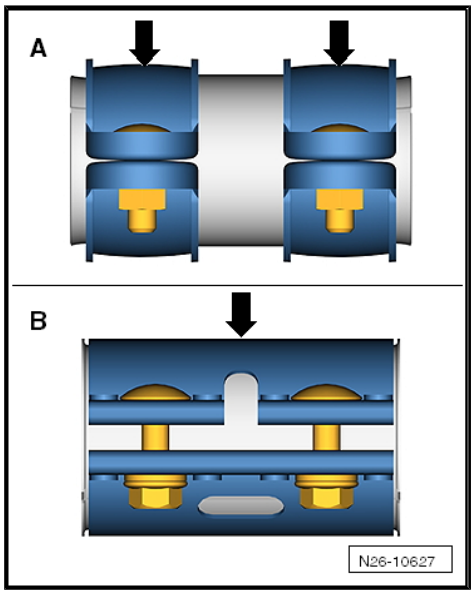


Specified torque for clamp

Variante A - 25 Nm

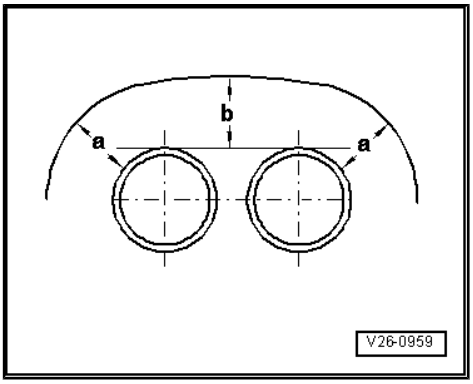
Variante B - 30 Nm

Tighten threaded connections evenly.



1.10 Aligning tailpipes

Procedure



– Align the rear silencer in such a way that -a- and -b- have an equal distance between the bumper cover and the exhaust tail pipe.

– Unfasten rear silencer mounting to align tailpipes.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

2 Emission control

⇒ “2.1 Assembly overview - emission control”, page 500

⇒ “2.2 Removing and installing catalytic converter”, page 504

⇒ “2.3 Removing and installing particulate filter”, page 505

⇒ “2.4 Removing and installing emission control module”, page 506

⇒ “2.5 Removing and installing exhaust flap control unit J883 ”, page 518

2.1 Assembly overview - emission control

⇒ “2.1.1 Exhaust purification system variants”, page 500

⇒ “2.1.2 Assembly overview - emission control, vehicles with emission control module”, page 501

⇒ “2.1.3 Assembly overview - emission control, vehicles with particulate filter or catalytic converter”, page 503

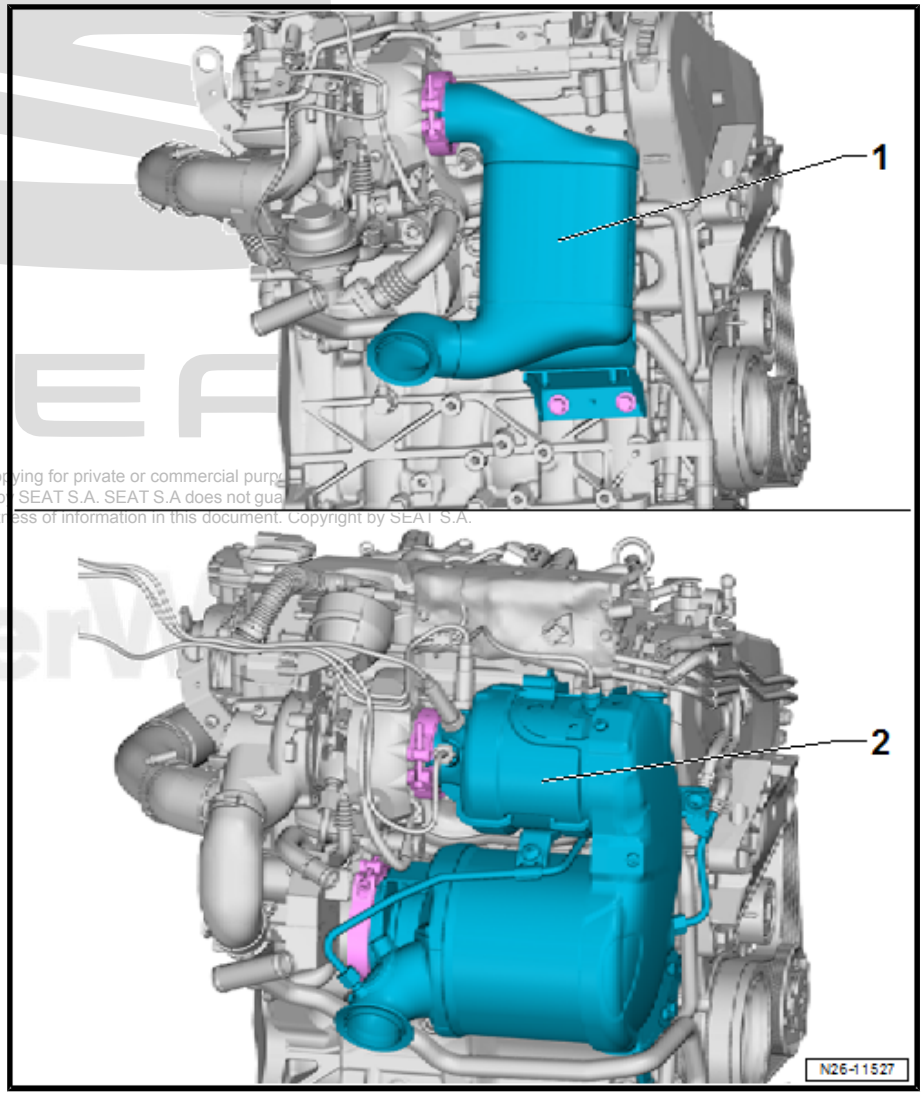
2.1.1 Exhaust purification system variants

1 - Diesel particulate filter or catalytic converter

- ⇒ “2.1.3 Assembly overview - emission control, vehicles with particulate filter or catalytic converter”, page 503
- ⇒ “2.2 Removing and installing catalytic converter”, page 504

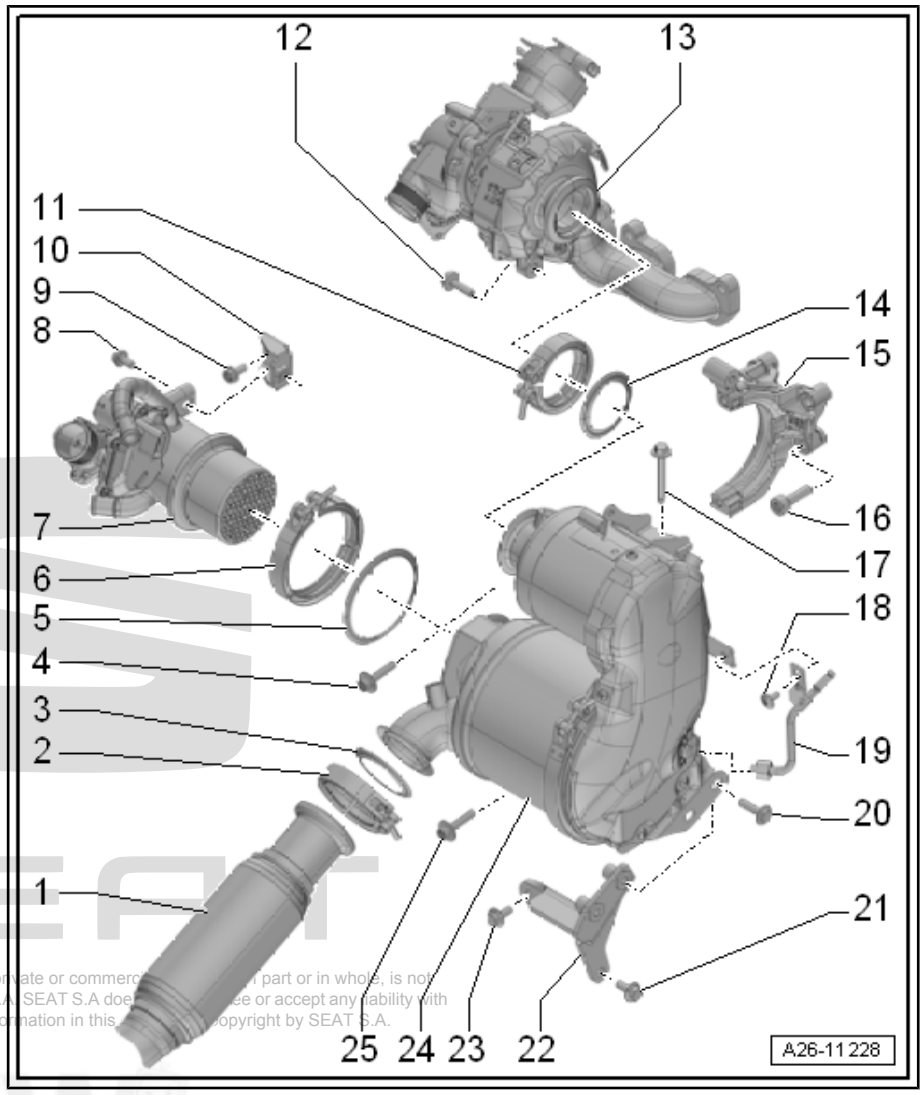
2 - Emission control module

- ⇒ “2.1.2 Assembly overview - emission control, vehicles with emission control module”, page 501
- ⇒ “2.4 Removing and installing emission control module”, page 506



Protected by copyright. Copying for private or commercial purp
permitted unless authorised by SEAT S.A. SEAT S.A does not gua
completeness of information in this document. Copyright by SEAT S.A.

2.1.2 Assembly overview - emission control, vehicles with emission control module



1 - Front exhaust pipe
- ❑ Removing and installing ⇒ page 489
- ❑ Aligning exhaust system free of stress ⇒ page 497

2 - Screw-type clamp
- ❑ 7 Nm
- ❑ Renew after removal

3 - Gasket
- ❑ Renew after removal
- ❑ Note installation position ⇒ page 482

4 - Bolt
- ❑ Specified torque and sequence ⇒ page 516 .

5 - Gasket
- ❑ Renew after removal

6 - Screw-type clamp
- ❑ Renew after removal
- ❑ Installation position ⇒ page 564
- ❑ Specified torque and sequence ⇒ page 564 .

7 - Exhaust gas recirculation cooler
- ❑ Removing and installing ⇒ page 567

8 - Bolt
- ❑ Specified torque and sequence ⇒ page 564 .

9 - Bolt
- ❑ Specified torque and sequence ⇒ page 564 .

10 - Bracket/bearing/support
- ❑ for the exhaust gas recirculation cooler

11 - Screw-type clamp
- ❑ Renew after removal
- ❑ Specified torque and sequence ⇒ page 516 .

12 - Bolt
- ❑ Specified torque and sequence ⇒ page 503 .

13 - Turbocharger
- ❑ Removing and installing ⇒ page 333

14 - Gasket
- ❑ Renew after removal
- ❑ Fit on catalytic converter

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

15 - Bracket/bearing/support

- ❑ For emission control module
- ❑ With compensation element
- ❑ Preparing compensation element for fitting ⇒ page 515

16 - Bolt

- ❑ Specified torque and sequence ⇒ page 503 .

17 - Bolt

- ❑ Specified torque and sequence ⇒ page 517 .

18 - Bolt

- ❑ 9 Nm

19 - Measuring tube

- ❑ To pressure differential sender - G505-
- ❑ Specified torque for union nut: 45 Nm

20 - Bolt

- ❑ Specified torque and sequence ⇒ page 516 .

21 - Bolt

- ❑ Specified torque and sequence ⇒ page 502 .

22 - Bracket/bearing/support

- ❑ For emission control module
- ❑ With compensation elements
- ❑ Preparing compensation elements for fitting ⇒ page 515

23 - Bolt

- ❑ Specified torque and sequence ⇒ page 502 .

24 - Emission control module

- ❑ Diesel particulate filter with catalytic converter
- ❑ Removing and installing ⇒ page 506

25 - Bolt

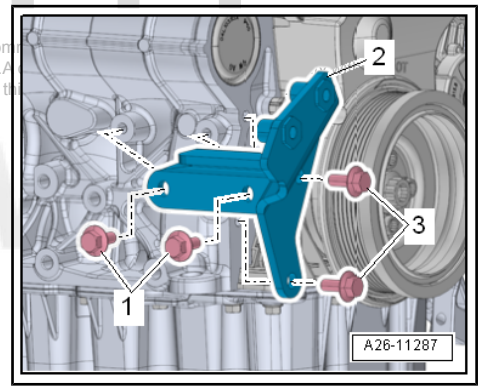
- ❑ Specified torque and sequence ⇒ page 516 .

Bracket -2- for emission control module - specified torque and tightening sequence

Protected by copyright. Copying for private or com
permitted unless authorised by SEAT S.A. SEAT S.A
the correctness of information in th

– Tighten bolts in stages in the sequence given:

Stage	Bolts	Specified torque
1st	-3-	Screw in by hand as far as stop
2nd	-1-	20 Nm
3rd	-3-	20 Nm

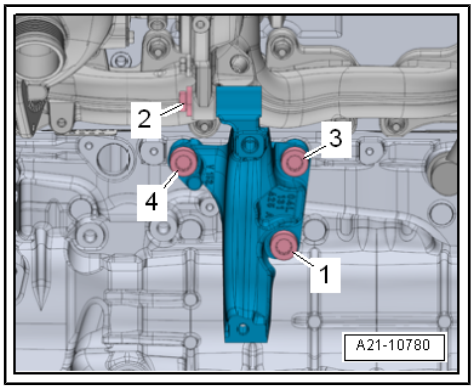


Bracket for emission control module - specified torques and tightening sequence

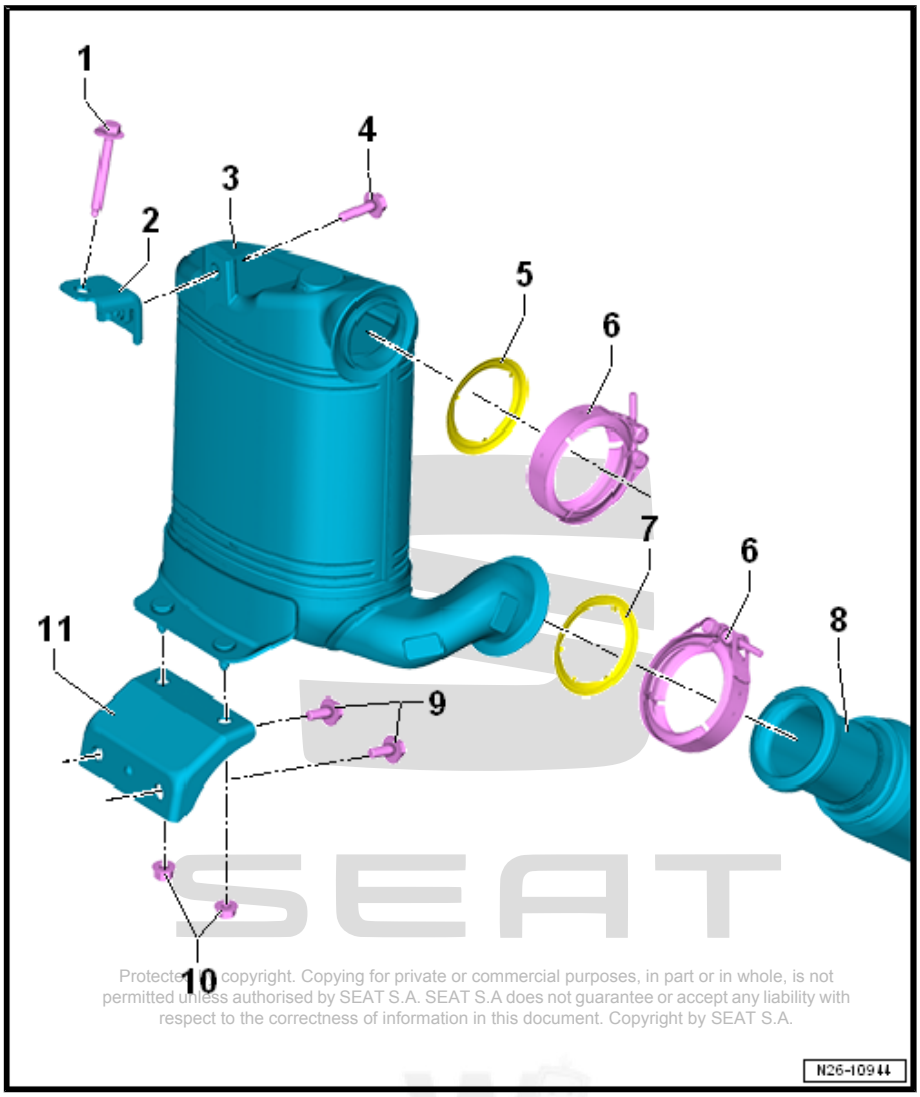
– Fit bracket in correct installation position.

– Tighten bolts in stages in the sequence given:

Stage	Bolts	Specified torque
1st	-1, 2, 3, 4-	Screw in by hand as far as stop
2nd	-2-	20 Nm
3rd	-1-	40 Nm
4th	-3, 4-	40 Nm



2.1.3 Assembly overview - emission control, vehicles with particulate filter or catalytic converter



1 - Bolt

- ❑ Not always installed.
- ❑ Specified torque and sequence ⇒ page 505 .

2 - Bracket/bearing/support

- ❑ Not always installed.
- ❑ bolted to the cylinder head
- ❑ Specified torque and sequence ⇒ page 505 .

3 - Catalytic converter/particulate filter

- ❑ Versions for specific countries
- ❑ Removing and installing ⇒ page 504

4 - Bolt

- ❑ Specified torque and sequence ⇒ page 505 .

5 - Gasket

- ❑ Renew after removal

6 - Screw-type clamp

- ❑ Renew after removal
- ❑ Specified torque and sequence ⇒ page 505 .

7 - Gasket

- ❑ Renew after removal

8 - Front exhaust pipe

9 - Bolt

- ❑ Specified torque and sequence ⇒ page 505 .

10 - Nut

- ❑ Specified torque and sequence ⇒ page 505 .

11 - Bracket/bearing/support

- ❑ bolted to the crankcase

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

❑ Specified torque and sequence ⇒ page 505 .

2.2 Removing and installing catalytic converter

Note

Depending on national emission thresholds an uncontrolled particle filter or catalytic converter is fitted with this engine. The difference for removal or installation is negligible. For this reason, only the removal of the catalytic converter is described.

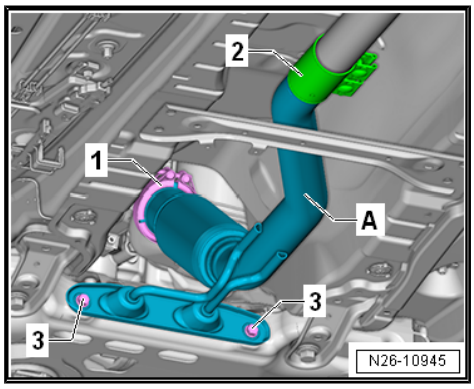
Removing

– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .

– Unscrew the bolts of the clamp -2- leaving the clamp in installation position.

– Open clamp -1- and detach.

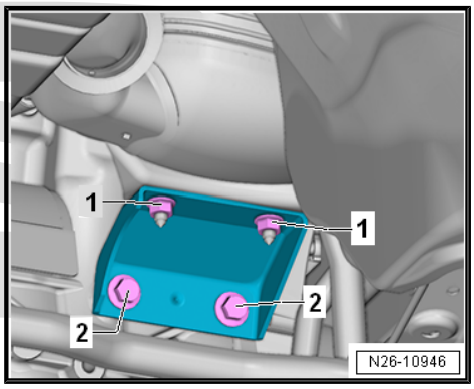
– Remove the bolts -3- push the clamp -2- backwards and remove the front exhaust pipe -A-.



– Detach fastening nuts -1- and loosen bolts -2- by one quarter turn.

– Remove engine cover panel ⇒ page 56 .

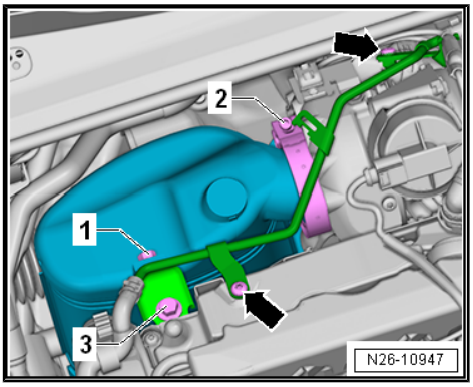
– Unscrew bolts -arrows- of the coolant line and pull the coolant line forwards.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Unscrew bolts -1- and -3- open clamp -2- and remove.

– Carefully remove catalytic converter upwards.



Installing

Note

- *Renew self-locking nuts and bolts as well as gaskets, seals and O-rings after each removal.*
- *Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ Electronic parts catalogue .*
- *When fitting, attach all cable ties back to the same location.*

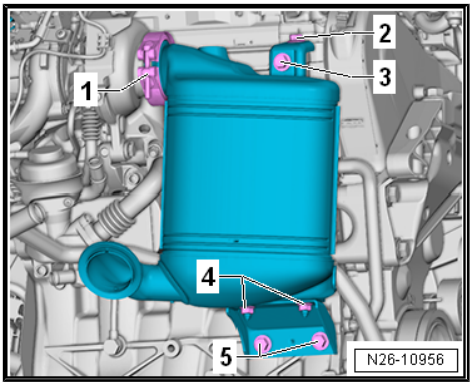
– Push new seal onto the centring supports of the inlet funnel on the catalytic converter and push a new clamp over the inlet funnel.

– Fit the catalytic converter from above into the lower mounting with the threaded studs.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Subsequent tightening sequence as per the following table ⇒ page 505

Tightening torques and sequence for catalytic converter



Stage	Bolt	Fault rectification
I	Screw-type clip -1-	position over the sealing flange, engage bolt
II	Bolts -2 and 3-	Tighten by hand and loosen immediately by 90°
III	Screw-type clip -1-	Tighten to 8 Nm
IV	Nuts -4-	Tighten to 20 Nm
V	Bolts -5-	Tighten to 20 Nm
VI	Bolt -2-	tighten to 20 Nm , turn another 90° and subsequently turn another 45°
VII	Bolt -3-	Tighten to 20 Nm

The further installation is in the reverse sequence

2.3 Removing and installing particulate filter

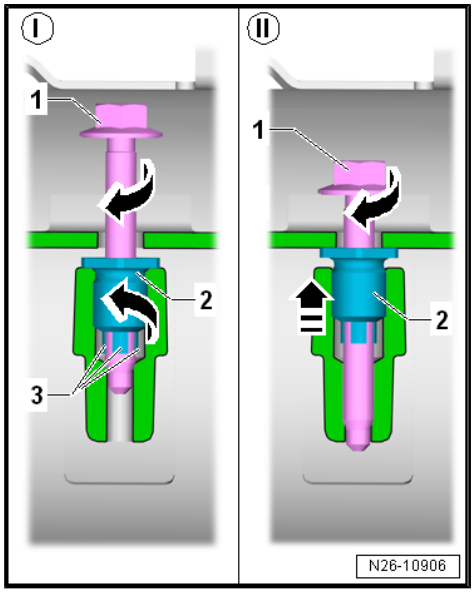
Note

Depending on national emission thresholds an uncontrolled particle filter or catalytic converter is fitted with this engine. The difference for removal or installation is negligible. For this reason, only the removal of the catalytic converter is described ⇒ page 504 .

2.4 Removing and installing emission control module

Note

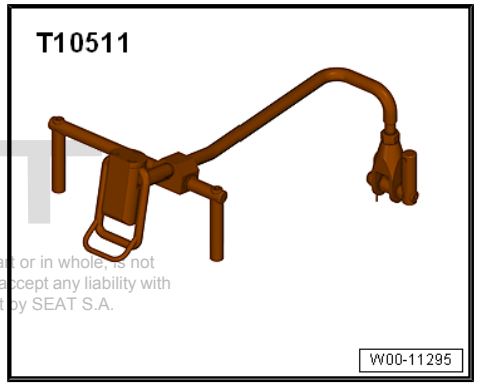
The emission control module is secured to the engine with four compensation elements. These compensation elements are provided with a left-hand thread on the outside. When the bolt -1- is screwed in, the friction against the retainer tabs -3- initially causes the compensation element -2- to turn as well. Due to the left-hand thread the compensation element travels towards the bolt head, although the bolt is turned in clockwise direction, and thus compensates the play between the components. The compensation element must turn easily via its left-hand thread. Otherwise the retaining tabs cannot provide the required friction for the compensation element to follow the bolt. To avoid impairing the required friction, ensure that the retainer tabs do not come in contact with any lubricant.



Function of compensation element

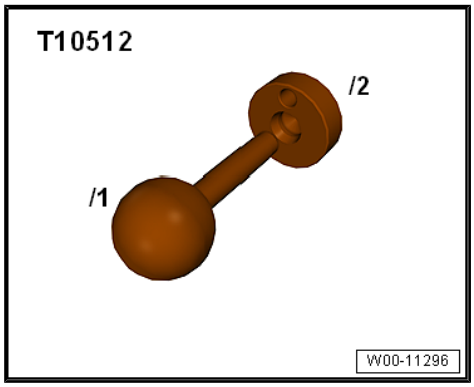
Special tools and workshop equipment required

- Assembly tool - T10511-

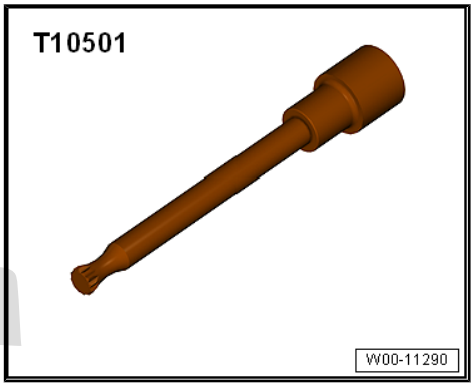


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- Calibration tool - T10512-



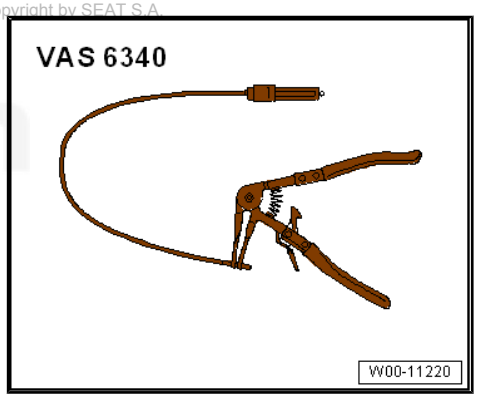
- Socket insert XZN 10 - T10501-



- Hexagon key extension, 8 mm - 3247-

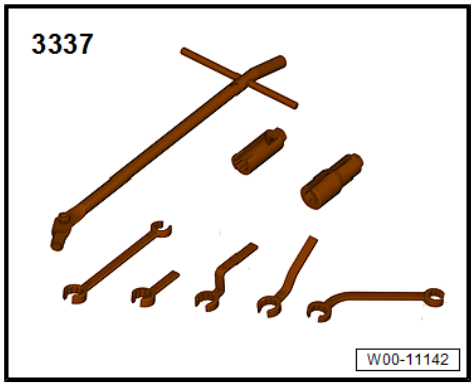
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- Hose clip pliers - VAS 6340-



- Engine support - T10533-

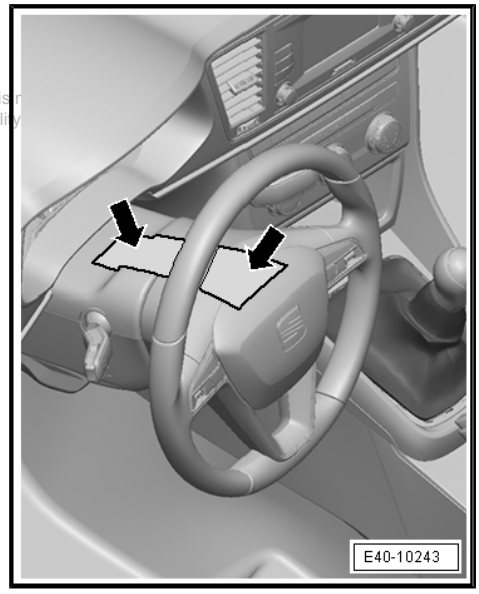
♦ Wrench kit - 3337-



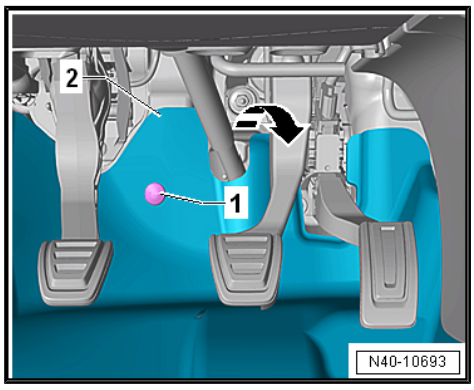
Removing

Vehicles with all-wheel drive

– Secure the steering wheel with the wheels straight ahead with adhesive tape -arrow-, to prevent its being turned inadvertently.

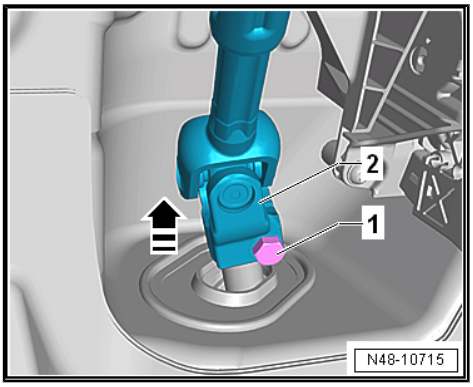


– Unscrew bolt -1- to lift the footwell lining -2- towards the passenger area in -the direction of the arrow-.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Unscrew the bolt -1- from the cross-piece -2- and take out the cross-piece in -the direction of the arrow-.



NOTICE

If the cross-piece is not in the steering gear, the following procedure are not allowed to be carried out:

- **Connect battery.**
- **Switch on ignition.**
- **rotating the steering gear,**
- **rotating the steering column.**

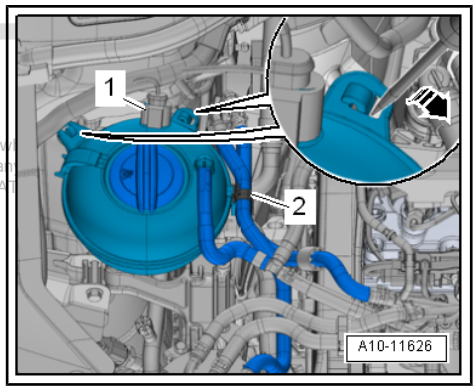
These points must be strictly observed, otherwise irreparable damage can occur.

– Remove front wheels.

Continued for all vehicles

– Remove engine cover panel ⇒ page 56

– Using a screwdriver, release fasteners -arrow- and move coolant expansion tank to one side.



Vehicles with pressure differential sender - G505- :

– Detach pressure differential sender - G505- from cylinder head cover ⇒ page 442 .

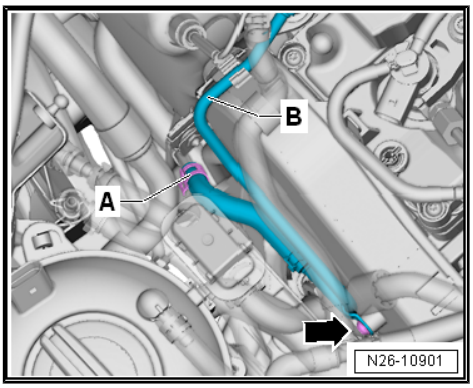
Vehicles with pressure differential sender - G505- and exhaust gas pressure sensor 1 - G450- :

– Detach pressure differential sender - G505- and exhaust gas pressure sensor 1 - G450- from cylinder head cover ⇒ page 442 .

Vehicles with one pressure differential line:

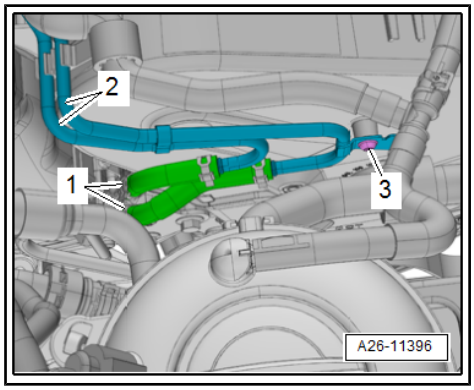
– Open clamp -A-, and pull off hose.

– Unclip pipe -B-, and remove it together with pressure differential sender - G505- .



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Vehicles with two pressure differential lines:



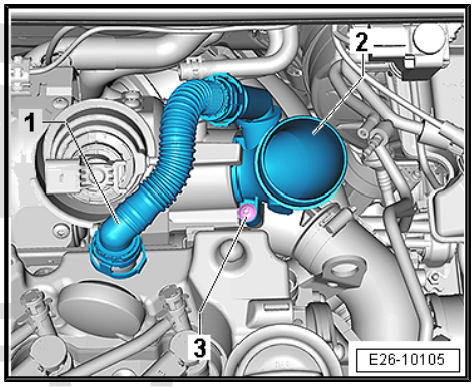
- Unscrew bolt -3-.
- Mark installation position and allocation of hoses in relation to pipes.
- Release hose clips -1- and detach hoses.
- Unclip pipe -2- and remove it together with pressure differential senders.

Vehicles with SCR system:

- To remove NOx sender - G295- from emission control module to free some space ⇒ page 452 :
- To make more space, remove injector for reducing agent - N474- from emission control module and lay it to one side with lines connected ⇒ page 537 .

Continued for all vehicles

- Remove exhaust gas temperature sender 3 - G495- ⇒ page 548 .
- Remove exhaust gas temperature sender 2 - G448- ⇒ page 548 .
- Remove Lambda probe 1 before catalytic converter - GX10- ⇒ page 469 .
- Remove air pipe ⇒ page 366 .



- Press release tabs on crankcase breather hose -1- and disconnect hose from cylinder head cover.
- Unscrew bolt -3-, swing air pipe with inlet connection -2- to rear and pull off from turbocharger.

Vehicles with dual clutch gearbox

- Remove selector lever cable from gearbox ⇒ ; Rep. gr. 34 ; Selector mechanism; Removing and installing selector lever cable .
- Release and pull off connector for mechatronic unit for dual clutch gearbox - J743- ⇒ Rep. gr. 34 ; Mechatronic unit .
- Detach wiring harness from front of gearbox and push upwards.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

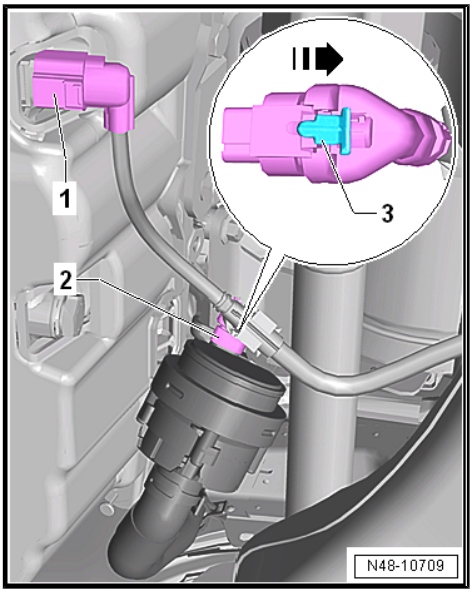
Vehicles with manual gearbox

- Disconnect gear selector cable and gate selector cable from gearbox. Then, unbolt cable support bracket and lay it to one side, together with cables ⇒ Rep. gr. 34 ; Selector mechanism .

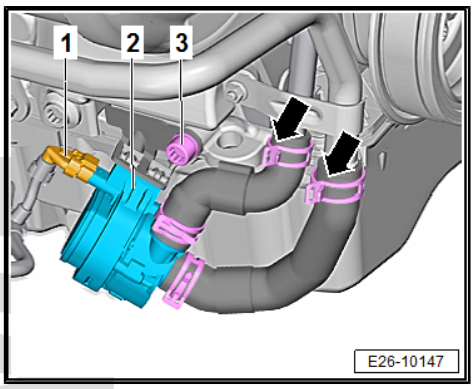
Continued for all vehicles

- Remove radiator cowl ⇒ page 317 .

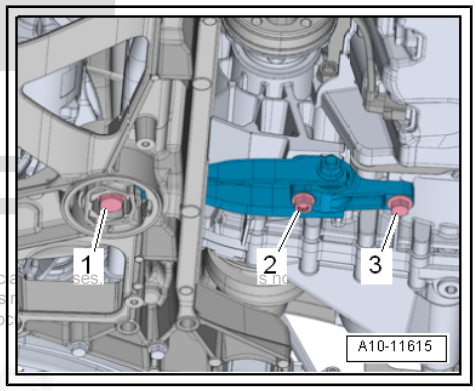
– Release and pull off connector -1- for oil level and oil temperature sender - G266- .
– Release connector -2- and remove auxiliary pump for heating - V488- .
– To do this, open locking device -3- by pressing in direction of -arrow- and release connector.
– Drain coolant ⇒ page 214 .



– Release and unplug electrical connector -1-.
– Release hose clips and remove coolant hoses -arrows- from the auxiliary heating pump - V488- -2-.
– Unscrew bolt -3-.
– Remove the auxiliary pump for heating - V488- -2- together with the bracket.
– Remove front exhaust pipe ⇒ page 489 .
– Remove exhaust gas temperature sender 4 - G648- ⇒ page 559 .



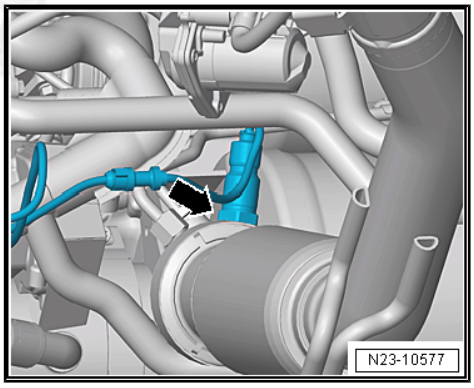
– Unscrew bolts -1, 2 and 3-, and remove pendulum support.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document.

Vehicles with lambda probe 1 after catalytic converter - GX7-

– Remove lambda probe 1 after catalytic converter - GX7- -arrow- ⇒ page 469 .

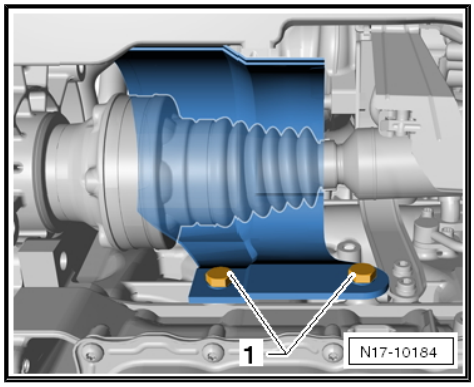


Models with front-wheel drive

– If installed, remove bolts -1- and the heat guard.

– Remove heat shield for right drive shaft ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft heat shield .

– Remove right drive shaft ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .



Vehicles with all-wheel drive

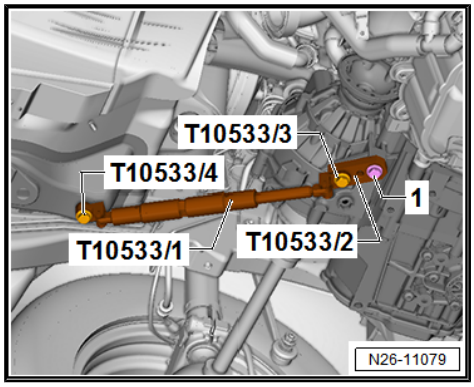
– Remove subframe together with steering rack ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing subframe with steering rack .

– Unbolt right drive shaft from bevel box ⇒ Rep. gr. 40 ; Drive shaft; Assembly overview - drive shaft and tie it up towards rear.

– Unbolt prop. shaft from bevel box ⇒ Prop. shaft and rear final drive; Rep. gr. 39 ; Prop. shaft; Assembly overview - prop. shaft .

– Tie up prop. shaft to left side of vehicle.

– Fit engine support - T10533- as shown in illustration, and tighten bolts by hand. Bolt -1- = original bolt for pendulum support.



Models with front-wheel drive

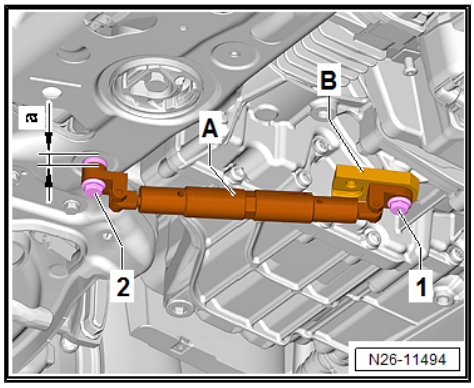
– Position engine support - T10533- -A- as shown.

– Engine support - T10533/2- -B- is positioned on flat bolt connecting point of engine support - T10533/1- .

– Screw in original bolt of pendulum support -1- in front threaded hole of pendulum support.

– Screw a bolt M8 x 60 mm -2- with washer into threaded hole of noise insulation.

– Between high bolt connecting point and subframe, engineer a distance of 20 mm with washers -a-.



Continued for all vehicles

– Using engine support - T10533- , push engine as far forwards as possible.

– In the case of right-hand drive models, make sure that electrical connection from starter does not contact battery tray.

– Remove rear coolant pipe ⇒ page 293 .

Vehicles with auxiliary heater

– Remove coolant lines from bulkhead ⇒ Auxiliary heater; Rep. gr. 82 ; Coolant circuit with auxiliary heater; Removing and installing coolant pipes for auxiliary heater .

SEAT
This document is protected by copyright. Reproduction of any part or in whole, is not permitted without the prior written consent of SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

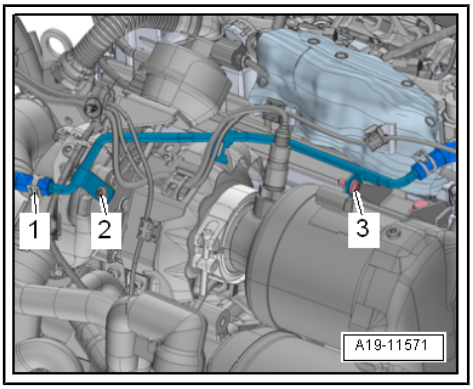
Vehicles with coolant pipe above emission control module:

– Open hose clip -1- and pull off coolant hose.

– Unscrew bolts -2- and -3-, and swivel coolant pipe to one side.

Continued for all vehicles

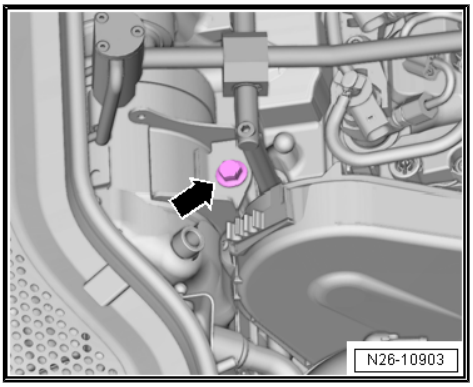
– Remove exhaust gas recirculation cooler ⇒ page 567 .



– Unscrew bolt -5-.

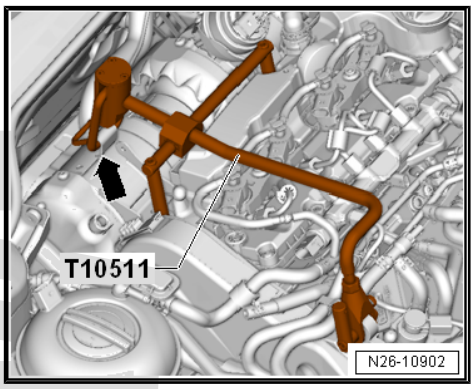
Note

The feet of assembly tool - T10511- are supported on the bolt heads of the cylinder head cover.



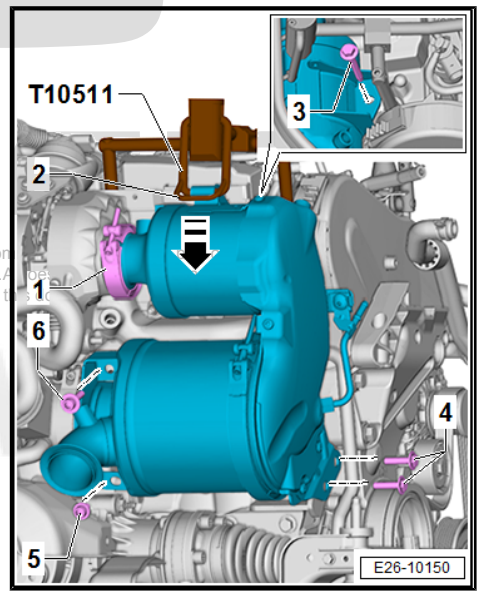
– Fit assembly tool - T10511- as shown.

– Attach retaining bracket -arrow- in lifting shackle of emission control module.



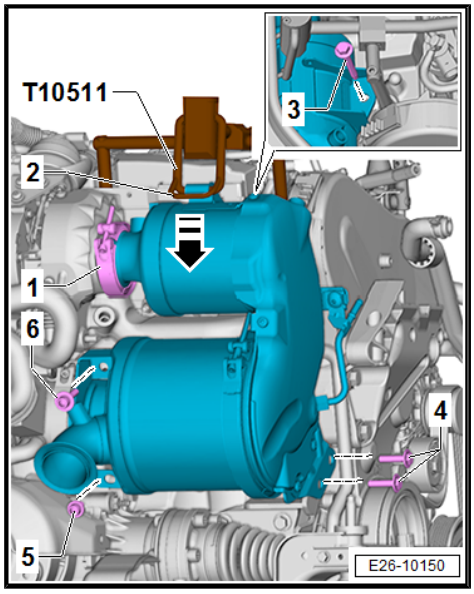
– Open clip -1- and position it on intake funnel of emission control module.

– Unscrew bolts -4-.



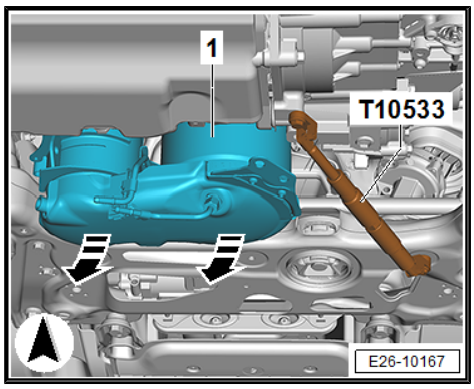
Protected by copyright. Copying for private or com
permitted unless authorised by SEAT S.A. SEAT S.A. doe
respect to the correctness of information in th

– Unscrew remaining bolts in sequence -4 to 6-.
– Remove bolt -5- using the XZN 10 - T10501- .
– Pull down mechanism -2- of assembly tool - T10511- in -direction of arrow- to release the retaining bracket of the transportation shackle of the emission control module.



Models with front-wheel drive

– Detach emission control module -1- between engine and sub-frame. Turn and tilt it as necessary while doing so.



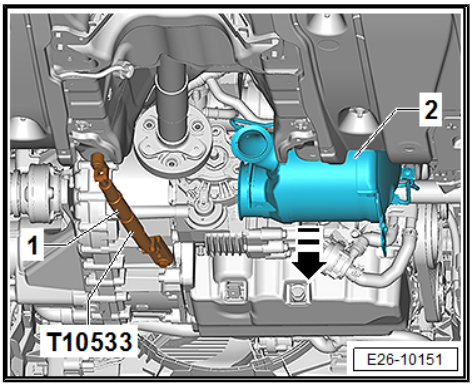
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Vehicles with all-wheel drive

– Remove exhaust gas cleaning module -2-. Turn and tilt it as necessary while doing so.

Installing

• Assembly aid - T10511- set up on engine



Note

♦ *Ensure that the retaining bar of the assembly tool - T10511- is »opened« towards plenum chamber bulkhead.*

♦ *Renew gaskets, self-locking nuts and screw-type clamp for emission control module after removal.*

♦ *Re-fit all cable ties and heat insulation sleeves in the same locations when installing.*

NOTICE

Emission control module must be installed free of tension to avoid risk of stress fractures and engine damage.

♦ **Prior to installation, ensure that the compensation elements move easily and do not stick.**

♦ **Compensation element must turn easily on its threads.**

♦ **Only apply lubricant to thread; retainer tabs must remain »clean«.**

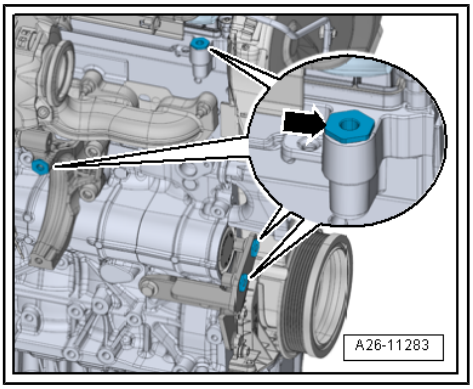
♦ **The retainer tabs for the bolt must be bent together so that when the bolt is screwed in, the compensation element turns as well.**

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Check that compensation elements -arrow- are free to move.

– Unscrew compensation elements completely in clockwise direction (left-hand thread).

– Clean any threads that do not turn easily and lubricate lightly with rust remover if necessary.



NOTICE

Ensure that no lubricant gets on the retainer tabs of the compensation elements. If the friction is reduced, functional impairment of the compensation elements will be the result.

– Adjust retainer tabs to functional dimension using calibration tool - T10512- as follows:

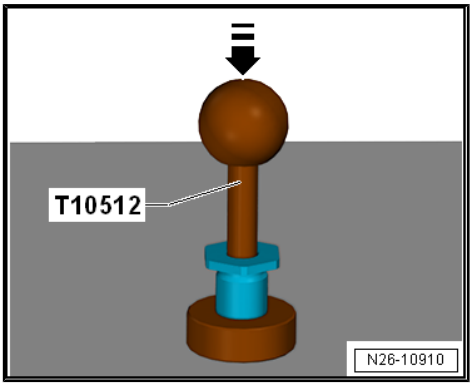
– Slide compensation element onto shaft of calibration tool.

– Insert compensation element into centring sleeve.

– Bend the retainer tabs back with light blows on the ball head using your hand.

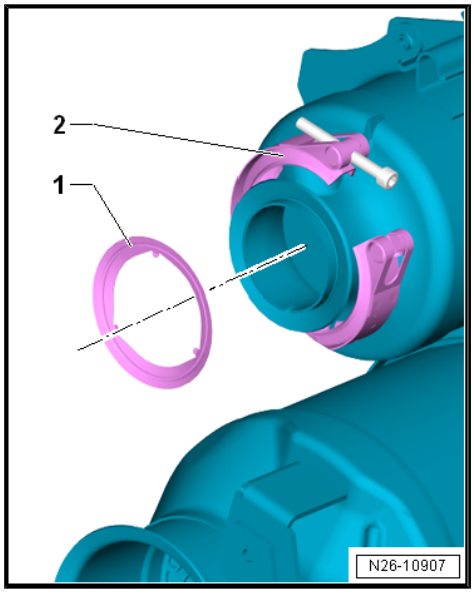
– Screw in compensation elements by hand as far as they will go, then loosen again by 45°.

– Fit seal -1- onto emission control module.



– Unhook bolt of clamp.
– Place clamp -2- completely on intake funnel of emission control module.
– Do not bend open clip.
– Guide emission control module into installation position from below, push upwards and hook retainer into bracket of emission control module.

Emission control module is now suspended approximately in installation position with its weight supported.

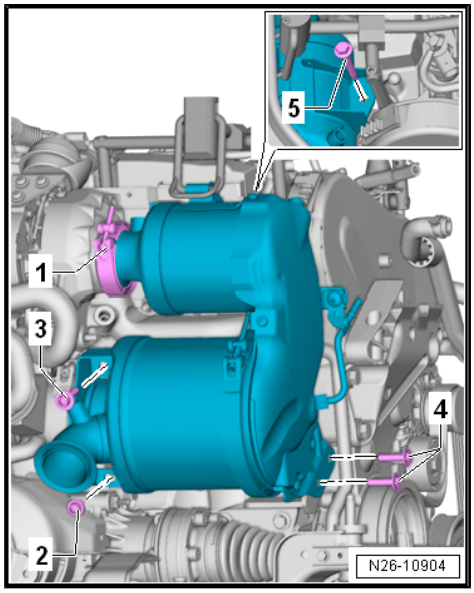


Copyright by SEAT S.A. Any form of duplication, distribution or storage, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

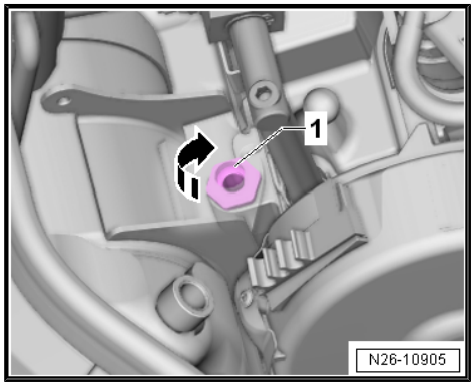
Tightening sequence for emission control module

– Renew all securing bolts of the emission control module after removal.

Stage	Bolt	Fault rectification
I	Screw-type clip -1-	Position over sealing flange and engage bolt.
II	Bolt -2-	Tighten by hand and loosen immediately by 90°
III	Screw-type clip -1-	Tighten to 8 Nm
IV	Bolt -2-	Tighten to 20 Nm
V	Bolt -3-	Insert and press until it engages. Do not tighten or turn bolt.
VI	Bolts -4-	Insert and press until it engages. Tighten bolts to 20 Nm
VII	Bolt -3-	Tighten to 20 Nm

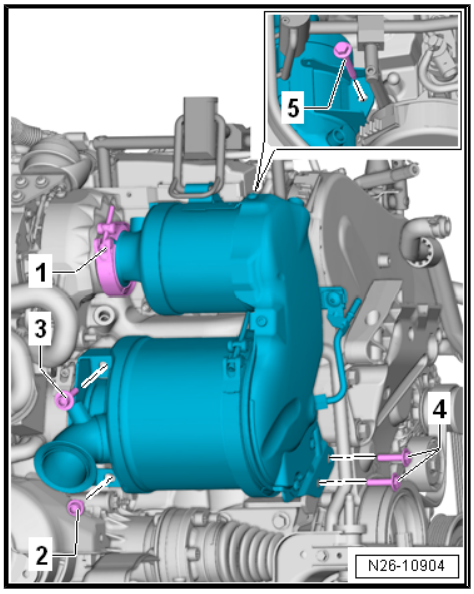


– Unscrew compensation element (left-hand thread) -1- on cylinder head in -direction of arrow- as far as stop using hexagon key extension, 8 mm - 3247- . Then, turn it 90° further.



Continuation of tightening sequence

Stage	Bolt	Fault rectification
VIII	Bolt -5-	Insert and press until it engages
IX	Bolt -5-	Tighten to 20 Nm
X	Bolt -5-	Turn 90° further
XI	Bolt -5-	Turn another 45° further.



Further installation is carried out in the reverse order; note the following:

– Install exhaust gas recirculation cooler ⇒ page 567 .

– Install coolant pipe (rear) ⇒ page 293 .

Vehicles with all-wheel drive

– Bolt prop. shaft to bevel box ⇒ Rep. gr. 39 ; Prop. shaft; Removing and installing prop. shaft .

– Install right drive shaft to bevel box ⇒ Rep. gr. 40 ; Drive shaft; Assembly overview - drive shaft , and tie it up towards rear.

– Install subframe ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing subframe with steering box .

Continued for all vehicles

– Remove engine support - T10533- .

– Observe electrical connections and routing ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

– Install front exhaust pipe ⇒ page 489 .

– Install coolant pipes (left-side) ⇒ page 291 .

– Install sensor ⇒ page 548 .

– Install engine cover panel ⇒ page 56 .

– After renewing emission control module, perform `Adaption` in `Guided Functions` ⇒ Vehicle diagnostic tester.

Specified torques

- ⇒ “3.9 Assembly overview - injector for reducing agent N474 ”, page 540
- ⇒ “9.1 Assembly overview - Lambda probe”, page 466
- ⇒ “1.1 Assembly overview - silencers”, page 473
- ⇒ “3.1 Assembly overview - coolant pipes”, page 282
- ⇒ “4.1 Assembly overview - exhaust gas temperature regulation”, page 548
- ⇒ “2.1 Assembly overview - assembly mountings”, page 42
- ⇒ “5.1 Assembly overview - exhaust gas recirculation”, page 562
- ⇒ “2.1 Assembly overview - emission control”, page 500
- ⇒ “1.2 Assembly overview - cylinder head cover”, page 102
- ⇒ “2.1 Assembly overview - toothed belt cover”, page 123
- ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Assembly overview - drive shaft .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Assembly overview - underbody trim panels
- ⇒ “2.2 Assembly overview - electric coolant pump”, page 250
-

2.5 Removing and installing exhaust flap control unit - J883-

Removing

– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

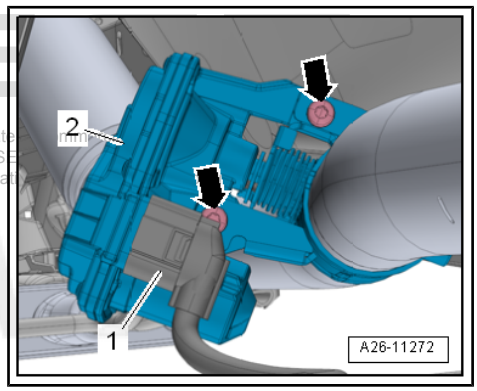
– If fitted, remove front centre underbody cover behind subframe ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody cover; Assembly overview - underbody covers .

– If fitted, remove heat insulation sleeve from connector.

– Unplug the electrical connector -1-.

– Unscrew bolts -arrows- and remove exhaust flap control unit - J883- .

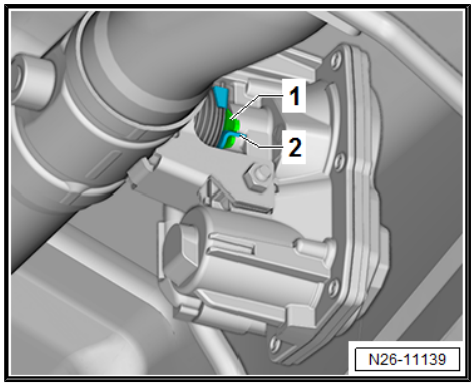
Protected by copyright. Copying for private
permitted unless authorised by SEAT S.A. SE
respect to the correctness of informa



Installing

– Fit new exhaust flap control unit . Make sure that the follower of the control unit -1- engages properly in the tab of the exhaust flap -2-.

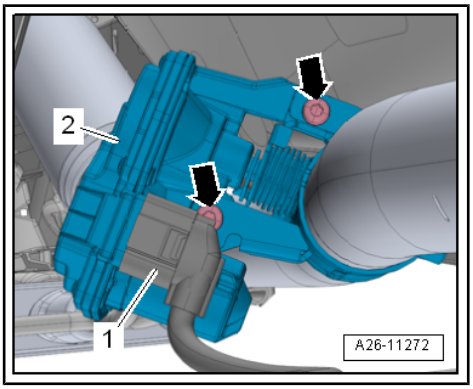
– Insert new securing bolts, and start new nuts.



– First tighten upper bolt, then tighten lower bolt. Specified torque: 10 Nm

– Remove protective cap from the electrical connector and complete the connection -1-. If applicable, fasten the head protection sleeve.

– After renewing the exhaust flap control unit - J883- , adapt learnt values in engine control unit. To do this, switch on ignition and select the following menu item in the vehicle diagnostic and service information system :



♦ `Self-diagnosis-capable systems`

♦ `0001 - Engine electronics, functions`

♦ `0001 - Basic setting`

♦ `Adapt exhaust flap`

Specified torques

♦ ⇒ “1.1 Assembly overview - silencers”, page 473

♦ ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Assembly overview - underbody trim panels

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

3 SCR system (selective catalytic reduction)

⇒ “3.1 Assembly overview - reducing-agent tank”, page 520

⇒ “3.2 Assembly overview - delivery line for reducing agent”, page 523

⇒ “3.3 Assembly overview - delivery module for reducing agent”, page 524

⇒ “3.4 Removing and installing reducing agent tank”, page 524

⇒ “3.5 Removing and installing reducing agent supply line”, page 527

⇒ “3.6 Removing and installing delivery module for reducing agent”, page 534

⇒ “3.7 Removing and installing injector for reduction agent N474 ”, page 537

⇒ “3.8 Removing and installing control unit for reducing-agent heater J891 ”, page 540

⇒ “3.9 Assembly overview - injector for reducing agent N474 ”, page 540

⇒ “3.10 Drain the reducing agent tank”, page 541

⇒ “3.11 Removing and installing filler pipe for tank for reducing agent”, page 544

⇒ “3.12 Disconnecting reducing agent supply line”, page 545

⇒ “3.13 Resetting SCR learnt values”, page 547

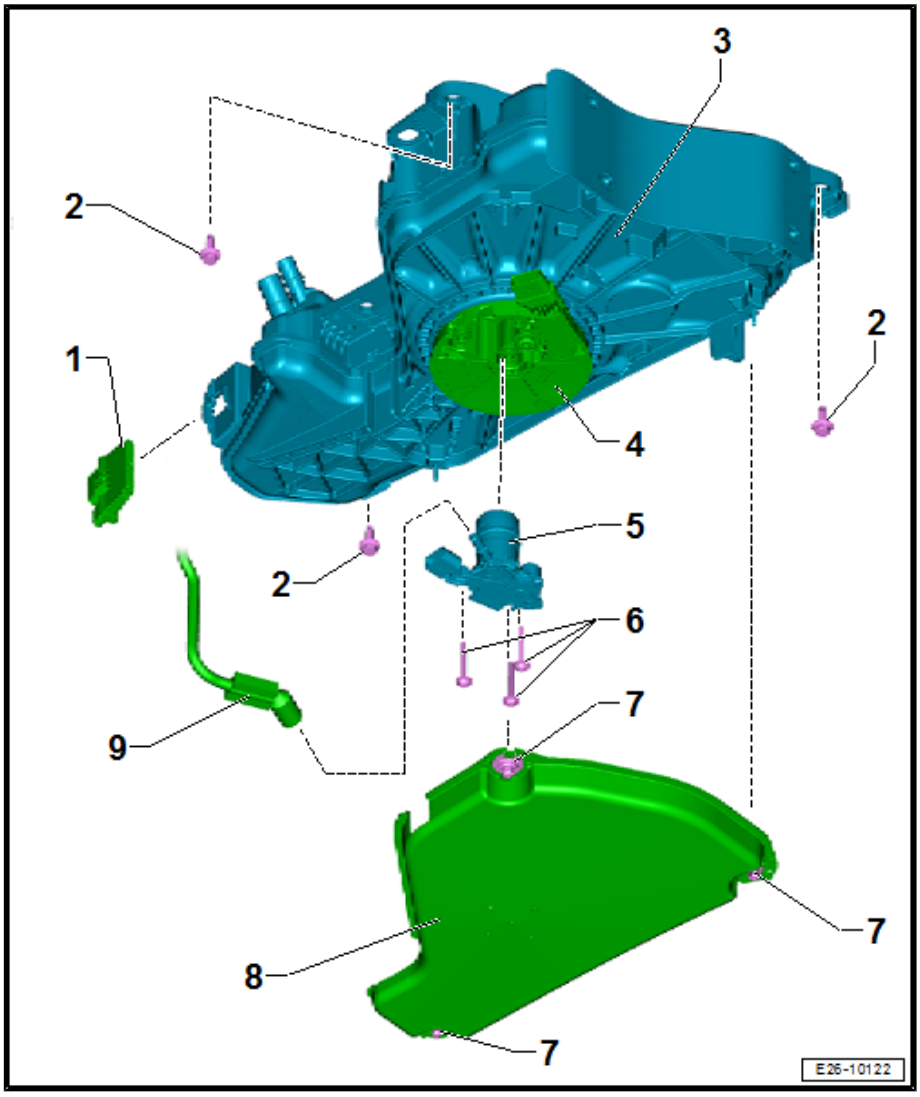
3.1 Assembly overview - reducing-agent tank

⇒ “3.1.1 Assembly overview - reducing agent tank from below, Ateca”, page 520

⇒ “3.1.2 Assembly overview - reducing agent tank from above, Ateca”, page 522

3.1.1 Assembly overview - reducing agent tank from below, Ateca

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



1 - Control unit for reduction agent heater - J891-

- ❑ Removing and installing ⇒ page 540

2 - Bolt

- ❑ 3x.
- ❑ 20 Nm

3 - Reducing agent tank

- ❑ with:

- ♦ Delivery unit
- ♦ Temperature sender for reducing agent - G685-
- ♦ Sensor for reducing-agent tank - G697-
- ♦ Heater for reducing-agent tank (heater circuit 1) - Z102-
  - ❑ Fitting location: rear right
  - ❑ Removing and installing ⇒ page 524

4 - Delivery unit for reducing agent

- ❑ Part of tank for reducing agent
- ❑ Cannot be removed

5 - Delivery module

- ❑ with:

- ♦ Pump for reduction agent - V437-
- ♦ Reducing agent return flow pump - V561-
- ♦ On some vehicle models with reducing agent quality sensor - G849-
  - ❑ Assembly overview ⇒ page 524
  - ❑ Removing and installing delivery module ⇒ page 534 .

6 - Bolt

- ❑ 6 Nm

7 - Nut

- ❑ 3x.
- ❑ 2 Nm

8 - Cover

9 - Reducing agent line

- ❑ From delivery module to injector for reducing agent - N474-
- ❑ With heater for reducing-agent line (heater circuit 2) - Z104-
- ❑ Removing and installing ⇒ page 533

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

3.1.2 Assembly overview - reducing agent tank from above, Ateca

1 - Reduction agent delivery line

- ❑ Assembly overview ⇒ page 523
- ❑ Removing and installing ⇒ page 533
- ❑ Separating supply line ⇒ page 545

2 - Bracket/bearing/support

- ❑ On filler pipe of fuel tank

3 - Sealing grommet

- ❑ Between body and wheel housing

4 - Sealing cap

5 - Bolt

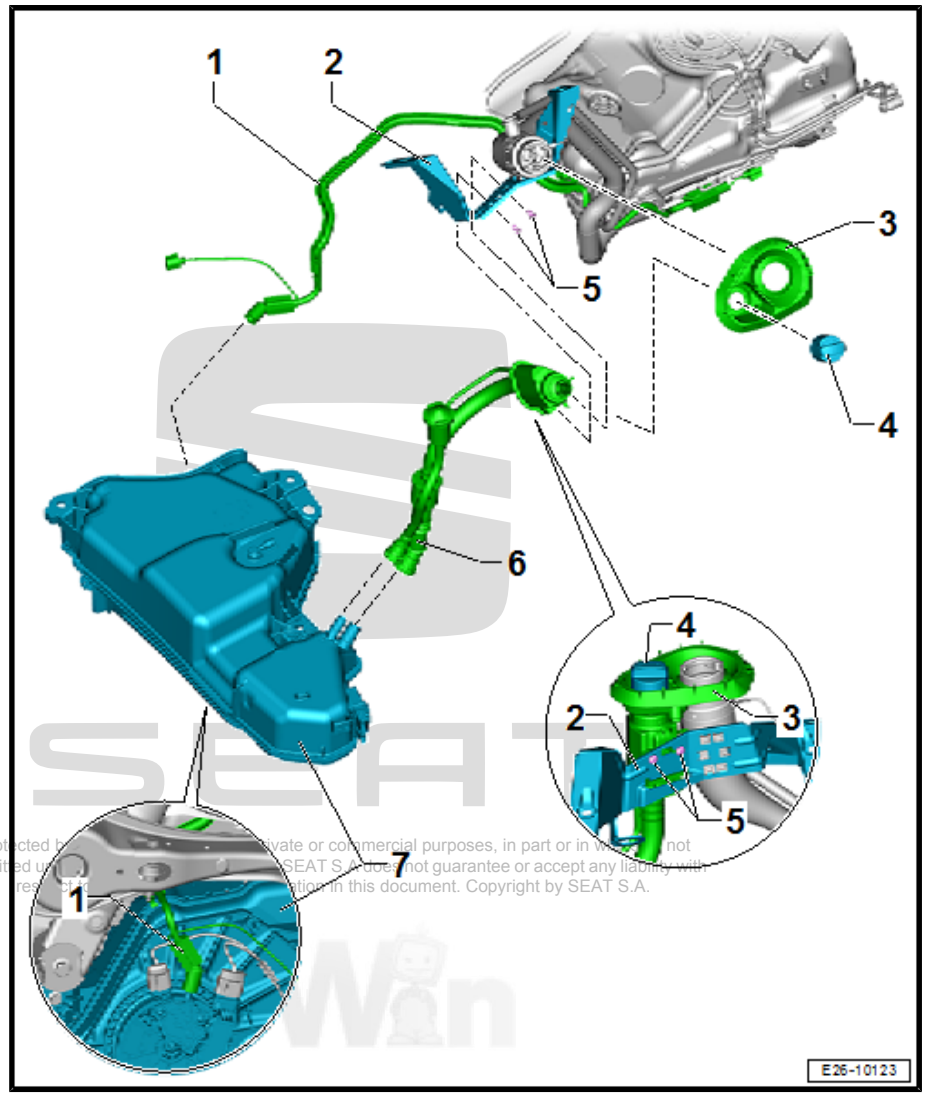
- ❑ 8 Nm

6 - Filler pipe for the reducing agent tank

- ❑ Removing and installing ⇒ page 544

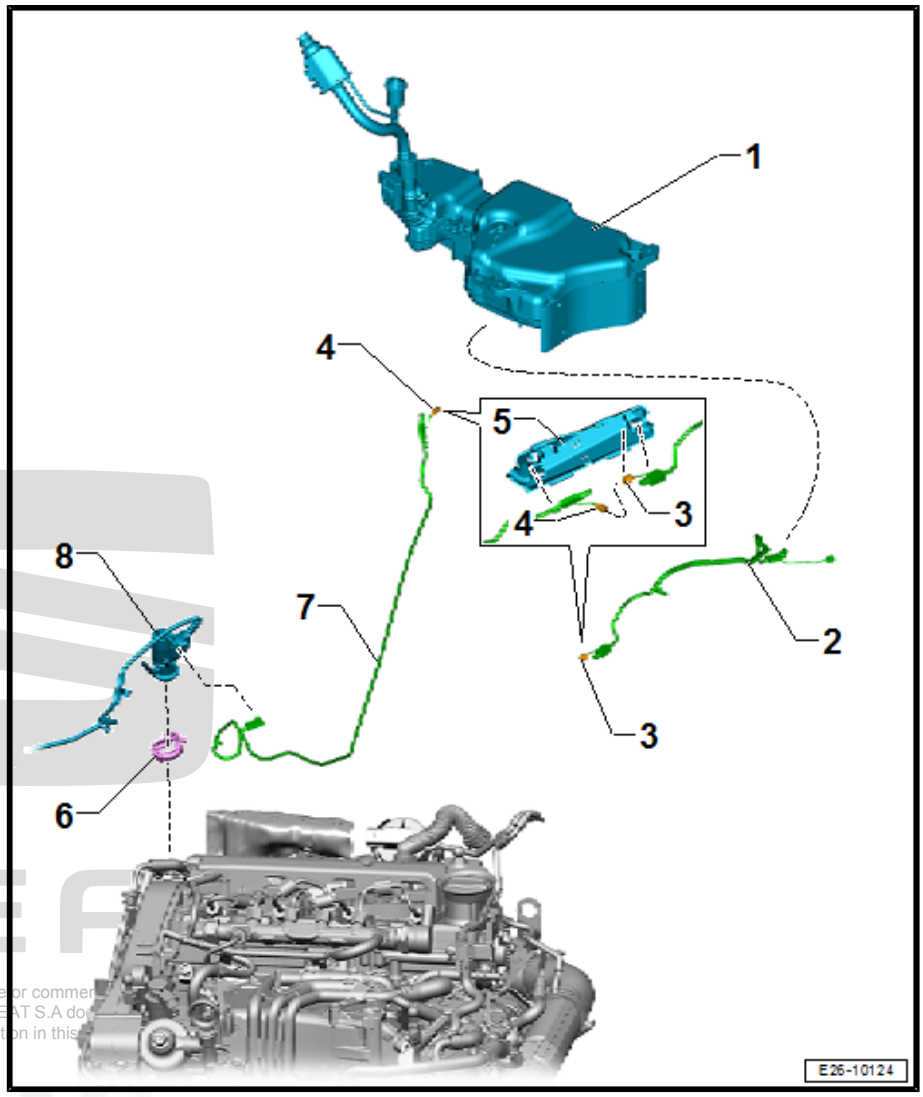
7 - Reducing agent tank

- ❑ Assembly overview from below ⇒ page 520
- ❑ Removing and installing ⇒ page 524



Protected by ... private or commercial purposes, in part or in whole, is not permitted unless ... SEAT S.A. does not guarantee or accept any liability with respect to ... information in this document. Copyright by SEAT S.A.

3.2 Assembly overview - delivery line for reducing agent



1 - Reducing agent tank

- ❑ Assembly overview ⇒ page 520
- ❑ Removing and installing ⇒ page 524
- ❑ Draining ⇒ page 541

2 - Reducing agent line

- ❑ From delivery module to coupling point at underbody
- ❑ With heater for reducing-agent line (heater circuit 2) - Z104-
- ❑ Assembly overview ⇒ page 523
- ❑ Disconnecting connection ⇒ page 545
- ❑ Removing and installing ⇒ page 533

3 - Electrical connector of delivery line

- ❑ For heater for reducing-agent line - Z104-

4 - Electrical connector of delivery line

- ❑ For heater for reducing-agent line - Z104-

5 - Protection cover

- ❑ Under-floor, on the right side, in the area of the fuel tank
- ❑ Disconnecting connection ⇒ page 545

6 - Spring-type clip

- ❑ Renew after removal
- ❑ ⇒ Fig. ““Screw-type clip versions”“ , page 541

7 - Reducing agent line

- ❑ From coupling point at underbody to injector for reducing agent - N474-
- ❑ With heater for reducing-agent line (heater circuit 2) - Z104-
- ❑ Assembly overview ⇒ page 523
- ❑ Disconnecting connection ⇒ page 545
- ❑ Removing and installing ⇒ page 527

8 - Injector for reduction agent - N474-

- ❑ Removing and installing ⇒ page 537
- ❑ Assembly overview ⇒ page 540

9 - Reducing agent line connection

- ❑ ⇒ page 545

10 - Connector for reducing agent line

- ❑ For heater for reducing-agent line - Z104-

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document.

3.3 Assembly overview - delivery module for reducing agent

1 - Delivery module for reducing agent

- ❑ Removing and installing ⇒ page 534

2 - Spacer bush

- ❑ 3x.
- ❑ Renew after removal
- ❑ Are part of repair kit

3 - Shock absorber

- ❑ 3x.
- ❑ Renew after removal
- ❑ Are part of repair kit

4 - Gasket

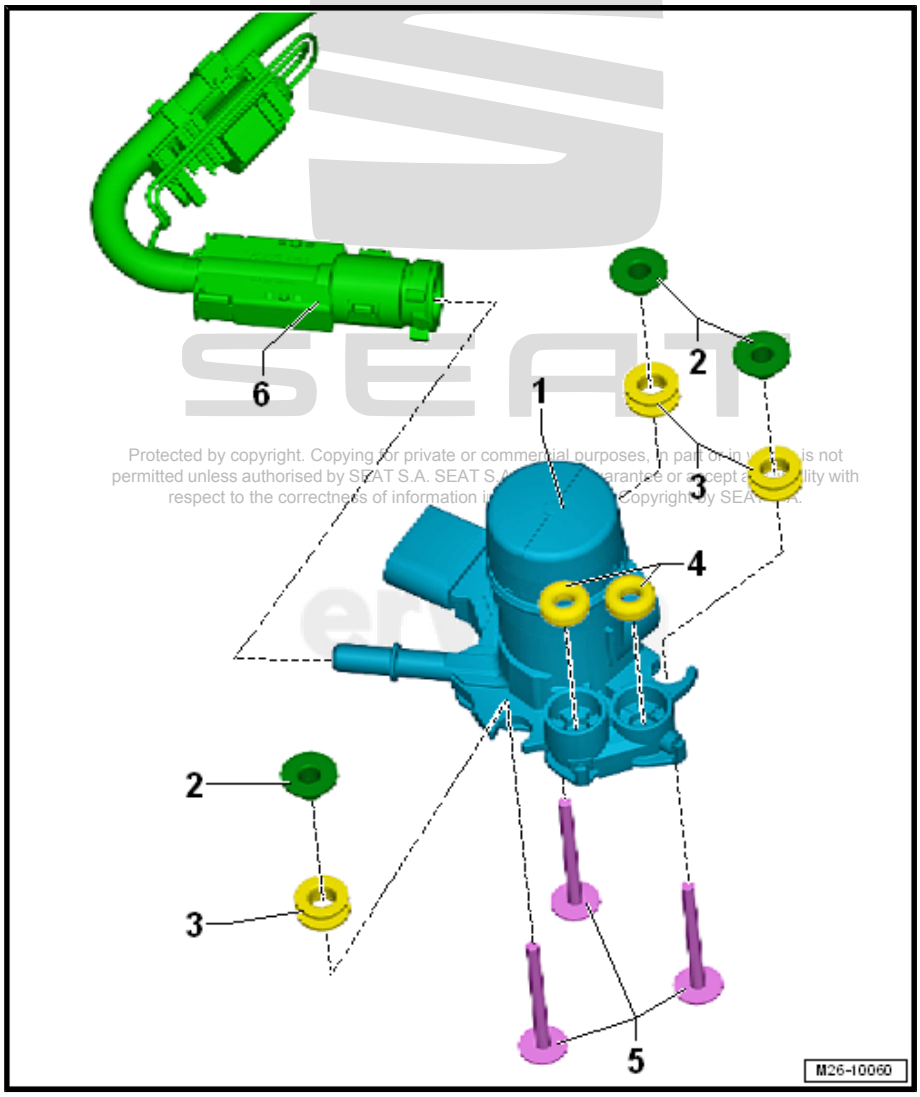
- ❑ 2x.
- ❑ Renew after removal

5 - Bolt

- ❑ 3x.
- ❑ Renew after removal
- ❑ 6 Nm

6 - Reducing agent line

- ❑ From delivery module to injector for reducing agent - N474-
- ❑ With heater for reducing-agent line (heater circuit 2) - Z104-
- ❑ Assembly overview ⇒ page 523
- ❑ Disconnecting connection ⇒ page 545

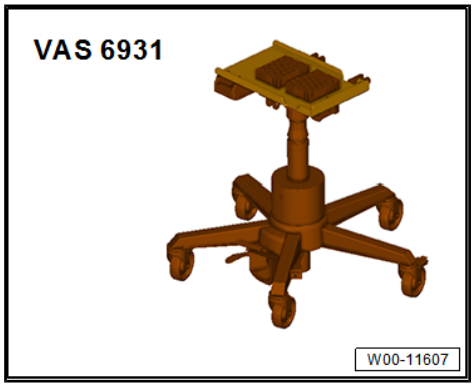


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

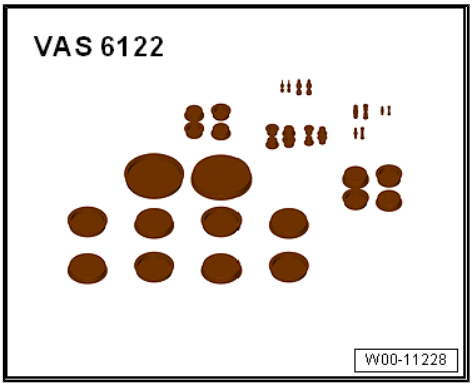
3.4 Removing and installing reducing agent tank

Special tools and workshop equipment required

- ♦ Engine and gearbox jack - VAS 6931-



♦ Engine bung set - VAS 6122-



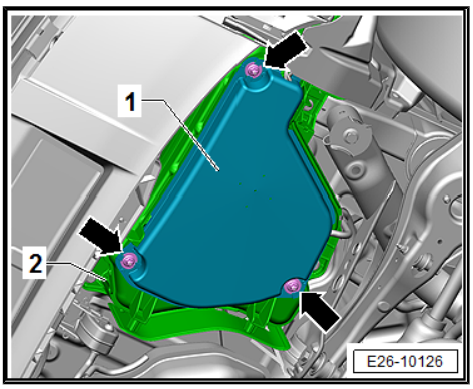
Removing

WARNING

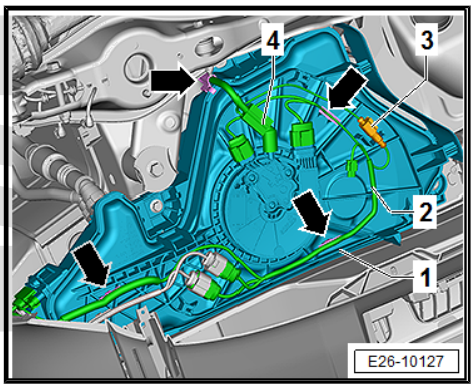
Safety risk due to escaping reducing agent.

♦ **Observe safety measures when handling reducing agent ⇒ page 2 .**

– Emptying tank for reduction agent ⇒ page 541 .
– Remove filler pipes for reducing agent tank ⇒ page 544 .
– Remove cover -1- on tank for reducing agent -2-.
– Unscrew nuts -arrows- to do so.

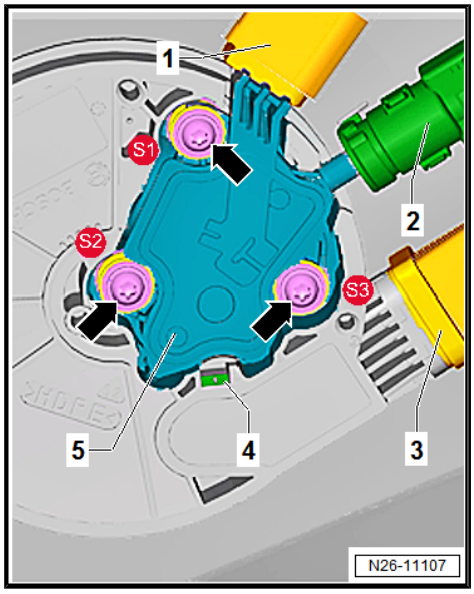


– Unclip all lines -arrows- of the reducing agent tank -1-.
– Unclip, release and pull off connector -3-.

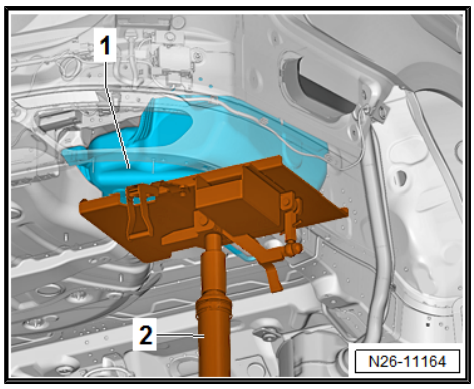


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Release and pull off connectors -1- and -3-.
– Release and pull off reducing agent line -2-. Disconnect reducing agent line ⇒ page 545 .
– Place a cloth underneath coupling point to catch any escaping reducing agent.
– Seal off all open lines and connections with clean plugs from engine bung set - VAS 6122- .



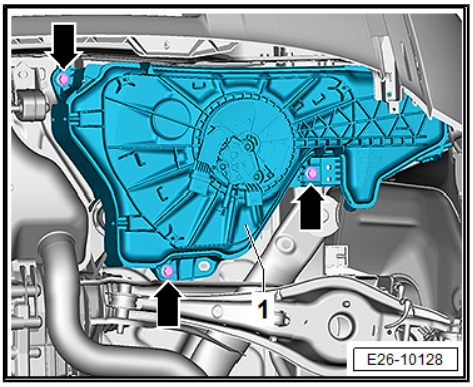
– Place engine and gearbox jack - VAS 6931- equipped with a soft foam padding under tank for reducing agent to support it.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Loosen bolts -arrows- of tank for reducing agent -1-.

– Carefully lower tank for reducing agent, and guide it out while doing this.



Note

For reasons of clarity, the engine and gearbox jack is not shown.

– Lower tank for reducing agent with engine and gearbox jack -VAS 6931- .

– Additionally support tank for reducing agent by hand while doing so.

Installing

Install in reverse order of removal, observing the following.

Note

Attach cable ties in all the same places when installing.

– Ensure lines are secured properly by pulling.

– Check that all lines are clipped into tank for reducing agent.

– Adapt learnt value for SCR system after reducing agent has been drained or after components have been renewed ⇒ page 547 .

Specified torques

- ⇒ “3.1 Assembly overview - reducing-agent tank”, page 520
- ⇒ “3.1.2 Assembly overview - reducing agent tank from above, Ateca”, page 522
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Assembly overview - underbody trim panels

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

3.5 Removing and installing reducing agent supply line

⇒ “3.5.1 Removing and installing front section of reducing agent supply line”, page 527

⇒ “3.5.2 Removing and installing rear section of reducing agent supply line”, page 533

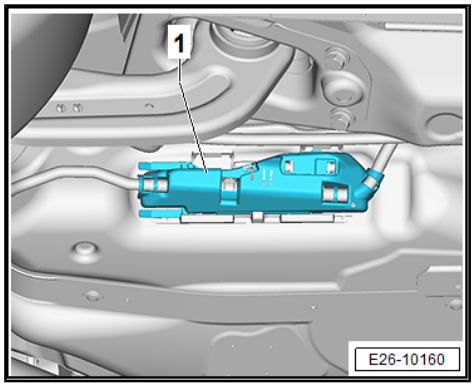
3.5.1 Removing and installing front section of reducing agent supply line

Removing

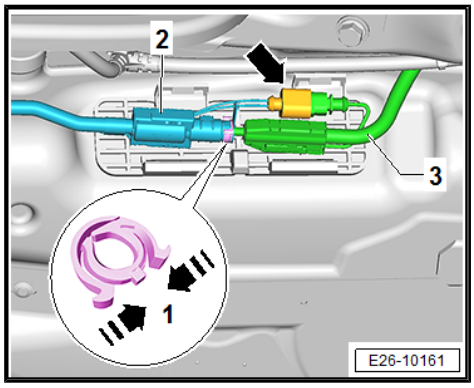
– Observe safety precautions when working on the SCR system ⇒ page 2 .

– Seal off all open lines and connections with clean plugs from engine bung set - VAS 6122- .

– Unclip protective cover -1- of the reducing agent line on the right side of the fuel tank.



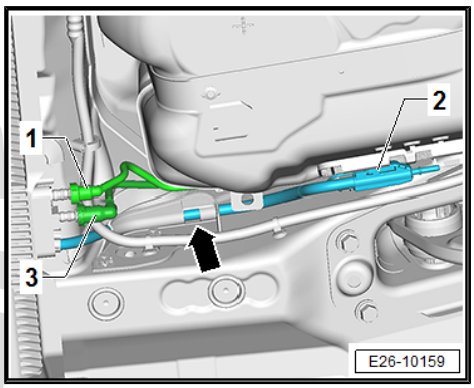
– Unclip, release and pull off the electrical connector -arrow- of the heating for reducing agent line - Z104- .
– Unclip the supply line for reducing agent -2 and 3- from the bracket at the connection point.
– Press together the securing clip of the reducing agent line as shown, in -the direction of the arrows 1-.



Note

Place a cloth underneath coupling point to catch any escaping reducing agent.

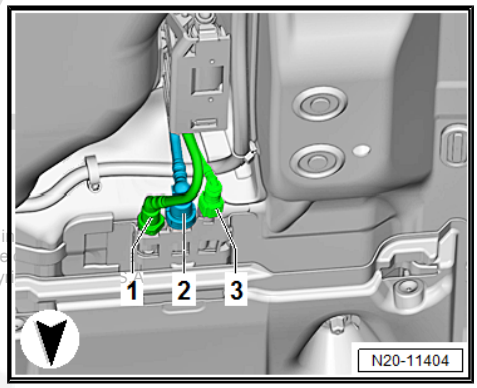
– Pull back the supply line for reducing agent -2- out of the fixing bracket -arrow-.



– Disconnect fuel supply lines -1- and -2- at underbody. Separate plug-in connectors ⇒ Rep. gr. 20 ; plug-in connectors: plug-in connectors: separate .

Vehicles with auxiliary heater

– Disconnect fuel line -3- to auxiliary heater. Opening the quick-release coupling. Separate plug-in connectors ⇒ Rep. gr. 20 ; plug-in connectors: plug-in connectors: separate .



Protected by copyright. Copying for private or commercial purposes, in
permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee
respect to the correctness of information in this document. Copy

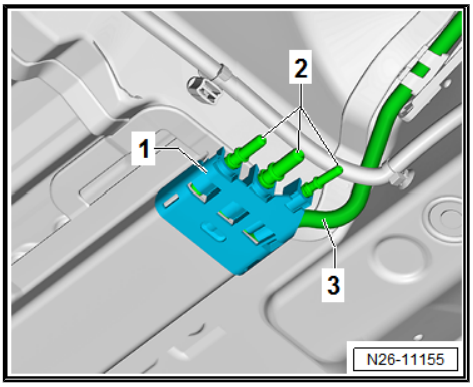
Continued for all vehicles

– Loosen underbody cladding at right side and lower ⇒ General body repairs, exterior; Rep. gr. 66 ; underbody trim; assembly overview - underbody covers .

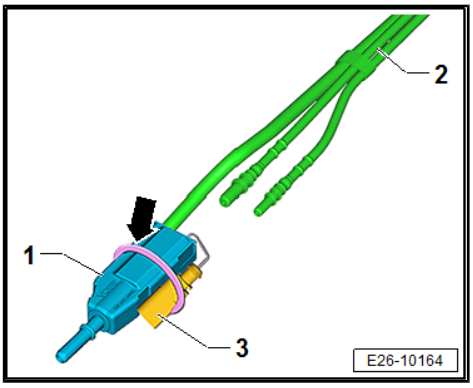
Note

Note the installed positions of the fuel and reducing agent lines for later re-installation.

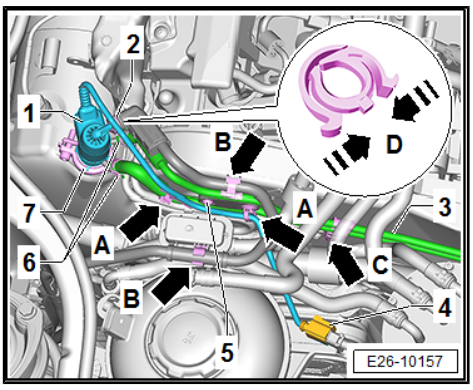
– Unclip retainer -1- on underbody and on lines -2-.
– Unclip reducing agent supply line -3-.
– Secure a pulling aid (e.g. cable or cord) to fuel lines.
– The pulling aid eases reinstallation; choose an appropriate length.



– Tie up supply line for reducing agent -1- together with the plug -3- -arrow-.
– Lower vehicle using lifting platform.



– Unclip the reducing agent line from the fastenings -arrows B-.
– Separate the supply line for reducing agent -2- in the injector for reducing agent - N474- .
– Release and pull off the electrical connectors -4- from the reducing agent injector - N474- .



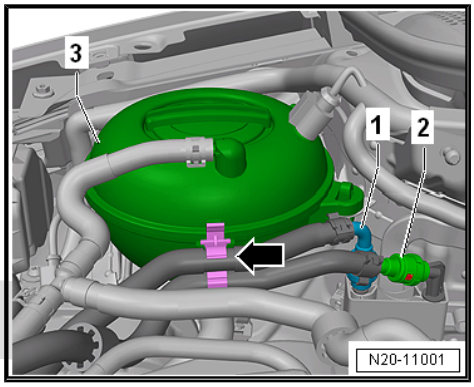
Note

Place a cloth underneath coupling point to catch any escaping reducing agent.

– Press together the securing clip of the reducing agent line as shown, in -the direction of the arrows D-.
– Pull out the supply line without aids and without »jerky movements«.
– Seal off all open lines and connections with clean plugs from engine bung set - VAS 6122- .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Pull off fuel supply lines -1- and -2-. Separate connector couplings ⇒ Rep. gr. 20 ; Connector couplings; Separating connector couplings .



CAUTION

The fuel system is pressurised.

Danger of injury caused by fuel spray.

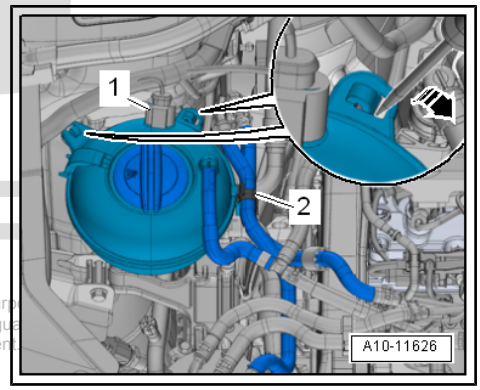
- **Wear safety goggles.**
- **Wear protective gloves.**
- **Release pressure: place clean cloth around connection and carefully open connection.**

– Unclip fuel lines -1- and -2- from retainer -arrow- on coolant expansion tank -3-.

– Unplug the electrical connector -1-.

– Using a screwdriver, release fasteners -arrow- and move coolant expansion tank to one side.

– Open retainer for refrigerant lines on right wheel housing.

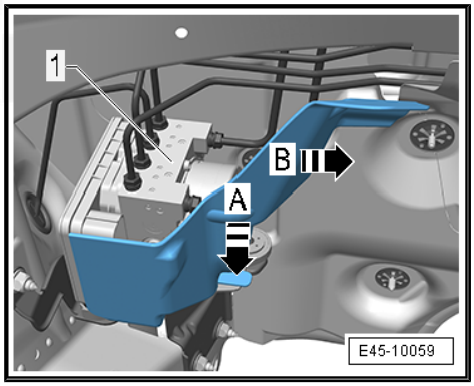


Note

The cover is not installed in all models.

Protected by copyright. Copying for private or commercial purp
permitted unless authorised by SEAT S.A. SEAT S.A does not gu
respect to the correctness of information in this documen

– Lift clips on floor of cover -arrow A- and pull out laterally -arrow B-.

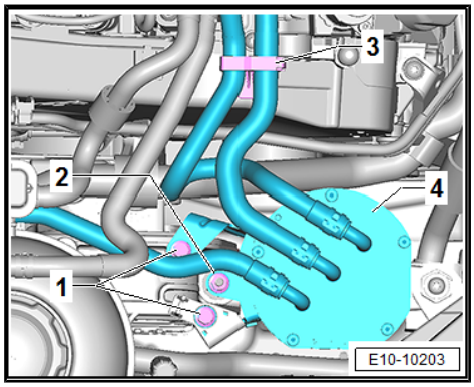


Vehicles with auxiliary heater

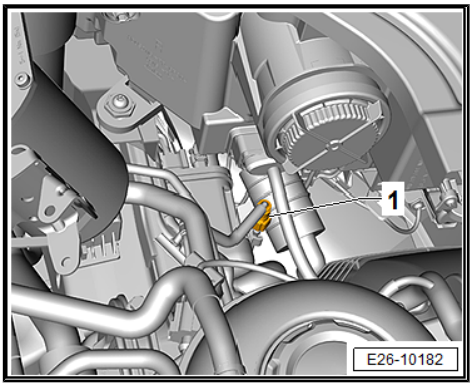
– Move clear bracket -3- with fuel hoses.

– Unscrew nut -2- and bolts -1-.

– Remove the fuel filter -4- and lay it with the fuel lines connected on the engine.



– Release and pull off fuel line -1-.
– Unclip fuel line from its secure.
– Unclip retainers for refrigerant lines from body ⇒ Heating, air conditioning; Rep. gr. 87 ; Refrigerant circuit; Removing and installing refrigerant lines with internal heat exchanger .
– Guide out fuel line from underneath refrigerant lines and engine mounting.



Continued for all vehicles

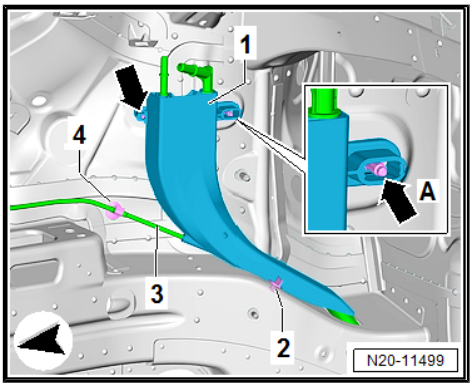
– Loosen cover -1- from the stud -arrow-.
– Unlock spreader rivet -arrow A- and loosen cover.

Vehicles with auxiliary heater

– If fitted, detach clip -4- for fuel line of auxiliary heater -3- from body.

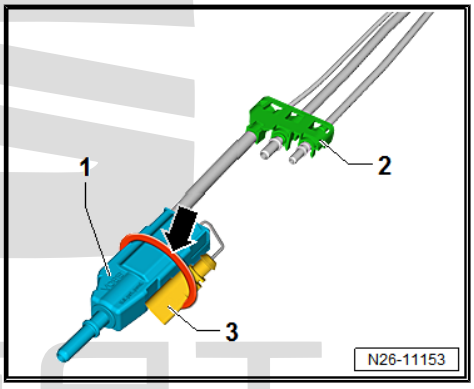
Continued for all vehicles

– Loosen lines in upper area of the cover -1-.
– Pull out lines upwards.
– Turn lines while doing this, do not jerk them.
– Remove cover up
– Pull reducing agent supply line and fuel lines in engine compartment together out of duct.
– Unclip reducing agent supply line -1- from retaining clip -2- for the lines.

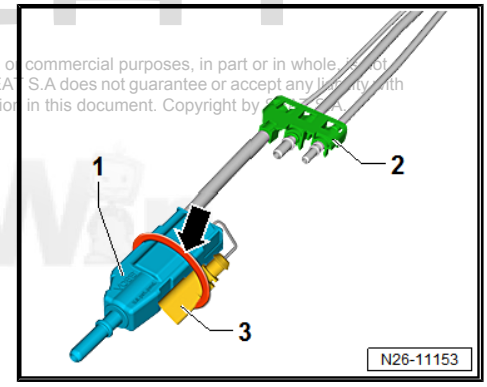


Installing

– Remove pulling aid from old lines.

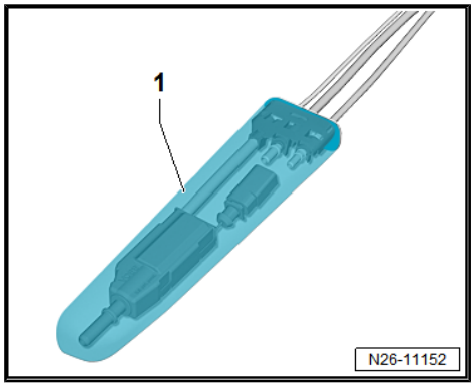


– Clip reducing agent supply line into retaining clip -2- for the lines.
– Make sure that the plugs are properly seated on the new lines.
– If necessary, seal lines with suitable plugs from engine bung set - VAS 6122- .



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

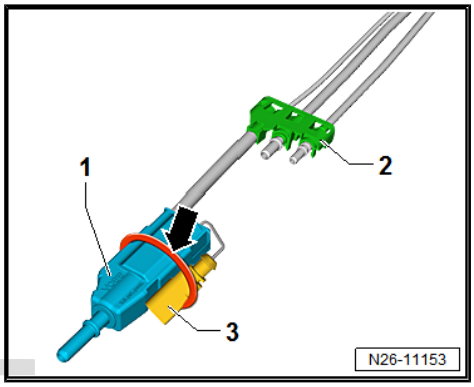
– Install threading aid -1- as shown in illustration.



Note

- *The threading aid is supplied via the ⇒ Electronic parts catalogue .*
- *The threading aid can be ordered via ⇒ Electronic parts catalogue .*
- *The reducing agent supply line, fuel line, breather line and fuel line for the auxiliary heater are installed together.*
- *If necessary, use adhesive tape to fix the lines in position.*

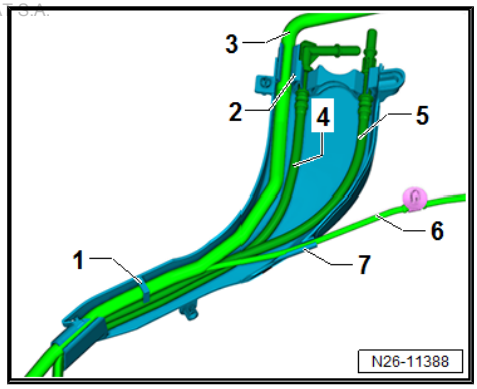
– Secure electrical connector -3- as shown on the conveyor line.



– Insert lines in guides of heat shield, as shown, and clip in place ⇒ page 532 .
– Clip in fuel lines in upper area of heat shield only after guiding in ⇒ page 532 .
– Secure pulling aid to fuel lines.
– Use adhesive tape to secure pulling aid.
– Make sure that the pulling aid is only attached in the front area of the lines.
– Close slotted guide at bottom area of guard with adhesive tape to prevent lines from slipping out.
– Position fuel lines at opening in longitudinal member along with heat shield.

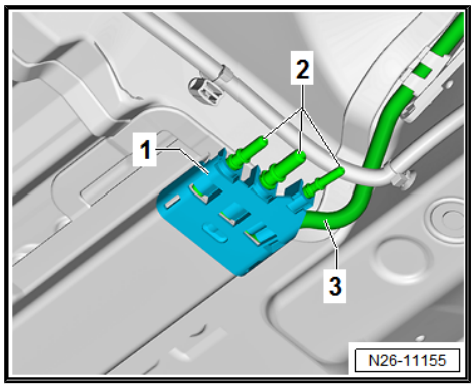
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Installation position of lines on heat shield:



1 - Guide for reducing agent supply line
2 - Retainer for lines in area of coupling point
3 - Reduction agent delivery line
4 - Return line
5 - Fuel supply line
6 - Fuel line for auxiliary heater
7 - Guide for fuel line for auxiliary heater

– Push in reducing agent supply line together with fuel lines from front towards rear.
– Clip reducing agent supply line into retaining clip for the lines.



– Clip lines into retainer on underbody -1-.
– Then clip the clip -1- to the under-floor.
– Connect reducing agent supply line and connector, and clip them into retainer.

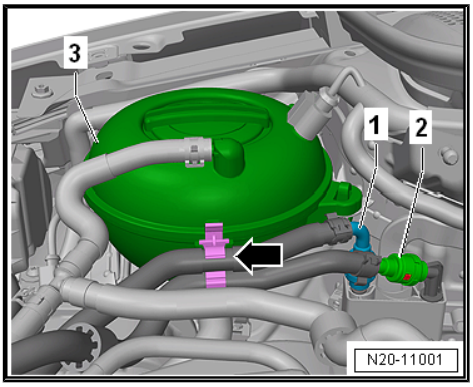
Vehicles with auxiliary heater:

– Fit metering pump - V54- to mounting, and pull it downwards.
– Make sure that the metering pump - V54- engages properly in mounting.

Installation position of fuel lines on coupling point in engine compartment:

1 - Fuel supply line

2 - Fuel return line

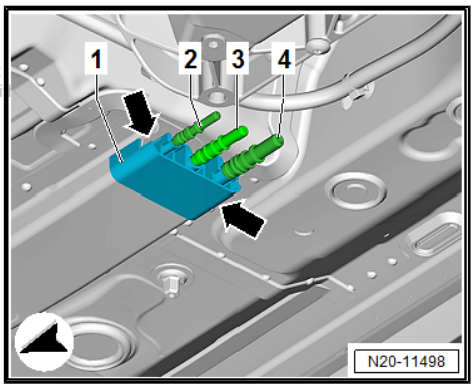


Installation position of fuel lines on underbody:

2 - Fuel return line

3 - Fuel supply line

4 - Fuel line for auxiliary heater



Copyright by SEAT. Copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Remaining assembly is performed in reverse sequence.

– Adapt learnt value for SCR system after reducing agent has been drained or after components have been renewed ⇒ page 547 .

Specified torques

♦ ⇒ Rep. gr. 20 ; Fuel tank; Assembly overview - fuel tank

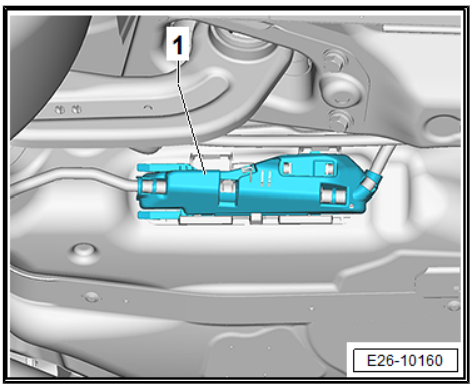
3.5.2 Removing and installing rear section of reducing agent supply line

Removing

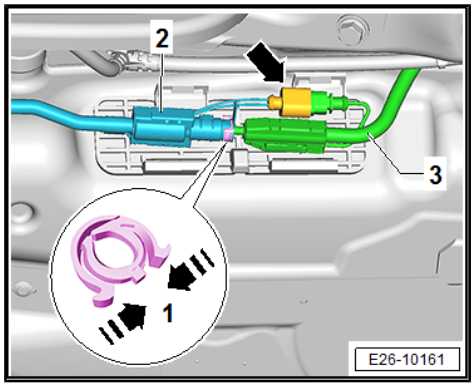
– Observe safety precautions when working on the SCR system ⇒ page 2 .

– Seal off all open lines and connections with clean plugs from engine bung set - VAS 6122- .

– Unclip protective cover -1- of the reducing agent line on the right side of the fuel tank.



– Unclip, release and pull off the electrical connector -arrow- of the heating for reducing agent line - Z104- .
– Unclip the supply line for reducing agent -2 and 3- from the bracket at the connection point.
– Press together the securing clip of the reducing agent line as shown, in -the direction of the arrows 1-.

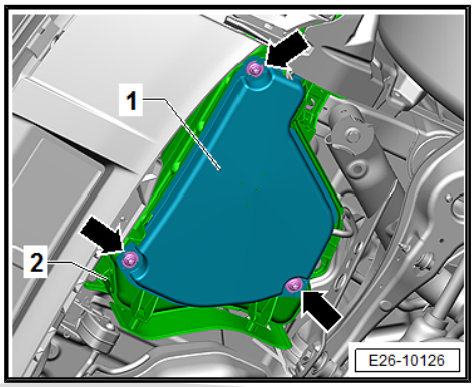


Note

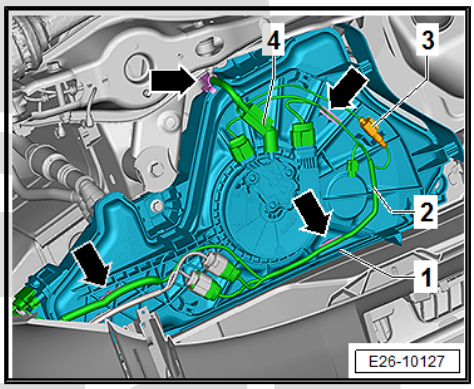
Place a cloth underneath coupling point to catch any escaping reducing agent.

– Seal off all open lines and connections with clean plugs from engine bung set - VAS 6122- .
– Unclip supply line for reducing agent from all available brackets and fasteners on the body.

– Remove cover -1- on tank for reducing agent -2-.
– Unscrew nuts -arrows- to do so.



– Release and pull off reducing agent line -4-. Disconnect reducing agent line ⇒ page 545 .
– Seal off all open lines and connections with clean plugs from engine bung set - VAS 6122- .



Installing

Remaining assembly is performed in reverse sequence.

– Adapt learnt value for SCR system after reducing agent has been drained or after components have been renewed ⇒ page 547 .

Specified torques

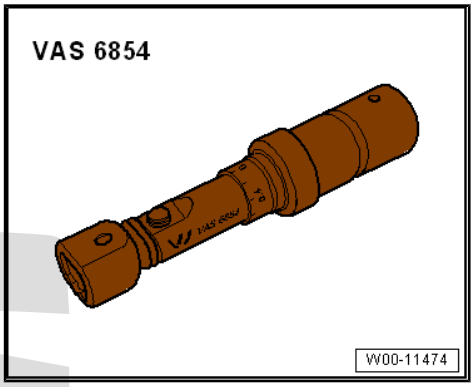
♦ ⇒ “3.1.1 Assembly overview - reducing agent tank from below, Ateca”, page 520

3.6 Removing and installing delivery module for reducing agent

Special tools and workshop equipment required

Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

♦ Torque wrench - VAS 6854-

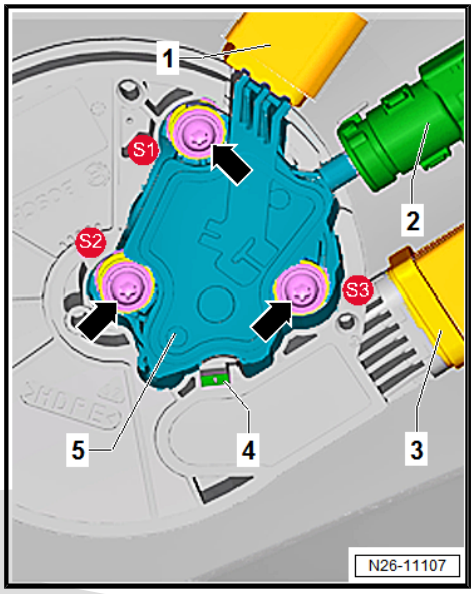


Removing

– Observe safety instructions ⇒ page 1 .
– Observe rules for cleanliness ⇒ page 17 .
– Observe safety precautions when working on the SCR system ⇒ page 2 .
– Emptying tank for reduction agent ⇒ page 541 .
– Remove reducing agent tank ⇒ page 524 .
– Place tank for reducing agent on a clean surface.
– The delivery module must be facing upwards when doing this.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Clean area around delivery module -5-.
– Release and unplug electrical connector -1-.
– Release and pull off reducing agent line -2-. Disconnect reducing agent line ⇒ page 545 .
– Remove bolts -arrows-.
– Carefully lever out delivery module -5- at recess -4- using a flat-bladed screwdriver.
– Pull delivery module out of tank for reducing agent.



Installing

Install in reverse order of removal, observing the following.

Note

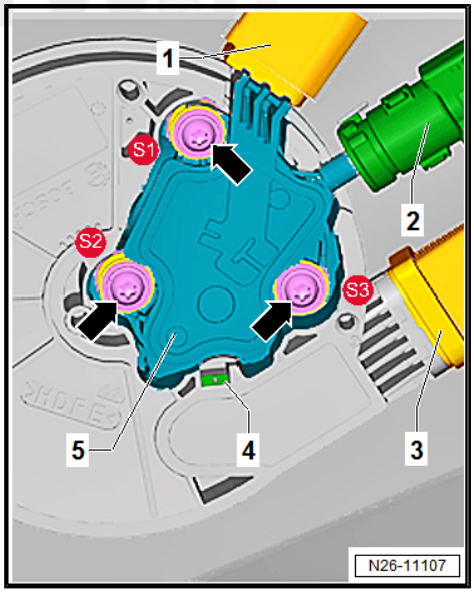
- *Do not clean the delivery module for reducing agent with compressed air.*
- *Clean all components and connections with water and a lint-free cloth.*
- *All components must be dry when installing them.*
- *Moisten seals with a suitable lubricant before installing ⇒ Electronic Parts Catalogue .*
- *Check seals for damage.*

– Clean all components and connections with water and a lint-free cloth.
– Renew dampers ⇒ Item 3 (page 524) .
– Renew spacer sleeves ⇒ Item 2 (page 524) .
– Renew seals ⇒ Item 4 (page 524) .
– Fit delivery module for reducing agent, and push it into mounting without canting.
– Apply the required force over the entire surface.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Note

- *There are letters indicated on the supply unit at the tank for reducing agent.*
- *The letters -S1- to -S3- indicate the tightening sequence.*
- *Tighten the delivery module as follows:*
- *Renew bolts.*



Tightening sequence	Designation of bolts on supply unit	Position of bolt	Specified torque
1	S1	Bolt with largest distance to seal	6 Nm
2	S2	Bolt with medium distance to seal	
3	S3	Bolt with smallest distance to seal	

– Adapt learnt value for SCR system after reducing agent has been drained or after components have been renewed ⇒ page 547 .

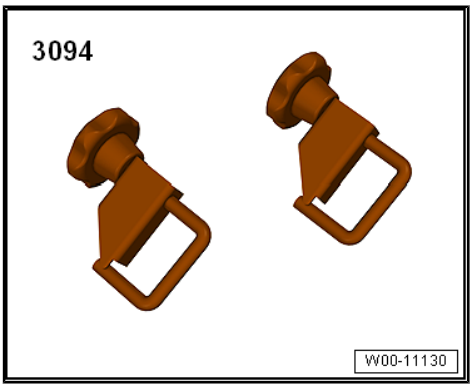
Specified torques

♦ ⇒ “3.1 Assembly overview - reducing-agent tank”, page 520

3.7 Removing and installing injector for reduction agent - N474-

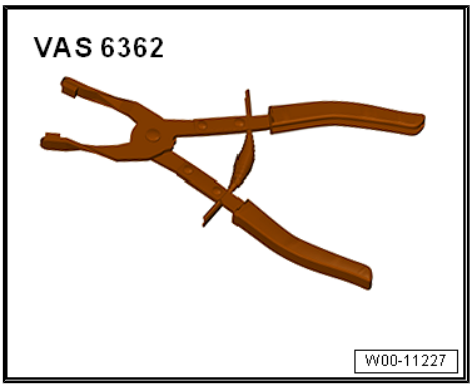
Special tools and workshop equipment required

♦ Hose clamps, up to Ø 25 mm - 3094-

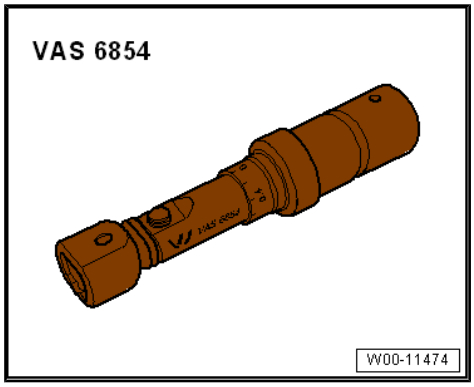


SEAT
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

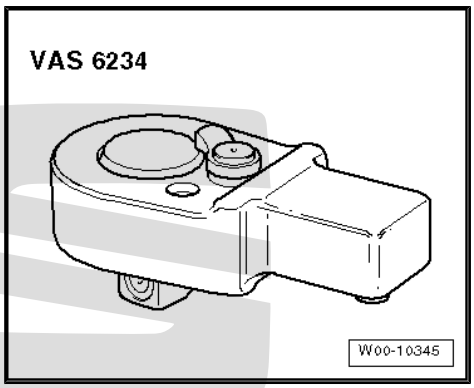
♦ Hose clip pliers - VAS 6362-



♦ Torque wrench - VAS 6854-



♦ Ratchet insert 1/4" - VAS 6234-



Removing

– Observe safety precautions when working on the SCR system ⇒ page 2 .

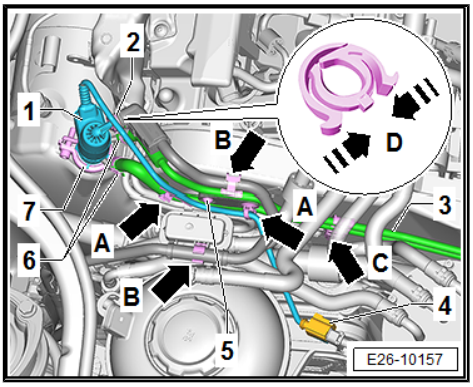
CAUTION

Safety risk due to escaping reducing agent.

♦ **To prevent large amounts of reducing agent from escaping when the metering line is opened, wait until the reducing agent has been drawn back automatically ⇒ page 3 .**

– Remove engine cover panel ⇒ page 56 .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



– Unclip the reducing agent line from the fastenings -arrows B-.
– Release and pull off the reducing agent line -2- by pressing together the securing clamps of the line in -the direction of the arrows D-.
– Pull back the supply line for reducing agent -2-
– Unclip the electrical connecting lead from the fastenings -arrows A-.
– Release and pull off the electrical connectors -4- from the reducing agent injector - N474- .
– Clamp off coolant hoses -6- with hose clips up to 25 mm - 3094- .

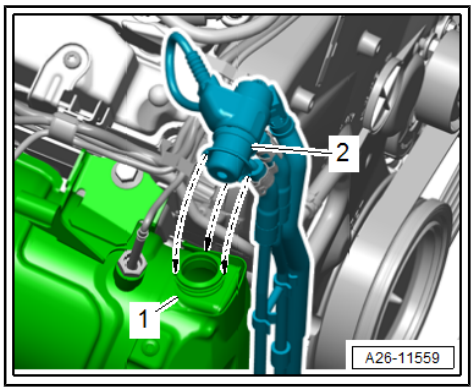
Note

Place a cloth underneath coupling point to catch any escaping reducing agent.

– Release and remove the hose clamps from the coolant hoses -6-.
– Release clamp -7- and remove the injector for reducing agent - N474- -1-.
– Remove injector for reducing agent - N474- -1-.
– Seal off all open lines and connections with clean plugs from engine bung set - VAS 6122- .

Installing

Install in reverse order of removal, observing the following.



Note

- *Renew gasket.*
- *Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .*

- Installation position: The lugs of the injector for reducing agent - N474- -item 2- must fit with the seats provided in the front exhaust pipe -1- -arrows-.

– Install engine cover panel ⇒ page 56 .
– Adapt learnt value for SCR system after reducing agent has been drained or after components have been renewed ⇒ page 547 .

Specified torques

- ⇒ “3.9 Assembly overview - injector for reducing agent N474 ”, page 540
- ⇒ “3.1 Assembly overview - reducing-agent tank”, page 520
- ⇒ “2.1 Assembly overview - toothed belt cover”, page 123

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

3.8 Removing and installing control unit for reducing-agent heater - J891-

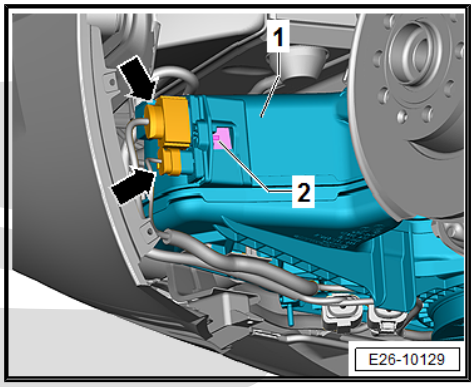
3.8.1 Removing and installing control unit for reducing-agent heater - J891- , Ateca

Removing

– Remove rear right wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liner; Assembly overview - rear wheel housing liner .

– Release and unplug connector -arrows-.

– Through the opening -2-, free and remove the control unit for reducing agent heating - J891- .



Installing

Installation is in the reverse sequence of removal. Please observe the following.

Specified torques

- ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Assembly overview- rear wheel housing liner .
- ⇒ General body repairs, interior; Rep. gr. 70 ; Load space lining; Assembly overview - Load space side lining

3.8.2 Removing and installing control unit for reducing-agent heater - J891- , Leon

3.9 Assembly overview - injector for reducing agent - N474-

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

1 - Injector for reduction agent - N474-

- ❑ Removing and installing ⇒ page 537

2 - Spring-type clip

3 - Coolant line

- ❑ Connection schema ⇒ page 199

4 - Coolant line

- ❑ Connection schema ⇒ page 199

5 - Emission control module

- ❑ Assembly overview ⇒ page 500
- ❑ Removing and installing ⇒ page 506

6 - Bolt

- ❑ Renew after removal
- ❑ Specified torque ⇒ page 541
- ❑ Note different versions

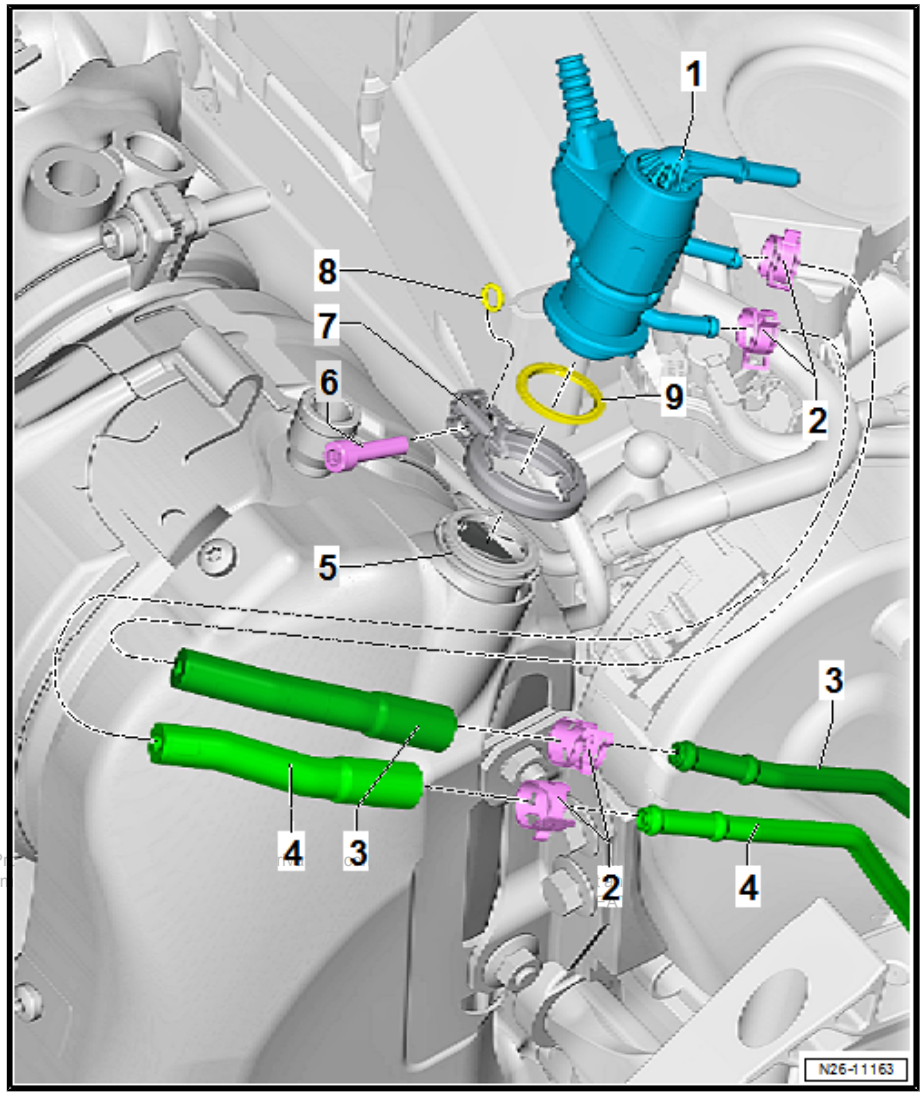
7 - Screw-type clamp

- ❑ Renew after removal
- ❑ Versions ⇒ page 541

8 - Rubber ring

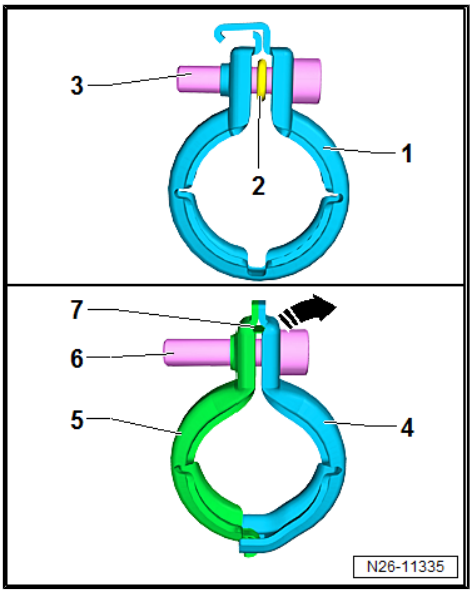
9 - Gasket

- ❑ Renew after removal



Screw-type clip versions

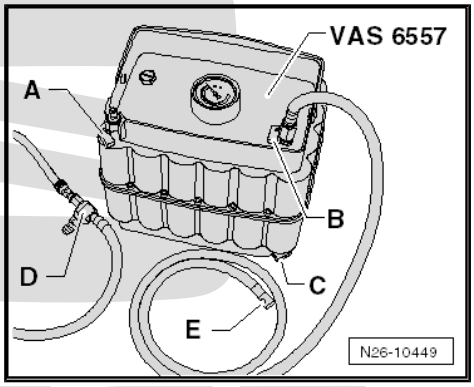
1 - Screw-type clip, one-piece design
2 - O-ring
3 - Bolt, 12 Nm
4 - Clamp, two-piece design with eye
5 - Clamp, two-piece design with hook
6 - Bolt, 8 Nm
7 - Locking plate



3.10 Drain the reducing agent tank

Special tools and workshop equipment required

- Vacuum box - VAS 6557-



- AdBlue extraction hose - VAS 6557A/1-

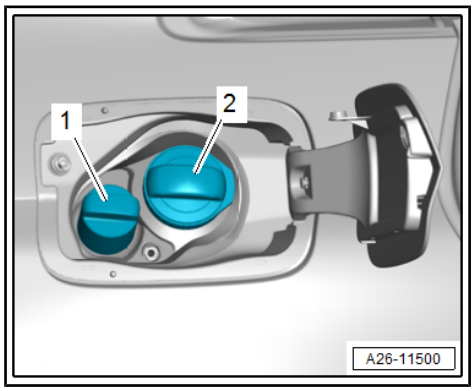
Draining

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Note

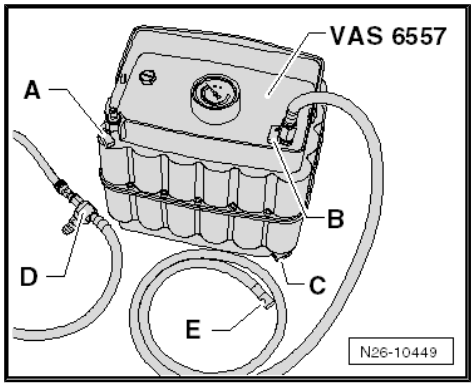
To keep the following description as short as possible the "NO_X reduction agent AUS 32" (AdBlue®) is just called a reduction agent.

– Observe safety precautions when working on the SCR system ⇒ page 2 .
– Open fuel tank flap and clean area around fuel tank cap.
– Open cap -1- on reducing agent tank.



Prepare vacuum box - VAS 6557- as follows:

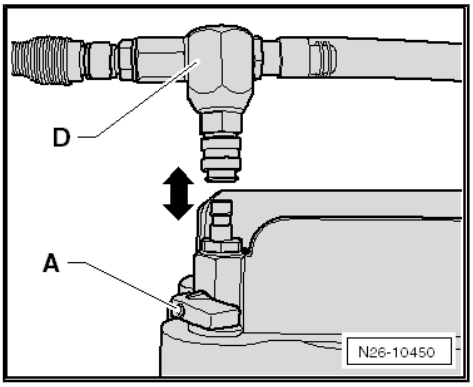
– Attach AdBlue extraction hose - VAS 6557A/1- to extraction hose -E-.
– Close shut-off taps -A-, -B- and -C-.



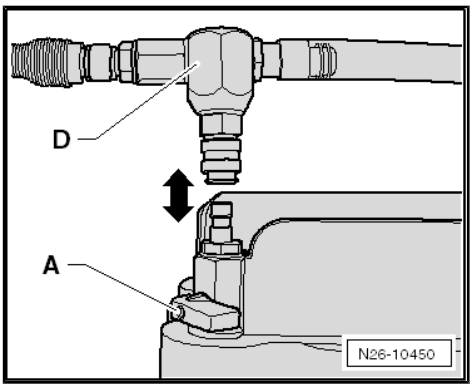
– Connect coupling -D- to connection on shut-off tap -A-.
– Pressurise compressed air hose with compressed air.
– Open cut-off tap -A-.

Now a vacuum is created in vacuum box - VAS 6557- .

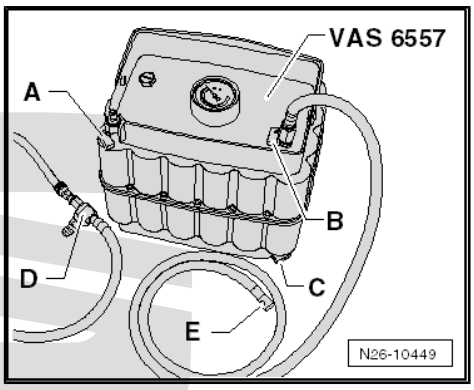
– Close cut-off tap -A- as soon as the pressure gauge shows a vacuum pressure of 0.8 bar.



– Disconnect coupling -D- from connection on shut-off tap -A-.
– Interrupt the compressed air supply through the compressed air hose.
– Moisten AdBlue extraction hose - VAS 6557A/1- with water slightly. This will facilitate insertion of AdBlue extraction hose - VAS 6557A/1- into filler neck.
– Insert AdBlue extraction hose - VAS 6557A/1- as far as possible into filler neck until it reaches bottom of reducing agent tank.



– Open the cut-off valve -B-.



Note

- *The reducing agent is then drawn through the filler pipe and into the vacuum box - VAS 6557- by the vacuum. The capacity of the vacuum box - VAS 6557- is 11 litres. This extracted volume is sufficient for removal of the reduction agent tank.*
- *If the tank for reducing agent holds a greater amount of reducing agent, it must be emptied completely. Repeat procedure if necessary.*

– To empty vacuum box - VAS 6557- , hold connection on shut-off tap -C- over suitable container and open shut-off taps -A- and -C-.

NOTICE

Never reuse extracted reduction agent. For information on storage and disposal see ⇒ Service net → Environment → Workshop disposal . For country specific information about storage and disposal, ask the importer.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Extract reducing agent completely as described above.
– Clean all components and connections with water and a lint-free cloth.
– When procedure is complete, thoroughly flush out vacuum box - VAS 6557- and AdBlue extraction hose - VAS 6557A/1- with water.
– Adapt learnt value for SCR system after reducing agent has been drained or after components have been renewed ⇒ page 547 .

3.11 Removing and installing filler pipe for tank for reducing agent

– Remove rear right wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres and alignment .

– Remove rear right wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liner; Assembly overview - rear wheel housing liner .

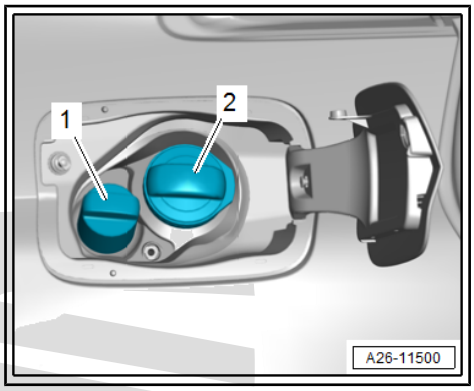
– Open fuel tank flap and clean area around fuel tank cap.

– Clean area around fuel filler neck.

– Unscrew cap -1- for fuel filler neck.

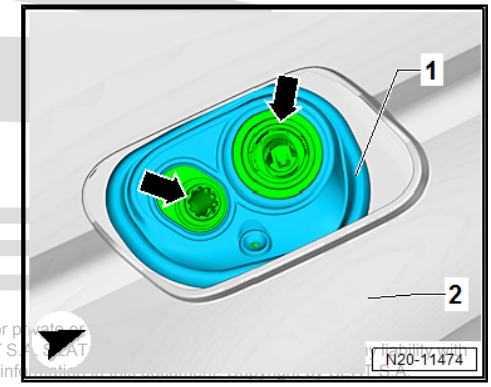
– In order to prevent the ingress of dirt, seal the opening of the fuel filler neck with a clean plug.

– Remove tank flap unit -2- ⇒ General body repairs, exterior; Rep. gr. 55 ; Tank flap unit, Removing and installing tank flap unit .



– Guide sealing grommet -1- out of filler pipes -arrows-.

– Pull sealing grommet -1- off body -2-, and remove it.



Protected by copyright. Copying for private or
permitted unless authorised by SEAT S.A. SEAT
respect to the correctness of information

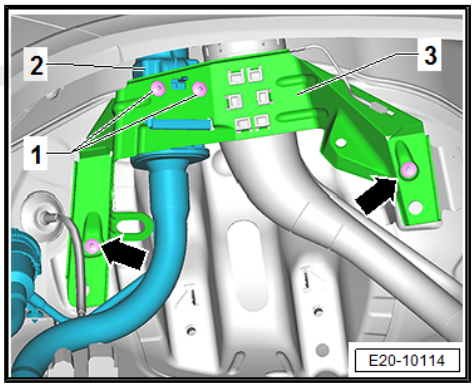
– Unscrew bolts -1-.

– Unscrew bolts -arrows- from the fuel filler neck.

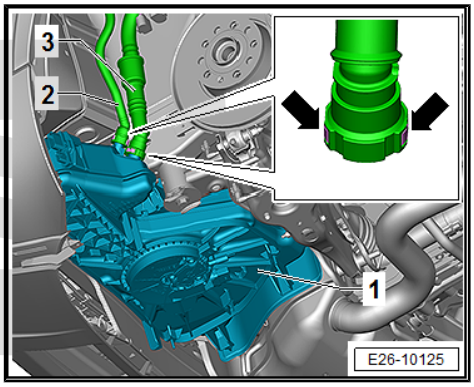
– Take out the fuel filler neck -2- from the holder -3-, fuel tank.

– Place drip tray for workshop hoist - VAS 6208- underneath.

– Place a cloth underneath coupling point to catch any escaping reducing agent.



– Remove the air vent line -2- and filler pipe -3- of the reducing agent tank -1-.
– To do this, press release tabs -arrows-.
– Pull off filler pipe and line.



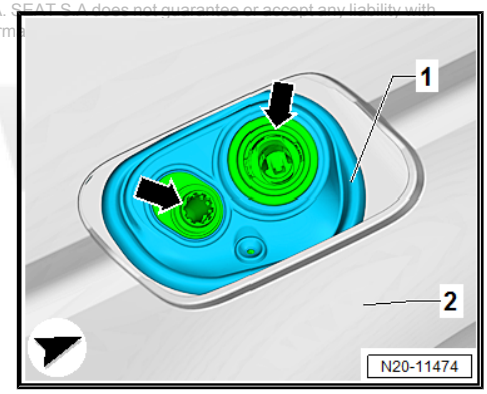
Installing

Installation is in the reverse sequence of removal. The following must be taken into account:

– Clean all components and connections with water and a lint-free cloth.
– Remove any reducing agent residue from connections.
– Fit filler pipes to reducing agent tank, and engage them.
– Push filler pipe completely onto bracket, and bolt it on.
– Make sure that filler pipe is properly seated in guide on bracket.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information.

– Make sure that sealing grommet -1- is properly seated on body -2- and filler pipes -arrows-.



Specified torques

- ⇒ “3.1.2 Assembly overview - reducing agent tank from above, Ateca”, page 522
- ⇒ Rep. gr. 20 ; Fuel tank; Assembly overview - fuel tank
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Assembly overview- rear wheel housing liner .
- ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Wheel change .
- ⇒ General body repairs, exterior; Rep. gr. 55 ; Tank flap unit; Assembly overview – tank flap unit

3.12 Disconnecting reducing agent supply line

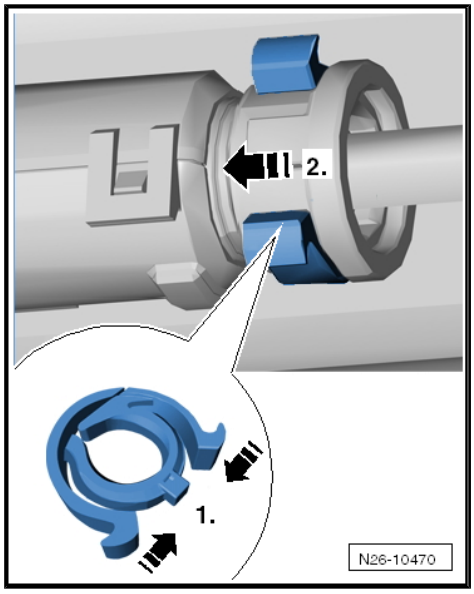
– Observe safety precautions when working on the SCR system ⇒ page 2 .

WARNING

Safety risk due to escaping reducing agent.

- **To prevent large amounts of reducing agent from escaping when the metering line is opened, wait until the reducing agent has been drawn back automatically ⇒ page 3 .**

– Press together securing clip of reducing agent line -1- in -direction of arrow 1- as shown in illustration.



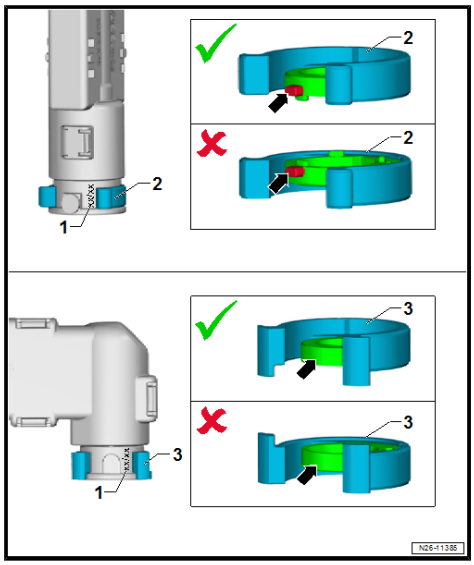
Releasing:

– Use water to clean area around securing clip.
– Place a cloth underneath coupling point to catch any escaping reducing agent.
– Push connector in opposite -direction of arrow 2-.
– Hold connector on both sides, press locking mechanism together, and keep it pressed.
– Press together securing clip of reducing agent line -1- in -direction of arrow 1- as shown in illustration.
– Pull off delivery line in -direction of arrow 2- without tools and without »jerking«.
– Seal off all open lines and connections with clean plugs from engine bung set - VAS 6122- .
– Clean all components and connections with water and a lint-free cloth.

Locking:

Note

- *Note the different versions of the securing clip.*
- *The allocation depends on the type which is specified on the plug-in connector.*
- *The different versions can be distinguished via the guide lug -arrow-.*
- *The type is specified in area -1-.*
- *Refer to the table for allocating the securing clip* *⇒ page 546* .
- *Note the installation position of the securing clip.*
- *The securing clip must be installed as shown in the illustration.*
- *If the securing clip/locking clip is not installed properly, the connection cannot be released anymore without being damaged.*
- *The mating connector may then be damaged.*



For personal use only. Any other use, in particular reproduction and publication, is not permitted unless authorized by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Allocation of securing clip:

Specification of type	Allocation of securing clip
5/16 and 3/8	Securing clip 2 with guide lug
1/4	Securing clip 3

– Make sure that the connections are clean, and clean them as necessary.
– Check connections for damage, and renew them as necessary.
– Push on line until it can be heard to engage.
– Ensure connections are secured properly by pulling.

3.13 Resetting SCR learnt values

The learnt value in the engine control unit must be re-adapted using the Vehicle diagnostic and service information system if reducing agent was drained or one of the following components was replaced.

- Reducing agent tank
- Pump for reduction agent
- Injector for reduction agent
- Reducing agent line
- Engine (motor) control unit

Reset learnt values ⇒ Vehicle diagnostic tester.

```
Self-diagnosis-capable systems
```

```
0001 - Engine electronics
```

```
0001 - Engine electronics, functions
```

```
0001 - Adapting learnt values for SCR system
```

The reproduction, copying or supplying to private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to errors in this document. Copyright by SEAT S.A.

4 Exhaust gas temperature regulation

⇒ “4.1 Assembly overview - exhaust gas temperature regulation”, page 548

⇒ “4.2 Removing and installing exhaust gas temperature sender 1 G235 ”, page 551

⇒ “4.3 Removing and installing exhaust gas temperature sender 2 G448 ”, page 555

⇒ “4.4 Removing and installing exhaust gas temperature sender 3 G495 ”, page 557

⇒ “4.5 Removing and installing exhaust gas temperature sender 4 G648 ”, page 559

4.1 Assembly overview - exhaust gas temperature regulation

⇒ “4.1.1 Assembly overview - exhaust gas temperature regulation, models without selective catalytic reduction”, page 548

⇒ “4.1.2 Assembly overview - exhaust gas temperature regulation, models with selective catalytic reduction”, page 550

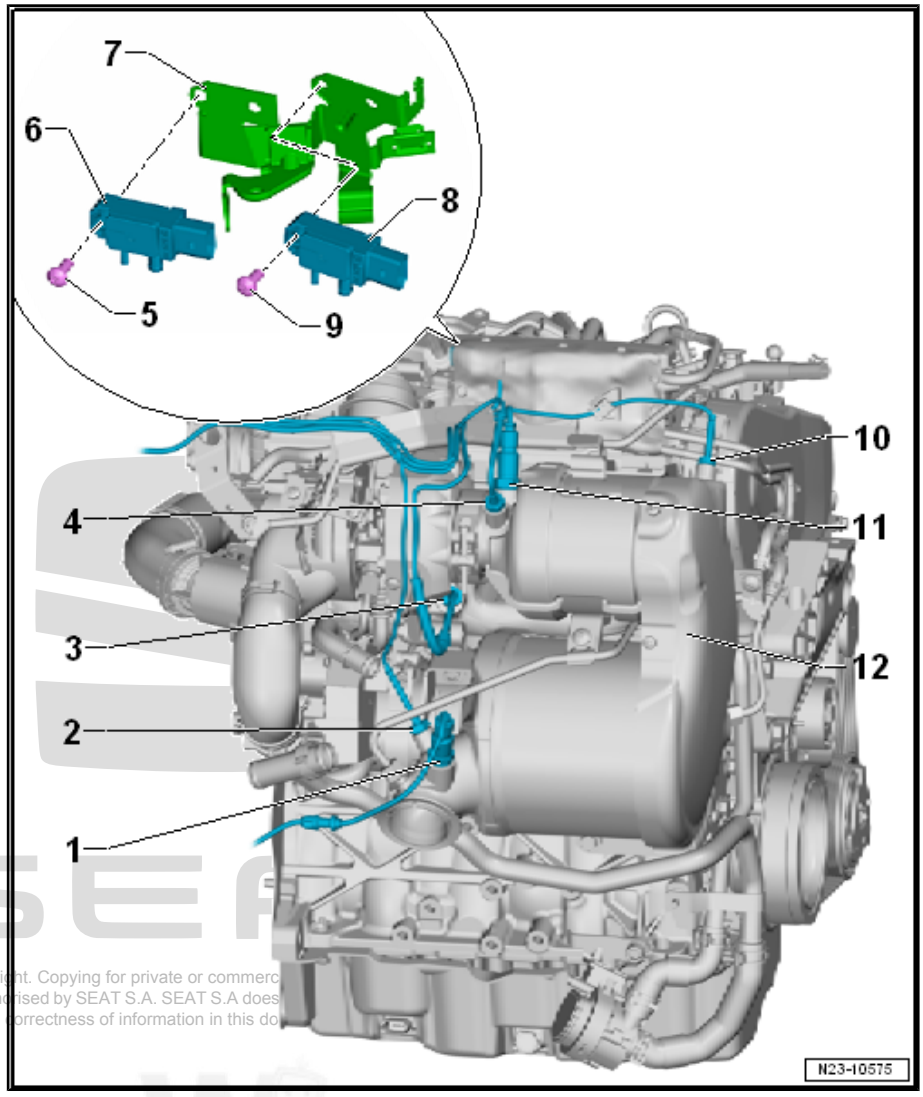
⇒ “4.1.3 Assembly overview - exhaust gas temperature regulation, vehicles with particulate filter or catalytic converter”, page 551

4.1.1 Assembly overview - exhaust gas temperature regulation, models without selective catalytic reduction

Note

- *Observe safety precautions ⇒ “1.6 Safety precautions when working on exhaust system”, page 4 .*
- *Risk of malfunctions caused by improperly secured exhaust gas temperature sensors.*
- *The threads of the exhaust gas temperature sensors -G495- and -G648- are coated. It is important that you do NOT coat them additionally with high-temperature paste and that you tighten them to the specified torque.*

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



1 - Lambda probe 1 after catalytic converter - GX7-

- ❑ Consisting of:
- ♦ Lambda probes after the catalytic converter - G130-
- ♦ Lambda probe 1 heater after catalytic converter - Z29-
  - ❑ Depending on vehicle
  - ❑ Removing and installing ⇒ page 470
  - ❑ 52 Nm

2 - Exhaust gas temperature sender 4 - G648-

- ❑ Depending on vehicle
- ❑ Removing and installing ⇒ page 557
- ❑ 2.0-l engines: 60 Nm
- ❑ 1.6-l engines: 45 Nm

3 - Exhaust gas temperature sender 1 - G235-

- ❑ Removing and installing ⇒ page 551
- ❑ Coat with high-temperature paste; high-temperature paste ⇒ Electronic Parts Catalogue .
- ❑ 45 Nm

4 - Exhaust gas temperature sender 2 - G448-

- ❑ Removing and installing ⇒ page 555
- ❑ 60 Nm

5 - Bolt

- ❑ Specified torque ⇒ page 466

6 - Pressure differential sender - G505-

- ❑ Removing and installing ⇒ page 442

7 - Bracket/bearing/support

- ❑ For pressure differential sender - G505-

8 - Exhaust gas pressure sensor 1 - G450-

- ❑ Depending on vehicle
- ❑ Removing and installing ⇒ page 446

9 - Bolt

- ❑ Specified torque ⇒ Item 9 (page 467)

10 - Exhaust gas temperature sender 3 - G495-

- ❑ Removing and installing ⇒ page 557
- ❑ 2.0-l engines: 60 Nm
- ❑ 1.6-l engines: 45 Nm

11 - Lambda probe 1 before catalytic converter - GX10-

- ❑ consists of lambda probe - G39- and lambda probe heater - Z19-
- ❑ Removing and installing ⇒ page 469

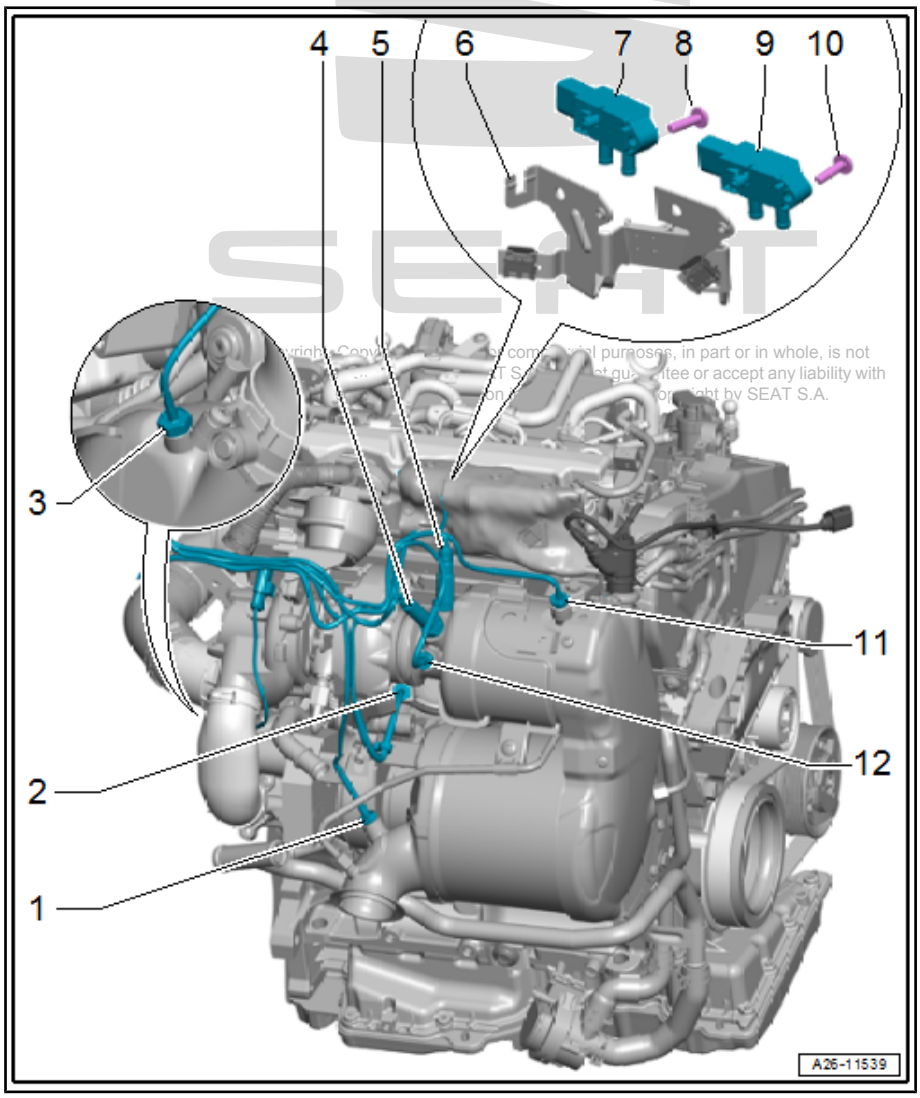
SEAT
erWin

12 - Emission control module

4.1.2 Assembly overview - exhaust gas temperature regulation, models with selective catalytic reduction

Note

- *Observe safety precautions ⇒ "1.6 Safety precautions when working on exhaust system", page 4 .*
- *Risk of malfunctions caused by improperly secured exhaust gas temperature sensors.*
- *The threads of the exhaust gas temperature sensors -G495- and -G648- are coated. It is important that you do NOT coat them additionally with high-temperature paste and that you tighten them to the specified torque.*



1 - Exhaust gas temperature sender 4 - G648-

- ❑ Removing and installing ⇒ page 548
- ❑ 60 Nm

2 - Exhaust gas temperature sender 1 - G235-

- ❑ Removing and installing ⇒ page 548
- ❑ Coat with high-temperature paste; high-temperature paste ⇒ Electronic Parts Catalogue .
- ❑ 45 Nm

3 - Exhaust gas recirculation temperature sensor - G98-

- ❑ Depending on vehicle
- ❑ Removing and installing ⇒ page 577
- ❑ 45 Nm

4 - NOx sender control unit - GX30-

- ❑ Comprising: NOx sender - G295- and control unit for NOx sender - J583-
- ❑ Removing and installing ⇒ page 451

5 - Lambda probe 1 before catalytic converter - GX10-

- ❑ Consisting of:

- ♦ Lambda probe - G39-
- ♦ Lambda probe heater - Z19-
  - ❑ Removing and installing ⇒ page 469

6 - Bracket/bearing/support

- ❑ For pressure differential sender

7 - Exhaust gas pressure sensor 1 - G450-

- ❑ Depending on vehicle

- ❑ Removing and installing ⇒ page 446

8 - Bolt

- ❑ 8 Nm

9 - Pressure differential sender - G505-

- ❑ Removing and installing ⇒ page 442

10 - Bolt

- ❑ 8 Nm

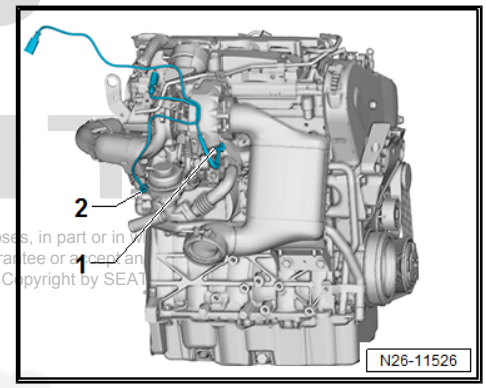
11 - Exhaust gas temperature sender 3 - G495-

- ❑ Removing and installing ⇒ page 548
- ❑ 45 Nm

12 - Exhaust gas temperature sender 2 - G448-

- ❑ Removing and installing ⇒ page 548
- ❑ 60 Nm

4.1.3 Assembly overview - exhaust gas temperature regulation, vehicles with particulate filter or catalytic converter



1 - Exhaust gas recirculation temperature sensor - G98-
⇒ “5.6 Removing and installing exhaust gas recirculation temperature sensor G98 ”, page 577

2 - Exhaust gas temperature sender 1 - G235-
⇒ “4.2.1 Removing and installing exhaust gas temperature sender 1 G235 ”, page 551

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT.

4.2 Removing and installing exhaust gas temperature sender 1 - G235-

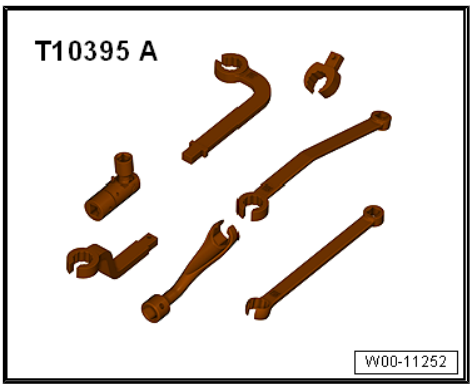
⇒ “4.2.1 Removing and installing exhaust gas temperature sender 1 G235 ”, page 551

⇒ “4.2.2 Removing and installing exhaust gas temperature sender 1 G235 , models with water-cooled turbocharger”, page 553

4.2.1 Removing and installing exhaust gas temperature sender 1 - G235-

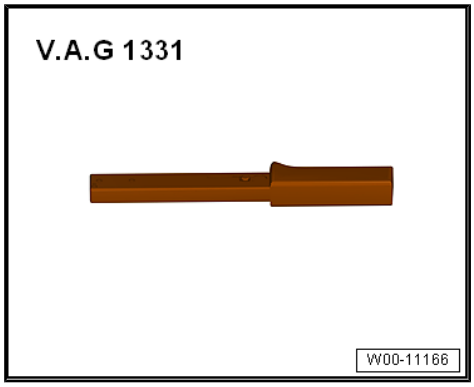
Special tools and workshop equipment required

- ♦ Tool set - T10395 A-



- ♦ Additional tool set - T10395/5-

♦ Torque wrench - V.A.G 1331-



Removing

Note

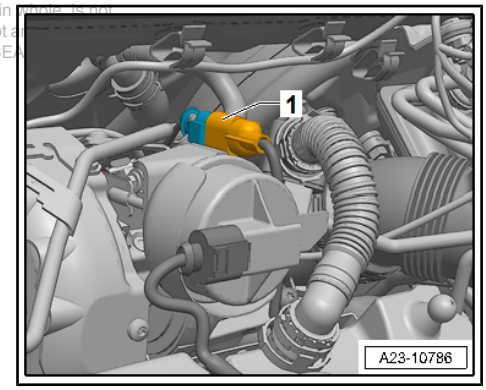
♦ *Attach cable ties in all the same places when installing.*

♦ *When removing, the electrical wiring must not be cut, otherwise a fault diagnosis would no longer be possible.*

– Remove engine cover panel ⇒ page 56 .

Vehicles with particulate filter or catalytic converter

– Release and unplug electrical connector -1-.



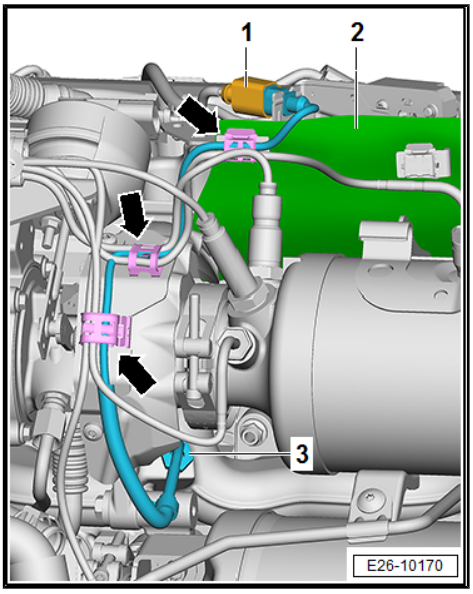
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any respect to the correctness of information in this document. Copyright by SEAT

Continuation for all other vehicles

– Open heat insulation sleeve -2-.

– Release and unplug electrical connector -1-.

– Move electrical wiring clear -arrows-.



Continued for all vehicles

– Screw out the exhaust gas temperature senders 1 - G235- -3- with the wrench set - T10395/5- .

Installing

Install in reverse order of removal, observing the following.

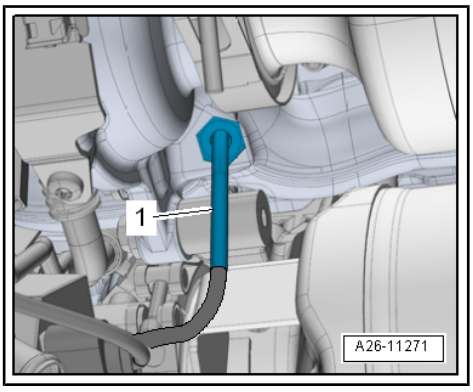
– Attach cable ties in all the same places when installing.

Note

♦ *Take care to protect exhaust gas temperature sender from knocks and impact; if dropped, the exhaust gas temperature sender can no longer be used.*

♦ *Coat thread with high-temperature paste; high-temperature paste ⇒ Electronic Parts Catalogue .*

Installation position of exhaust gas temperature sensor -G235- .



• Angled part of shaft -1- positioned vertically downward.

– Observe electrical connections and routing ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

– Install engine cover panel ⇒ page 56 .

Specified torques

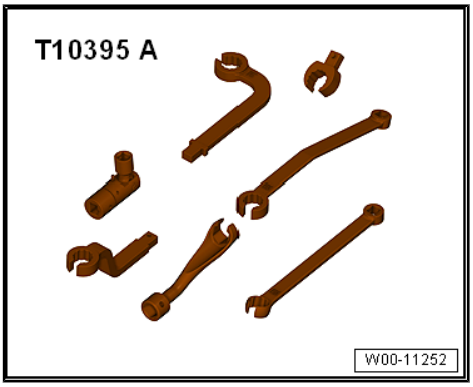
♦ ⇒ “4.1 Assembly overview - exhaust gas temperature regulation”, page 548

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness and completeness of this document.

4.2.2 Removing and installing exhaust gas temperature sender 1 - G235- , models with water-cooled turbocharger

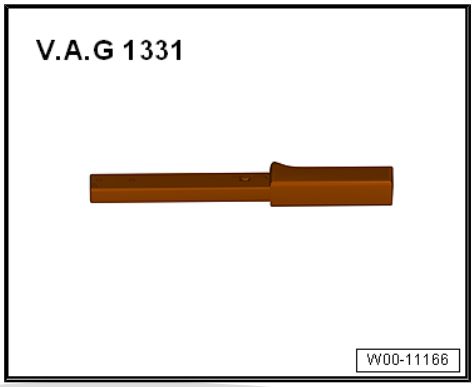
Special tools and workshop equipment required

♦ Tool set - T10395 A-



♦ Additional tool set - T10395/5-

- Torque wrench - V.A.G 1331-



Assembly overview - turbocharger, water-cooled turbocharger
⇒ page 328

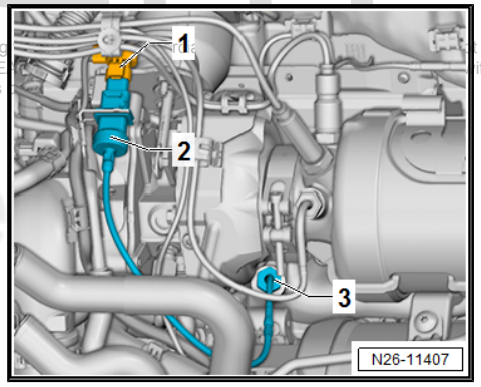
Removing

Note

- *Attach cable ties in all the same places when installing.*
- *When removing, the electrical wiring must not be cut, otherwise a fault diagnosis would no longer be possible.*

Fitting location ⇒ page 548 :

– Remove engine cover panel ⇒ page 56 .
– Release and unplug electrical connector -1-.
– Detach electrical connector -2- from bracket.
– Lay bare wiring harness.
– Screw out the exhaust gas temperature senders 1 - G235- -3- with the wrench set - T10395/5- .



Installing

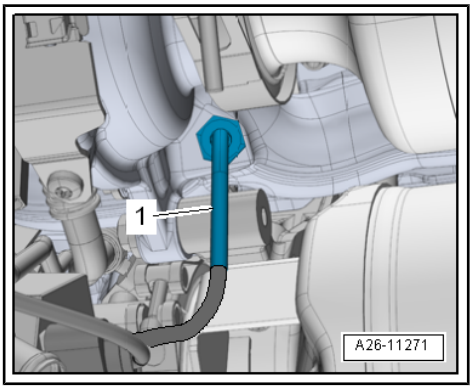
Installation is carried out in reverse order; noting the following:

Note

- *Take care to protect exhaust gas temperature sender from knocks and impacts; if dropped, the exhaust gas temperature sender can no longer be used.*
- *Coat thread with high-temperature paste; high-temperature paste ⇒ Electronic parts catalogue*

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Installation position of exhaust gas temperature sensor -G235- .



- Angled part of shaft -1- positioned vertically downward.

– Electrical connections and routing ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes , ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ page 548 .

– Install engine cover panel ⇒ page 56 .

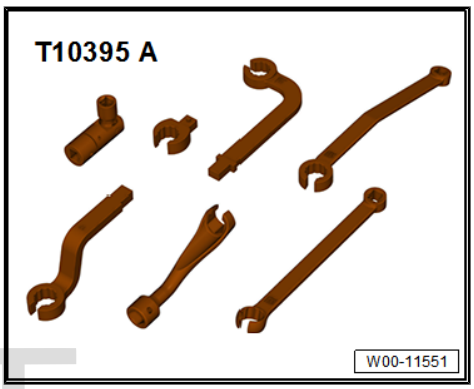
Specified torques

♦ ⇒ “4.1 Assembly overview - exhaust gas temperature regulation”, page 548

4.3 Removing and installing exhaust gas temperature sender 2 - G448-

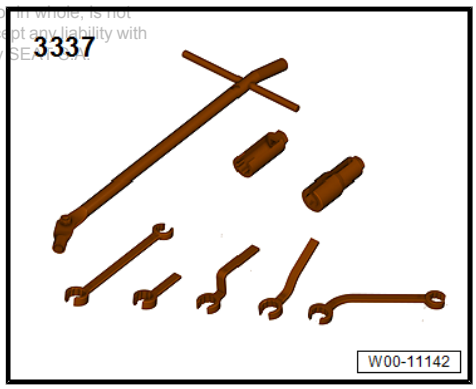
Special tools and workshop equipment required

♦ Tool set - T10395 A-



♦ Additional tool set - T10395/8-

♦ Lambda probe open ring spanner - 3337/7-



♦ Torque wrench - V.A.G 5820-

Removing

Note

♦ *Attach cable ties in all the same places when installing.*

♦ *When removing, the electrical wiring must not be cut, otherwise a fault diagnosis would no longer be possible.*

– Remove engine cover panel ⇒ page 56 .

– Release and pull off electrical connector for exhaust temperature sensor 2 - G448- and free electrical cable ⇒ page 387 .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

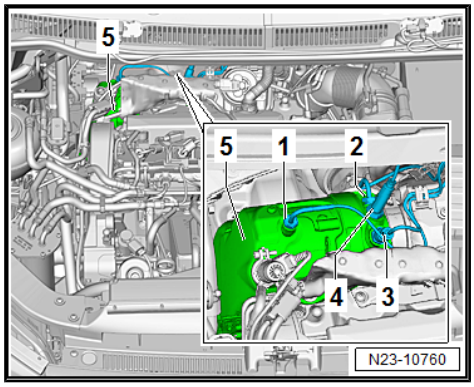
Vehicles with SCR system

Installation location for exhaust temperature sensor 2 - G448- -2-.

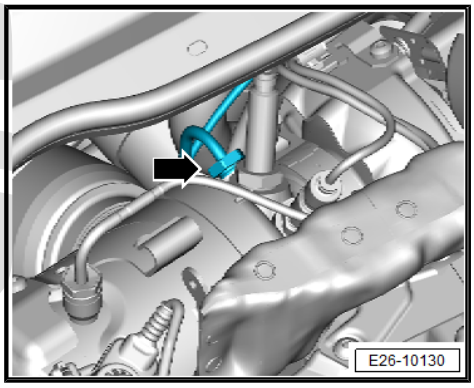
– Remove the control module for NOx sender - GX30- -4- for space reasons on the emission control module ⇒ page 452 .

– The clamp of the emission control module must be loosened or rotated due to space ⇒ Item 6 (page 501) .

– Disconnect connector for exhaust gas temperature sender 2 - G448- , and move wire clear ⇒ page 387 .



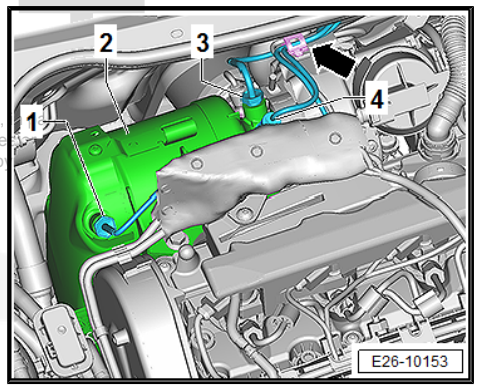
– Remove exhaust gas temperature sender 2 - G448- -arrow-.



Vehicles without SCR system

Installation location for exhaust temperature sensor 2 - G448- -3-.

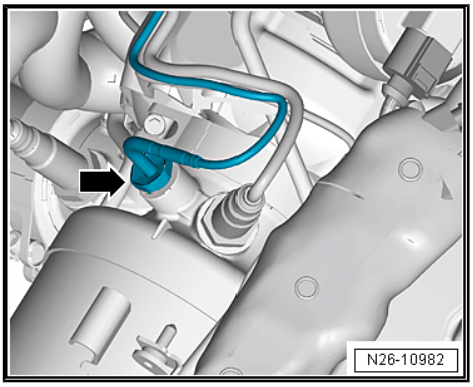
– Disconnect connector for exhaust gas temperature sender 2 - G448- , and move wire clear ⇒ page 387 .



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

– Remove exhaust gas temperature sender 2 - G448- -arrow-.

– To do this, use a suitable tool from the list of tools.



Installing

Install in reverse order of removal, observing the following.

– Attach cable ties in all the same places when installing.

NOTICE

Risk of malfunctions caused by improperly secured exhaust gas temperature sensors.

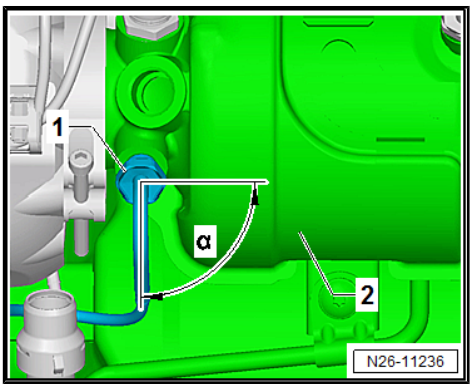
- **Thread of exhaust gas temperature sender 2 - G448- is coated. Do NOT additionally coat it with high temperature paste and always adhere to the specified torque.**

Note

Take care to protect exhaust gas temperature sender from knocks and impact; if dropped, the exhaust gas temperature sender can no longer be used.

– Installation position of exhaust temperature sender.

– Install exhaust gas temperature sender as shown in illustration.



a - 90°

– The angled shaft must face vertically downwards towards front exhaust pipe.

– Observe electrical connections and routing ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes , ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ page 548 .

– Install engine cover panel ⇒ page 56 .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

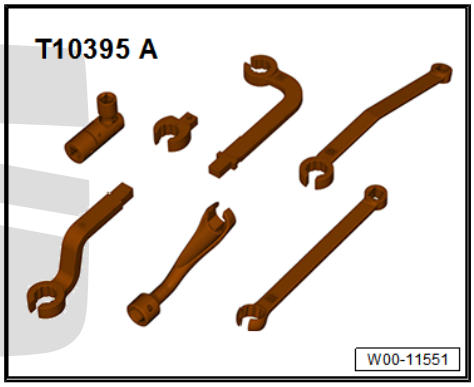
Specified torques

- ⇒ “4.1 Assembly overview - exhaust gas temperature regulation”, page 548
- ⇒ “2.1 Assembly overview - emission control”, page 500
- ⇒ “9.1 Assembly overview - Lambda probe”, page 466
- ⇒ “4.2 Assembly overview - radiator cowl and radiator fans”, page 307
- ⇒ “2.1 Assembly overview - assembly mountings”, page 42

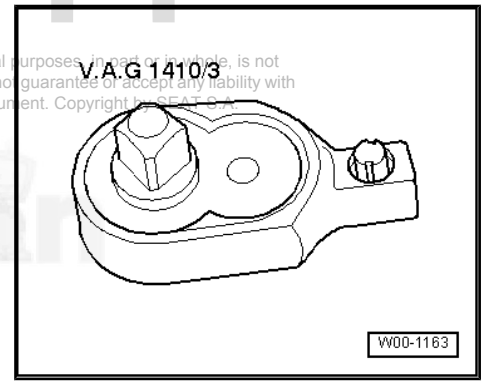
4.4 Removing and installing exhaust gas temperature sender 3 - G495-

Special tools and workshop equipment required

- Tool set - T10395 A-

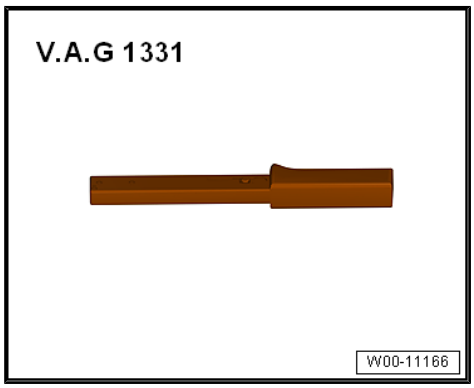


- Additional tool set - T10395/9- , engine with SCR
- Additional tool set - T10395/5- , engine without SCR
- Open-end spanner - VAG 1410/3-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- Torque wrench - V.A.G 1331-



Removing

Note

- *Attach cable ties in all the same places when installing.*
- *When removing, the electrical wiring must not be cut, otherwise a fault diagnosis would no longer be possible.*

– Remove engine cover panel ⇒ page 56 .

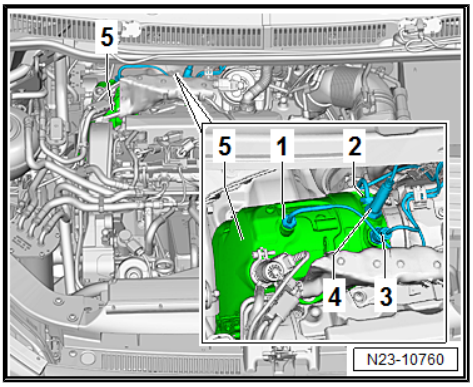
– Mark alignment of angled shaft of exhaust gas temperature sensor 3 - G495- to ease re-installation.

– Release and pull off electrical connector for exhaust temperature sensor 3 - G495- and free electrical cable ⇒ page 387 .

Vehicles with SCR system

Installation location for exhaust temperature sensor 3 - G495- -1-.

– Unscrew exhaust gas temperature sender 3 - G495- -1-.

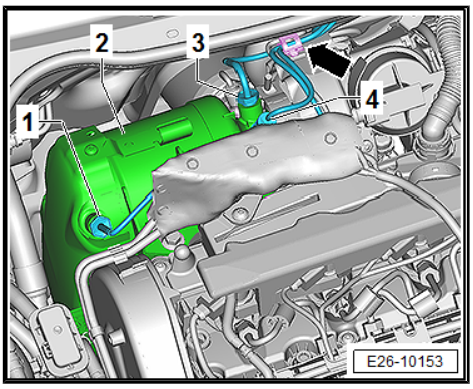


Vehicles without SCR system

Installation location for exhaust temperature sensor 3 - G495- -1-.

– Unscrew exhaust gas temperature sender 3 - G495- -1-.

– To do this, use a suitable tool from the list of tools.



Installing

Install in reverse order of removal, observing the following.

– Attach cable ties in all the same places when installing.

NOTICE

Risk of malfunctions caused by improperly secured exhaust gas temperature sensors.

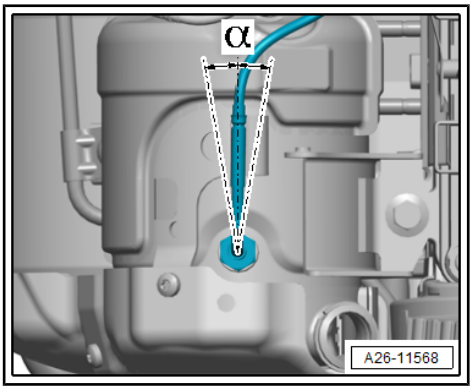
- **The threads of the exhaust gas temperature sensors -G495- and -G648- are coated. It is important that you do NOT coat them additionally with high-temperature paste and that you tighten them to the specified torque.**

Note

ected by copyright. Copying for private or commercial purposes, in part or in whole, is not ted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Take care to protect exhaust gas temperature sender from knocks and impact; if dropped, the exhaust gas temperature sender can no longer be used.

Installation position of the exhaust gas temperature sender 3 - G495- :



- Angle α = 5°

– Observe electrical connections and routing ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

– Install engine cover panel ⇒ page 56 .

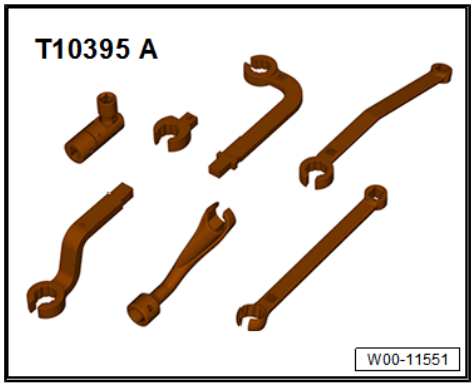
Specified torques

- ⇒ “4.1 Assembly overview - exhaust gas temperature regulation”, page 548

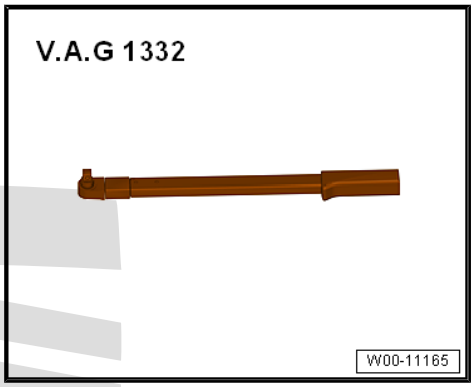
4.5 Removing and installing exhaust gas temperature sender 4 - G648-

Special tools and workshop equipment required

- Tool set - T10395 A-



- Additional tool set - T10395/8-
- Additional tool set - T10395/1-
- Torque wrench - V.A.G 1332-



Removing

Note

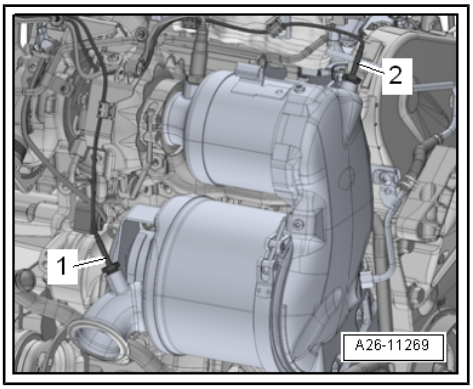
- *Attach cable ties in all the same places when installing.*
- *When removing, the electrical wiring must not be cut, otherwise a fault diagnosis would no longer be possible.*

Fitting location ⇒ page 548 :

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Remove engine cover panel ⇒ page 56 .
– Release and pull off electrical connector for exhaust temperature sensor 4 - G648- and free electrical cable ⇒ page 387 .
– Remove connector from bracket.

– Unscrew exhaust temperature sender 4 - G648- -1-.



Installing

Install in reverse order of removal, observing the following.

– Attach cable ties in all the same places when installing.

NOTICE

Risk of malfunctions caused by improperly secured exhaust gas temperature sensors.

- **The threads of the exhaust gas temperature sensors -G495- and -G648- are coated. It is important that you do NOT coat them additionally with high-temperature paste and that you tighten them to the specified torque.**

Note

Take care to protect exhaust gas temperature sender from knocks and impact; if dropped, the exhaust gas temperature sender can no longer be used.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Observe electrical connections and routing ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes , ⇒ Current flow diagrams, Electrical fault finding and Fitting locations and ⇒ page 548 .

– Install engine cover panel ⇒ page 56 .

Specified torques

- ⇒ “4.1 Assembly overview - exhaust gas temperature regulation”, page 548

5 Exhaust gas recirculation

⇒ “5.1 Assembly overview - exhaust gas recirculation”, page 562

⇒ “5.2 Assembly overview - exhaust gas recirculation valve 1 GX5 ”, page 566

⇒ “5.3 Removing and installing exhaust gas recirculation cooler”, page 567

⇒ “5.4 Removing and installing exhaust gas recirculation valve 1 GX5 ”, page 574

⇒ “5.5 Removing and installing exhaust gas recirculation valve 2 GX6 ”, page 575

⇒ “5.6 Removing and installing exhaust gas recirculation temperature sensor G98 ”, page 577

⇒ “5.7 Checking exhaust gas recirculation cooler for leaks”, page 580

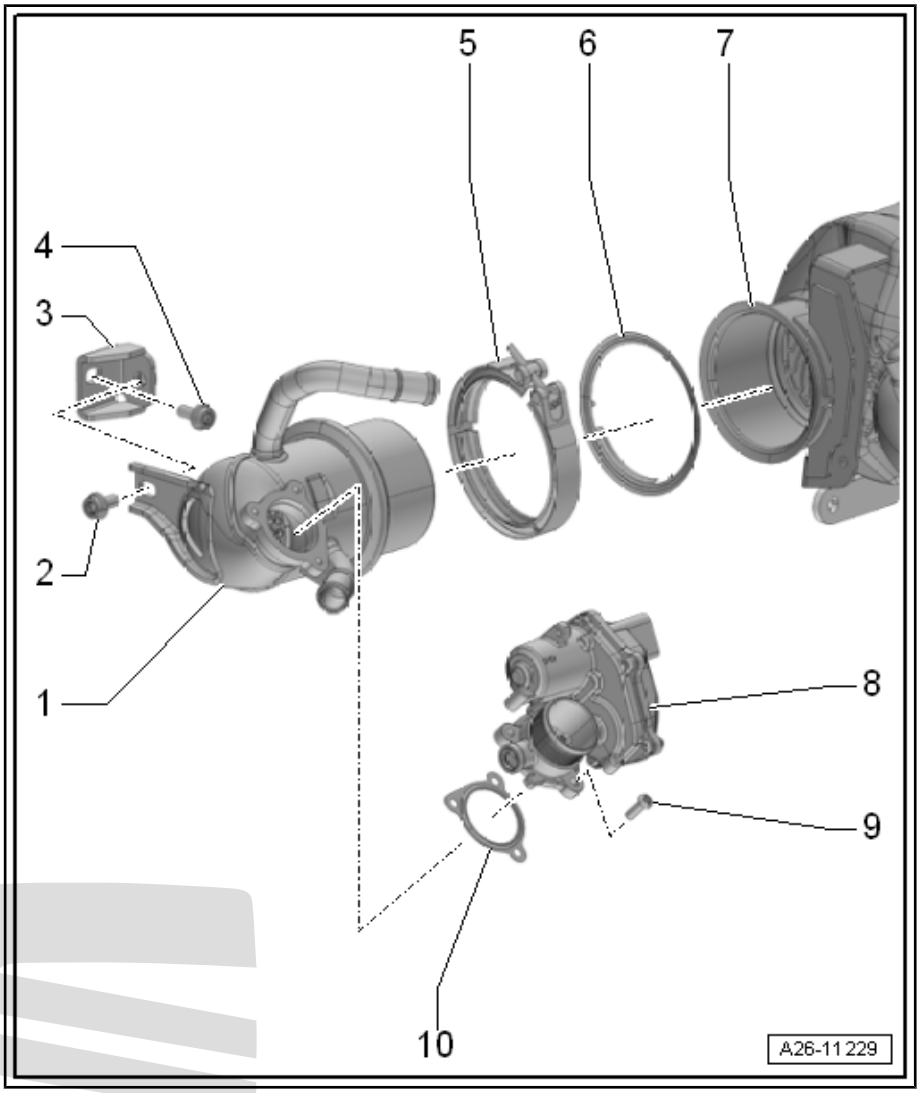
5.1 Assembly overview - exhaust gas recirculation

⇒ “5.1.1 Assembly overview - exhaust gas recirculation”, page 562

⇒ “5.1.2 Assembly overview - exhaust gas recirculation, vehicles with particulate filter or catalytic converter”, page 564

5.1.1 Assembly overview - exhaust gas recirculation

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted. Unauthorised distribution or publication guarantee or accept any liability with respect to the information in this document. Copyright by SEAT S.A.



1 - Exhaust gas recirculation cooler

- ❑ Removing and installing ⇒ page 567
- ❑ Check for leaks ⇒ page 580

2 - Bolt

- ❑ Specified torque and tightening sequence ⇒ page 564 if only exhaust gas recirculation cooler was removed.

3 - Bracket/bearing/support

- ❑ for the exhaust gas recirculation cooler

4 - Bolt

- ❑ Specified torque and tightening sequence ⇒ page 564 if only exhaust gas recirculation cooler was removed.

5 - Screw-type clamp

- ❑ Renew after removal
- ❑ Installation position ⇒ page 564
- ❑ Specified torque and sequence ⇒ page 564 .

6 - Gasket

- ❑ Renew after removal

7 - Emission control module

- ❑ Removing and installing ⇒ page 506

8 - Exhaust gas recirculation valve 2 - GX6-

- ❑ With exhaust gas recirculation control motor 2 - V339- .
- ❑ With exhaust gas recirculation potentiometer 2 - G466- .
- ❑ Removing and installing ⇒ page 575

9 - Bolt

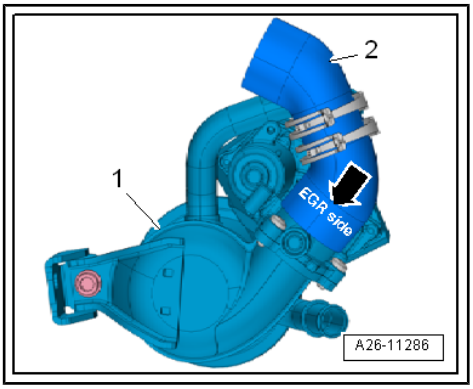
- ❑ 9 Nm

10 - Gasket

- ❑ Renew after removal

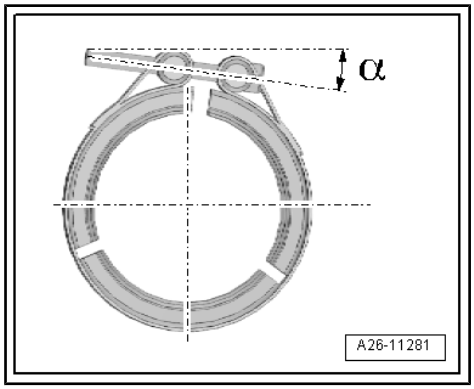
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Installation position of air hose on exhaust gas recirculation cooler



Installation position of screw-type clip for exhaust gas recirculation cooler

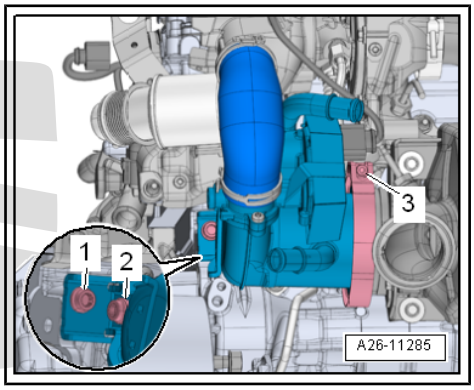
- Angle -α- = 10 ... 15°



Exhaust gas recirculation cooler - specified torque and tightening sequence

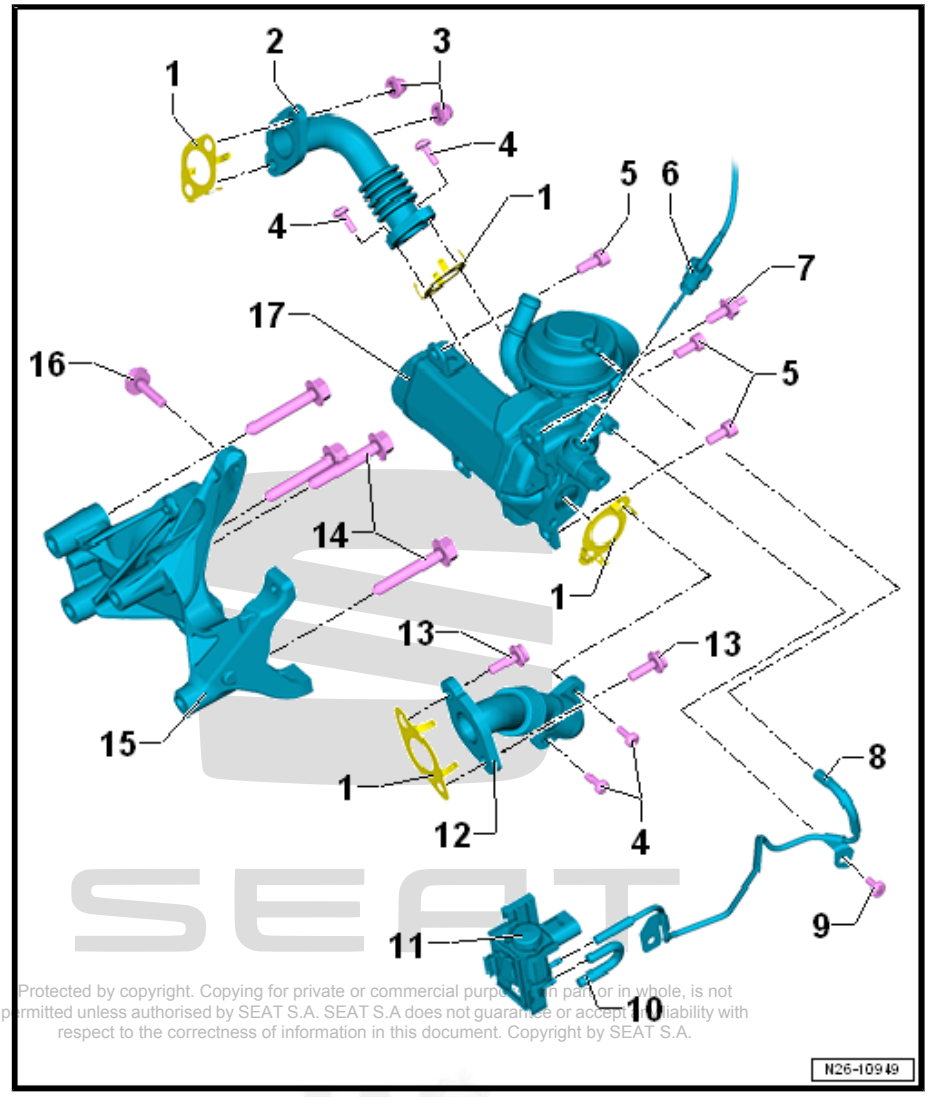
– Tighten bolts in stages in the sequence shown:

Stage	Bolts	Specified torque
1st	Screw-type clip -3-	7 Nm
2nd	-1, 2-	Screw in by hand as far as stop
3rd	-1, 2-	20 Nm



5.1.2 Assembly overview - exhaust gas recirculation, vehicles with particulate filter or catalytic converter

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

1 - Gasket
- ❑ Renew after removal

2 - Connection pipe
- ❑ To the exhaust inlet manifold

3 - Nut
- ❑ Renew after removal
- ❑ 20 Nm

4 - Bolt
- ❑ Renew after removal
- ❑ 8 Nm

5 - Bolt
- ❑ Renew after removal
- ❑ 20 Nm

6 - Exhaust gas recirculation temperature sensor - G98-
- ❑ Removing and installing ⇒ page 577
- ❑ 45 Nm

7 - Centre hex stud
- ❑ Renew after removal
- ❑ 20 Nm

8 - Vacuum line

9 - Bolt
- ❑ 8 Nm

10 - Vacuum line

11 - Exhaust gas recirculation radiator change-over valve - N345-
- ❑ Fitting location ⇒ page 566

12 - Connection pipe
- ❑ To cylinder head

13 - Bolt
- ❑ Renew after removal
- ❑ 20 Nm

14 - Bolt
- ❑ Observe tightening sequence ⇒ page 566 .

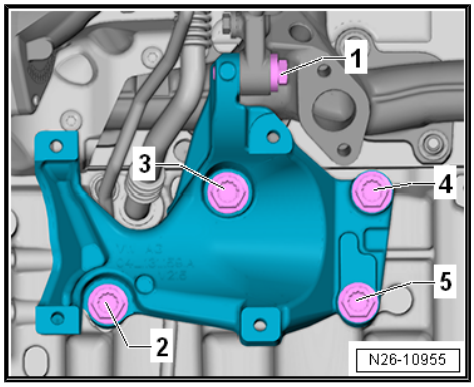
15 - Bracket/bearing/support
- ❑ for the exhaust gas recirculation cooler
- ❑ Bolted to engine block
- ❑ Observe tightening sequence ⇒ page 566 .

16 - Bolt
- ❑ Observe tightening sequence ⇒ page 566 .

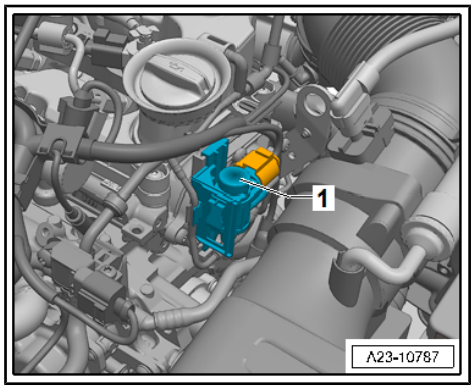
17 - Exhaust gas recirculation cooler
- ❑ Removing and installing ⇒ page 572
- ❑ Check for leaks ⇒ page 580

Specified torques and sequence for mounting of exhaust gas recirculation cooler

Stage	Bolts	Specified torque
1st	-2 ... 5-	Screw in by hand as far as stop
2nd	-1-	Tighten to 20 Nm
3rd	-2 ... 5-	Tighten to 55 Nm



Exhaust gas recirculation cooler changeover valve - N345- -1-



5.2 Assembly overview - exhaust gas recirculation valve 1 - GX5-

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

1 - Coolant hoses

2 - Spring-type clip

3 - Exhaust gas recirculation valve 1 - GX5-

- ❑ Consisting of: Potentiometer for exhaust gas - G212- and control motor for exhaust gas - V338-
- ❑ Removing and installing ⇒ page 574

4 - Gasket

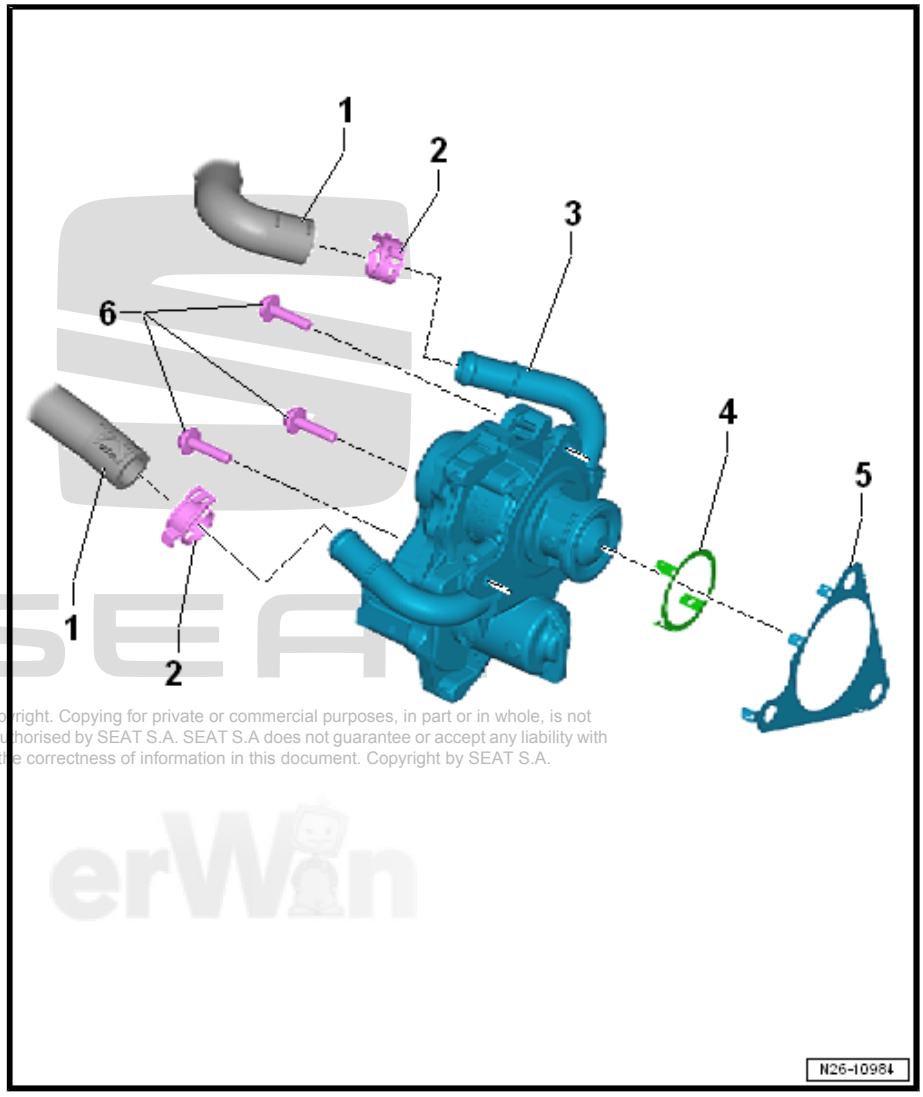
- ❑ Renew after removal

5 - Gasket

- ❑ Renew after removal

6 - Bolt

- ❑ 9 Nm



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

5.3 Removing and installing exhaust gas recirculation cooler

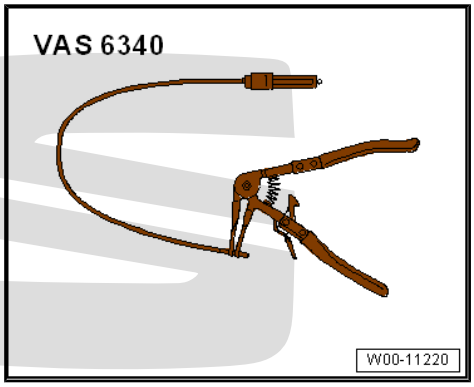
⇒ "5.3.1 Removing and installing exhaust gas recirculation cooler", page 567

⇒ "5.3.2 Removing and installing exhaust gas recirculation cooler, vehicles with particulate filter or catalytic converter", page 572

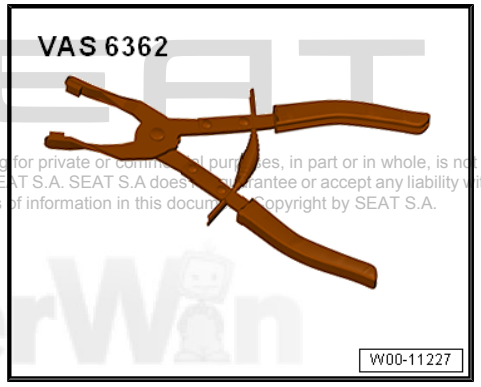
5.3.1 Removing and installing exhaust gas recirculation cooler

Special tools and workshop equipment required

- Hose clip pliers - VAS 6340-



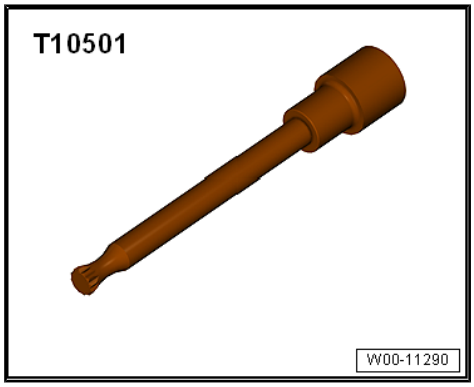
- Hose clip pliers - VAS 6362-



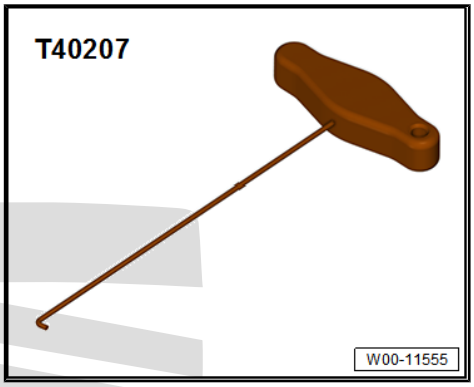
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- Torx screw insert T 30 - T10405-

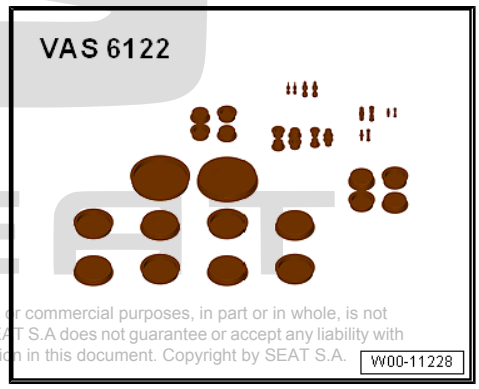
- Socket insert XZN 10 - T10501-



♦ Hooks - T40207-



♦ Engine plug set - VAS 6122-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

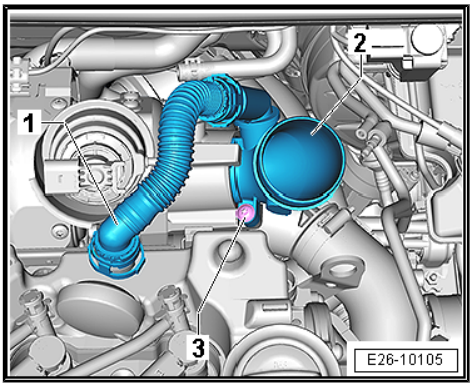
Removing

– Remove engine cover panel ⇒ page 56 .

– For reasons of space, remove the air filter housing together with the intake hose ⇒ page 422 .

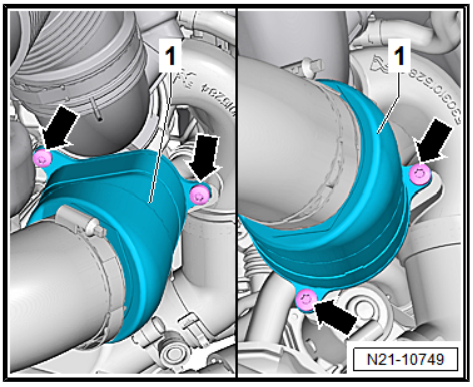
– Press release tabs on crankcase breather hose -1- and disconnect hose from cylinder head cover.

– Unscrew bolt -3-, swing air pipe with inlet connection -2- to rear and pull off from turbocharger.



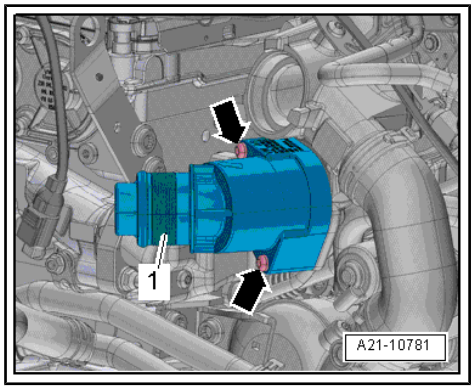
Vehicles with water-cooled turbocharger

– Unscrew bolts -arrows- and detach pulsation damper -1-.



Continued for all vehicles

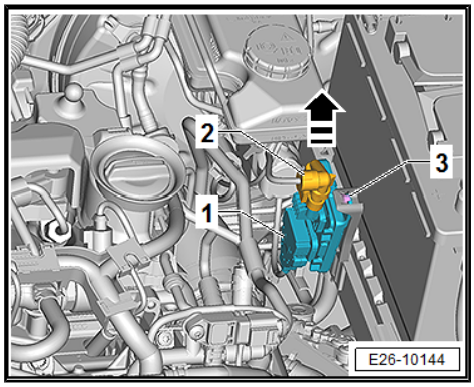
– Unscrew bolts -arrows- and remove resonator -1-.



Vehicles with SCR system

– Release the latch -3- and pull out the control unit for the NOx sensor - J583- -1- out of its bracket in -the direction of the arrow-.

– Unclip wiring harness from brake fluid reservoir and release.



Continued for all vehicles

– Remove battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray .

– Remove coolant pipes (left-side) ⇒ page 291 .

– Remove rear coolant pipes ⇒ page 293 .

Vehicles with manual gearbox

– Disconnect gear selector cable and gate selector cable from gearbox. Then, unbolt cable support bracket and lay it to one side, together with cables ⇒ Rep. gr. 34 ; Selector mechanism .

Vehicles with dual clutch gearbox

– Remove selector lever cable from gearbox ⇒ ; Rep. gr. 34 ; Selector mechanism; Removing and installing selector lever cable .

– Remove the gearbox oil filter ⇒ Rep. gr. 34 ; gearbox oil circuit; removing and installing the gearbox oil filter .

– Remove exhaust gas recirculation control motor 2 - V339- ⇒ page 575 .

Vehicles with all-wheel drive

– Remove front exhaust pipe ⇒ page 489 .

Continued for all vehicles

– Push heat insulation sleeve to one side and unplug electrical connector -5-.

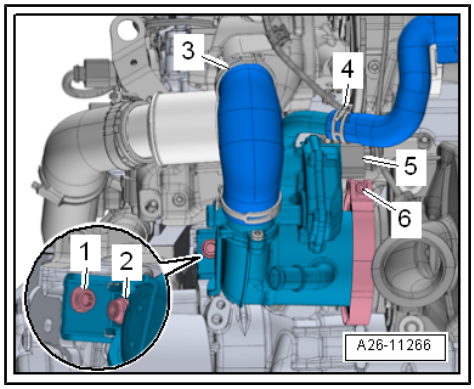
– Loosen the hose clip -3-, remove the air intake hose.

– Loosen the hose clip -4-, remove the coolant hose.

– Loosen bolt -6-, and push screw-type clip towards emission control module.

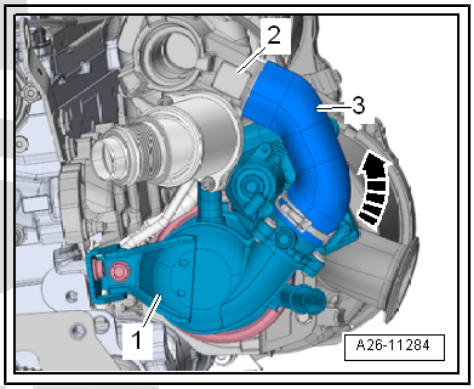
– Unscrew bolt -1- using bit XZN 10 - T10501- .

– Unscrew bolt -2- using bit XZN 10 - T10501- .

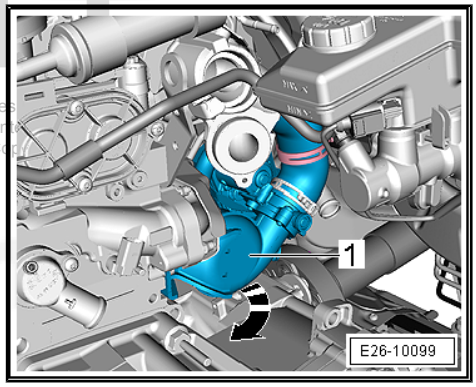


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Turn exhaust gas recirculation cooler in opposite direction of -arrow- towards bottom.
– While turning, hose -3- is pulled off turbocharger -2-.
– Loosen lower clamp on exhaust gas recirculation cooler -1-.
– Detach hose -3- on exhaust gas recirculation cooler -1-.
– Pull exhaust gas recirculation cooler out of emission control module.



– Detach exhaust gas recirculation cooler -1- upwards in direction of gearbox -arrow-.



Installing

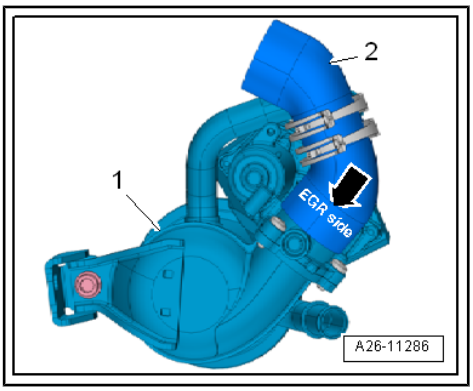
Protected by copyright. Copying for private or commercial purposes, permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee respect to the correctness of information in this document. Co

Install in reverse order of removal, observing the following.

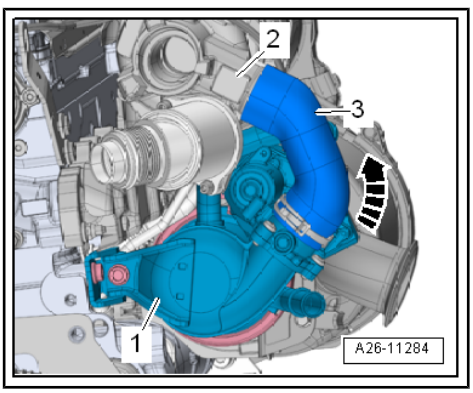
Note

- *Check insulation mat for damage and renew it if necessary.*
- *If the insulation mat is damaged, check the exhaust gas recirculation valve 2 - GX6- for damage caused by heat, and renew it if necessary.*
- *Renew seals, screw-type clip and hose clips after each removal.*
- *Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .*

– Fit hose -2- on exhaust gas recirculation cooler -1-.
• Fitting position: the marking “EGR side” -arrow- faces exhaust gas recirculation cooler.
– Ensure that air hose is not under tension.

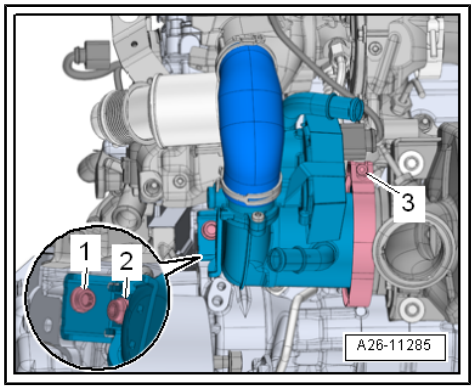


– Fit exhaust gas recirculation cooler -1- with seal and screw-type clip on emission control module.
– Turn exhaust gas recirculation cooler in -direction of arrow-, and at the same time fit hose -3- to turbocharger -2-.



– Fit screw-type clip -3- in correct installation position ⇒ page 564 .

– Tighten connections ⇒ page 564 .



Vehicles with dual clutch gearbox

– Install the gearbox oil filter ⇒ Rep. gr. 34 ; gearbox oil circuit; removing and installing the gearbox oil filter .

Continued for all vehicles

– Install coolant pipes (left-side) ⇒ page 291 .

Specified torques

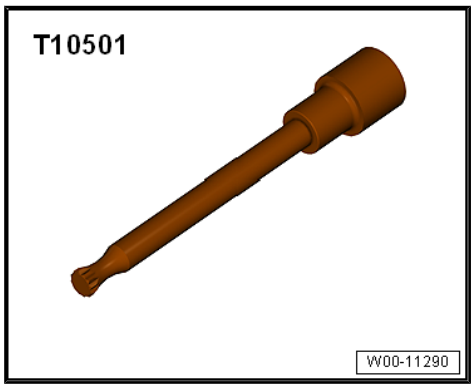
- ⇒ page 564
- ⇒ “5.1 Assembly overview - exhaust gas recirculation”, page 562
- ⇒ Rep. gr. 34 ; Gearbox oil circuit Assembly overview - Gearbox oil circuit
- Assembly overview - silencers ⇒ “1.1 Assembly overview - silencers”, page 473 .
- Assembly overview - battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Assembly overview - battery .
- Selector mechanism; Assembly overview: Cable support bracket ⇒ Rep. gr. 34 ; Selector mechanism; Assembly overview: Cable support bracket

5.3.2 Removing and installing exhaust gas recirculation cooler, vehicles with particulate filter or catalytic converter

Special tools and workshop equipment required

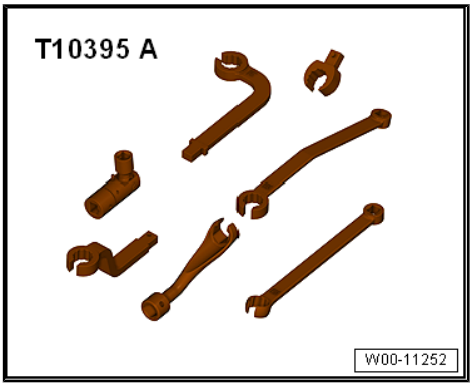
- Socket insert - T10347-

- Socket insert XZN 10 - T10501-

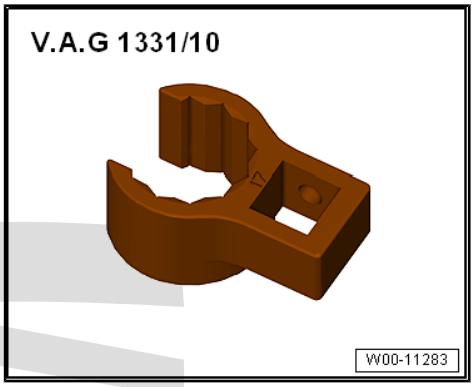


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- Tool set - T10395 A-

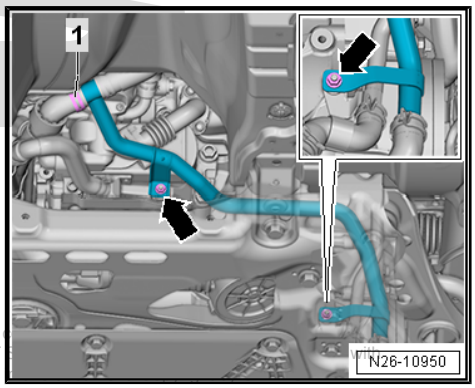


- Additional tool set - T10395/8-/10-
- Flared ring spanner tool insert AF17 - V.A.G 1331/10-



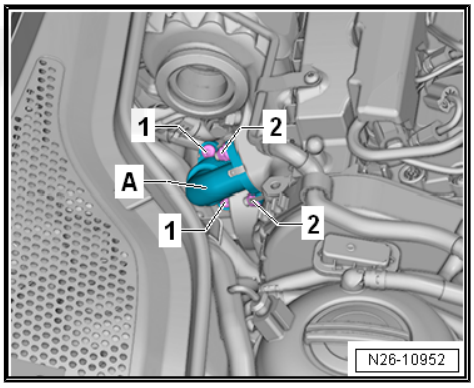
Removing

– Remove catalytic converter ⇒ page 504 .
– Drain coolant ⇒ page 211 .
– Open clamp -1- and detach hose. Remove nuts -arrows-.
– Tie coolant pipe upwards with cable ties.

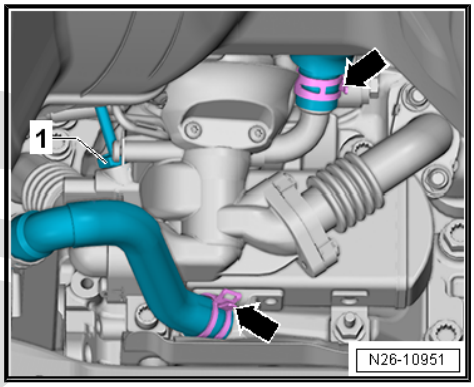


Protected by copyright. Copying for private or
permitted unless authorised by SEAT S.A. SEAT
respect to the correctness of information

– Unscrew bolt -1- with socket - T10347- screw off nuts -2-.
– Remove connecting pipe -A-.

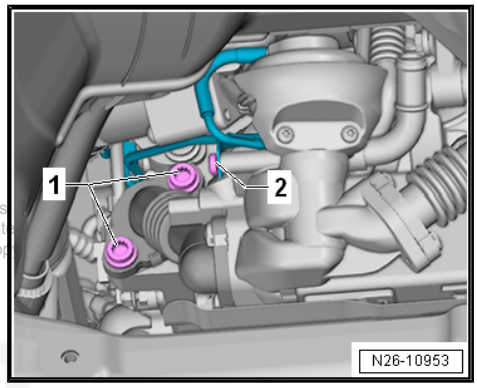


– Open clips -arrows-, pull off coolant hoses and unscrew exhaust gas recirculation temperature sensor - G98- -1- using suitable tool from tool set - T10395 A- .



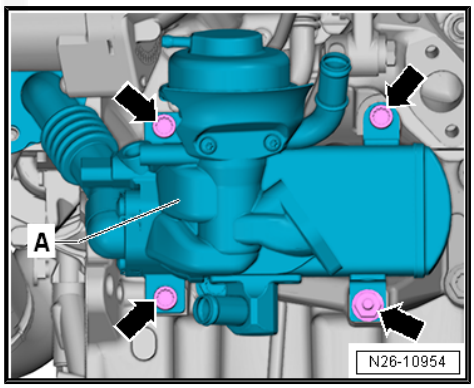
– Unscrew bolts -1- with socket XZN 10 - T10501- unscrew the holder for the vacuum line -2-.

– Pull off the vacuum line on the exhaust gas recirculation cooler.



Protected by copyright. Copying for private or commercial purposes, permitted unless authorised by SEAT S.A. SEAT S.A does not guarant respect to the correctness of information in this document. Co

– Unscrew bolts -arrows- and carefully remove the exhaust gas recirculation cooler -A- through the vehicle tunnel.



Installing

Install in reverse order of removal, observing the following.

Note

- *Renew self-locking nuts and bolts as well as gaskets, seals and O-rings after each removal.*
- *Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ Electronic parts catalogue .*
- *When fitting, attach all cable ties back to the same location.*

– Install catalytic converter ⇒ page 504 .

– Add coolant ⇒ page 214 .

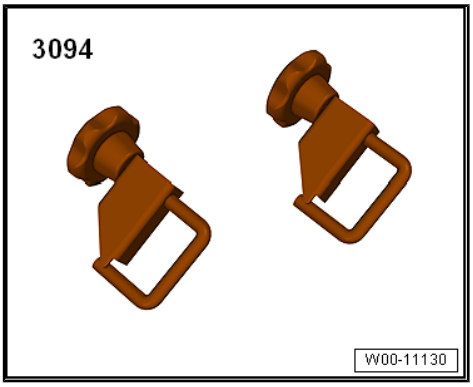
Specified torques

- ⇒ “5.1.2 Assembly overview - exhaust gas recirculation, vehicles with particulate filter or catalytic converter”, page 564

5.4 Removing and installing exhaust gas recirculation valve 1 - GX5-

Special tools and workshop equipment required

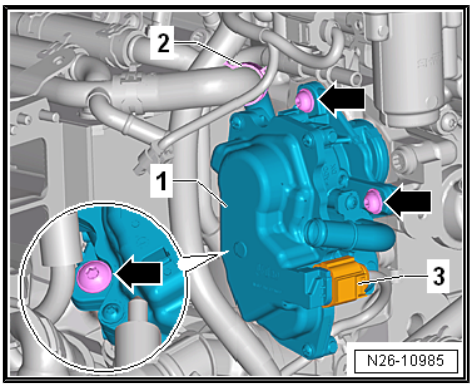
- Hose clamps, up to Ø 25 mm - 3094-



The exhaust valve 1 - GX5- consists of:

- Potentiometer for exhaust gas recirculation - G212-
- Exhaust gas recirculation control motor - V338-

Removing



Note

Observe rules for cleanliness.

– Remove throttle valve module - J338- ⇒ page 429 .
– Unplug the electrical connector -3-.
– Clamp off coolant hose with hose clamps up to 25 mm - 3094- .
– Loosen the hose clip -2-, remove the coolant hose.
– Unscrew bolts -arrows-, and remove exhaust gas recirculation valve 1 - GX5-.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. accepts no liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Installing

Install in reverse order of removal, observing the following.

Note

- *Renew seals*
- *Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .*

– Check coolant level ⇒ page 218 .

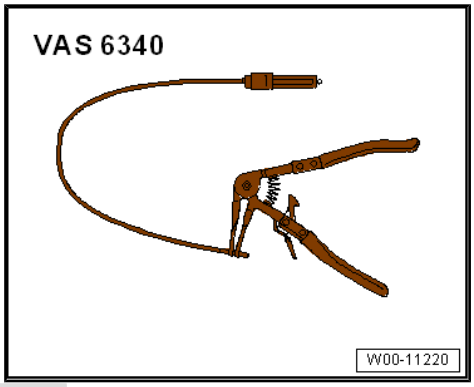
Specified torques

- Assembly overview - exhaust gas recirculation ⇒ “5.2 Assembly overview - exhaust gas recirculation valve 1 GX5 ”, page 566
- Assembly overview - intake manifold ⇒ “5.1 Assembly overview - intake manifold”, page 424

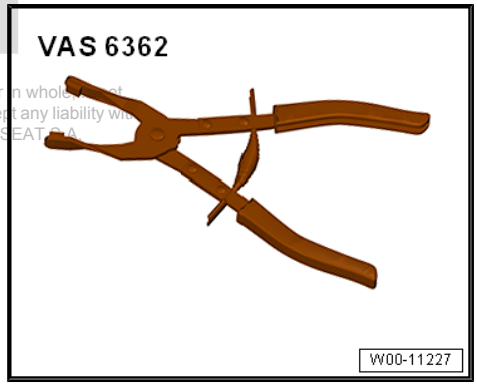
5.5 Removing and installing exhaust gas recirculation valve 2 - GX6-

Special tools and workshop equipment required

- Hose clip pliers - VAS 6340-

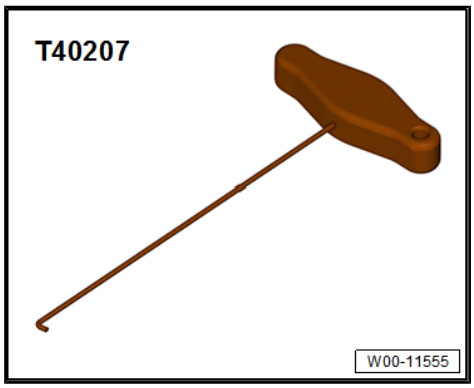


- Hose clip pliers - VAS 6362-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

- Hooks - T40207-



The exhaust valve 2 - GX6- consists of:

- Control motor 2 for exhaust gas recirculation - V339-
- Potentiometer 2 for exhaust gas recirculation - G466-

Removing

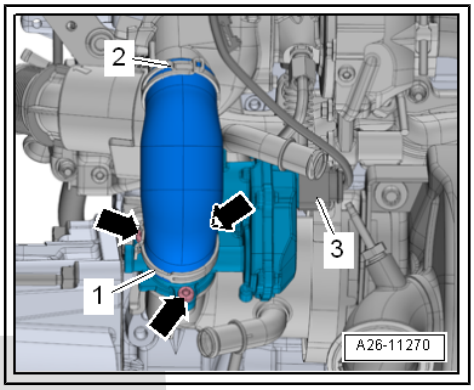
– Remove engine cover panel ⇒ page 56 .

– Remove connecting piece on turbocharger ⇒ page 360 .

– Loosen the hose clips -1, 2-, remove the exhaust gas recirculation hose.

– Push heat insulation sleeve to one side and unplug electrical connector -3-.

– Unscrew screws -picture-, remove exhaust valve 2 - GX6- .



Installing

Install in reverse order of removal, observing the following.

Note

- *Renew seal and O-ring after removal.*
- *Secure all hose connections with the correct hose clips (as original equipment); refer to ⇒ Electronic parts catalogue .*

– Install engine cover panel ⇒ page 56 .

Specified torques

- ⇒ “5.1 Assembly overview - exhaust gas recirculation”, page 562
- ⇒ “1.1 Assembly overview - turbocharger”, page 326

5.6 Removing and installing exhaust gas recirculation temperature sensor - G98-

⇒ “5.6.1 Removing and installing exhaust gas recirculation temperature sensor G98 , vehicles with particulate filter or catalytic converter”, page 577

⇒ “5.6.2 Removing and installing exhaust gas recirculation temperature sensor G98 , vehicles with emission control module and selective catalytic reduction system.”, page 578

Reproduction and distribution for private or commercial purposes, in part or in whole, is not permitted unless authorized by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

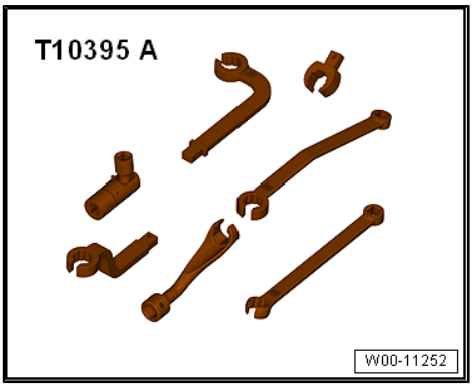
5.6.1 Removing and installing exhaust gas recirculation temperature sensor - G98- , vehicles with particulate filter or catalytic converter

Note

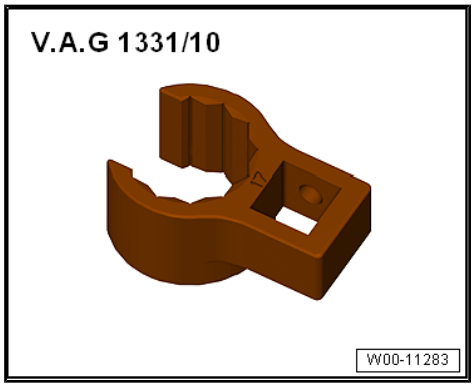
Depending on national emission thresholds an uncontrolled particle filter or catalytic converter is fitted with this engine.

Special tools and workshop equipment required

- Tool set - T10395 A-



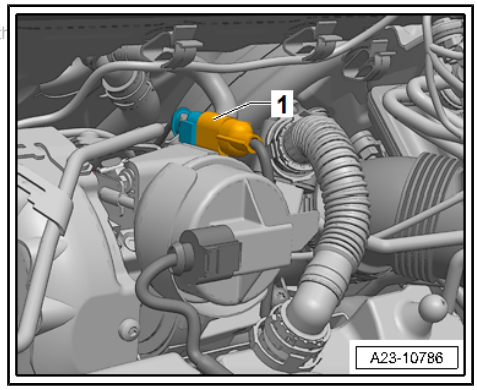
- Additional tool set - T10395/8-/10-
- Flared ring spanner tool insert AF17 - V.A.G 1331/10-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Removing

– Remove engine cover panel ⇒ page 56 .
– Remove connecting piece on turbocharger ⇒ page 360 .
– Release connector -1-, and remove from bracket.
– Lay wiring harness to one side.



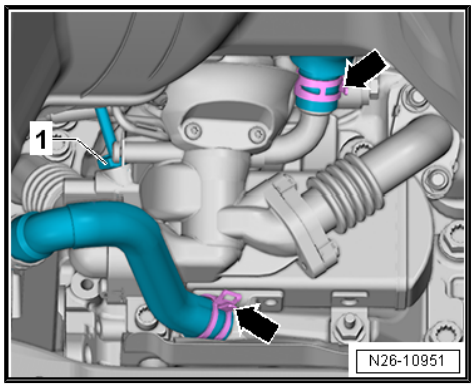
– Unscrew exhaust gas recirculation temperature sensor - G98- -1- using suitable tool from tool set - T10395 A- .

Installing

Installation is carried out in reverse order; noting the following:

Note

Take care to protect exhaust gas temperature sender from knocks and impacts; if dropped, the exhaust gas temperature sender can no longer be used.



– Electrical connections and routing ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
– Install engine cover panel ⇒ page 56 .

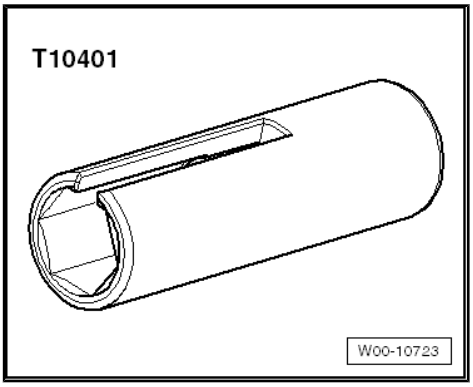
Specified torques

- ⇒ “5.1.2 Assembly overview - exhaust gas recirculation, vehicles with particulate filter or catalytic converter”, page 564

5.6.2 Removing and installing exhaust gas recirculation temperature sensor - G98- , vehicles with emission control module and selective catalytic reduction system.

Special tools and workshop equipment required

♦ Socket, AF 14 - T10401-



Removing

Note

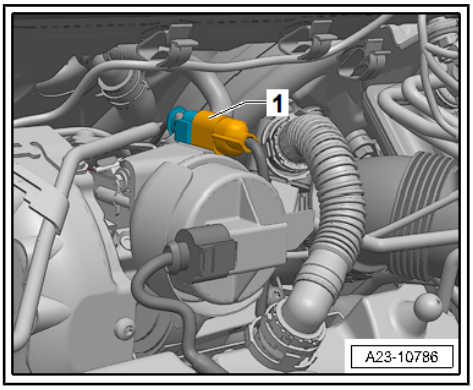
♦ *Attach cable ties in all the same places when installing.*

♦ *When removing, the electrical wiring must not be cut, otherwise a fault diagnosis would no longer be possible.*

– Remove engine cover panel ⇒ page 56 .

– Remove connecting piece on turbocharger ⇒ page 360 .

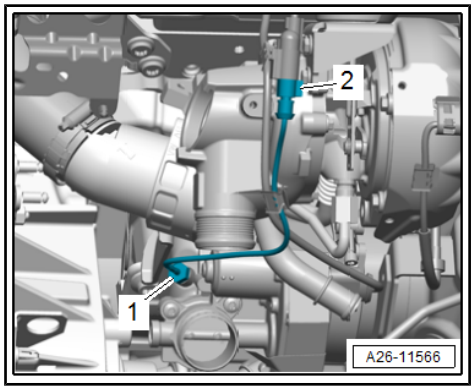
– Release connector -1-, and remove from bracket.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

– Free the electrical wire -2-.

– Unscrew exhaust gas recirculation temperature sensor - G98- -1-.



Installing

Installation is carried out in reverse order; noting the following:

Note

Take care to protect exhaust gas temperature sender from knocks and impacts; if dropped, the exhaust gas temperature sender can no longer be used.

– Electrical connections and routing ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

– Install engine cover panel ⇒ page 56 .

Specified torques

◆ ⇒ “4.1 Assembly overview - exhaust gas temperature regulation”, page 548

5.7 Checking exhaust gas recirculation cooler for leaks

The exhaust gas recirculation cooler is checked for leaks using the ⇒ Vehicle diagnostic tester. Connect the ⇒ Vehicle diagnostic tester to the vehicle and perform the function `Leak tightness of cooling system`.

– `Select own test`

– `Power unit`

– `0001 - Diesel engine`

– `Repair groups`

– `19 - Cooling`

– `Cooling system leak tightness`

Note

Depending on the vehicle, the engine and the firmware version of the vehicle diagnostic tester the specified path may vary slightly.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

28 – Glow plug system

1 Glow plug system

⇒ “1.1 Assembly overview - glow plug system”, page 581

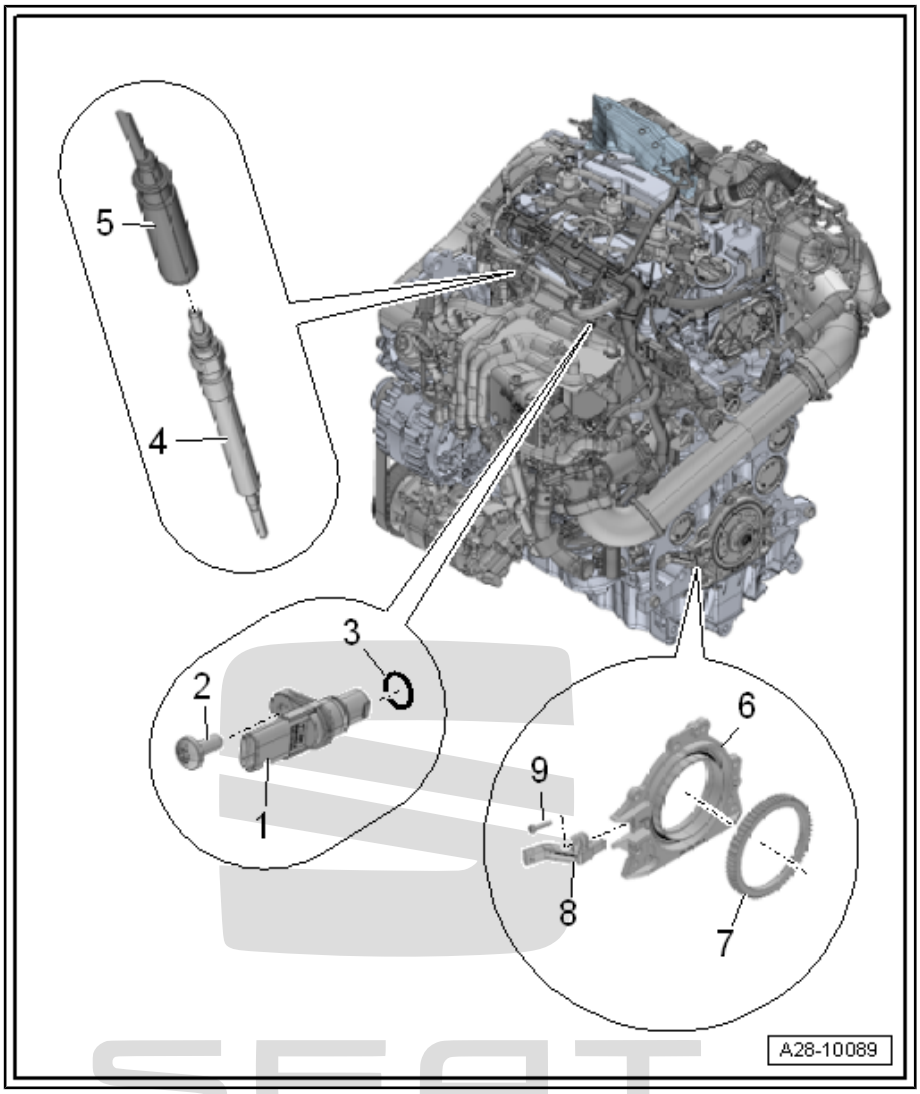
⇒ “1.2 Removing and installing glow plug”, page 582

⇒ “1.3 Removing and installing automatic glow period control unit J179 ”, page 584

⇒ “1.4 Removing and installing Hall sender G40 ”, page 585

⇒ “1.5 Removing and installing engine speed sender G28 ”, page 585

1.1 Assembly overview - glow plug system



1 - Hall sender - G40-

- ❑ Removing and installing ⇒ page 585

2 - Bolt

- ❑ 9 Nm

3 - O-ring

- ❑ No replacement part. Renew Hall sender if damaged.

4 - Glow plug

- ♦ Glow plug 1 - Q10-
- ♦ Glow plug 2 - Q11-
- ♦ Glow plug 3 - Q12-
- ♦ Glow plug 4 - Q13-
  - ❑ Depending on the vehicle model, there is a combustion chamber pressure sender integrated in the glow plug
- ♦ Glow plug 1 - Q10- with cylinder 1 combustion chamber pressure sender - G677-
- ♦ Glow plug 2 - Q11- with cylinder 2 combustion chamber pressure sender - G678-
- ♦ Glow plug 3 - Q12- with cylinder 3 combustion chamber pressure sender - G679-
- ♦ Glow plug 4 - Q13- with cylinder 4 combustion chamber pressure sender - G680-
  - ❑ Glow plug versions ⇒ page 583
  - ❑ Glow plug without combustion chamber pressure sender: 17 Nm.
  - ❑ Glow plug with combustion chamber pressure sender: 12 Nm.
  - ❑ Removing and installing ⇒ page 582

SEAT
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.
erWin

5 - Electric connector

- ❑ For glow plug

6 - Sealing flange (gearbox end)

- ❑ Removing and installing ⇒ page 70

7 - Sender wheel

- ❑ For engine speed sender - G28- .
- ❑ Removing and installing ⇒ page 68

8 - Engine speed sensor - G28-

- ❑ Removing and installing ⇒ page 585

9 - Bolt

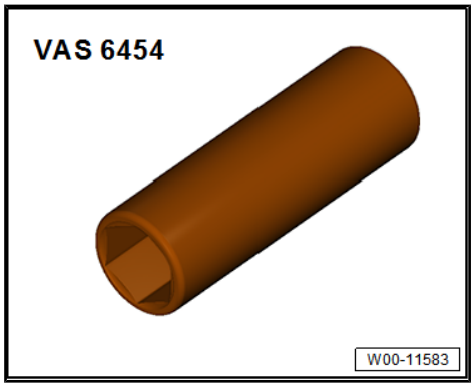
- ❑ 4.5 Nm

1.2 Removing and installing glow plug

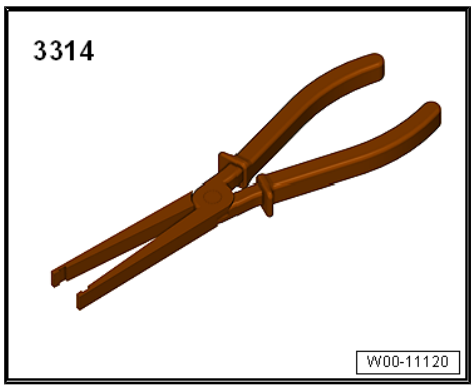
Special tools and workshop equipment required

- ♦ 10 mm articulated wrench - 3220-

- ♦ Socket insert AF 12 for glow plugs 4-cyl.TDI CR diesel - VAS 6454- for cylinder 3



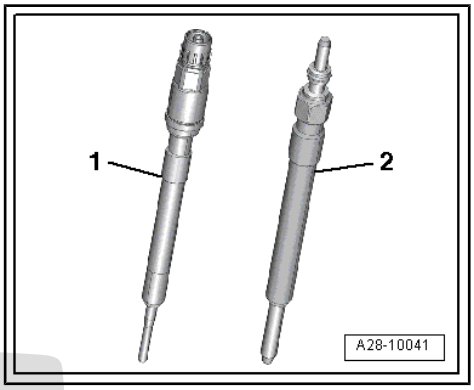
- ♦ Pincers - 3314-



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

Removing

Glow plug versions



1 - Glow plug with internal cylinder pressure sensor - not on all vehicles

2 - Glow plug without combustion chamber pressure sender

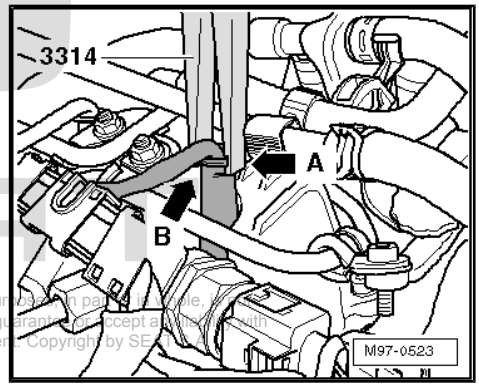
– Remove engine cover panel ⇒ page 56 .

NOTICE

Risk of damage to support sleeves.

- **Use pliers - 3314- to remove glow plug connectors, squeezing just enough to grasp the collar of the support sleeve securely. Do not damage connector.**

– Release retaining clips at wiring harness and pull connectors off glow plugs as follows:



– Apply groove -arrow A- of pliers - 3314- to collar of support sleeve -arrow B- as shown in illustration.

– Carefully detach glow plug connectors from glow plugs.

– Clean glow plug port in cylinder head. Make sure that no dirt falls into the cylinder.

Note

- *Cleaning procedure:*
- *Use a vacuum cleaner to remove coarse dirt.*
- *Spray brake cleaner or suitable cleaning agent into glow plug port, let it work in briefly, and blow out with compressed air.*
- *Then clean glow plug opening using a cloth moistened with oil.*

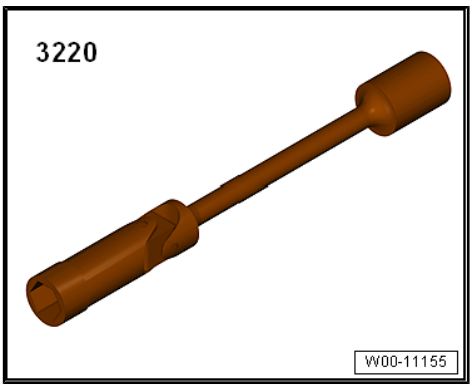
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

WARNING

Risk of eye injury.

- **Use safety goggles!**

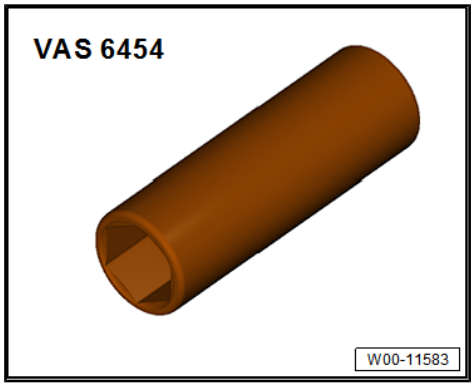
Glow plug without combustion chamber pressure sender:



– Loosen glow plugs using U/J extension and socket, 10 mm - 3220- and unscrew by hand.

Glow plug with combustion chamber pressure sender:

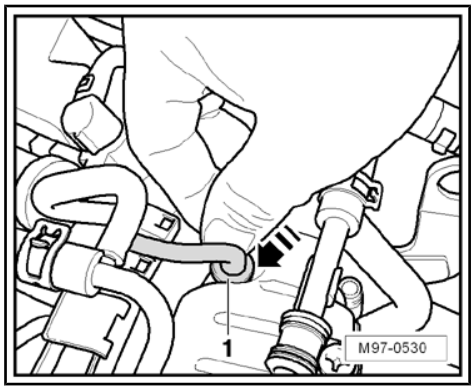
– Loosen the glow plugs with SW 12 socket, glow plug 4-cyl.TDI CR-Diesel - VAS 6454- and remove them by hand.



Installing

Install in reverse order of removal, observing the following.

– Fit glow plug connectors -1- back onto glow plugs -arrow-.



Note

Check that glow plug connectors are securely seated.

– Install engine cover panel ⇒ page 56 .

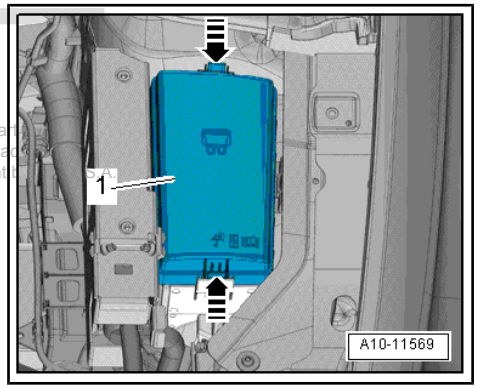
Specified torques

♦ ⇒ “1.1 Assembly overview - glow plug system”, page 581

1.3 Removing and installing automatic glow period control unit - J179-

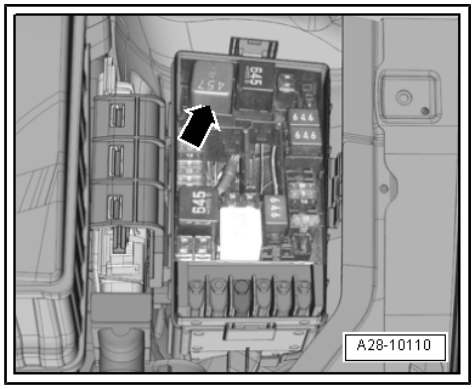
Removing

– Release fasteners -arrows- and detach cover.



Protected by copyright. Copying for private or commercial purposes, in pa
permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or a
respect to the correctness of information in this document. Copyright

– Pull automatic glow period control unit - J179- -arrow- off slot in electronics box in engine compartment.



Installing

Installation is in the reverse sequence of removal.

1.4 Removing and installing Hall sender - G40-

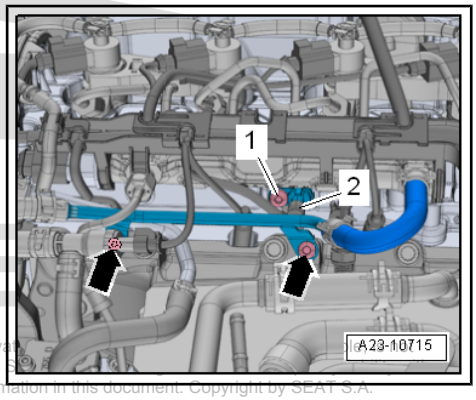
Removing

– Remove engine cover panel ⇒ page 56 .

– Remove bolts -arrows- and push fuel lines slightly towards front.

– Unplug the electrical connector -2-.

– Unscrew bolt -1- and detach Hall sender - G40- .



Installing

Installation is in the reverse sequence of removal.

– Install engine cover panel ⇒ page 56 .

Specified torques

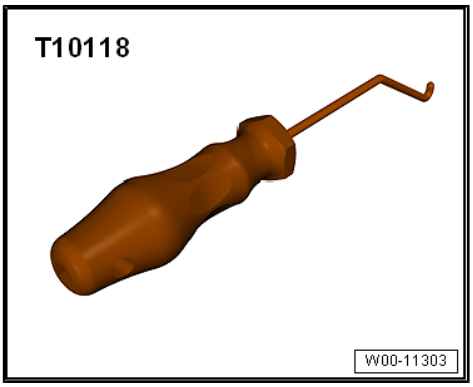
♦ ⇒ “1.1 Assembly overview - glow plug system”, page 581

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.

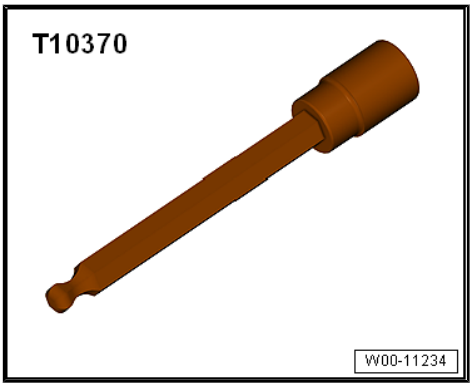
1.5 Removing and installing engine speed sender - G28-

Special tools and workshop equipment required

♦ Assembly tool - T10118-



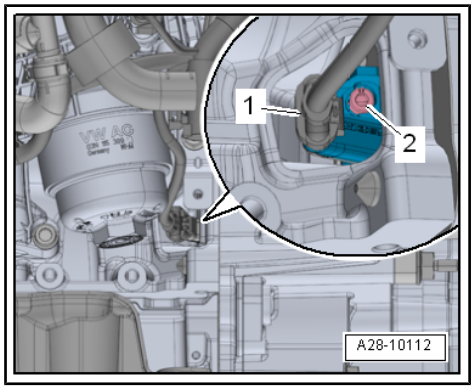
♦ Hexagon key extension, 4 mm - T10370-



Removing

– Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation .

– Use assembly tool - T10118- to unplug electrical connector -1-.



Note

- *Use a screwdriver to release the connector, if the assembly tool - T10118- is not available.*
- *Push on connector for engine speed sensor.*
- *At the same time lift release tab with a thin wire hook.*

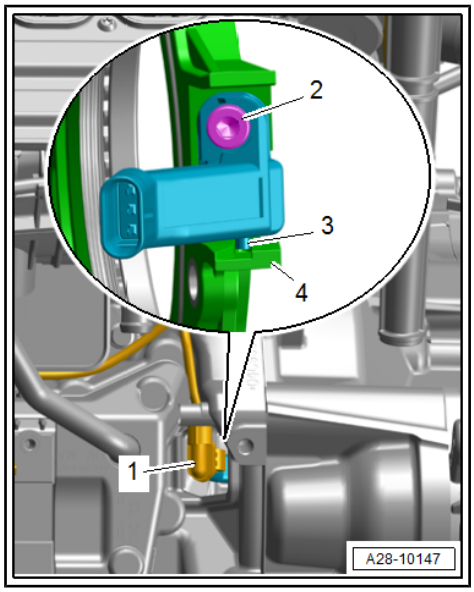
– Unscrew bolt -2- and detach engine speed sender - G28- .

Installing

Installation is in the reverse sequence of removal.

– Move the engine speed sender - G28- to the installation position; make sure that the catch -3- engages with the guide of the sealing flange -4-.

– Install noise dampers ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - Noise insulation .



Specified torques

- ⇒ “1.1 Assembly overview - glow plug system”, page 581
- ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Assembly overview - noise insulation

SEAT
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by SEAT S.A. SEAT S.A does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SEAT S.A.
erWin