



Workshop Manual
Golf Variant 2007 >
Golf Variant 2010 >
Jetta 2005 >

Electrical system

Edition 07.2010



List of Workshop Manual Repair Groups

Repair Group

- 27 - Starter, current supply, CCS
- 90 - Gauges, instruments
- 92 - Windscreen wash/wipe system
- 94 - Lights, bulbs, switches - exterior
- 96 - Lights, bulbs, switches - interior
- 97 - Wiring



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.



Contents

27 - Starter, current supply, CCS	1
1 Battery A	1
1.1 Types of battery	1
1.2 Warning notices and safety regulations	1
1.3 Battery terminal connection	1
2 Checking battery A	2
3 Charging battery A	3
4 Disconnecting and connecting battery A	4
4.1 Disconnecting and connecting battery A (battery A in engine compartment)	4
5 Removing and installing battery A	7
5.1 Removing and installing battery A (battery A in engine compartment)	7
6 Starter B	13
6.1 Checking starter B	13
6.2 Removing and installing starter B (automatic gearbox)	14
6.3 Removing and installing starter B (DSG)	35
6.4 Removing and installing starter B (manual gearbox)	60
7 Alternator C	88
7.1 Securing battery positive wire on alternator C	88
7.2 Checking poly V-belt	88
7.3 Checking alternator C	89
7.4 Alternator C 1.4l petrol engine	90
7.5 Alternator C 1.4l FSI engine	95
7.6 Alternator C 1.4l, TSI engine	100
7.7 Alternator C 1.6l petrol engine	106
7.8 Alternator C 1.6l FSI engine	110
7.9 Alternator C 2.0l FSI engine	114
7.10 Alternator C 2.0l TFSI engine	121
7.11 Alternator C 2.5l petrol engine	128
7.12 Alternator C 1.9l diesel engine	131
7.13 Alternator C 1.9l diesel engine with diesel particle filter	138
7.14 Alternator C 2.0l SDI engine	144
7.15 Alternator C 2.0l diesel engine	148
7.16 Alternator C 2.0l CR diesel engine	153
7.17 Alternator C 2.0l TSI engine	158
7.18 Removing and installing poly-V belt pulley on alternator C	163
7.19 Voltage regulator C1 for alternator C	168
8 Cruise control system (CCS)	172
90 - Gauges, instruments	173
1 Dash panel insert	173
1.1 Renewing dash panel insert	173
1.2 Removing and installing dash panel insert (up to MY2009)	174
1.3 Removing and installing dash panel insert (from MY2010)	175
1.4 Back of dash panel insert (up to MY2009)	176
1.5 Back of dash panel insert (from MY2010)	176
1.6 Pin assignment of connectors at dash panel insert	176
1.7 Warning lamp symbols on dash panel insert (up to MY2009)	176
1.8 Warning lamp symbols on dash panel insert (from MY2010)	178
2 Service interval display	180
2.1 Resetting service interval display	180
92 - Windscreen wash/wipe system	181



1	Windscreen wiper system	181
1.1	Deactivating wiper motor control unit J400 APP function	181
1.2	Assembly overview - windscreen wiper system	183
1.3	Removing and installing windscreen wiper system	183
1.4	Removing and installing wiper arms	188
1.5	Adjusting wiper blade park position	188
1.6	Removing and installing joint-free wiper blades	190
1.7	Removing and installing rain and light sensor G397	190
1.8	Coding rain and light sensor G397	192
2	Windscreen washer system	194
2.1	Assembly overview - windscreen washer system	194
2.2	Removing and installing washer fluid reservoir	195
2.3	Removing and installing windscreen and rear window washer pump V59	197
2.4	Removing and installing windscreen washer fluid level sender G33	198
2.5	Removing and installing windscreen washer system spray jets	199
2.6	Adjusting windscreen washer system spray jets	199
3	Rear window wiper system	200
3.1	Assembly overview - rear window wiper system	200
3.2	Removing rear window wiper	200
3.3	Adjusting rear window wiper park position	202
3.4	Removing and installing joint-free wiper blades	203
4	Rear window washer system	205
4.1	Assembly overview - rear window washer system	205
4.2	Removing and installing washer jet	206
4.3	Adjusting spray jet	206
5	Headlight washer system	207
5.1	Assembly overview - headlight washer system	207
5.2	Removing and installing headlight washer system pump V11	208
5.3	Removing and installing spray jet pop-up cylinders	209
5.4	Removing and installing spray jet assembly	209
5.5	Adjusting headlight washer system spray jets	210
5.6	Bleeding headlight washer system	210
6	Washer fluid line hose couplings	212
7	Hose repair	213
94	Lights, bulbs, switches - exterior	214
1	Headlights with halogen bulbs (up to MY2009)	214
1.1	Assembly overview	214
1.2	Removing and installing headlight	215
1.3	Adjusting headlight installation position	217
1.4	Renewing bulbs	218
1.5	Removing and installing headlight range control motor	224
1.6	Repairing headlight retaining tabs	231
1.7	Converting headlights for use when driving on the left or right	233
1.8	Adjusting headlights	235
2	Headlights with halogen bulbs (from MY2009)	236
2.1	General description	236
2.2	Assembly overview	236
2.3	Removing and installing headlight	238
2.4	Adjusting headlight installation position	240
2.5	Renewing bulbs	241
2.6	Removing and installing headlight range control motor	247
2.7	Repairing headlight securing tabs	251
2.8	Converting headlights for use when driving on the left or right	254



2.9	Adjusting headlights	257
3	Headlights with gas discharge bulbs (up to MY2009)	258
3.1	Operation and safety notes for gas discharge bulbs	258
3.2	Assembly overview	261
3.3	Removing and installing headlight	262
3.4	Adjusting headlight installation position	262
3.5	Renewing bulbs	262
3.6	Removing and installing headlight range control motor	268
3.7	Removing and installing gas discharge light control unit	271
3.8	Control unit for headlight range control J431	272
3.9	Vehicle level sender	275
3.10	Repairing headlight securing tabs	276
3.11	Converting headlights for use when driving on the left or right	277
3.12	Adjusting headlights	277
4	Headlights with gas discharge bulbs and cornering lights (from MY2010)	278
4.1	General description	278
4.2	Assembly overview	279
4.3	Removing and installing headlight	280
4.4	Adjusting headlight installation position	282
4.5	Renewing bulbs	282
4.6	Headlight starter for gas discharge bulb	287
4.7	Power output module for headlight	288
4.8	Headlight range control unit J431	290
4.9	Headlight range control motor	292
4.10	Swivel module position sensor	292
4.11	Headlight screen adjustment solenoid	293
4.12	Vehicle level sender	294
4.13	LED module for daytime running light and side light	294
4.14	Converting headlights for use when driving on the left or right	294
4.15	Repairing headlight securing tabs	296
4.16	Adjusting headlights	296
5	Fog lights	297
5.1	Assembly overview - fog lights (up to MY2009)	297
5.2	Assembly overview - fog lights (from MY2010)	298
5.3	Removing and installing fog lights (up to MY2009)	298
5.4	Removing and installing fog lights (from MY2010)	299
5.5	Removing and installing fog light/cornering light bulb	300
5.6	Adjusting fog lights	301
6	Bulb for turn signal repeater light and entry light in exterior mirror	302
6.1	Removing and installing turn signal bulb	302
6.2	Removing and installing entry light in exterior mirror	302
7	Removing and installing front side marker light in front bumper	305
8	Rear side marker bulb (USA/Canada only)	306
9	Tail lights	307
9.1	Assembly overview - tail light in side panel (bulbs) - saloon	307
9.2	Removing and installing tail light in side panel (bulbs) - saloon	307
9.3	Removing and installing tail light bulb carrier in side panel - saloon	308
9.4	Tail light in side panel (LED) - saloon	309
9.5	Removing and installing tail light in side panel (LED) - saloon	309
9.6	Assembly overview - tail light in rear lid - saloon	310
9.7	Removing and installing tail light in rear lid - saloon	311
9.8	Removing and installing tail light bulb holder in rear lid - saloon	311
9.9	Assembly overview - tail light - Variant	313
9.10	Removing and installing tail light - Variant	313
9.11	Removing and installing tail light bulb holder - Variant	314



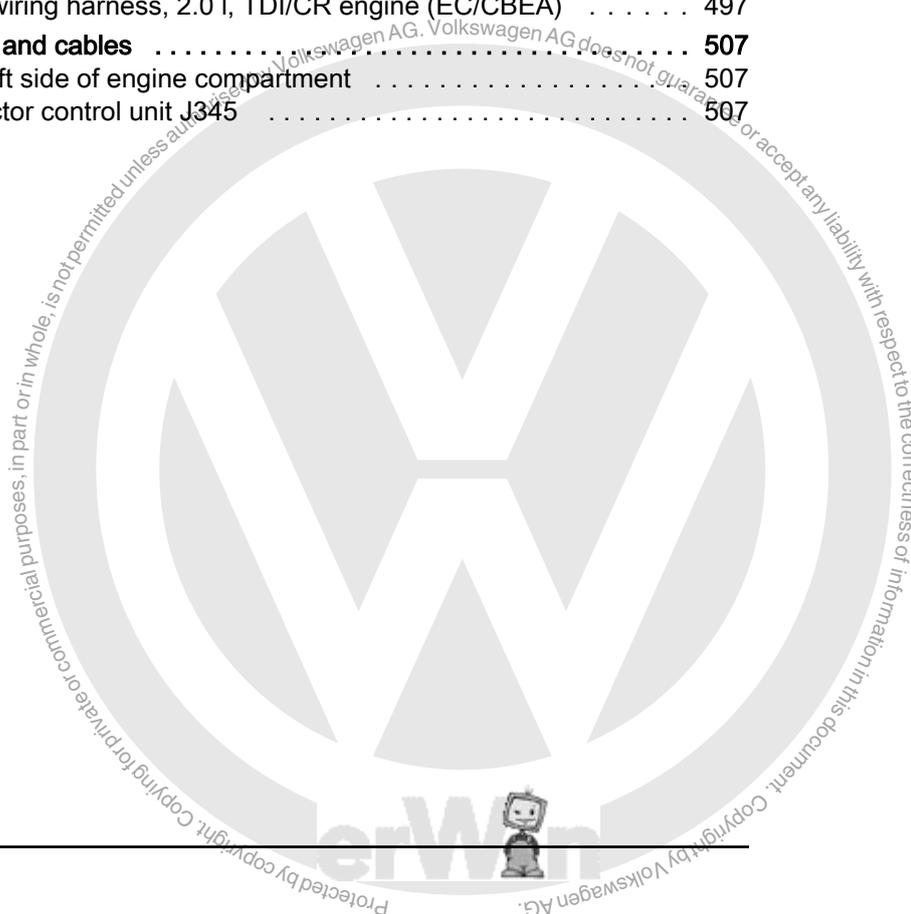
10	Removing and installing number plate lights	315
11	Additional brake lights	316
11.1	Removing and installing additional brake light bulb M25 - saloon	316
11.2	Removing and installing additional brake light bulb M25 - estate	316
12	Steering column switch	319
12.1	Assembly overview - steering column switch	320
12.2	Removing and installing steering column switch	320
12.3	Steering column electronics control unit J527	327
12.4	Steering angle sender G85	328
13	Ignition/starter switch and lock cylinder	330
13.1	Removing and installing steering lock housing	330
13.2	Removing and installing lock cylinder	330
13.3	Removing and installing ignition/starter switch D	332
14	Parking aid	334
14.1	General description	334
14.2	Assembly overview - 4-channel parking aid	335
14.3	Assembly overview - 8-channel parking aid	337
14.4	Removing and installing parking aid control unit J446 (4-channel) - saloon	338
14.5	Removing and installing parking aid control unit J446 (4-channel) - estate	338
14.6	Removing and installing parking aid control unit J446 (8-channel)	339
14.7	Coding parking aid control unit J446	341
14.8	Adjust optical display	341
14.9	Removing and installing rear parking aid senders	342
14.10	Removing and installing front parking aid senders	345
14.11	Bonding sender holder in bumper cover	347
14.12	Renewing parking aid senders	349
14.13	Testing parking aid senders	350
14.14	Removing and installing rear parking aid warning buzzer H15 - saloon	351
14.15	Removing and installing rear parking aid warning buzzer H15 - estate	351
14.16	Adjusting rear parking aid warning buzzer H15 volume	352
14.17	Adjusting rear parking aid warning buzzer pitch H15	352
14.18	Removing and installing front parking aid warning buzzer H22	353
14.19	Adjusting front parking aid warning buzzer H22 volume	353
14.20	Adjusting front parking aid warning buzzer pitch H22	354
14.21	Parking aid final control diagnosis	354
14.22	Checking parking aid button E266	355
15	Park assist steering	357
15.1	General description	357
15.2	Assembly overview - park assist steering	359
15.3	Park assist steering control unit J791	360
15.4	Park assist steering senders	363
15.5	Renewing park assist steering sender	366
15.6	Front parking aid warning buzzer H22	367
15.7	Rear parking aid warning buzzer H15	369
15.8	Park assist steering/parking aid button	370
16	Reversing camera system	372
16.1	General description	372
16.2	Assembly overview – reversing camera system	373
16.3	Removing and installing reversing camera R189	373
16.4	Calibrating reversing camera system	375
17	Removing and installing trailer socket U10	380
96	Lights, bulbs, switches - interior	382
1	Lights and switches in engine compartment	382



1.1	Removing and installing bonnet contact switch F266	382
2	Lights and switches in dash panel	383
2.1	Removing and installing light switch E1	383
2.2	Removing and installing glove compartment light W6	384
2.3	Removing and installing glove compartment light switch E26	385
2.4	Removing and installing regulator for switch and instrument illumination E20	386
2.5	Removing and installing warning lamp for airbag deactivated on front passenger side K145	387
2.6	Removing and installing hazard warning light switch E3	388
2.7	Removing and installing footwell lights	388
2.8	Removing and installing key operated switch to deactivate front passenger side airbag E224	390
3	Lights and switches in front doors and B-pillar	392
3.1	Removing and installing window regulator switch in front passenger door E107	392
3.2	Removing and installing switch module for mirror adjustment on driver side	393
3.3	Removing and installing driver side interior locking button for central locking system E308	393
3.4	Components - front door locks	394
3.5	Removing and installing switch module for driver side window regulator	395
3.6	Removing and installing remote release button for fuel filler flap and rear lid E463	396
3.7	Removing and installing interior monitoring/vehicle inclination deactivation switch	397
3.8	Removing and installing central locking deadlock function warning lamp -SAFE- K133	398
4	Lights and switches in rear doors	400
4.1	Components - rear door locks	400
4.2	Removing and installing rear window regulator switch in door	400
5	Lights and switches in luggage compartment	402
5.1	Removing and installing luggage compartment light W3	402
5.2	Removing and installing rear lid lock unit F256	403
6	Lights and switches in roof trim	404
6.1	Front interior light W1 (without sunroof)	404
6.2	Front interior light W1 (with sunroof)	407
6.3	Rear interior light W45 (vehicles without anti-theft alarm)	411
6.4	Rear interior light W45 (vehicles with anti-theft alarm) up to MY2009	413
6.5	Removing and installing illuminated vanity mirrors	416
6.6	Removing and installing garage door operating unit E284	417
7	Lights and switches in centre console	418
7.1	Buttons in centre console storage compartment	418
7.2	Removing and installing buttons in centre console storage compartment	418
7.3	Removing and installing AC/DC converter with socket	420
8	immobiliser	423
8.1	Removing and installing immobiliser control unit J362	423
8.2	immobiliser reader coil D2	423
8.3	Ignition key	423
9	Anti-theft alarm (ATA)	428
9.1	Assembly overview	428
9.2	Activating and deactivating anti-theft alarm system	430
9.3	Removing and installing ultrasonic sensor (rear interior light) (up to MY2009)	431
9.4	Removing and installing ultrasonic sensor (rear left-hand side of roof) (up to MY2009)	431
9.5	Anti-theft alarm sensor G578 (from MY2010)	432
9.6	Removing and installing vehicle inclination sender G384 (up to 2006)	434
9.7	Vehicle inclination sender G384 (from MY2010)	434
9.8	Interior monitoring sensor G273 (from MY2010)	435
9.9	Central locking and anti-theft alarm system aerial R47	435
9.10	Removing and installing alarm horn H12	435
10	Horn	438



10.1	Removing and installing treble horn H2 / bass horn H7	438
10.2	Checking treble horn H2 / bass horn H7	438
97	- Wiring	439
1	Vehicle diagnosis, testing and information systems	439
2	Removing and installing fuse holder	440
2.1	Removing and installing fuse holder on left of dash panel	440
3	Removing and installing relay carrier	442
3.1	Removing and installing relay carrier on left beneath dash panel	442
3.2	Removing and installing relay carrier on onboard supply control unit J519 (up to MY2009)	443
3.3	Removing and installing relay carrier on onboard supply control unit J519 (from MY2010)	445
4	Electronics boxes	446
4.1	Removing and installing electronics box on left side of engine compartment	446
5	Control units	450
5.1	Onboard supply control unit J519	450
5.2	Data bus diagnostic interface J533	467
5.3	Convenience system central control unit J393	472
5.4	Driver door control unit J386	477
5.5	Front passenger door control unit J387	478
5.6	Coding rear left door control unit J388	479
5.7	Coding rear right door control unit J389	480
5.8	Trailer detector control unit J345	481
5.9	Garage door operation control unit J530	486
6	Wiring harness and connector repairs	488
7	Removing and installing engine wiring harness	489
7.1	Operation and safety notes	489
7.2	Installation notes	490
7.3	Assembly overview - 2.0 TDI engine /CR engine (engine code CBEA) wiring harness	491
7.4	Removing and installing engine wiring harness, 2.0 I, TDI/CR engine (EC/CBEA)	497
8	Specified torques for wires, lines and cables	507
8.1	Specified torques for E-box on left side of engine compartment	507
8.2	Specified torques for trailer detector control unit J345	507





27 – Starter, current supply, CCS

1 Battery -A-



WARNING

Danger of injury! Observe warning notices and safety regulations => page 1!

1.1 Types of battery

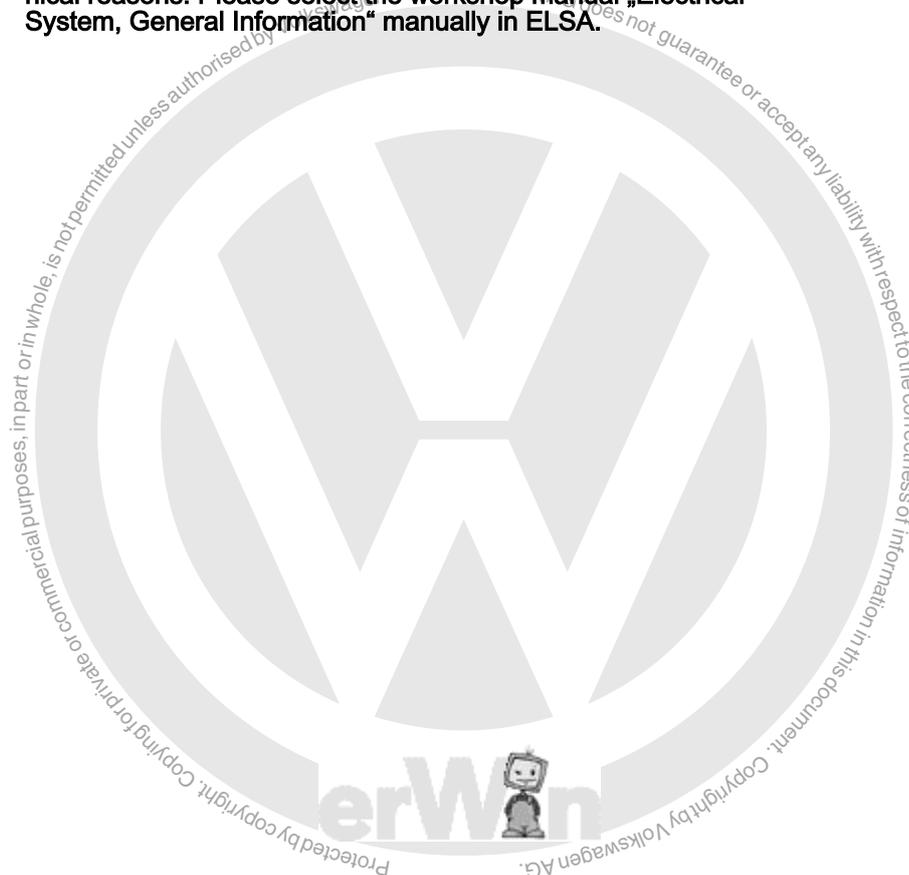
All the instructions and information for this manual are found in the workshop manual „Electrical System, General Information“. A link to this workshop manual is not possible at present for technical reasons. Please select the workshop manual „Electrical System, General Information“ manually in ELSA.

1.2 Warning notices and safety regulations

All the instructions and information for this manual are found in the workshop manual „Electrical System, General Information“. A link to this workshop manual is not possible at present for technical reasons. Please select the workshop manual „Electrical System, General Information“ manually in ELSA.

1.3 Battery terminal connection

All the instructions and information for this manual are found in the workshop manual „Electrical System, General Information“. A link to this workshop manual is not possible at present for technical reasons. Please select the workshop manual „Electrical System, General Information“ manually in ELSA.





2 Checking battery -A-

All the instructions and information for this manual are found in the workshop manual „Electrical System, General Information“. A link to this workshop manual is not possible at present for technical reasons. Please select the workshop manual „Electrical System, General Information“ manually in ELSA.





3 Charging battery -A-

All the instructions and information for this manual are found in the workshop manual „Electrical System, General Information“. A link to this workshop manual is not possible at present for technical reasons. Please select the workshop manual „Electrical System, General Information“ manually in ELSA.





4 Disconnecting and connecting battery -A-

4.1 Disconnecting and connecting battery -A- (battery -A- in engine compartment)



WARNING

Danger of injury! Observe warning notices and safety regulations ⇒ [page 1](#)!

Disconnect battery -A- ⇒ [page 5](#)

Reconnecting battery -A- ⇒ [page 5](#) .

4.1.1 Assembly overview - battery -A-

1 - Earth wire battery terminal clamp

- ❑ Observe notes for battery pole terminal clamp bolt ⇒ [page 1](#) .

2 - Nut

- ❑ 6 Nm

3 - Positive wire battery terminal clamp

- ❑ Observe notes for battery terminal clamp bolt ⇒ [page 1](#) .

4 - Nut

- ❑ 6 Nm

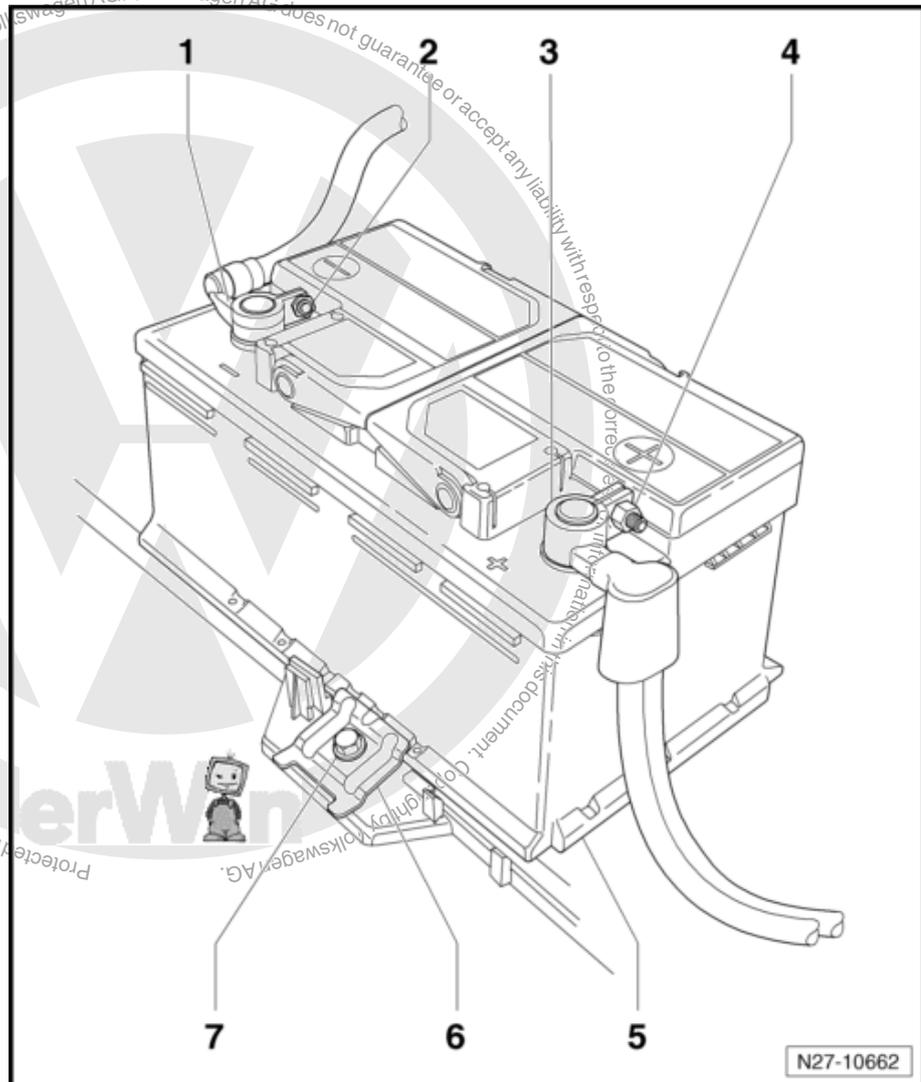
5 - Battery -A-

- ❑ Removing and installing ⇒ [page 7](#)

6 - Clamping plate

7 - Bolt

- ❑ 35 Nm





4.1.2 Disconnecting battery -A-



Caution

- ◆ *Always make sure that the electrical system of the vehicle is protected by disconnecting the battery -A- before any work on the electrical system starts.*
- ◆ *Do not unfasten or remove the earthing cable from your body. Only remove the negative terminal (-) of the battery -A- .*
- ◆ *The positive terminal (B+) of the battery -A- is only allowed to be removed if the battery -A- has been removed from the vehicle.*
- ◆ *Observe warning notices and safety regulations*
⇒ [page 1](#) .

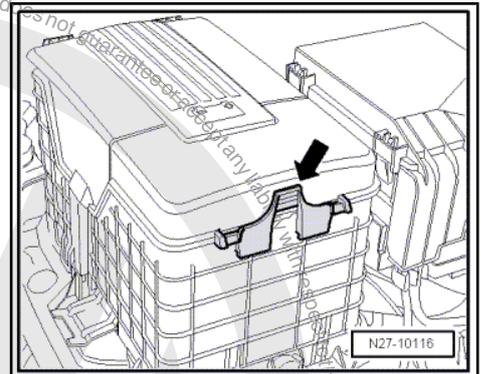


Caution

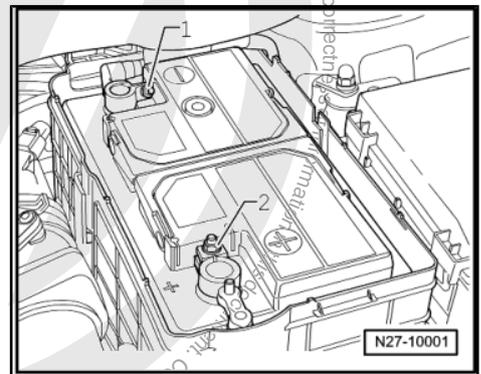
- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

Carry out following procedures:

- Release catch -arrow- and take cover off battery housing.
- First unscrew battery earth terminal clamp -1- from battery negative terminal.



- Then unscrew battery positive terminal clamp -2- from battery positive terminal.



4.1.3 Connecting battery -A-



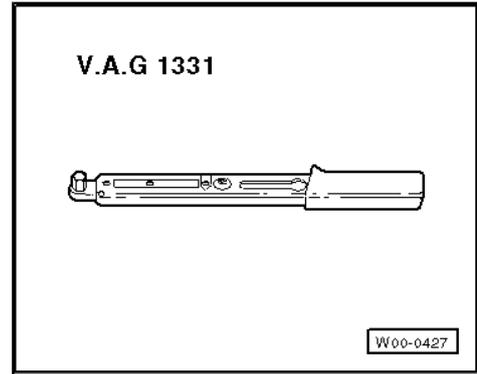
Caution

Observe notes for battery pole terminal clamp bolt ⇒ [page 1](#) .



Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-



Note

After battery -A- has been connected and ignition is switched on, ESP and TCS warning lamp -K155- will light up permanently. The ESP and TCS warning lamp -K155- will go out automatically when the vehicle is driven at 15 to 20 km/h in a straight line. This has effect of reactivating steering angle sender -G85- .

Caution

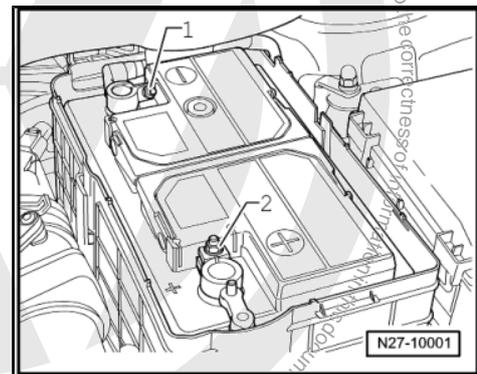
When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ page 4 .

Carry out following procedures:

- Fit battery positive wire clamp -2- to positive terminal of battery -A- and tighten bolt to specified torque ⇒ page 4 .
- Fit battery earth wire clamp -1- to negative terminal of battery -A- and tighten bolt to specified torque ⇒ page 4 .
- Carry out steps as detailed in the table.

Steps after connecting battery -A-

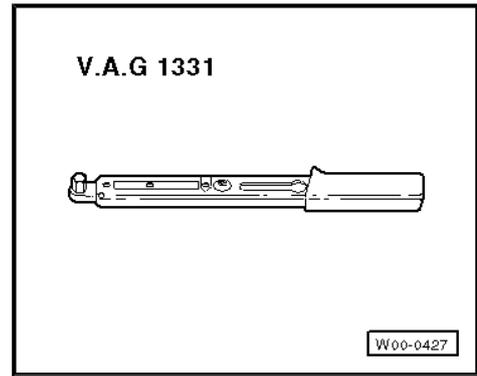
Step	Performed
Switch ignition on and off again using ignition key.	
Read fault memory ⇒ Vehicle diagnostic, testing and information system VAS 5051	
Clock: Check time setting and reset.	
Open all electric windows fully and close again.	
Test function of all electrical consumers.	



You can also print out the table.



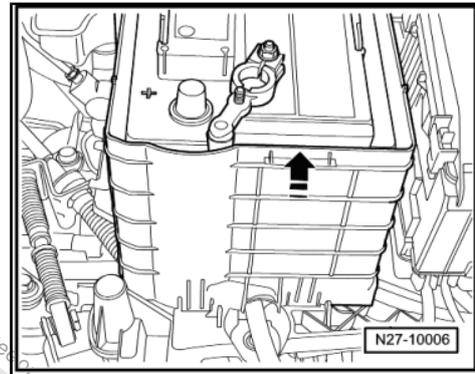
- ◆ Torque wrench -V.A.G 1331-



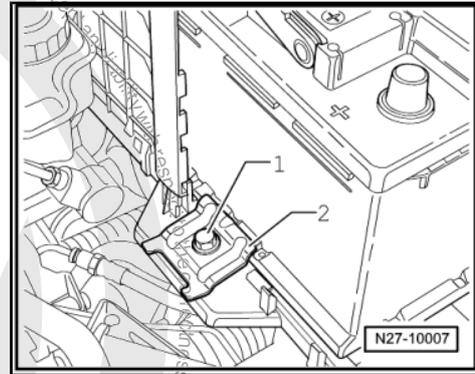
Carry out following procedures:

Removing

- Disconnect battery -A- → [page 5](#) .
- Pull panel of battery housing out upwards in direction of arrow.



- Undo bolt -1- and remove clamping plate -2-.





- Fold up handles -arrows- upwards and remove battery -A- .

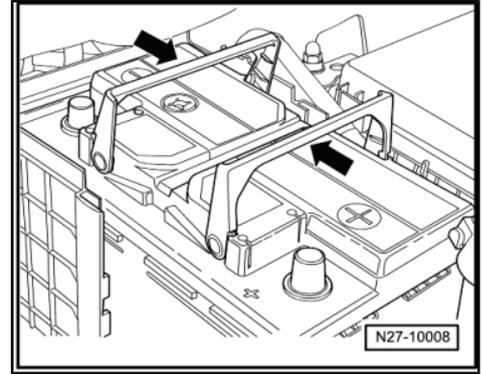
Installing



Caution

A loosely fitted battery -A- creates the following dangers:

- ◆ *Shortened service life due to damage from vibration (danger of explosion)*
- ◆ *The cells in the battery -A- will be damaged if the battery -A- is not secured correctly.*
- ◆ *Damage to battery housing due to clamping plate (possibility of acid leaking, with high consequential costs)*
- ◆ *Poor crash safety*



Carry out installation in the reverse sequence, noting the following:

- Tighten threaded connections to specified torque ⇒ [page 7](#) .
- After installing, check that battery -A- is seated securely.
- Connect battery -A- ⇒ [page 4](#) .



Caution

When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#) .

5.1.3 Vehicles with a diesel engine

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-

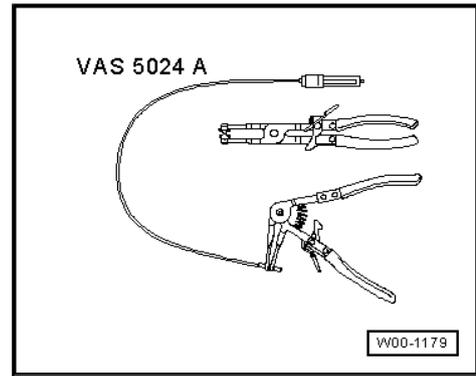
V.A.G 1331



W00-0427



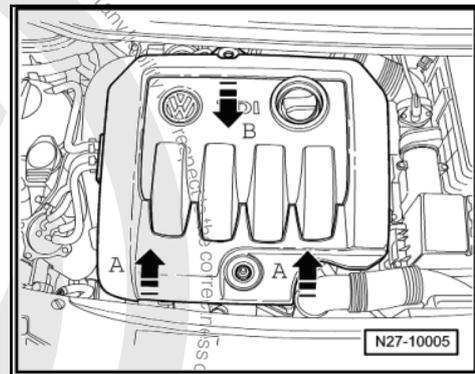
- ◆ Spring-type clip pliers -VAS 5024A-



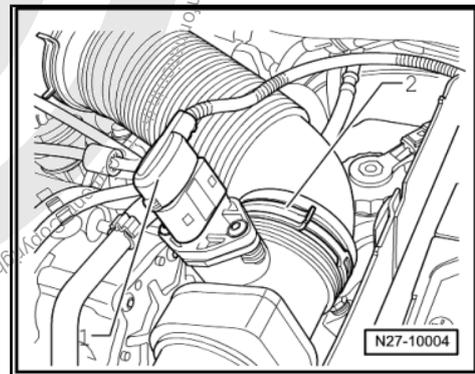
Carry out following procedures:

Removing

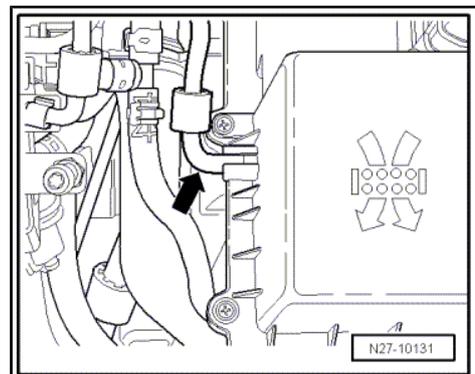
- Disconnect battery -A- → [page 4](#) .
- Pull engine cover upwards -arrows A- and forwards -arrow B-.



- Disconnect connector -1- and release spring-type clip -2- using spring type clip pliers -VAS 5024A- .

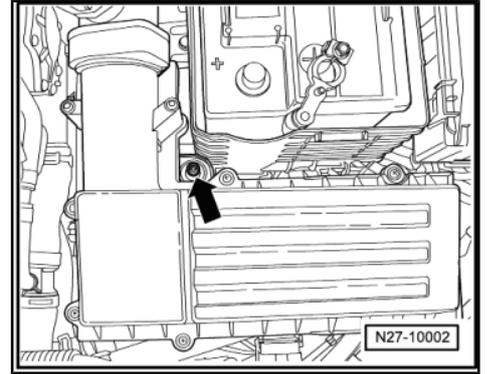


- Pull vacuum hose -arrow- off air filter housing.

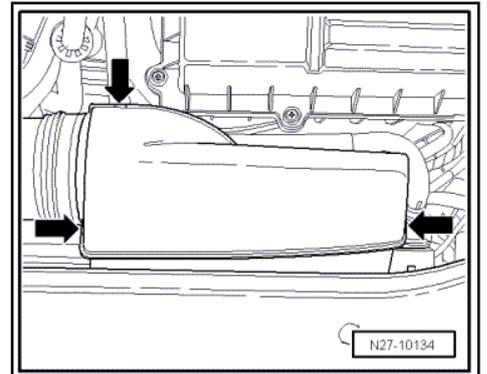




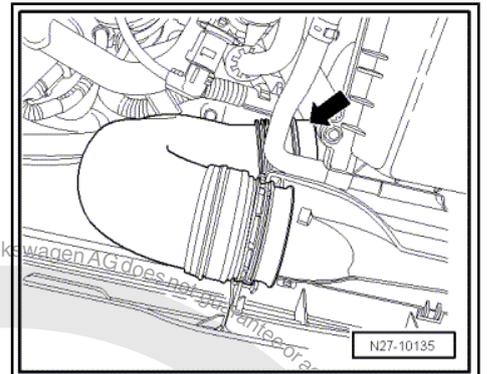
- Remove bolt of air filter housing -arrow-.



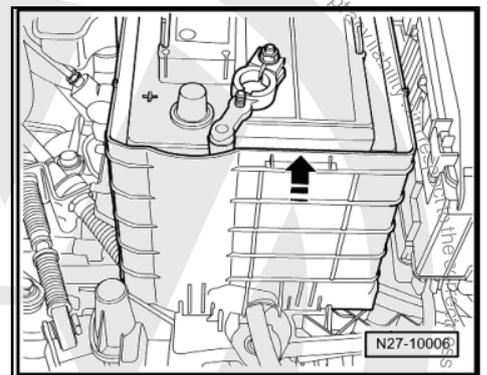
- Release locking lugs -arrows- and take off cover.



- Pull hose -arrow- off air filter housing and remove.
- Pull air filter housing upwards out of brackets and remove.

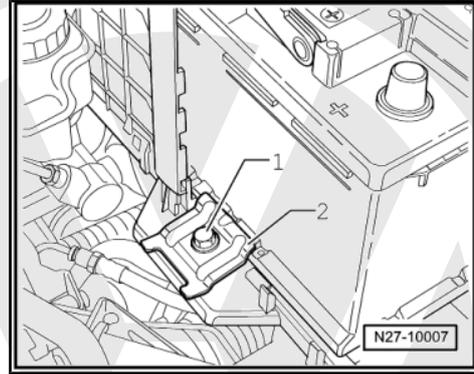


- Pull panel of battery housing out upwards
-in direction of arrow-.





- Undo bolt -1- and remove clamping plate -2-.



- Fold up handles -arrows- upwards and remove battery -A- .

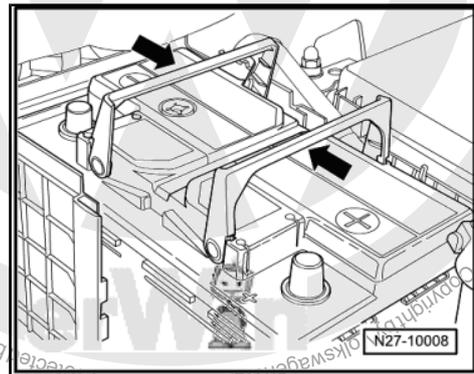
Installing



Caution

A loosely fitted battery -A- creates the following dangers:

- ◆ *Shortened service life due to damage from vibration (danger of explosion)*
- ◆ *The cells in the battery -A- will be damaged if the battery -A- is not secured correctly.*
- ◆ *Damage to battery housing due to clamping plate (possibility of acid leaking, with high consequential costs)*
- ◆ *Poor crash safety*



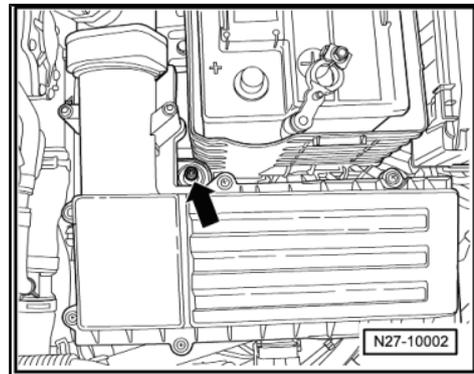
Carry out installation in the reverse sequence, noting the following:

- Tighten bolt for air filter housing -arrow- to 10 Nm.
- Tighten threaded connections to specified torques ⇒ [page 7](#) .
- After installing, check that battery -A- is seated securely.
- Connect battery -A- ⇒ [page 4](#) .



Caution

When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#) .





6 Starter -B-



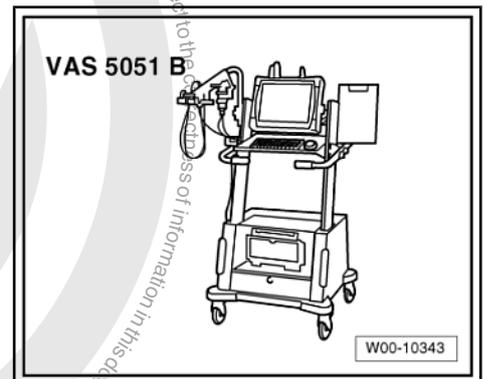
Caution

When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed => [page 4](#) .

6.1 Checking starter -B-

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B



Carry out following procedures:

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .

In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.

- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:

- ◆ Body
- ◆ Electrical system
- ◆ 27 - Starter, current supply
- ◆ Electrical components
- ◆ B - Starter



6.2 Removing and installing starter -B- (automatic gearbox)

6.2.1 Assembly overview - starter -B-

1 - Starter -B-

- Checking ⇒ [page 13](#)

2 - Battery positive wire connection to starter -B-

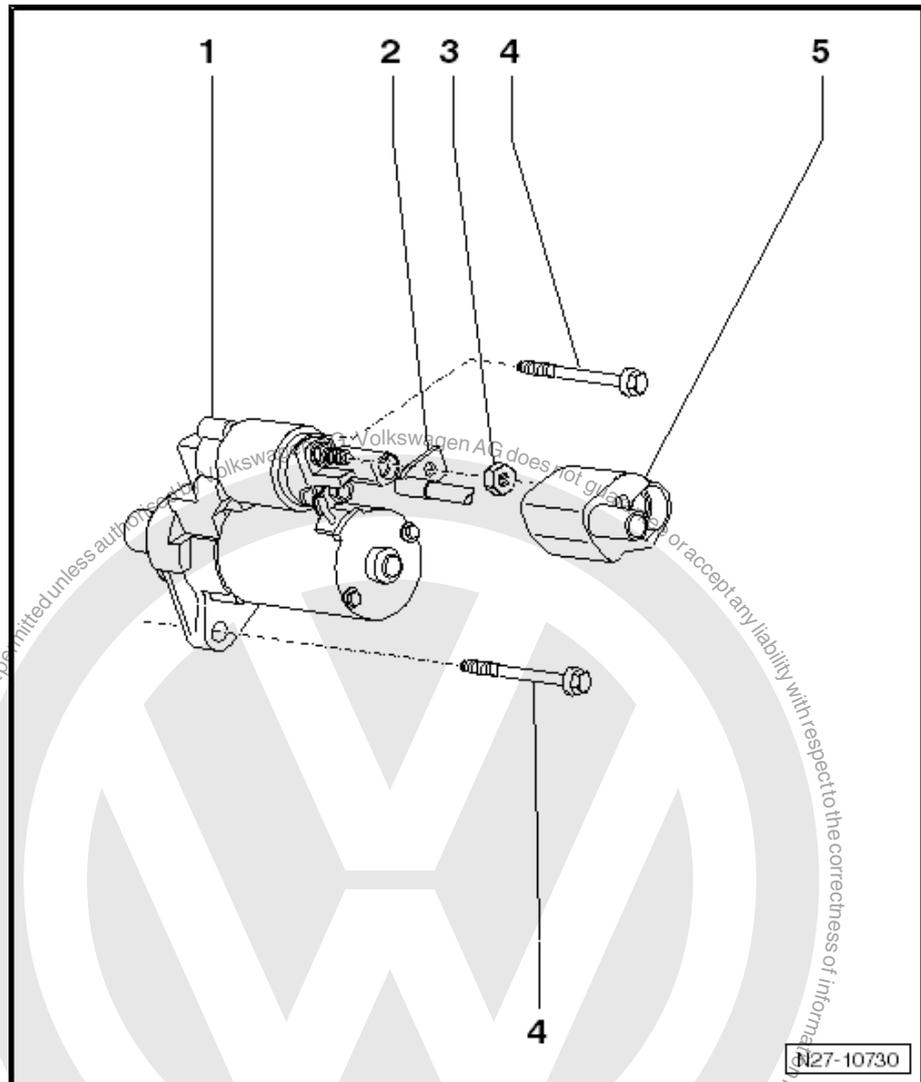
3 - Nut

- 15 Nm

4 - Bolt

- 75 Nm

5 - Protective cap



Not illustrated

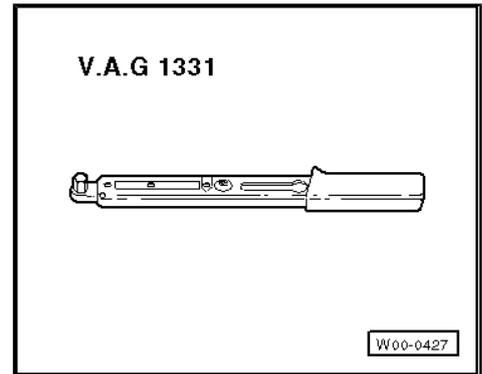
- ◆ Air filter housing bolt to body: 10 Nm
- ◆ Earth wire to automatic gearbox housing: 15 Nm

6.2.2 Vehicles with 1.6l petrol engine

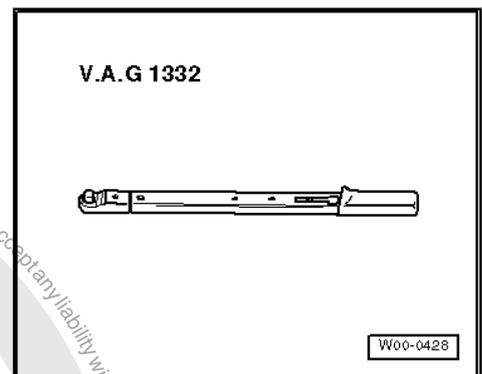
Special tools and workshop equipment required



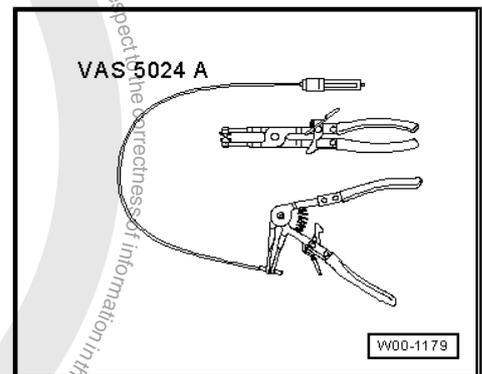
- ◆ Torque wrench -V.A.G 1331-



- ◆ Torque wrench -V.A.G 1332-



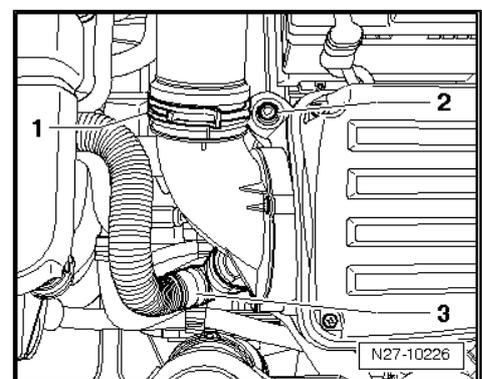
- ◆ Spring-type clip pliers -VAS 5024A-



Carry out following procedures:

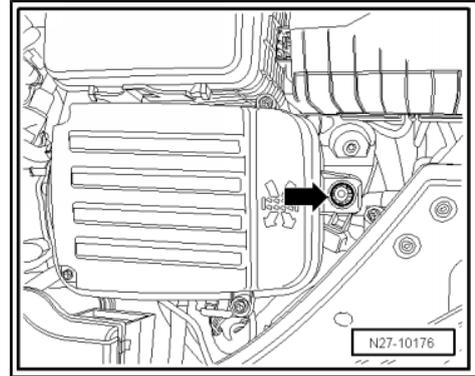
Removing

- Disconnect battery -A- => [page 4](#) .
- Loosen spring-type clip -1- using spring-type clip pliers -VAS 5024A- and remove bolt -2-.
- Release hose -3- and pull it off the air filter housing.

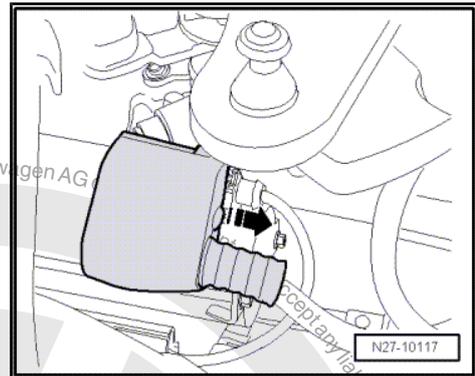




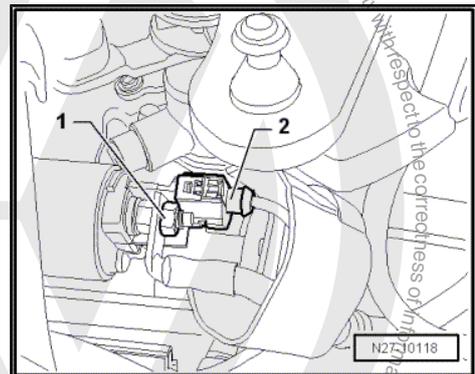
- Pull air filter housing upwards on right-hand side out of rubber mounting -arrow-.
- Take air filter housing out of vehicle.



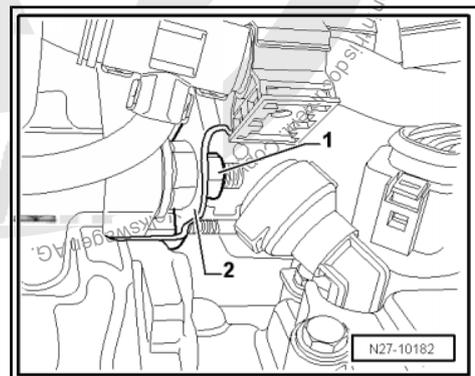
- Slide protective cap in direction of -arrow- off solenoid switch.



- Unscrew positive wire -1- and disconnect connector from terminal 50 -2-.
- Remove noise insulation ⇒ General body repairs, exterior;
Rep. gr. 50 .

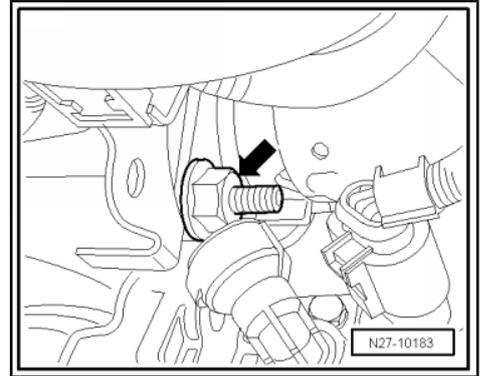


- Remove nut -1- from lower starter bolt.
- Remove wiring retainer -2-.

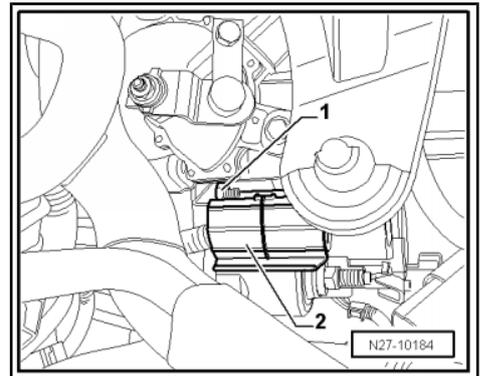




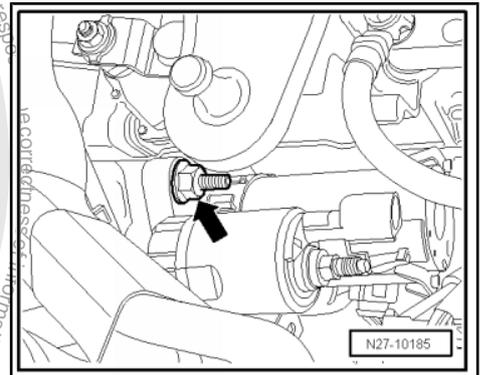
- Remove lower bolt -arrow- from starter.



- Remove nut -1- from upper starter bolt.
- Remove wiring retainer -2-.



- Remove upper bolt -arrow- from starter.

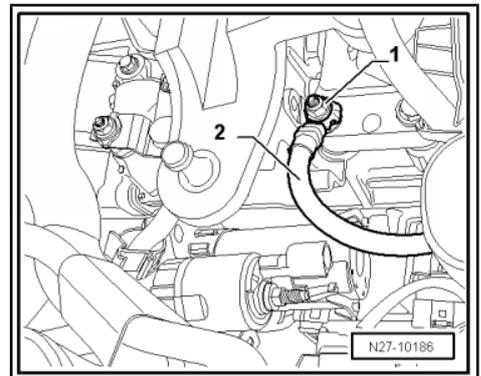


- Remove nut of earth wire -1- and place end of earth wire -2- to one side.
- Remove starter -B- from vehicle upwards.

Installing

Install in the reverse order of removal. When doing this, note the following:

- Tighten threaded connections to specified torques
=> [page 14](#) .

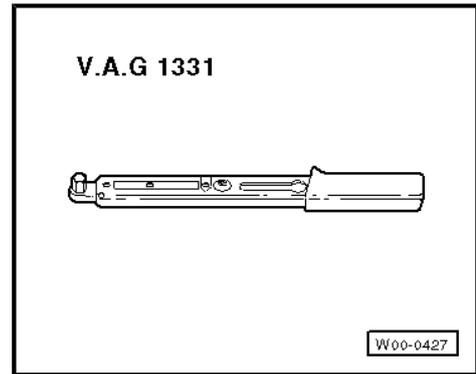


6.2.3 Vehicles with 1.6l FSI engine

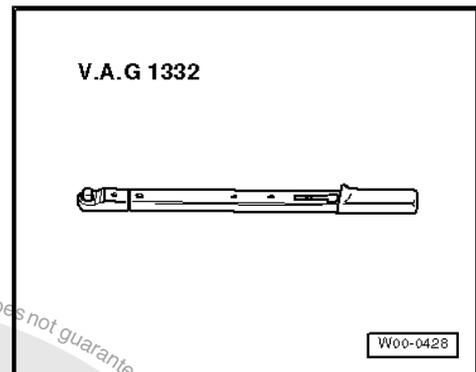
Special tools and workshop equipment required



- ◆ Torque wrench -V.A.G 1331-



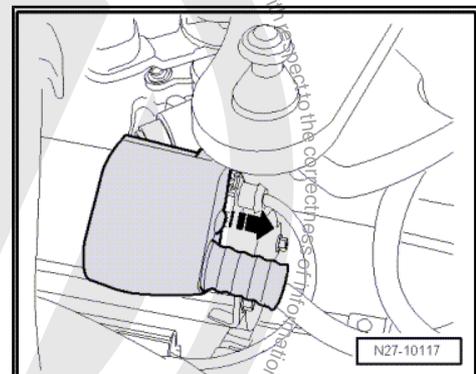
- ◆ Torque wrench -V.A.G 1332-



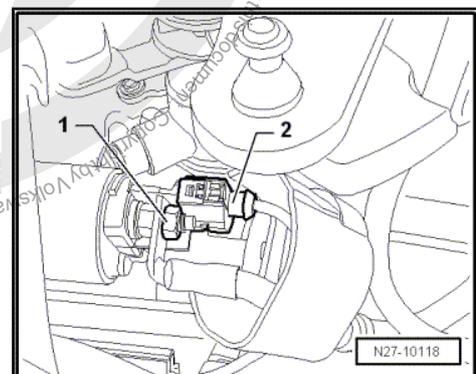
Carry out following procedures:

Removing

- Disconnect battery -A- → [page 4](#) .
- Slide protective cap in direction of -arrow- off solenoid switch.

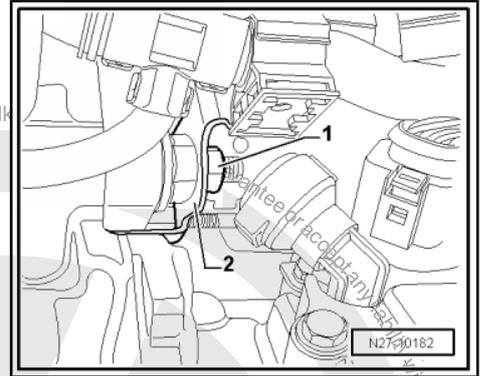


- Unscrew positive wire 1- and disconnect connector from terminal 50 -2-.
- Remove noise insulation ← General body repairs, exterior;
Rep. gr. 50 .

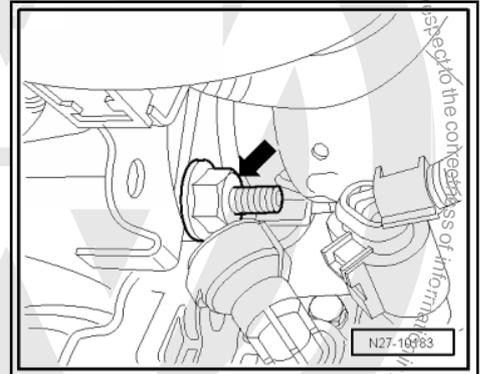




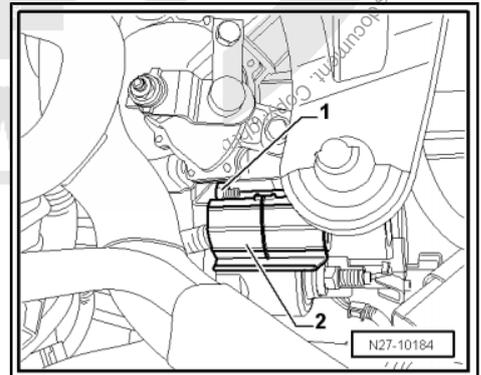
- Remove nut -1- from lower starter bolt.
- Remove wiring retainer -2-.



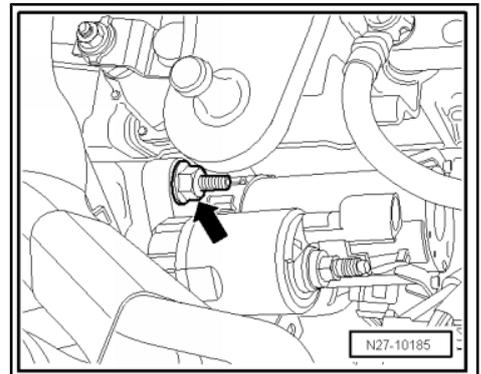
- Remove lower bolt -arrow- from starter.



- Remove nut -1- from upper starter bolt.
- Remove wiring retainer -2-.



- Remove upper bolt -arrow- from starter.



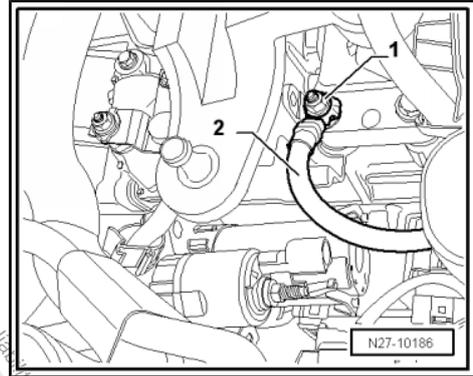


- Remove nut of earth wire -1- and place end of earth wire -2- to one side.
- Remove starter -B- from vehicle upwards.

Installing

Install in the reverse order of removal. When doing this, note the following:

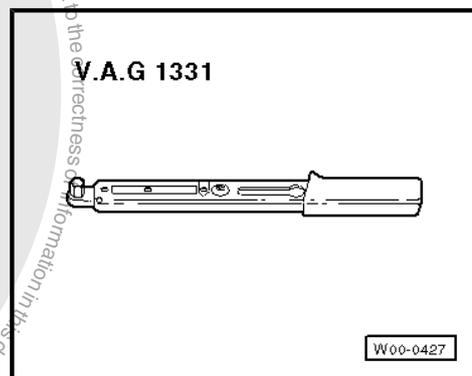
- Tighten threaded connections to specified torques
⇒ [page 14](#) .



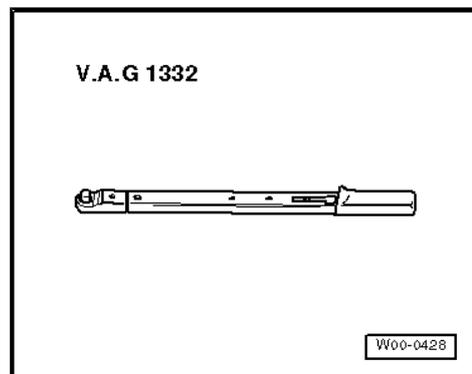
6.2.4 Vehicles with 2.0l FSI engine

Special tools and workshop equipment required

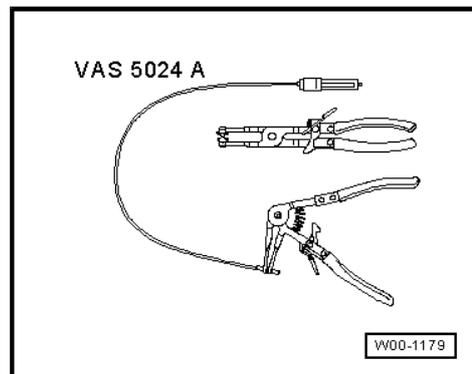
- ◆ Torque wrench -V.A.G 1331-



- ◆ Torque wrench -V.A.G 1332-



- ◆ Spring-type clip pliers -VAS 5024A-



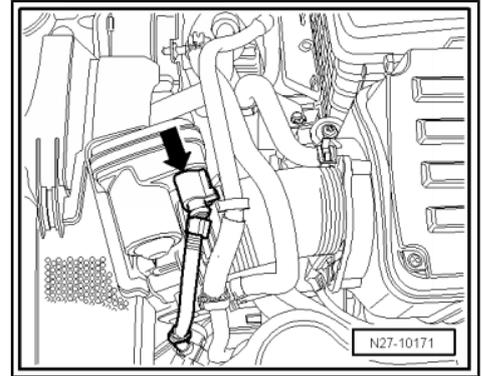
Carry out following procedures:

Removing

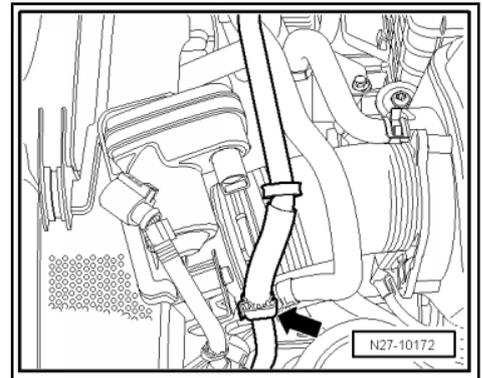
- Disconnect battery -A- ⇒ [page 4](#) .



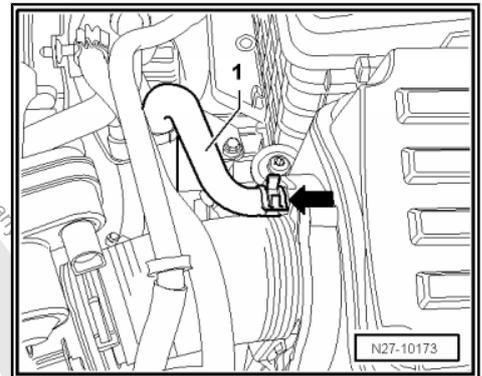
- Disconnect connector -arrow-.



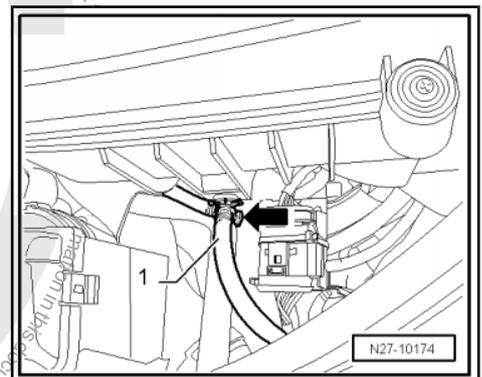
- Unclip vacuum hose out of retainer -arrow-.



- Loosen spring-type clip -arrow- from hose -1- using spring-type clip pliers -VAS 5024A-.
- Pull hose -1- off air filter housing.

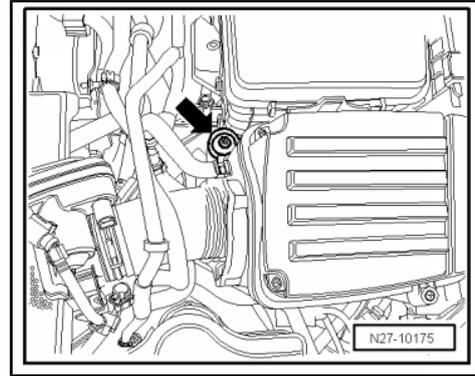


- Open retainer -arrow- on front of air filter housing and remove line -1-.

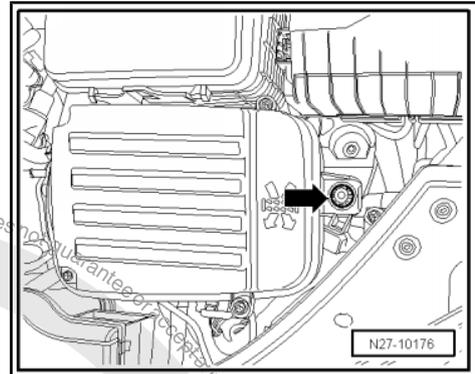




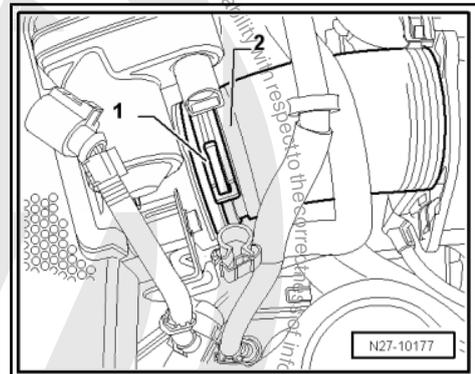
- Remove bolt of air filter housing -arrow-.



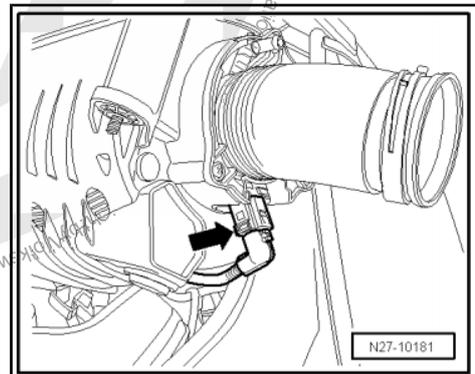
- Pull air filter housing upwards on right-hand side out of rubber mounting -arrow-.



- Loosen spring-type clip -1- using spring-type clip pliers -VAS 5024A- .
- Pull hose -2- off connection.
- Carefully lift up air filter housing out of vehicle as far as wiring allows.

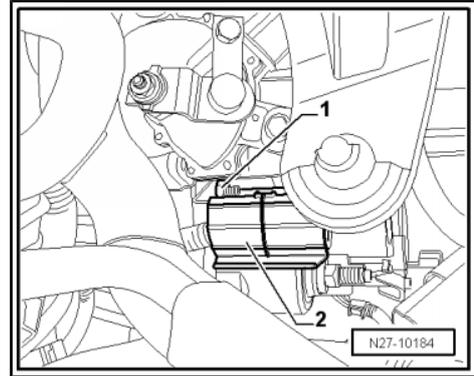


- Disconnect connector -arrow- on rear of air filter housing.

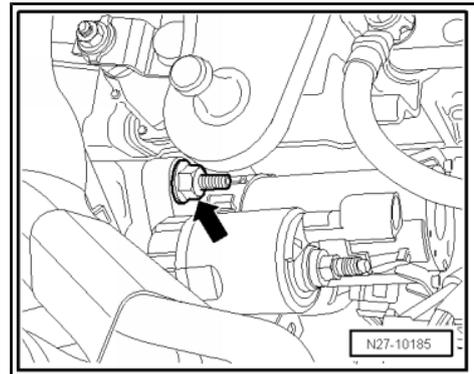




- Remove nut -1- from upper starter bolt.
- Remove wiring retainer -2-.



- Remove upper bolt -arrow- from starter.

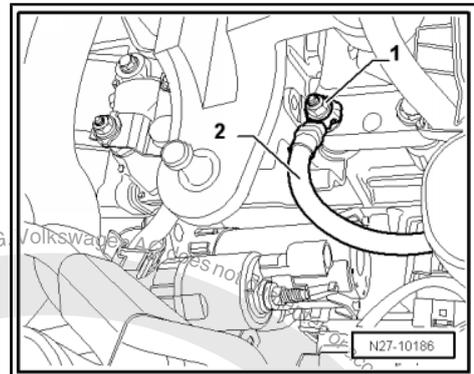


- Remove nut of earth wire -1- and place end of earth wire -2- to one side.
- Remove starter -B- from vehicle upwards.

Installing

Install in the reverse order of removal. When doing this, note the following:

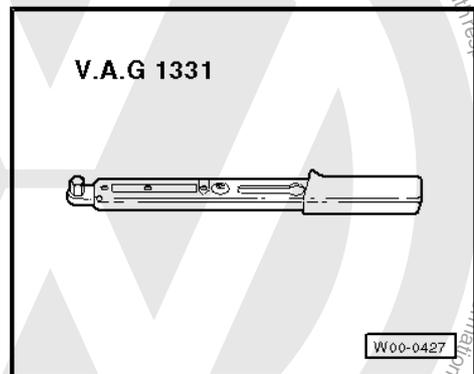
- Tighten threaded connections to specified torques
⇒ [page 14](#) .



6.2.5 Vehicles with 2.5l petrol engine

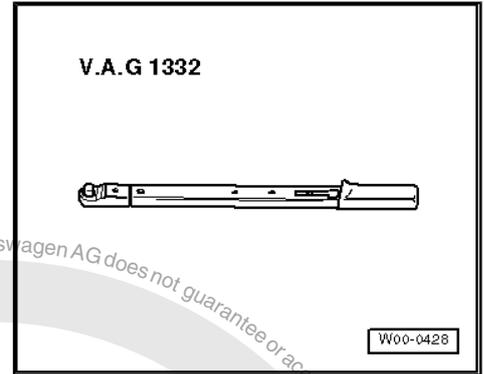
Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-

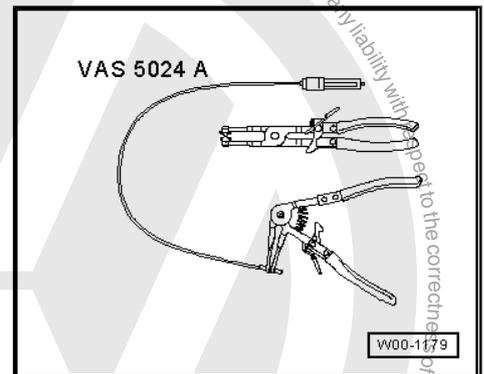




- ◆ Torque wrench -V.A.G 1332-



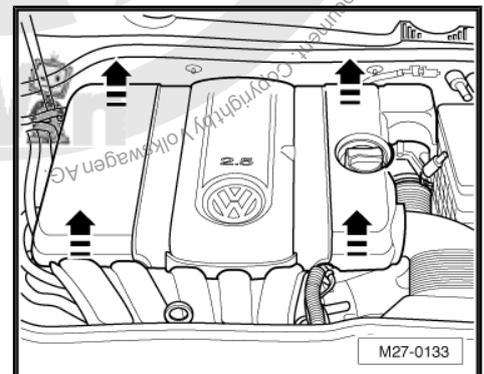
- ◆ Spring-type clip pliers -VAS 5024A-



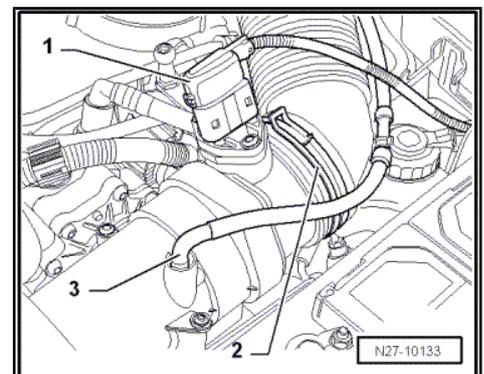
Carry out following procedures:

Removing

- Disconnect battery -A- ⇒ [page 4](#)
- Pull engine cover off upwards -arrows-.

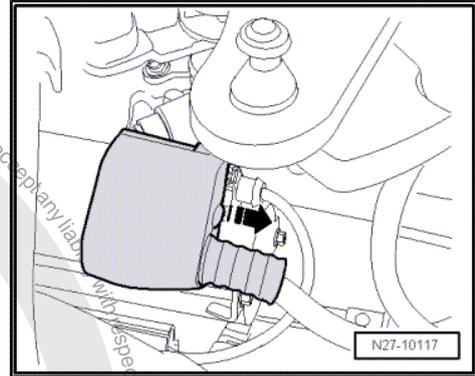


- Separate connector -1-, release spring-type clip -2- with spring-type clip pliers -VAS 5024A- and pull off vacuum hoses -3-.
- Pull air filter housing upwards out of brackets and remove.

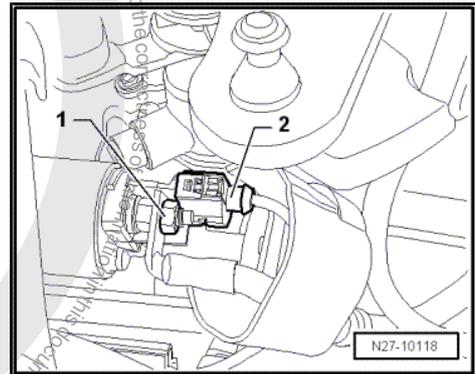




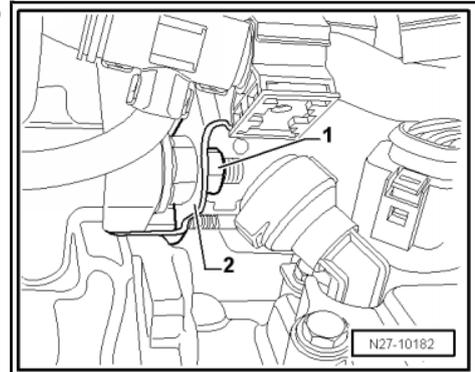
- Push down protective cap in direction of -arrow- from solenoid switch.



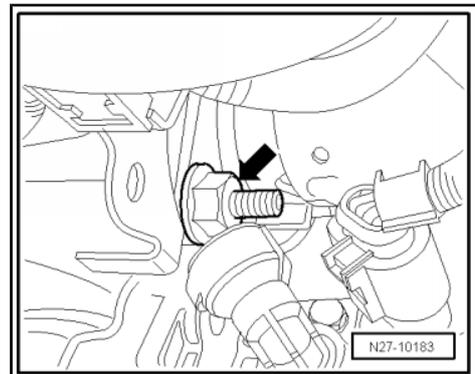
- Unscrew positive wire -1- and disconnect connector from terminal 50 -2-.
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 .



- Remove nut -1- from lower starter bolt.
- Remove wiring retainer -2-.

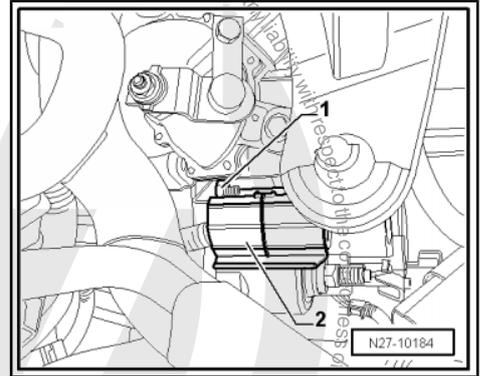


- Remove lower bolt -arrow- from starter.





- Remove nut -1- from upper starter bolt.
- Remove wiring retainer -2-.

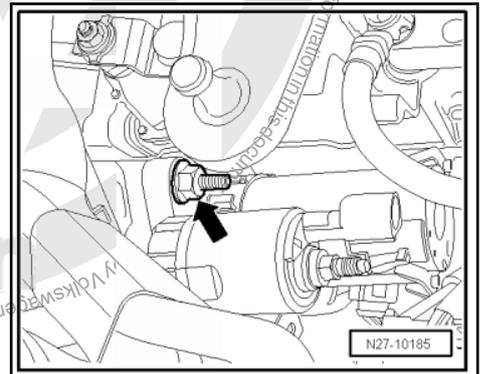


- Remove upper bolt -arrow- from starter.
- Lower starter -B- out of vehicle.

Installing

Install in the reverse order of removal. When doing this, note the following:

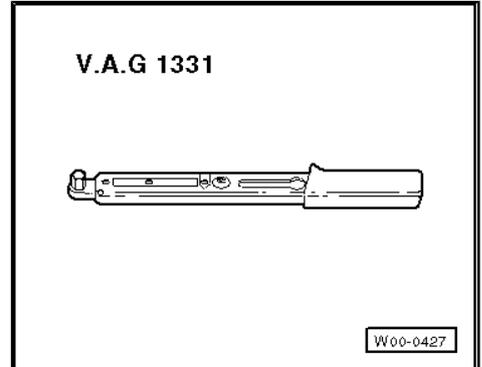
- Tighten threaded connections to specified torques
=> [page 14](#) .



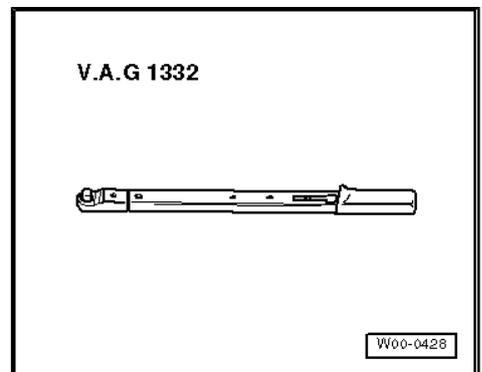
6.2.6 Vehicles with 1.9l diesel engine

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-



- ◆ Torque wrench -V.A.G 1332-





◆ Spring-type clip pliers -VAS 5024A-

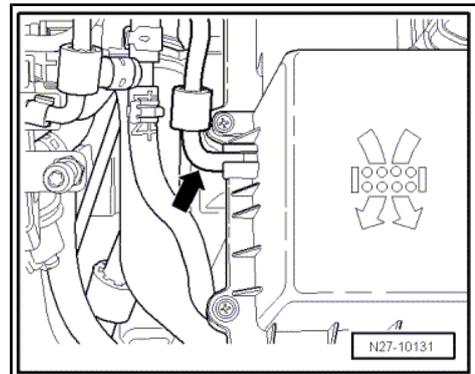
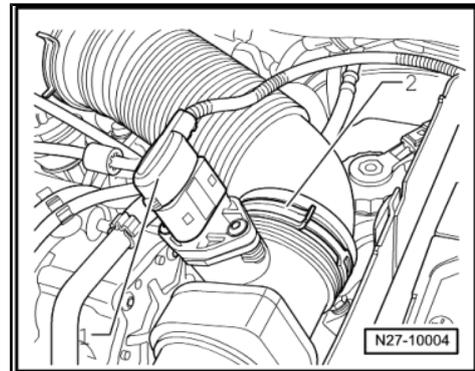
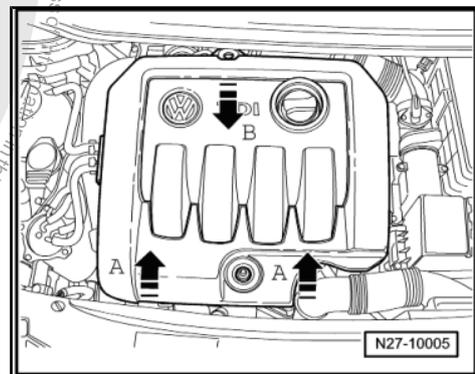
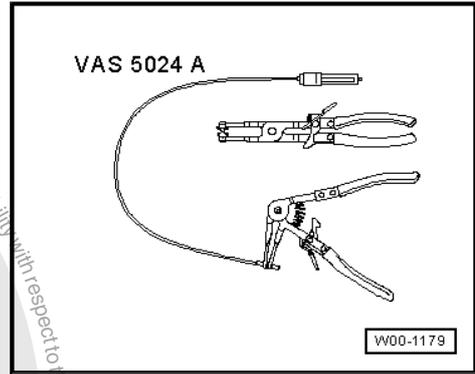
Carry out following procedures:

Removing

- Disconnect battery -A- → [page 4](#) .
- Pull engine cover upwards -arrows A- and forwards -arrow B-.

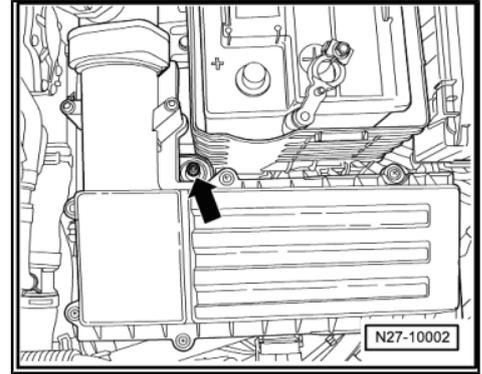
- Disconnect connector -1- and release spring-type clip -2- using spring type clip pliers -VAS 5024A- .

- Pull vacuum hose -arrow- off air filter housing.

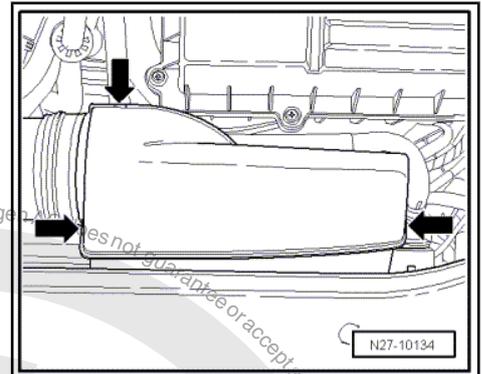




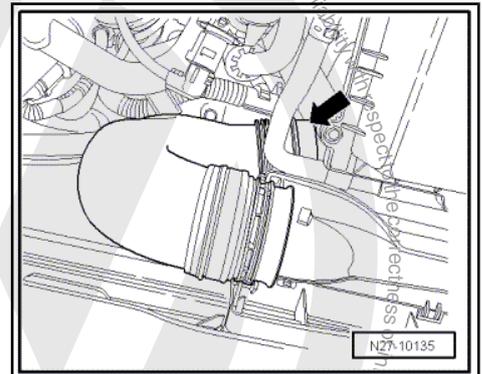
- Remove bolt of air filter housing -arrow-.



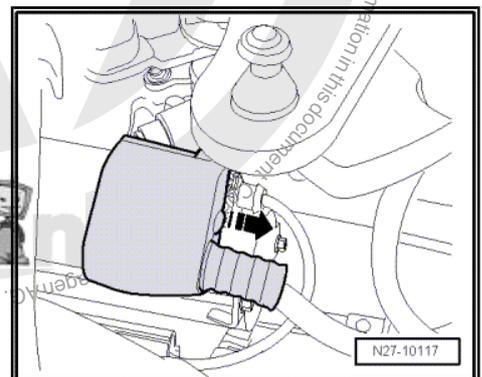
- Release locking lugs -arrows- and take off cover.



- Pull hose -arrow- off air filter housing and remove.
- Pull air filter housing upwards out of brackets and remove.

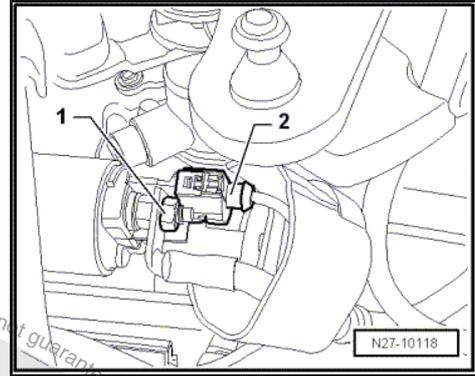


- Push down protective cap in direction of -arrow- from solenoid switch.

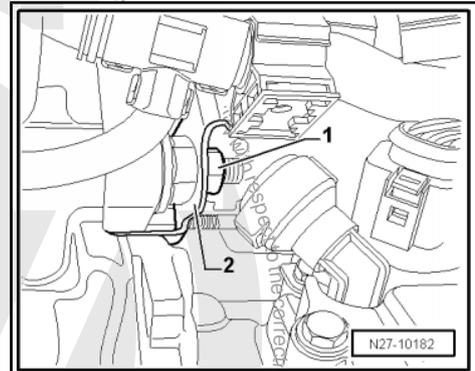




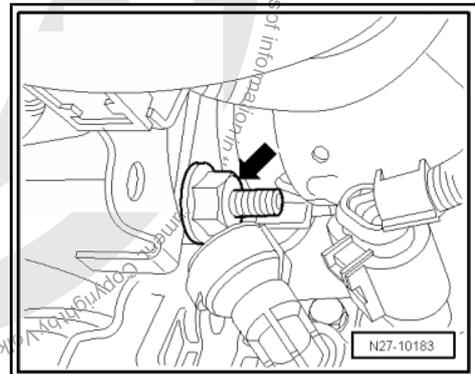
- Unscrew positive wire -1- and disconnect connector from terminal 50 -2-.
- Remove noise insulation => General body repairs, exterior; Rep. gr. 50 .



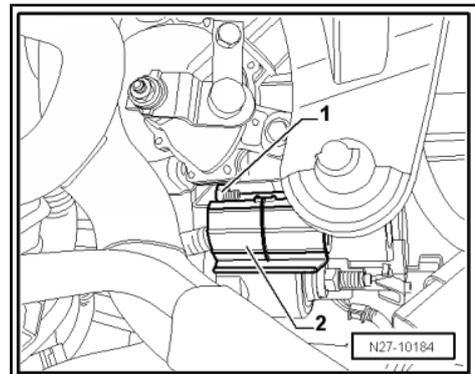
- Remove nut -1- from lower starter bolt.
- Remove wiring retainer -2-.



- Remove lower bolt -arrow- from starter.

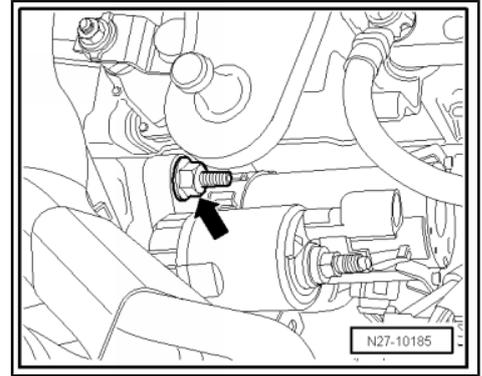


- Remove nut -1- from upper starter bolt.
- Remove wiring retainer -2-.





- Remove upper bolt -arrow- from starter.

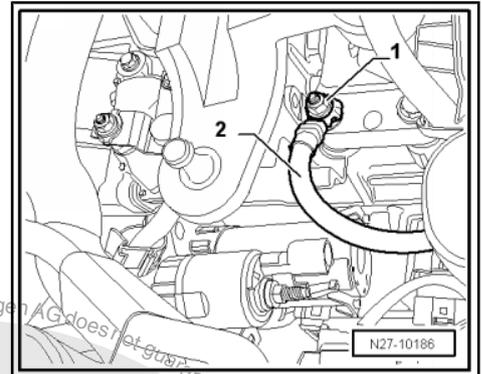


- Remove nut of earth wire -1- and place end of earth wire -2- to one side in direction of battery -A- .
- Remove starter -B- from vehicle upwards.

Installing

Install in the reverse order of removal. When doing this, note the following:

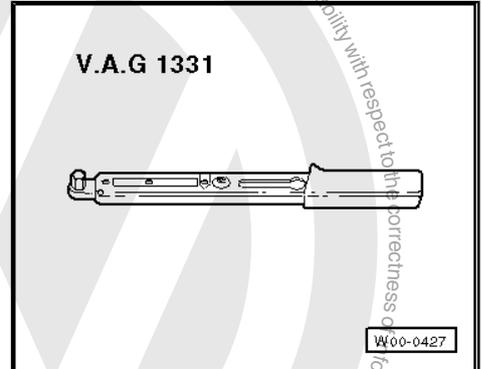
- Tighten threaded connections to specified torques
=> [page 14](#) .



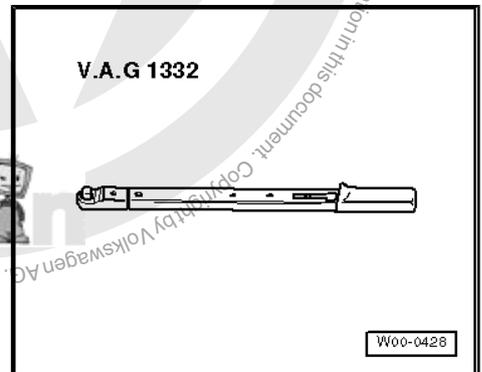
6.2.7 Vehicles with 2.0l SDI engine

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-

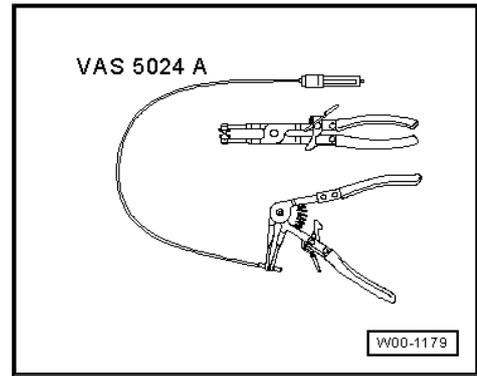


- ◆ Torque wrench -V.A.G 1332-





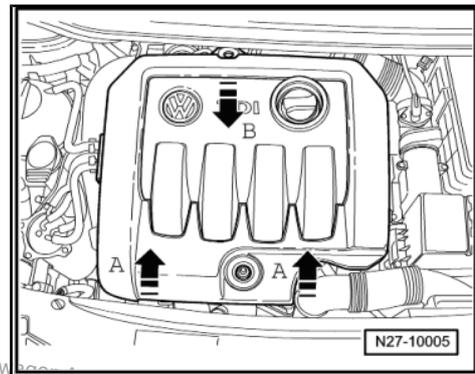
- ◆ Spring-type clip pliers -VAS 5024A-



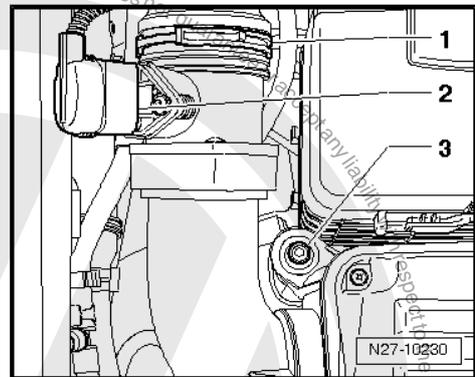
Carry out following procedures:

Removing

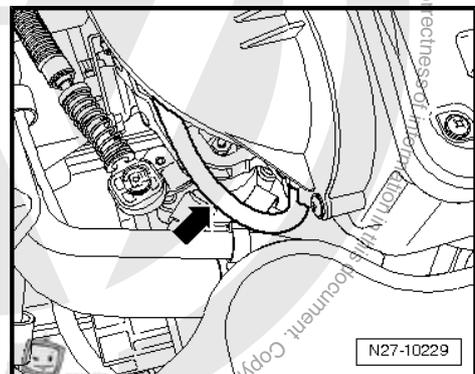
- Disconnect battery -A- → [page 4](#) .
- Pull engine cover upwards -arrows A- and forwards -arrow B-.



- Loosen spring-type clip -1- using spring-type clip pliers -VAS 5024A- and disconnect connector -2-.
- Remove bolt -3-.

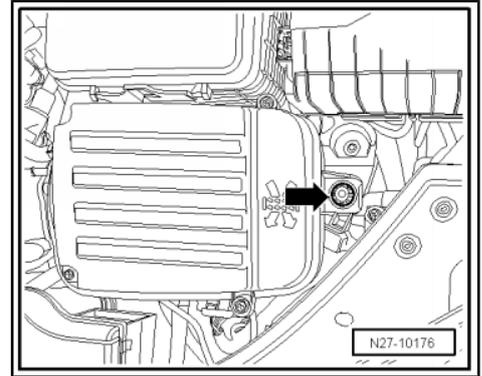


- Pull off vacuum hose -arrow-.

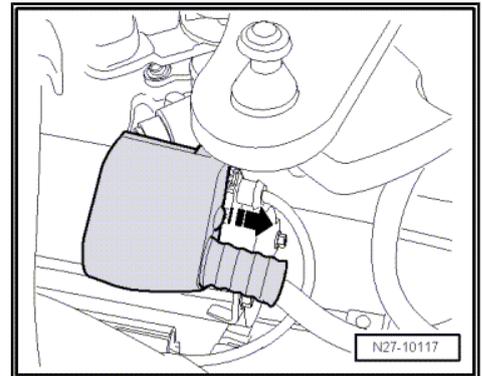




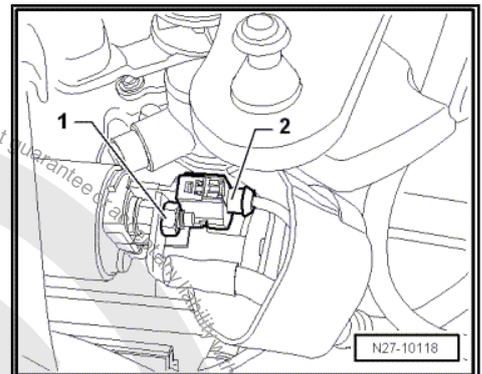
- Pull air filter housing upwards on right-hand side out of rubber mounting -arrow-.
- Take air filter housing out of vehicle.



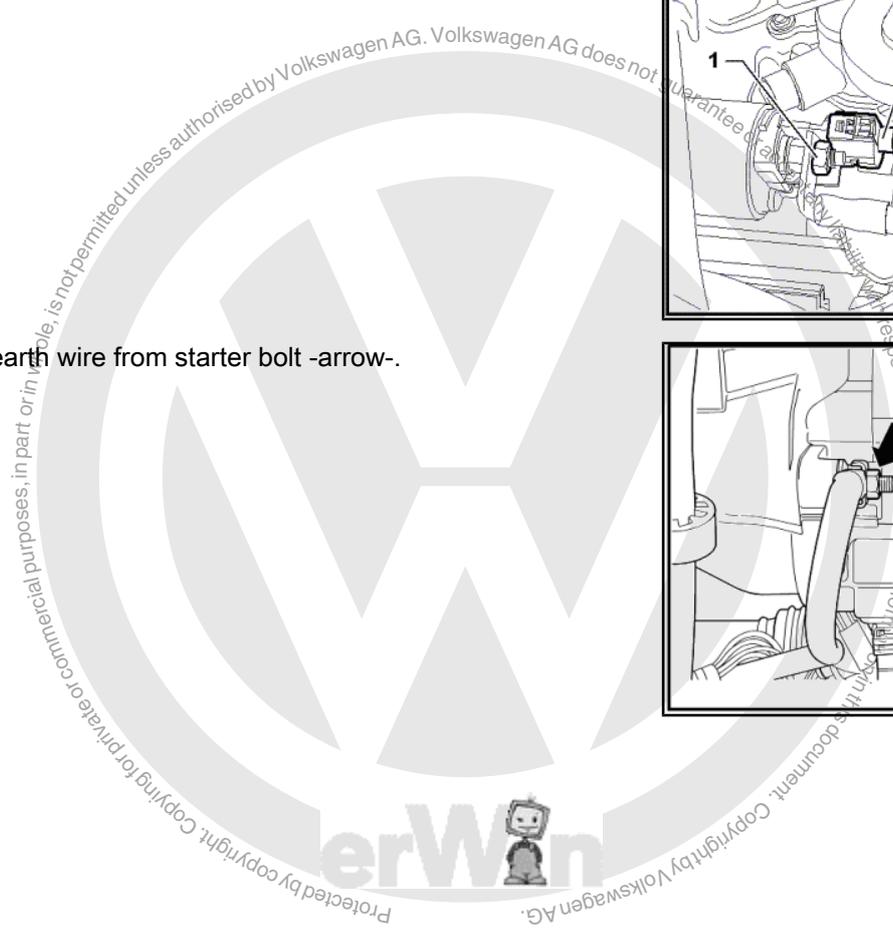
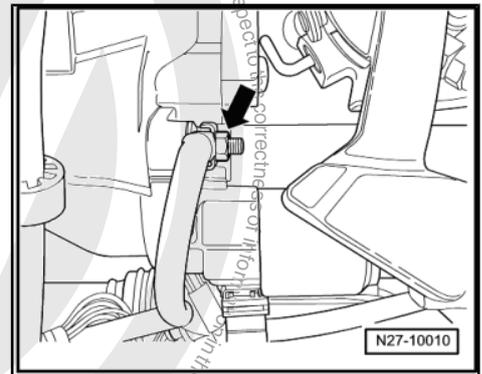
- Slide protective cap in direction of -arrow- off solenoid switch.



- Unscrew positive wire -1- and disconnect connector from terminal 50 -2-.

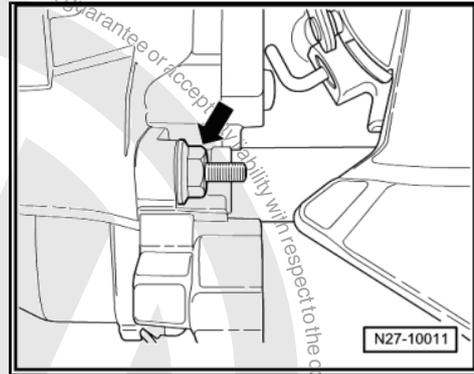


- Unscrew earth wire from starter bolt -arrow-.

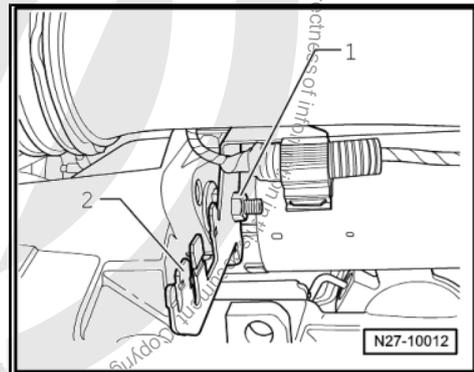




- Unscrew starter bolt -arrow-.
- Remove noise insulation => General body repairs, exterior;
Rep. gr. 50 .



- Remove nut -1- from lower starter bolt.
- Remove wiring retainer -2-.

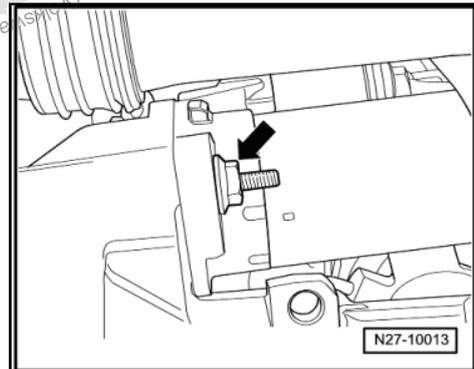


- Unscrew starter bolt -arrow-.
- Lower starter -B- out of vehicle.

Installing

Install in the reverse order of removal. When doing this, note the following:

- Tighten threaded connections to specified torques
=> [page 14](#) .





6.3 Removing and installing starter -B- (DSG)

6.3.1 Assembly overview - starter -B-

1 - Starter -B-

- ☐ Checking ⇒ [page 13](#)

2 - Battery positive wire connection to starter -B-

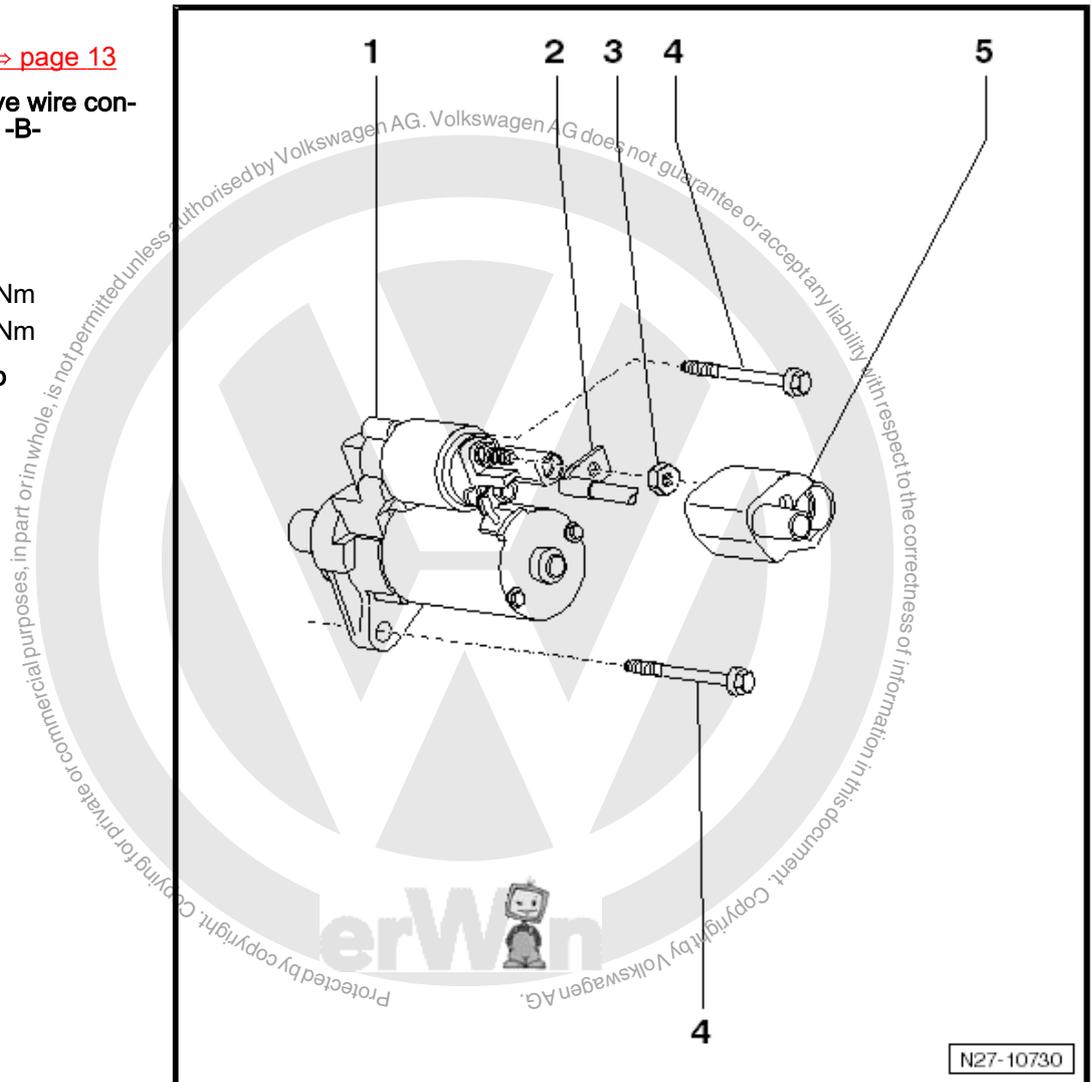
3 - Nut

- ☐ 20 Nm

4 - Bolt

- ☐ M12 = 75 Nm
- ☐ M10 = 40 Nm

5 - Protective cap



Not illustrated

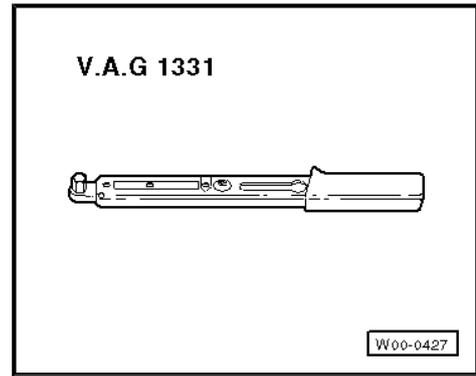
- ◆ Air filter housing bolt to body: 10 Nm

6.3.2 Vehicles with 1.4I TSI engine (90kW)

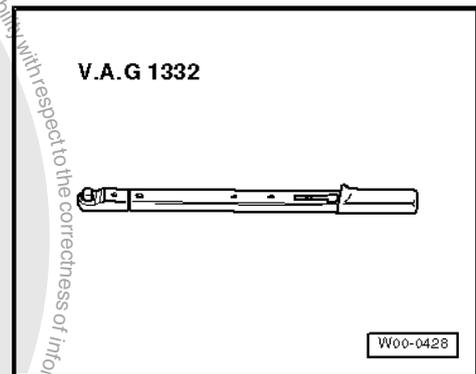
Special tools and workshop equipment required



- ◆ Torque wrench -V.A.G 1331-



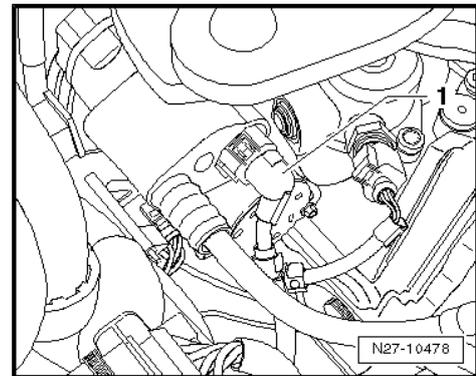
- ◆ Torque wrench -V.A.G 1332-



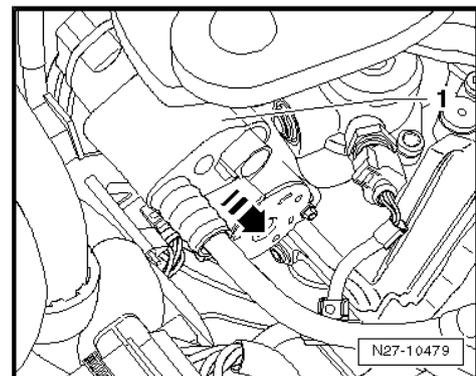
Carry out following procedures:

Removing

- Disconnect battery -A- ⇒ [page 4](#) .
- Remove air filter housing ⇒ Engine; Rep. gr. 24 .
- Release and disconnect connector -1-

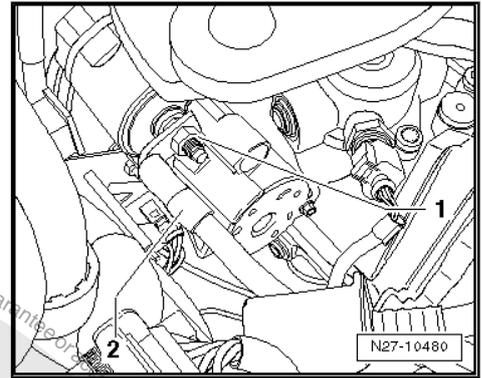


- Slide protective cap -1- off solenoid switch in direction of -arrow-.

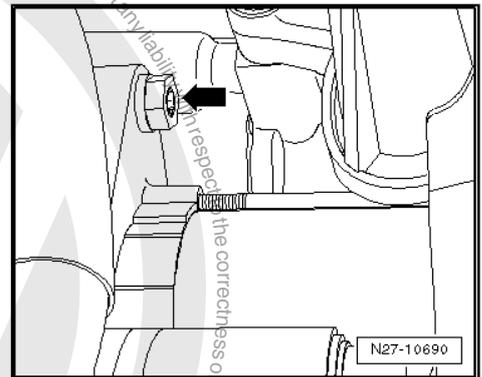




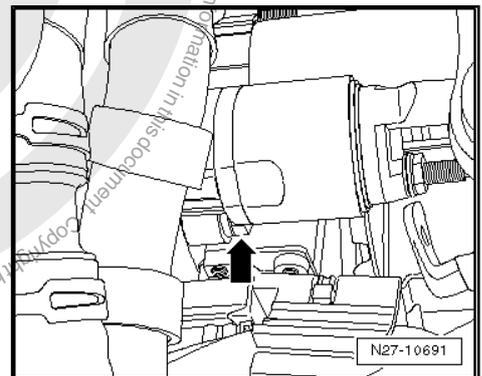
- Unscrew nut -1- and remove positive wire -2- from connector thread of solenoid switch.



- Remove upper bolt -arrow- from starter.



- Remove lower bolt -arrow- from starter.
- Lift starter -B- -1- upwards out of vehicle.



Installing

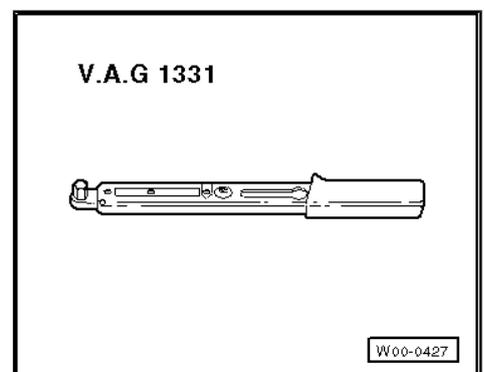
Install in the reverse order of removal. When doing this, note the following:

- Tighten threaded connections to specified torques
⇒ [page 35](#) .

6.3.3 Vehicles with 1.4l TSI engine (103kW/125kW)

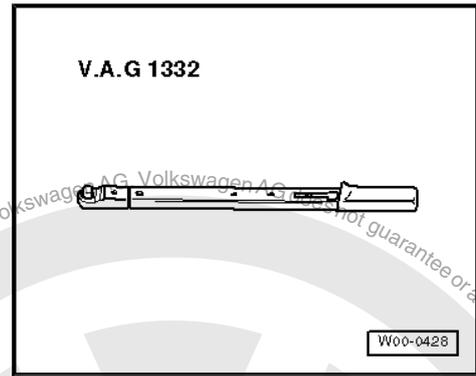
Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-





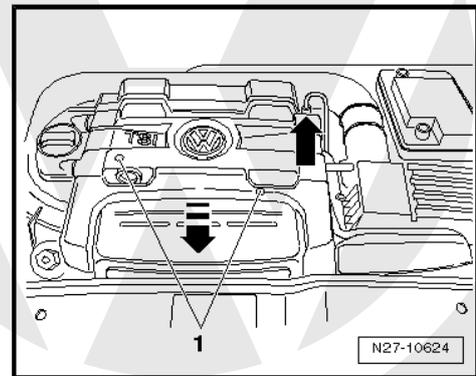
- ◆ Torque wrench -V.A.G 1332-



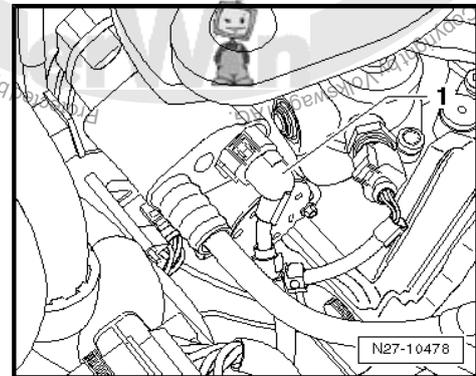
Carry out following procedures:

Removing

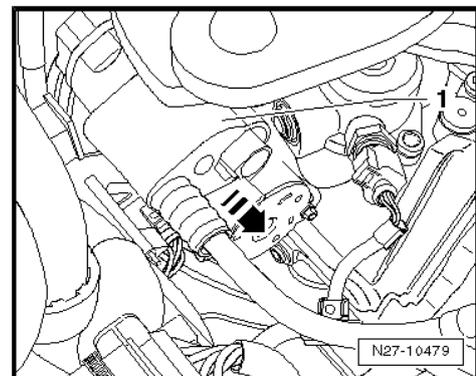
- Disconnect battery -A- → [page 4](#) .
- Pull off vacuum hose at engine cover panel -arrow-.
- Pull off engine cover upwards from its rubber mountings -1- and remove it forwards in -direction of arrow-.
- Remove air filter housing → Engine; Rep. gr. 24 .



- Release and disconnect connector -1-.

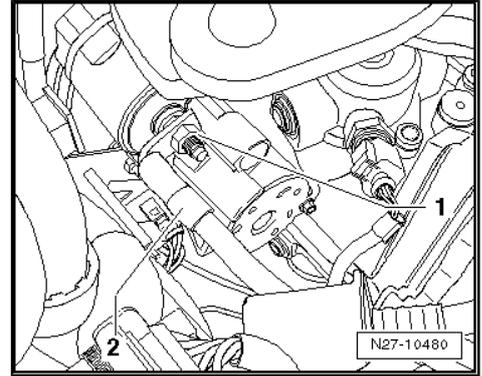


- Slide protective cap -1- off solenoid switch in direction of -arrow-.

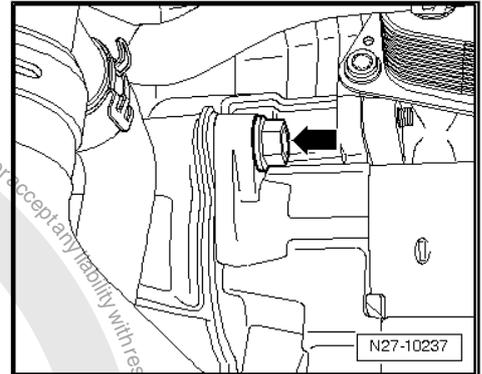




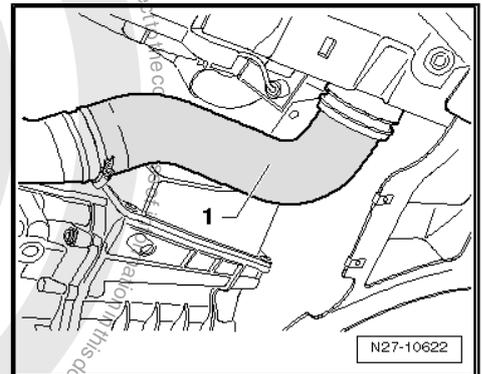
- Unscrew nut -1- and remove positive wire -2- from connector thread of solenoid switch.



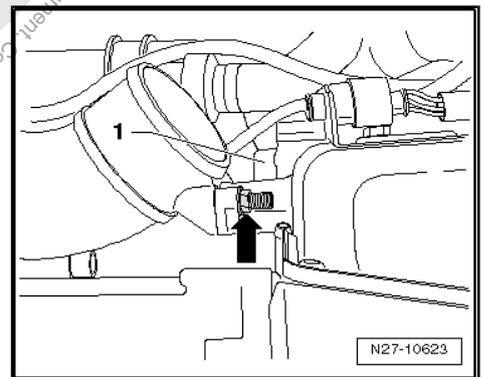
- Remove upper bolt -arrow- from starter.
- Remove noise insulation => General body repairs, exterior; Rep. gr. 50 .



- Remove charge air hose -1-.



- Remove lower bolt -arrow- from starter.
- Lift starter -B- -1- upwards out of vehicle.



Installing

Install in the reverse order of removal! When doing this, note the following:

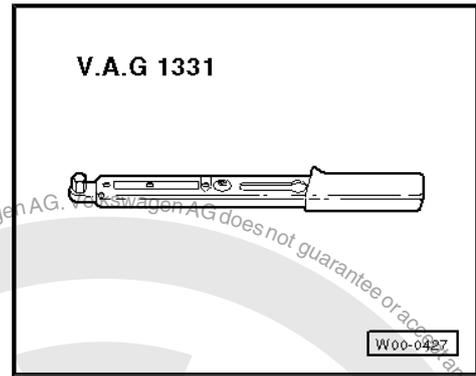
- Tighten threaded connections to specified torques => [page 35](#) .

6.3.4 Vehicles with 1.6l petrol engine

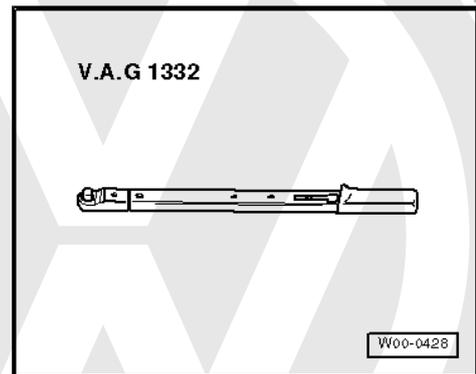
Special tools and workshop equipment required



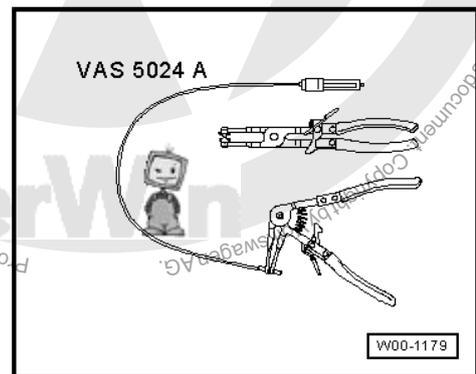
- ◆ Torque wrench -V.A.G 1331-



- ◆ Torque wrench -V.A.G 1332-



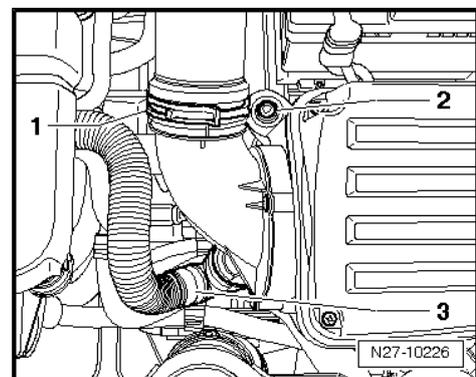
- ◆ Spring-type clip pliers -VAS 5024A-



Carry out following procedures:

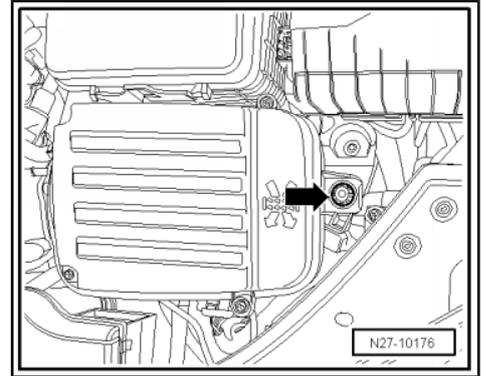
Removing

- Disconnect battery -A- → [page 4](#) .
- Loosen spring-type clip -1- using spring-type clip pliers -VAS 5024A- and remove bolt -2-.
- Release hose -3- and pull it off the air filter housing.

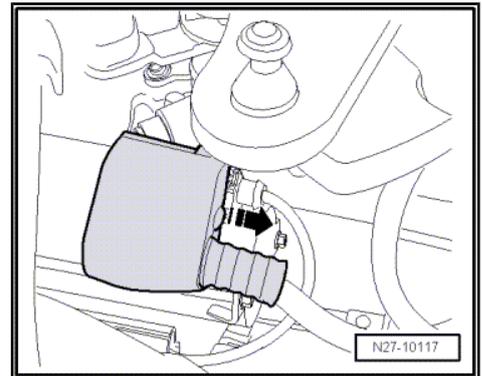




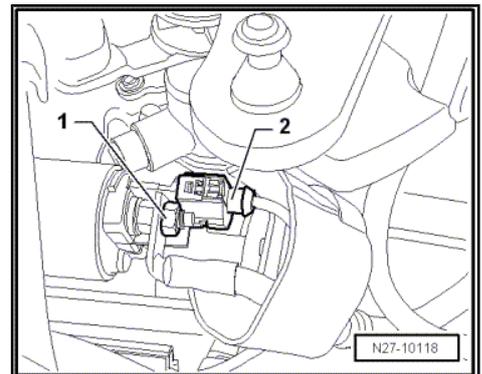
- Pull air filter housing upwards on right-hand side out of rubber mounting -arrow-.
- Take air filter housing out of vehicle.



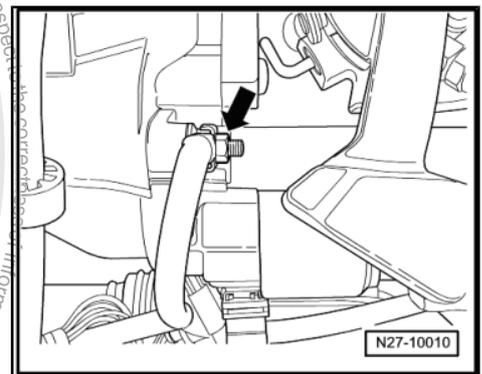
- Slide protective cap in direction of -arrow- off solenoid switch.



- Unscrew positive wire -1- and disconnect connector from terminal 50 -2-.

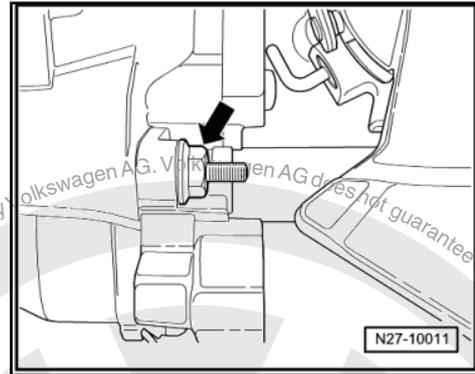


- Unscrew earth wire from starter bolt -arrow-.

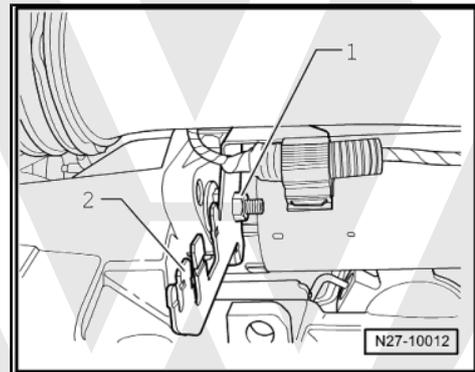




- Unscrew starter bolt -arrow-.
- Remove noise insulation => General body repairs, exterior;
Rep. gr. 50 .



- Remove nut -1- from lower starter bolt.
- Remove wiring retainer -2-.

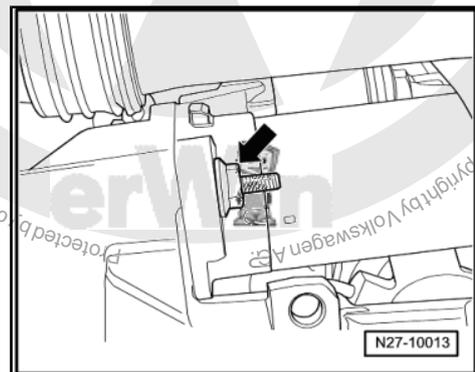


- Unscrew starter bolt -arrow-.
- Lower starter -B- out of vehicle.

Installing

Install in the reverse order of removal. When doing this, note the following:

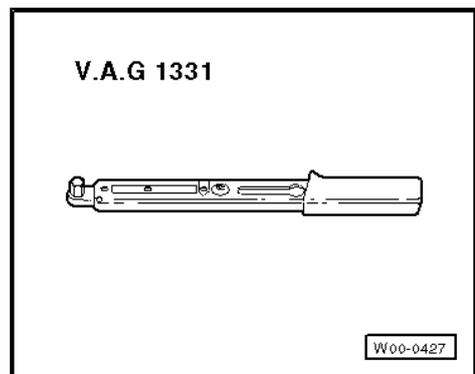
- Tighten threaded connections to specified torques
=> [page 35](#) .



6.3.5 Vehicles with 2.0l FSI engine

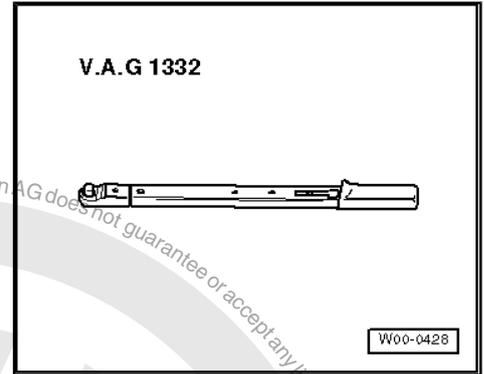
Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-

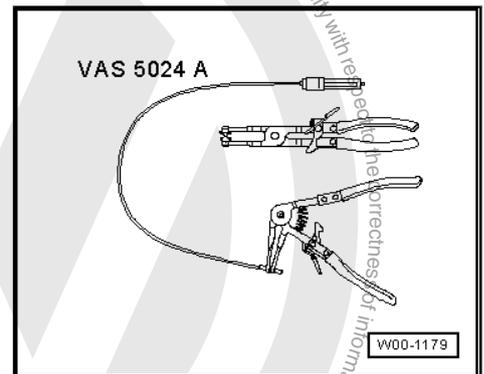




- ◆ Torque wrench -V.A.G 1332-



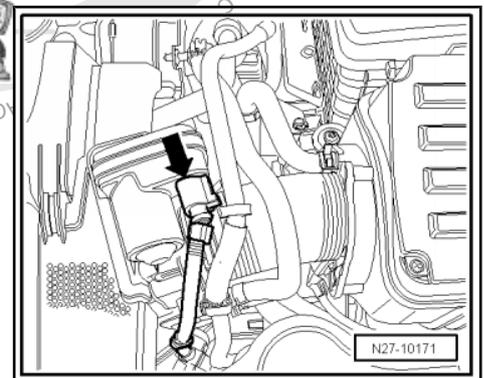
- ◆ Spring-type clip pliers -VAS 5024A-



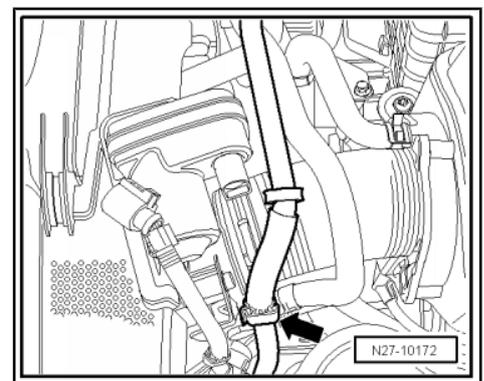
Carry out following procedures:

Removing

- Disconnect battery -A- => [page 4](#)
- Disconnect connector -arrow-

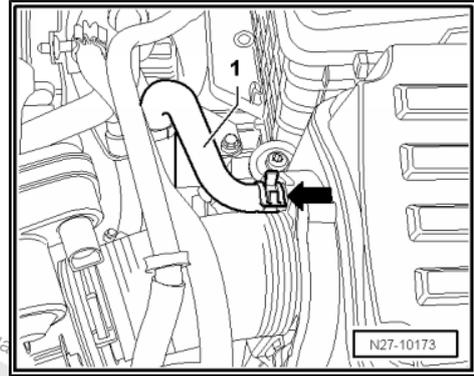


- Unclip vacuum hose out of retainer -arrow-

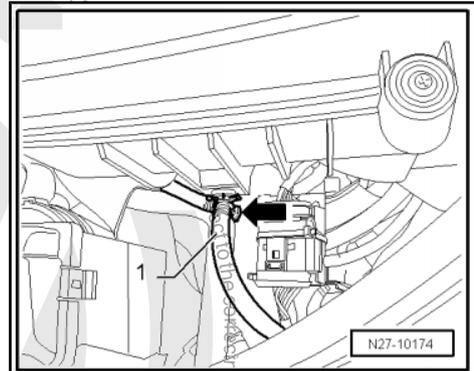




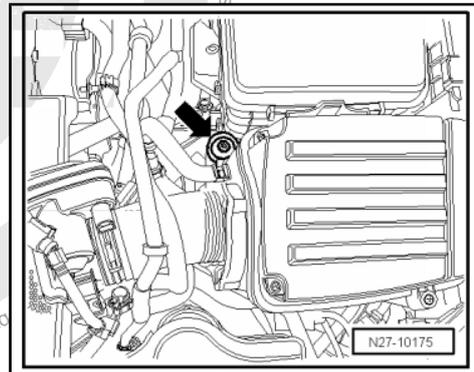
- Loosen spring-type clip -arrow- from hose -1- using spring-type clip pliers -VAS 5024A- .
- Pull hose -1- off air filter housing.



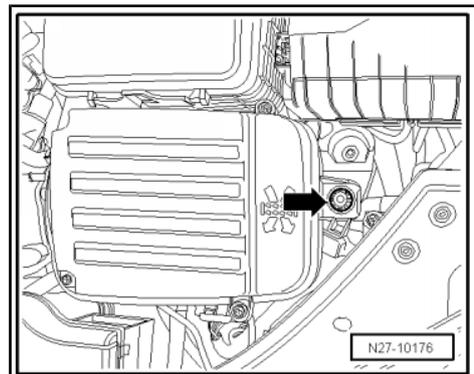
- Open retainer -arrow- on front of air filter housing and remove line -1-.



- Remove bolt of air filter housing -arrow-.

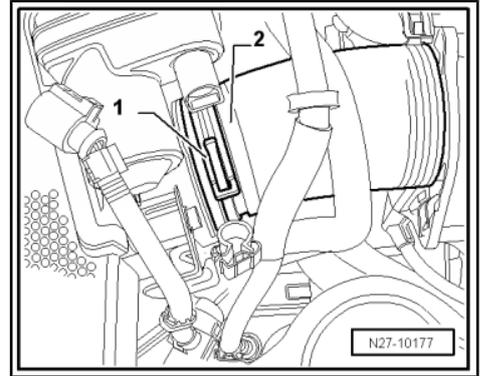


- Pull air filter housing upwards on right-hand side out of rubber mounting -arrow-.

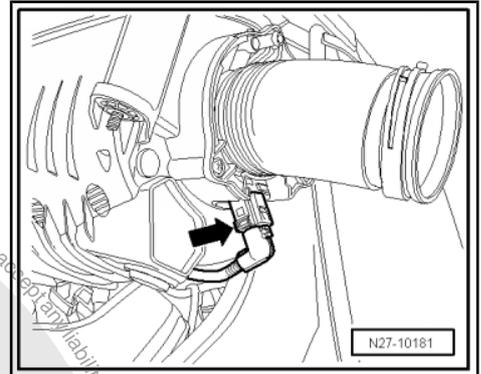




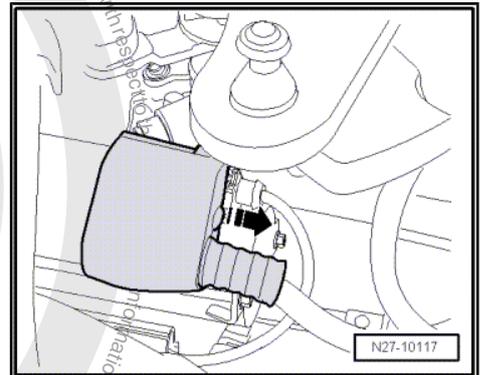
- Loosen spring-type clip -1- using spring-type clip pliers -VAS 5024A- .
- Pull hose -2- off connection.
- Carefully lift up air filter housing out of vehicle as far as wiring allows.



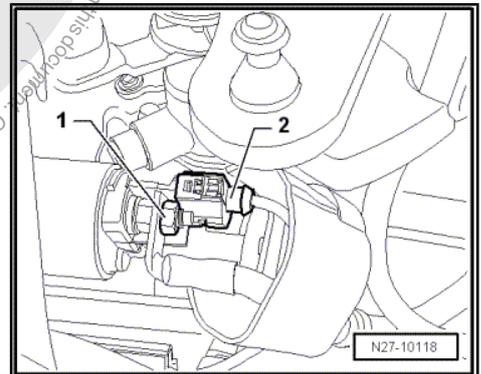
- Disconnect connector -arrow- on rear of air filter housing.



- Take air filter housing out of vehicle.
- Slide protective cap in direction of -arrow- off solenoid switch.

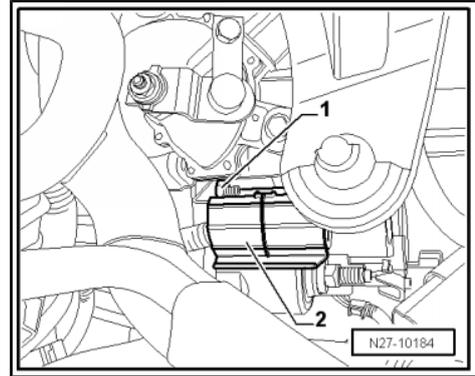


- Unscrew positive wire -1- and disconnect connector from terminal 50 -2-.

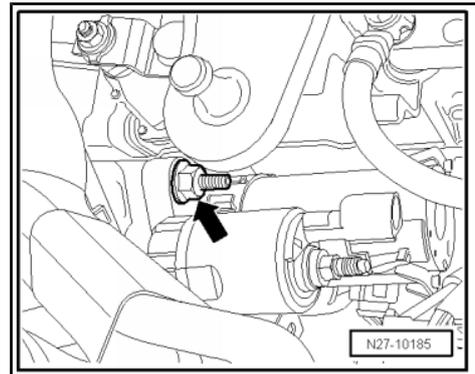




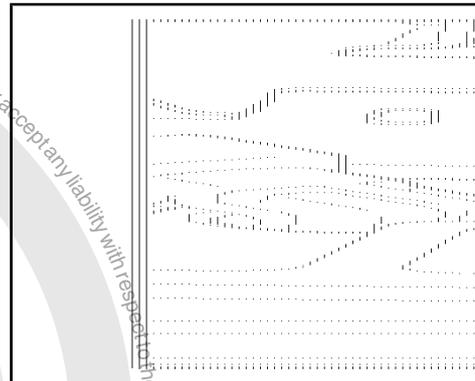
- Remove nut -1- from upper starter bolt.
- Remove wiring retainer -2-.



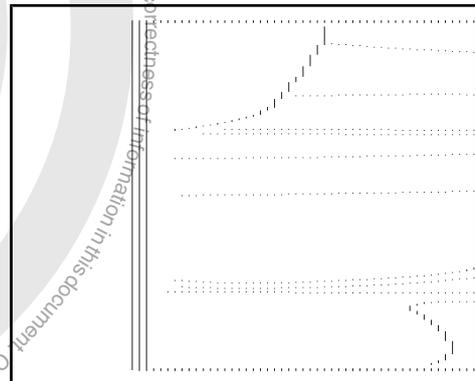
- Remove upper bolt -arrow- from starter.
- Remove noise insulation => General body repairs, exterior; Rep. gr. 50 .



- Disconnect connectors -arrows-.



- Remove nut -1- from lower starter bolt.
- Remove wiring retainer -2-.



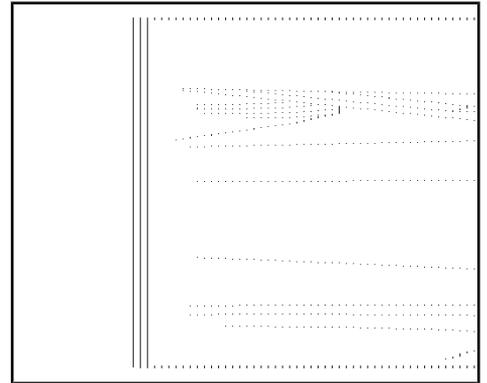


- Remove lower bolt -arrow- from starter.
- Lower starter -B- out of vehicle.

Installing

Install in the reverse order of removal. When doing this, note the following:

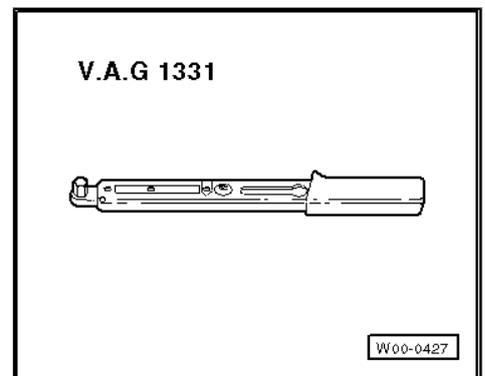
- Tighten threaded connections to specified torques
⇒ [page 35](#) .



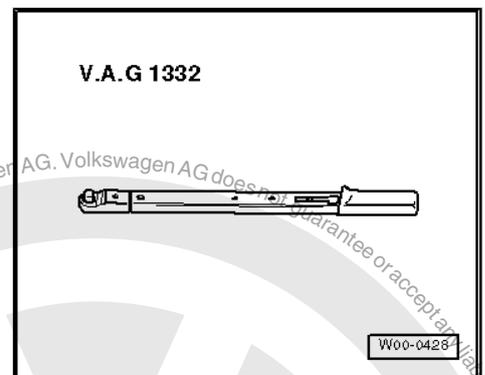
6.3.6 Vehicles with 2.0l TFSI engine

Special tools and workshop equipment required

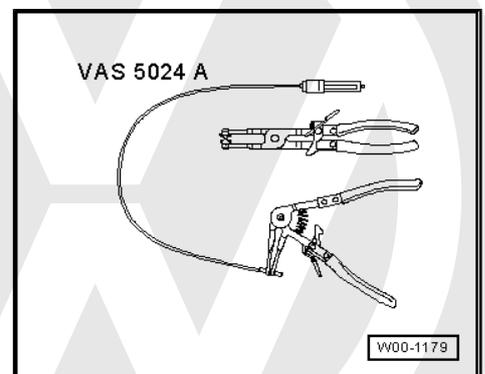
- ◆ Torque wrench -V.A.G 1331-



- ◆ Torque wrench -V.A.G 1332-



- ◆ Spring-type clip pliers -VAS 5024A-



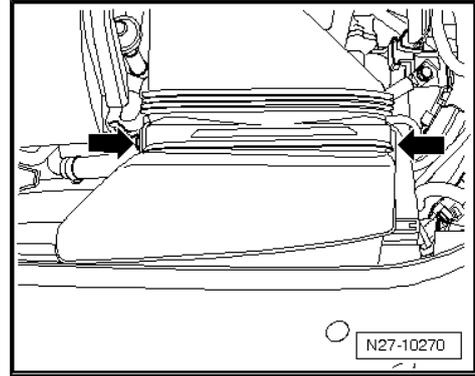
Carry out following procedures:

Removing

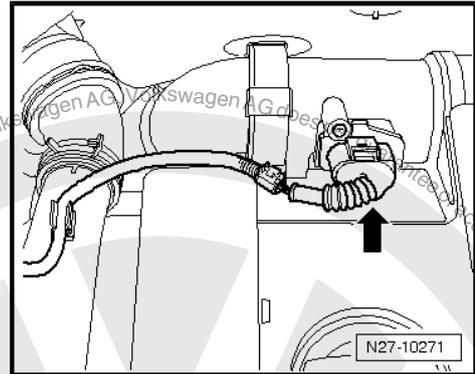
- Disconnect battery -A- ⇒ [page 4](#) .



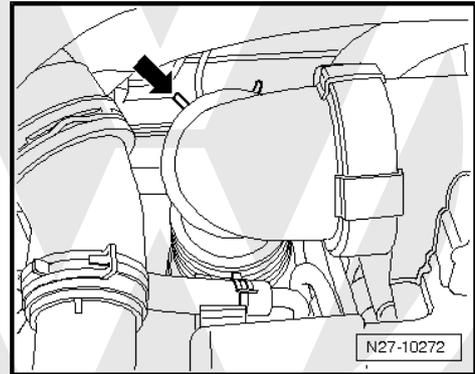
- Remove bolts -arrows-.



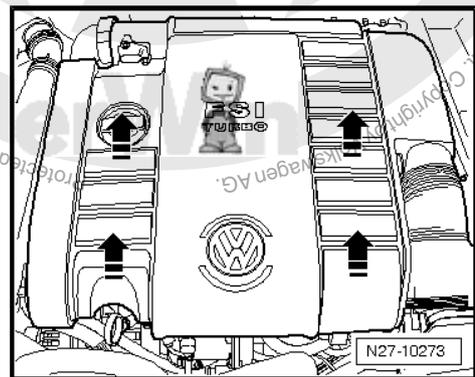
- Disconnect connector -arrow-.



- Loosen spring-type clips -arrow- using spring-type clip pliers -VAS 5024A- .

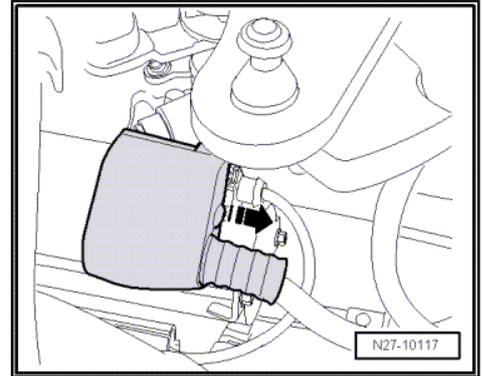


- Pull engine cover panel upwards -arrows-.

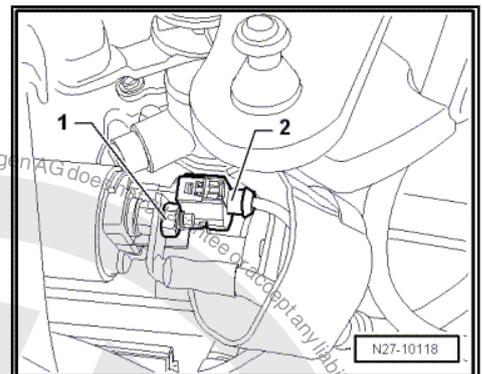




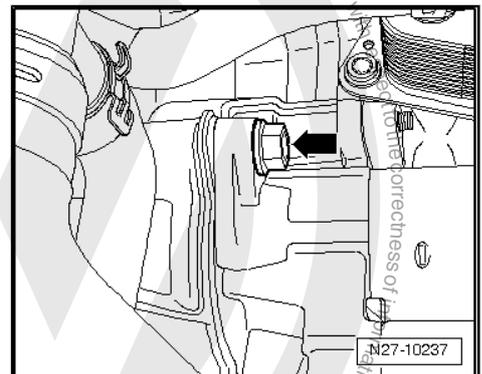
- Slide protective cap in direction of -arrow- off solenoid switch.



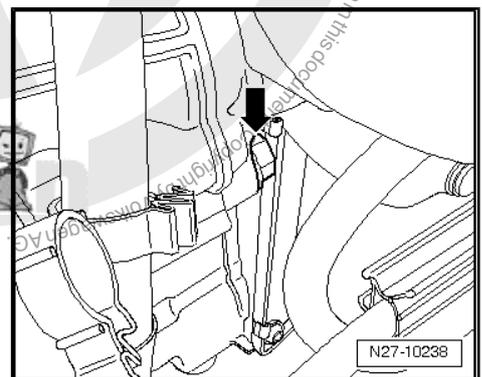
- Unscrew positive wire -1- and disconnect connector from terminal 50 -2-.



- Remove upper bolt -arrow- from starter.



- Remove lower bolt -arrow- from starter.
- Remove starter -B- from vehicle upwards.



Installing

Install in the reverse order of removal. When doing this, note the following:

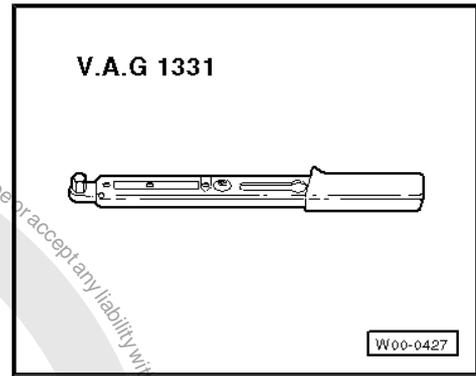
- Tighten threaded connections to specified torques
 ⇒ [page 35](#) .

6.3.7 Vehicles with 1.9l diesel engine

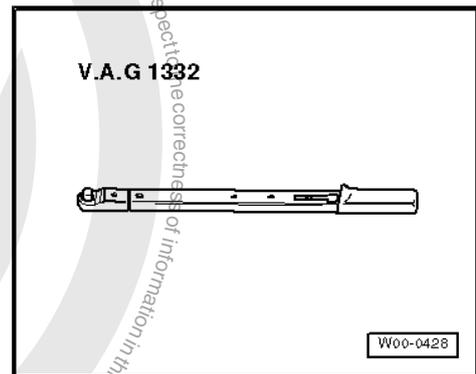
Special tools and workshop equipment required



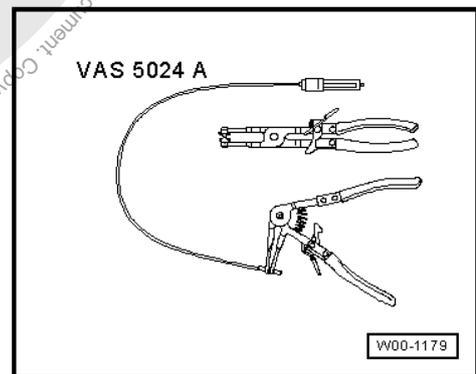
- ◆ Torque wrench -V.A.G 1331-



- ◆ Torque wrench -V.A.G 1332-



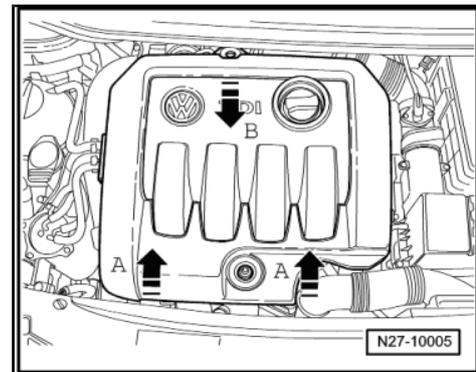
- ◆ Spring-type clip pliers -VAS 5024A-



Carry out following procedures:

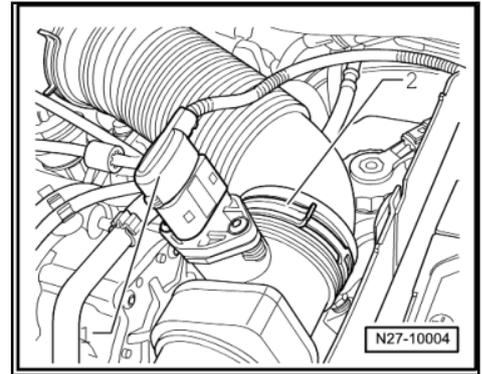
Removing

- Disconnect battery -A- → [page 4](#) .
- Pull engine cover upwards -arrows A- and forwards -arrow B-.

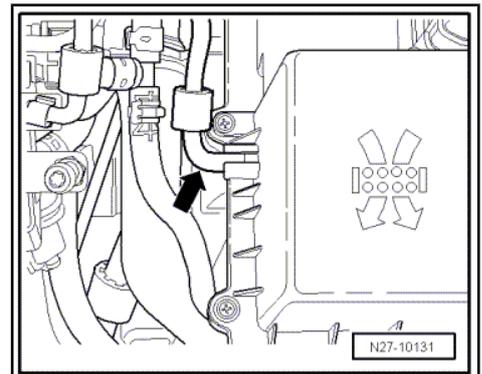




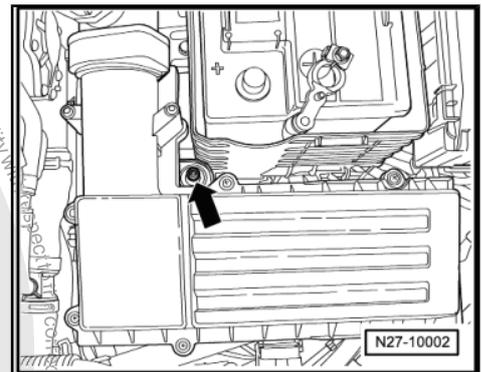
- Disconnect connector -1- and release spring-type clip -2- using spring type clip pliers -VAS 5024A- .



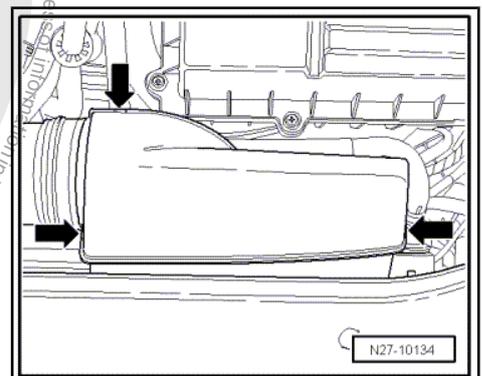
- Pull vacuum hose -arrow- off air filter housing.



- Remove bolt of air filter housing -arrow-.

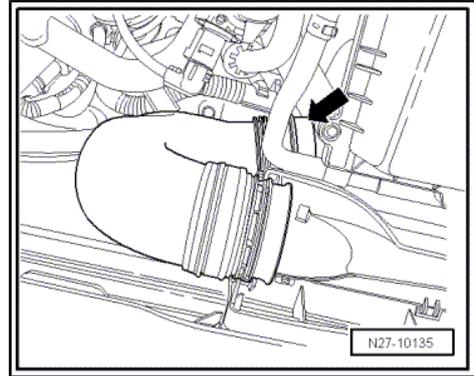


- Release locking lugs -arrows- and take off cover.

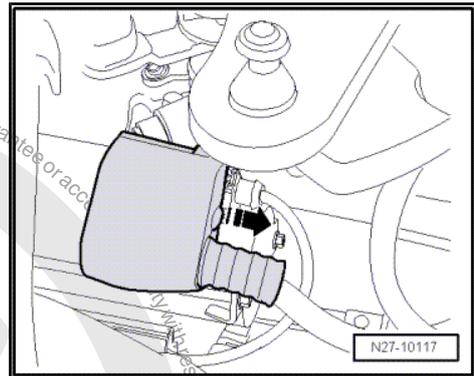




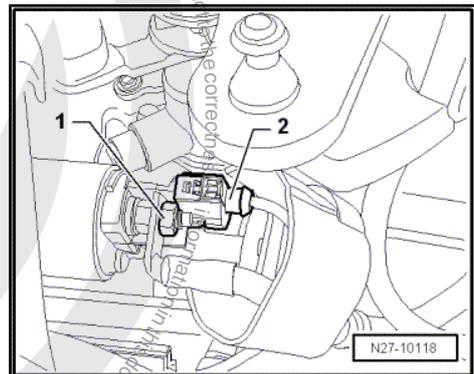
- Pull hose -arrow- off air filter housing and remove.
- Pull air filter housing upwards out of brackets and remove.



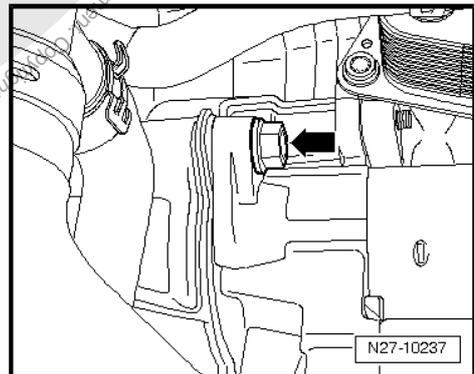
- Push down protective cap in direction of -arrow- from solenoid switch.



- Unscrew positive wire -1- and disconnect connector from terminal 50-2-.



- Remove upper bolt -arrow- from starter.



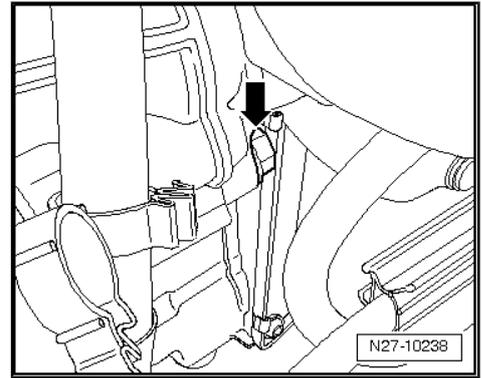


- Remove lower bolt -arrow- from starter.
- Remove starter -B- from vehicle upwards.

Installing

Install in the reverse order of removal. When doing this, note the following:

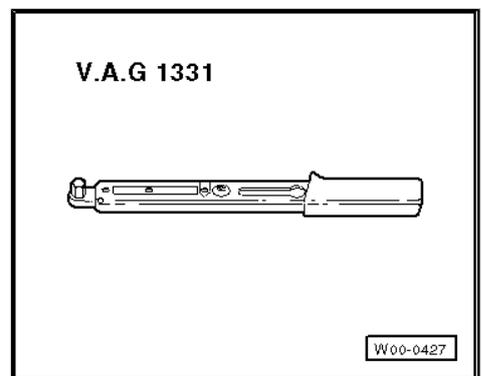
- Tighten threaded connections to specified torques
⇒ [page 35](#) .



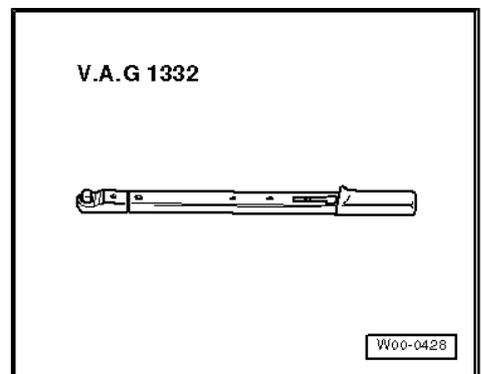
6.3.8 Vehicles with 2.0l diesel engine

Special tools and workshop equipment required

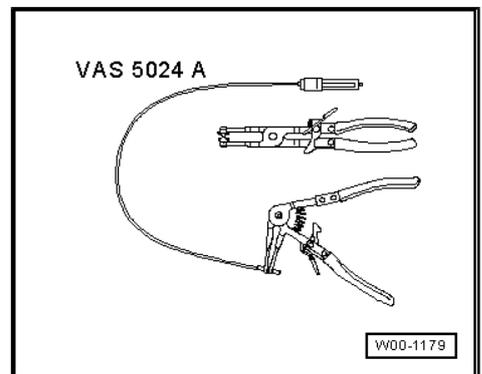
- ◆ Torque wrench -V.A.G 1331-



- ◆ Torque wrench -V.A.G 1332-



- ◆ Spring-type clip pliers -VAS 5024A-



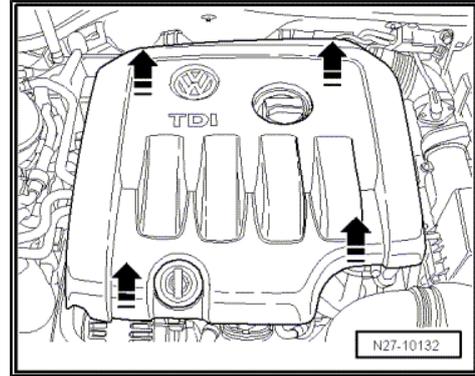
Carry out following procedures:

Removing

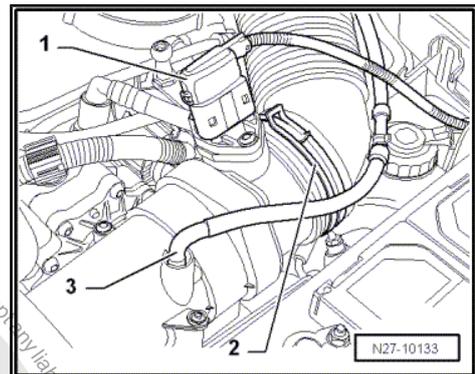
- Disconnect battery -A- ⇒ [page 4](#) .



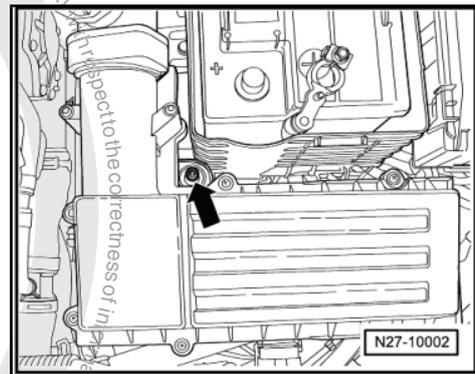
- Pull engine cover panel upwards -arrows-.



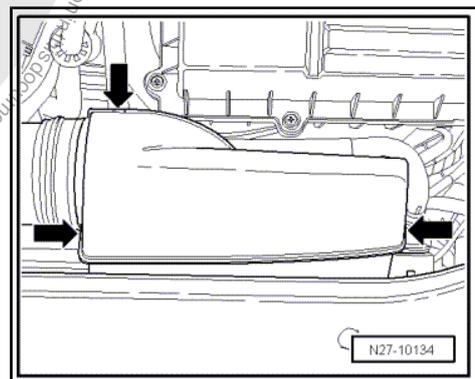
- Disconnect connector -1-, release spring-type clip -2- with spring-type clip pliers -VAS 5024A- and pull off vacuum hose -3-.



- Remove bolt of air filter housing -arrow-.

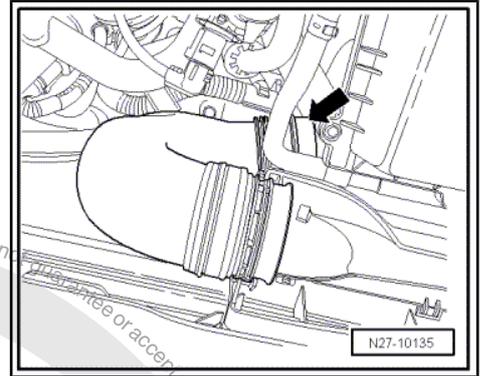


- Release locking lugs -arrows- and take off cover.

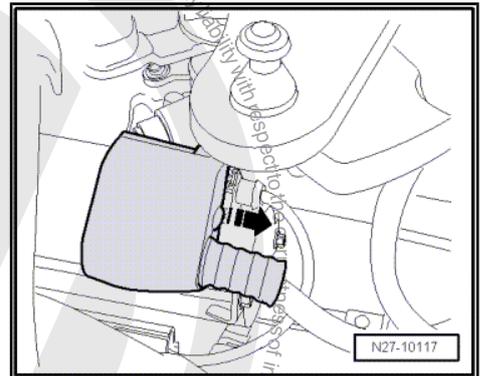




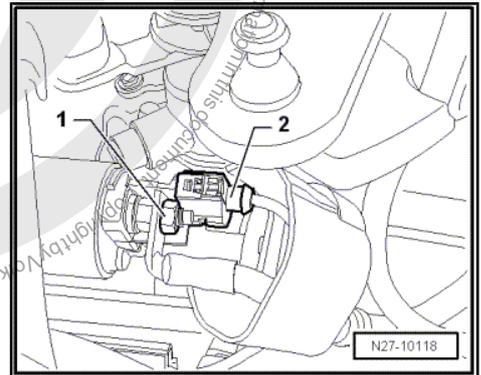
- Pull hose -arrow- off air filter housing and remove.
- Pull air filter housing upwards out of brackets and remove.



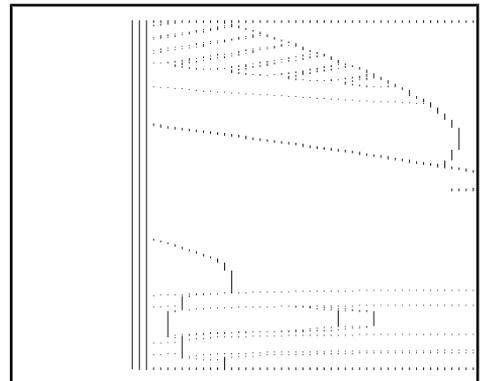
- Slide protective cap in direction of -arrow- off solenoid switch.



- Unscrew positive wire -1- and disconnect connector from terminal 50 -2-.

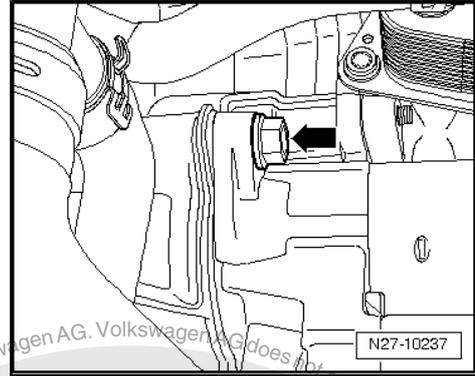


- Unclip wiring -1- from wiring retainer -2-.





- Remove upper bolt -arrow- from starter.

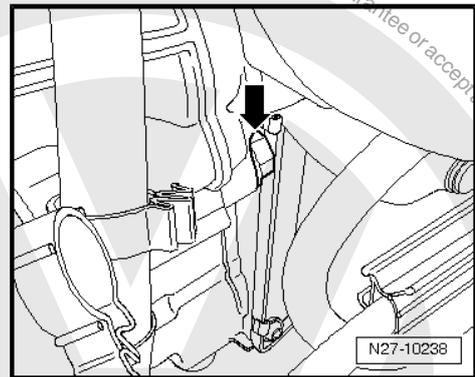


- Remove lower bolt -arrow- from starter.
- Remove starter -B- from vehicle upwards.

Installing

Install in the reverse order of removal. When doing this, note the following:

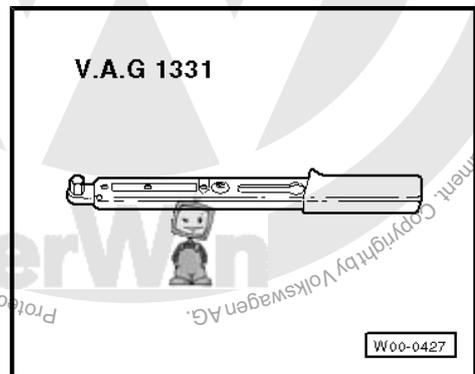
- Tighten threaded connections to specified torques
=> [page 35](#) .



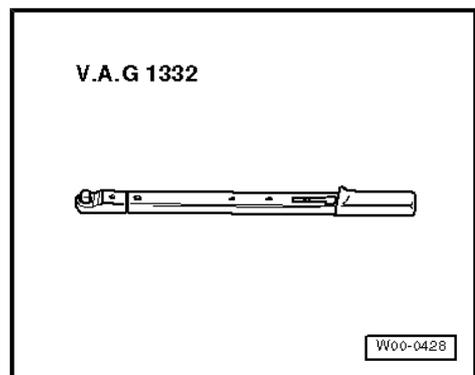
6.3.9 Vehicles with 2.0l CR TDI engine

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-

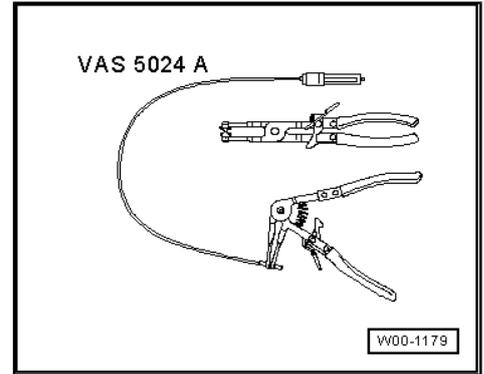


- ◆ Torque wrench -V.A.G 1332-





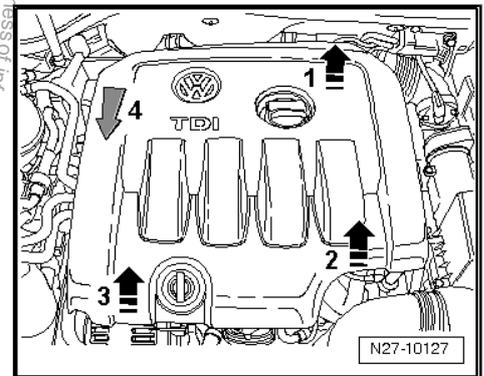
◆ Spring-type clip pliers -VAS 5024A-



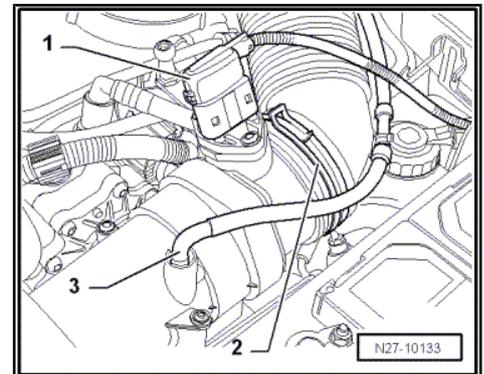
Carry out following procedures:

Removing

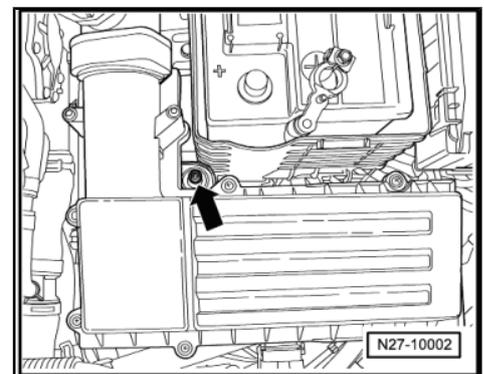
- Disconnect battery -A- ⇒ [page 4](#) .
- Pull engine cover panel upwards -arrows-.



- Disconnect connector -1-, release spring-type clip -2- with spring-type clip pliers -VAS 5024A- and pull off vacuum hose -3-.

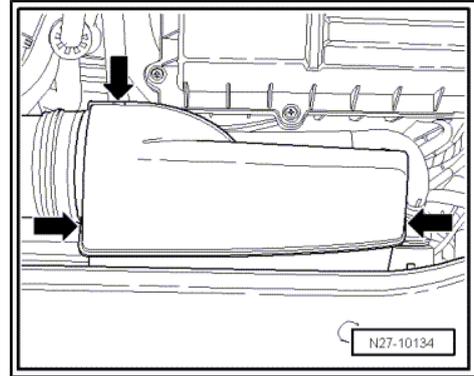


- Remove bolt of air filter housing -arrow-.

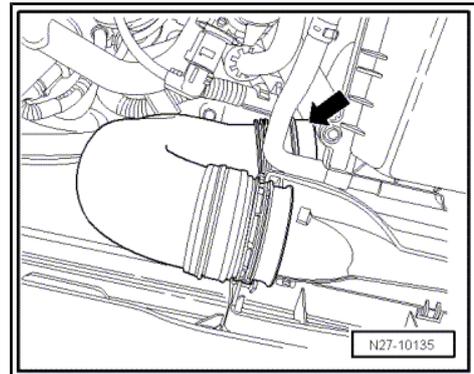




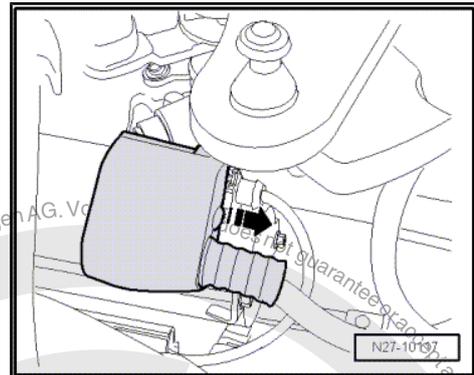
- Release locking lugs -arrows- and take off cover.



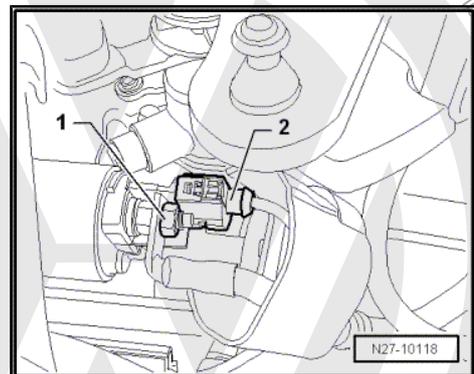
- Pull hose -arrow- off air filter housing and remove.
- Pull air filter housing upwards out of brackets and remove.



- Slide protective cap in direction of -arrow- off solenoid switch.

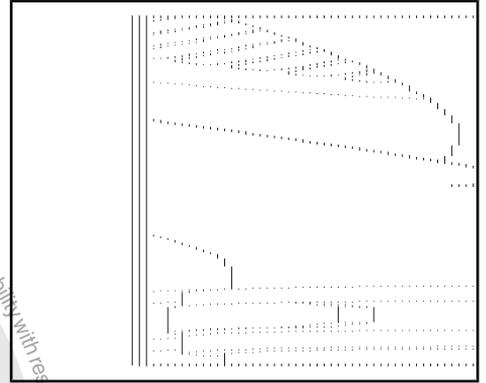


- Unscrew positive wire -1- and disconnect connector from terminal 50 -2-.

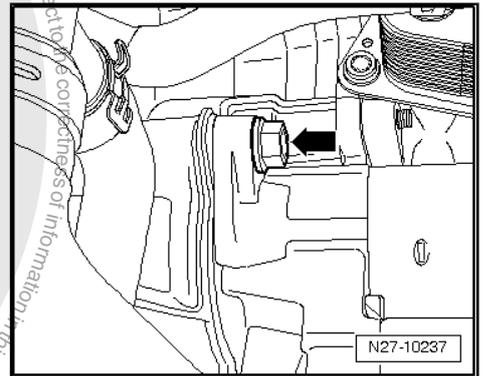




- Unclip wiring -1- from wiring retainer -2-.



Remove upper bolt -arrow- from starter.

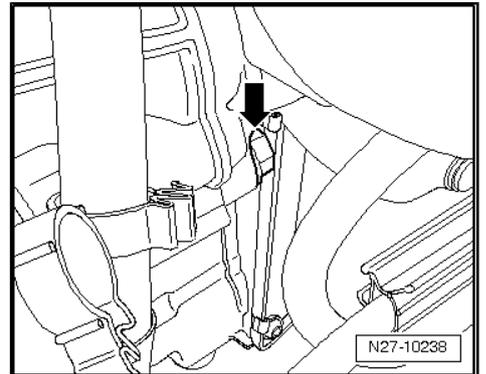


- Remove lower bolt -arrow- from starter.
- Remove starter -B- from vehicle upwards.

Installing

Install in the reverse order of removal. When doing this, note the following:

- Tighten threaded connections to specified torques
⇒ [page 35](#) .

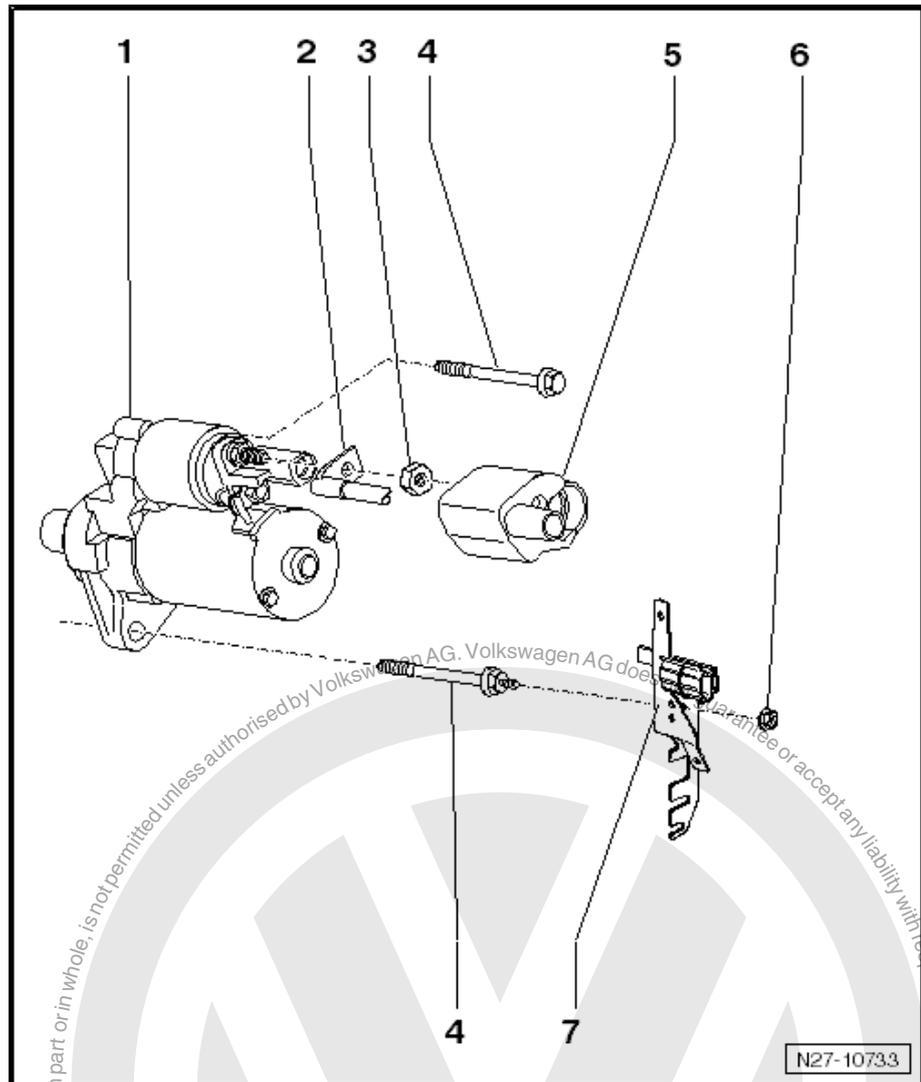




6.4 Removing and installing starter -B- (manual gearbox)

6.4.1 Assembly overview - starter -B-

- 1 - Starter -B-
 - Checking ⇒ [page 13](#)
- 2 - Battery positive wire connection to starter -B-
- 3 - Nut
 - 15 Nm
- 4 - Bolt
 - 75 Nm
- 5 - Protective cap
- 6 - Nut
 - 23 Nm
- 7 - Wiring retainer



Not illustrated

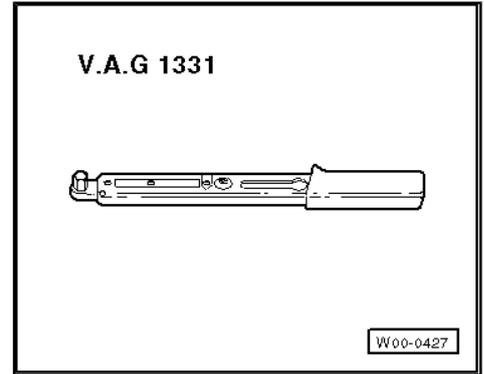
- ◆ Air filter housing bolt to body: 10 Nm

6.4.2 Vehicles with 1.4l TSI engine

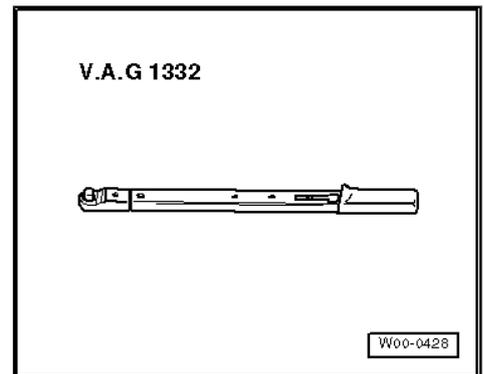
Special tools and workshop equipment required



- ◆ Torque wrench -V.A.G 1331-



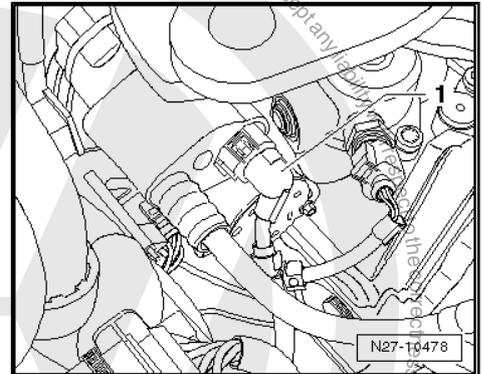
- ◆ Torque wrench -V.A.G 1332-



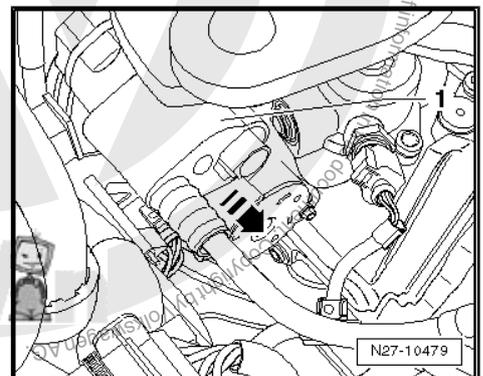
Carry out following procedures:

Removing

- Disconnect battery -A- ⇒ [page 4](#) .
- Remove air filter housing ⇒ Engine; Rep. gr. 24 .
- Release and disconnect connector -1-.

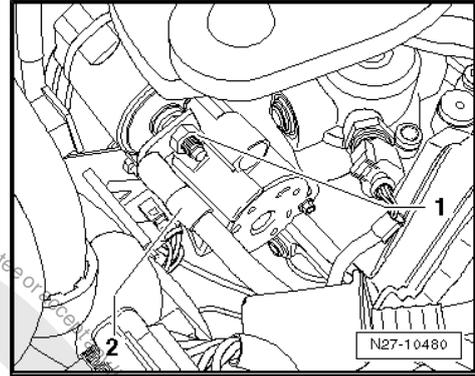


- Slide protective cap -1- off solenoid switch in direction of -arrow-.

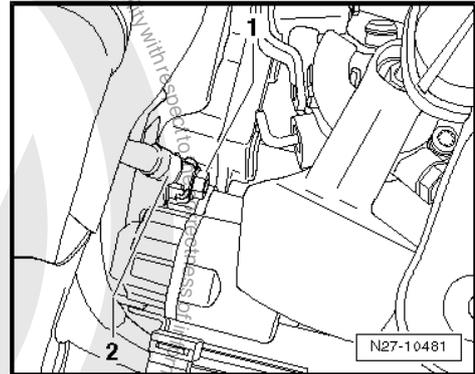




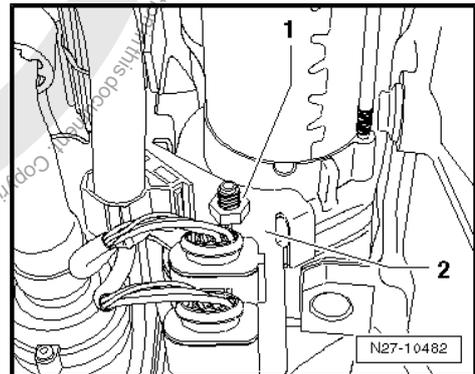
- Unscrew nut -1- and remove positive wire -2- from connector thread of solenoid switch.



- Unscrew nut -1- from upper starter bolt and remove earth cable -2-.
- Remove upper starter bolt behind from starter.
- Remove noise insulation => General body repairs, exterior; Rep. gr. 50 .



- Unscrew nut -1- and remove wiring retainer -2- from lower starter bolt.

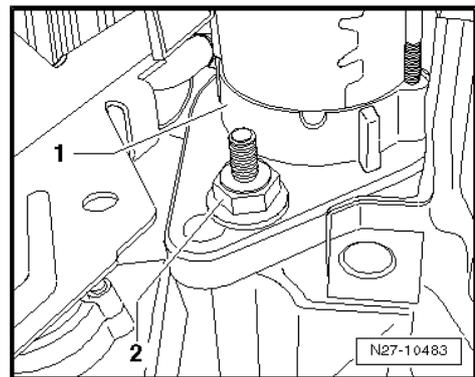


- Remove lower starter bolt -2-.
- Remove starter -B- -1- from vehicle downwards.

Installing

Install in the reverse order of removal. When doing this, note the following:

- Tighten threaded connections to specified torques => [page 60](#) .

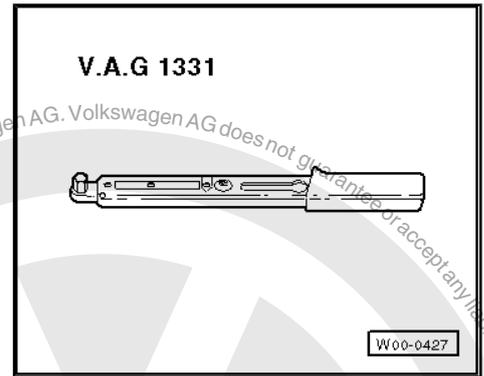


6.4.3 Vehicles with 1.4 I petrol engine and 1.4/1.6 I FSI engine

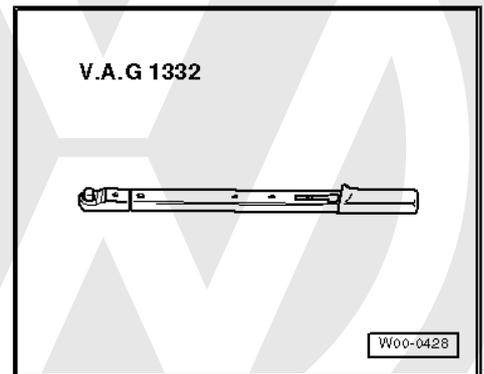
Special tools and workshop equipment required



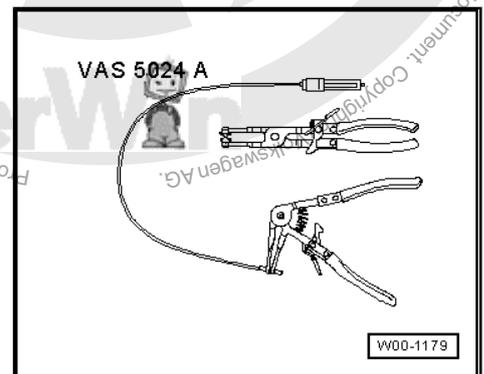
- ◆ Torque wrench -V.A.G 1331-



- ◆ Torque wrench -V.A.G 1332-



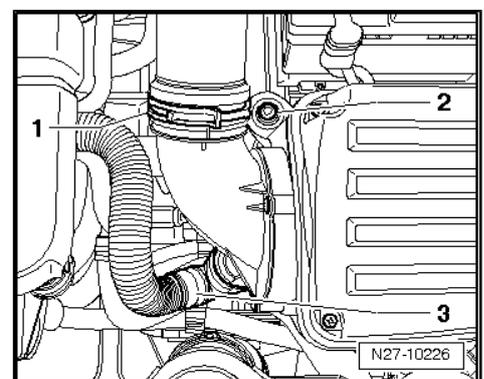
- ◆ Spring-type clip pliers -VAS 5024A-



Carry out following procedures:

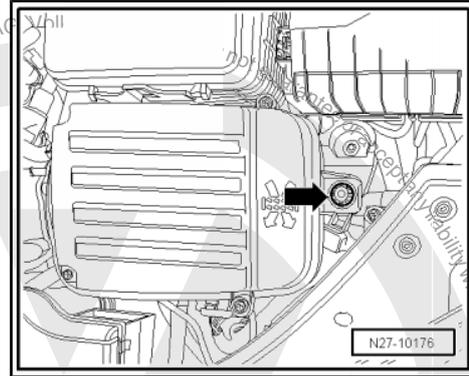
Removing

- Disconnect battery -A- => [page 4](#) .
- Loosen spring-type clip -1- using spring-type clip pliers -VAS 5024A- and remove bolt -2-.
- Release hose -3- and pull it off the air filter housing.

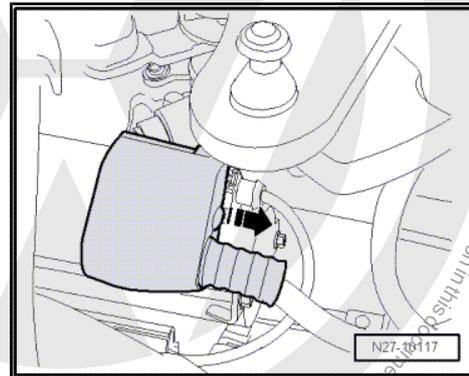




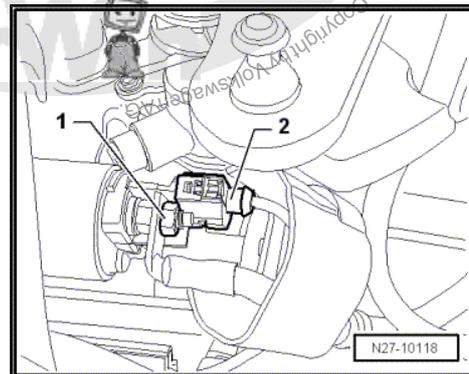
- Pull air filter housing upwards on right-hand side out of rubber mounting -arrow-.
- Take air filter housing out of vehicle.



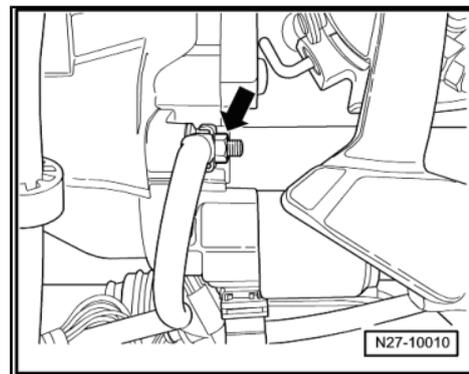
- Slide protective cap in direction of -arrow- off solenoid switch.



- Unscrew positive wire -1- and disconnect connector from terminal 50 -2-.

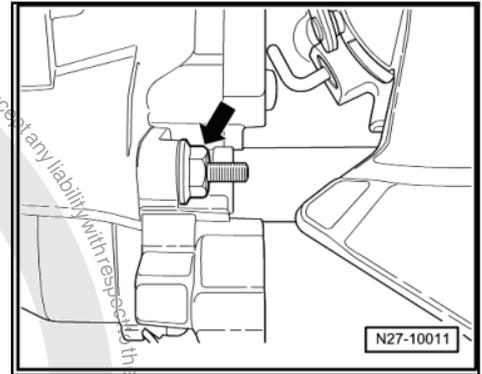


- Unscrew earth wire from starter bolt -arrow-.

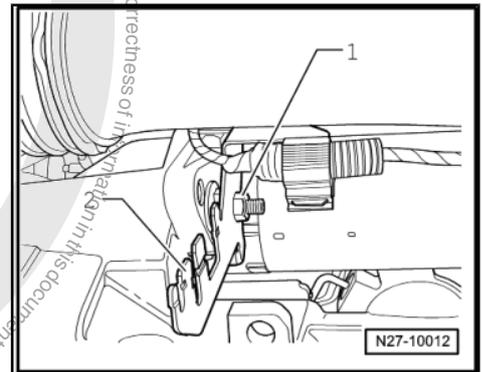




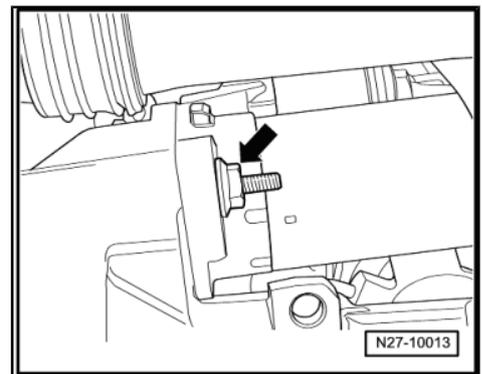
- Unscrew starter bolt -arrow-.
- Remove noise insulation => General body repairs, exterior; Rep. gr. 50



- Remove nut -1- from lower starter bolt.
- Remove wiring retainer -2-.



- Unscrew starter bolt -arrow-.
- Lower starter -B- out of vehicle.



Installing

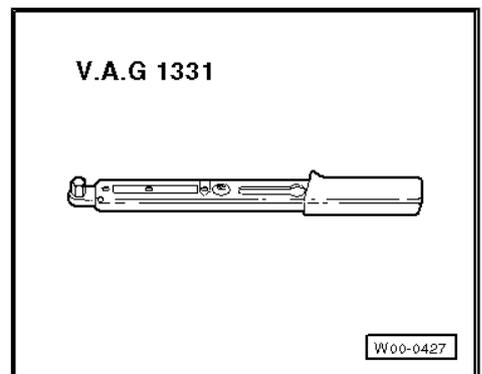
Install in the reverse order of removal. When doing this, note the following:

- Tighten threaded connections to specified torques
 => [page 60](#) .

6.4.4 Vehicles with 1.6l petrol engine

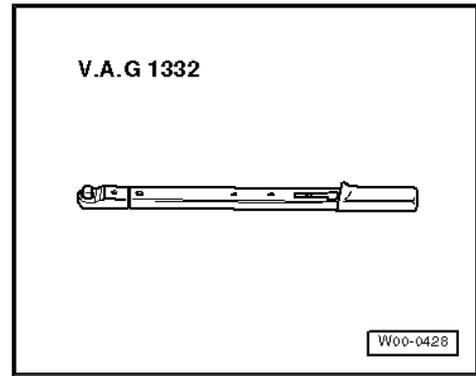
Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-





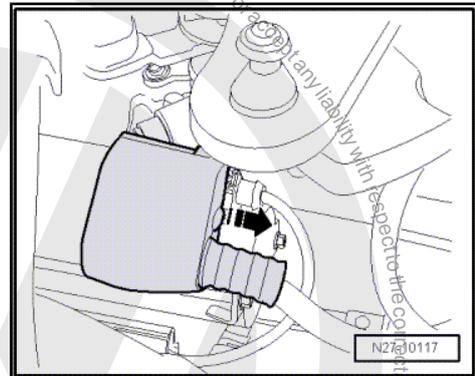
- ◆ Torque wrench -V.A.G 1332-



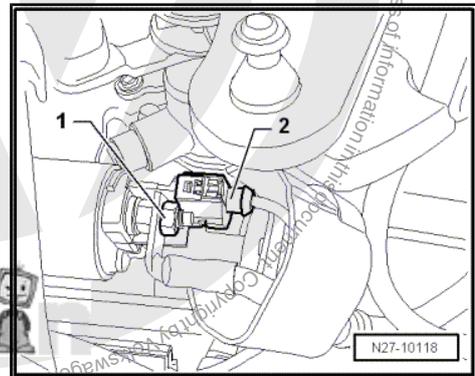
Carry out following procedures:

Removing

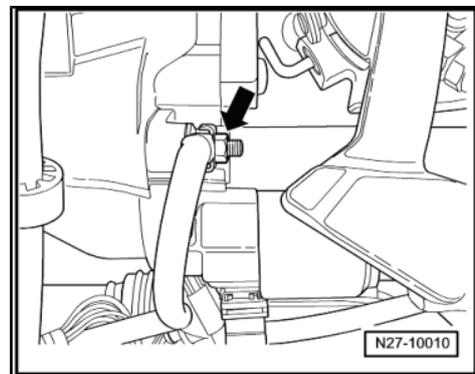
- Disconnect battery -A- → [page 4](#) .
- Push down protective cap in direction of -arrow- from solenoid switch.



- Unscrew positive wire -1- and disconnect connector from terminal 50 -2-.

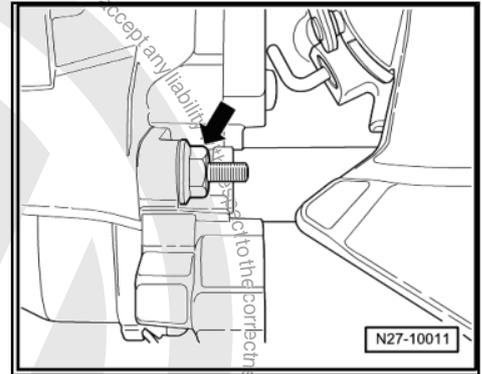


- Unscrew earth wire from starter bolt -arrow-.

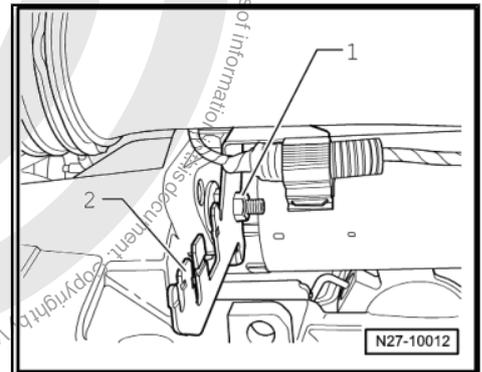




- Unscrew starter bolt -arrow-.
- Remove noise insulation => General body repairs, exterior; Rep. gr. 50 .



- Remove nut -1- from lower starter bolt.
- Remove wiring retainer -2-.

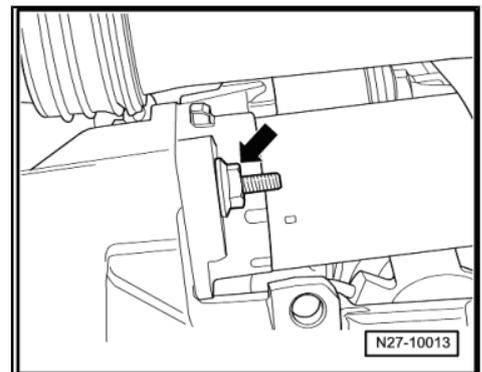


- Unscrew starter bolt -arrow-.
- Remove starter -B- .

Installing

Install in the reverse order of removal. When doing this, note the following:

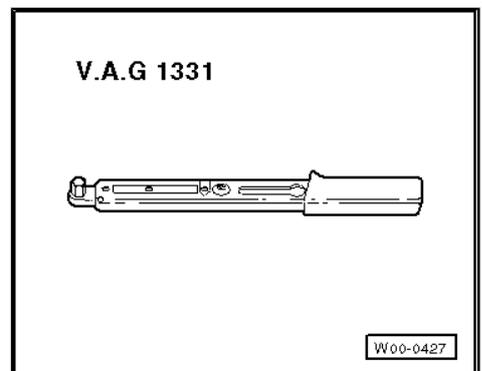
- Tighten threaded connections to specified torques
 => [page 60](#) .



6.4.5 Vehicles with 2.0l FSI engine

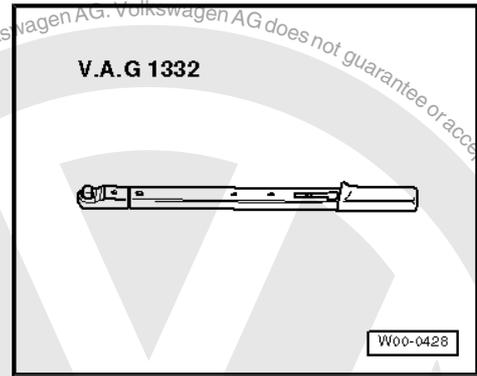
Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-

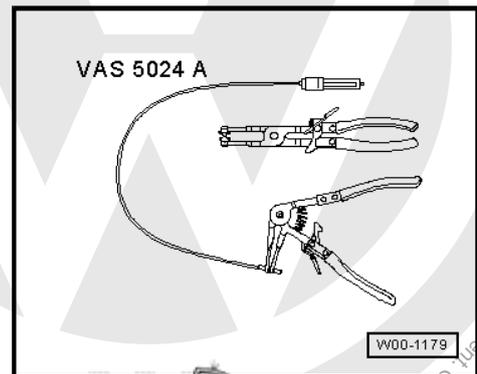




- ◆ Torque wrench -V.A.G 1332-



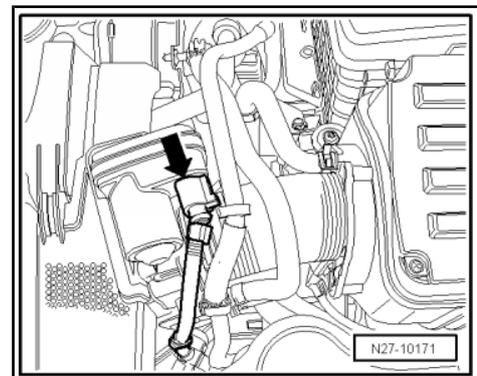
- ◆ Spring-type clip pliers -VAS 5024A-



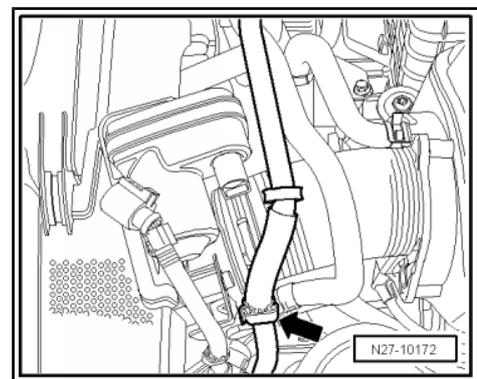
Carry out following procedures:

Removing

- Disconnect battery -A- ⇒ [page 4](#) .
- Disconnect connector -arrow-.

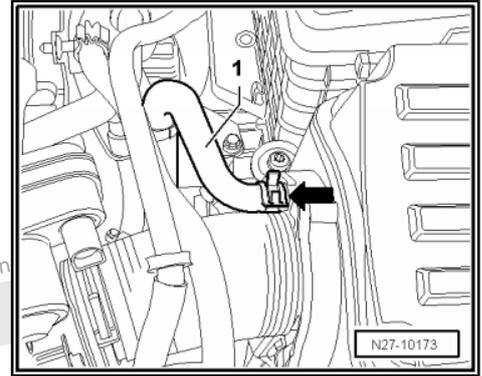


- Unclip vacuum hose out of retainer -arrow-.

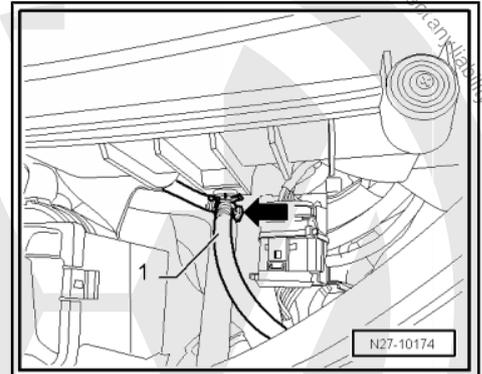




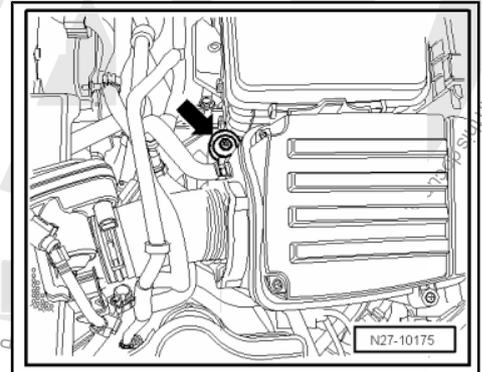
- Loosen spring-type clip -arrow- from hose -1- using spring-type clip pliers -VAS 5024A- .
- Pull hose -1- off air filter housing.



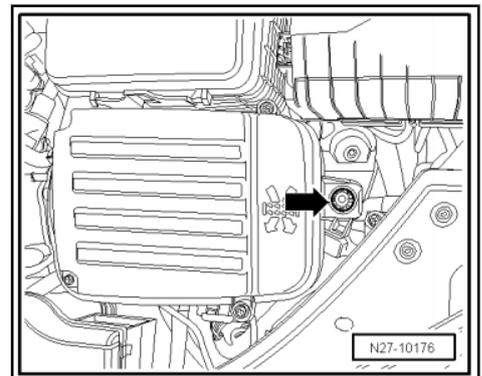
- Open retainer -arrow- on front of air filter housing and remove line -1-.



- Remove bolt of air filter housing -arrow-.

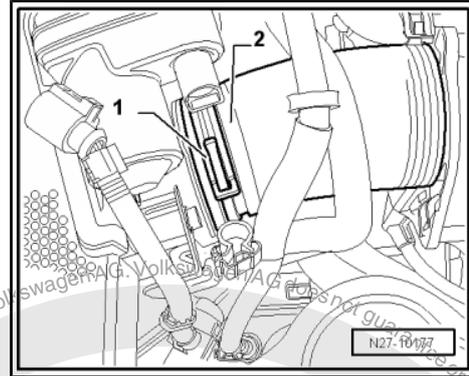


- Pull air filter housing upwards on right-hand side out of rubber mounting -arrow-.
- Loosen spring-type clip -1- using spring-type clip pliers -VAS 5024A- .

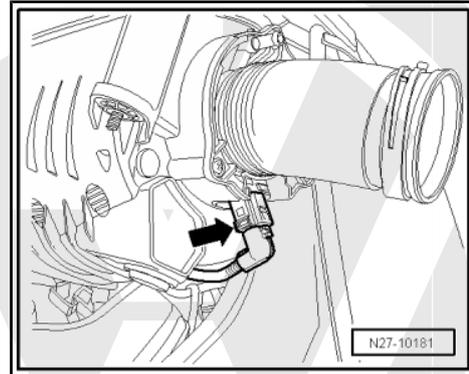




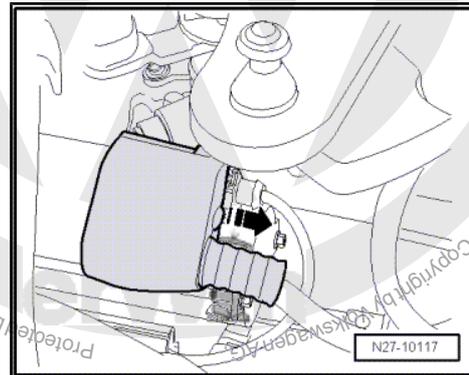
- Pull hose -2- off connection.
- Carefully lift up air filter housing out of vehicle as far as wiring allows.



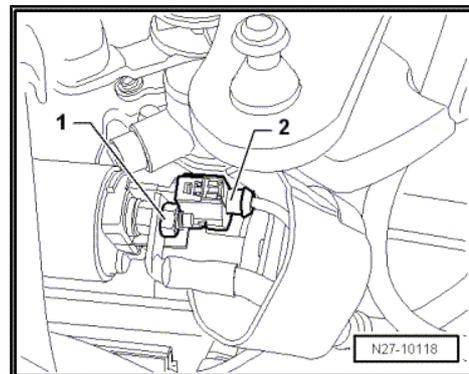
- Disconnect connector -arrow- on rear of air filter housing.



- Take air filter housing out of vehicle.
- Slide protective cap in direction of -arrow- off solenoid switch.

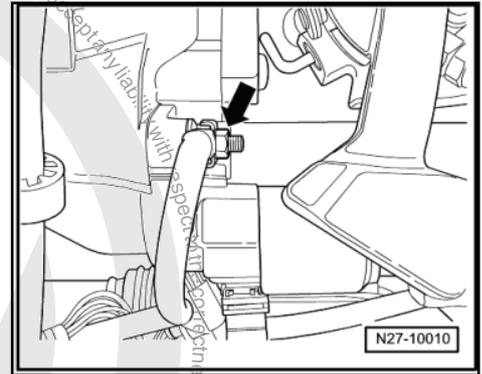


- Unscrew positive wire -1- and disconnect connector from terminal 50 -2-.

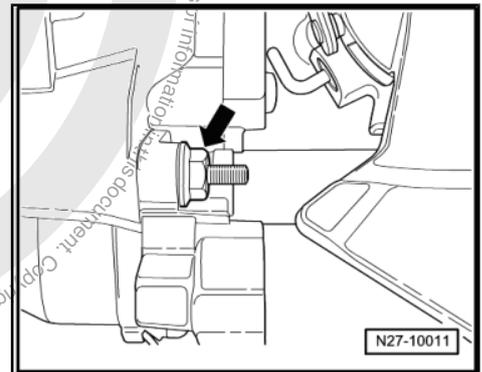




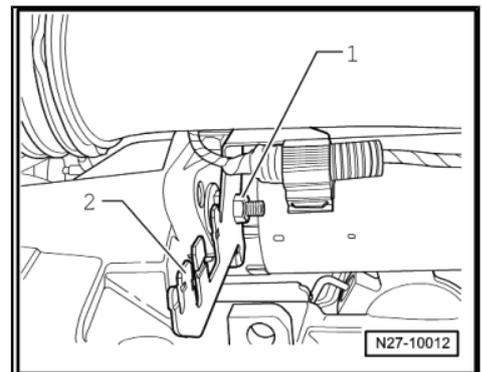
- Unscrew earth wire -arrow-.



- Unscrew starter bolt -arrow-.
- Remove noise insulation => General body repairs, exterior; Rep. gr. 50 .



- Remove nut -1- from lower starter bolt.
- Remove wiring retainer -2-.

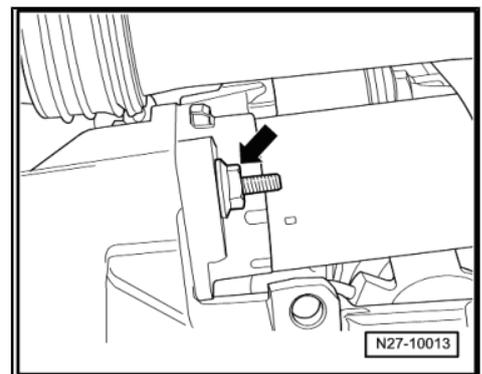


- Unscrew starter bolt -arrow-.
- Lower starter -B- out of vehicle.

Installing

Install in the reverse order of removal. When doing this, note the following:

- Tighten threaded connections to specified torques
 => [page 60](#) .

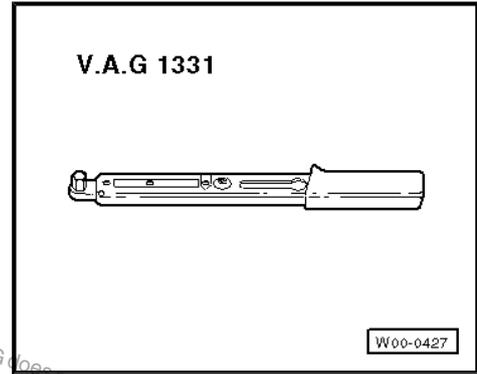


6.4.6 Vehicles with 2.0l TFSI engine

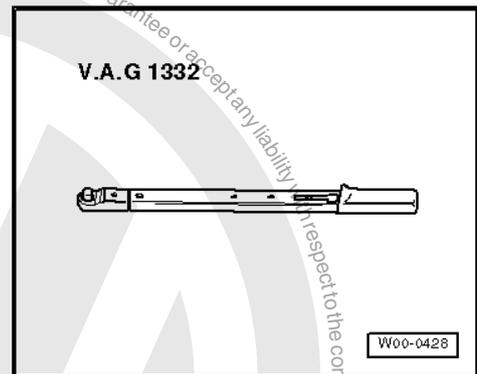
Special tools and workshop equipment required



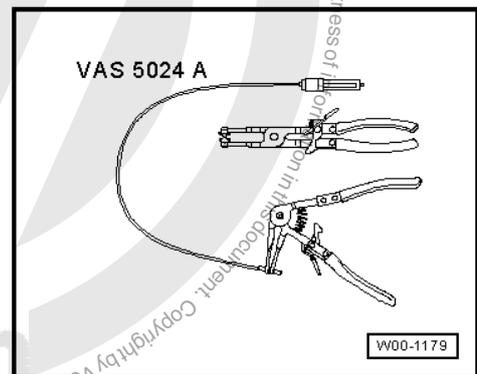
- ◆ Torque wrench -V.A.G 1331-



- ◆ Torque wrench -V.A.G 1332-



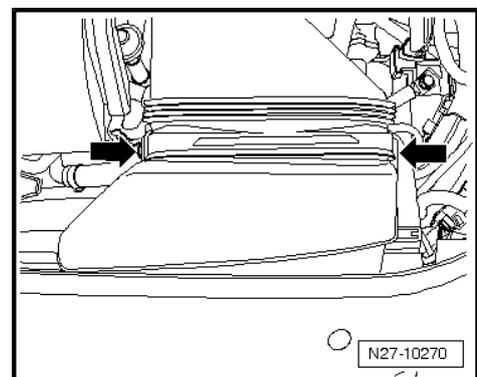
- ◆ Spring-type clip pliers -VAS 5024A-



Carry out following procedures:

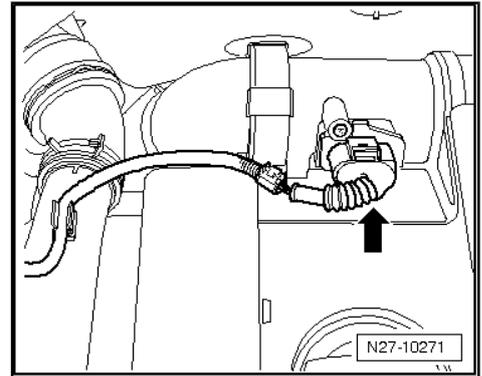
Removing

- Disconnect battery -A- → [page 4](#) .
- Remove bolts -arrows-.

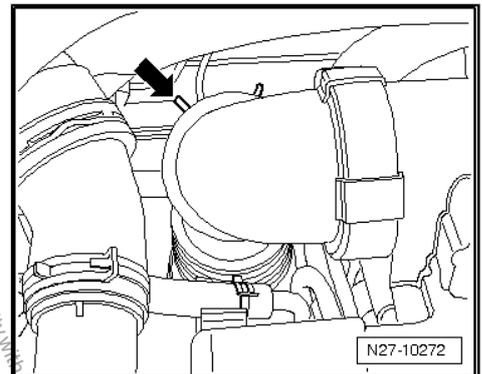




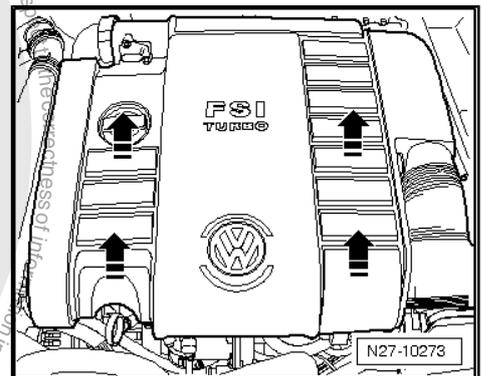
- Disconnect connector -arrow-.



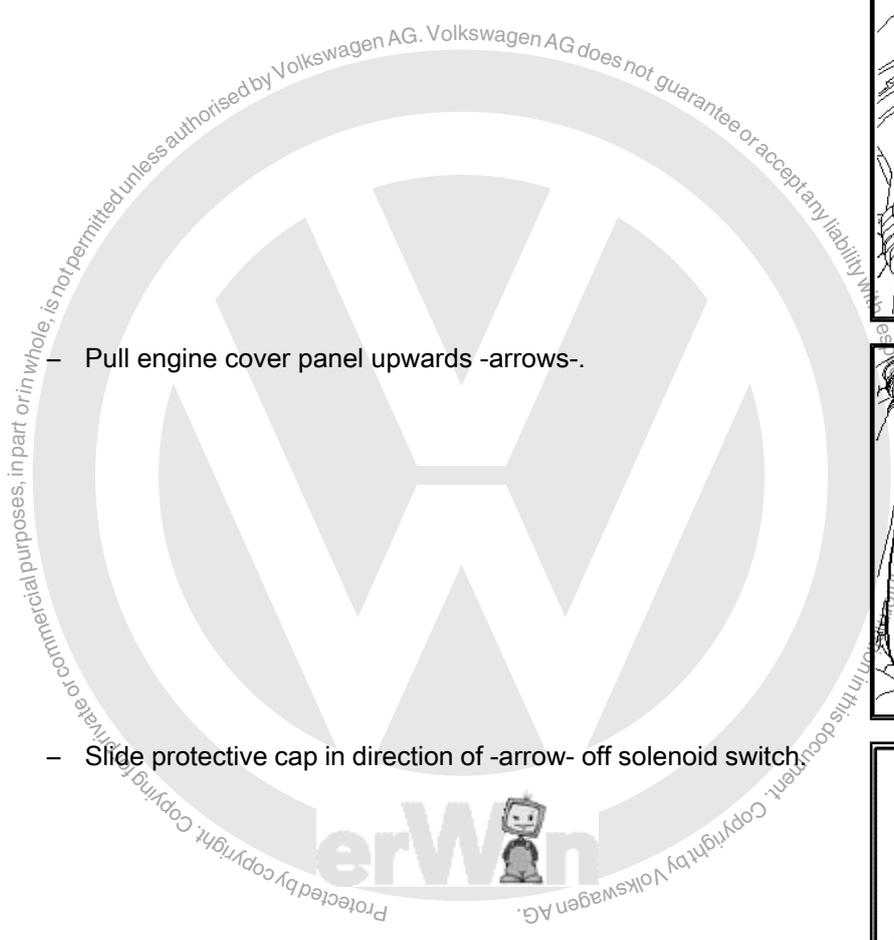
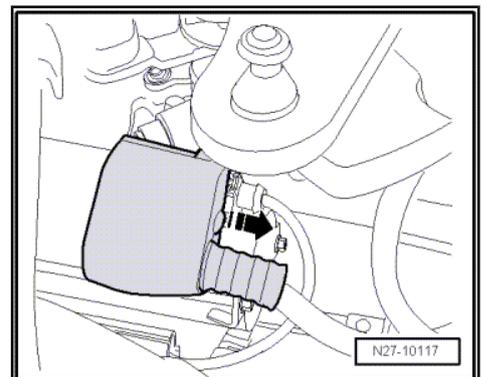
- Loosen spring-type clips -arrow- using spring-type clip pliers - VAS 5024A- .



- Pull engine cover panel upwards -arrows-.

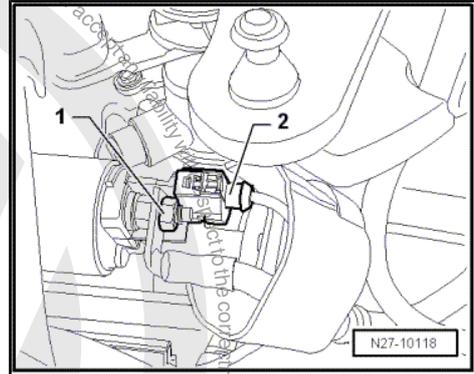


- Slide protective cap in direction of -arrow- off solenoid switch.

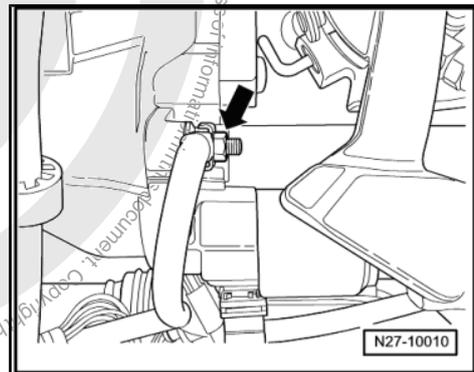




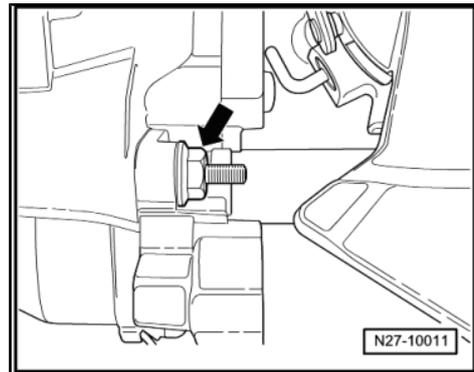
- Unscrew positive wire -1- and disconnect connector from terminal 50 -2-.



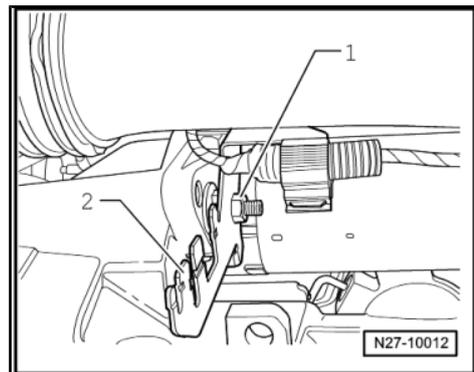
- Unscrew earth wire from starter bolt -arrow-.



- Unscrew starter bolt -arrow-.
- Remove noise insulation => General body repairs, exterior; Rep. gr. 50 .



- Remove nut -1- from lower starter bolt.
- Remove wiring retainer -2-.



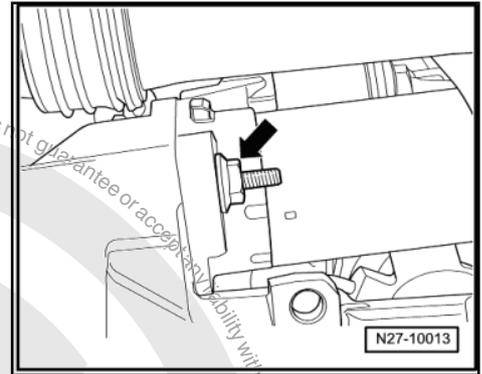


- Unscrew starter bolt -arrow-.
- Lower starter -B- out of vehicle.

Installing

Install in the reverse order of removal! When doing this, note the following:

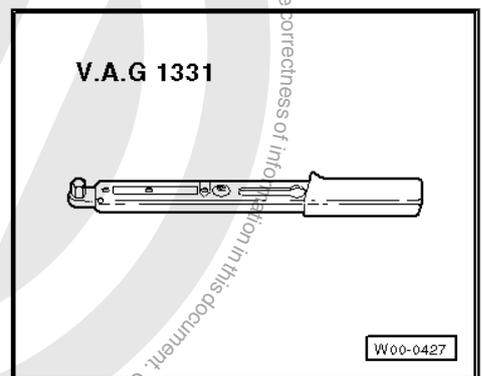
- Tighten threaded connections to specified torques
⇒ [page 60](#) .



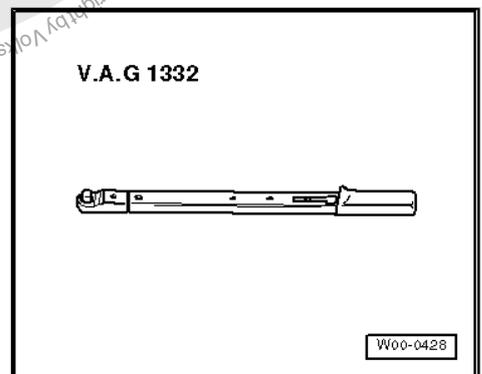
6.4.7 Vehicles with 2.5l petrol engine

Special tools and workshop equipment required

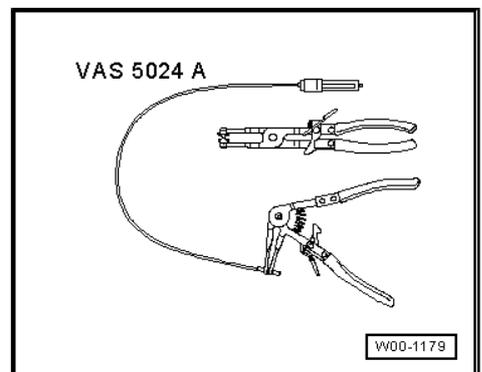
- ◆ Torque wrench -V.A.G 1331-



- ◆ Torque wrench -V.A.G 1332-



- ◆ Spring-type clip pliers -VAS 5024A-



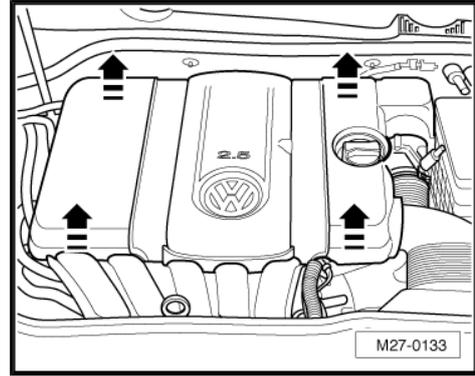
Carry out following procedures:

Removing

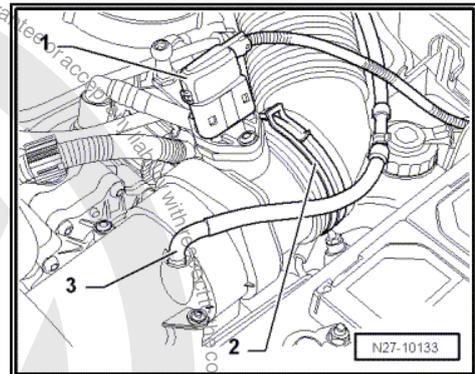
- Disconnect battery -A- ⇒ [page 4](#) .



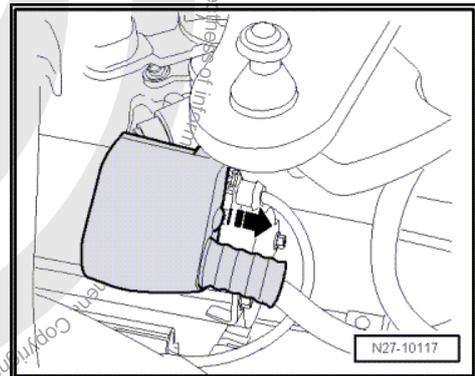
- Pull engine cover panel upwards -arrows-.



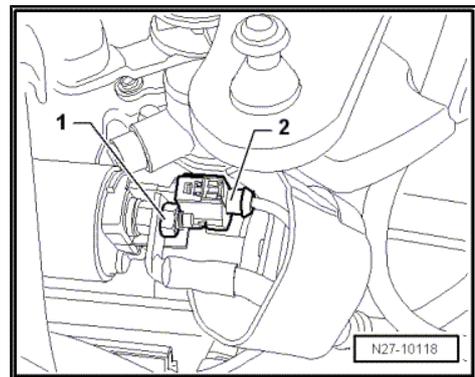
- Separate connector -1-, release spring-type clip -2- with spring-type clip pliers -VAS 5024A- and pull off vacuum hoses -3-.



- Push down protective cap in direction of -arrow- from solenoid switch.

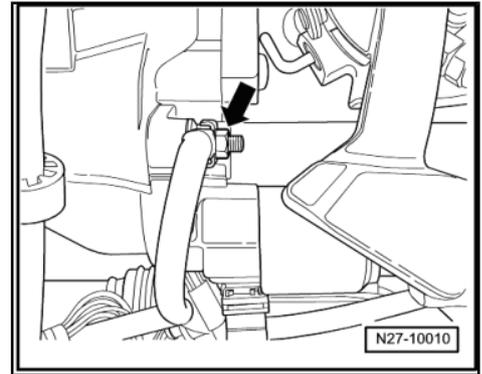


- Unscrew positive wire -1- and disconnect connector from terminal 50 -2-.

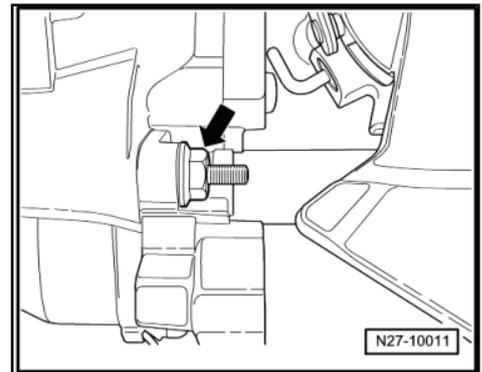




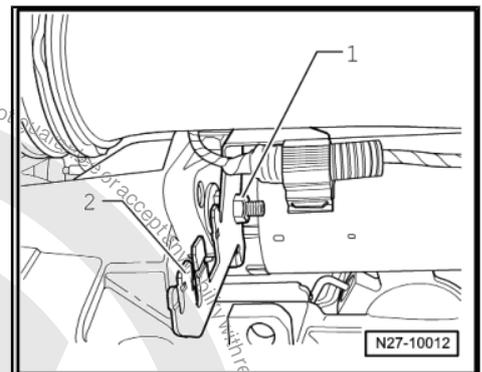
- Unscrew earth wire from starter bolt -arrow-.



- Unscrew starter bolt -arrow-.
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 .



- Remove nut -1- from lower starter bolt.
- Remove wiring retainer -2-.

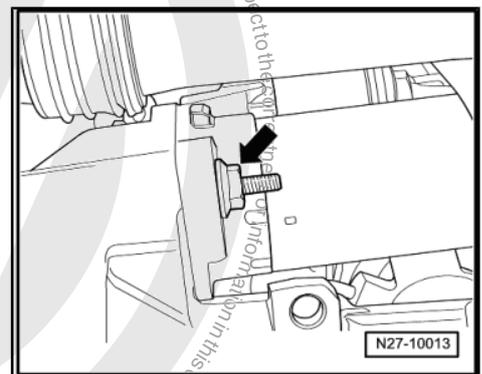


- Unscrew starter bolt -arrow-.
- Remove starter -B- .

Installing

Install in the reverse order of removal. When doing this, note the following:

- Tighten threaded connections to specified torques ⇒ [page 60](#) .



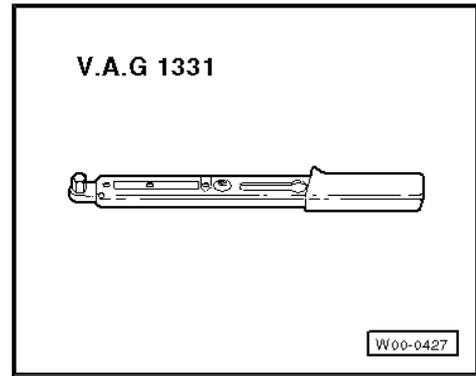
6.4.8 Vehicles with 1.9l/2.0l diesel engine and 2.0l CR diesel engine

Special tools and workshop equipment required

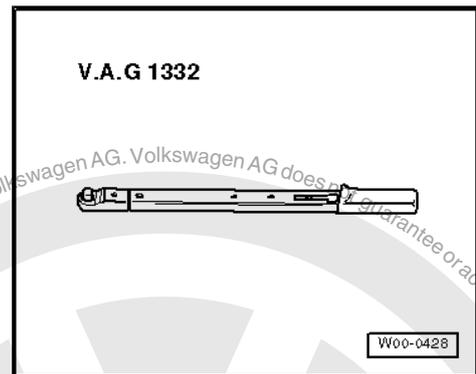




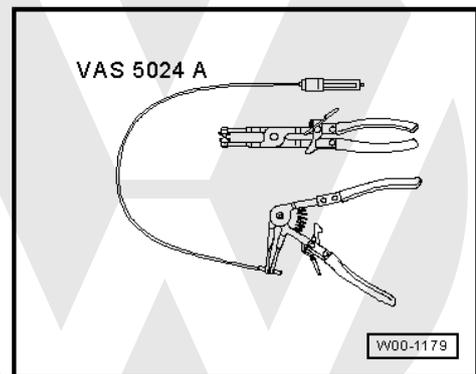
- ◆ Torque wrench -V.A.G 1331-



- ◆ Torque wrench -V.A.G 1332-



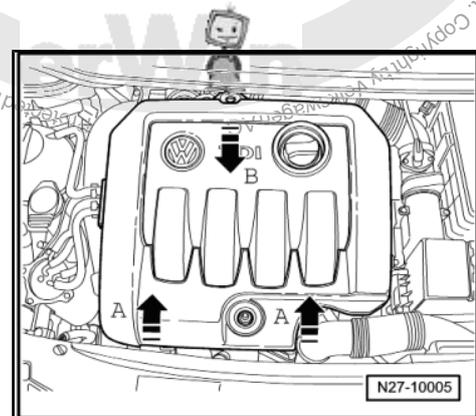
- ◆ Spring-type clip pliers -VAS 5024A-



Carry out following procedures:

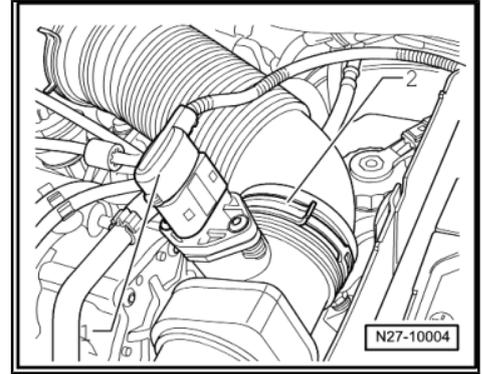
Removing

- Disconnect battery -A- → [page 4](#) .
- Pull engine cover upwards -arrows A- and forwards -arrow B-.

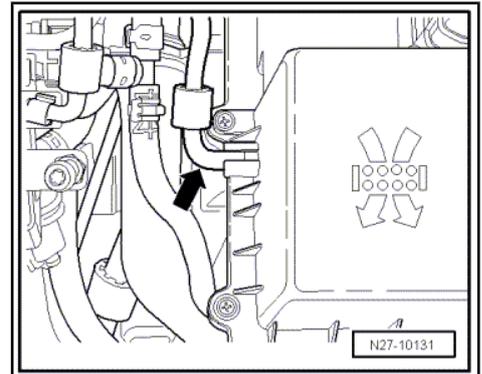




- Disconnect connector -1- and release spring-type clip -2- using spring type clip pliers -VAS 5024A- .



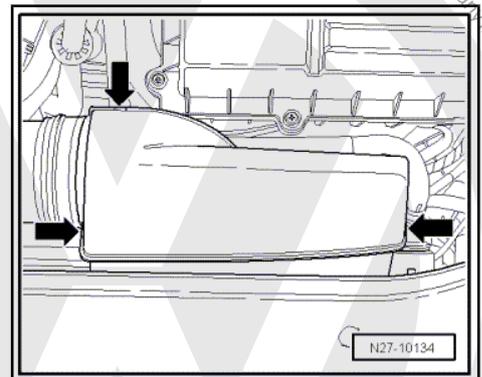
- Pull vacuum hose -arrow- off air filter housing.



- Remove bolt of air filter housing -arrow-.



- Release locking lugs -arrows- and take off cover.

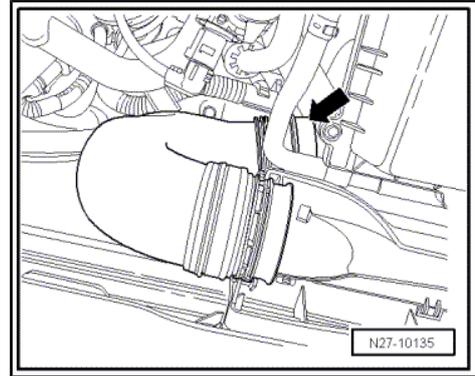


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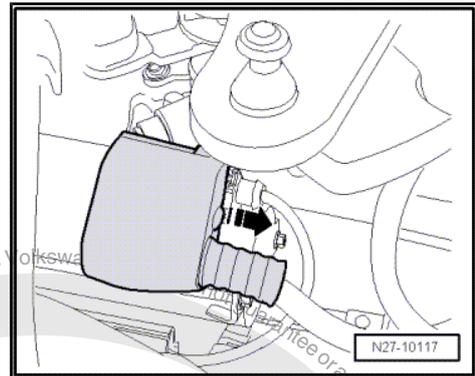




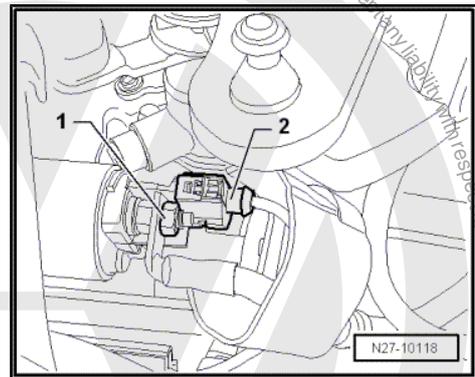
- Pull hose -arrow- off air filter housing and remove.
- Pull air filter housing upwards out of brackets and remove.



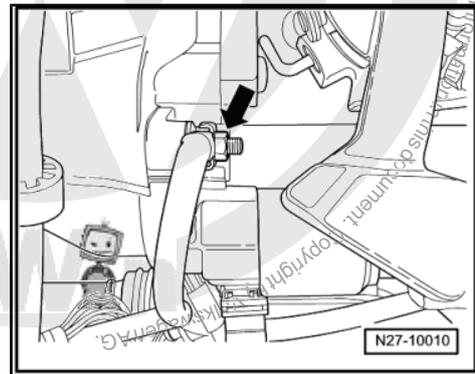
- Push down protective cap in direction of -arrow- from solenoid switch.



- Unscrew positive wire -1- and disconnect connector from terminal 50 -2-.

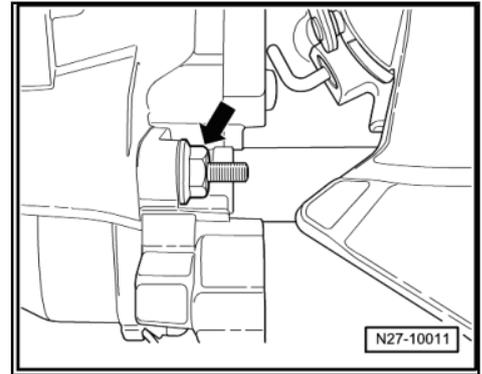


- Unscrew earth wire from starter bolt -arrow-.

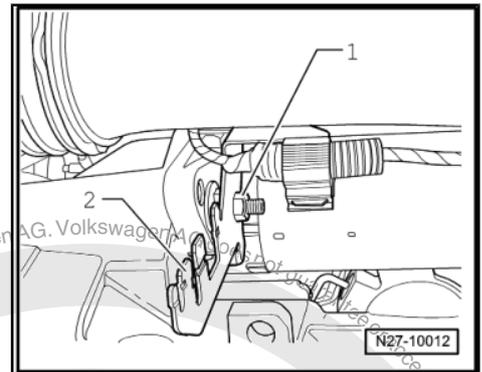




- Unscrew starter bolt -arrow-.
- Remove noise insulation => General body repairs, exterior;
Rep. gr. 50 .



- Remove nut -1- from lower starter bolt.
- Remove wiring retainer -2-.

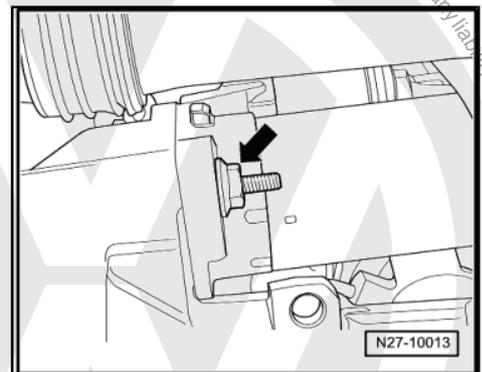


- Unscrew starter bolt -arrow-.
- Remove starter -B- .

Installing

Install in the reverse order of removal. When doing this, note the following:

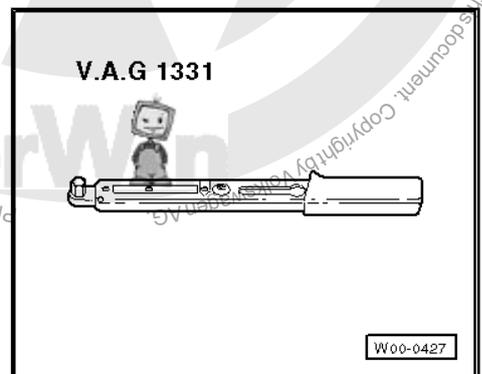
- Tighten threaded connections to specified torques
=> [page 60](#) .



6.4.9 Vehicles with 2.0l SDI engine

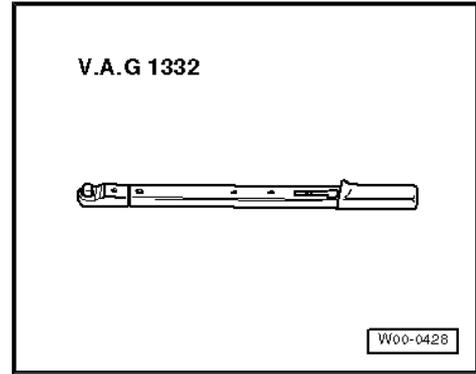
Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-

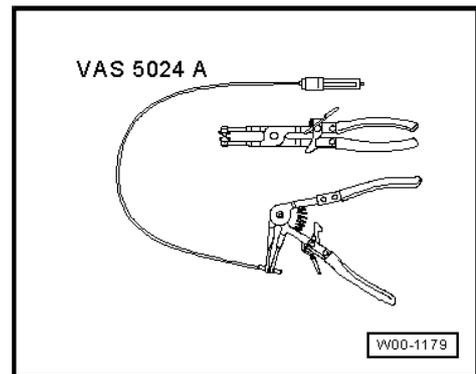




- ◆ Torque wrench -V.A.G 1332-



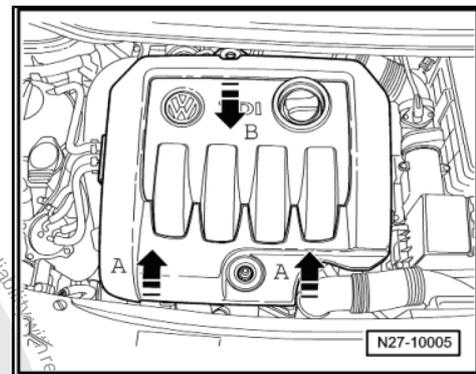
- ◆ Spring-type clip pliers -VAS 5024A-



Carry out following procedures:

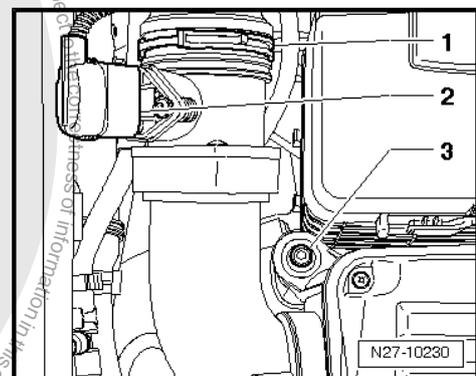
Removing

- Disconnect battery -A- → [page 4](#) .
- Pull engine cover upwards -arrows A- and forwards -arrow B-.



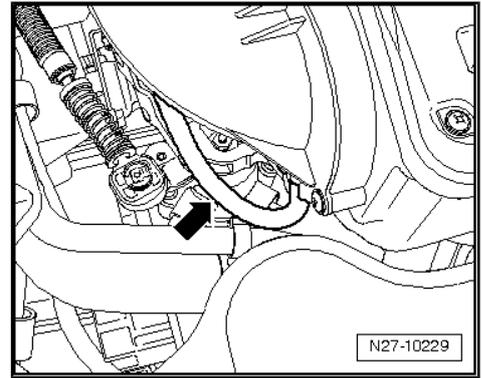
Loosen spring-type clip -1- using spring-type clip pliers -VAS 5024A- and disconnect connector -2-.

Remove bolt -3-.

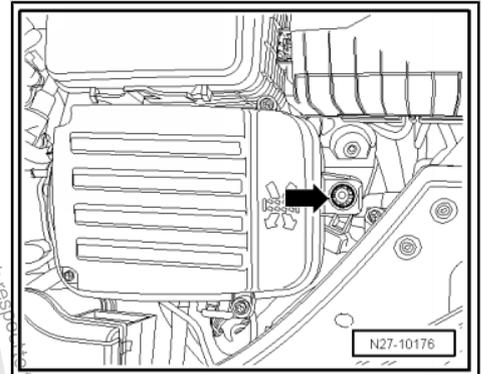




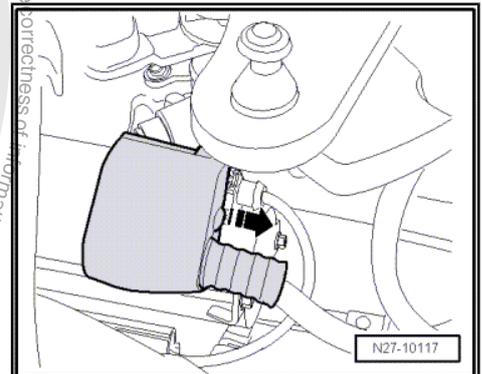
- Pull off vacuum hose -arrow-.



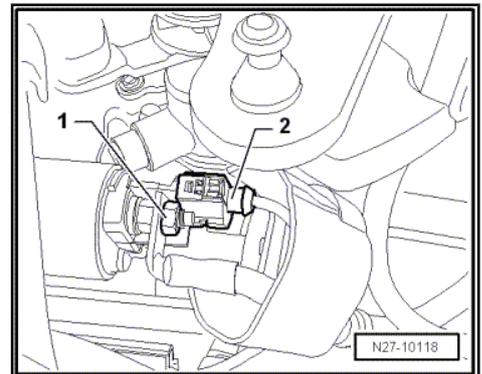
- Pull air filter housing upwards on right-hand side out of rubber mounting -arrow-.
- Take air filter housing out of vehicle.



- Push down protective cap in direction of -arrow- from solenoid switch.

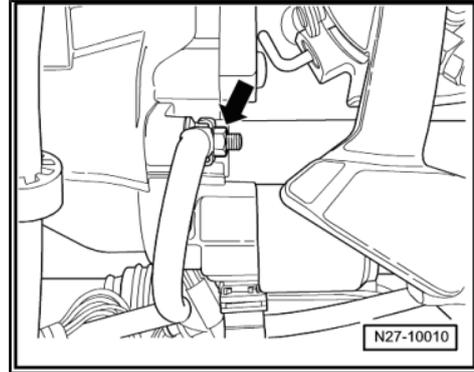


- Unscrew positive wire -1- and disconnect connector from terminal 50 -2-.

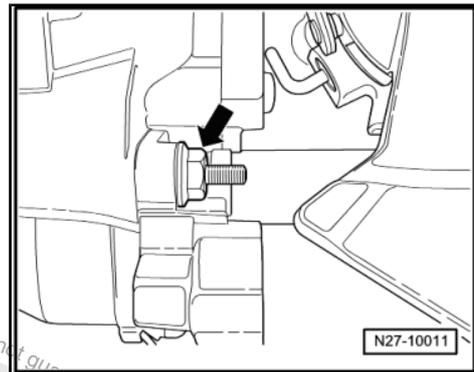




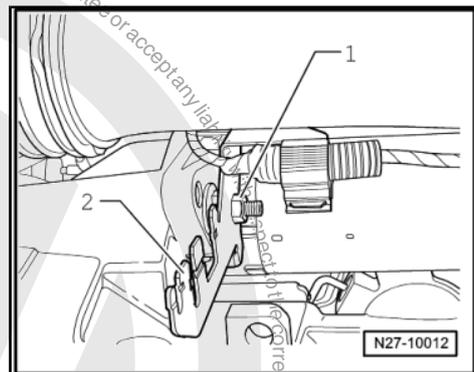
- Unscrew earth wire from starter bolt -arrow-.



- Unscrew starter bolt -arrow-.
- Remove noise insulation => General body repairs, exterior;
Rep. gr. 50 .



- Remove nut -1- from lower starter bolt.
- Remove wiring retainer -2-.

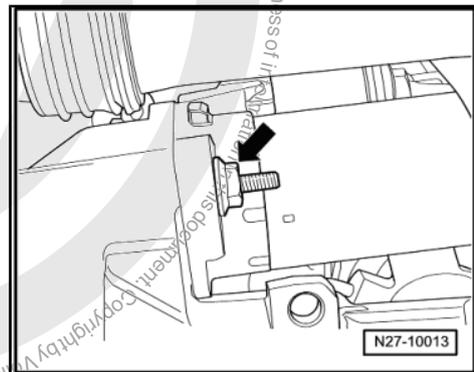


- Unscrew starter bolt -arrow-.
- Remove starter -B- .

Installing

Install in the reverse order of removal. When doing this, note the following:

- Tighten threaded connections to specified torques
=> [page 60](#) .

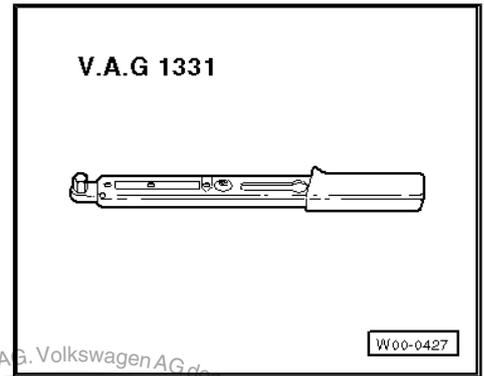


6.4.10 Vehicles with 2.0l TSI engine

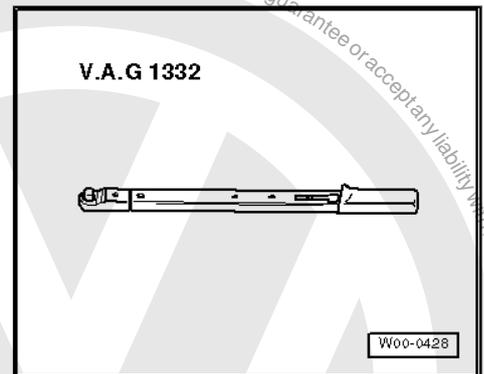
Special tools and workshop equipment required



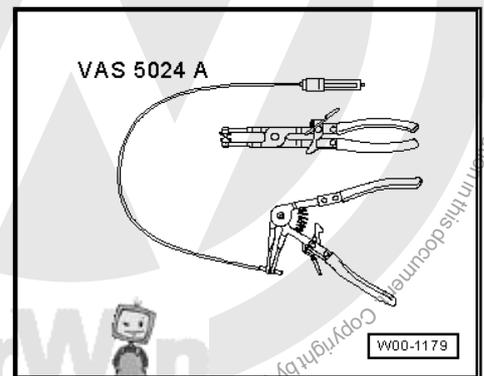
- ◆ Torque wrench -V.A.G 1331-



- ◆ Torque wrench -V.A.G 1332-



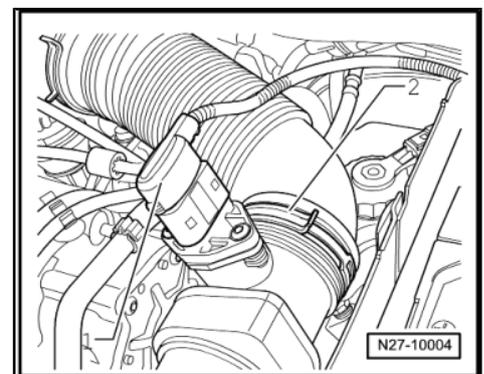
- ◆ Spring-type clip pliers -VAS 5024A-



Carry out following procedures:

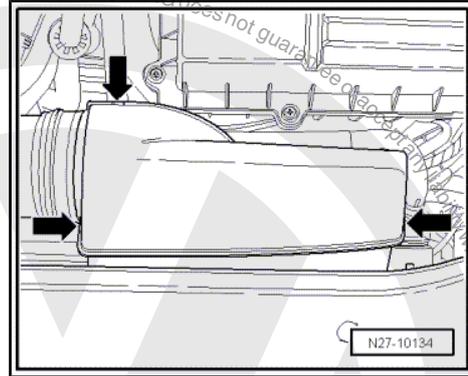
Removing

- Disconnect battery -A- => [page 4](#) .
- Release and disconnect connector -1- and release spring-type clip -2- using spring-type clip pliers -VAS 5024- .

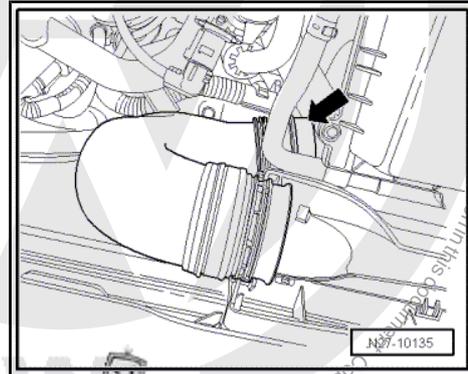




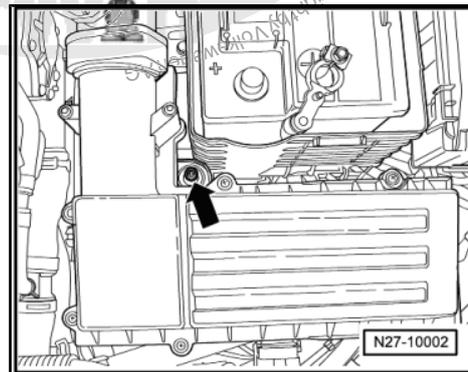
- Release locking lugs -arrows- and take off cover.



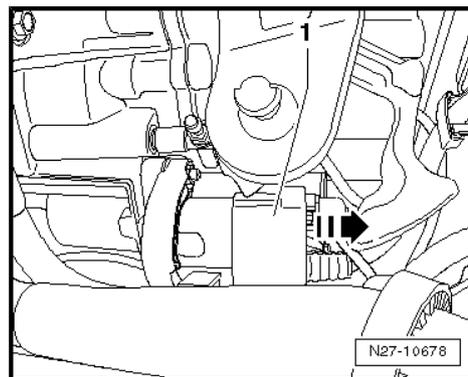
- Pull off hose -arrow- from air filter housing and remove from vehicle.



- Remove bolt of air filter housing -arrow-.
- Pull air filter housing upwards out of its rubber mountings and remove from vehicle.

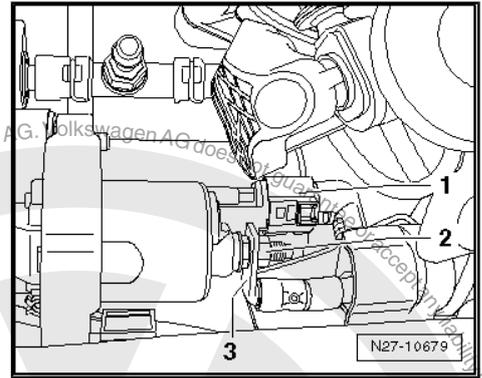


- Slide protective cap -1- off solenoid switch in direction of -arrow-.

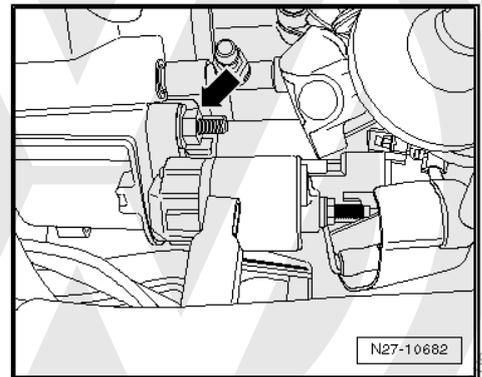




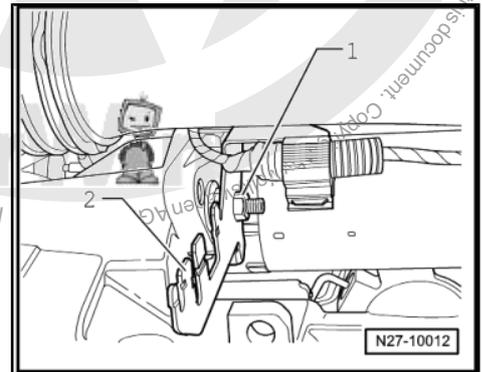
- Release and disconnect terminal 50 connector -1-.
- Unscrew nut -2- and remove positive lead -3- from solenoid switch.



- Remove upper bolt -arrow- from starter.
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 .



- Remove nut -1- from lower starter bolt.
- Remove wiring retainer -2-.

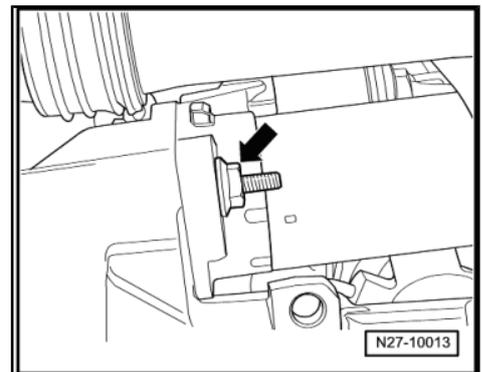


- Unscrew starter bolt -arrow-.
- Lower starter -B- out of vehicle.

Installing

Install in the reverse order of removal. When doing this, note the following:

- Tighten threaded connections to specified torques
 ⇒ [page 60](#) .





7 Alternator -C-



Caution

When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#).

7.1 Securing battery positive wire on alternator -C-

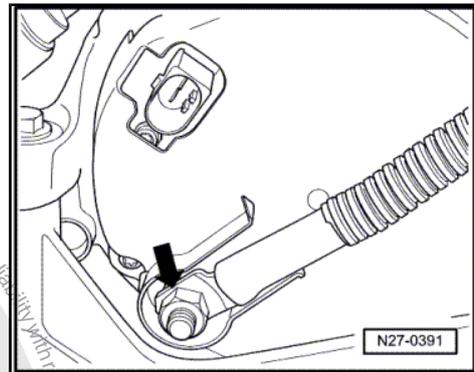


Caution

If the battery positive wire is not tightened to the specified torque, there is a risk of the following:

- ◆ *The battery -A- will not be charged fully.*
- ◆ *Vehicle electrics or electronics fail completely (break-down).*
- ◆ *Danger of fires from sparks*
- ◆ *Damage to electronic components and control units due to excessive voltage*

- The specified torque for the nut -arrow- of the B+ wire is 15 Nm.



7.2 Checking poly V-belt



Caution

Always renew poly V-belt if it is defective. This will avoid possible breakdowns or operating problems.

Carry out following procedures:

- Crank engine at vibration damper/belt pulley using a socket.
- Check poly V-belt for:
 - ◆ Sub-surface cracks (cracks, core ruptures, cross sectional breaks)
 - ◆ Layer separation (top layer, cord strands)
 - ◆ Base break-up
 - ◆ Fraying of cord strands



- ◆ Flank wear (material wear, frayed flanks, flank brittleness - glassy flanks-, surface cracks)
- ◆ Traces of oil and grease



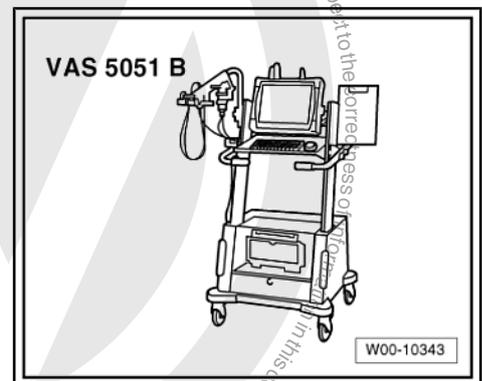
Caution

If faults are found, it is essential for the poly V-belt to be renewed. This will avoid possible breakdowns or operating problems.

7.3 Checking alternator -C-

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .

In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.

- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 27 - Starter, current supply
 - ◆ Electrical components
 - ◆ C - alternator



7.4 Alternator -C- 1.4l petrol engine

7.4.1 Assembly overview

1 - Hexagon head flange bolt

- 60 Nm

2 - Washer

3 - Tensioning roller

4 - Hexagon head flange bolts

- 20 Nm

5 - Hexagon head flange bolts

- 40 Nm

6 - Ancillary bracket

- For alternator -C- and air conditioner compressor
- Tightening sequence ⇒ Engine; Rep. gr. 13

7 - Hexagon head flange bolt

- 20 Nm

8 - Hexagon head flange bolts

- 40 Nm

9 - Protective cap

10 - Hexagon bolts with washer

- 2 Nm

11 - Protective cap for carbon brushes

12 - Voltage regulator -C1-

- Removing and installing ⇒ [page 168](#)

13 - Alternator -C-

- Removing and installing ⇒ [page 91](#)
- Checking ⇒ [page 89](#)
- Securing battery positive wire ⇒ [page 88](#)
- Removing and installing poly V-belt pulley ⇒ [page 163](#)

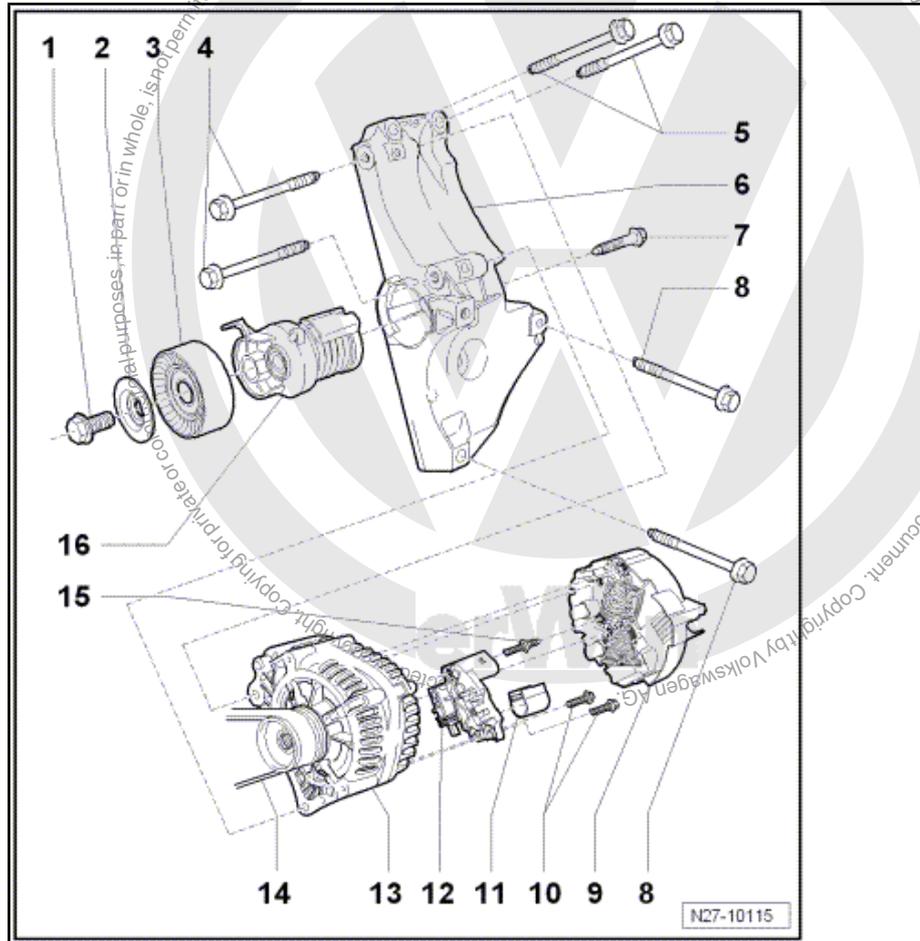
14 - Poly V-belt

- Checking ⇒ [page 88](#)
- Process ⇒ power unit; Rep. gr. 13
- Removing and installing ⇒ Engine; Rep. gr. 13

15 - Hexagon bolt with washer and threaded element

- 2 Nm

16 - Poly V-belt tensioning element



Not illustrated

- ◆ Nut of B+ wire on rear of alternator: 15 Nm
- ◆ Nut of wire holder on back of alternator : 3.2 Nm

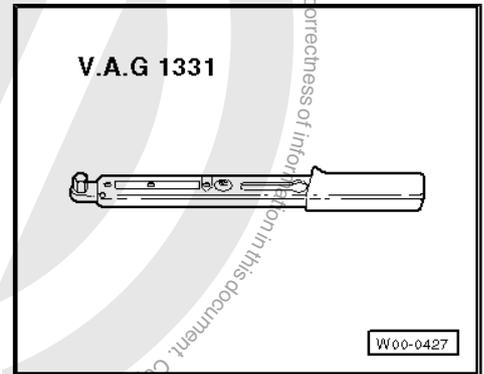


- ◆ Poly V-belt pulley without freewheel: 65 Nm
- ◆ Poly V-belt pulley with freewheel: 80 Nm
- ◆ Removing and installing ancillary bracket ⇒ Engine; Rep. gr. 13

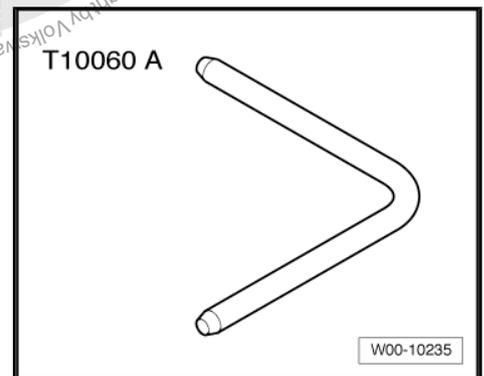
7.4.2 Removing and installing alternator -C-

Special tools and workshop equipment required

- ◆ Torque wrench V.A.G 1331-



- ◆ Locking pin -T10060A-



Carry out following procedures:

Removing

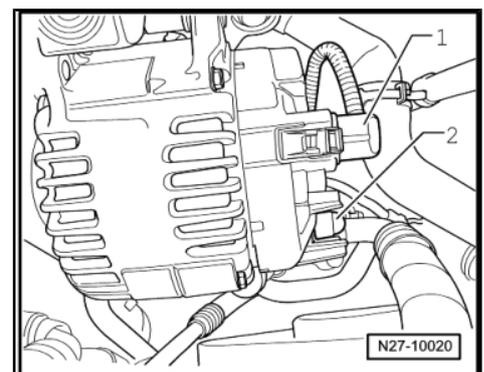
- Disconnect battery -A- ⇒ [page 4](#) .



Caution

When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#) .

- Disconnect DF wire connector -1- and pull off protective cap -2-.



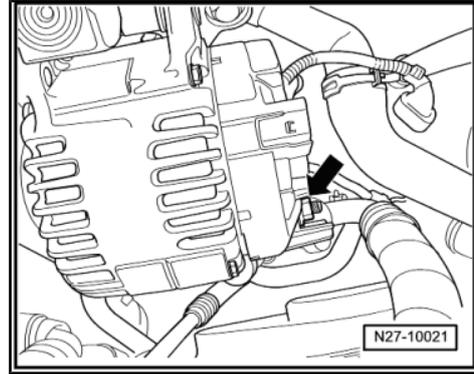


- Unscrew B+ wire -arrow- from alternator -C- .
- Remove noise insulation => General body repairs, exterior; Rep. gr. 50 .

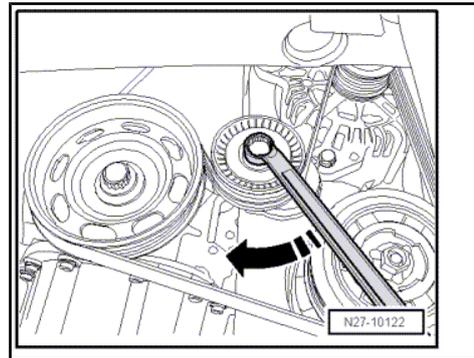


Caution

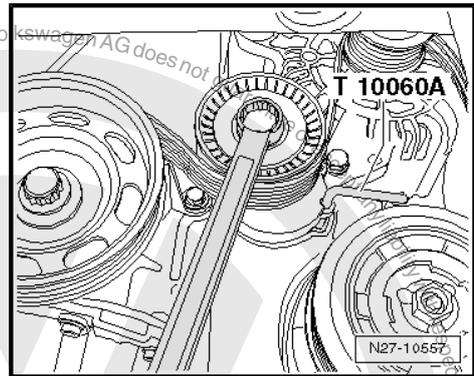
Before removing, mark the top side and direction of rotation of the poly V-belt. When installing, ensure correct fitting position and direction of rotation. If the belt is installed in the wrong position or against direction of rotation, the belt will be destroyed!



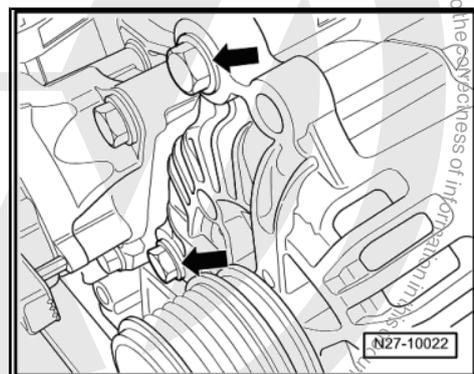
- Mark direction of rotation of poly V-belt.
- Release tension of poly V-belt by swivelling tensioning element in direction of -arrow- using a ring spanner.



- Lock tensioning element using locking pin -T10060A- .
- Remove poly V-belt.



- Remove bolts of alternator -C- -arrows- .





- Unscrew wiring retainer -arrow- from alternator -C- .
- Remove alternator -C- .

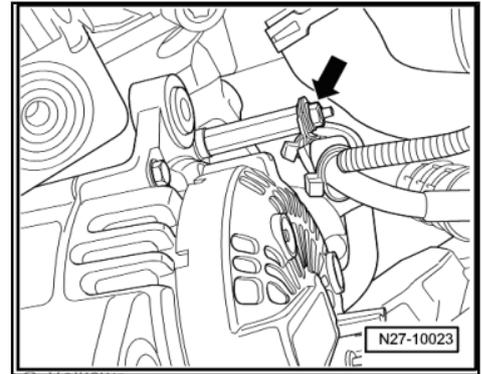
Installing

Install in the reverse order of removal. When doing this, note the following:

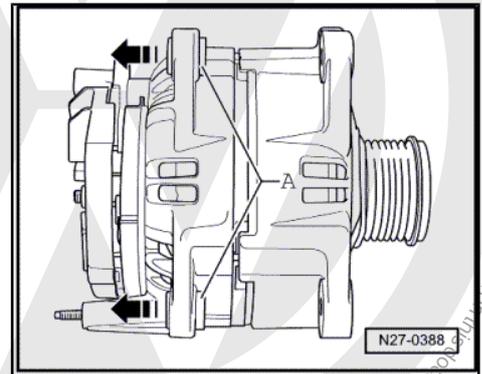


Caution

- ◆ *In order to avoid damage to cylinder block, note the different bolt lengths for aluminium and grey cast iron cylinder blocks when installing the ancillary bracket. → Engine; Rep. gr. 13 .*
- ◆ *When installing used poly V-belts observe the direction of rotation marked on removal!*
- ◆ *Before installing poly V-belt, make sure all assemblies (alternator -C- / air conditioner compressor) are firmly in position.*
- ◆ *When fitting belt, ensure that poly V-belt seats correctly in pulleys!*



- Drive threaded sleeves -A- roughly 4 mm in -direction of arrow- out of alternator -C- housing.



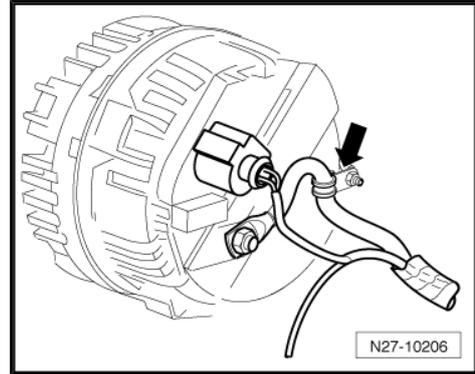


- Secure wire holder -arrow- on back of alternator -C- in 9 o'clock position.
- Tighten threaded connections to specified torques
⇒ [page 90](#) .



Caution

- ◆ *When installing used poly V-belts observe the direction of rotation marked on removal!*
- ◆ *Before installing poly V-belt, make sure all assemblies (alternator -C- / air conditioner compressor / vane pump) are firmly in position.*
- ◆ *When fitting poly V-belt, make sure it is properly seated on the pulleys.*



- Connect battery -A- ⇒ [page 4](#) .



Caution

Observe notes for battery pole terminal clamp bolt ⇒ [page 1](#) .

- Start engine and check belt is running correctly.
- Switch off engine.





7.5 Alternator -C- 1.4l FSI engine

7.5.1 Assembly overview

1 - Hexagon bolt

- 40 Nm

2 - Washer

3 - Idler roller

4 - Washer

5 - Valve timing housing

6 - Securing nut battery positive cable

- 15 Nm

7 - Cross-head screw

- 4.5 Nm

8 - Hexagon nut

9 - Washer

10 - Protective cap

11 - Cross-head screws

- 2 Nm

12 - Cross-head screw

- 2 Nm

13 - Voltage regulator -C1-

- Removing and installing
 ⇒ [page 168](#)

14 - Alternator -C-

- Removing and installing
 ⇒ [page 96](#)
- Checking ⇒ [page 89](#)
- Securing battery positive wire ⇒ [page 88](#)
- Removing and installing poly V-belt pulley ⇒ [page 163](#)

15 - Poly V-belt

- Checking ⇒ [page 88](#)
- Removing and installing ⇒ Engine; Rep. gr. 13
- Process ⇒ power unit; Rep. gr. 13

16 - Hexagon head flange bolts

- 23 Nm

17 - Hexagon head flange bolts

- 25 Nm

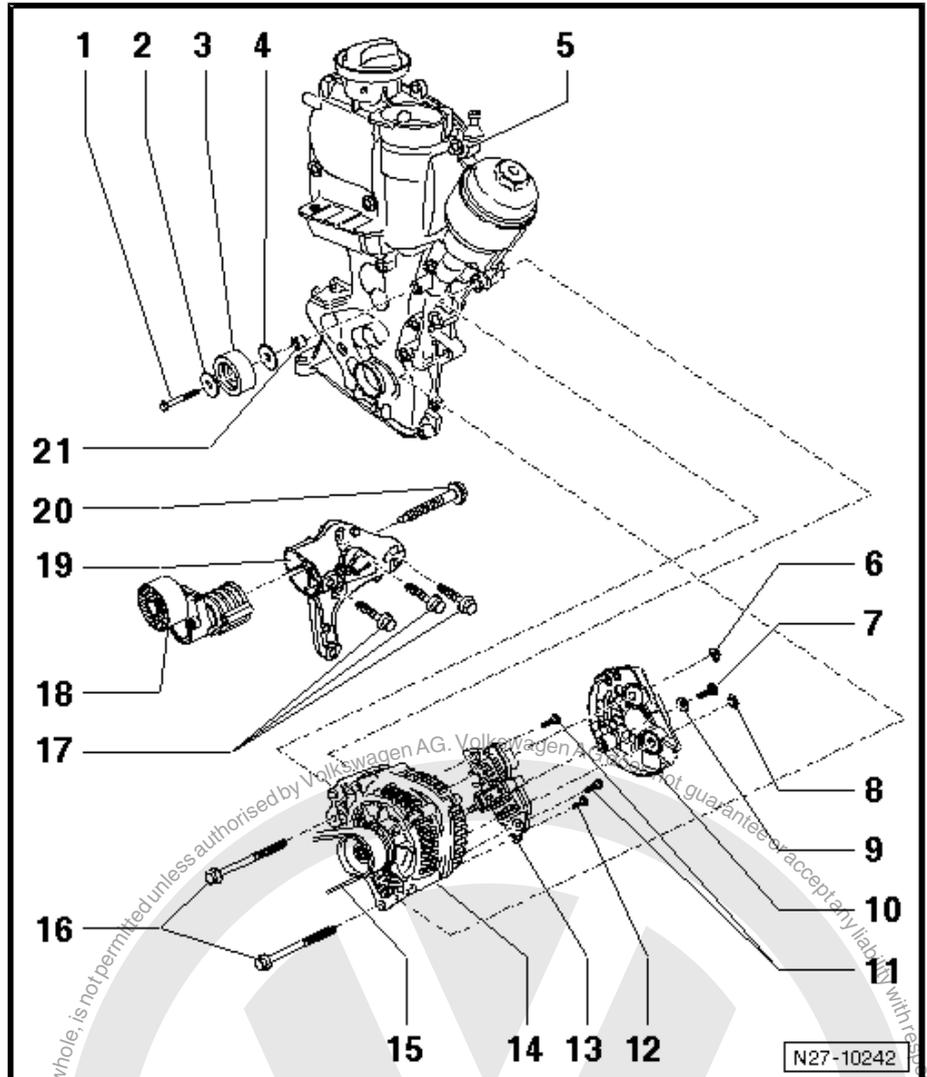
18 - Tensioning element

19 - Bracket

- For tensioning element and air conditioner compressor

20 - Hexagon head flange bolt

- 20 Nm + 1/4 turn (90 degrees) further



N27-10242



21 - Spacer sleeve

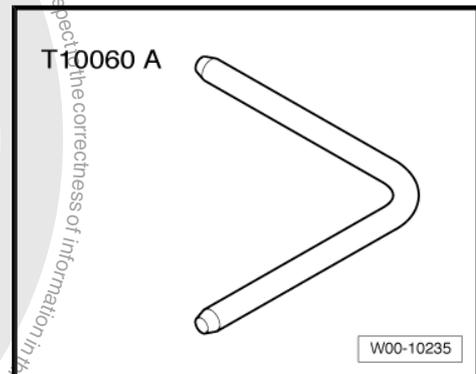
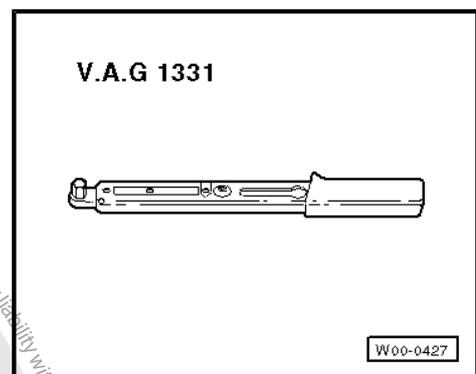
Not illustrated

- ◆ Nut of B+ wire on rear of alternator: 15 Nm
- ◆ Nut of wire holder on back of alternator : 3.2 Nm
- ◆ Poly V-belt pulley without freewheel: 65 Nm
- ◆ Poly V-belt pulley with freewheel: 80 Nm
- ◆ Removing and installing ancillary bracket ⇒ Engine; Rep. gr. 13

7.5.2 Removing and installing alternator -C-

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-



- ◆ Locking pin -T10060A-

Carry out following procedures:

Removing

- Disconnect battery -A- ⇒ [page 4](#) .

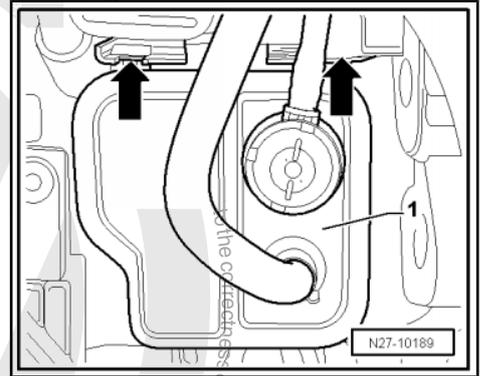


Caution

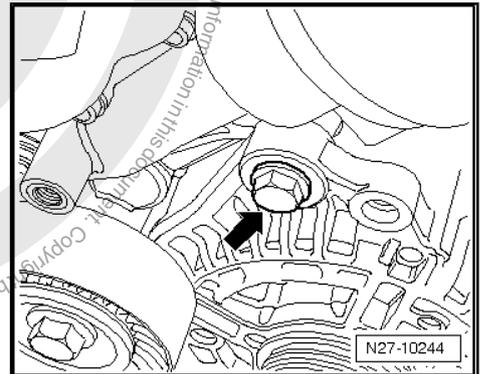
When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#) .



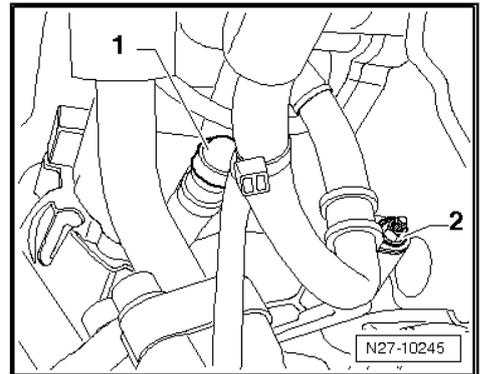
- Pull activated charcoal filter -1- upwards out of fasteners -arrows-.
- Place activated charcoal filter -1- with connected hoses to one side.



- Remove upper bolt of alternator -C- -arrow-.
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50



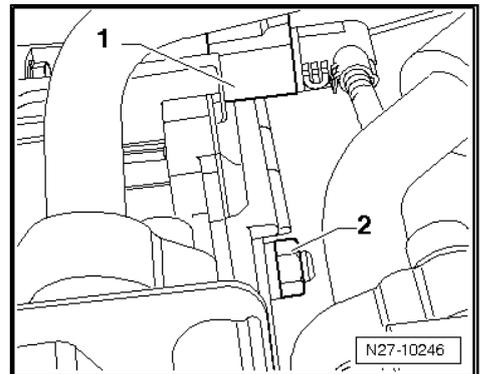
- Unscrew wiring retainer -1- and pull off protective cap -2-.



- Disconnect DF connector -1- and unscrew battery positive wire -2- from alternator -C- .

Caution

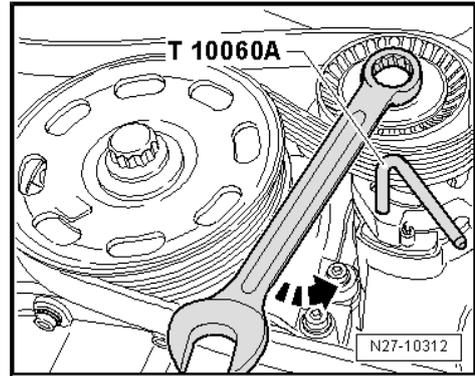
Before removing, mark the top side and direction of rotation of the poly V-belt. When installing, ensure correct fitting position and direction of rotation. If the belt is installed in the wrong position or against direction of rotation, the belt will be destroyed!



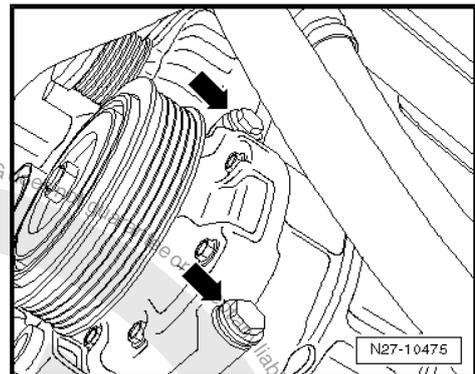
- Mark direction of rotation of poly V-belt.



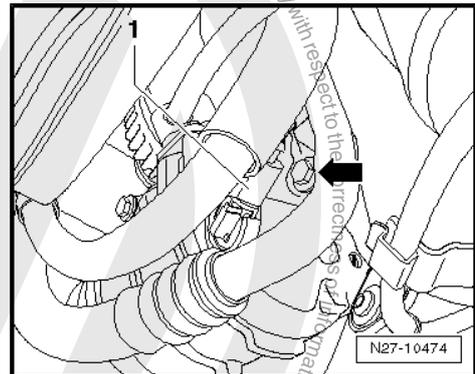
- Release tension of poly V-belt by swivelling tensioning element in direction of -arrow- using an open-jaw spanner.
- Lock tensioning element using locking pin -T10060A- .
- Remove poly V-belt.



- Remove bolts of air conditioner compressor -arrows-.

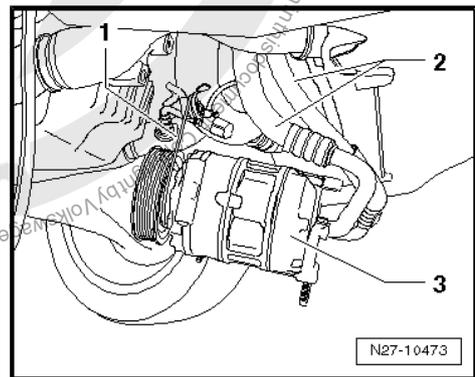


- Release and disconnect connector -1-.
- Unscrew third bolt -arrow- and remove air conditioner compressor from bracket.



i Note

- ◆ The hoses of the air conditioner compressor can remain connected.
- ◆ Suspend the air conditioner compressor -3- using a piece of wire -1- at a suitable position under the vehicle until it is ready to be reinstalled.
- ◆ Ensure that the hoses -2- are not stretched or kinked when doing this.





- Remove lower bolt of alternator -C- -arrow-.
- Lower alternator -C- out of vehicle.

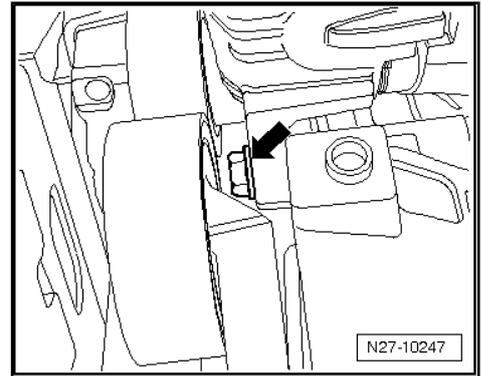
Installing

Install in the reverse order of removal. When doing this, note the following:

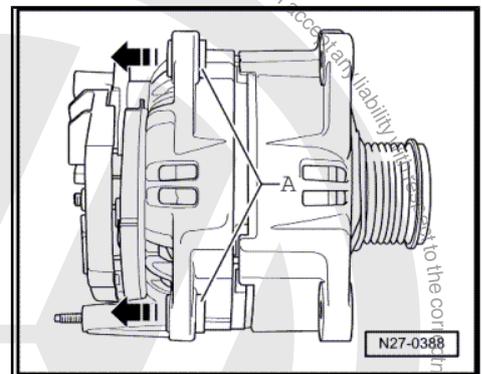


Caution

- ◆ *When installing used poly V-belts observe the direction of rotation marked on removal!*
- ◆ *Before installing poly V-belt, make sure all assemblies (alternator -C- / air conditioner compressor / vane pump) are firmly in position.*
- ◆ *When fitting belt, ensure that poly V-belt seats correctly in pulleys!*



- Drive threaded sleeves -A- roughly 4 mm in -direction of arrow- out of alternator -C- housing.

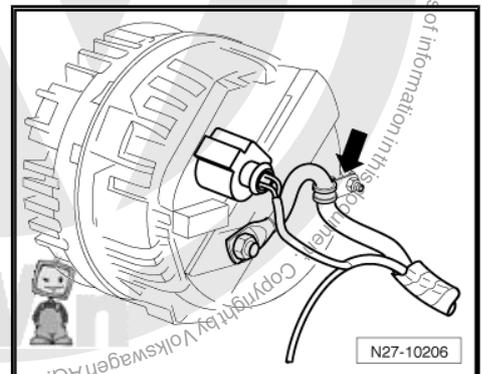


- Secure wire holder -arrow- on back of alternator -C- in 9 o'clock position.
- Tighten threaded connections to specified torques => [page 95](#) .
- Connect battery -A- => [page 4](#) .



Caution

Observe notes for battery pole terminal clamp bolt => [page 1](#) .



- Start engine and check belt is running correctly.
- Switch off engine.



19 - Hexagon head flange bolt

- 45 Nm

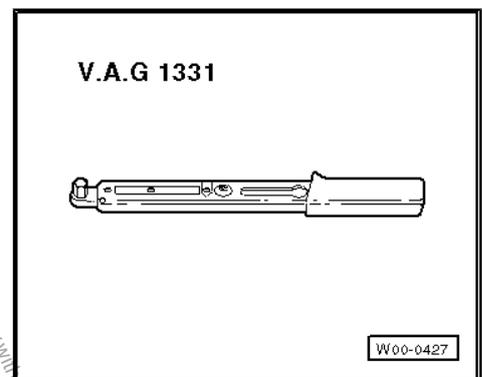
Not illustrated

- ◆ Nut of B+ wire on rear of alternator: 15 Nm
- ◆ Nut of wire holder on back of alternator : 3.2 Nm
- ◆ Poly V-belt pulley without freewheel: 65 Nm
- ◆ Poly V-belt pulley with freewheel: 80 Nm
- ◆ Removing and installing ancillary bracket ⇒ Engine; Rep. gr. 13

7.6.2 Removing and installing alternator -C-

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-



Carry out following procedures:

Removing

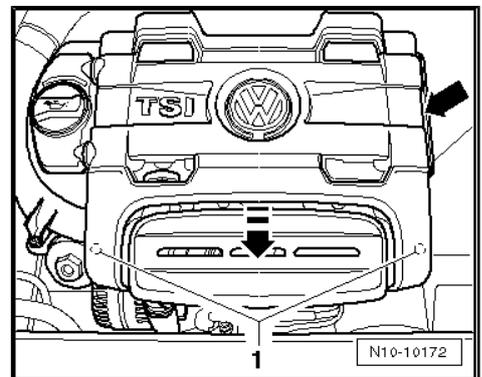
- Disconnect battery -A- ⇒ [page 4](#) .



Caution

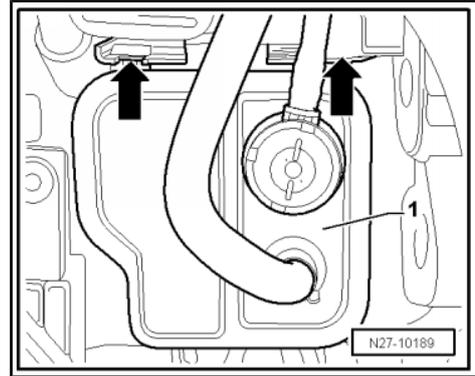
When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#) .

- Release vacuum hose -arrow- and pull it off.
- Pull off engine cover upwards out of its rubber mountings -1- and remove it forwards in -direction of arrow-.

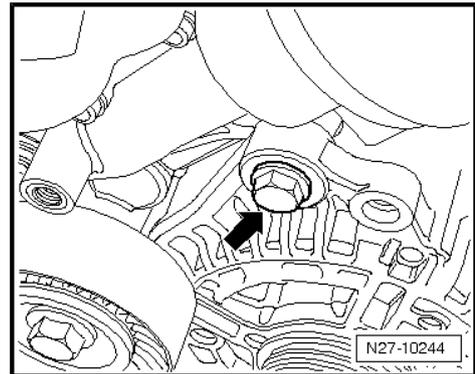




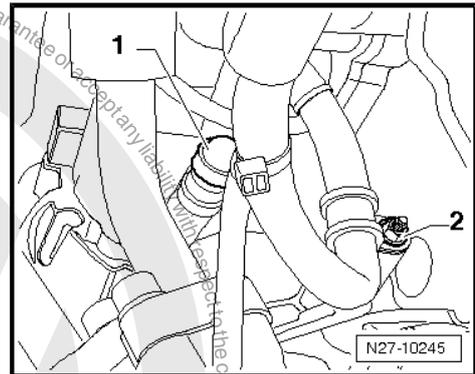
- Pull activated charcoal filter -1- upwards out of fasteners -arrows-.
- Place activated charcoal filter -1- with connected hoses to one side.
- Remove poly V-belt ⇒ Engine; Rep. gr. 13 .
- Unscrew bolts -arrows- and remove the upper belt tensioner from the vehicle.



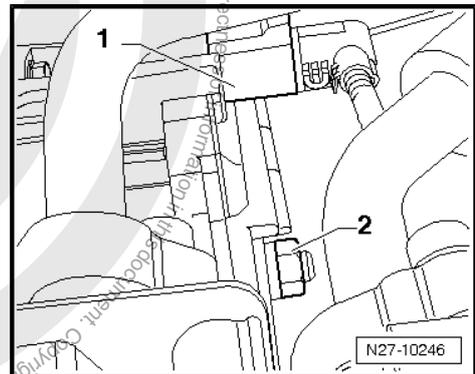
- Remove upper bolt of alternator -C- -arrow-.
- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Noise insulation .



- Unscrew wiring retainer -2- and pull off protective cap -1-.

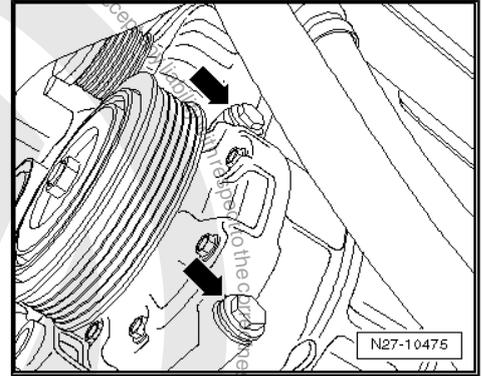


- Disconnect DF connector -1- and unscrew battery positive wire -2- from alternator -C- .

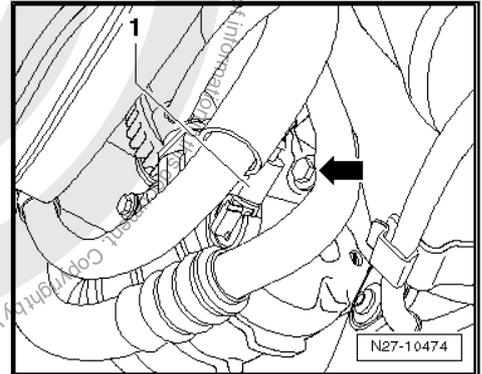




- Remove bolts of air conditioner compressor -arrows-.

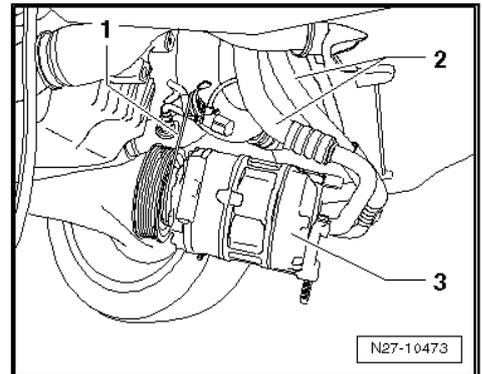


- Release and disconnect connector -1-.
- Unscrew third bolt -arrow- and remove air conditioner compressor from bracket.

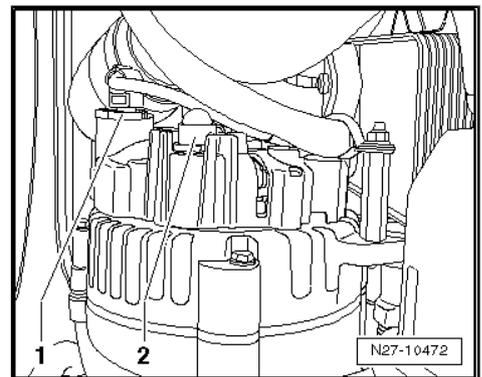


i Note

- ◆ The hoses of the air conditioner compressor can remain connected.
- ◆ Suspend the air conditioner compressor -3- using a piece of wire -1- at a suitable position under the vehicle until it is ready to be reinstalled.
- ◆ Ensure that the hoses -2- are not stretched or kinked when doing this.

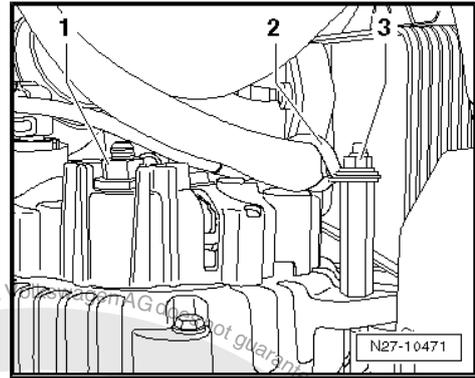


- Release and disconnect DF wire connector -1-.
- Lever off protective cap -2-.

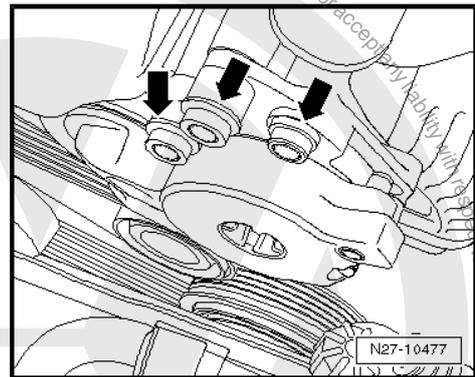




- Remove nut -1- and remove the battery positive wire, located beneath, from the connector thread of the alternator -C- .
- Unscrew nut -3- and remove wiring retainer -2- from the alternator -C- .
- Relieve tension on upper tensioning roller again.



- Unscrew the three bolts -arrows- and remove upper tensioning roller -1- from vehicle.



- Remove bolts of alternator -C- -arrows-.
- Lower alternator -C- out of vehicle.

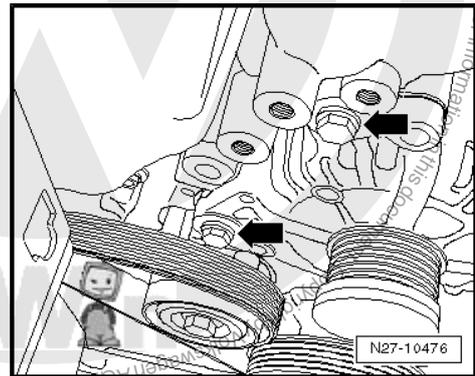
Installing

Install in the reverse order of removal. When doing this, note the following:

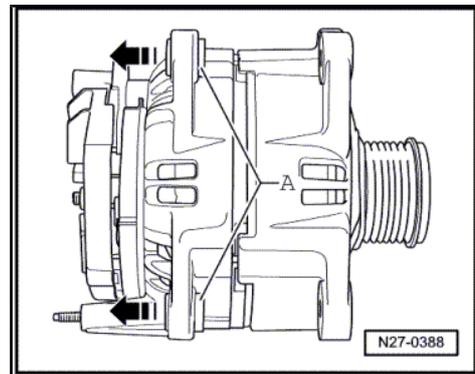


Caution

- ◆ **When installing used poly V-belts observe the direction of rotation marked on removal!**
- ◆ **Before installing poly V-belt, make sure all assemblies (alternator -C- / air conditioner compressor / vane pump) are firmly in position.**
- ◆ **When fitting belt, ensure that poly V-belt seats correctly in pulleys!**



- Drive threaded sleeves -A- roughly 4 mm in -direction of arrow- out of alternator -C- housing.





- Secure wire holder -arrow- on back of alternator -C- in 9 o'clock position.

i Note

Before installing the air conditioner compressor, ensure that both centring sleeves ⇒ [Item 16 \(page 100\)](#) are inserted in the threaded holes (one above the other) of the bracket.

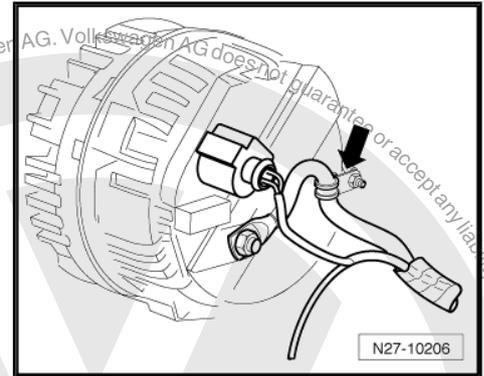
- Tighten threaded connections to specified torques ⇒ [page 100](#) .
- Connect battery -A- ⇒ [page 4](#) .



Caution

Observe notes for battery pole terminal clamp bolt ⇒ [page 1](#) .

- Start engine and check belt is running correctly.
- Switch off engine.





7.7 Alternator -C- 1.6l petrol engine

7.7.1 Assembly overview

1 - Hexagon head flange bolt

- 23 Nm

2 - Hexagon head flange bolts

- 23 Nm

3 - Bracket

4 - Hexagon flange nut

5 - Hexagon head flange bolts

- 52 Nm

6 - Protective cap

7 - Hexagon flange nut

8 - Cross-head screw

- 4.5 Nm

9 - Hexagon nut

10 - Washer

11 - Cross-head screws

- 2 Nm

12 - Cross-head screw

- 2 Nm

13 - Voltage regulator -C1-

- Removing and installing
⇒ [page 168](#)

14 - Alternator -C-

- Removing and installing
⇒ [page 107](#)
- Checking ⇒ [page 89](#)
- Securing battery positive wire ⇒ [page 88](#)

15 - Poly V-belt

- Checking ⇒ [page 88](#)
- Removing and installing ⇒ Engine; Rep. gr. 13
- Poly V-belt routing ⇒ Engine; Rep. gr. 13

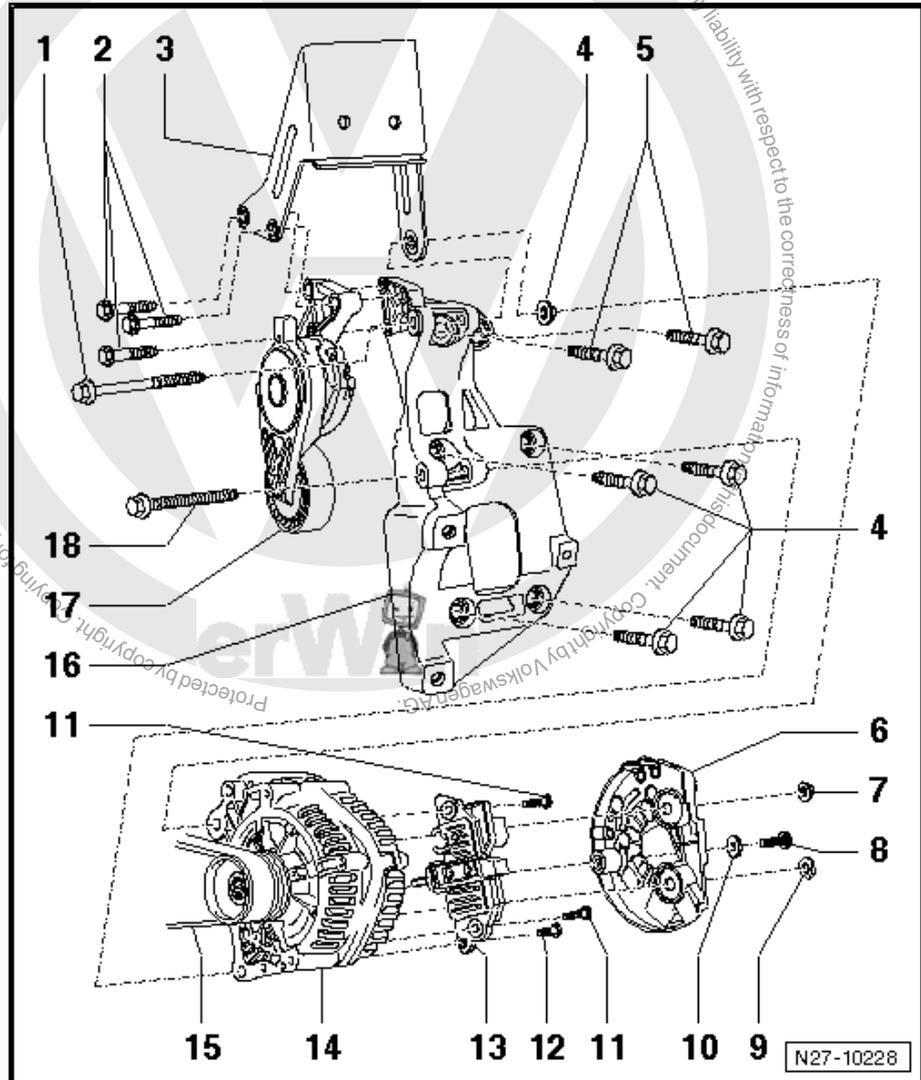
16 - Ancillary bracket

- For alternator -C- and air conditioner compressor
- Tightening sequence ⇒ Engine; Rep. gr. 13

17 - Poly V-belt tensioning element

18 - Hexagon head flange bolt

- 23 Nm



Not illustrated

- ◆ Nut of B+ wire on rear of alternator: 15 Nm
- ◆ Nut of wire holder on back of alternator : 3.2 Nm

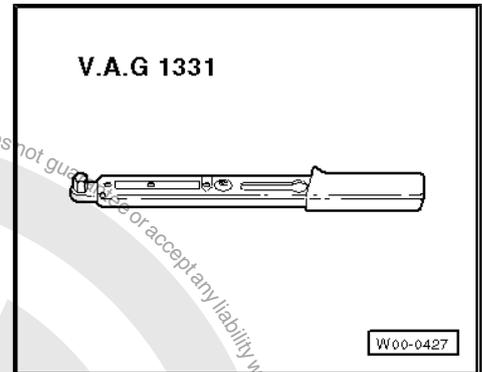


- ◆ Poly V-belt pulley without freewheel: 65 Nm
- ◆ Poly V-belt pulley with freewheel: 80 Nm
- ◆ Removing and installing ancillary bracket ⇒ Engine; Rep. gr. 13

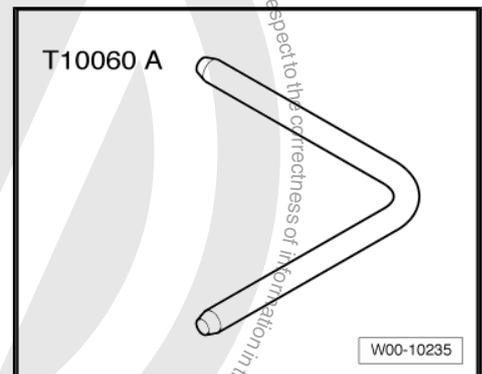
7.7.2 Removing and installing alternator -C-

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-



- ◆ Locking pin -T10060A-



Removing

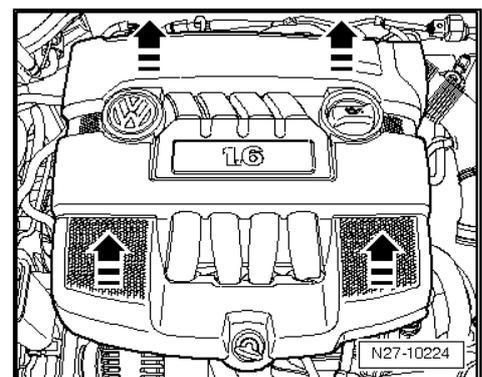
- Disconnect battery -A- ⇒ [page 4](#) .



Caution

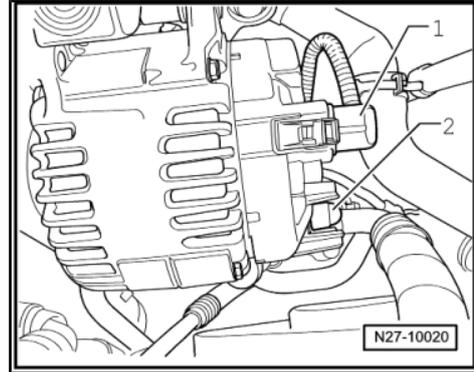
When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#) .

- Pull engine cover panel upwards -arrows-.





- Disconnect DF wire connector -1- and pull off protective cap -2-.

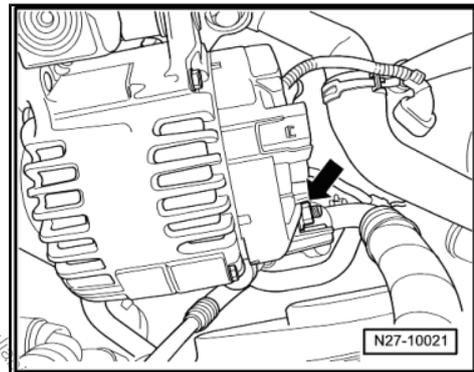


- Unscrew B+ wire -arrow- from alternator -C- .

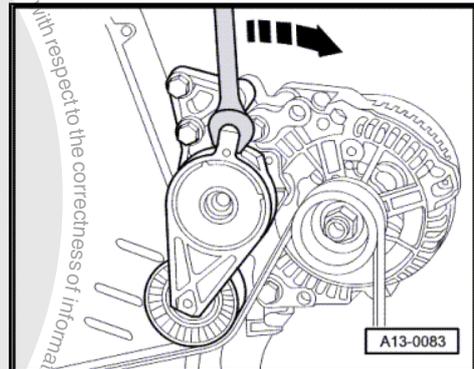


Caution

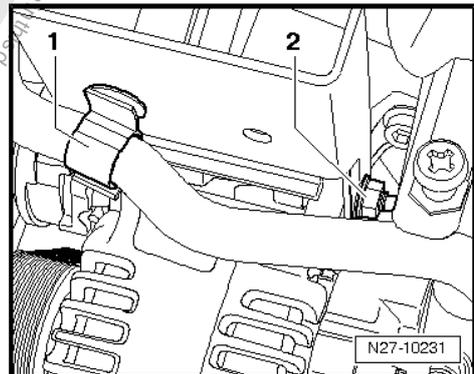
Before removing, mark the top side and direction of rotation of the poly V-belt. When installing, ensure correct fitting position and direction of rotation. If the belt is installed in the wrong position or against direction of rotation, the belt will be destroyed!



- Mark direction of rotation of poly V-belt.
- Release tension of poly V-belt by swivelling tensioning element in direction of -arrow- using an open-jaw spanner.
- Lock tensioning element using locking pin -T10060A- .
- Remove poly V-belt.

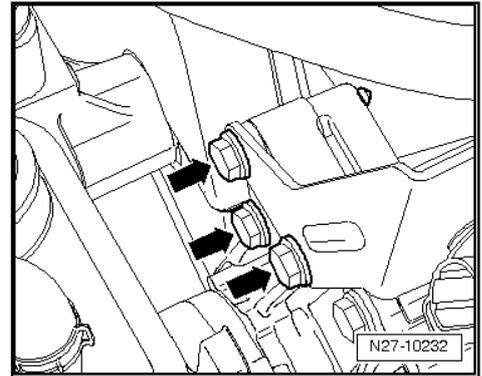


- Unclip coolant hose from hose bracket -1- and unscrew securing nut -2-.

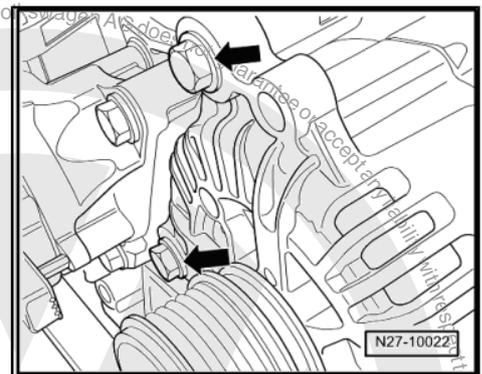




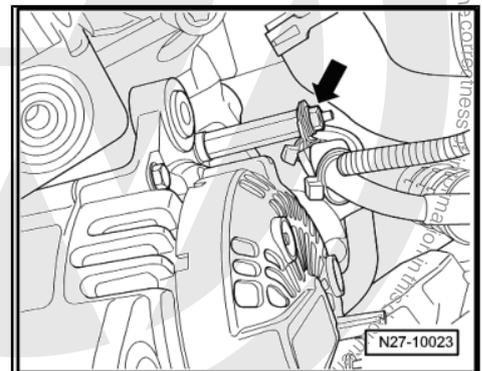
- Remove bolts -arrows-.
- Remove holder together with clamping element from vehicle.



- Remove bolts of alternator -C- -arrows-.



- Unscrew wiring retainer -arrow- from alternator -C- .
- Remove alternator -C- .



Installing

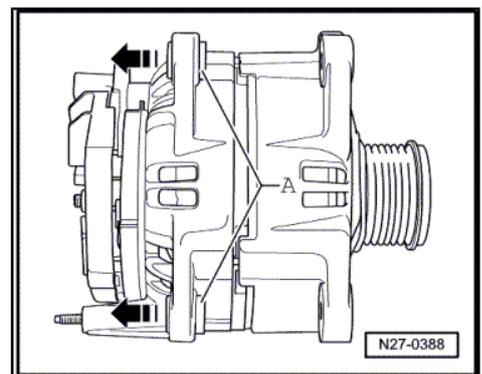
Install in the reverse order of removal. When doing this, note the following:



Caution

- ◆ *When installing used poly V-belts observe the direction of rotation marked on removal!*
- ◆ *Before installing poly V-belt, make sure all assemblies (alternator -C- / air conditioner compressor) are firmly in position.*
- ◆ *When fitting belt, ensure that poly V-belt seats correctly in pulleys!*

- Drive threaded sleeves -A- roughly 4 mm in -direction of arrow- out of alternator -C- housing.



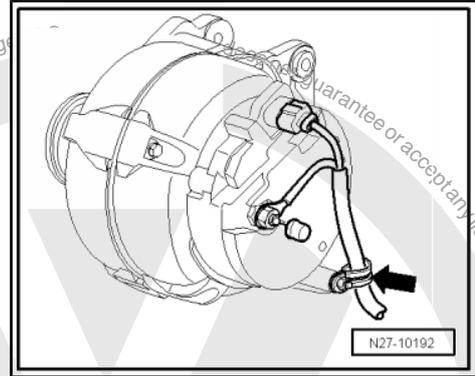


- Secure wire holder -arrow- on back of alternator -C- in 3 o'clock position.
- Tighten threaded connections to specified torques
⇒ [page 106](#) .
- Connect battery -A- ⇒ [page 4](#) .



Caution

Observe notes for battery pole terminal clamp bolt ⇒ [page 1](#) .

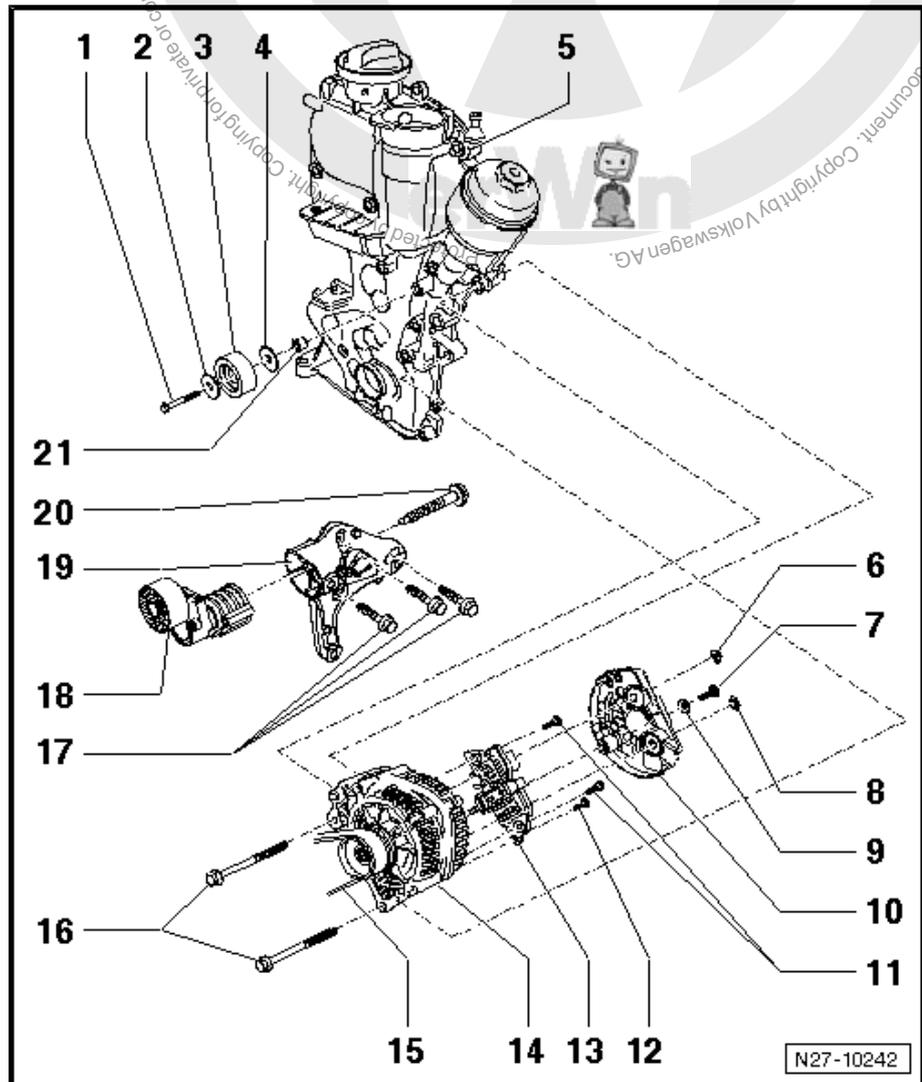


- Start engine and check belt is running correctly.
- Switch off engine.

7.8 Alternator -C- 1.6l FSI engine

7.8.1 Assembly overview

- 1 - Hexagon bolt
□ 40 Nm
- 2 - Washer
- 3 - Idler roller
- 4 - Washer
- 5 - Valve timing housing
- 6 - Hexagon flange nut
- 7 - Cross-head screw
□ 4.5 Nm
- 8 - Hexagon nut
- 9 - Washer
- 10 - Protective cap
- 11 - Cross-head screws
□ 2 Nm
- 12 - Cross-head screw
□ 2 Nm
- 13 - Voltage regulator -C1-
□ Removing and installing
⇒ [page 168](#)
- 14 - Alternator -C-
□ Removing and installing
⇒ [page 111](#)
□ Checking ⇒ [page 89](#)
□ Securing battery positive wire ⇒ [page 88](#)
- 15 - Poly V-belt
□ Checking ⇒ [page 88](#)
□ Removing and installing
⇒ Engine; Rep. gr. 13
□ Poly V-belt routing ⇒ Engine; Rep. gr. 13





16 - Hexagon head flange bolts

- 23 Nm

17 - Hexagon head flange bolts

- 25 Nm

18 - Tensioning element

19 - Bracket

- For tensioning element and air conditioner compressor

20 - Hexagon head flange bolt

- 20 Nm + 1/4 turn (90 degrees) further

21 - Spacer sleeve

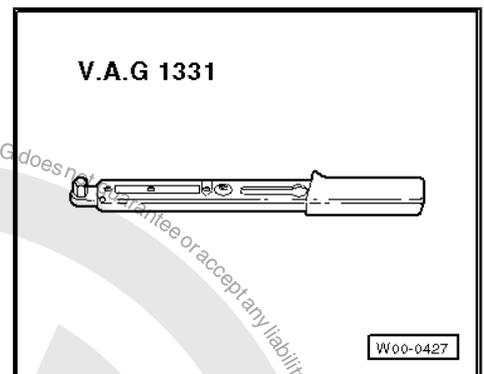
Not illustrated

- ◆ Nut of B+ wire on rear of alternator: 15 Nm
- ◆ Nut of wire holder on back of alternator : 3.2 Nm
- ◆ Poly V-belt pulley without freewheel: 65 Nm
- ◆ Poly V-belt pulley with freewheel: 80 Nm
- ◆ Removing and installing ancillary bracket ⇒ Engine; Rep. gr. 13

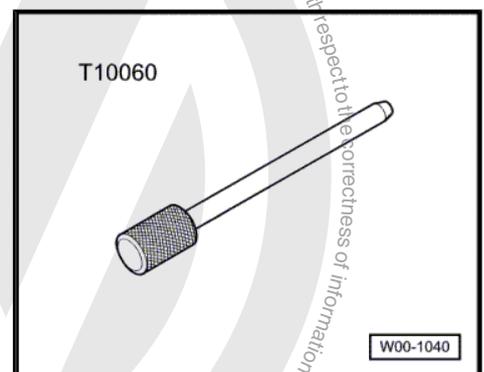
7.8.2 Removing and installing alternator -C-

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-



- ◆ Locking pin -T10060-



Removing

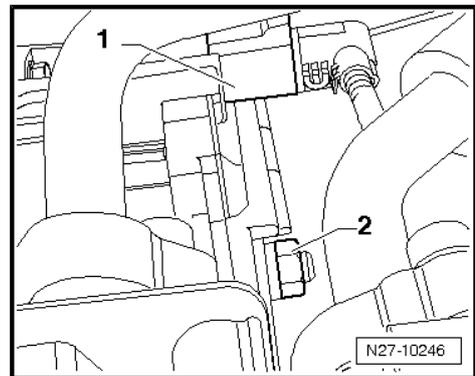
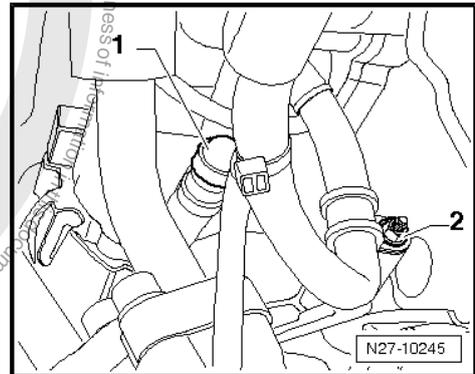
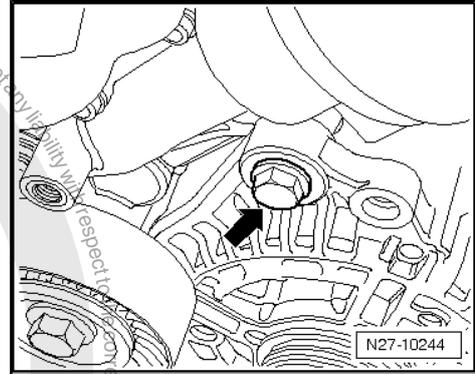
- Disconnect battery -A- ⇒ [page 4](#).



Caution

When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed => page 4 .

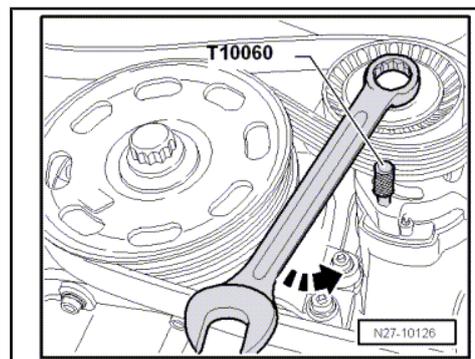
- Remove upper bolt of alternator -C- -arrow-.
- Remove noise insulation => General body repairs, exterior; Rep. gr. 50 .
- Unscrew wiring retainer -1- and pull off protective cap -2-.
- Disconnect DF connector -1- and unscrew battery positive wire -2- from alternator -C- .



Caution

Before removing, mark the top side and direction of rotation of the poly V-belt. When installing, ensure correct fitting position and direction of rotation. If the belt is installed in the wrong position or against direction of rotation, the belt will be destroyed!

- Mark direction of rotation of poly V-belt.
- Release tension of poly V-belt by swivelling tensioning element in direction of -arrow- using an open-jaw spanner.
- Lock tensioning element using locking pin -T10060- .
- Remove poly V-belt.
- Remove air conditioner compressor => Heating, ventilation, air conditioning system; Rep. gr. 87 .





- Remove lower bolt of alternator -C- -arrow-.
- Lower alternator -C- out of vehicle.

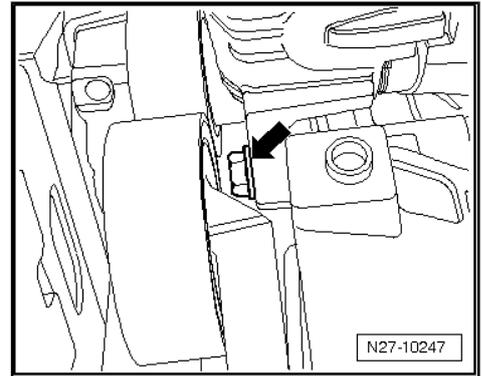
Installing

Install in the reverse order of removal. When doing this, note the following:

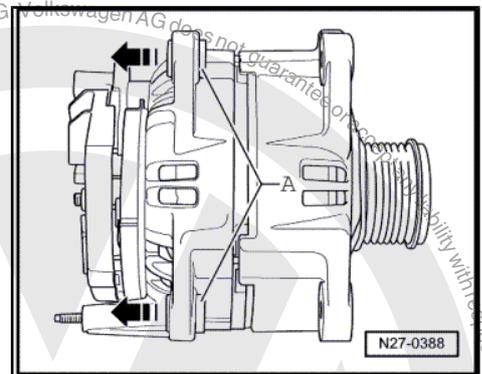


Caution

- ◆ *When installing used poly V-belts observe the direction of rotation marked on removal!*
- ◆ *Before installing poly V-belt, make sure all assemblies (alternator -C- / air conditioner compressor / vane pump) are firmly in position.*
- ◆ *When fitting belt, ensure that poly V-belt seats correctly in pulleys!*



- Drive threaded sleeves -A- roughly 4 mm in -direction of arrow- out of alternator -C- housing.

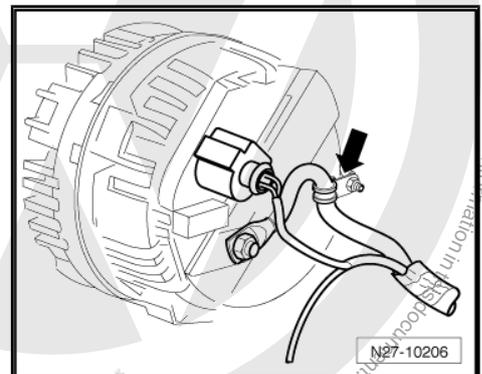


- Secure wire holder -arrow- on back of alternator -C- in 9 o'clock position.
- Tighten threaded connections to specified torques
=> [page 110](#) .
- Connect battery -A- => [page 4](#) .



Caution

Observe notes for battery pole terminal clamp bolt => [page 1](#) .



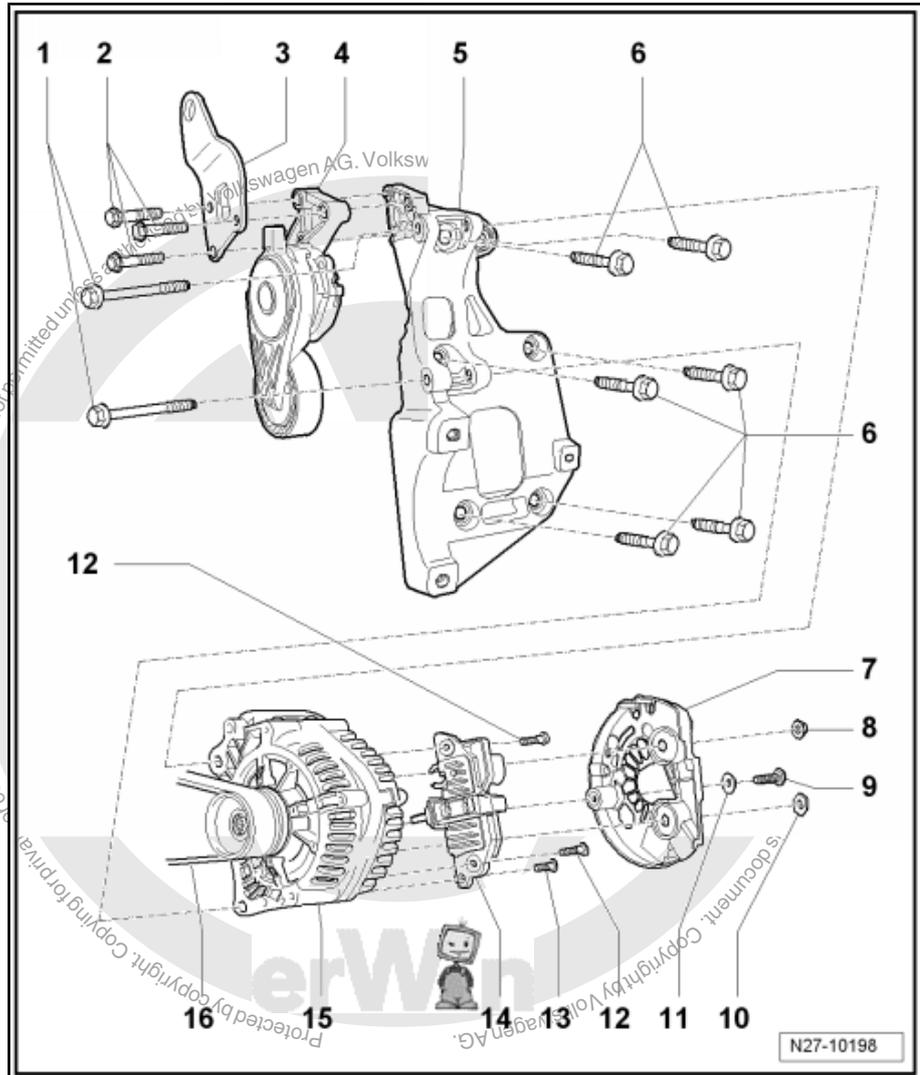
- Start engine and check belt is running correctly.
- Switch off engine.



7.9 Alternator -C- 2.0l FSI engine

7.9.1 Assembly overview

- 1 - Hexagon head flange bolts
 - 23 Nm
- 2 - Hexagon head flange bolts
 - 23 Nm
- 3 - Transportation bracket
- 4 - Poly V-belt tensioning element
- 5 - Ancillary bracket
 - For alternator -C- and air conditioner compressor
 - Tightening sequence ⇒ Engine; Rep. gr. 13
- 6 - Hexagon head flange bolts
 - 52 Nm
- 7 - Protective cap
- 8 - Hexagon flange nut
- 9 - Cross-head screw
 - 4.5 Nm
- 10 - Hexagon nut
- 11 - Washer
- 12 - Cross-head screws
 - 2 Nm
- 13 - Cross-head screw
 - 2 Nm
- 14 - Voltage regulator -C1-
 - Removing and installing ⇒ [page 168](#)
- 15 - Alternator -C-
 - Removing and installing ⇒ [page 115](#)
 - Checking ⇒ [page 89](#)
 - Securing battery positive wire ⇒ [page 88](#)
- 16 - Poly V-belt
 - Checking ⇒ [page 88](#)
 - Removing and installing ⇒ Engine; Rep. gr. 13
 - Poly V-belt routing ⇒ Engine; Rep. gr. 13



Not illustrated

- ◆ Nut of B+ wire on rear of alternator: 15 Nm
- ◆ Nut of wire holder on back of alternator : 3.2 Nm
- ◆ Poly V-belt pulley without freewheel: 65 Nm

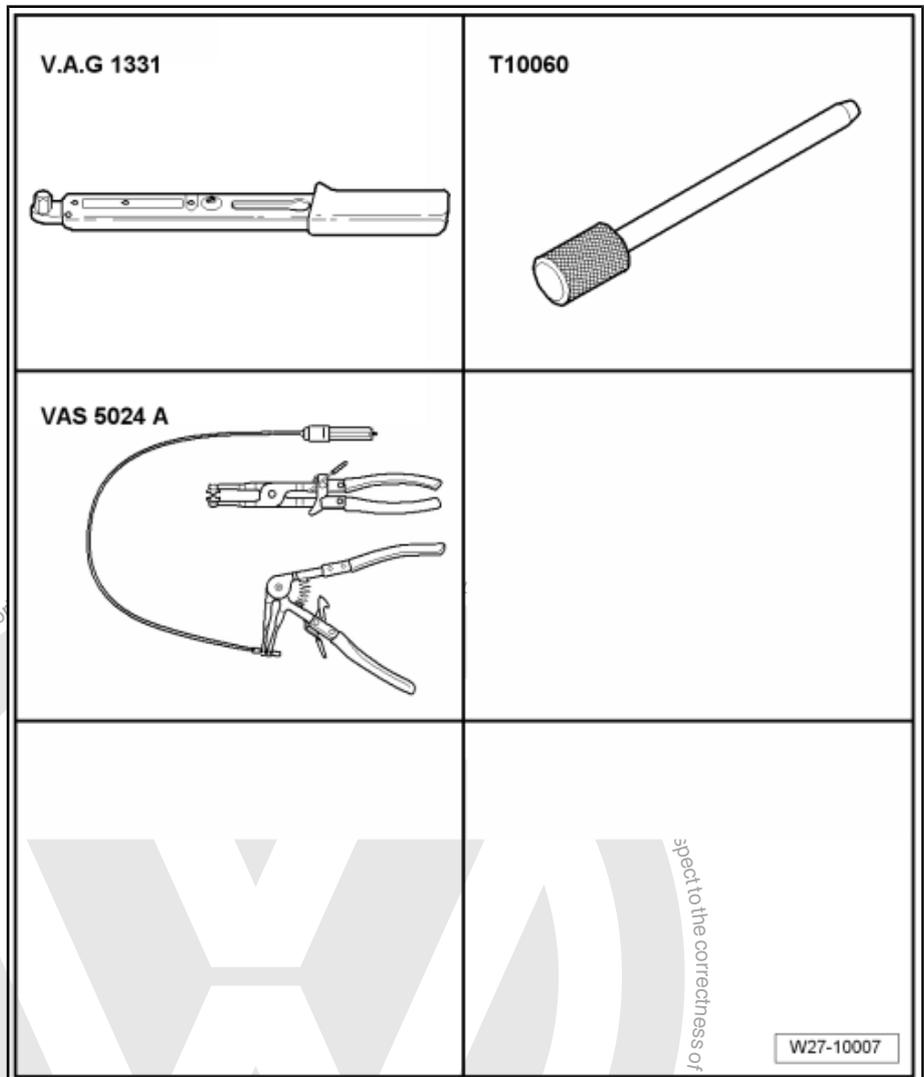


- ◆ Poly V-belt pulley with freewheel: 80 Nm
- ◆ Removing and installing ancillary bracket ⇒ Engine; Rep. gr. 13

7.9.2 Removing and installing alternator -C-

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-
- ◆ Locking pin -T10060-
- ◆ Spring-type clip pliers -VAS 5024A-



Carry out following procedures:

Removing

- Disconnect battery -A- ⇒ [page 4](#) .

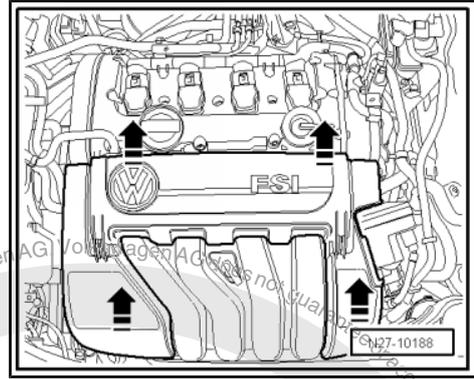


Caution

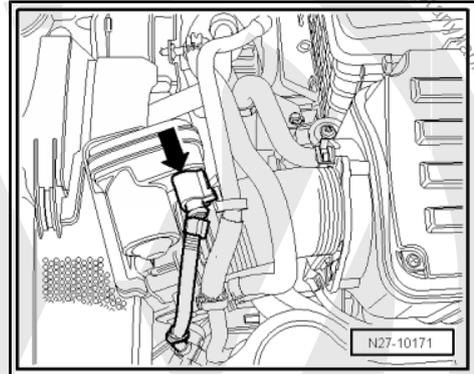
When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#) .



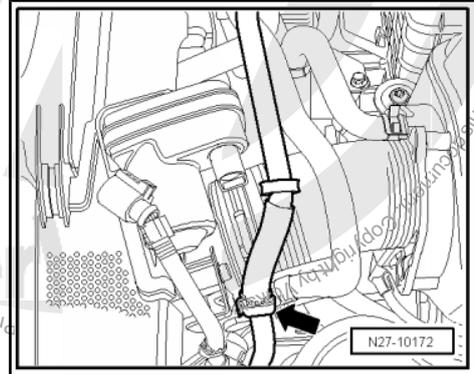
- Pull engine cover panel upwards -arrows-.



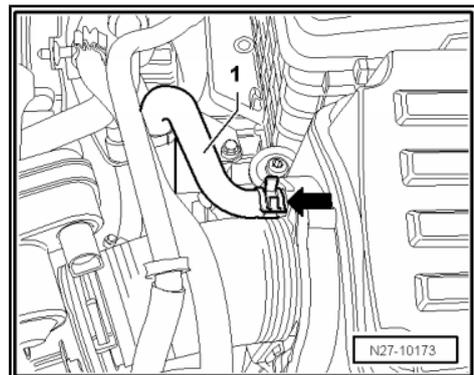
- Disconnect connector -arrow-.



- Unclip vacuum hose out of retainer -arrow-.

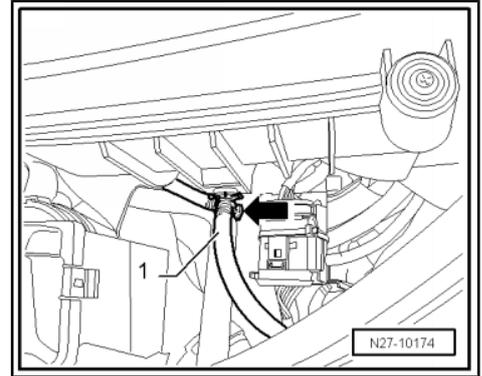


- Loosen spring-type clip -arrow- from hose -1- using spring-type clip pliers -VAS 5024A- .
- Pull hose -1- off air filter housing.

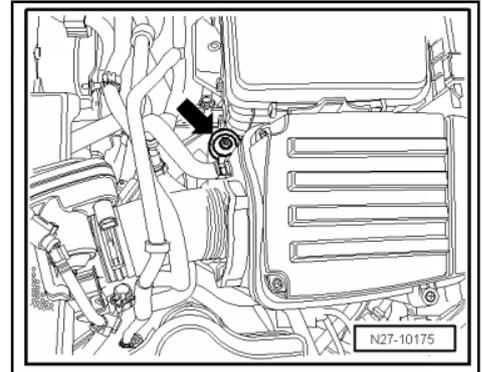




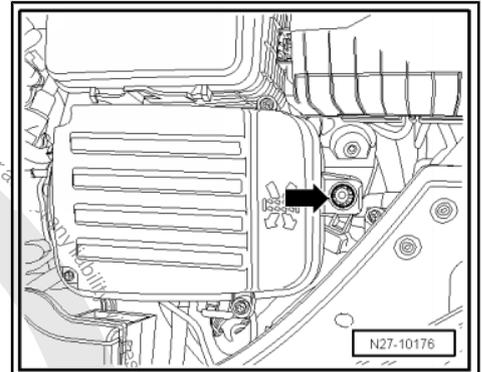
- Open retainer -arrow- on front of air filter housing and remove line -1-.



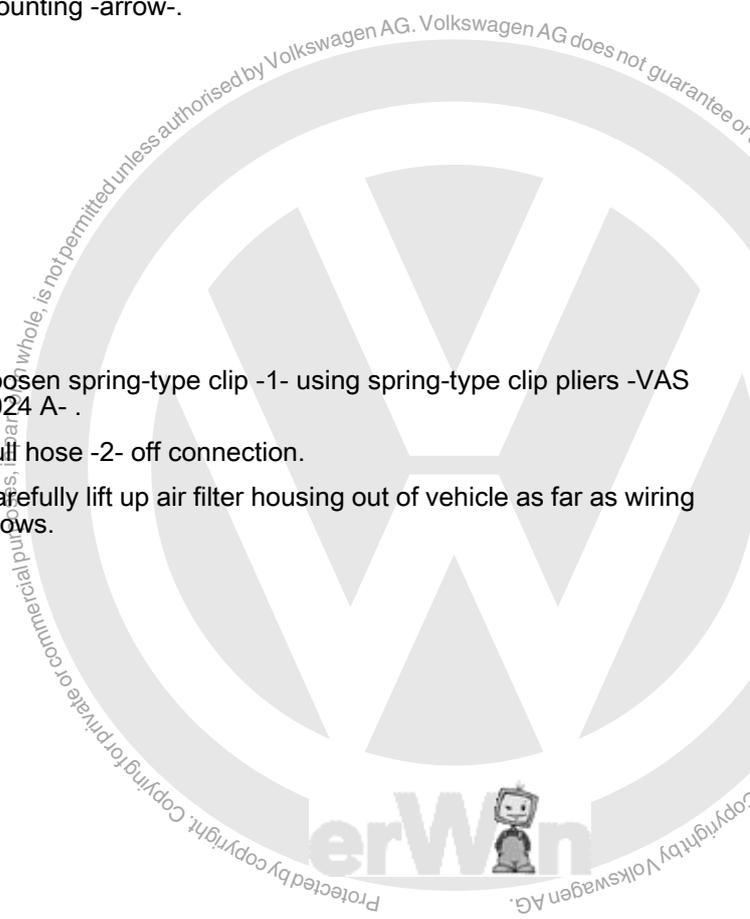
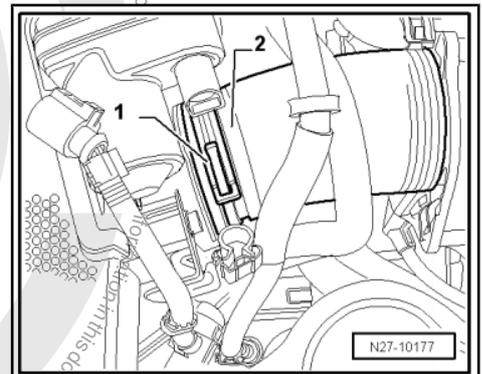
- Remove bolt of air filter housing -arrow-.



- Pull air filter housing upwards on right-hand side out of rubber mounting -arrow-.

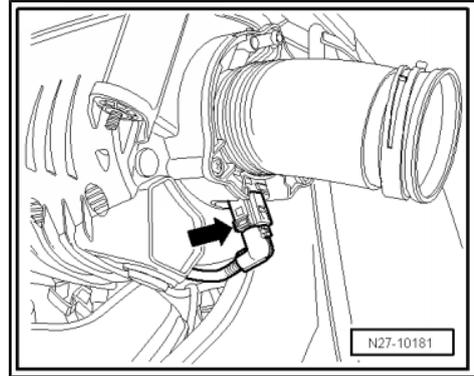


- Loosen spring-type clip -1- using spring-type clip pliers -VAS 5024 A- .
- Pull hose -2- off connection.
- Carefully lift up air filter housing out of vehicle as far as wiring allows.

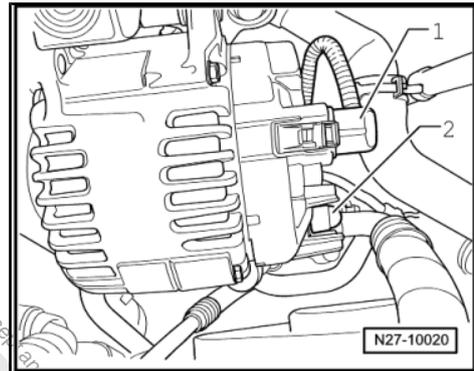




- Disconnect connector -arrow- on rear of air filter housing.
- Take air filter housing out of vehicle.
- Remove top part of intake manifold.



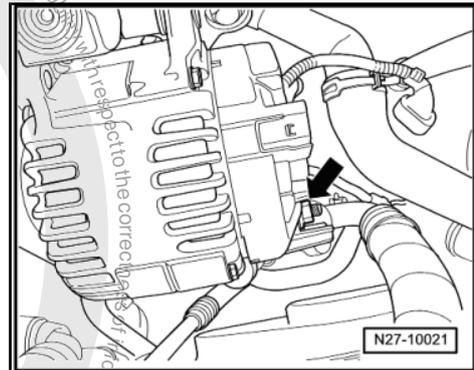
- Disconnect DF wire connector -1- and pull off protective cap -2-.



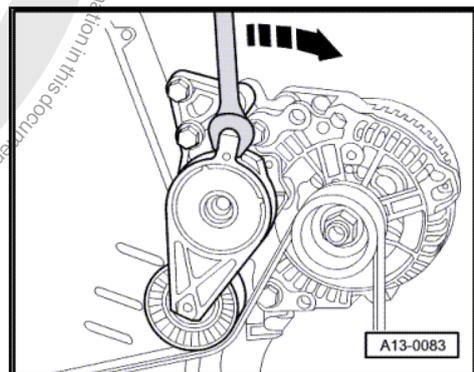
- Unscrew B+ wire -arrow- from alternator -C- .

 **Caution**

Before removing, mark the top side and direction of rotation of the poly V-belt. When installing, ensure correct fitting position and direction of rotation. If the belt is installed in the wrong position or against direction of rotation, the belt will be destroyed!

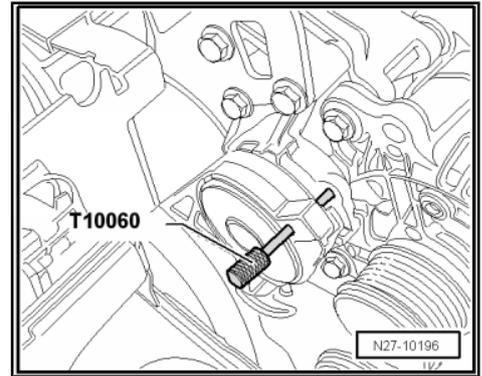


- Mark direction of rotation of poly V-belt.
- Release tension of poly V-belt by swivelling tensioning element in direction of -arrow- using an open-jaw spanner.

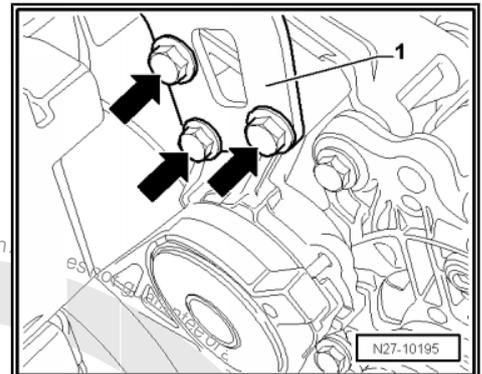




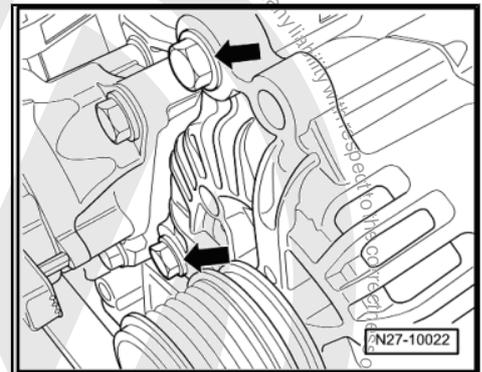
- Lock tensioning element using locking pin -T10060- .
- Remove poly V-belt.



- Remove bolts of tensioning element -arrows-.
- Remove tensioning element together with lifting eye -1- out of vehicle.



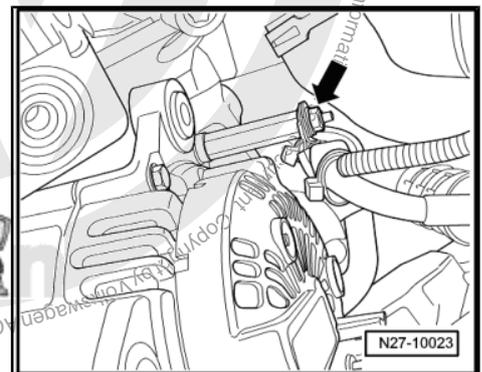
- Remove bolts of alternator -C- -arrows-.



- Unscrew wiring retainer -arrow- from alternator -C- .
- Remove alternator -C- from vehicle.

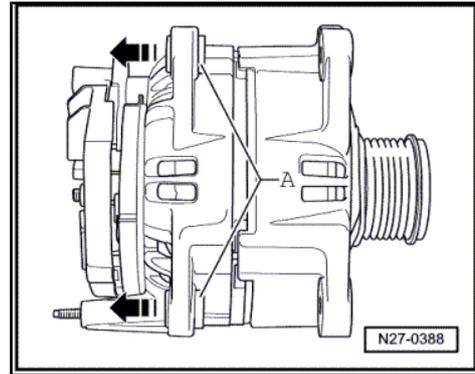
Installing

Install in the reverse order of removal. When doing this, note the following:

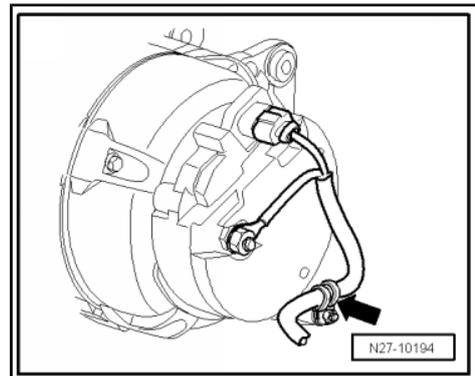




- Drive threaded sleeves -A- roughly 4 mm in
-direction of arrow- out of alternator -C- housing.



- Secure wire holder -arrow- on back of alternator -C- in 12 o'clock position.
- Tighten threaded connections to specified torques
=> [page 114](#) .



Caution

- ◆ *When installing used poly V-belts observe the direction of rotation marked on removal!*
- ◆ *Before installing poly V-belt, make sure all assemblies (alternator -C- / air conditioner compressor) are firmly in position.*
- ◆ *When fitting belt, ensure that poly V-belt seats correctly in pulleys!*

- Connect battery -A- => [page 4](#) .



Caution

Observe notes for battery pole terminal clamp bolt => [page 1](#).

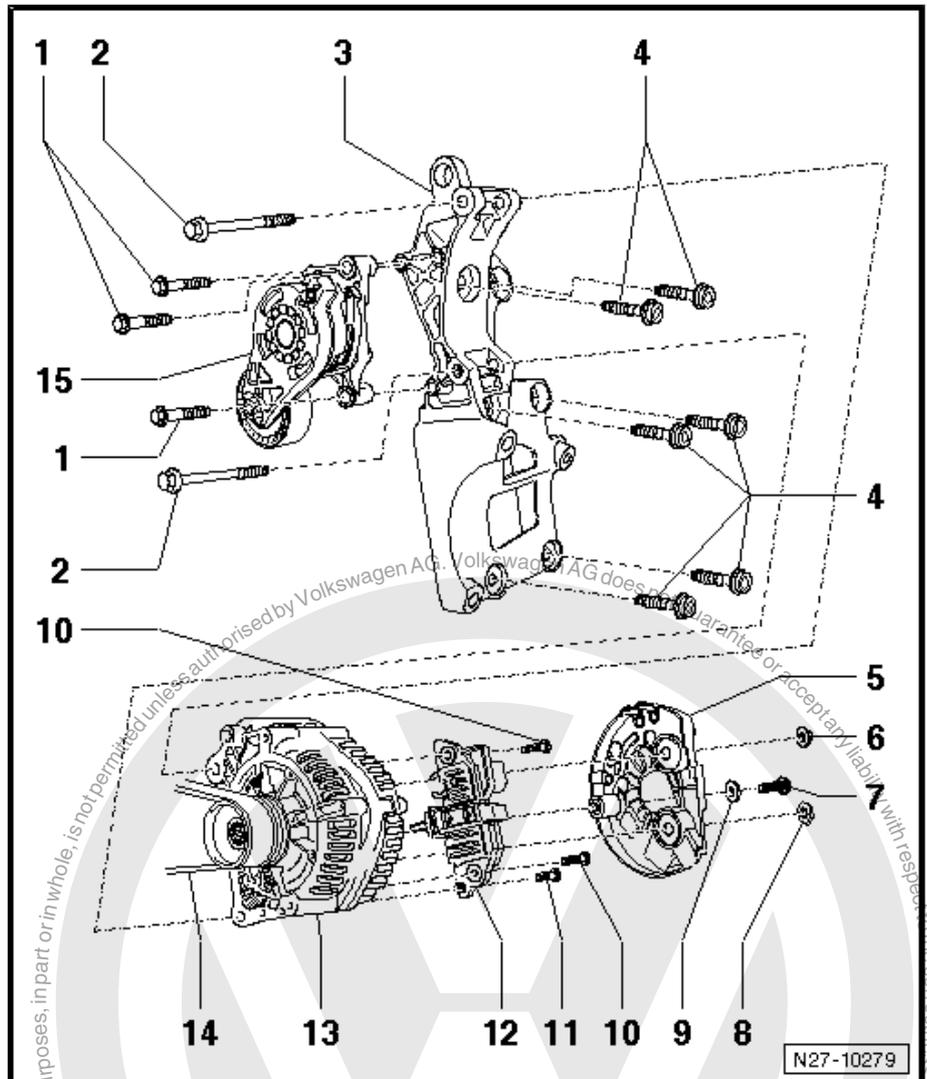
- Start engine and check belt is running correctly.
- Switch off engine.



7.10 Alternator -C- 2.0l TFSI engine

7.10.1 Assembly overview

- 1 - Hexagon head flange bolts**
 - 23 Nm
- 2 - Hexagon head flange bolts**
 - 23 Nm
- 3 - Ancillary bracket**
 - For alternator -C- and air conditioner compressor
 - Tightening sequence ⇒ Engine; Rep. gr. 13
- 4 - Hexagon head flange bolts**
 - 45 Nm
- 5 - Protective cap**
- 6 - Hexagon flange nut**
- 7 - Cross-head screw**
 - 4.5 Nm
- 8 - Hexagon nut**
- 9 - Washer**
- 10 - Cross-head screws**
 - 2 Nm
- 11 - Cross-head screw**
 - 2 Nm
- 12 - Voltage regulator -C1-**
 - Removing and installing ⇒ [page 168](#)
- 13 - Alternator -C-**
 - Removing and installing ⇒ [page 122](#)
 - Checking ⇒ [page 89](#)
 - Securing battery positive wire ⇒ [page 88](#)
- 14 - Poly V-belt**
 - Checking ⇒ [page 88](#)
 - Removing and installing ⇒ Engine; Rep. gr. 13
 - Poly V-belt routing ⇒ Engine; Rep. gr. 13
- 15 - Poly V-belt tensioning element**



Not illustrated

- ◆ Nut of B+ wire on rear of alternator: 15 Nm
- ◆ Nut of wire holder on back of alternator : 3.2 Nm
- ◆ Poly V-belt pulley without freewheel: 65 Nm
- ◆ Poly V-belt pulley with freewheel: 80 Nm

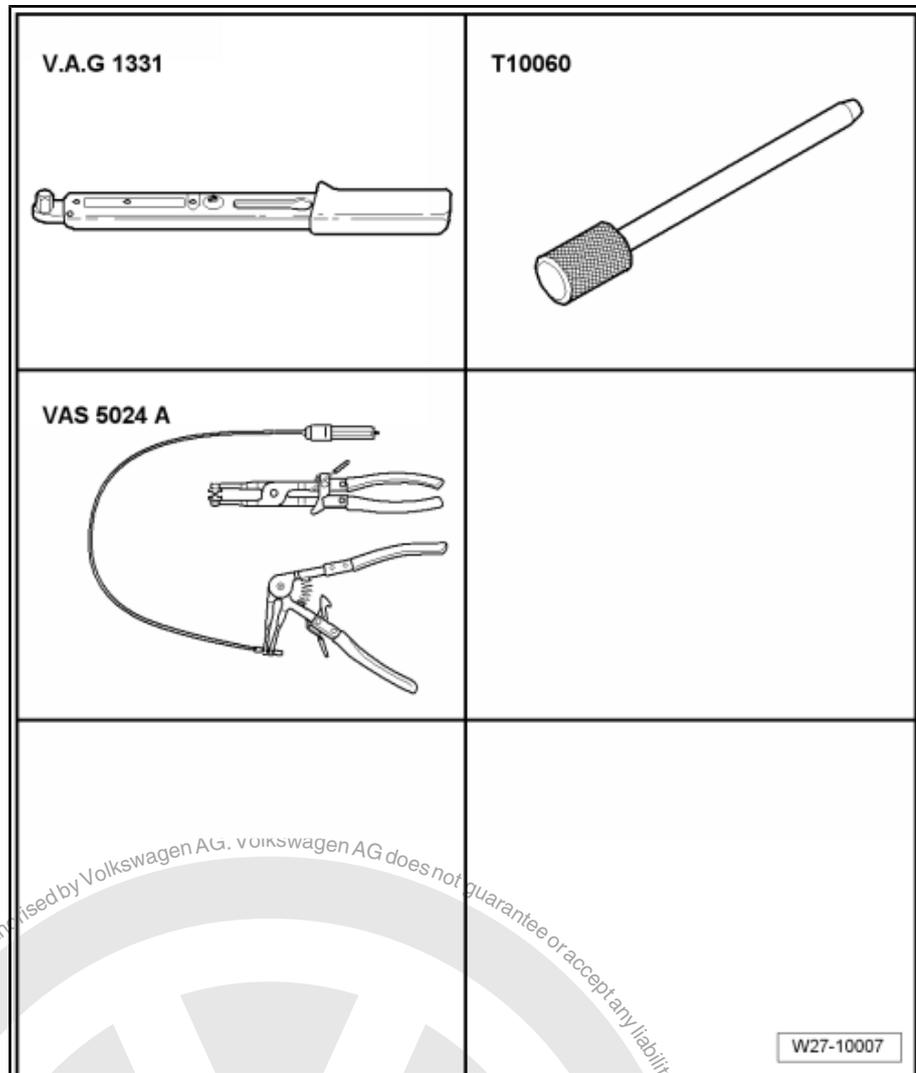


- ◆ Removing and installing ancillary bracket ⇒ Engine; Rep. gr. 13

7.10.2 Removing and installing alternator -C-

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-
- ◆ Spring-type clip pliers -VAS 5024 A-
- ◆ Locking pin -T10060-



Carry out following procedures:

Removing

- Disconnect battery -A- ⇒ [page 4](#) .

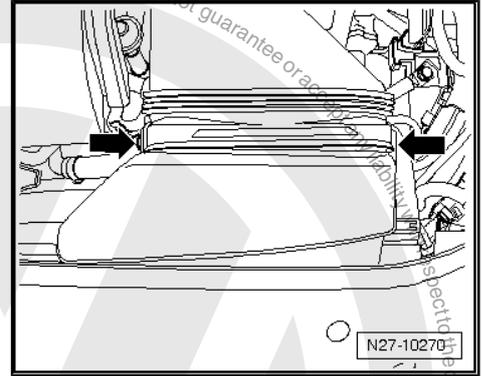


Caution

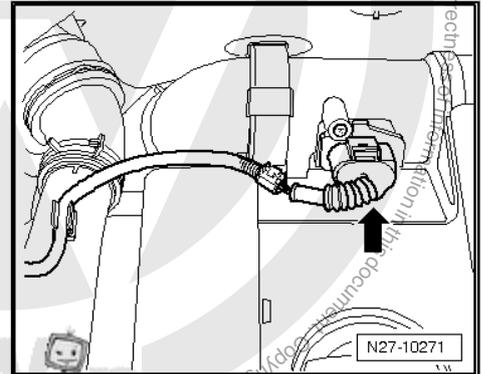
When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#) .



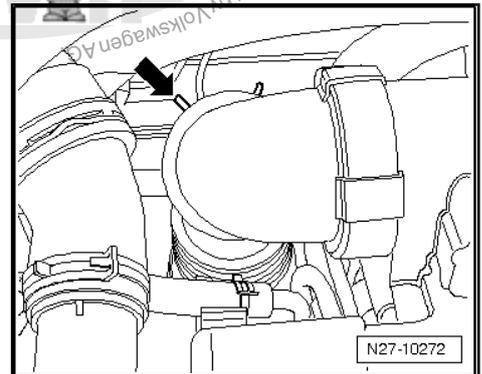
- Remove bolts -arrows-.



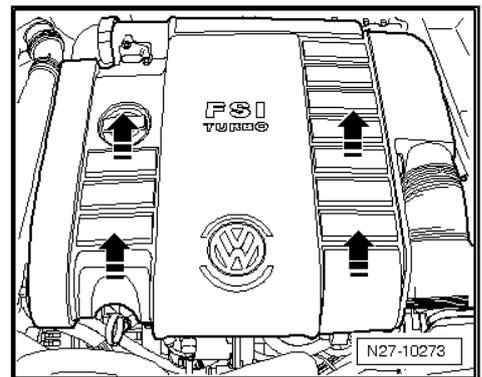
- Disconnect connector -arrow-.



- Loosen spring-type clips -arrow- using spring-type clip pliers -VAS 5024 A- .



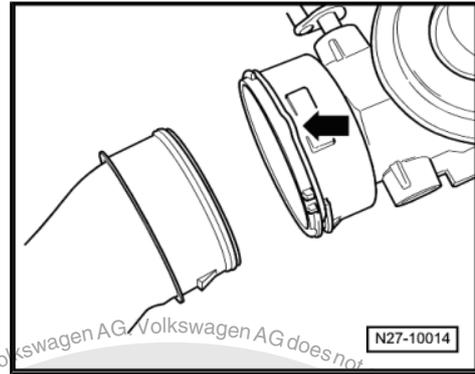
- Pull engine cover panel upwards -arrows-.



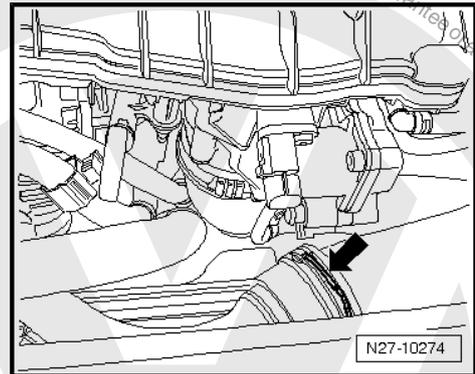


Note

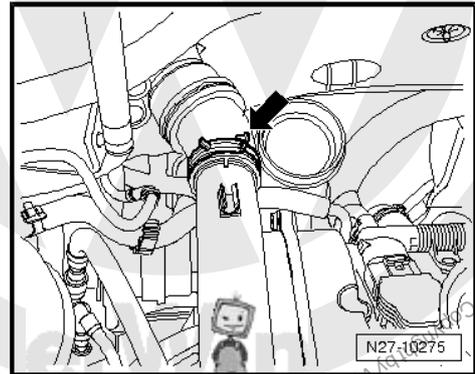
- ◆ All hose connections of charge air system are secured with spring-type clips or push-on connectors. The following points must be observed for push-on connectors:
- ◆ Release push-on connection by pulling securing ring -arrow-.
- ◆ Pull off hose/pipe without tools.



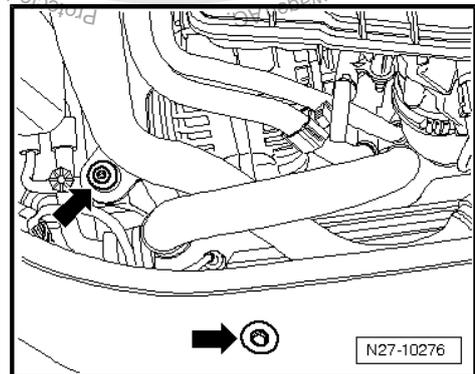
- Disconnect plug connector -arrow-.



- Loosen spring-type clip -arrow- using spring-type clip pliers -VAS 5024 A- .



- Remove bolts -arrows-.
- Remove hose from vehicle.
- Remove connecting pipe between charge air cooler and turbocharger.



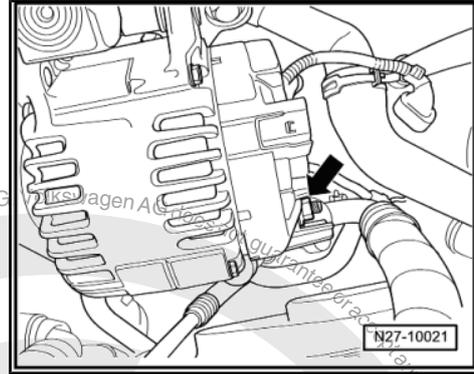
Caution

Before removing, mark the top side and direction of rotation of the poly V-belt. When installing, ensure correct fitting position and direction of rotation. If the belt is installed in the wrong position or against direction of rotation, the belt will be destroyed!

- Mark direction of rotation of poly V-belt.



- Unscrew B+ wire -arrow- from alternator -C- .



- Unscrew wiring retainer -arrow- from alternator -C- .
- Remove alternator -C- from vehicle.

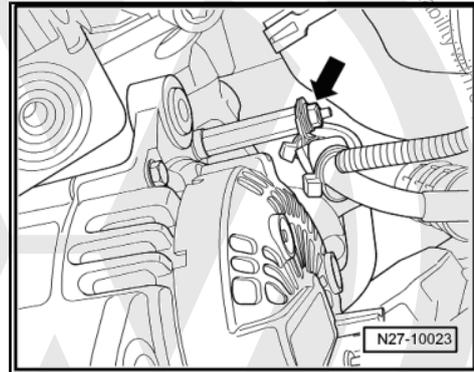
Installing

Install in the reverse order of removal. When doing this, note the following:

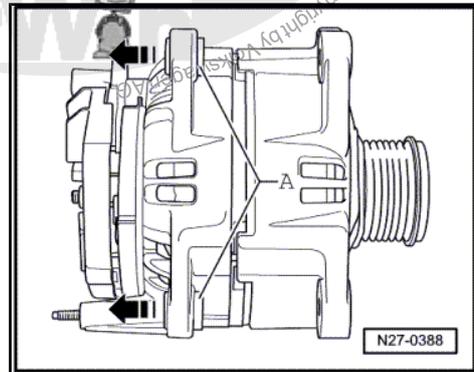


Caution

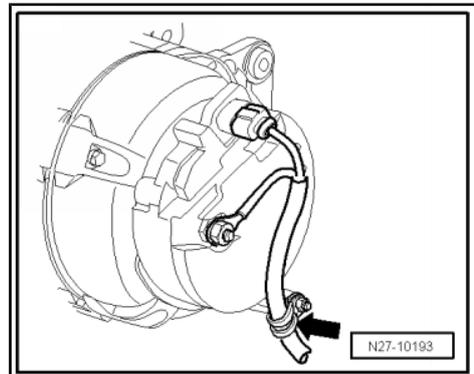
- ◆ *When installing used poly V-belts observe the direction of rotation marked on removal!*
- ◆ *Before installing poly V-belt, make sure all assemblies (alternator -C- / air conditioner compressor) are firmly in position.*
- ◆ *When fitting belt, ensure that poly V-belt seats correctly in pulleys!*



- Drive threaded sleeves -A- roughly 4 mm in -direction of arrow- out of alternator -C- housing.



- Secure wire holder -arrow- on back of alternator -C- in 9 o'clock position.





Note

- ◆ *All hose connections of charge air system are secured with spring-type clips or push-on connectors. The following points must be observed for push-on connectors:*
- ◆ *Push on hose or pipe without tools.*
- ◆ *Ensure that locking lugs are securely engaged -arrow-*
- Tighten threaded connections to specified torques
⇒ [page 121](#) .
- Connect battery -A- ⇒ [page 4](#) .



Caution

Observe notes for battery pole terminal clamp bolt ⇒ [page 1](#) .

- Start engine and check belt is running correctly.
- Switch off engine.





7.11 Alternator -C- 2.5l petrol engine

7.11.1 Assembly overview

1 - Ancillary bracket

- For alternator -C- and air conditioner compressor

2 - Multi-point socket head bolt

- 25 Nm

3 - Multi-point socket head bolt

- 25 Nm

4 - Hexagon socket head bolts

- 25 Nm

- Qty. 4

5 - Protective cap for alternator -C-

6 - Cross-head screws

- 2 Nm

7 - Protective cap for carbon brushes

8 - Voltage regulator -C1-

- Removing and installing ⇒ [page 168](#)

9 - Alternator -C-

- Removing and installing ⇒ [page 132](#)

- Checking ⇒ [page 89](#)

- Securing battery positive wire ⇒ [page 88](#)

- Removing and installing poly V-belt pulley ⇒ [page 163](#)

10 - Poly V-belt

- Checking ⇒ [page 88](#)

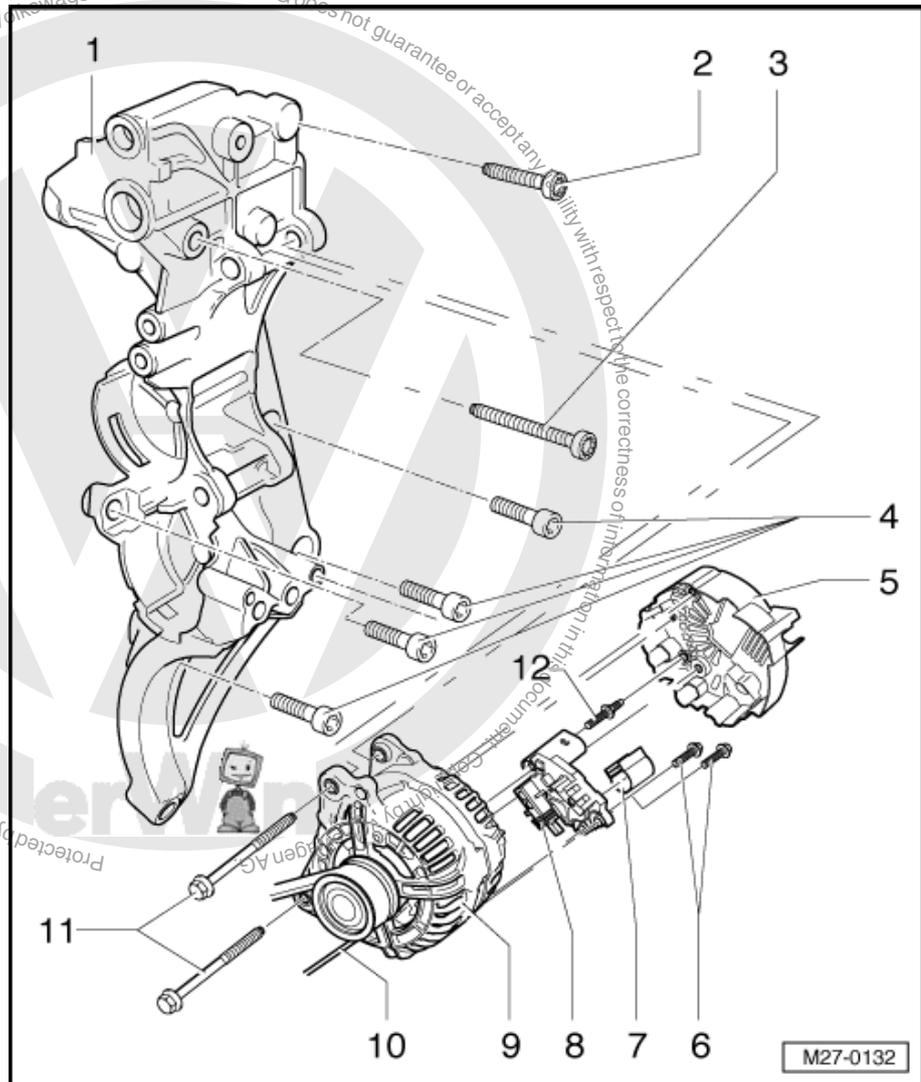
- Removing and installing ⇒ Engine; Rep. gr. 13

- Process ⇒ power unit; Rep. gr. 13

11 - Hexagon head flange bolts

- 25 Nm

- Qty. 2



Not illustrated

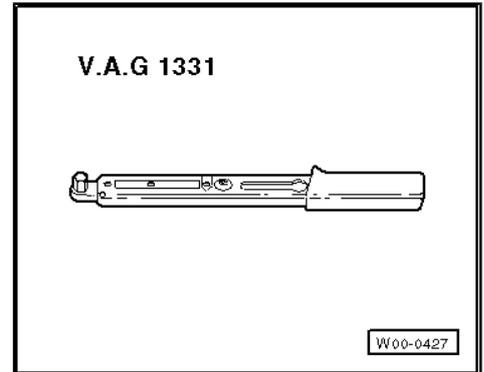
- ◆ Nut of B+ wire on rear of alternator: 15 Nm
- ◆ Nut of wire holder on back of alternator : 3.2 Nm
- ◆ Poly V-belt pulley without freewheel: 65 Nm
- ◆ Poly V-belt pulley with freewheel: 80 Nm
- ◆ Removing and installing ancillary bracket ⇒ Engine; Rep. gr. 13



7.11.2 Removing and installing alternator -C-

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-



Carry out following procedures:

Removing

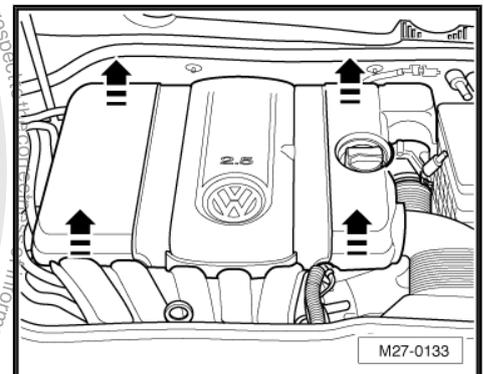
- Disconnect battery -A- ⇒ [page 4](#) .



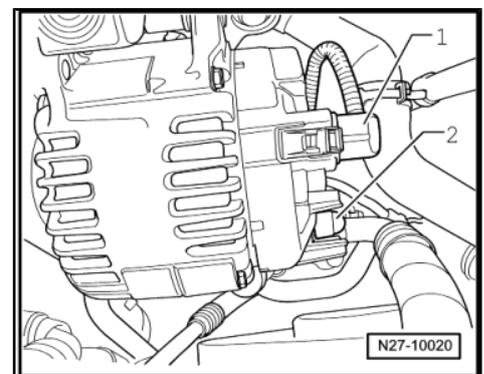
Caution

When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#) .

- Pull off engine cover upwards and forwards.
- Place lock carrier in service position ⇒ General body repairs, exterior; Rep. gr. 50 .
- Remove poly V-belt ⇒ Engine; Rep. gr. 13 .



- Disconnect DF wire connector -1- and pull off protective cap



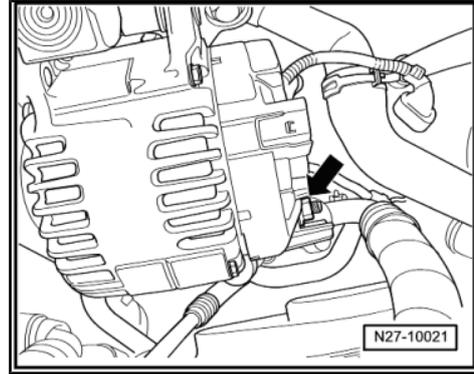


- Unscrew B+ wire -arrow- from alternator -C- .



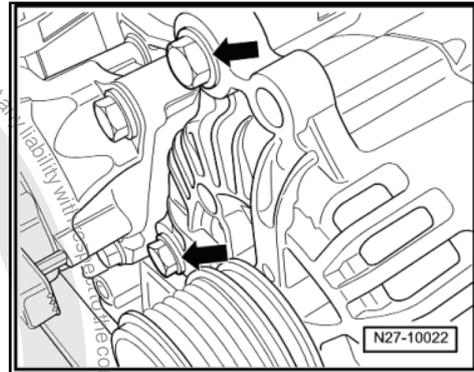
Caution

Before removing, mark the top side and direction of rotation of the poly V-belt. When installing, ensure correct fitting position and direction of rotation. If the belt is installed in the wrong position or against direction of rotation, the belt will be destroyed!



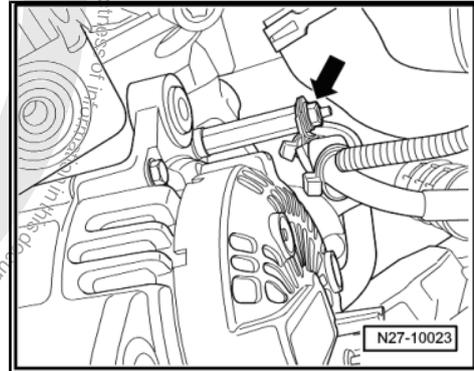
- Remove the upper idler wheel, lower idler wheel and the poly V-belt tensioner for alternator -C- and coolant pump => Engine; Rep. gr. 13 .

- Remove bolts of alternator -C- -arrows-.



- Unscrew wiring retainer from alternator -C- -arrow-.

- Take alternator -C- out upwards.



Installing

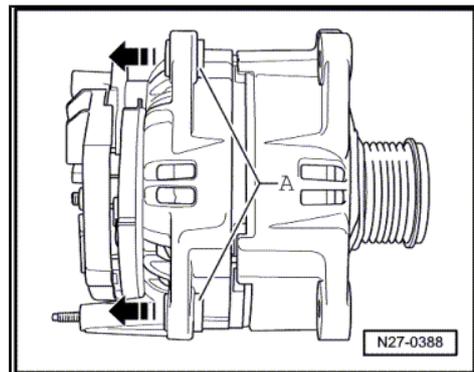
Install in the reverse order of removal. When doing this, note the following:



Caution

- ◆ *When installing used poly V-belts observe the direction of rotation marked on removal!*
- ◆ *Before installing poly V-belt, make sure all assemblies (alternator -C- / air conditioner compressor) are firmly in position.*
- ◆ *When fitting belt, ensure that poly V-belt seats correctly in pulleys!*

- Drive threaded sleeves -A- roughly 4 mm in direction of arrow out of alternator -C- housing.

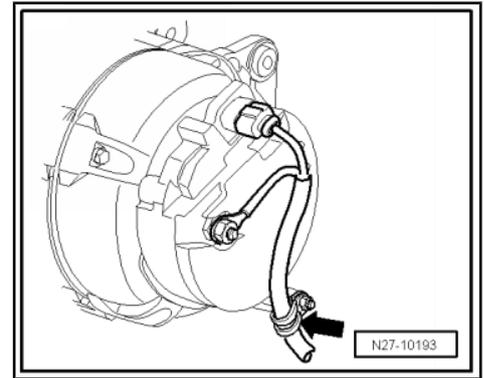




- Secure wire holder -arrow- on back of alternator -C- in 9 o'clock position.
- Tighten threaded connections to specified torques
 => [page 128](#) .
- Connect battery -A- => [page 4](#) .

Caution

Observe notes for battery pole terminal clamp bolt => [page 1](#) .

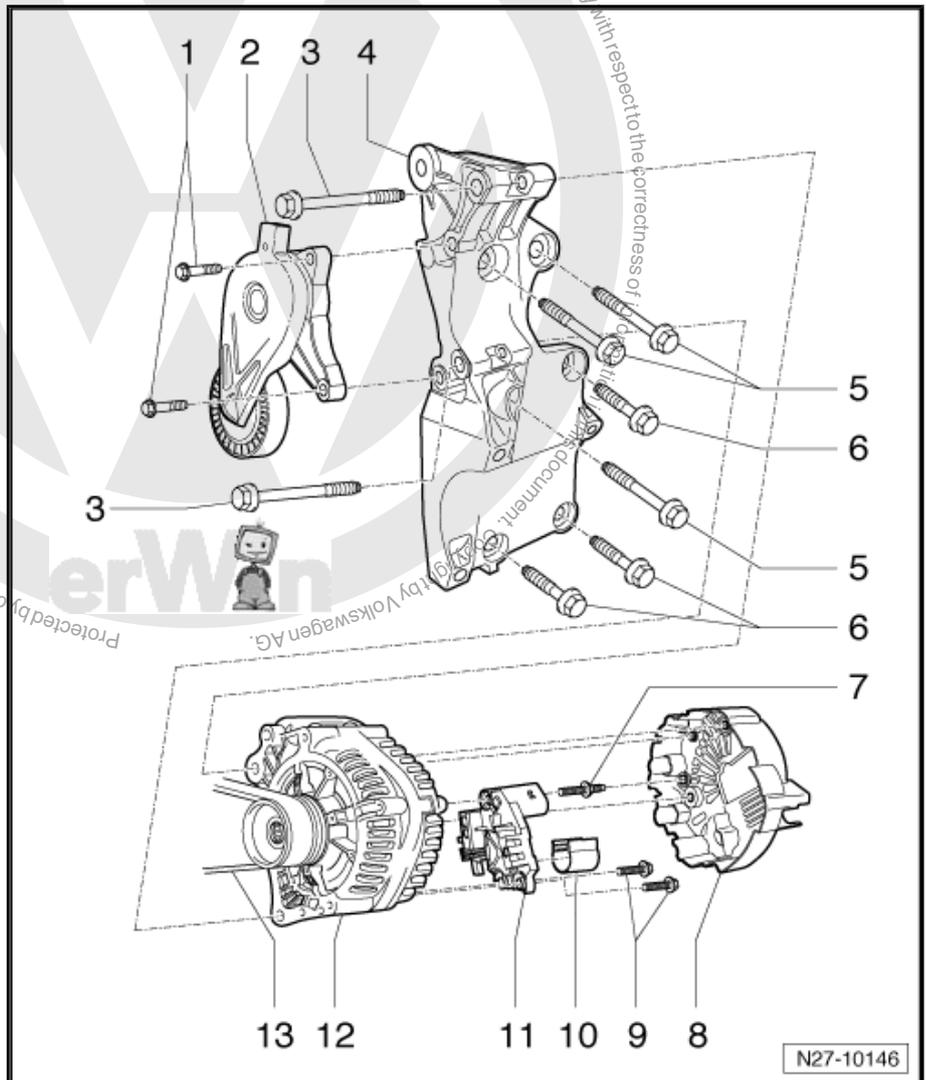


- Start engine and check belt is running correctly.
- Switch off engine.

7.12 Alternator -C- 1.9l diesel engine

7.12.1 Assembly overview

- 1 - Hexagon head flange bolts
 - 20 Nm
- 2 - Poly V-belt tensioning element
- 3 - Hexagon head flange bolts
 - 20 Nm
- 4 - Ancillary bracket
 - For alternator -C- and air conditioner compressor
 - Tightening sequence => Engine; Rep. gr. 13
- 5 - Hexagon head flange bolts
 - 40 Nm
- 6 - Hexagon head flange bolts
 - 40 Nm
- 7 - Hexagon bolt with washer and threaded element
 - 2 Nm
- 8 - Protective cap for alternator -C-
- 9 - Cross-head screws
 - 2 Nm
- 10 - Protective cap for carbon brushes
- 11 - Voltage regulator -C1-
 - Removing and installing
 => [page 168](#)
- 12 - Alternator -C-
 - Removing and installing
 => [page 132](#)
 - Checking => [page 89](#)





- ❑ Securing battery positive wire ⇒ [page 88](#)

13 - Poly V-belt

- ❑ Checking ⇒ [page 88](#)
- ❑ Removing and installing ⇒ Engine; Rep. gr. 13
- ❑ Poly V-belt routing ⇒ Engine; Rep. gr. 13

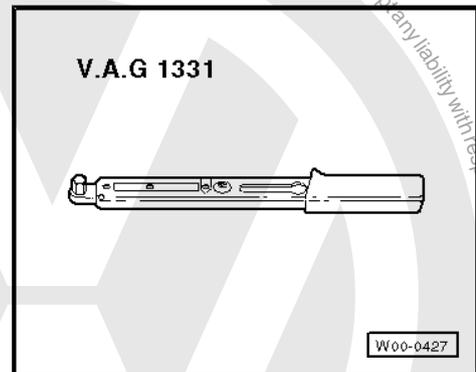
Not illustrated

- ◆ Nut of B+ wire on rear of alternator: 15 Nm
- ◆ Nut of wire holder on back of alternator : 3.2 Nm
- ◆ Poly V-belt pulley without freewheel: 65 Nm
- ◆ Poly V-belt pulley with freewheel: 80 Nm
- ◆ Removing and installing ancillary bracket ⇒ Engine; Rep. gr. 13

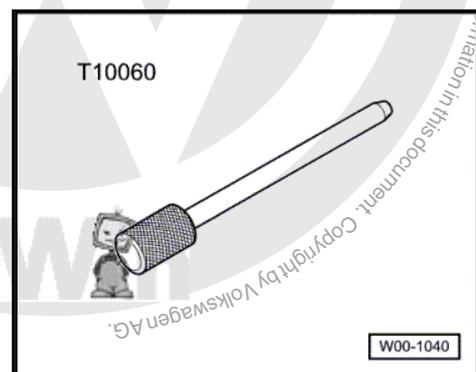
7.12.2 Removing and installing alternator -C-

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-



- ◆ Locking pin -T10060-



Carry out following procedures:

Removing

- Disconnect battery -A- ⇒ [page 4](#) .

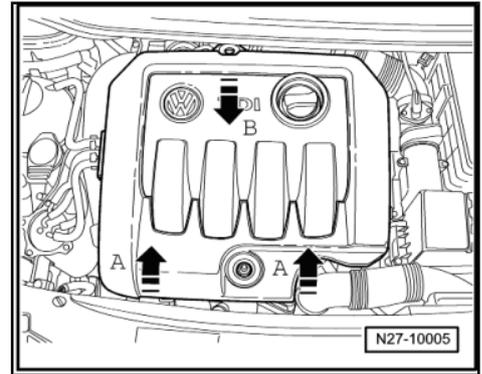


Caution

When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#) .

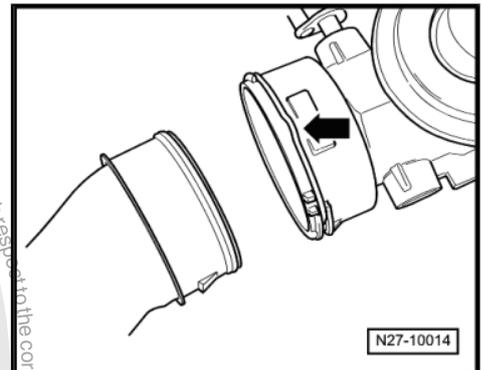


- Pull engine cover off upwards -arrows A- and forwards -arrow B-.

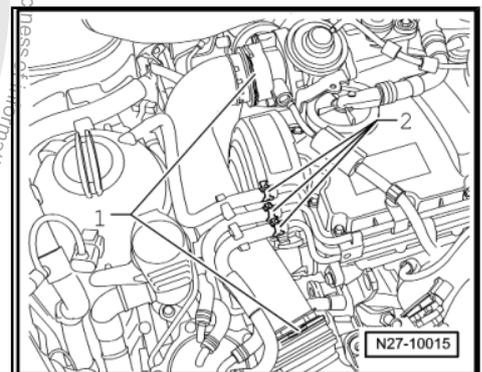


Note

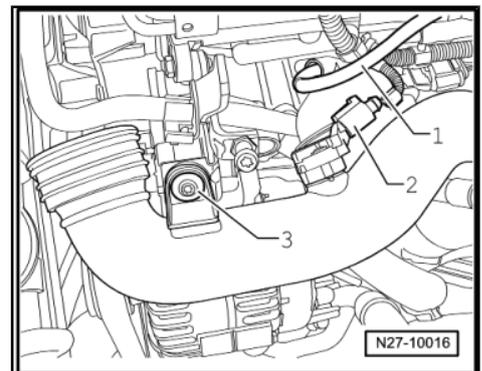
- ◆ All hose connections of charge air system are secured with spring-type clips or push-on connectors. The following points must be observed for push-on connectors:
- ◆ Release push-on connection by pulling securing ring -arrow-.
- ◆ Pull off hose/pipe without tools.



- Separate push-on connectors -1-.
- Unclip fuel hoses -2- and remove charge air hose.

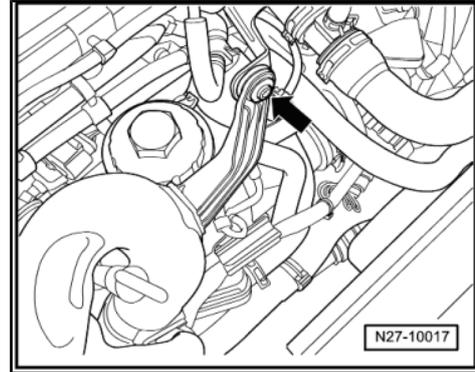


- Pull off vacuum hose -1-.
- Disconnect connector -2-.
- Remove bolt -3-.

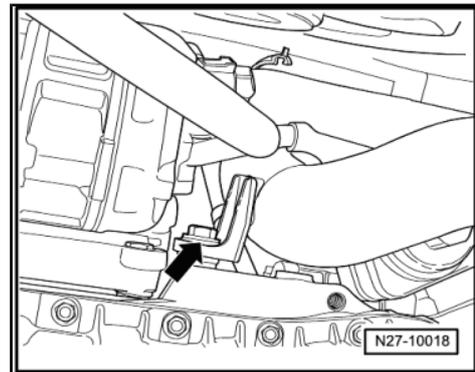




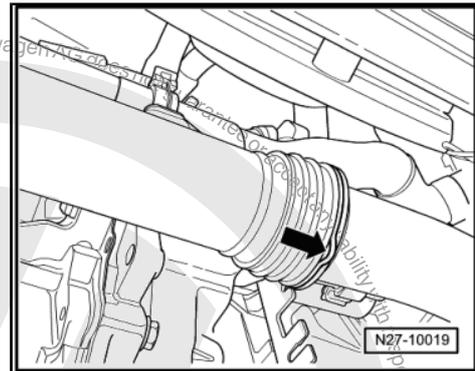
- Unscrew bolt -arrow-.
- Remove noise insulation => General body repairs, exterior;
Rep. gr. 50 .



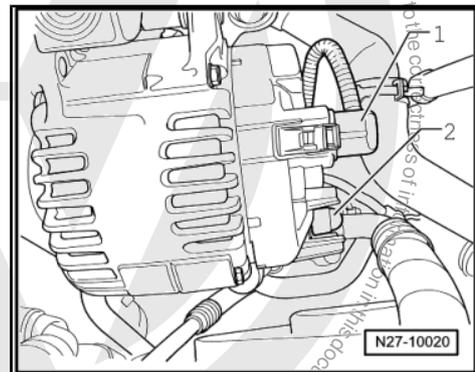
- Remove bolt of charge air pipe -arrow-.



- Separate push-fit coupling of charge air pipe -arrow-.
- Remove charge air pipe upwards.



- Disconnect DF wire connector -1- and pull off protective cap -2-.



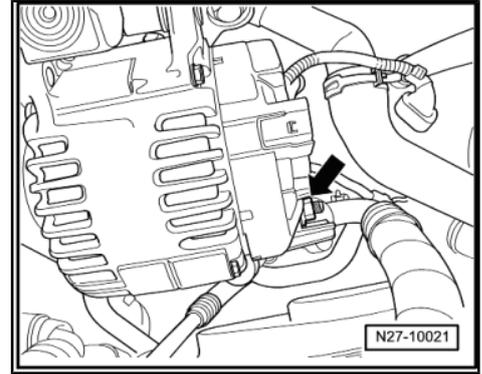


- Unscrew B+ wire -arrow- from alternator -C- .
- Pull fuel filter out of bracket and place to one side. When doing this, the fuel hoses can remain connected.

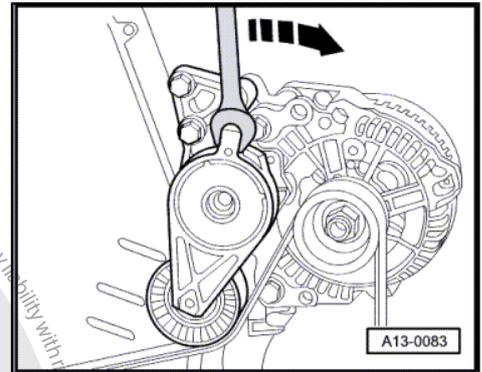


Caution

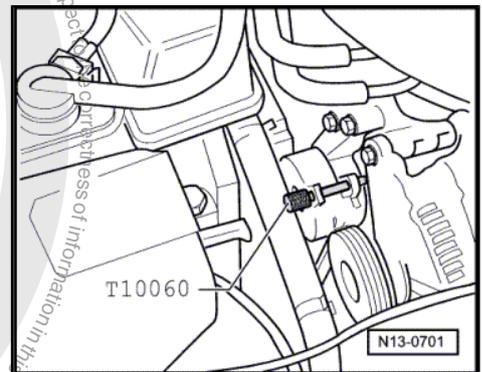
Before removing, mark the top side and direction of rotation of the poly V-belt. When installing, ensure correct fitting position and direction of rotation. If the belt is installed in the wrong position or against direction of rotation, the belt will be destroyed!



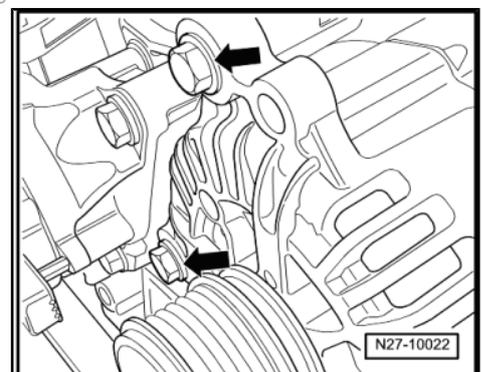
- Mark direction of rotation of poly V-belt.
- Release tension of poly V-belt by swivelling tensioning element in direction of -arrow- using an open-jaw spanner.



- Lock tensioning element using locking pin -T10060- .
- Remove poly V-belt.



- Remove bolts of alternator -C- -arrows-.





- Unscrew wiring retainer from alternator -C- -arrow-.
- Remove alternator -C- .

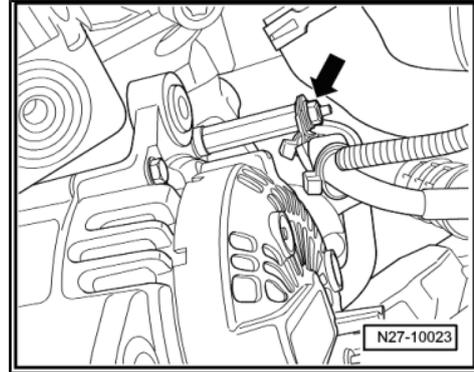
Installing

Install in the reverse order of removal. When doing this, note the following:

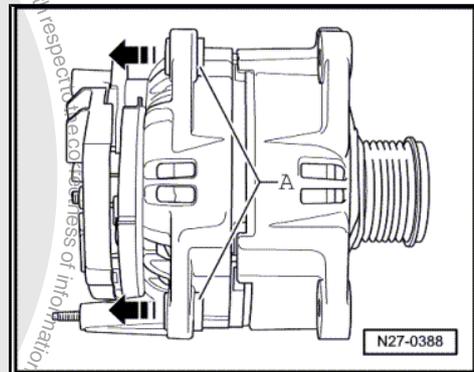


Caution

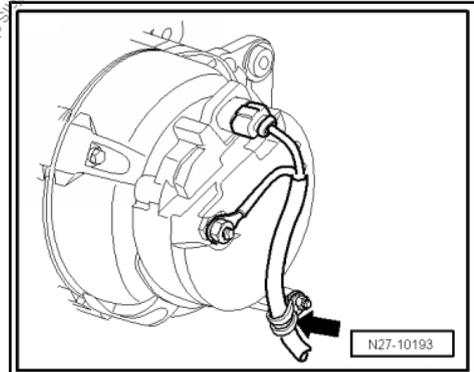
- ◆ **When installing used poly V-belts observe the direction of rotation marked on removal!**
- ◆ **Before installing poly V-belt, make sure all assemblies (alternator -C- / air conditioner compressor) are firmly in position.**
- ◆ **When fitting belt, ensure that poly V-belt seats correctly in pulleys!**



- Drive threaded sleeves -A- roughly 4 mm in -direction of arrow- out of alternator -C- housing.



- Secure wire holder -arrow- on back of alternator -C- in 9 o'clock position.





Note

- ◆ *All hose connections of charge air system are secured with spring-type clips or push-on connectors. The following points must be observed for push-on connectors:*
- ◆ *Push on hose or pipe without tools.*
- ◆ *Ensure that locking lugs are securely engaged -arrow-*
- Tighten threaded connections to specified torques
⇒ [page 131](#) .
- Connect battery -A- ⇒ [page 4](#) .



Caution

Observe notes for battery pole terminal clamp bolt ⇒ [page 1](#) .

- Start engine and check belt is running correctly.
- Switch off engine.





7.13 Alternator -C- 1.9l diesel engine with diesel particle filter

7.13.1 Assembly overview

1 - Hexagon head flange bolts

- 20 Nm

2 - Poly V-belt tensioning element

3 - Hexagon head flange bolts

- 20 Nm

4 - Ancillary bracket

- For alternator -C- and air conditioner compressor
- Observe specified tightening sequence ⇒ Engine; Rep. gr. 13

5 - Hexagon head flange bolts

- Observe specified tightening sequence ⇒ Engine; Rep. gr. 13
- 40 Nm

6 - Hexagon head flange bolts

- Observe specified tightening sequence ⇒ Engine; Rep. gr. 13
- 40 Nm

7 - Hexagon bolt with washer and threaded element

- 2 Nm

8 - Protective cap for alternator -C-

9 - Cross-head screws

- 2 Nm

10 - Protective cap for carbon brushes

11 - Voltage regulator -C1-

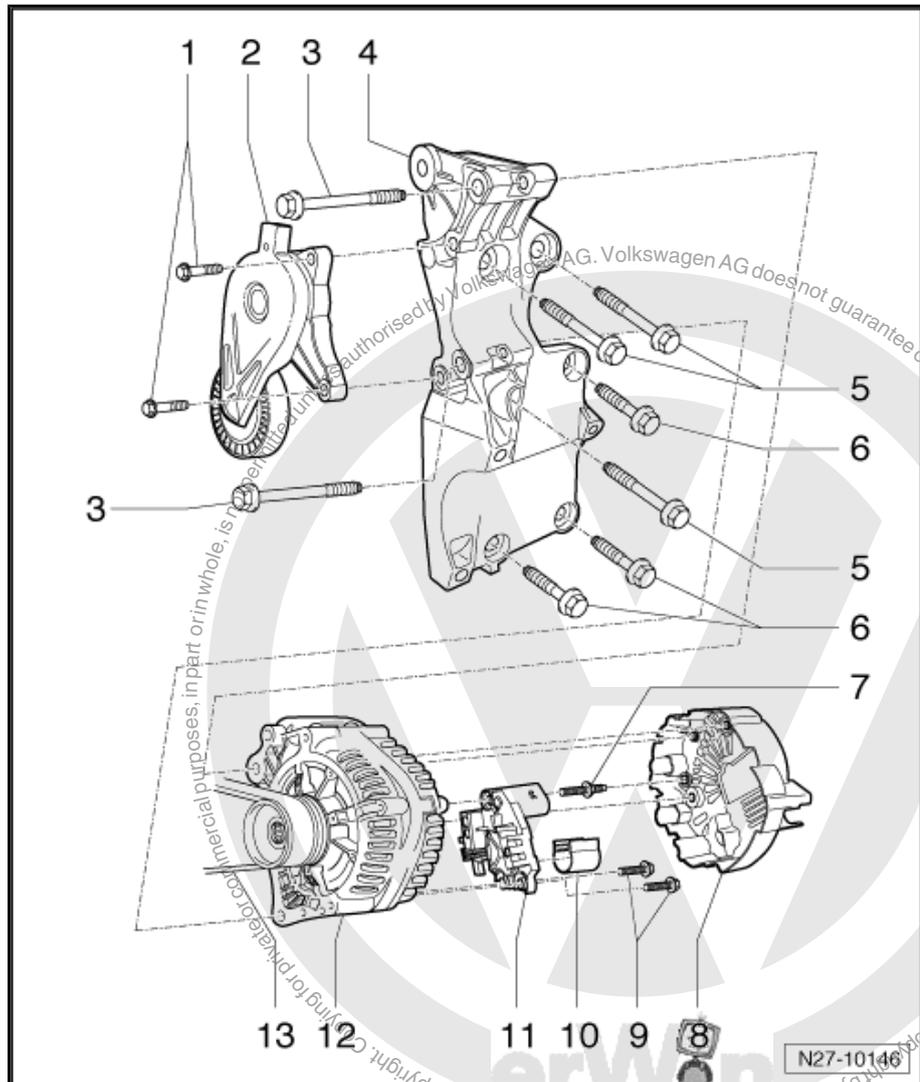
- Removing and installing ⇒ [page 168](#)

12 - Alternator -C-

- Removing and installing ⇒ [page 139](#)
- Checking ⇒ [page 89](#)
- Securing battery positive wire ⇒ [page 88](#)
- Removing and installing poly V-belt pulley ⇒ [page 163](#)

13 - Poly V-belt

- Checking ⇒ [page 88](#)
- Removing and installing ⇒ Engine; Rep. gr. 13
- Poly V-belt routing ⇒ Engine; Rep. gr. 13



N27-10146



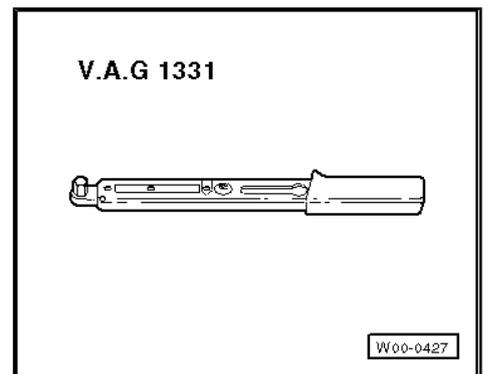
Not illustrated

- ◆ Nut of B+ wire on rear of alternator: 15 Nm
- ◆ Nut of wire clip on back of alternator : 3.2 Nm
- ◆ Poly V-belt pulley without freewheel: 65 Nm
- ◆ Poly V-belt pulley with freewheel: 80 Nm
- ◆ Removing and installing ancillary bracket ⇒ Engine; Rep. gr. 13 .

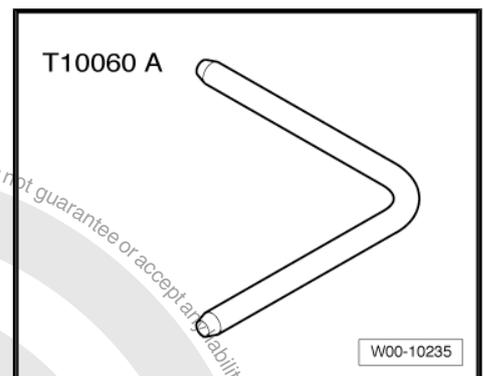
7.13.2 Removing and installing alternator -C-

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-



- ◆ Locking pin -T10060A-



Carry out following procedures:

Removing

- Disconnect battery -A- ⇒ [page 4](#) .

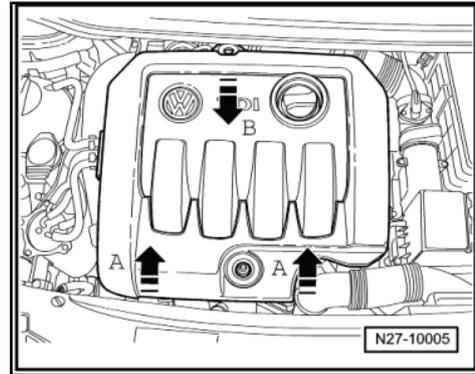


Caution

When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#) .

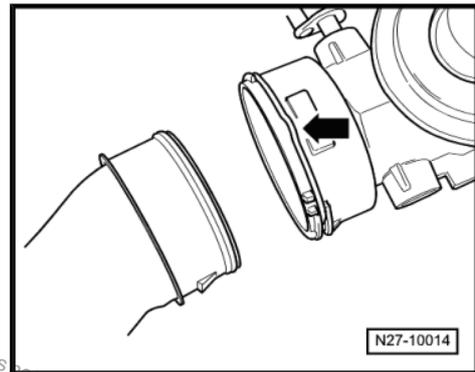


- First pull engine cover upwards -arrows A- and then forwards -arrow B-.

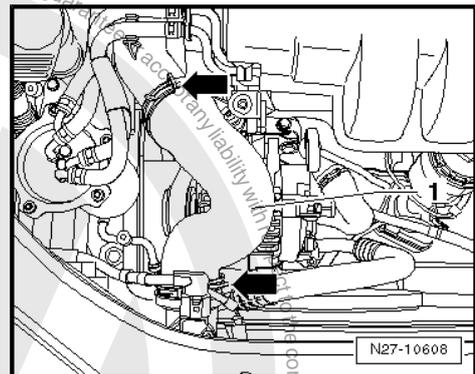


Note

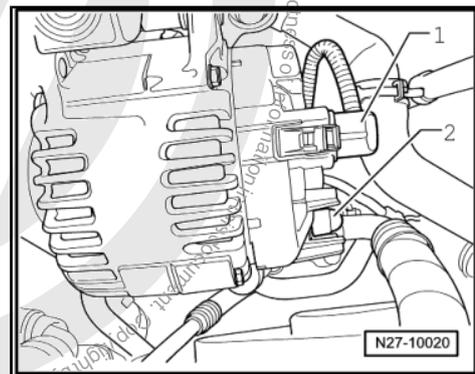
- ◆ All hose connections of charge air system are secured with spring-type clips or push-on connectors. The following points must be observed for push-on connectors:
- ◆ Release push-on connection by pulling securing ring -arrow-.
- ◆ Pull off hose/pipe without tools.



- Separate hose connection -arrows-.
- Remove charge air pipe -1- upwards.



- Disconnect DF wire connector -1- and pull off protective cap -2-.



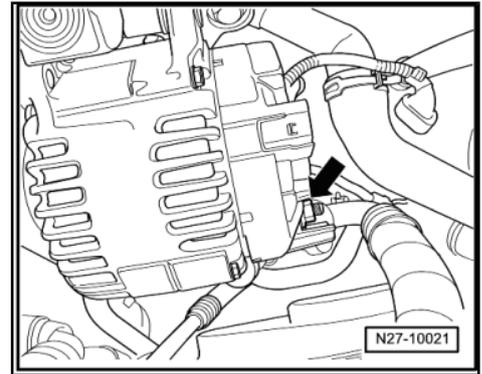


- Unscrew B+ wire -arrow- from alternator -C- .
- Pull fuel filter out of bracket and place to one side. When doing this, the fuel hoses can remain connected.

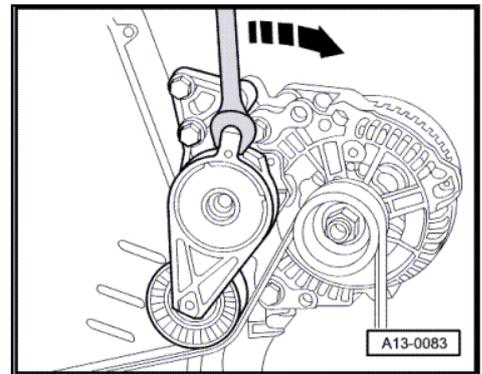


Caution

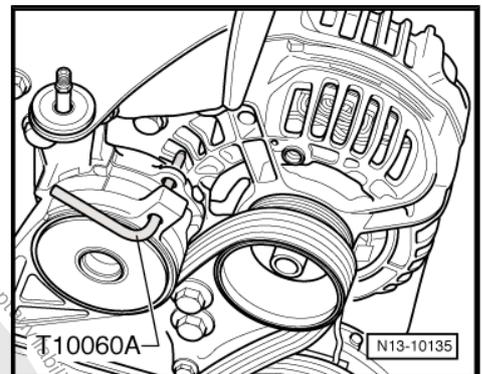
Before removing, mark the top side and direction of rotation of the poly V-belt. When installing, ensure correct fitting position and direction of rotation. If the belt is installed in the wrong position or against direction of rotation, the belt will be destroyed!



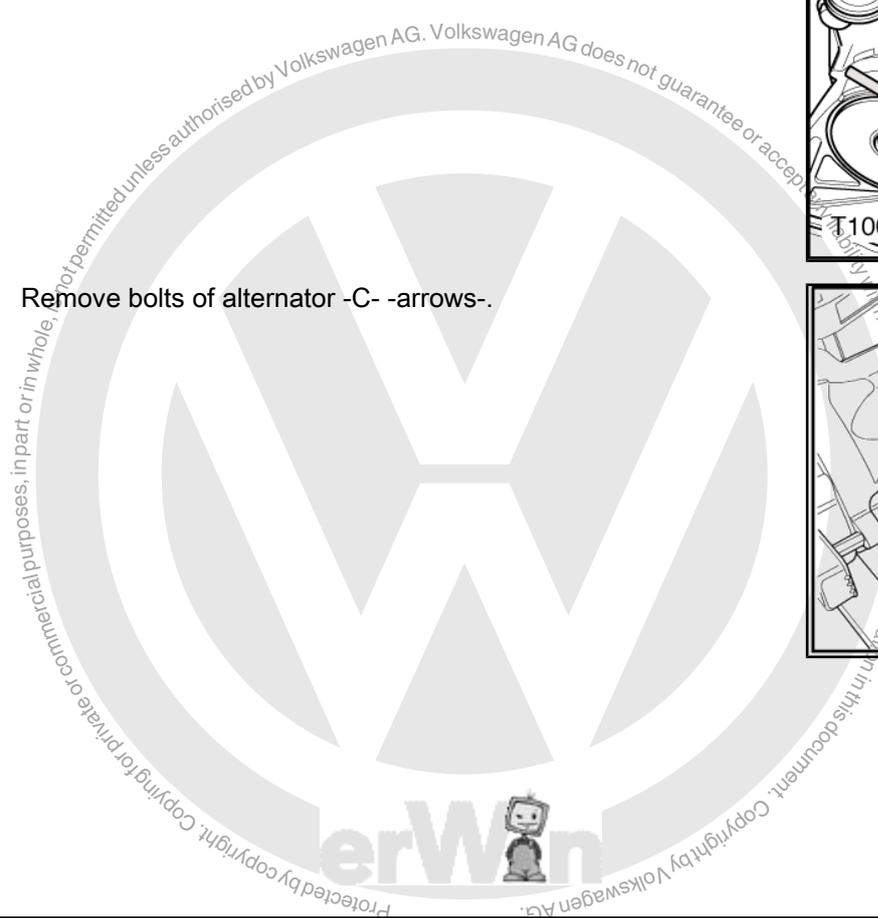
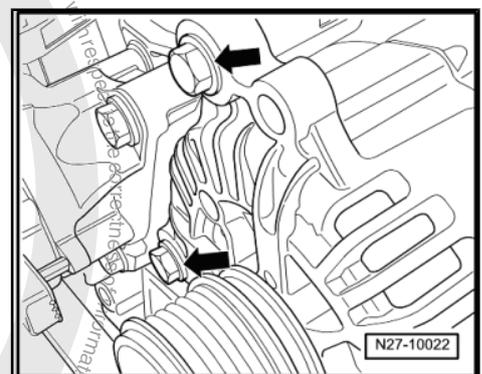
- Mark direction of rotation of poly V-belt.
- Release tension of poly V-belt by swivelling tensioning element in direction of -arrow- using an open-jaw spanner.



- Lock tensioning element using locking pin -T10060A- .
- Remove poly V-belt.



- Remove bolts of alternator -C- -arrows-.





- Unscrew wiring retainer from alternator -C- -arrow-.
- Remove alternator -C- .

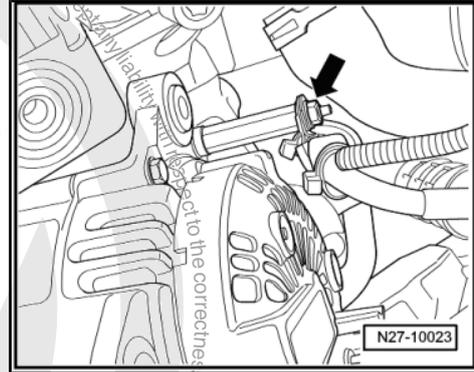
Installing

Install in the reverse order of removal. When doing this, note the following:

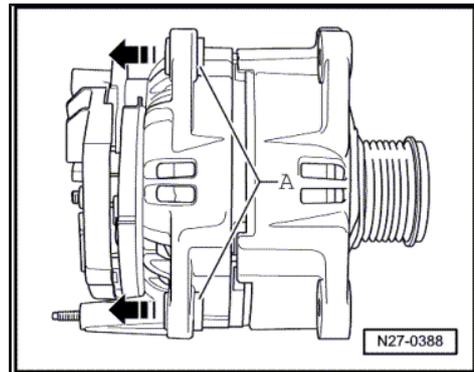


Caution

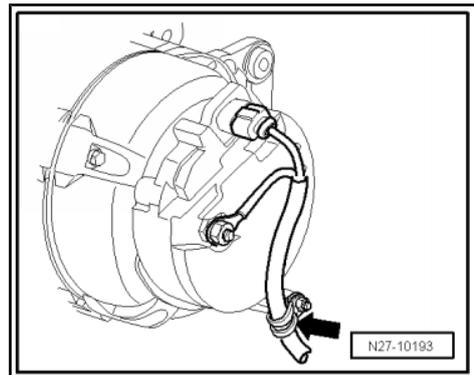
- ◆ *In order to avoid damage to cylinder block and ancillaries bracket, adhere strictly to the tightening sequence for the ancillaries bracket ⇒ Engine; Rep. gr. 13 .*
- ◆ *When installing used poly V-belts observe the direction of rotation marked on removal!*
- ◆ *Before installing poly V-belt, make sure all assemblies (alternator -C- / air conditioner compressor) are firmly in position.*
- ◆ *When fitting belt, ensure that poly V-belt seats correctly in pulleys!*



- Drive threaded sleeves -A- roughly 4 mm in -direction of arrow- out of alternator -C- housing.



- Secure wire holder -arrow- on back of alternator -C- in 9 o'clock position.





Note

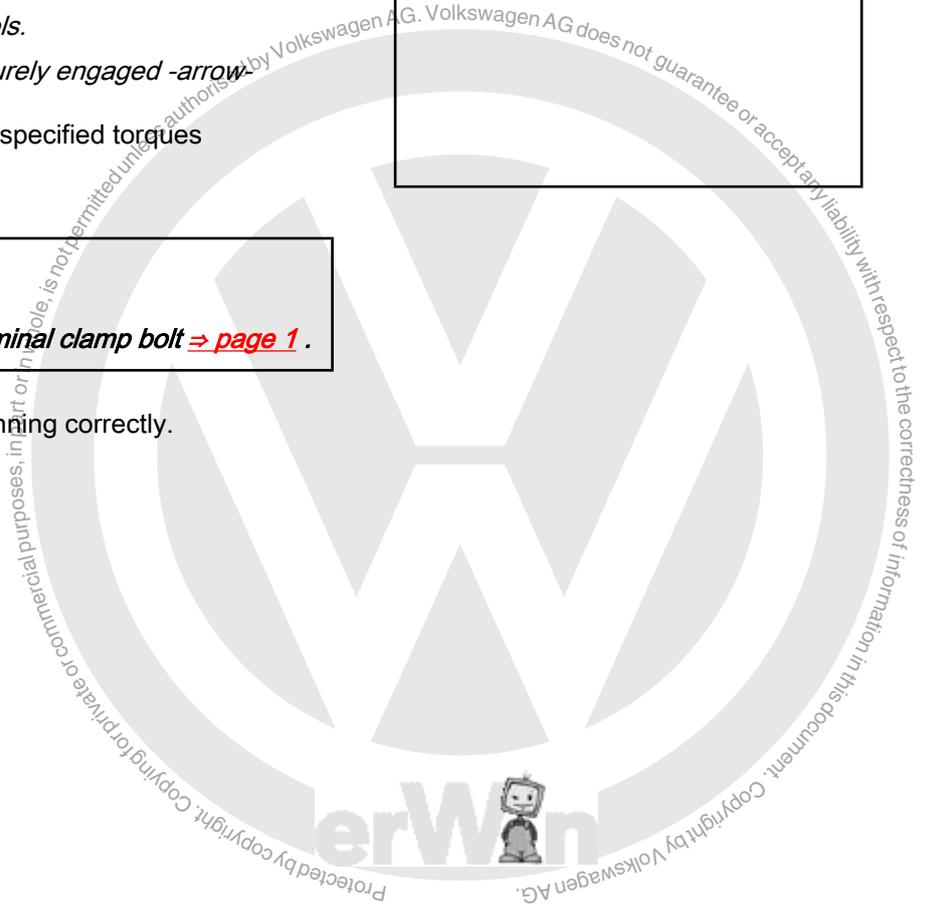
- ◆ *All hose connections of charge air system are secured with spring-type clips or push-on connectors. The following points must be observed for push-on connectors:*
- ◆ *Push on hose or pipe without tools.*
- ◆ *Ensure that locking lugs are securely engaged -arrow-*
- Tighten threaded connections to specified torques
⇒ [page 138](#) .
- Connect battery -A- ⇒ [page 4](#) .



Caution

Observe notes for battery pole terminal clamp bolt ⇒ [page 1](#) .

- Start engine and check belt is running correctly.
- Switch off engine.





7.14 Alternator -C- 2.0l SDI engine

7.14.1 Assembly overview

1 - Hexagon head flange bolts

- 20 Nm

2 - Poly V-belt tensioning element

3 - Hexagon head flange bolts

- 20 Nm

4 - Ancillary bracket

- For alternator -C- and air conditioner compressor
- Observe specified tightening sequence ⇒ Engine; Rep. gr. 13

5 - Hexagon head flange bolts

- 40 Nm
- Observe specified tightening sequence ⇒ Engine; Rep. gr. 13

6 - Hexagon head flange bolts

- 40 Nm
- Observe specified tightening sequence ⇒ Engine; Rep. gr. 13

7 - Cross-head screws

- 2 Nm

8 - Protective cap

9 - Voltage regulator -C1-

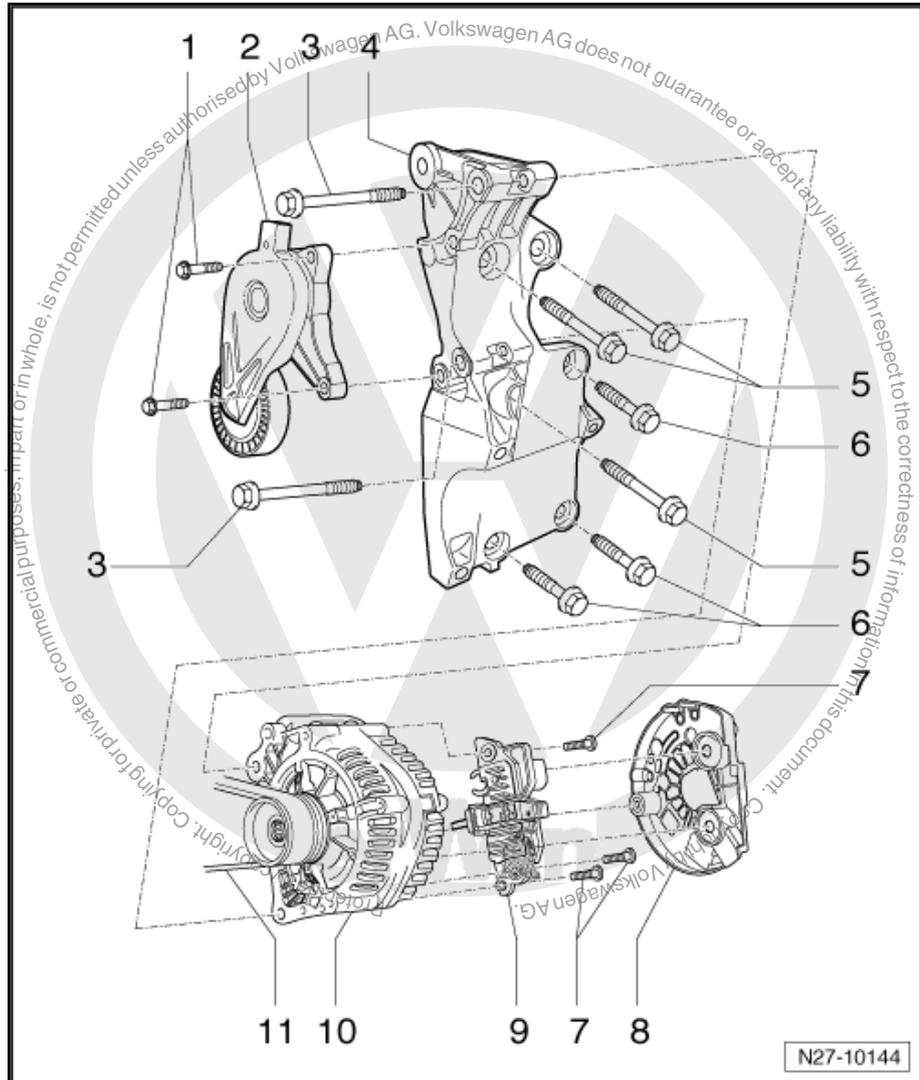
- Removing and installing ⇒ [page 168](#)

10 - Alternator -C-

- Removing and installing ⇒ [page 145](#)
- Checking ⇒ [page 89](#)
- Securing battery positive wire ⇒ [page 88](#)
- Removing and installing poly V-belt pulley ⇒ [page 163](#)

11 - Poly V-belt

- Checking ⇒ [page 88](#)
- Removing and installing ⇒ Engine; Rep. gr. 13
- Process for poly V-belt ⇒ Engine; Rep. gr. 13



Not illustrated

- ◆ Nut of B+ wire on rear of alternator: 15 Nm
- ◆ Nut of wire holder on back of alternator : 3.2 Nm
- ◆ Poly V-belt pulley without freewheel: 65 Nm

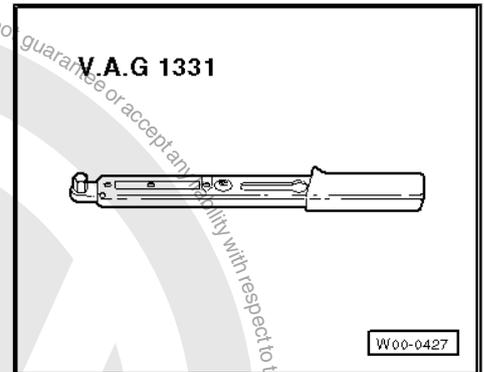


- ◆ Poly V-belt pulley with freewheel: 80 Nm
- ◆ Removing and installing ancillary bracket ⇒ Engine; Rep. gr. 13

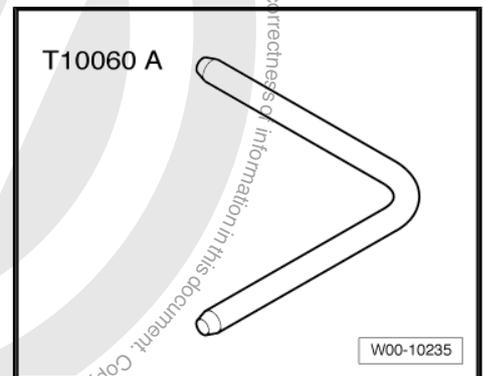
7.14.2 Removing and installing alternator -C-

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-



- ◆ Locking pin T10060A-



Carry out following procedures:

Removing

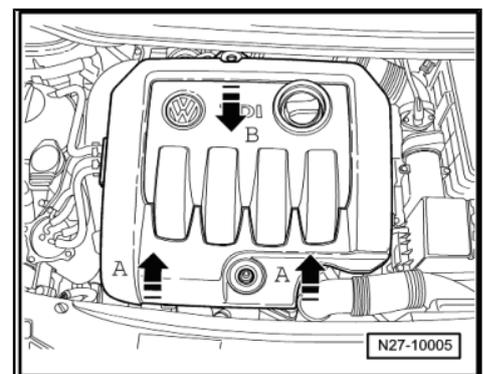
- Disconnect battery -A- ⇒ [page 4](#) .



Caution

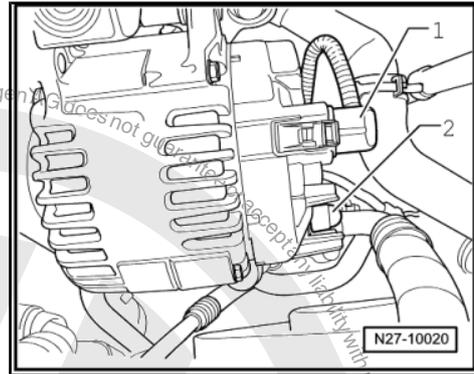
When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#) .

- Pull engine cover upwards -arrows A- and forwards -arrow B-.

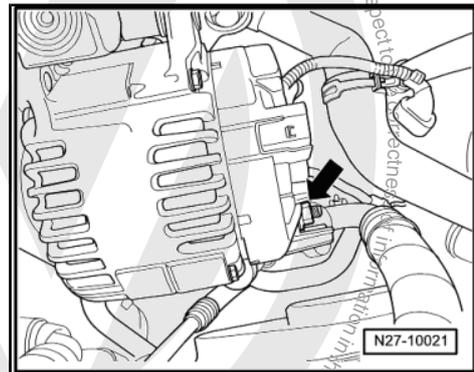




- Disconnect DF wire connector -1- and pull off protective cap -2-.



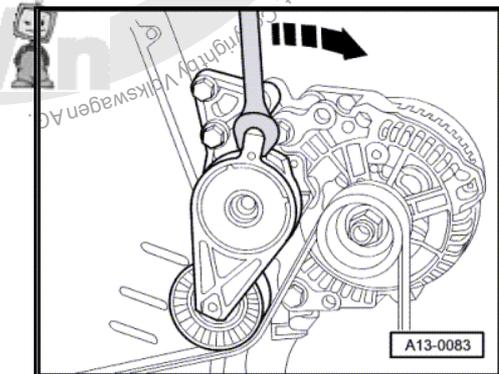
- Unscrew B+ wire -arrow- from alternator -C- .
- Pull fuel filter out of bracket and place to one side. When doing this, the fuel hoses can remain connected.



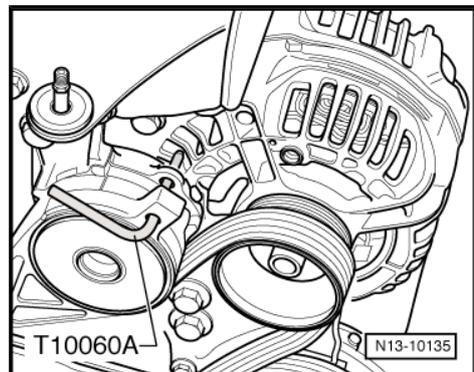
Caution

Before removing, mark the top side and direction of rotation of the poly V-belt. When installing, ensure correct fitting position and direction of rotation. If the belt is installed in the wrong position or against direction of rotation, the belt will be destroyed!

- Mark direction of rotation of poly V-belt.
- Release tension of poly V-belt by swivelling tensioning element in direction of -arrow- using an open-jaw spanner.

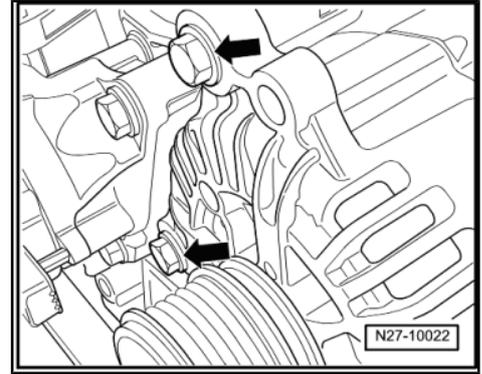


- Lock tensioning element using locking pin -T10060A- .
- Remove poly V-belt.





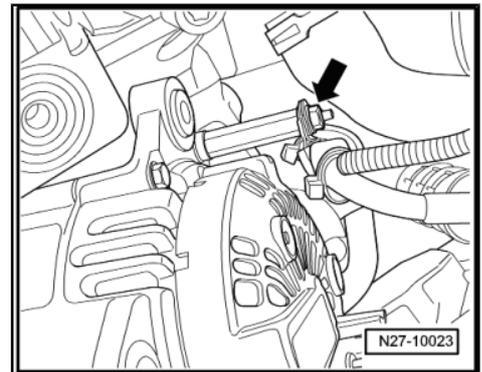
- Remove bolts of alternator -C- -arrows-.



- Unscrew wiring retainer -arrow- from alternator -C- .
- Remove alternator -C- .

Installing

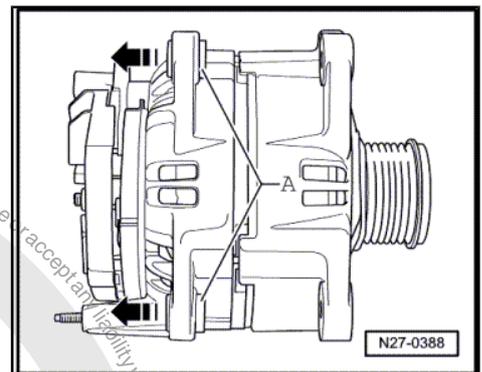
Install in the reverse order of removal. When doing this, note the following:



- Drive threaded sleeves -A- roughly 4 mm in -direction of arrow- out of alternator -C- housing.

Caution

- ◆ *In order to avoid damage to cylinder block and ancillaries bracket, adhere strictly to the tightening sequence for the ancillaries bracket ⇒ Engine; Rep. gr. 13 .*
- ◆ *When installing used poly V-belts observe the direction of rotation marked on removal!*
- ◆ *Before installing poly V-belt, make sure all assemblies (alternator -C- / air conditioner compressor / vane pump) are firmly in position.*
- ◆ *When fitting belt, ensure that poly V-belt seats correctly in pulleys!*



- Tighten threaded connections to specified torques ⇒ [page 144](#) .
- Connect battery -A- ⇒ [page 4](#) .

Caution

Observe notes for battery pole terminal clamp bolt ⇒ [page 1](#) .

- Start engine and check belt is running correctly.
- Switch off engine





7.15 Alternator -C- 2.0l diesel engine

7.15.1 Assembly overview

1 - Hexagon head flange bolts

- 20 Nm

2 - Poly V-belt tensioning element

3 - Hexagon head flange bolts

- 20 Nm

4 - Ancillary bracket

- For alternator -C- and air conditioner compressor
- Tightening sequence ⇒ Engine; Rep. gr. 13

5 - Hexagon head flange bolts

- 40 Nm

6 - Hexagon head flange bolts

- 40 Nm

7 - Cross-head screws

- 2 Nm

8 - Protective cap

9 - Voltage regulator -C1-

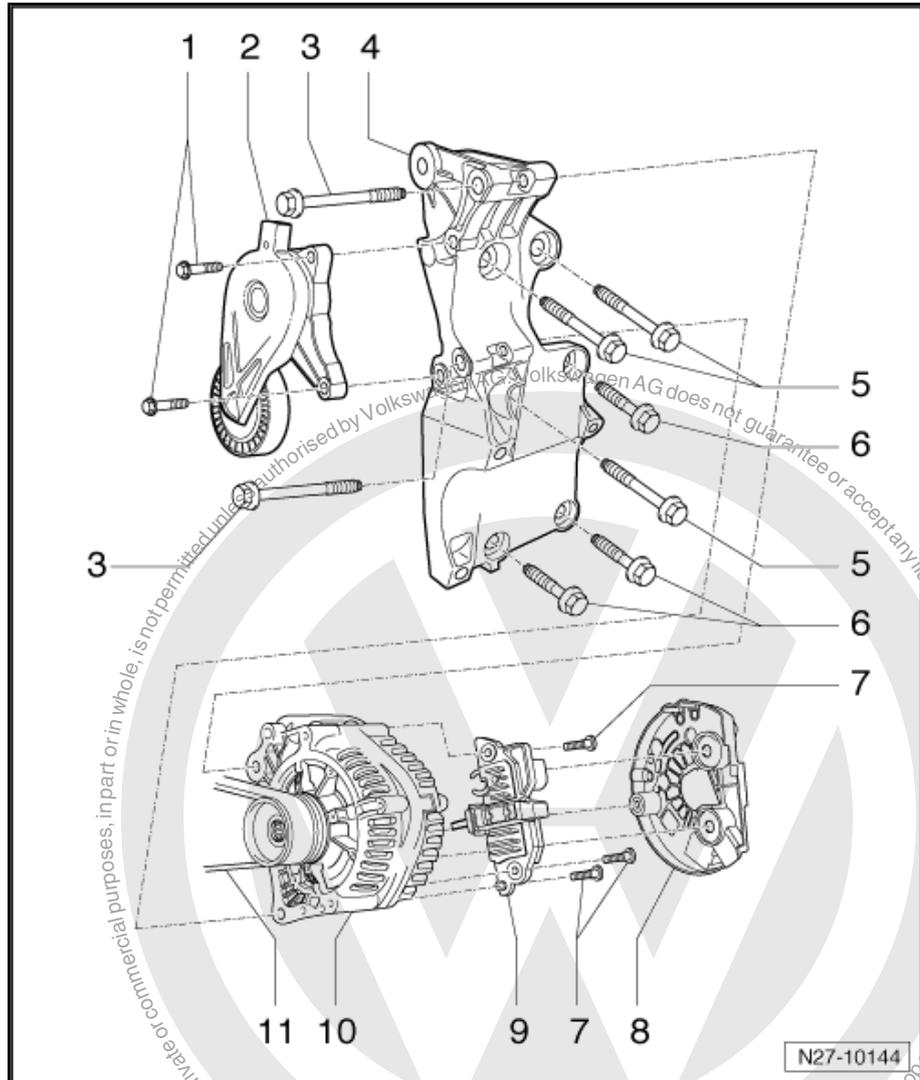
- Removing and installing ⇒ [page 168](#)

10 - Alternator -C-

- Removing and installing ⇒ [page 148](#)
- Checking ⇒ [page 89](#)
- Securing battery positive wire ⇒ [page 88](#)

11 - Poly V-belt

- Checking ⇒ [page 88](#)
- Process for poly V-belt ⇒ Engine; Rep. gr. 13



Not illustrated

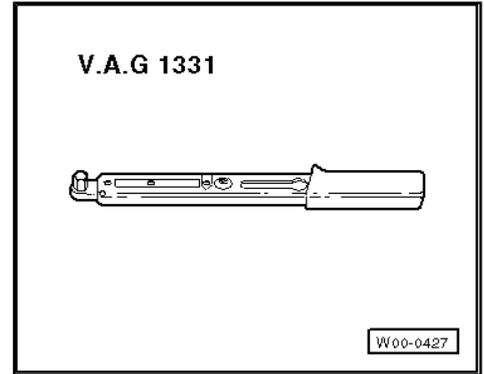
- ◆ Nut of B+ wire on rear of alternator: 15 Nm
- ◆ Nut of wire holder on back of alternator : 3.2 Nm
- ◆ Poly V-belt pulley without freewheel: 65 Nm
- ◆ Poly V-belt pulley with freewheel: 80 Nm
- ◆ Removing and installing ancillary bracket ⇒ Engine; Rep. gr. 13

7.15.2 Removing and installing alternator -C-

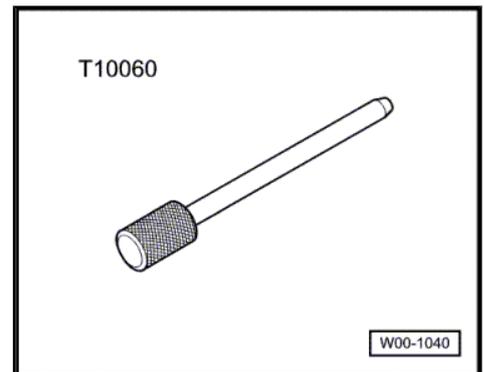
Special tools and workshop equipment required



- ◆ Torque wrench -V.A.G 1331-



- ◆ Locking pin -T10060-



Carry out following procedures:

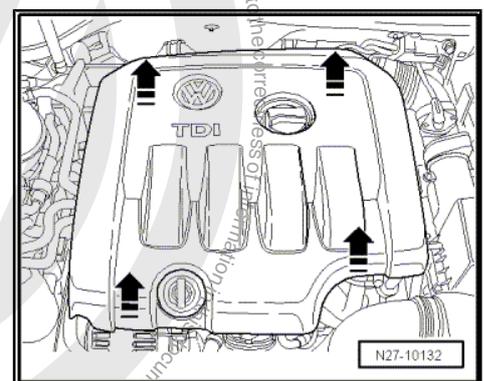
Removing

- Disconnect battery -A- => [page 4](#) .

 **Caution**

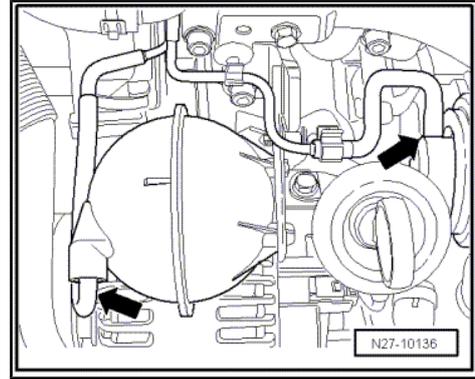
When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed => [page 4](#) .

- Pull engine cover panel upwards -arrows-.

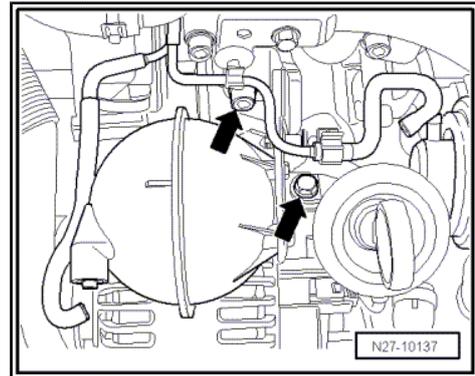




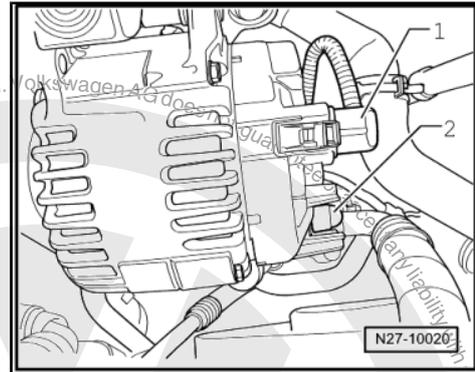
- Pull off vacuum hoses -arrows-.



- Remove bolts -arrows-.



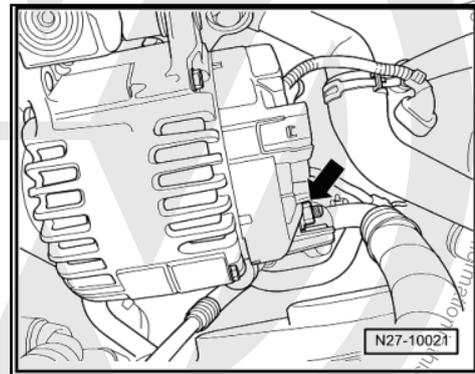
- Disconnect DF wire connector -1- and pull off protective cap -2-.



- Unscrew B+ wire -arrow- from alternator -C- .
- Pull fuel filter out of bracket and place to one side. When doing this, the fuel hoses can remain connected.

Caution

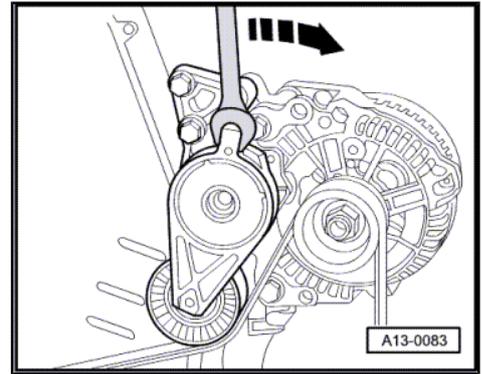
Before removing, mark the top side and direction of rotation of the poly V-belt. When installing, ensure correct fitting position and direction of rotation. If the belt is installed in the wrong position or against direction of rotation, the belt will be destroyed!



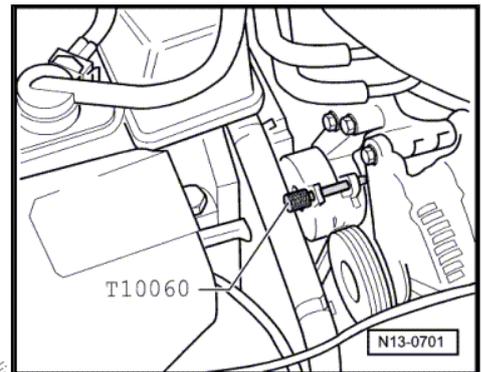
- Mark direction of rotation of poly V-belt.



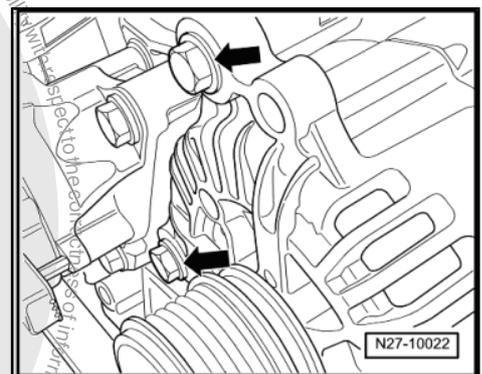
- Release tension of poly V-belt by swivelling tensioning element in direction of -arrow- using an open-jaw spanner.



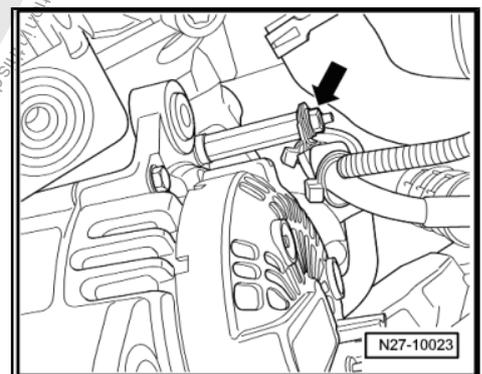
- Lock tensioning element using locking pin -T10060- .
- Remove poly V-belt.



- Remove bolts of alternator -C- -arrows-.



- Unscrew wiring retainer -arrow- from alternator -C- .
- Remove alternator -C- .



Installing

Install in the reverse order of removal. When doing this, note the following:

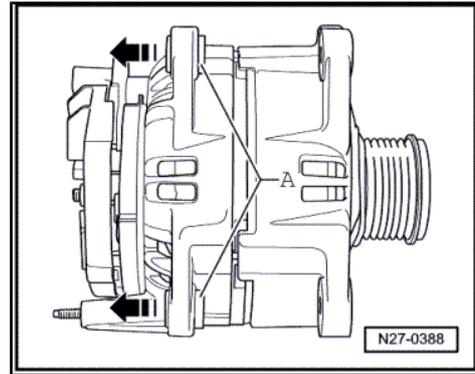


Caution

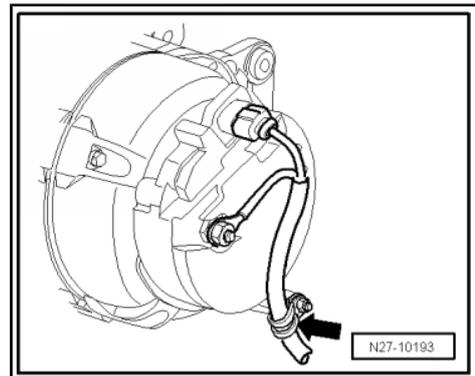
- ◆ **When installing used poly V-belts observe the direction of rotation marked on removal!**
- ◆ **Before installing poly V-belt, make sure all assemblies (alternator -C- / air conditioner compressor) are firmly in position.**
- ◆ **When fitting belt, ensure that poly V-belt seats correctly in pulleys!**



- Drive threaded sleeves -A- roughly 4 mm in -direction of arrow- out of alternator -C- housing.



- Secure wire holder -arrow- on back of alternator -C- in 9 o'clock position.
- Tighten threaded connections to specified torques
=> [page 148](#) .
- Connect battery -A- => [page 4](#) .



Caution

Observe notes for battery pole terminal clamp bolt => [page 1](#) .

- Start engine and check belt is running correctly.
- Switch off engine.





7.16 Alternator -C- 2.0l CR diesel engine

7.16.1 Assembly overview

1 - Hexagon bolt with washer and threaded element

- 2 Nm

2 - Protective cap for alternator -C-

3 - Cross-head screws

- 2 Nm

4 - Protective cap for carbon brushes

5 - Voltage regulator -C1-

- Removing and installing
⇒ [page 168](#)

6 - Alternator -C-

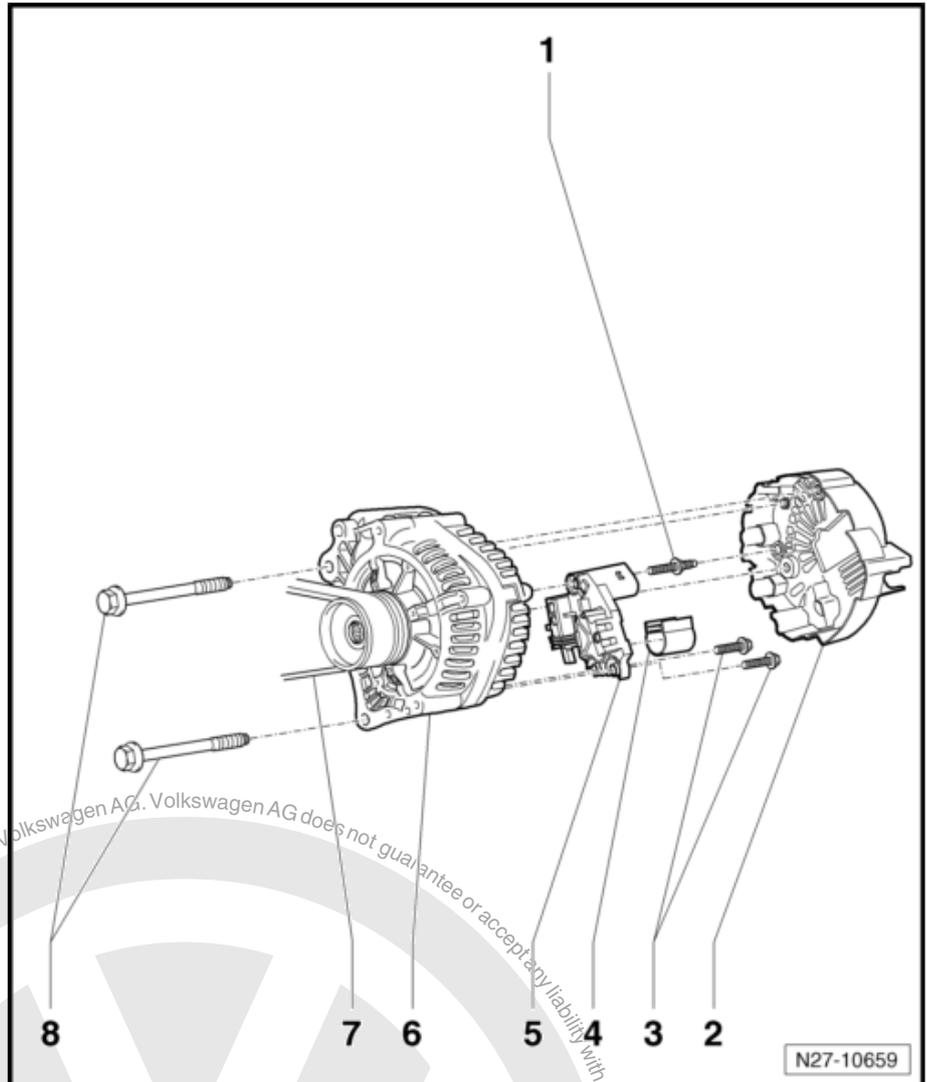
- Removing and installing
⇒ [page 153](#)
- Checking ⇒ [page 89](#)
- Securing battery positive wire ⇒ [page 88](#)

7 - Poly V-belt

- Removing and installing
⇒ Engine; Rep. gr. 13
- Poly V-belt routing ⇒
Engine; Rep. gr. 13
- Checking ⇒ [page 88](#)

8 - Hexagon head flange bolts

- 20 Nm



Not illustrated

- ◆ Nut of B+ wire on rear of alternator: 15 Nm
- ◆ Nut of wire holder on back of alternator : 3.2 Nm
- ◆ Poly V-belt pulley without freewheel: 65 Nm
- ◆ Poly V-belt pulley with freewheel: 80 Nm
- ◆ Removing and installing ancillary bracket ⇒ Engine; Rep. gr. 13

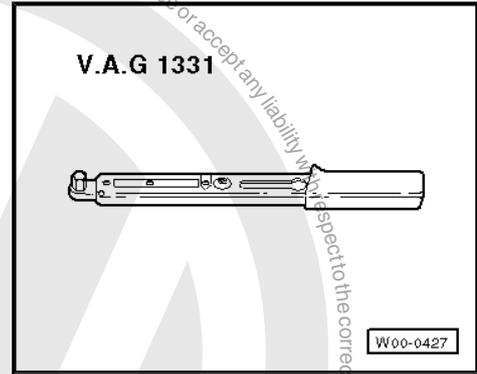
7.16.2 Removing and installing alternator -C-

Special tools and workshop equipment required





- ◆ Torque wrench -V.A.G 1331-



Carry out following procedures:

Removing

- Disconnect battery -A- ⇒ [page 4](#) .



Caution

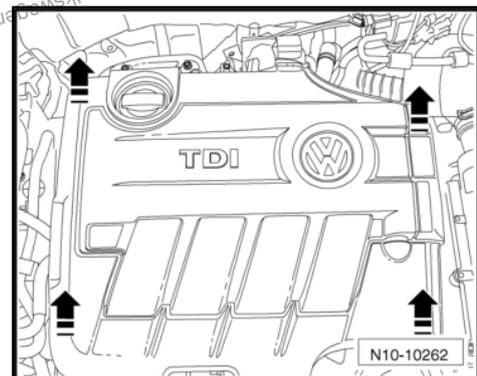
When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#) .

- Holding engine cover at corners -arrows-, jerk it upwards out of attachment points.
- Place lock carrier in service position ⇒ General body repairs, exterior; Rep. gr. 50 .

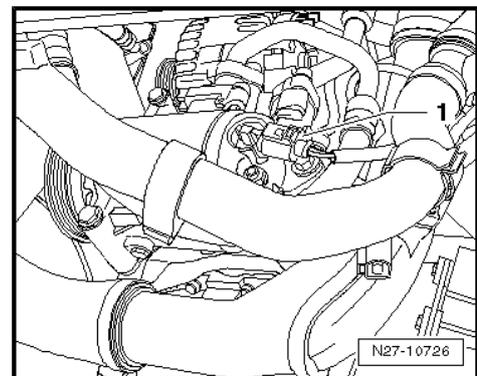


Caution

Before removing, mark the top side and direction of rotation of the poly V-belt. When installing, ensure correct fitting position and direction of rotation. If the belt is installed in the wrong position or against direction of rotation, the belt will be destroyed!



- Remove poly V-belt ⇒ Engine; Rep. gr. 13 .
- Release and disconnect connector -1-.

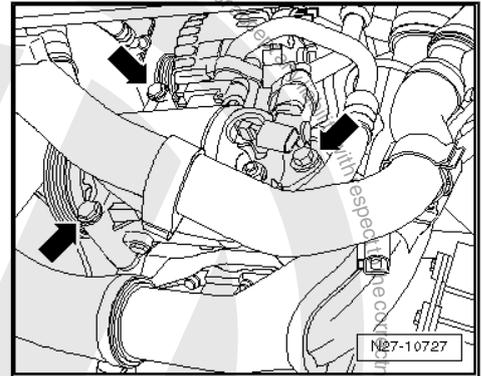




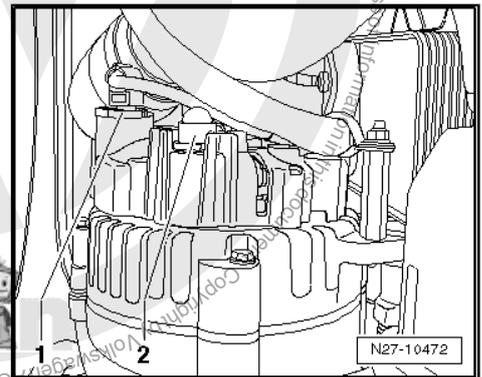
- Remove the two bolts of air conditioner compressor -arrows-.

i Note

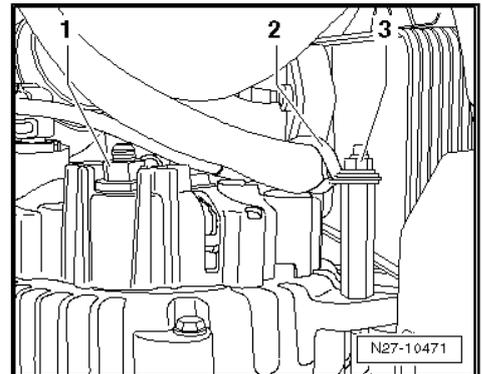
- ◆ The hoses of the air conditioner compressor can remain connected.
- ◆ Until reinstallation, suspend air conditioner compressor at a suitable position under vehicle using a piece of wire.
- ◆ When doing this, ensure that hoses are not stretched or kinked.



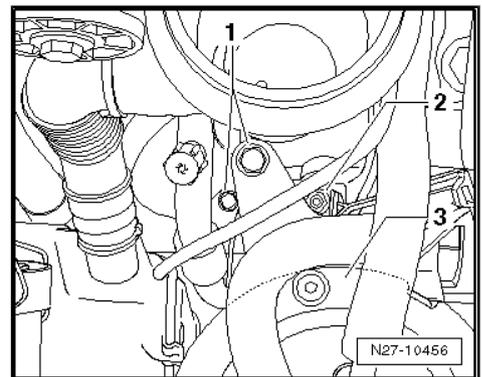
- Release and disconnect DF wire connector -1-.
- Lever off protective cap -2-.



- Remove nut -1- and remove the battery positive wire, located beneath, from the connector thread of the alternator -C- .
- Unscrew nut -3- and remove wiring retainer -2- from the alternator -C- .



- Unscrew both bolts -1- and nuts -2- of fuel filter -3- and place filter to one side. The fuel hoses can then remain connected.





- Remove the two bolts -arrows- of alternator -C- .
- Lower alternator -C- out of vehicle.

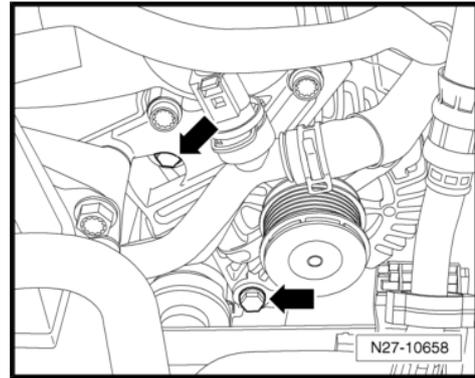
Installing

Install in the reverse order of removal. When doing this, note the following:

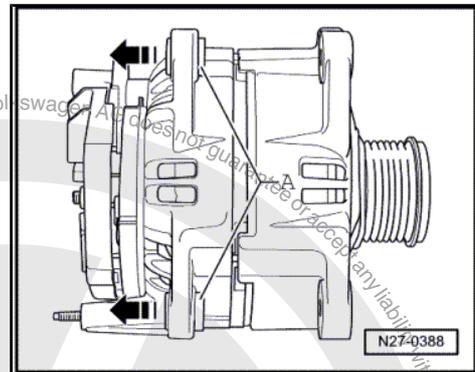


Caution

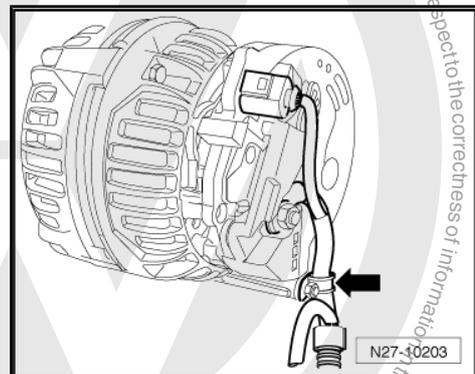
- ◆ *When installing used poly V-belts observe the direction of rotation marked on removal!*
- ◆ *Before installing poly V-belt, make sure all assemblies (alternator -C- / air conditioner compressor) are firmly in position.*
- ◆ *When fitting belt, ensure that poly V-belt seats correctly in pulleys!*



- Drive threaded sleeves -A- roughly 4 mm in direction of arrow out of alternator -C- housing.



- Secure wire holder -arrow- on back of alternator -C- in 3 o'clock position.





- Tighten threaded connections to specified torques
⇒ [page 153](#) .



Caution

Before installing engine cover, check correct position of 4 attachment elements (ball sockets) and return these to their position. Otherwise, engine cover will be damaged.

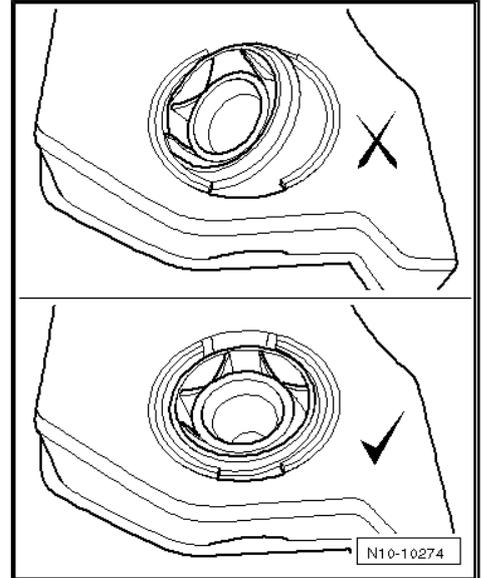
- Place engine cover on attachment points and press into locking points at corners.
- Connect battery -A- ⇒ [page 4](#) .



Caution

Observe notes for battery pole terminal clamp bolt ⇒ [page 1](#) .

- Start engine and check belt is running correctly.
- Switch off engine.





7.17 Alternator -C- 2.0l TSI engine

7.17.1 Assembly overview

1 - Hexagon head flange bolt

- 20 Nm

2 - Cross-head screws

- 2 Nm

3 - Washer

4 - Cross-head screw

- 4.5 Nm

5 - Hexagon nut

- 15 Nm

6 - Hexagon nut

7 - Protective cap for alternator -C-

8 - Cross-head screw

- 2 Nm

9 - Voltage regulator -C1-

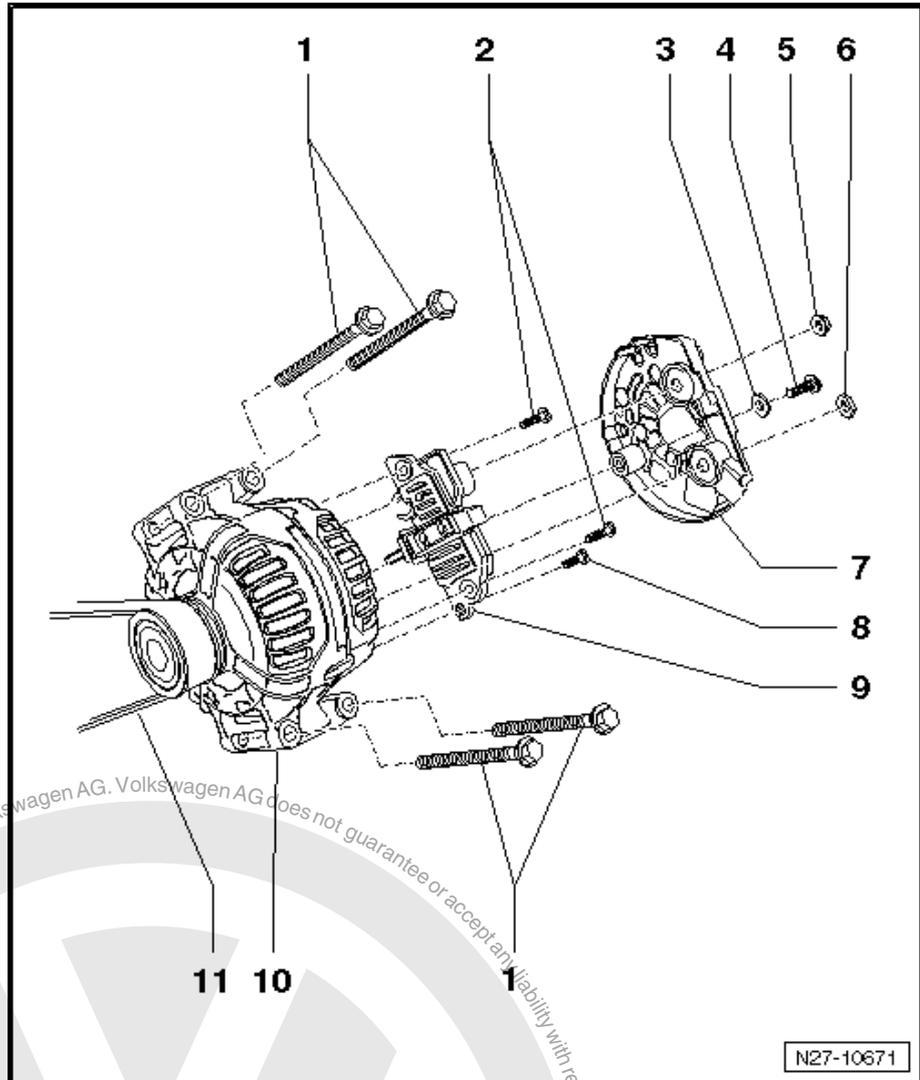
- Removing and installing
⇒ [page 169](#)

10 - Alternator -C-

- Removing and installing
⇒ [page 159](#)
- Checking ⇒ [page 89](#)
- Securing battery positive wire ⇒ [page 88](#)
- Removing and installing poly V-belt pulley
⇒ [page 163](#)

11 - Poly V-belt

- Removing and installing
⇒ Engine; Rep. gr. 13
- Checking ⇒ [page 88](#)
- Poly V-belt routing ⇒ Engine; Rep. gr. 13



Not illustrated

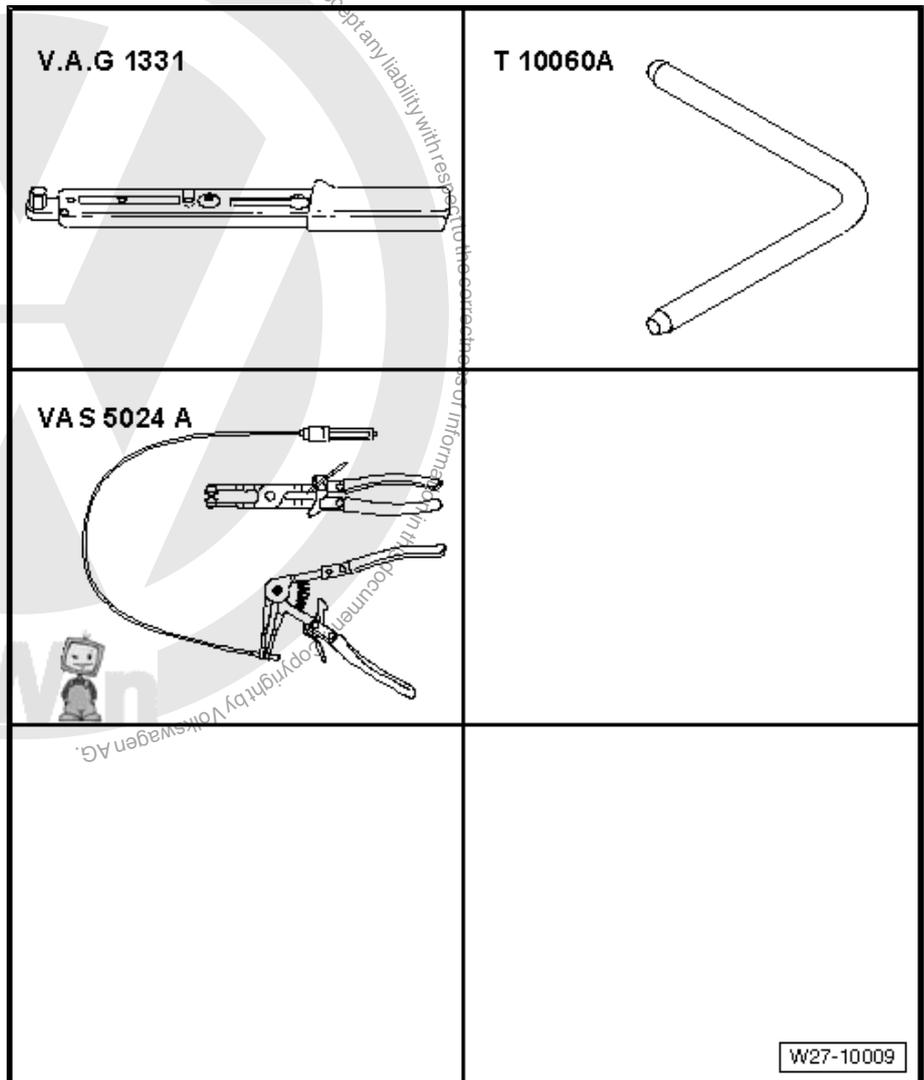
- ◆ Nut of B+ wire on rear of alternator: 15 Nm
- ◆ Nut of wire holder on back of alternator : 3.2 Nm
- ◆ Poly V-belt pulley without freewheel: 65 Nm
- ◆ Poly V-belt pulley with freewheel: 80 Nm
- ◆ Removing and installing ancillary bracket ⇒ Engine; Rep. gr. 13



7.17.2 Removing and installing alternator -C-

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-
- ◆ Locking pin -T10060 A-
- ◆ Spring-type clip pliers -VAS 5024 A-



Carry out following procedures:

Removing

- Disconnect battery -A- => [page 4](#) .

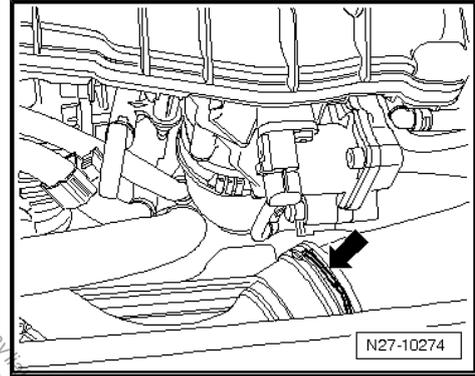


Caution

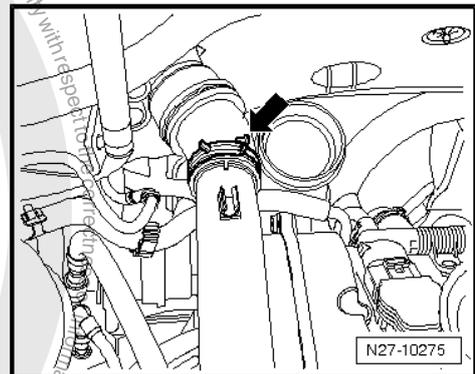
When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed => [page 4](#) .



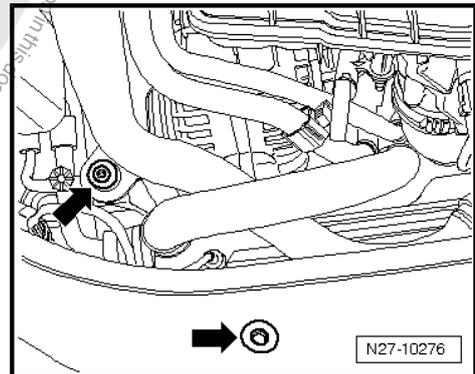
- Disconnect plug connector -arrow-.



- Loosen spring-type clip -arrow- using spring-type clip pliers -VAS 5024 A- .



- Remove bolts -arrows-.
- Remove charge air hose from vehicle.

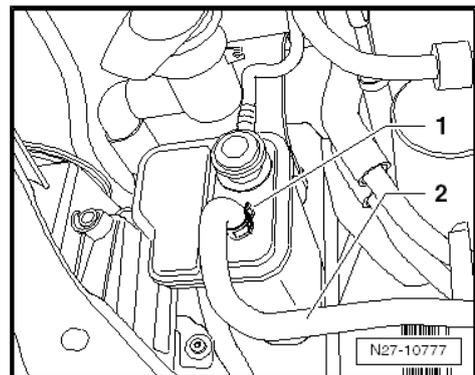


- Unfasten clip -1- and remove hose -2- from activated charcoal filter.



Note

For reasons of clarity, the activated charcoal filter bracket is shown removed in the following illustration. The bracket does not need to be removed to release the filter.



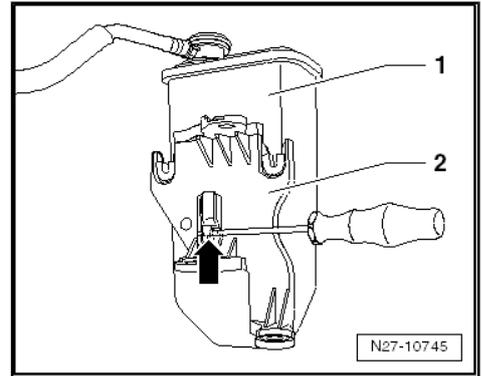


- Slightly lift locking lug on rear of bracket -arrow- using a suitable screwdriver and pull activated charcoal filter -1- upwards out of bracket -2-.
- Place activated charcoal filter -1- with connected hose to one side.



Caution

Before removing, mark the top side and direction of rotation of the poly V-belt. When installing, ensure correct fitting position and direction of rotation. If the belt is installed in the wrong position or against direction of rotation, the belt will be destroyed!



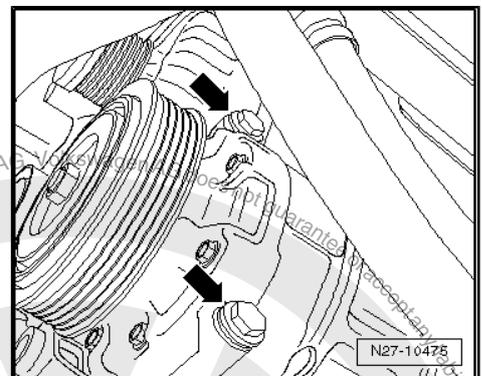
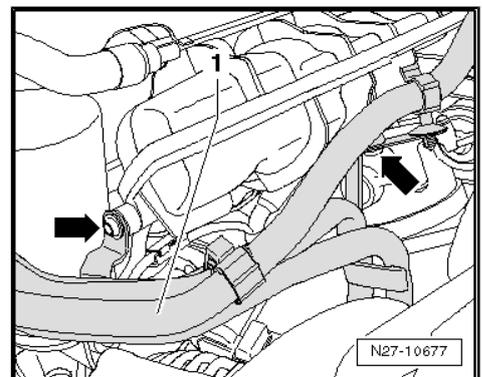
- Remove poly V-belt ⇒ Engine; Rep. gr. 13 .
- Remove both bolts -arrows- and put coolant pipes and hose -1- up to make room for removing alternator -C- .



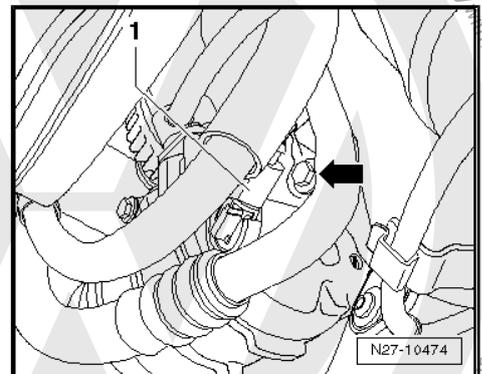
Note

Coolant pipes and hose can remain connected.

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 .
- Remove bolts of air conditioner compressor -arrows-.



- Release and disconnect connector -1-.
- Unscrew third bolt -arrow- and remove air conditioner compressor from bracket.



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Note

- ◆ The hoses of the air conditioner compressor can remain connected.
- ◆ Suspend the air conditioner compressor -3- using a piece of wire -1- at a suitable position under the vehicle until it is ready to be reinstalled.
- ◆ Ensure that the hoses -2- are not stretched or kinked when doing this.

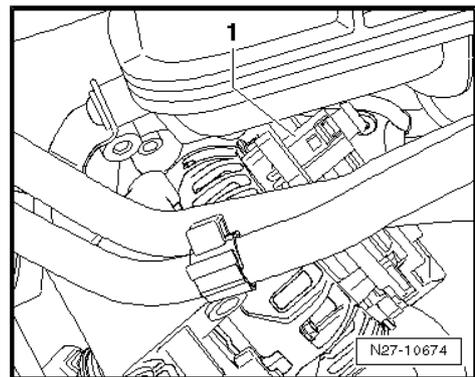
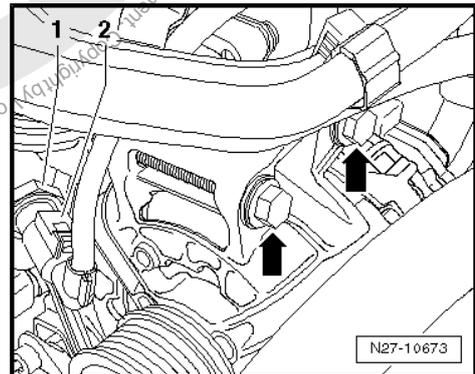
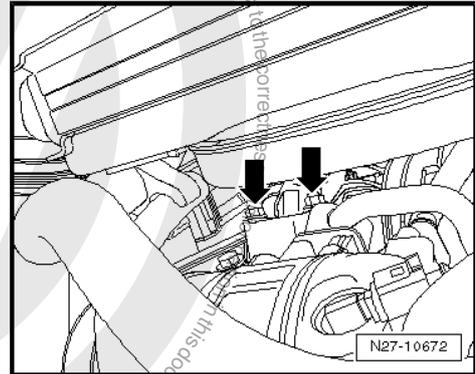
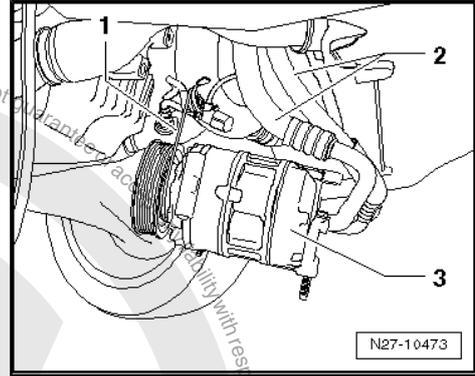
– Remove the two lower bolts -arrows- of alternator -C- from below.

– Release and disconnect connector -2-.

– Remove the two bolts -arrows- of alternator -C- .

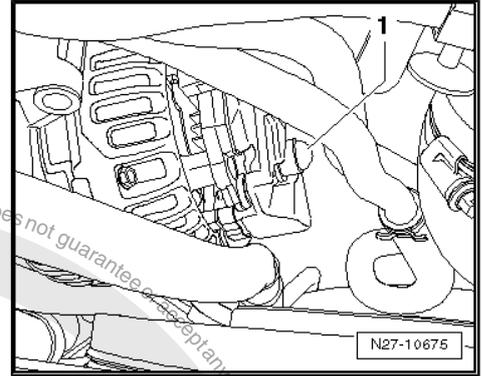
– Swing alternator -C- slightly to the left to gain access to connections on generator side.

– Release and disconnect DF wire connector -1-.

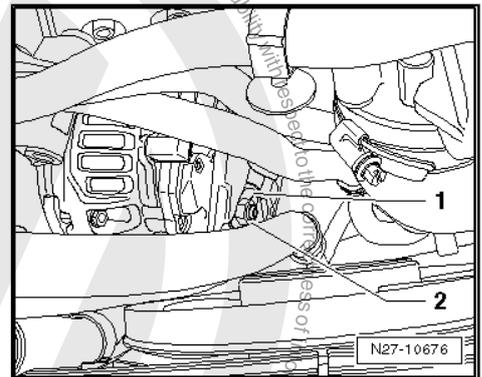




- Lever off protective cap -1-.



- Remove nut -2- and remove the battery positive cable -1-, located beneath, from the connector thread of the alternator -C-.
- Lift alternator -C- out of vehicle.



Installing

Install in the reverse order of removal. When doing this, note the following:



Caution

- ◆ *When installing used poly V-belts observe the direction of rotation marked on removal!*
- ◆ *Before installing poly V-belt, make sure all assemblies (alternator -C- / air conditioner compressor) are firmly in position.*
- ◆ *When fitting belt, ensure that poly V-belt seats correctly in pulleys!*

- Tighten threaded connections to specified torques
⇒ [page 158](#) .
- Connect battery -A- ⇒ [page 4](#) .



Caution

Observe notes for battery pole terminal clamp bolt ⇒ [page 1](#) .

- Start engine and check belt is running correctly.
- Switch off engine.

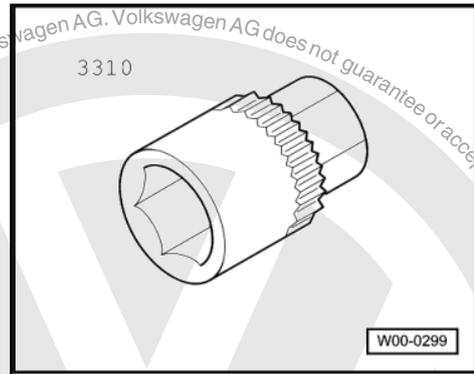
7.18 Removing and installing poly-V belt pulley on alternator -C-

7.18.1 Removing and installing poly V-belt pulley (without freewheel)

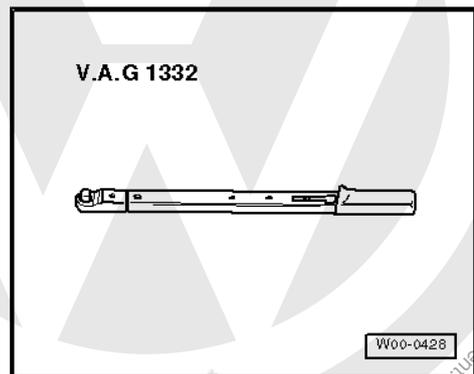
Special tools and workshop equipment required



◆ Socket -VAS 3310-



◆ Torque wrench -V.A.G 1332-



Carry out following procedures:

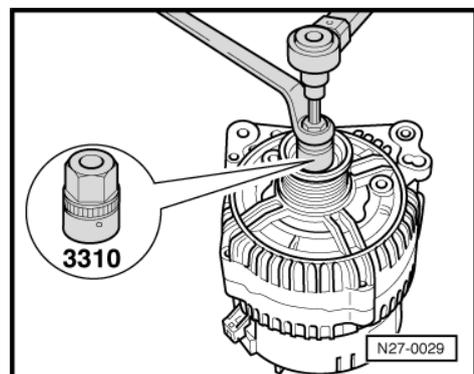
Removing

- Remove alternator -C- ⇒ [page 88](#) .
- Clamp alternator -C- in a vice at holding points of alternator.
- Use socket -VAS 3310- to unscrew poly-V-belt pulley nut from alternator shaft.

Installing

Carry out installation in the reverse sequence, noting the following:

- Tighten threaded connections to specified torques ⇒ [page 158](#) .

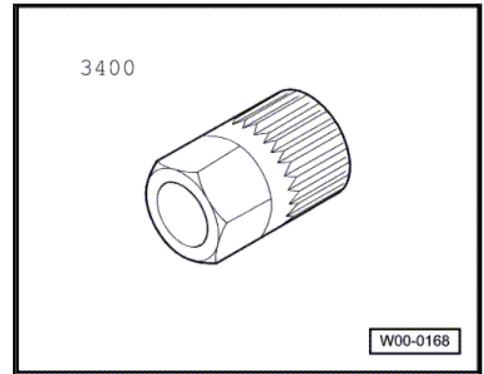


7.18.2 Removing and installing poly V-belt pulley (with freewheel, Bosch)

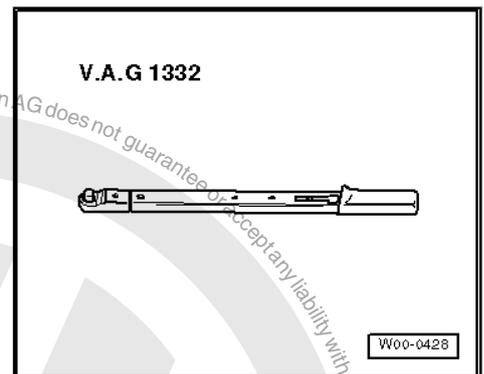
Special tools and workshop equipment required



◆ Multipoint adapter -VAS 3400-



◆ Torque wrench -V.A.G 1332-



Carry out following procedures:

Removing

- Remove alternator -C- => [page 88](#) .
- Clamp alternator -C- in a vice at holding points of alternator.
- Remove protective cap from poly V-belt pulley with freewheel.

Note

The thread on the alternator shaft is left-handed. To loosen the connection, turn clockwise, and to tighten it, turn anti-clockwise.

- Insert multi-point adapter -VAS 3400- with ring spanner in alternator -C- poly V-belt pulley with freewheel.



- Insert an M10 multi-point bit -1- into alternator shaft.
- Loosen threaded connection by turning clockwise. Counterhold with ring spanner when doing this.
- Hold poly V-belt pulley with freewheel by hand. Turn drive shaft of alternator -C- until poly V-belt pulley with freewheel can be removed.

Installing

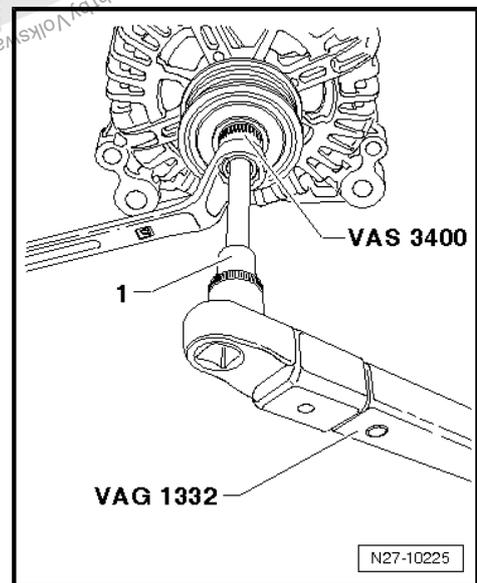
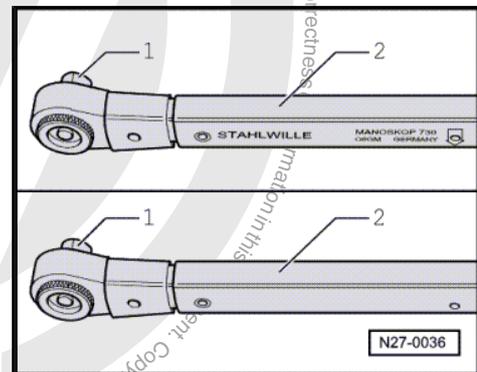
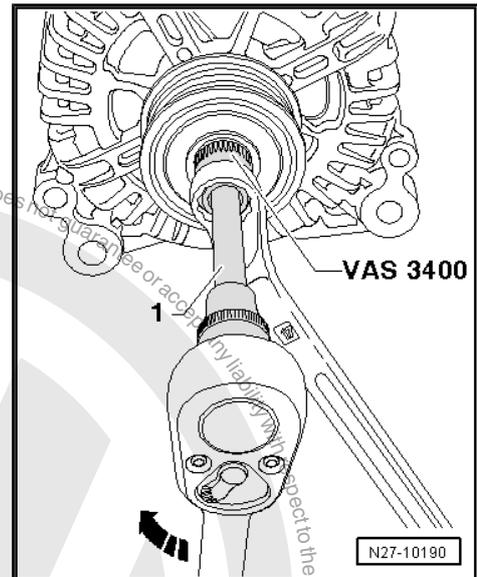
Install in the reverse order of removal. When doing this, note the following:

- First screw poly V-belt pulley with freewheel on drive shaft of alternator -C- by hand as far as limit stop.

The torque wrench -V.A.G 1332- must be modified for assembly of poly V-belt with freewheel as follows:

- Release socket drive -1- and pull off grip -2-.
- Turn grip -2- of torque wrench by 180 degrees and reinsert socket drive.
- Set turning direction of torque wrench to anti-clockwise on socket drive.

- Insert an M10 multi-point bit -1- into alternator shaft.
- Counterhold using multi-point adapter -VAS 3400- and ring spanner.
- Tighten poly V-belt pulley with freewheel by turning alternator -C- drive shaft anti-clockwise using torque wrench -V.A.G 1332- .
- Tighten threaded connections to specified torques
[=> page 158](#) .

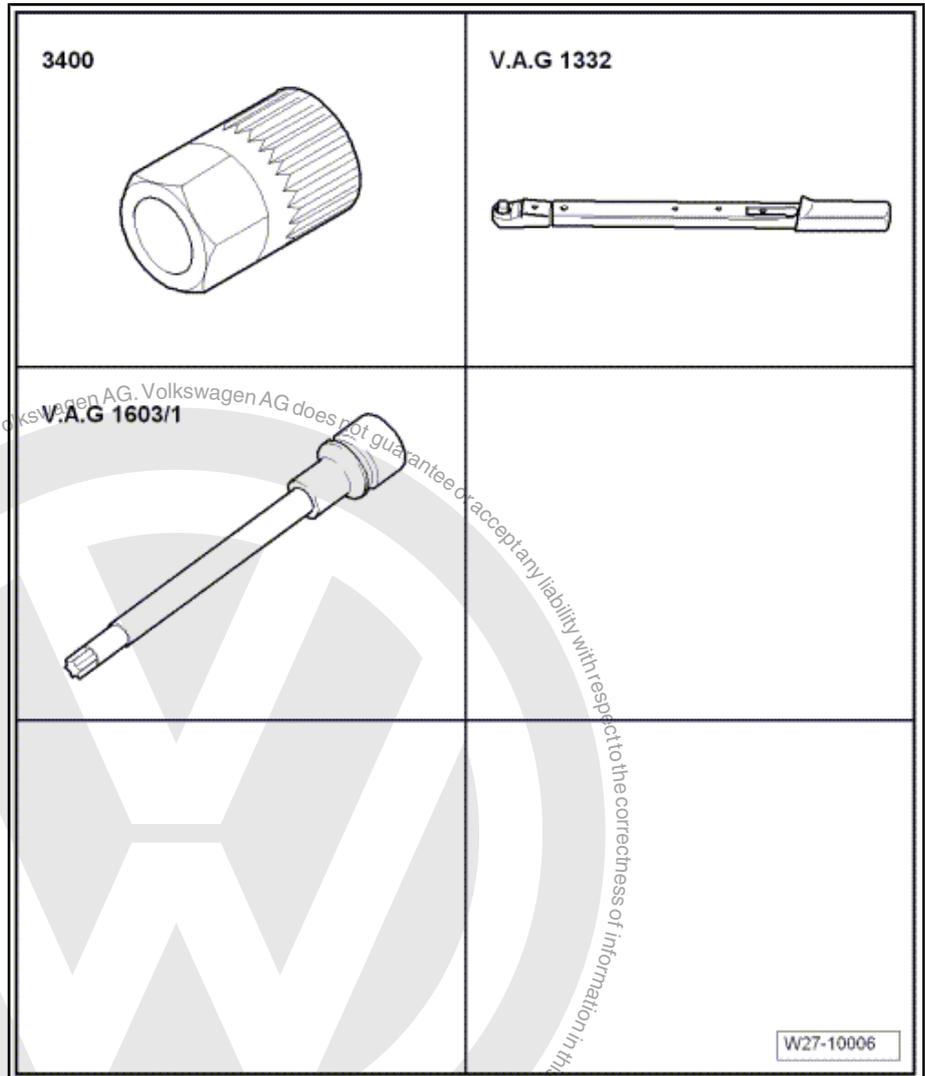




7.18.3 Removing and installing poly V-belt pulley (with freewheel, Valeo)

Special tools and workshop equipment required

- ◆ Multipoint adapter -VAS 3400-
- ◆ Torque wrench -V.A.G 1332-
- ◆ TORX driver bit -V.A.G 1603/1-



Carry out following procedures:

Removing

- Remove alternator -C- => [page 88](#).
- Clamp alternator -C- in a vice at holding points of alternator.
- Remove protective cap from poly V-belt pulley with freewheel.

Note

The thread on the alternator shaft is left-handed. To loosen the connection, turn clockwise, and to tighten it, turn anti-clockwise.

- Insert multi-point adapter -VAS 3400- with ring spanner in alternator -C- poly V-belt pulley with freewheel.



- Insert TORX driver bit -V.A.G 1603/1- in alternator shaft.
- Loosen threaded connection by turning clockwise. Counterhold with ring spanner when doing this.
- Hold poly V-belt pulley with freewheel by hand. Turn drive shaft of alternator -C- until poly V-belt pulley with freewheel can be removed.

Installing

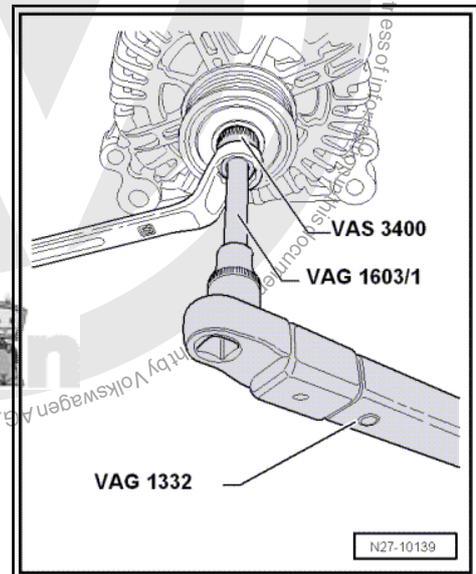
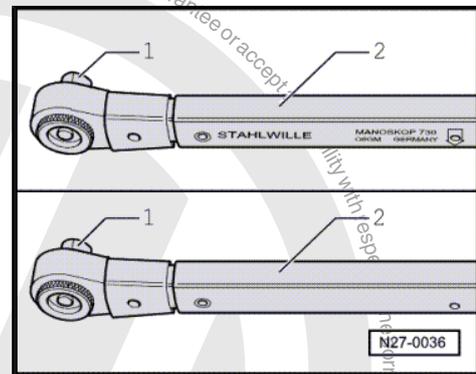
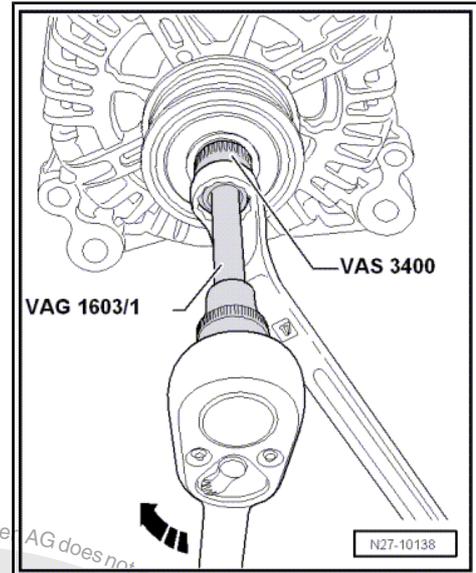
Install in the reverse order of removal. When doing this, note the following:

- First screw poly V-belt pulley with freewheel on drive shaft of alternator -C- by hand as far as limit stop.

The torque wrench -V.A.G 1332- must be modified for assembly of poly V-belt with freewheel as follows:

- Release socket drive -1- and pull off grip -2-.
- Turn grip -2- of torque wrench by 180 degrees and reinsert socket drive.
- Set turning direction of torque wrench to anti-clockwise on socket drive.

- Insert TORX driver bit -V.A.G 1603/1- in alternator shaft.
- Counterhold using multi-point adapter -VAS 3400- and ring spanner.
- Tighten poly V-belt pulley with freewheel by turning alternator -C- drive shaft anti-clockwise using torque wrench -V.A.G 1332- .
- Tighten threaded connections to specified torques
=> [page 158](#) .



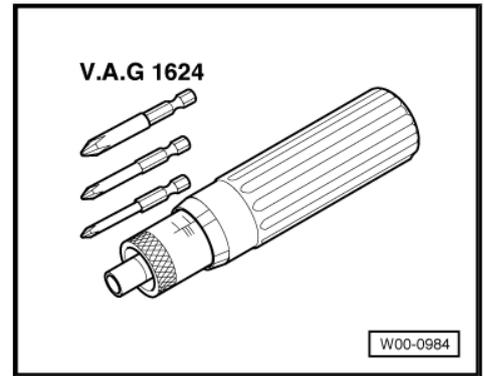
7.19 Voltage regulator -C1- for alternator -C-

7.19.1 Removing and installing voltage regulator -C1- (Bosch)

Special tools and workshop equipment required



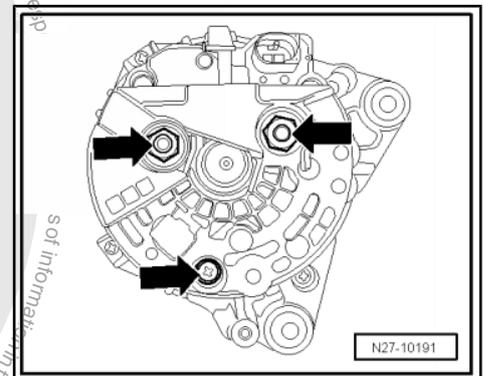
- ◆ Torque screwdriver -V.A.G 1624-



Carry out following procedures:

Removing

- Remove alternator -C- ⇒ [page 88](#) .
- Undo bolt and nuts -arrows- and detach protective cap from alternator -C- .

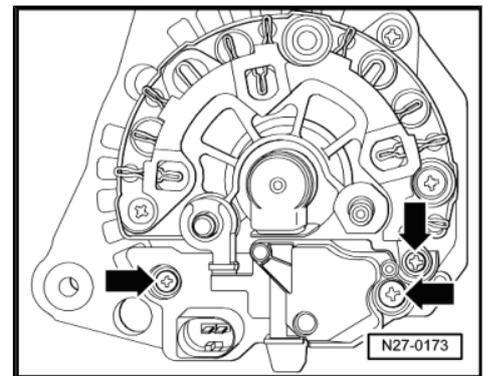


- Remove bolts for voltage regulator -C1- -arrows-.
- Remove voltage regulator -C1- from alternator -C- .

Installing

Installation is carried out in reverse order of removal.

- Tighten threaded connections to specified torques ⇒ [page 158](#) .

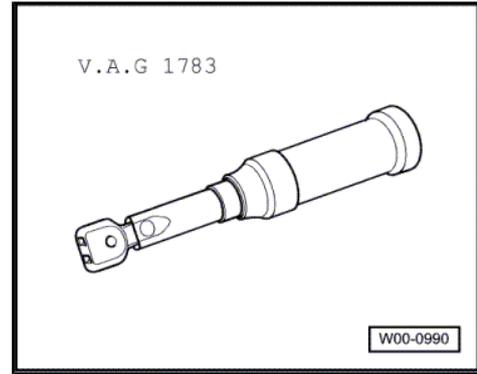


7.19.2 Removing and installing voltage regulator -C1- (Valeo)

Special tools and workshop equipment required



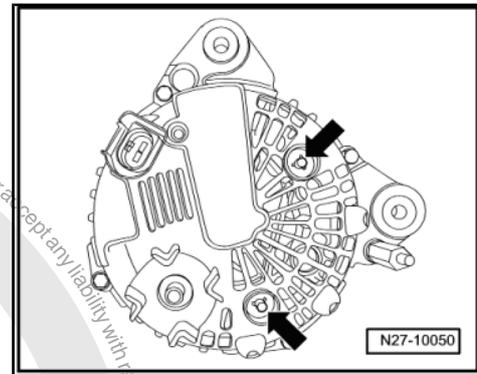
- ◆ Torque wrench -V.A.G 1783/-



Carry out following procedures:

Removing

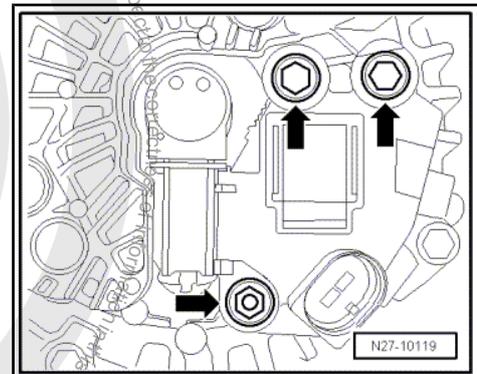
- Remove alternator -C- → [page 88](#) .
- Remove clamping rings -arrows- and detach protective cap from alternator -C- .



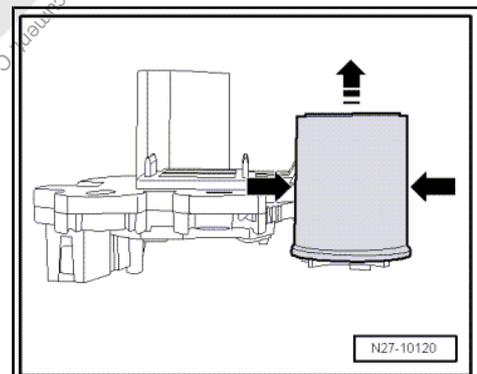
- Remove bolts for voltage regulator -C1- -arrows-.
- Remove voltage regulator -C1- from alternator -C- .

Installing

Install in the reverse order of removal. When doing this, note the following:

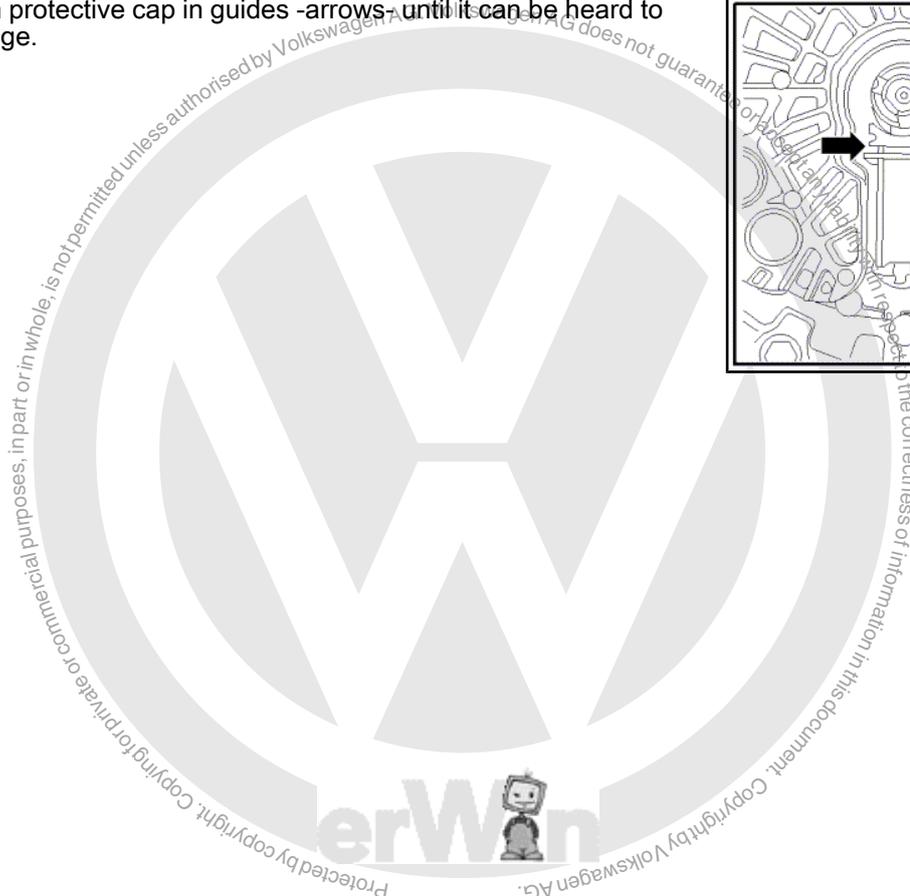
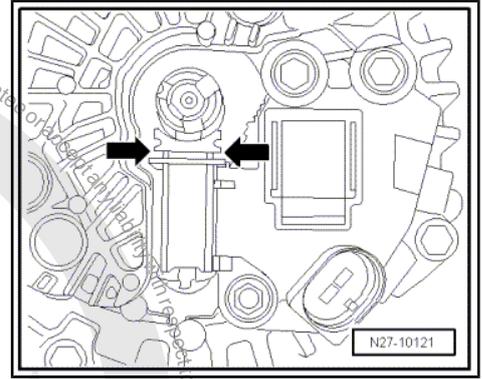


- Release locking lugs -arrows- and pull protective cap off voltage regulator -C1- .
- Press carbon brushes into housing of voltage regulator -C1- and insert voltage regulator -C1- in alternator -C- .
- Tighten threaded connections to specified torques → [page 158](#) .





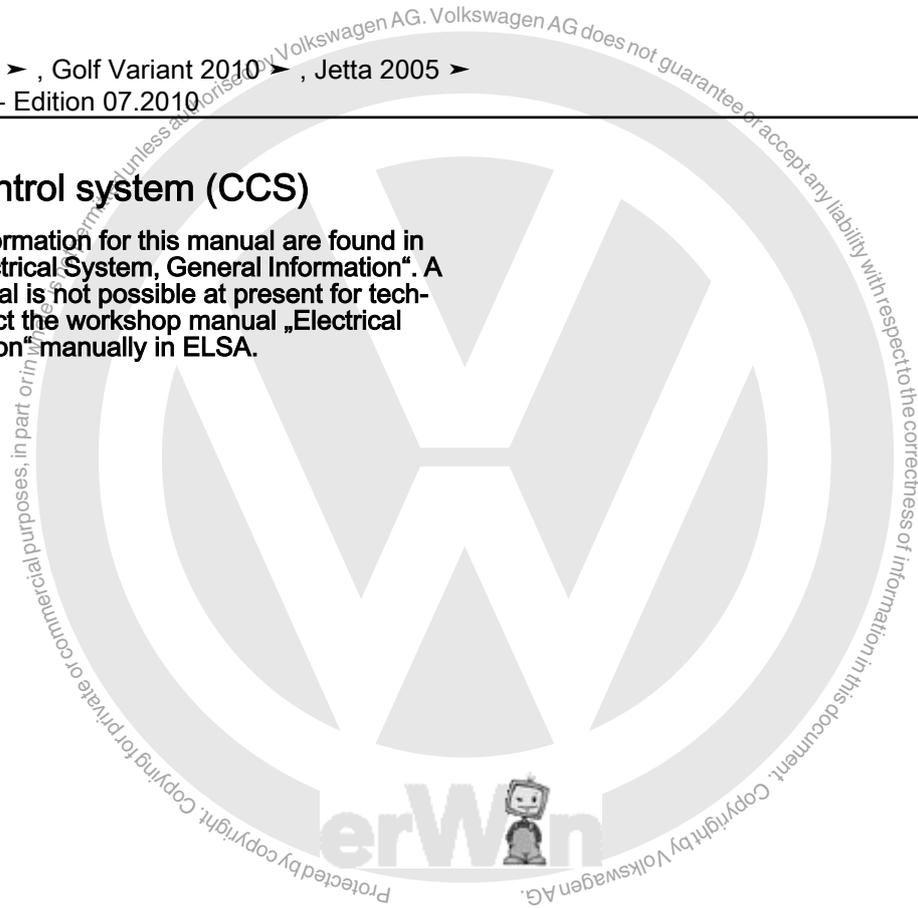
- Push protective cap in guides -arrows- until it can be heard to engage.





8 Cruise control system (CCS)

All the instructions and information for this manual are found in the workshop manual „Electrical System, General Information“. A link to this workshop manual is not possible at present for technical reasons. Please select the workshop manual „Electrical System, General Information“ manually in ELSA.





90 – Gauges, instruments

1 Dash panel insert

General description

The following components are integrated in the dash panel insert:

- ◆ Control unit in dash panel insert -J285-
- ◆ immobiliser control unit -J362-
- ◆ Speedometer -G21-
- ◆ Rev. counter -G5-
- ◆ Fuel gauge -G1-
- ◆ Coolant temperature gauge -G3-
- ◆ Multifunction display
- ◆ Warning lamps ⇒ [page 176](#)

To provide acoustic support to some of the visual displays, the dash panel features a warning buzzer, which is actuated by the control unit in dash panel insert -J285-.

All warning lamps are fitted with light-emitting diodes (LEDs). No provision is made for dash panel insert repair. If necessary, the dash panel insert is renewed as a unit ⇒ [page 173](#).

The data bus diagnostic interface -J533- is an individual control unit and not part of the dash panel insert ⇒ [page 467](#), unlike on several other vehicles.

Fault detection and fault display

The dash panel insert is equipped with self-diagnosis.

For fault finding, use vehicle diagnosis, testing and information system -VAS 5051B- in „Guided fault finding“ mode.

1.1 Renewing dash panel insert

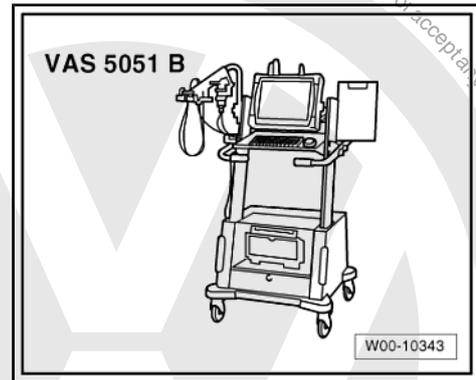
The procedure „Renewing dash panel insert“ covers the following additional tasks:

- ◆ If a new dash panel insert is installed in the vehicle, the control unit in dash panel insert -J285- must be adjusted to the different equipment features and associated country settings.
- ◆ To adapt integrated immobiliser control unit -J362- to engine control unit -J623-, data from engine control unit -J623- must be stored in replacement dash panel insert.
- ◆ Furthermore, if a new dash panel insert is installed, all ignition keys must be adapted.

Special tools and workshop equipment required



- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Carry out following procedures:

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- On vehicle diagnosis, testing and information system -VAS 5051B- select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Dash panel insert
 - ◆ Functions of dash panel insert
 - ◆ Adapting/renewing dash panel insert

1.2 Removing and installing dash panel insert (up to MY2009)



Note

Before removing the dash panel insert, the work procedure „Renewing dash panel insert“ must always be carried out in order that the data stored in the control unit in dash panel insert -J285- can be interrogated => [page 173](#) .



Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

Carry out following procedures:

Removing



Note

There is no need to remove the steering wheel.

- Pull out steering wheel fully and engage steering wheel in lowest position.



- Remove upper part of steering column trim => General body repairs, interior; Rep. gr. 68 .
- Remove bolts -arrows- from dash panel insert.

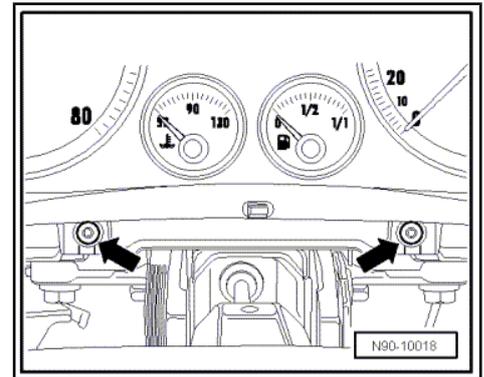
i Note

When pulling out dash panel insert, there is no need to separate the connectors. The connections comprise of one part that is fixed to the vehicle and are thus separated automatically when the dash panel insert is pulled out.

- Pull dash panel insert out of dash panel.

Installing

Installation is carried out in reverse order of removal.



1.3 Removing and installing dash panel insert (from MY2010)

i Note

Before removing the dash panel insert, the work procedure „Renewing dash panel insert“ must always be performed to read out the data stored in the control unit in dash panel insert -J285- => [page 173](#) .

⚠ Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

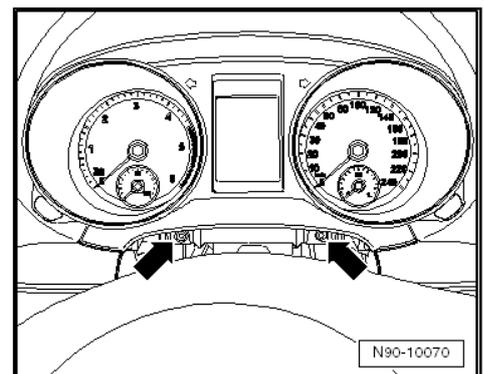
Carry out following procedures:

Removing

i Note

There is no need to remove the steering wheel.

- Pull out steering wheel fully and engage steering wheel in lowest position.
- Remove upper part of steering column trim => General body repairs, interior; Rep. gr. 68 .
- Remove bolts -arrows- from dash panel insert.
- Pull dash panel insert backwards straight out of dash panel, taking connected wiring length into consideration.



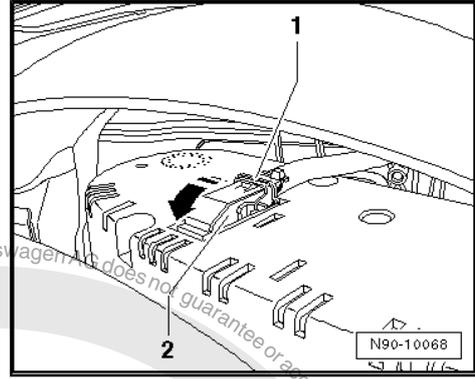


- Release retaining clip -1- in direction of -arrow- and disconnect connector -2-.
- Remove dash panel insert from vehicle.

Installing

Install in the reverse order of removal. When doing this, note the following:

- Tighten bolted connections to 1.5 Nm.



1.4 Back of dash panel insert (up to MY2009)

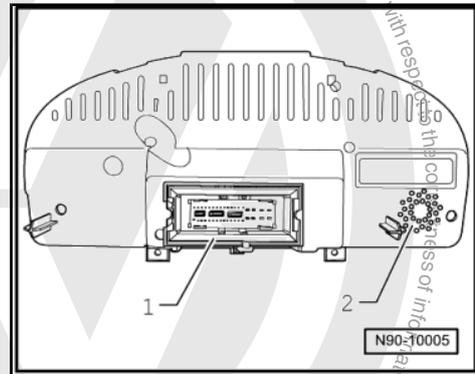


Note

The dash panel insert must not be dismantled. If necessary, the dash panel insert is renewed as a unit.

Back

- 1 - 36-pin connector
- 2 - Warning buzzer



1.5 Back of dash panel insert (from MY2010)

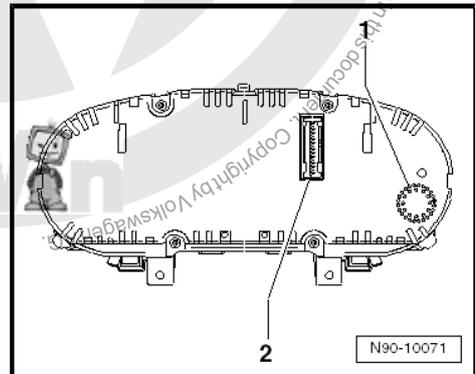
Back



Note

The dash panel insert must not be dismantled. If necessary, the dash panel insert is renewed as a unit.

- 1 - Warning buzzer
- 2 - 32-pin connector



1.6 Pin assignment of connectors at dash panel insert

For pin assignment of connectors on dash panel insert, refer to
⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

1.7 Warning lamp symbols on dash panel insert (up to MY2009)



Note

Different versions of dash panel insert are installed depending on the vehicle equipment level. Therefore, the arrangement of the warning lamps may differ.



1 - Emissions warning lamp - K83-

2 - Fault warning lamp for electric accelerator mechanism - K132-

Only vehicles with petrol engine

3 - immobiliser warning lamp - K115-

4 - Warning lamp for alternator -K2-

5 - Bulb failure warning lamp - K170-

6 - Warning lamp for rear fog light -K13-

7 - Coolant shortage warning lamp -K36-

8 - Brake pad warning lamp - K32-

9 - Washer fluid level warning lamp -K37-

10 - Reserve fuel warning lamp -K16-

11 - Airbag warning lamp -K75-

12 - Seat belt warning system warning lamp -K19-

13 - ABS warning lamp -K47-

14 - ESP and TCS warning lamp -K155-

15 - Brake system warning lamp -K118-

16 - Cruise control system warning lamp -K31-

17 - Warning lamp for daytime running lights -K205-

18 - Tyre pressure monitor warning lamp -K220-

19 - Water in fuel

20 - Rear seat backrest lock warning lamp -K193-

21 - Selector lever lock warning lamp -K169-

only on vehicles with automatic gearbox

22 - Oil level warning lamp -K38-

23 - Bonnet open warning lamp -K171-

24 - Door open warning lamp -K166-

25 - Oil pressure warning lamp -K3-

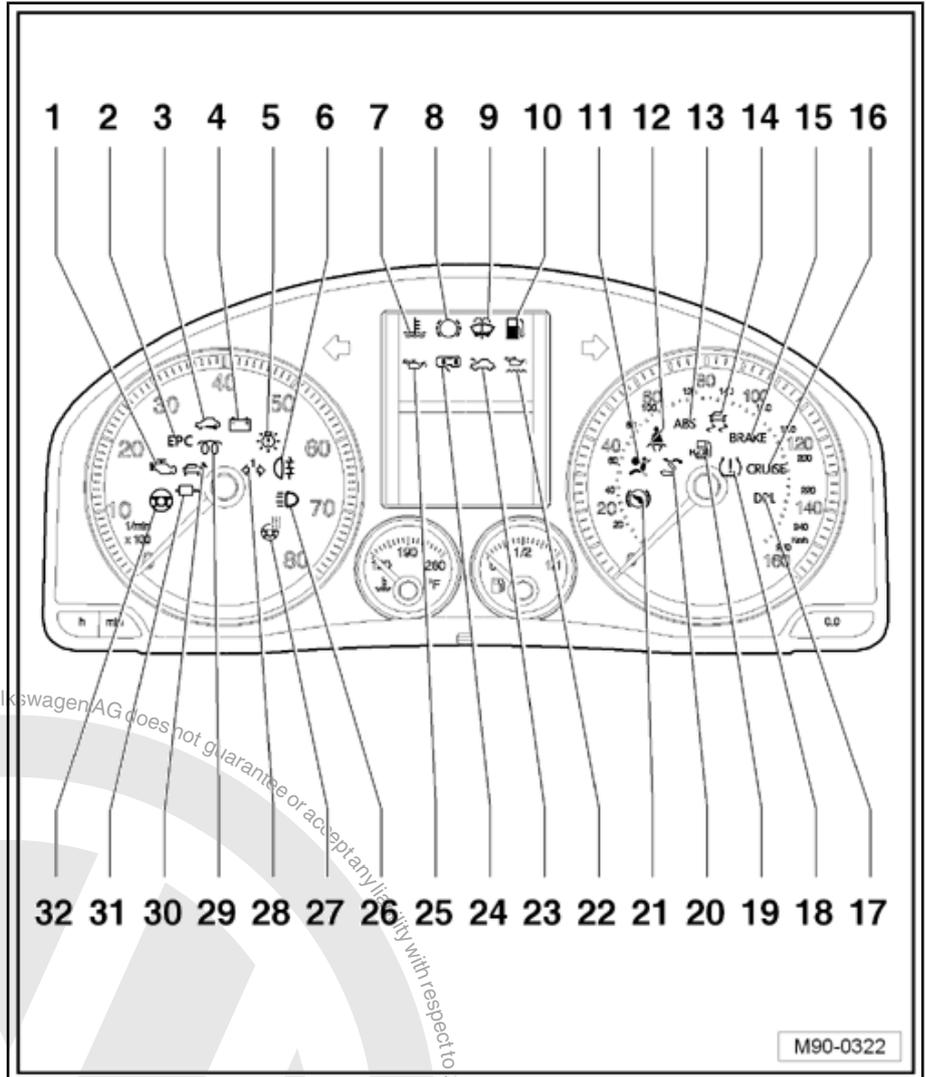
26 - Main beam warning lamp -K1-

27 - Steering wheel heating

28 - Warning lamp for trailer operation -K18-

29 - Glow period warning lamp -K29-

Only vehicles with diesel engine





- 30 - Fuel tank flap lock warning lamp -K201-
- 31 - Warning lamp for diesel particle filter -K231-
- 32 - Electromechanical power steering warning lamp -K161-

1.8 Warning lamp symbols on dash panel insert (from MY2010)



Note

Different versions of dash panel insert are installed depending on vehicle equipment. Therefore, the arrangement of the warning lamps may differ.

1 - Glow period warning lamp -K29-

- Only vehicles with diesel engine

2 - Fault warning lamp for electric accelerator mechanism -K132-

- Only vehicles with petrol engine

3 - Warning lamp for diesel particle filter -K231-

4 - Oil pressure warning lamp -K3-

5 - Bulb failure warning lamp -K170-

6 - Warning lamp for rear fog light -K13-

7 - Washer fluid level warning lamp -K37-

8 - Main beam warning lamp -K1-

9 - Seat belt warning system warning lamp -K19-

10 - ABS warning lamp -K47-

11 - ESP and TCS warning lamp -K155-

12 - Brake system warning lamp -K118-

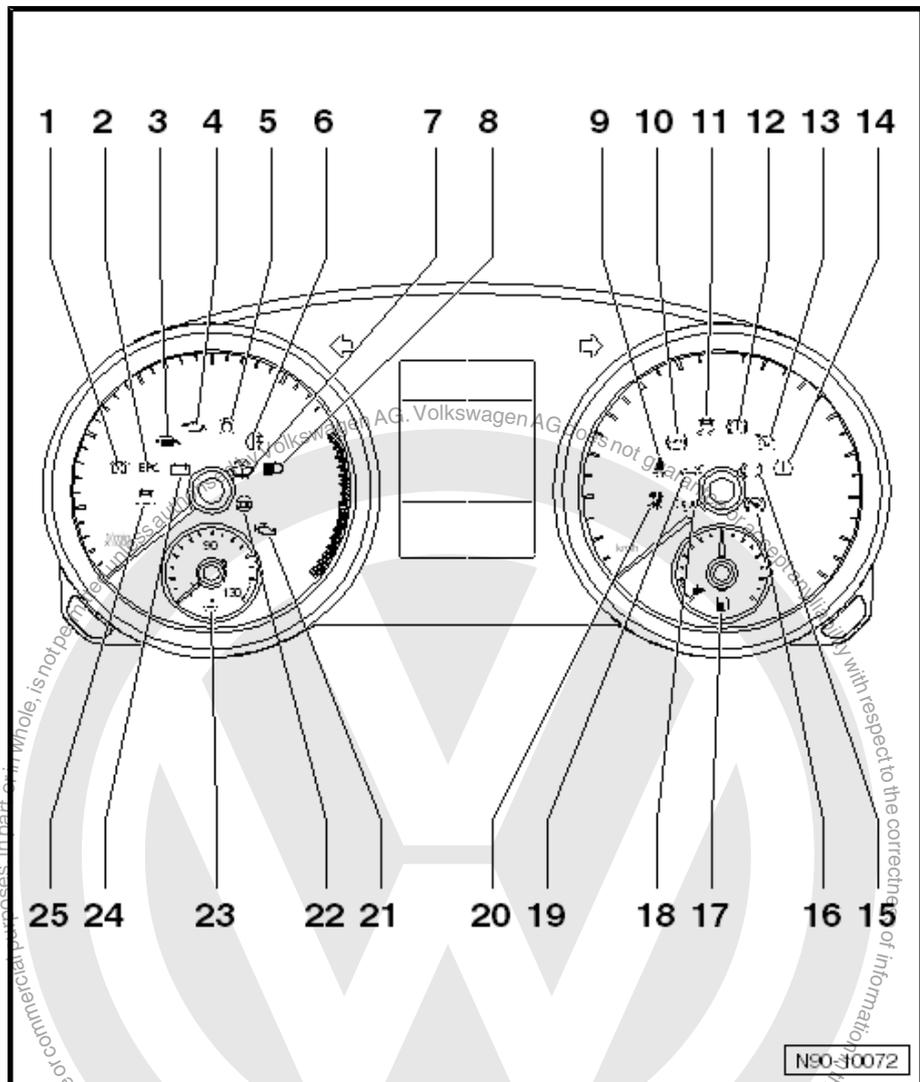
13 - Warning lamp for cruise control system -K31-

14 - Tyre pressure monitor warning lamp -K220-

15 - Brake pad warning lamp -K32-

16 - „Operate foot brake“ warning lamp

- Only vehicles with dual clutch gearbox (DSG)



N90-10072



- 17 - Reserve fuel warning lamp -K16-
- 18 - Door open warning lamp -K166-
- 19 - Rear lid open warning lamp -K127-
- 20 - Airbag warning lamp -K75-
- 21 - Emissions warning lamp -K83-
- 22 - Electromechanical power steering warning lamp -K161-
- 23 - Coolant shortage warning lamp -K36-
- 24 - Warning lamp for alternator -K2-
- 25 - Not assigned

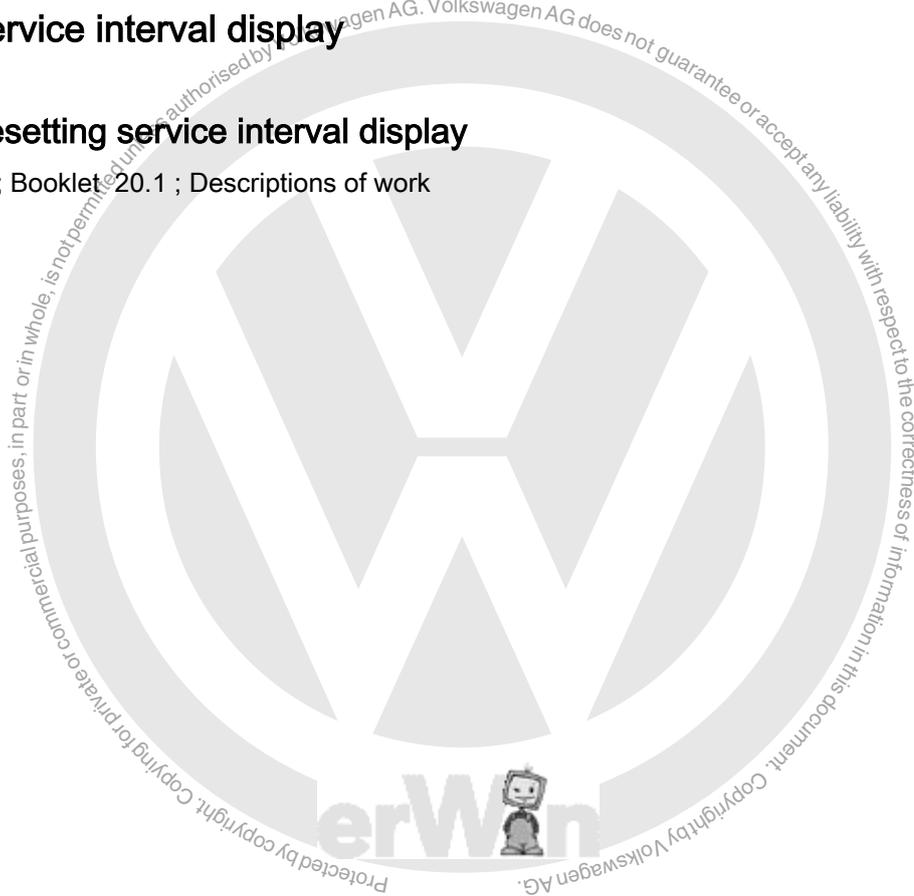




2 Service interval display

2.1 Resetting service interval display

⇒ Maintenance ; Booklet 20.1 ; Descriptions of work





92 – Windscreen wash/wipe system

1 Windscreen wiper system



Caution

When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#) .

General description

The wiper motor control unit -J400- and the windscreen wiper motor -V- are combined to form one unit.

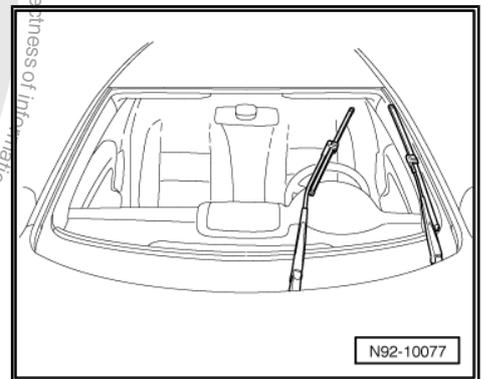
To remove the wiper blades, the wiper arms should be placed in the „service/winter position“. The „service/winter position“ is activated within 10 seconds after ignition is switched off by pressing the windscreen wiper lever in position „tip wipe“ ⇒ Operating manual .

Fault detection and fault display

The on-board supply control unit -J519- is equipped with self-diagnosis.

For fault finding, use vehicle diagnosis, testing and information system -VAS 5051B- in „Guided fault finding“ mode.

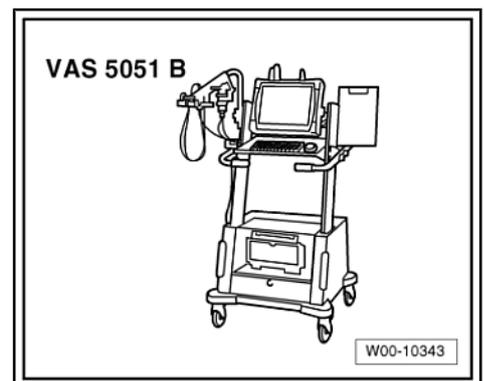
Additional information ⇒ Operating instructions



1.1 Deactivating wiper motor control unit - J400- APP function

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



The windscreen wiper system is equipped with an APP function (alternating park position).

With the APP function, the wiper arm is moved up slightly once it has reached the lowest position. This occurs every second time the wiper system is switched off.

The wiper motor must be set to the bottom park position for attaching the crank to the motor. This is done by deactivating the APP function (coding wiper motor control unit -J400-).



Note

- ◆ *The APP function cannot be activated.*
- ◆ *After 100 cycles of wiper movement, the APP function is activated automatically. This applies to wiper motors on which the APP function has been deactivated and also to new wiper motors.*

Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- On vehicle diagnosis, testing and information system -VAS 5051B- select „Guided fault finding“.
- Using button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Onboard supply control unit
 - ◆ Functions - onboard supply control unit
 - ◆ Coding wiper electronics control unit / deactivating APP function





1.2 Assembly overview - windscreen wiper system

1 - Nut

- 20 Nm

2 - Joint-free wipers

- Removing and installing
⇒ [page 190](#)
- Adjusting park position
⇒ [page 188](#)

3 - Wiper arms

- Removing and installing
⇒ [page 185](#)

4 - Bolt

- 8 Nm

5 - Wiper frame with linkage

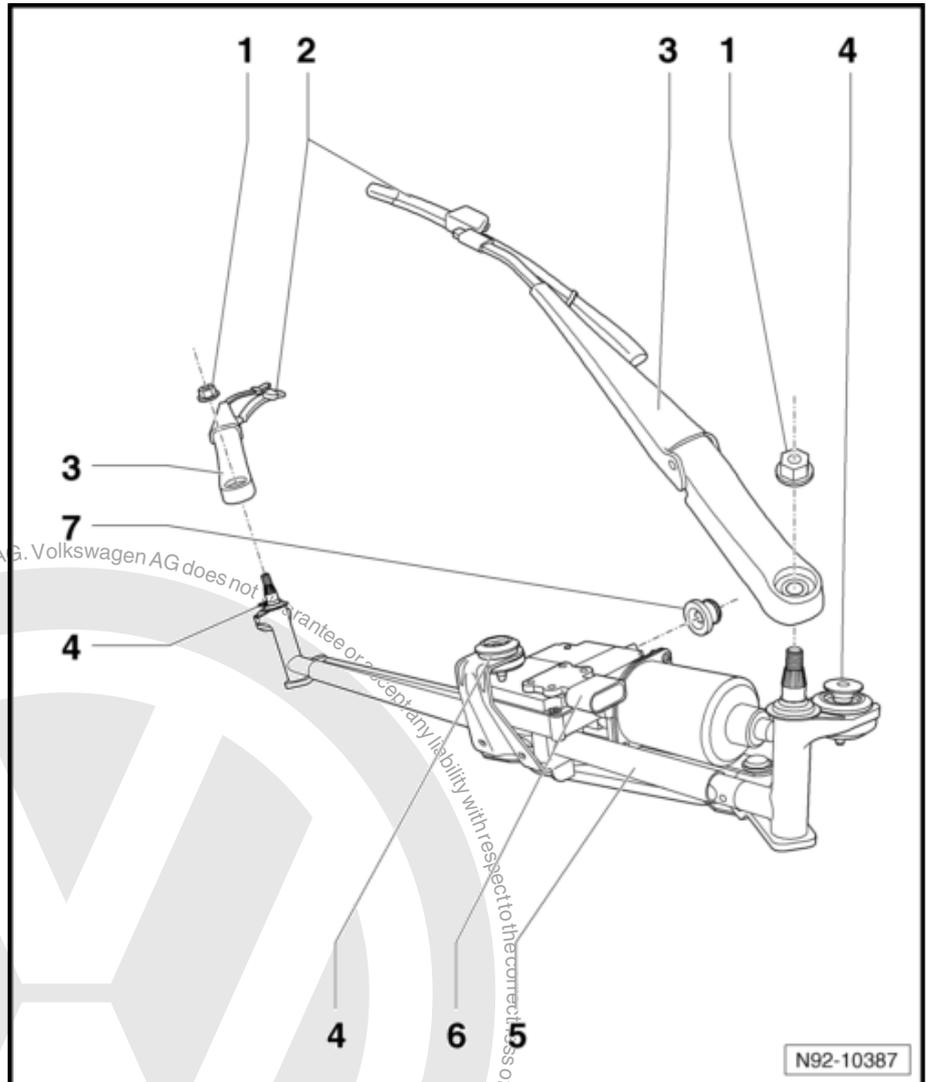
- Removing and installing
⇒ [page 186](#)

6 - Wiper motor -V- with wiper motor control unit -J400-

- Removing from wiper frame and installing
⇒ [page 186](#)
- Coding wiper motor control unit -J400- and deactivating APP function
⇒ [page 181](#)

7 - Rubber grommet in bulkhead

- Observe installation notes ⇒ [page 188](#)



Not illustrated

- ◆ Wiper motor -V- bolts to wiper frame with linkage – 8 Nm
- ◆ Wiper motor crank to wiper motor shaft: 18 Nm

1.3 Removing and installing windscreen wiper system



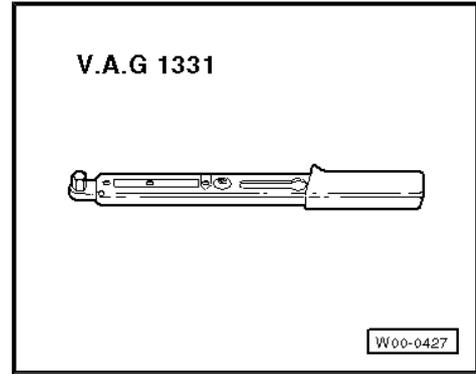
Caution

When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#).

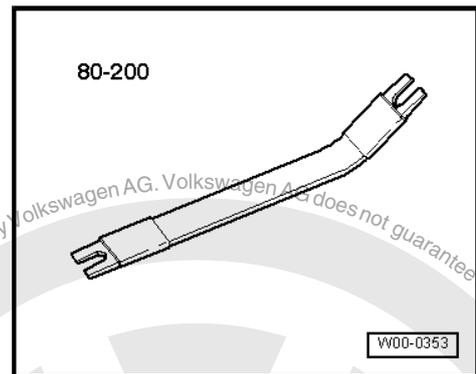
Special tools and workshop equipment required



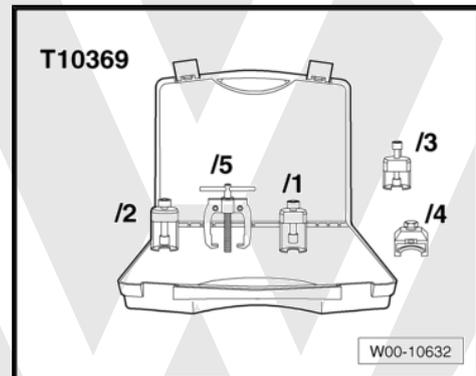
- ◆ Torque wrench -V.A.G 1331-



- ◆ Release lever -80-200-



- ◆ Puller -T10369-



1.3.1 Removing windscreen wiper system

Procedure

- Deactivate APP function ⇒ [page 181](#) .
- Allow wiper to move to park position and then switch ignition off.
- Disconnect battery -A- ⇒ [page 4](#) .



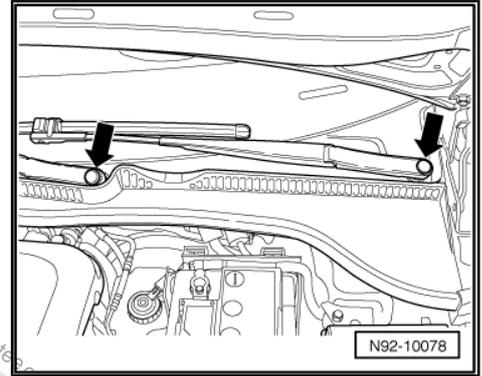
Note

Before the wiper frame with linkage and wiper motor can be removed, first remove the wiper arms, the plenum chamber cover and the air duct trim.



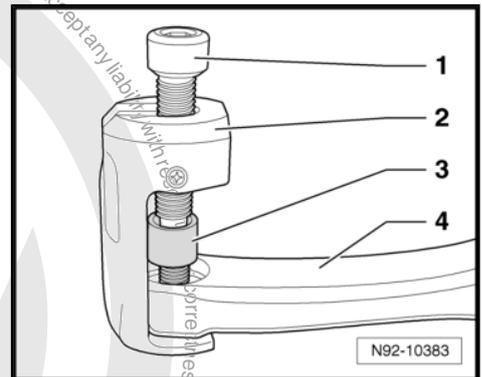
1.3.2 Removing wiper arms

- Lever off the cover caps -arrows- using a suitable screwdriver.
- Remove securing nut -arrows-.



- Slide legs of puller -T10369/1- -2- under wiper arm -4- as shown in the illustration.

 **Caution**
The wiper shaft may be damaged.
Always use the thrust piece -3- to loosen the wiper arm.



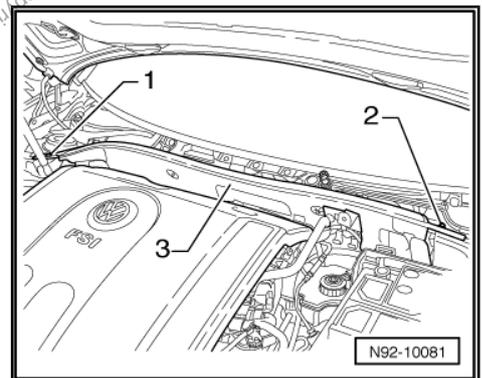
- Turn thrust bolt -1- of puller clockwise until thrust piece -3- comes into contact with wiper shaft. Turn thrust bolt -1- of puller clockwise using an Allen key until wiper arm -4- comes off shaft.
- Remove puller and wiper arm.

1.3.3 Removing plenum chamber cover

Removing and installing plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 64 .

1.3.4 Removing air ducting trim

- Remove bolt -1- and nut -2- from air duct trim -3-.
- Take air duct trim -3- upwards out of vehicle.

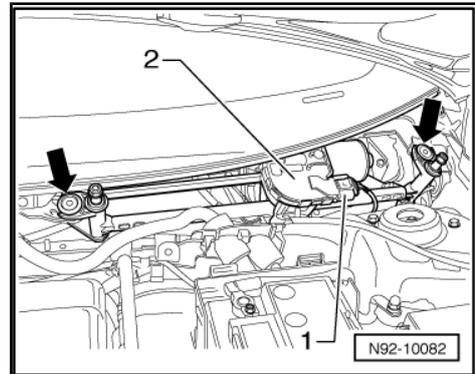




1.3.5 Removing wiper frame with linkage and wiper motor -V-

Procedure

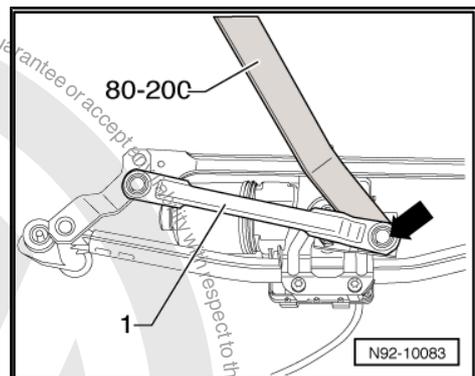
- Disconnect connector -1-.
- Remove bolts -arrows- and pull wiper frame -2- upwards off vehicle.



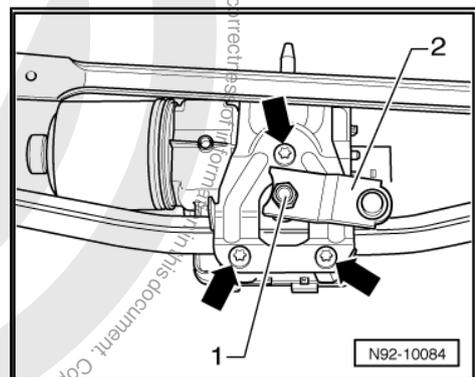
1.3.6 Removing wiper motor -V- from wiper frame

Procedure

- Lever ball end -arrow- of linkage -1- off motor crank using release lever -80-200- .



- Remove nut -1-.
- Pull motor crank -2- off wiper motor shaft.
- Unscrew bolts -arrows- and remove wiper motor -V- together with wiper motor control unit -J400- from wiper frame.

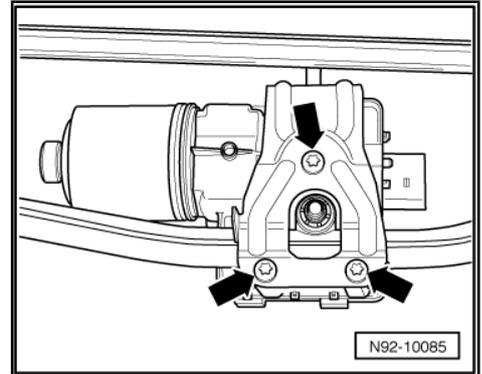




1.3.7 Installing wiper motor -V- in wiper frame

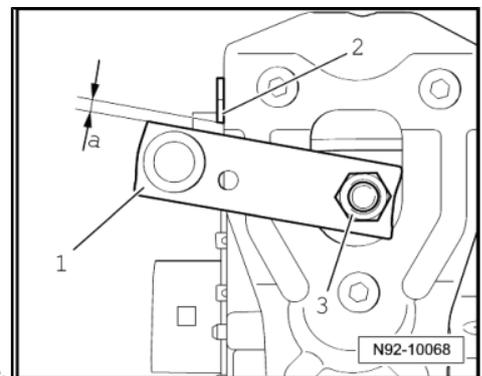
Procedure

- Insert wiper motor -V- with wiper motor control unit -J400- in wiper frame and secure it with bolts -arrows-.
- Tighten threaded connections to specified torques
=> [page 183](#) .
- Place motor crank -1- on shaft of wiper motor -V- .

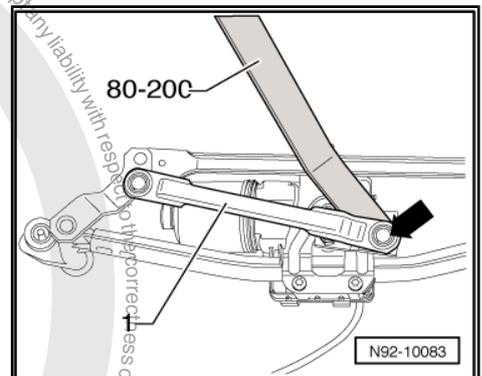


Distance -a- to limit stop -2- should be 3 ± 1 mm.

- Connect motor crank to shaft of wiper motor -V- using nut -3-.
- Tighten threaded connections to specified torques
=> [page 183](#) .



- Press ball head -arrow- of linkage -1- onto motor crank.

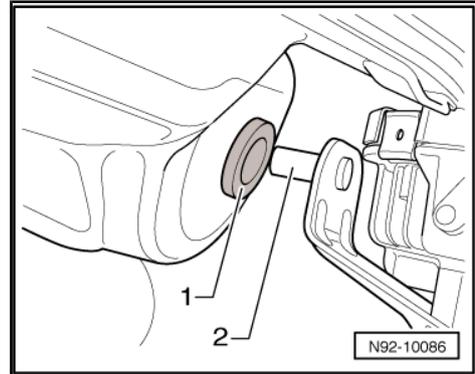




1.3.8 Installing windscreen wiper system

Procedure

- Install wiper frame in reverse order of removal. Note when installing that securing pin -2- of wiper frame must be inserted in grommet -1- in plenum chamber bulkhead.
- Tighten threaded connections to specified torques
⇒ [page 183](#) .
- Fit connector to wiper motor -V- connection and lock in position.
- Install air cowling and plenum chamber cover in reverse order of removal.
- Install the plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 64 .
- Connect battery -A- ⇒ [page 4](#) .
- Install wiper arms ⇒ [page 188](#) .



1.4 Removing and installing wiper arms

Removing

- Removing wiper arms ⇒ [page 185](#)

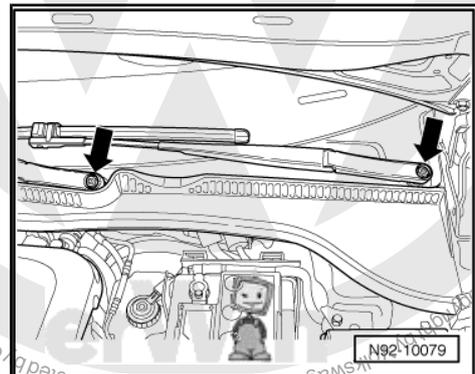
Installing



Note

Nuts of wiper arms are not tightened to specified torque until after wiper blade park position has been adjusted.

- Deactivate APP function ⇒ [page 181](#) .
- To move wiper motor -V- to park position, switch wipers on and off with ignition on.
- Insert wiper arms in approximate park position onto wiper arm shafts and tighten nuts -arrows- by hand.
- Adjust windscreen wiper blade park position ⇒ [page 188](#) .
- Install the cover and the trim.

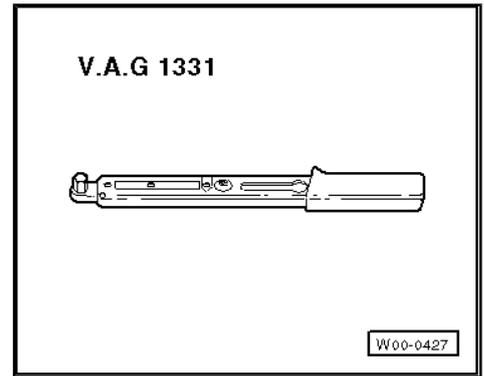


1.5 Adjusting wiper blade park position

Special tools and workshop equipment required



◆ Torque wrench -V.A.G 1331-



Note

On RHD vehicles, the wiper blades are a mirror image of those on LHD vehicles.

Procedure

- Deactivate APP function ⇒ [page 181](#) .
- Allow wiper to move to park position and then switch ignition off.
- Now adjust windscreen wiper blade park position.

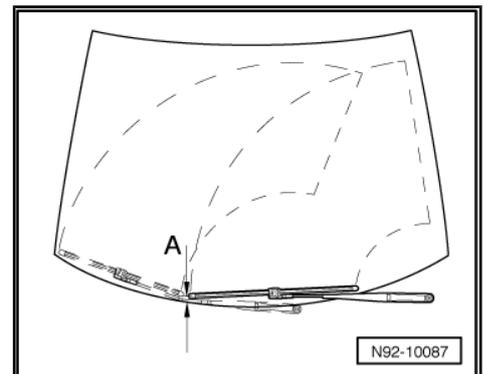
Driver side

Distance -A- between end of wiper blade and upper edge of plenum chamber cover must be 10 mm.

- If necessary, adjust wiper blade park position by moving wiper arm.

Removing wiper arms ⇒ [page 185](#)

- Tighten threaded connection to specified torque ⇒ [page 183](#) .



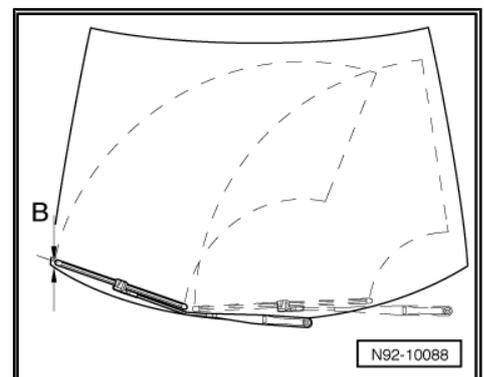
Front passenger side

Distance -B- between end of wiper blade and upper edge of plenum chamber cover must be 10 mm.

- If necessary, adjust wiper blade park position by moving wiper arm.

Removing wiper arms ⇒ [page 185](#)

- Tighten threaded connection to specified torque ⇒ [page 183](#) .





1.6 Removing and installing joint-free wiper blades



Note

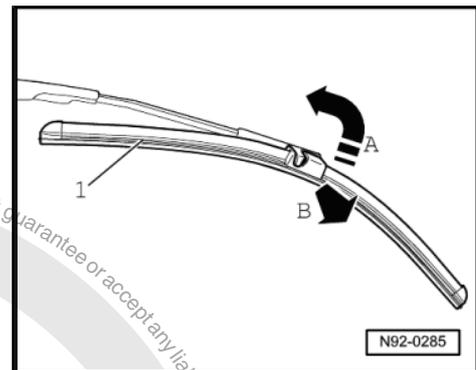
- ◆ *Driver and front passenger wiper blades must not be interchanged during installation.*
- ◆ *Joint-free wiper blades are very flexible. To lift the wiper blades off the windscreen, touch them only in the area in which the wiper blades are attached to the wipers.*
- ◆ *To remove the wiper blades, the wiper arms should be placed in the „service/winter position“. The „service/winter position“ is activated within 10 seconds after ignition is switched off by pressing the windscreen wiper lever in position „tip wipe“.*

Removing

- Place wiper arms in „service/winter position“ by pressing windscreen wiper lever to „flick wipe“ position 10 seconds after ignition has been switched off.
- Lift up wiper arm.
- Turn wiper blade -1- on wiper arm onto stop -arrow A-.
- Pull wiper blade -1- off axis of wiper arm -arrow B-.

Installing

- Slide wiper blade onto axis of wiper arm.
- Turn wiper blade on axis of wiper arm onto stop.
- Carefully fold wiper arm back down onto windscreen.



1.7 Removing and installing rain and light sensor -G397-

If an intact rain and light sensor -G397- has to be removed from its retaining plate on the windscreen (replacement of windscreen), it can be subsequently reinstalled. If the front windscreen is cracked in the area of the rain and light sensor -G397- before removal, the rain and light sensor -G397- cannot be used again.

On removal, store the rain and light sensor -G397- in a dust-free location until reinstallation and ensure the silicone contact pad is not soiled.



Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

Removing

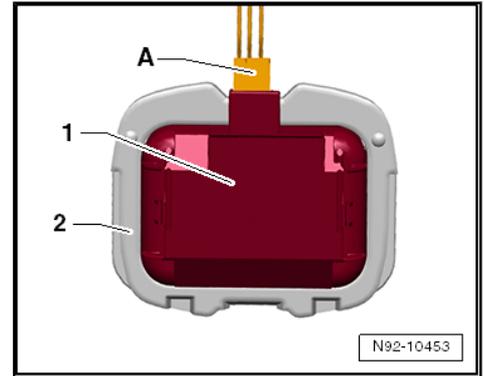
- Remove interior mirror ⇒ General body repairs, interior; Rep. gr. 68 .



- Disconnect connector -A- from rain and light sensor -G397- -1-.

i Note

There is not a recess 3 on all rain and light sensors -G397- . If there is no opening, lever out at another suitable place.



- Using a suitable plain slot screwdriver, lever rain and light sensor -G397- -1- on recess -3- out of retaining plate -2-.

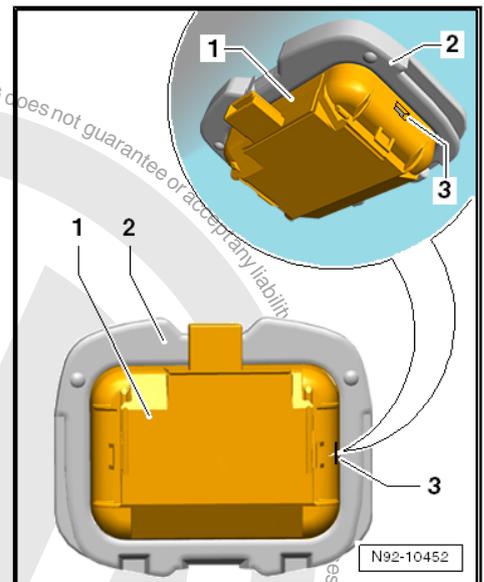
i Note

On removal, take care to prise out the entire rain and light sensor -G397- and not just the upper shell of the rain and light sensor -G397- .

Installing

Carry out installation in the reverse sequence, noting the following:

- Thoroughly clean the windscreen inside the retaining plate with isopropanol (isopropyl alcohol) ⇒ General body repairs, interior; Rep. gr. 68 .
- Remove protective cap on new rain and light detector sensor -G397- .



i Note

- ◆ *The surface (contact pad) of the rain and light sensor -G397- must not be soiled on installation.*
- ◆ *If the surface (coupling pad) of the rain and light sensor -G397- is soiled, it may be possible to clean it by „bonding on“ and then „pulling off“ one or more adhesive strips.*

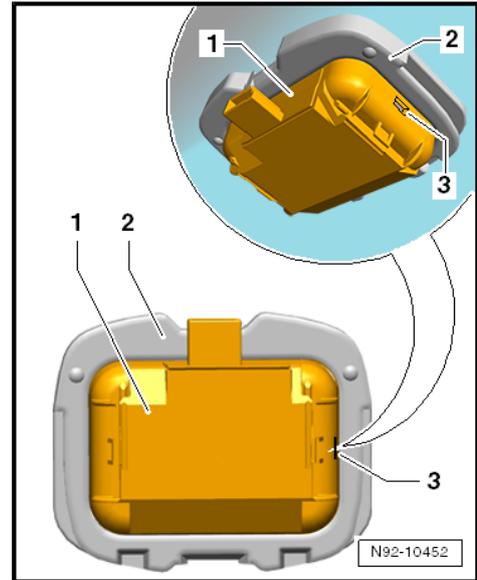


- Seat the rain and light sensor -G397- -1- in the retaining plate -2- on the windscreen and press it on until secure.

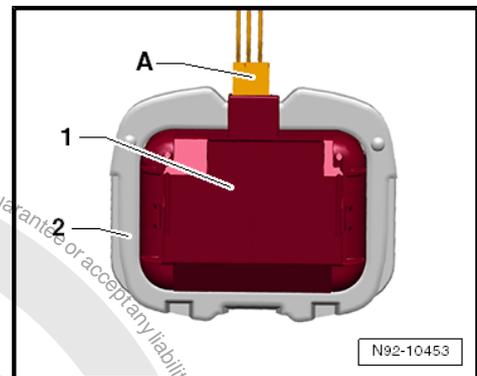


Note

About 10 minutes after installation, there must not be any air bubbles between the front windscreen and the contact pad of the rain and light sensor -G397- .



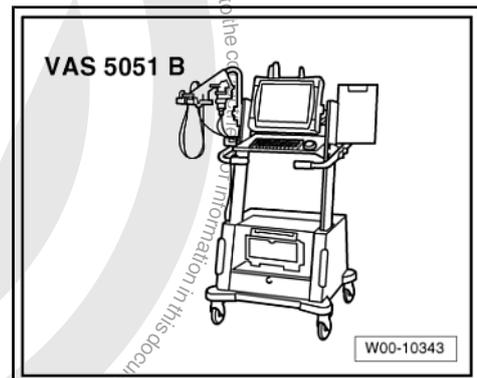
- Reconnect the connector -A- and secure the rain and light sensor -G397- -1- by installing the cable cover.
- Install interior mirror ⇒ General body repairs, interior; Rep. gr. 68 .
- Code the rain and light sensor -G397- ⇒ [page 192](#) .



1.8 Coding rain and light sensor -G397-

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system -VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system



- ◆ 01 - On Board Diagnosis capable systems
- ◆ Onboard supply control unit
- ◆ Functions - onboard supply control unit
- ◆ Coding rain/light sensor





2 Windscreen washer system



Note

Additional information:

⇒ Operating instructions

2.1 Assembly overview - windscreen washer system

1 - Y-piece

- ❑ Distribution of washer fluid line to windscreen washer system spray jets

2 - Right washer jet for windscreen washer system

- ❑ Removing and installing ⇒ [page 199](#)
- ❑ Adjusting ⇒ [page 199](#)

3 - Left washer jet windscreen washer system

- ❑ Removing and installing ⇒ [page 199](#)
- ❑ Adjusting ⇒ [page 199](#)

4 - Angled piece

- ❑ Connection to left windscreen washer system spray jet
- ❑ Overview of hose couplings for washer fluid lines ⇒ [page 212](#)

5 - Hose

- ❑ Hose repair ⇒ [page 213](#)

6 - Angled piece

- ❑ Connection to right windscreen washer system spray jet
- ❑ Overview of hose couplings for washer fluid lines ⇒ [page 213](#)

7 - Reservoir filler neck for windscreen and headlight washer system

- ❑ Removing and installing ⇒ [page 195](#)

8 - Windscreen and rear window washer pump -V59-

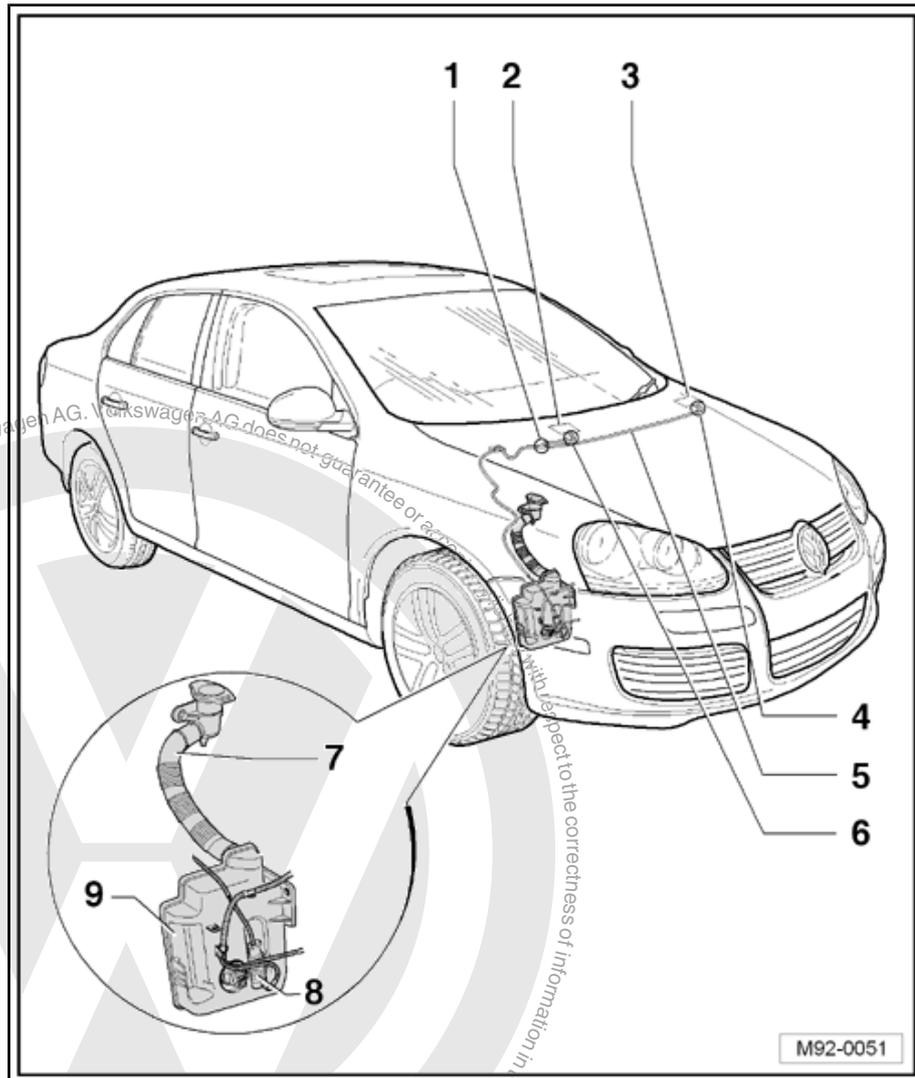
- ❑ Removing and installing ⇒ [page 197](#)

9 - Windscreen washer and headlight washer system reservoir

- ❑ Removing and installing ⇒ [page 196](#)

- Windscreen washer fluid level sender -G33-

- ❑ Removing and installing ⇒ [page 198](#)





Not illustrated

- ◆ Reservoir for windscreen and headlight washer systems to body - 8 Nm

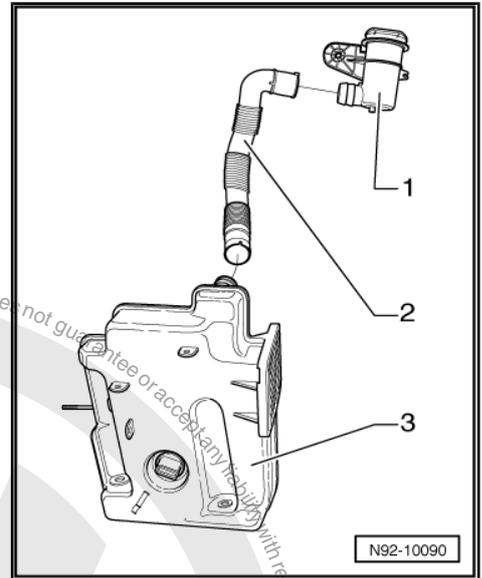
2.2 Removing and installing washer fluid reservoir

Washer fluid reservoir has 3 parts. The individual parts are combined together as a unit. In order to ensure the parts are placed together correctly, check when assembling that the guides of the individual parts engage in each other.

1 - Removing and installing filler neck for washer fluid reservoir ⇒ [page 195](#) .

2 - Connecting pipe between filler neck and reservoir. Connecting pipe is removed together with washer fluid reservoir ⇒ [page 196](#)

3 - Removing and installing washer fluid reservoir ⇒ [page 196](#)



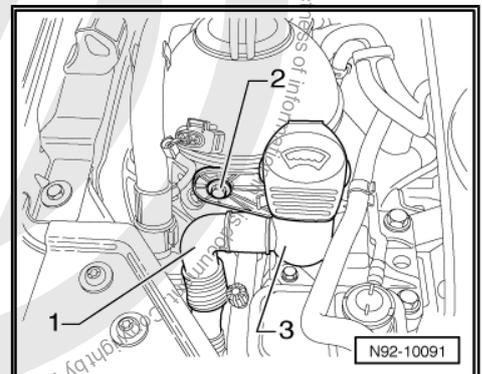
2.2.1 Removing and installing washer fluid reservoir filler neck

Removing

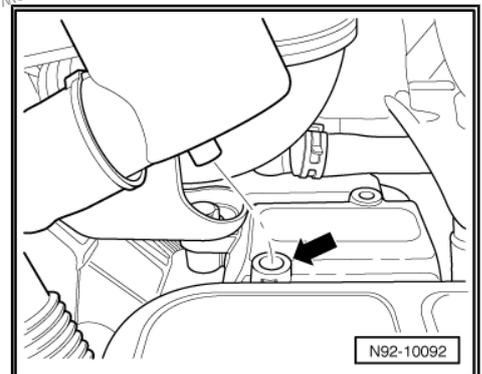
- Pull connecting pipe -1- off filler neck -3- on washer fluid reservoir.
- Remove bolt -2-.
- Unclip hose retainer from filler neck -3- and remove from vehicle.

Installing

Install in the reverse order of removal. When doing this, note the following:

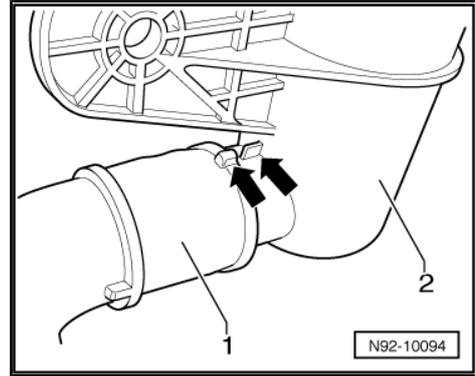


The protrusion on the underside of the filler neck should be inserted in the hole -arrow-.





Connecting pipe -1- and filler neck -2- should be pressed together so that the guides -arrows- engage in each other.



2.2.2 Removing and installing washer fluid reservoir



Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

Removing

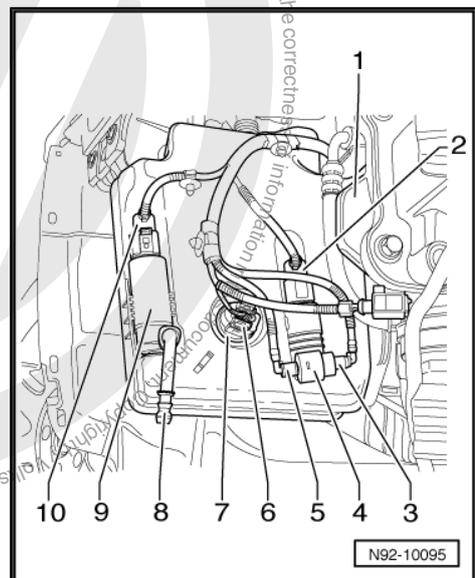
- Remove filler neck for washer fluid reservoir => [page 195](#).
- Remove front bumper cover => General body repairs, exterior; Rep. gr. 63 .



Note

The connections to the windscreen and rear window washer pump -V59- and hose lines are colour-coded in order to prevent the washer fluid lines being incorrectly connected to the windscreen and rear window washer pump -V59-. The hose fittings must be connected to the correct colour-coded pump connections during installation.

- To release, turn securing clips at hose connections -3- and -5- and pull these off windscreen and rear window washer pump -V59- -4-.
- Drain any escaping fluid in a suitable container.
- Disconnect connector -6- for windscreen washer fluid level sender -G33- -7-.
- Pull windscreen and rear window washer pump -V59- -4- upwards out of reservoir and disconnect connector -2-.
- Pull headlight washer pump -V11- -9- upwards out of reservoir and disconnect connector -10-.



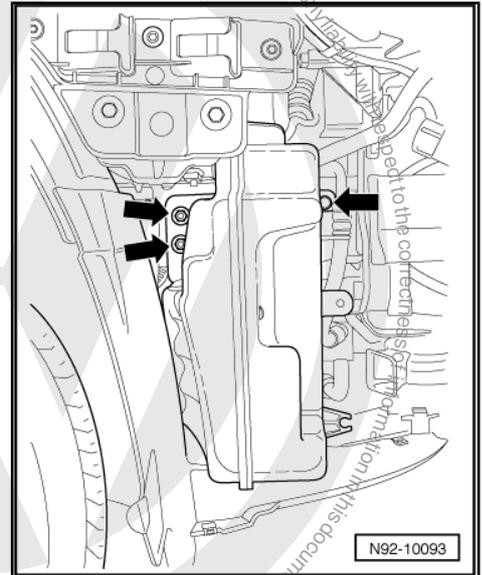


- Unscrew bolts -arrows- from reservoir and remove reservoir from vehicle.

Installing

Install in the reverse order of removal. When doing this, note the following:

- Tighten all threaded connections to specified torques ⇒ [page 194](#) .
- On completion of installation work, bleed headlight washer system ⇒ [page 210](#) .



2.3 Removing and installing windscreen and rear window washer pump -V59-



Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

Removing

- Remove front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 .



Note

The connections to the windscreen and rear window washer pump -V59- and hose lines are colour-coded in order to prevent the washer fluid lines being incorrectly connected to the windscreen and rear window washer pump -V59- . The hose fittings must be connected to the correct colour-coded pump connections during installation.

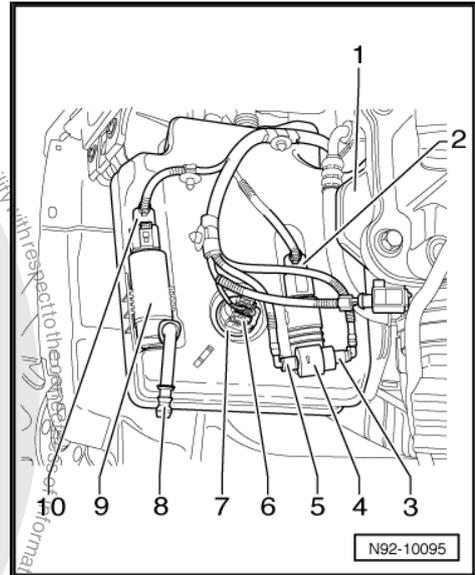


- To release, turn securing clips at hose connections -3- and -5- and pull these off windscreen and rear window washer pump -V59- -4-.
- Drain any escaping fluid in a suitable container.
- Pull windscreen and rear window washer pump -V59- -4- upwards out of reservoir.
- Disconnect connector -2-.

Installing

Install in the reverse order of removal. When doing this, note the following:

- Tighten all threaded connections to specified torques ⇒ [page 194](#) .
- On completion of installation work, bleed headlight washer system ⇒ [page 210](#) .



2.4 Removing and installing windscreen washer fluid level sender -G33-



Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

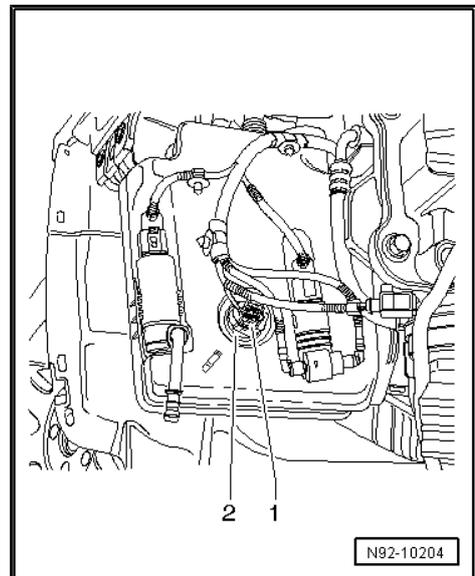
Removing

- Remove front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 .
- Disconnect connector -1- on windscreen washer fluid level sender -G33- -2-.
- Pull windscreen washer fluid level sender -G33- -2- out of its rubber seal.
- Drain any escaping fluid in a suitable container.

Installing

Install in the reverse order of removal. When doing this, note the following:

- On completion of installation work, bleed headlight washer system ⇒ [page 210](#) .

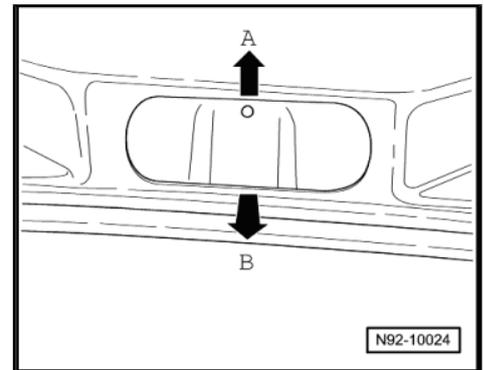




2.5 Removing and installing windscreen washer system spray jets

Removing

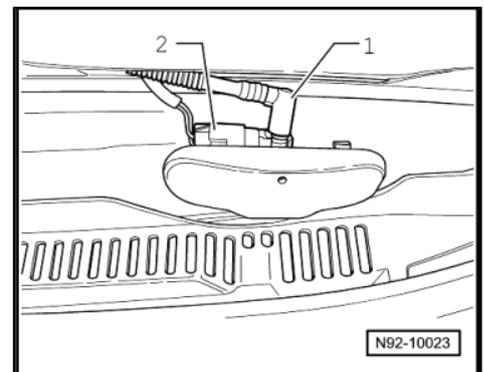
- Push spray jet upwards -arrow A- and pull it out of bonnet from rear -arrow B-.



- Pull hose -1- off spray jet and disconnect connector -2-.

Installing

- Fit connector -2- and hose -1- on spray jet.
- Push spray jet in installation hole until it is heard to lock in place.
- Adjust spray jets ⇒ [page 199](#) .



2.6 Adjusting windscreen washer system spray jets



Note

If impurities in the spray jet cause an uneven spray field, remove the spray jet and flush through with water against the spraying direction. Purging with compressed air against the spraying direction is then permitted. Do not use objects to clean the spray jets!

⇒ Maintenance ; Booklet 20.1 ; Descriptions of work



3 Rear window wiper system



Note

Additional information:

⇒ Operating instructions

3.1 Assembly overview - rear window wiper system

1 - Cover cap

2 - Nut

- 12 Nm

3 - Wiper arm

- Removing and installing ⇒ [page 200](#)
- Adjusting park position ⇒ [page 202](#)

4 - Seal

5 - Spray jet

- Renewing ⇒ [page 206](#)
- Adjusting ⇒ [page 206](#)

6 - Seal

7 - Rear window wiper motor - V12-

- Removing and installing ⇒ [page 201](#)

8 - Nut

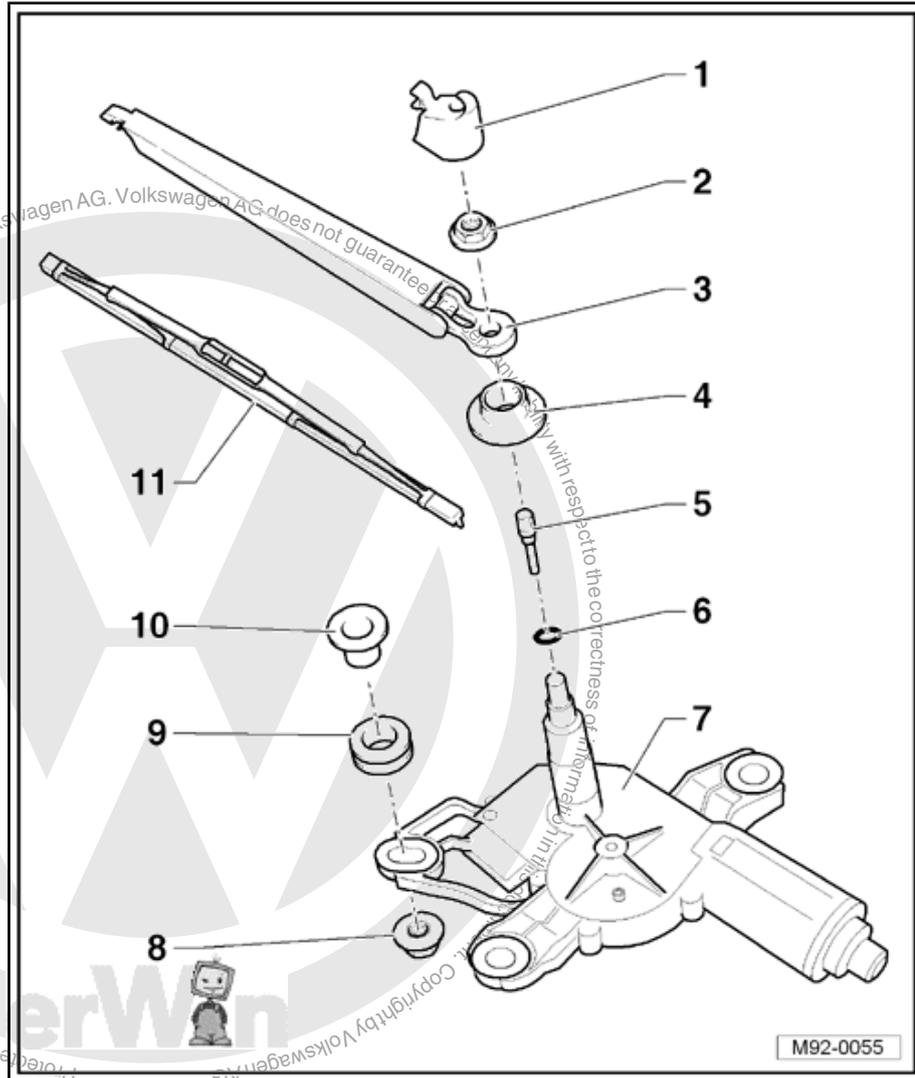
- 8 Nm

9 - Rubber ring

10 - Spacer

11 - Wiper blade

- Removing and installing aerodynamic wipers ⇒ [page 203](#)



3.2 Removing rear window wiper

3.2.1 Removing and installing wiper arm

Removing

- To place wiper motor in its park position, switch rear window wiper on and off with ignition on.
- Lift up and unclip cap -1- of rear window wiper.



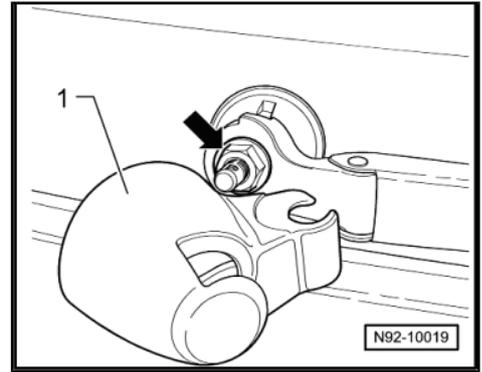
- Loosen hexagon nut -arrow- without removing it completely.



Note

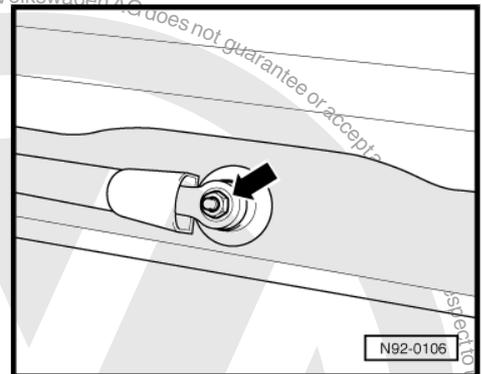
Aerodynamic wipers are very flexible. To lift the wiper blade off the rear window, grasp it only in the area in which the wiper blade is attached to the wiper.

- Lift up wiper arm and free off from taper by rocking from side to side.
- Unscrew nut -arrow- and remove from wiper arm.



Installing

- With ignition switched on, switch rear window wiper on and off to run rear window wiper motor -V12- to its rest position.
- Fit wiper arm in approximate park position on wiper arm shaft and tighten nut -arrow- by hand.
- Adjust rear window wiper park position ⇒ [page 202](#) .



3.2.2 Removing and installing rear window wiper motor -V12-



Caution

When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#) .

Removing

Remove wiper arm before removing rear window wiper motor -V12- ⇒ [page 200](#) .

- Disconnect battery -A- ⇒ [page 4](#) .
- Removing lower trim of rear lid ⇒ General body repairs, interior; Rep. gr. 70 .



- Release and disconnect connector -3-.
- Release hose connection -2- by pulling securing ring upwards and pull hose off connection on rear window wiper motor -V12- -1-.
- Unscrew hexagon nuts -arrows-.
- Carefully pull rear window wiper motor -V12- off rear lid.

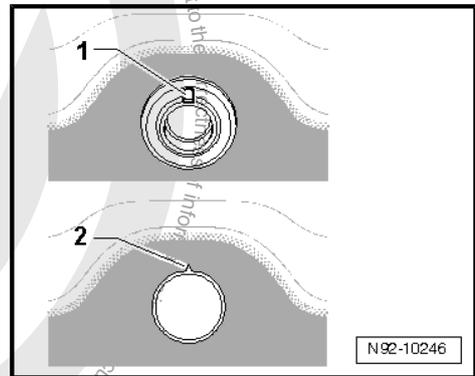
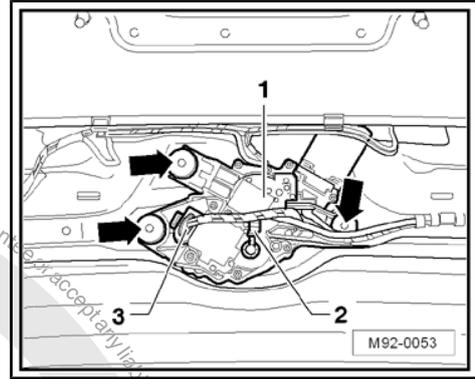
Installing

Install in the reverse order of removal. When doing this, note the following:

- Before installing rear window wiper motor -V12- , moisten inner side of seal in rear window with a rubber and plastic compatible lubricant (polyethylene glycol).
- Check seal is seated correctly in opening of rear window.

Mark -1- on seal must align with mark -2- on rear window.

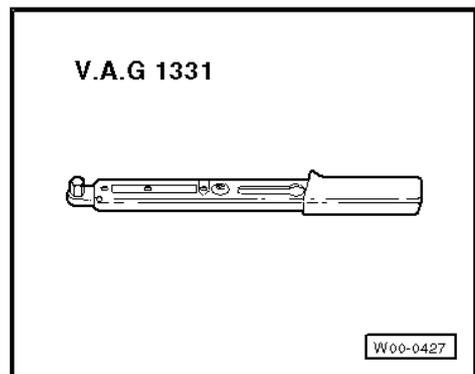
- Connect battery -A- => [page 4](#) .
- Tighten threaded connections to specified torques => [page 200](#) .



3.3 Adjusting rear window wiper park position

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-





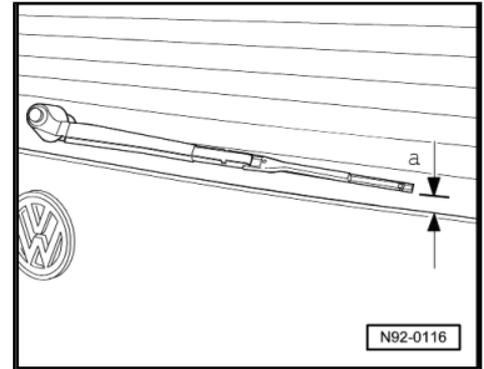
Procedure

Distance -a- between wiper rubber and lower edge of window must be 23 mm.

- If necessary, adjust rear window wiper park position by moving wiper arm on shaft.

Removing wiper arm ⇒ [page 200](#)

- Tighten threaded connections to specified torques ⇒ [page 200](#) .



3.4 Removing and installing joint-free wiper blades

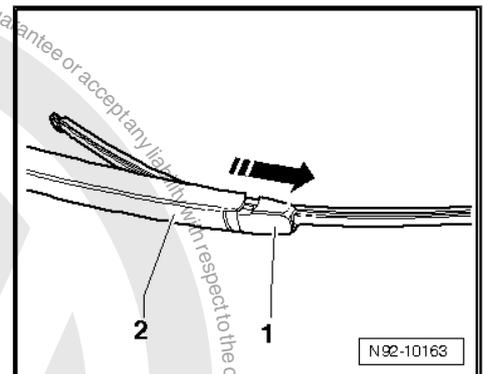


Note

Joint-free wiper blades are very flexible. To lift the wiper blade off the rear window, grasp it only in the area in which the wiper blade is attached to the wiper.

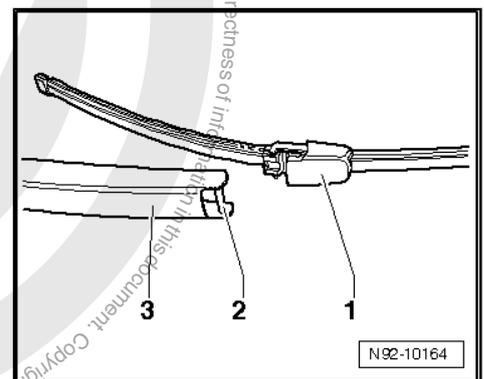
Removing

- Pull wiper arm -2- away from windscreen.
- Pull wiper blade mounting -1- out of wiper arm -2- -arrow-.



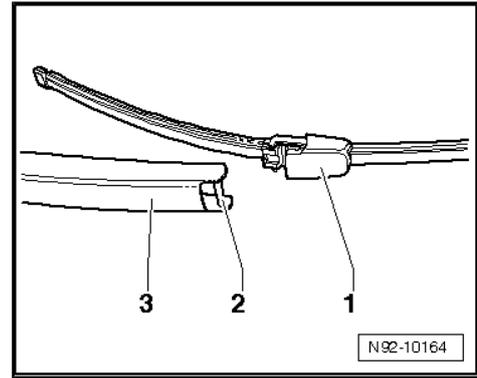
- Remove wiper blade fitting -1- from wiper arm shaft -2-.

Installing





- Fit the wiper blade fitting -1- onto the shaft -2- of the wiper arm -3-.
- Push on the wiper blade fitting until it engages in the wiper arm.
- Carefully fold wiper arm back down onto rear window.





4 Rear window washer system



Note

Additional information:

⇒ Operating instructions

4.1 Assembly overview - rear window washer system

1 - Connection piece

- Connection to rear window washer system spray jet
- Overview of hose couplings for washer fluid lines ⇒ [page 213](#)

2 - Connection piece

- Point of separation, passenger compartment wiring harness to rear lid wiring harness
- Overview of hose couplings for washer fluid lines ⇒ [page 213](#)

3 - Rear window washer system spray jet

- Removing and installing ⇒ [page 206](#)
- Adjusting ⇒ [page 206](#)

4 - Filler pipe of reservoir for windscreen washer and headlight washer systems

- Removing and installing ⇒ [page 195](#)

5 - Windscreen washer and headlight washer system reservoir

- Removing and installing ⇒ [page 195](#)

6 - Windscreen and rear window washer pump -V59-

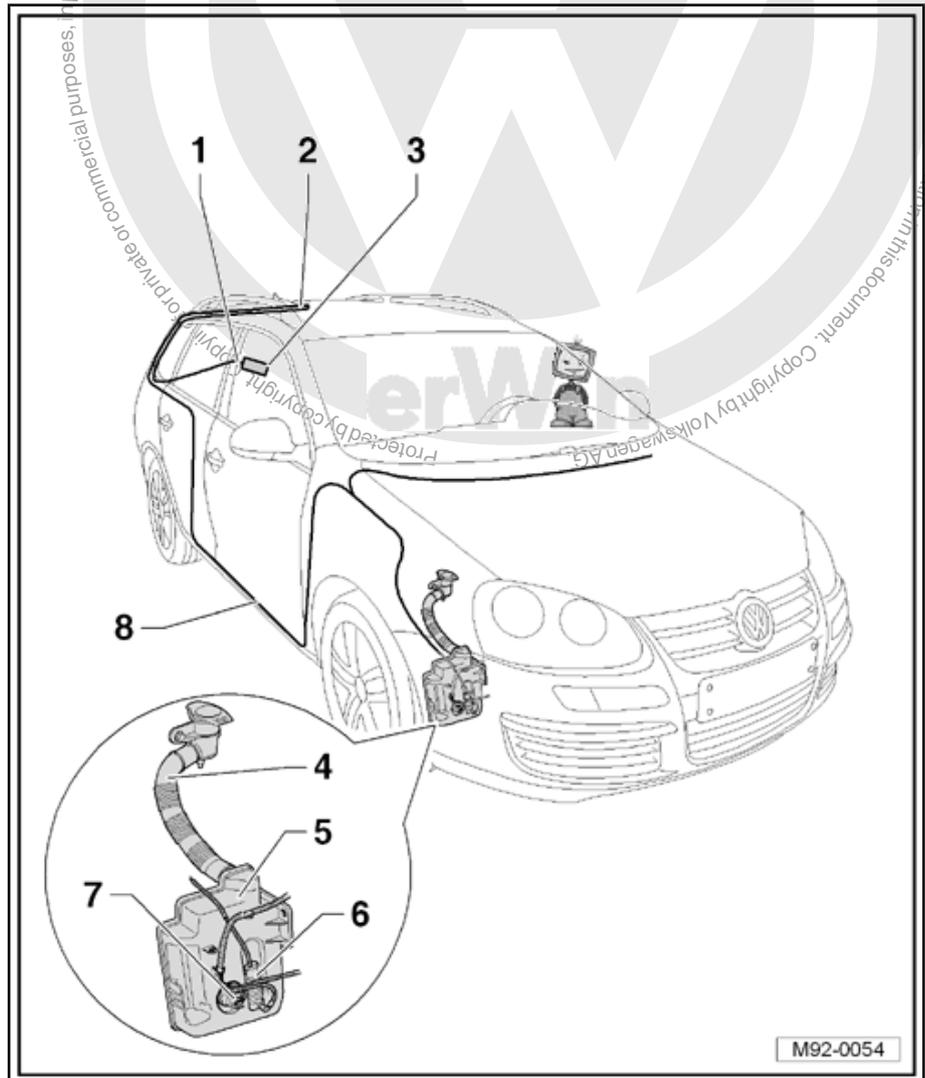
- Removing and installing ⇒ [page 197](#)

7 - Windscreen washer fluid level sender -G33-

- Removing and installing ⇒ [page 198](#)

8 - Hose

- Hose repair ⇒ [page 213](#)





4.2 Removing and installing washer jet



Caution

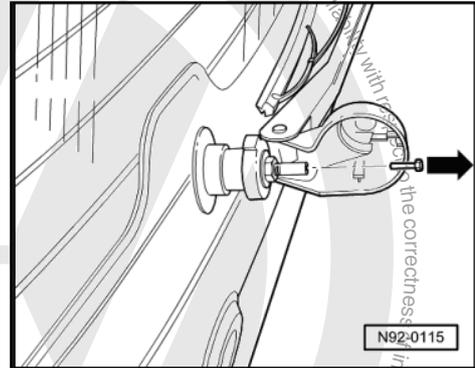
- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

Removing

- Allow wiper to come to park position.
- Lift up cover cap of rear window wiper arm.
- Pull spray jet out of wiper arm shaft using suitable pliers -arrow-.

Installing

- Push spray jet onto stop in wiper arm shaft with spray jet opening facing upwards.
- Adjust spray jet ⇒ [page 206](#) .



4.3 Adjusting spray jet



Note

If impurities in the spray jet cause an uneven spray field, remove the spray jet and flush through with water against the spraying direction. Purging with compressed air against the spraying direction is then permitted. Do not use objects to clean the spray jets!

⇒ Maintenance ; Booklet 20.1 ; Descriptions of work



5 Headlight washer system

Every fifth time the windscreen washer system is activated the headlights are also washed if the windscreen wiper lever on the steering wheel is pulled for at least 1.5 seconds and dipped beam or main beam are switched on.

The spraying time of the headlight washer system can be adjusted from between 0 and 12.75 seconds ⇒ [page 455](#) .

Following installation work or on initial start-up of the headlight washer system, the system must be bled to ensure proper operation of the pop-up cylinders and spray jets ⇒ [page 210](#) .

Fault detection and fault display

The on-board supply control unit -J519- is equipped with self-diagnosis.

For fault finding, use vehicle diagnosis, testing and information system -VAS 5051B- in „Guided fault finding“ mode.

Additional information ⇒ Current flow diagrams, Electrical fault finding and Fitting locations ⇒ Operating manual .

5.1 Assembly overview - headlight washer system

1 - Spray jet assembly with right spray jets

- Removing and installing spray jet assembly ⇒ [page 209](#)
- Adjusting spray jets ⇒ [page 210](#)
- Removing and installing spray jet pop-up cylinder ⇒ [page 209](#)

2 - Spray jet assembly with left spray jets

- Removing and installing spray jet assembly ⇒ [page 209](#)
- Adjusting spray jets ⇒ [page 210](#)
- Removing and installing spray jet pop-up cylinder ⇒ [page 209](#)

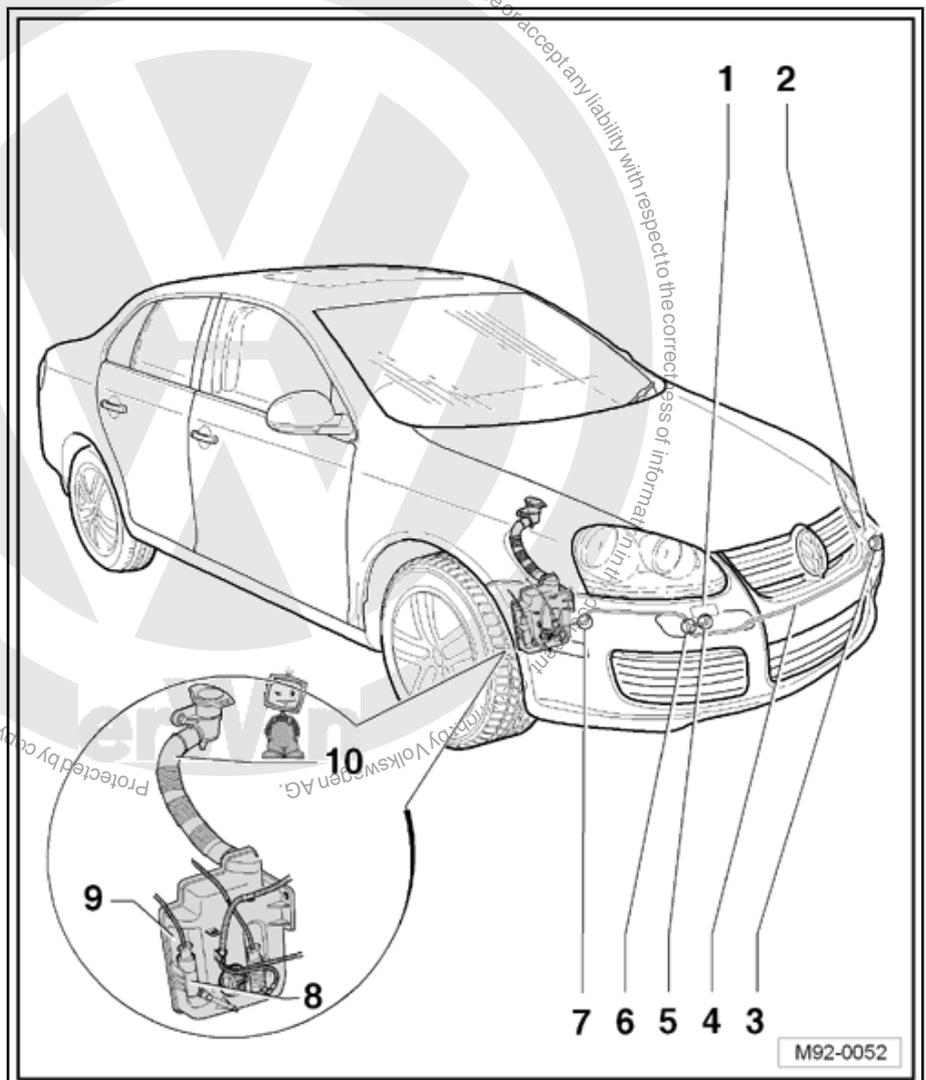
3 - Angled connection piece

- Connection to left spray jet pop-up cylinder
- Overview of hose couplings for washer fluid lines ⇒ [page 213](#)

4 - Hose

5 - Angled connection piece

- Connection to right spray jet pop-up cylinder
- Distribution of washer fluid line to washer jets
- Overview of hose couplings for washer fluid lines ⇒ [page 213](#)





6 - T-piece

- ❑ Distribution of washer fluid line to washer jets

7 - Angled piece

8 - Headlight washer system pump -V11-

- ❑ Removing and installing ⇒ [page 208](#)

9 - Windscreen washer and headlight washer system reservoir

- ❑ Removing and installing ⇒ [page 195](#)

10 - Filler pipe of reservoir for windscreen washer and headlight washer systems

- ❑ Removing and installing ⇒ [page 195](#)

Not illustrated

Pop-up spray jet cylinder to front bumper cover - 4.5 Nm

5.2 Removing and installing headlight washer system pump -V11-

The headlight washer system pump -V11- is mounted on the washer fluid reservoir in the right-hand wheel housing.



Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

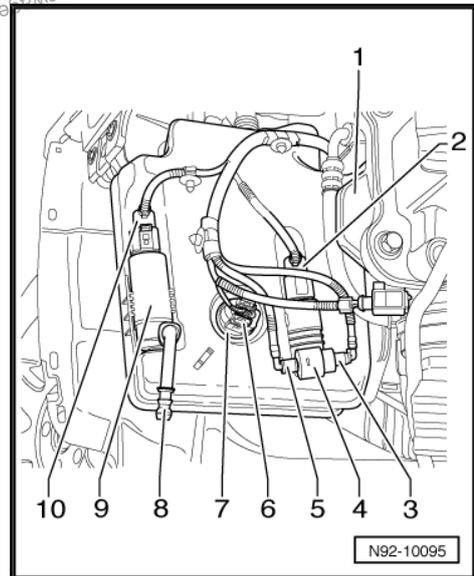
Removing

- Remove front bumper cover ⇒ General body repairs, exterior Rep. gr. 63 .
- Pull headlight washer pump -V11- -9- upwards out of reservoir.
- Disconnect connector -10-.
- To remove the connecting pipe -8-, pull out securing clip and pull connecting pipe -8- off headlight washer system pump -V11- .

Installing

Install in the reverse order of removal. When doing this, note the following:

- Tighten all threaded connections to specified torques ⇒ [page 207](#) .
- On completion of installation work, bleed headlight washer system ⇒ [page 210](#) .





5.3 Removing and installing spray jet pop-up cylinders

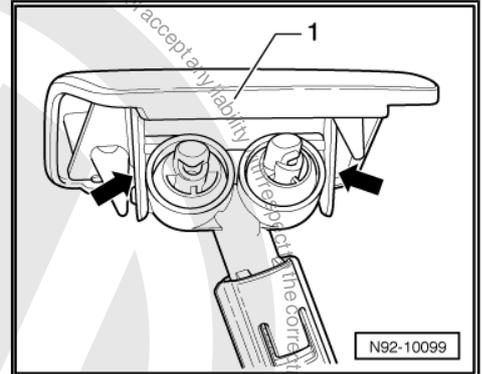


Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

Removing

- Pull spray jets together with cover cap -1- out of bumper cover to stop.
- Unclip cover cap -1- from mounting points -arrows- on spray jet assembly.
- Remove front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 .

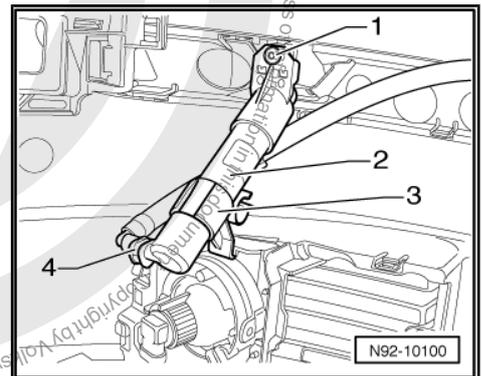


- Pull retainer -4- off hose connection.
- Pull hose connection off pop-up spray jet cylinder -2-.
- Remove bolt -1-.
- Unclip pop-up spray jet cylinder -2- out of bracket -3-

Installing

Install in the reverse order of removal. When doing this, note the following:

- The hose leading to the pop-up spray jet cylinder must be clipped into the hose retainer.
- Tighten all threaded connections to specified torques ⇒ [page 207](#) .
- On completion of installation work, bleed headlight washer system ⇒ [page 210](#) .



5.4 Removing and installing spray jet assembly



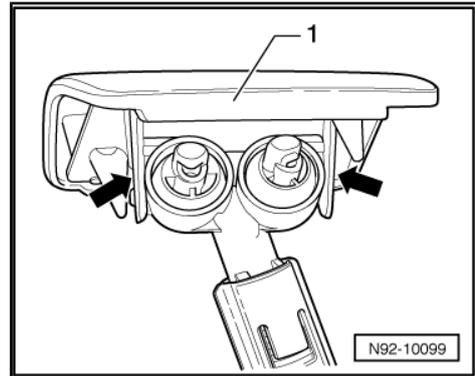
Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**



Removing

- Pull spray jet with cover cap -1- to stop out of bumper cover.
- Unclip cover cap -1- from mounting points -arrows- on spray jet assembly.



- Lever locking lug -arrow- up slightly and pull out spray jet assembly.

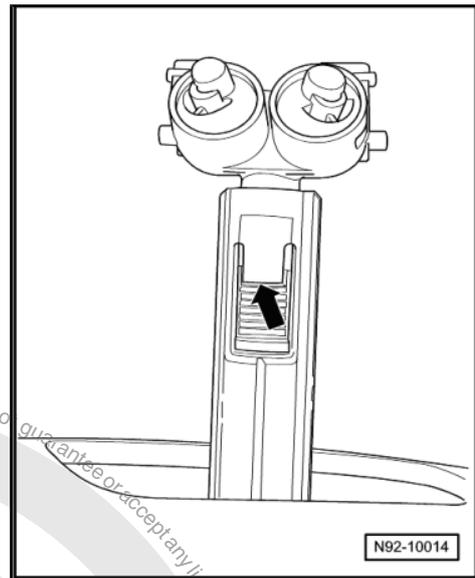
Installing



Note

The degree to which the cover cap of the spray jet is pulled down onto the bumper cover can be adjusted using the clips on the spray jet assembly. If the spray jet assembly is not pulled in far enough, the cover cap will not seat correctly. If the spray jet assembly is pulled in too far, the cover cap and the bumper cover could be pushed out of shape.

- Push spray jet assembly into pop-up cylinder until it engages.
- Fit cover cap on spray jet assembly and allow pop-up cylinder to retract.
- Check the cover cap is seated correctly on the bumper cover.
- If necessary, adjust seat of cover cap by pushing spray jet assembly in higher or lower position on pop-up cylinder.
- On completion of installation work, bleed headlight washer system => [page 210](#) .
- Check headlight washer system spray jets and adjust if necessary => [page 210](#) .



5.5 Adjusting headlight washer system spray jets

=> Maintenance ; Booklet 20.1 ; Descriptions of work

5.6 Bleeding headlight washer system

To guarantee sound functioning of pop-up cylinders and spray jets, the headlight washer system must be bled following assembly work or when operated for the first time.



WARNING

Apply handbrake and make sure that gearshift is set to "P".

Procedure

- Fill washer fluid reservoir.
- Start the engine.



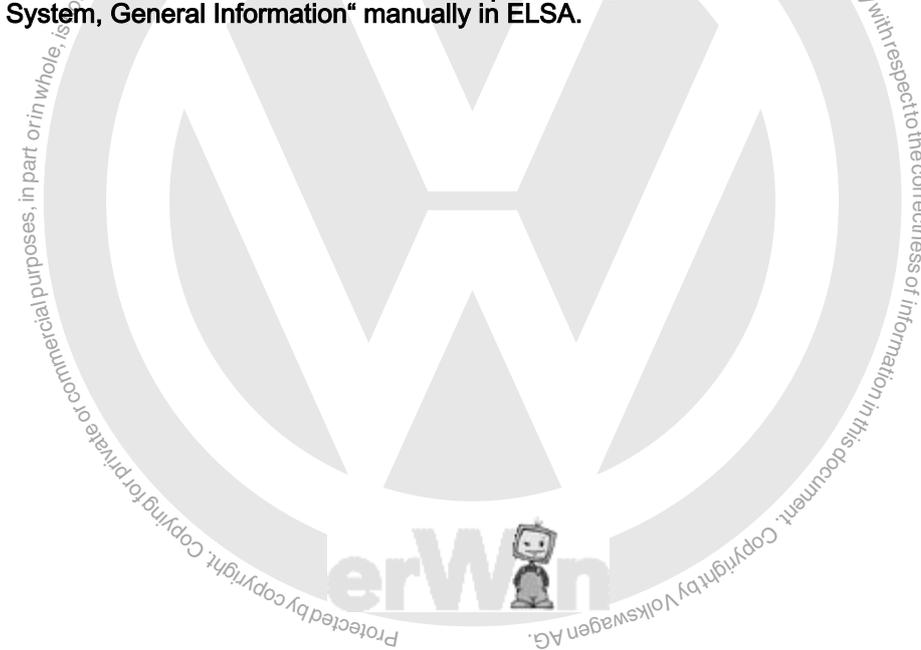
- Switch headlights to „ON“.
- Operate headlight washer system several times (3-5 times, 3 seconds each time).
- Repeat this bleeding procedure until the pop-up cylinders and spray jets are functioning soundly.





6 Washer fluid line hose couplings

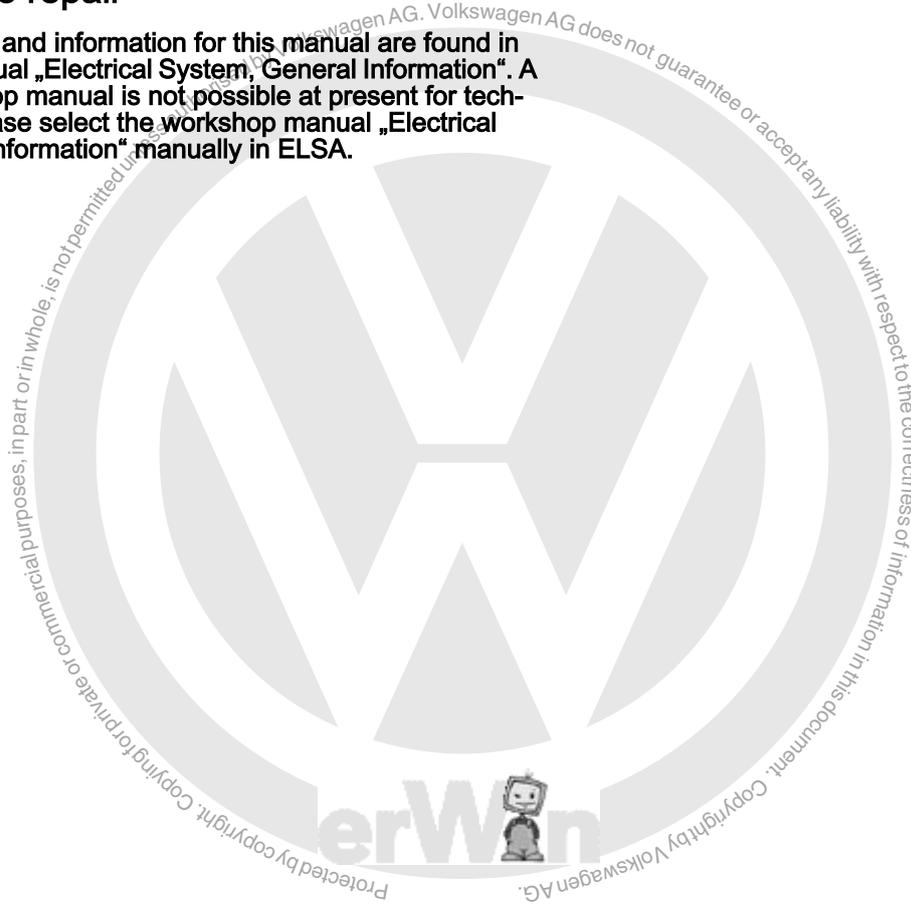
All the instructions and information for this manual are found in the workshop manual „Electrical System, General Information“. A link to this workshop manual is not possible at present for technical reasons. Please select the workshop manual „Electrical System, General Information“ manually in ELSA.





7 Hose repair

All the instructions and information for this manual are found in the workshop manual „Electrical System, General Information“. A link to this workshop manual is not possible at present for technical reasons. Please select the workshop manual „Electrical System, General Information“ manually in ELSA.





94 – Lights, bulbs, switches - exterior

1 Headlights with halogen bulbs (up to MY2009)



Note

- ◆ *Before working on headlights, always switch off the headlights and remove the ignition key.*
- ◆ *When dealing with complaints, it is absolutely necessary to understand the functions and the operation of the lighting system ⇒ Operating instructions .*

The vehicle is fitted with headlights from two different manufacturers:

- ◆ AL (Automotive Lighting)
- ◆ Hella

Removal and installation of the headlights are the same except for removal and installation of the control motors.

Fault detection and fault display

The on-board supply control unit -J519- is equipped with self-diagnosis.

For fault finding, use vehicle diagnosis, testing and information system -VAS 5051B- in "Guided fault finding" mode.

1.1 Assembly overview



Note

The exploded view does not show the control motors, as removal and installation differ from each other.



1 - Bolt

- 4 Nm

2 - Adjustment bushes

- Adjusting headlight installation position
⇒ [page 217](#)

3 - Left headlight main beam bulb -M30- / right headlight main beam bulb -M32-

- Bulb: H7U 12 V/55 W
- Renewing ⇒ [page 220](#)

4 - Left side light bulb -M1- / right side light bulb -M3-

- Bulb: 12 V/5 W
- Renewing ⇒ [page 222](#)

5 - Cover cap

6 - Front left turn signal bulb -M5- / front right turn signal bulb -M7-

- Bulb: 12 V/21 W
- Renewing ⇒ [page 223](#)

7 - Bulb holder with grip

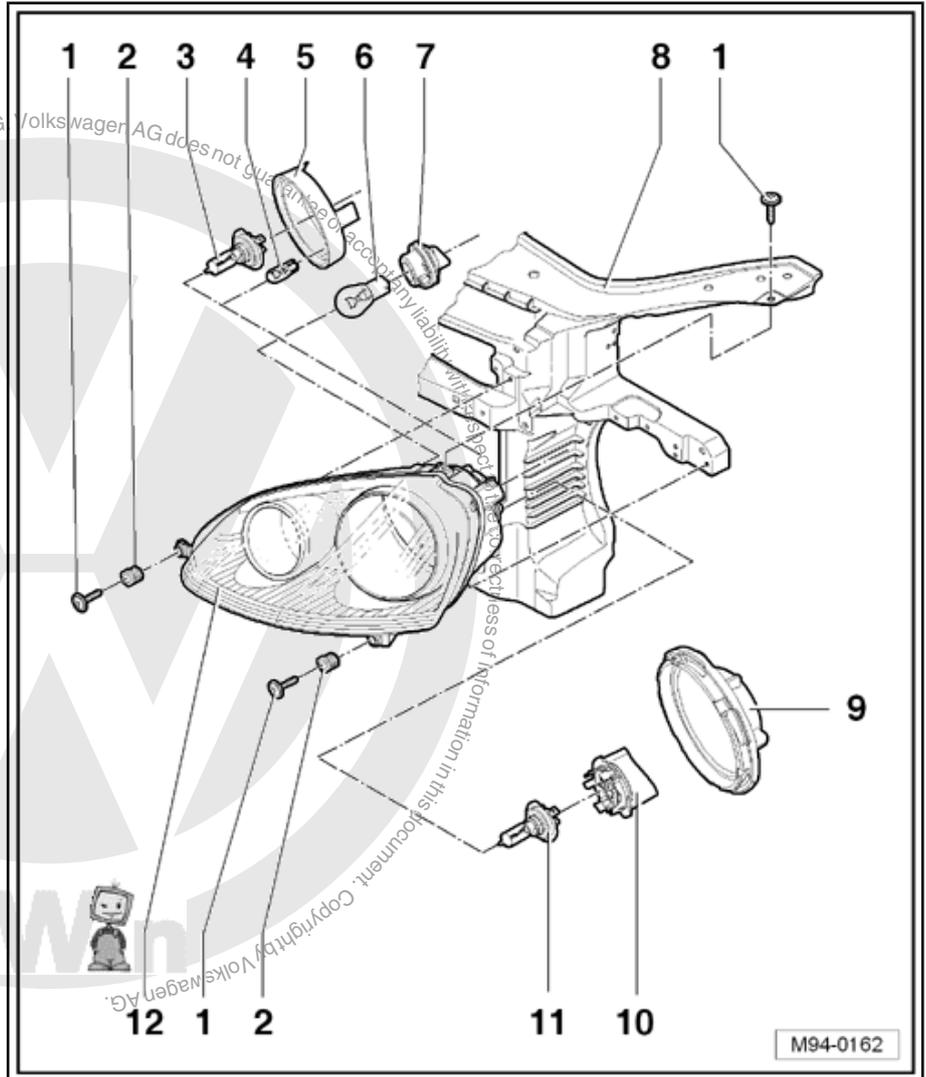
8 - Body aperture

9 - Cover cap

10 - Bulb holder with grip

11 - Left headlight dipped beam bulb -M29- / right headlight dipped beam bulb -M31-

- Bulb: H7 12 V/55 W
- Renewing ⇒ [page 218](#)



12 - Headlight

- Removing and installing ⇒ [page 215](#)
- Adjusting headlight installation position ⇒ [page 217](#)
- Repairing headlight securing tabs ⇒ [page 231](#)

1.2 Removing and installing headlight



Note

- ◆ You do not have to disconnect the earth wire of the battery - A- .
- ◆ The illustrations show removal and installation for the left headlight.
- ◆ If a headlight is removed, it should always be adjusted following installation ⇒ Maintenance ; Booklet 20.1 ; Description of work .
- ◆ If a headlight with gas discharge bulbs is removed, the basic setting of the headlight should always be checked when reinstalling ⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .

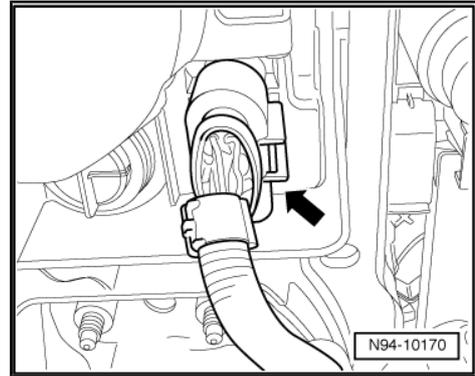


Caution

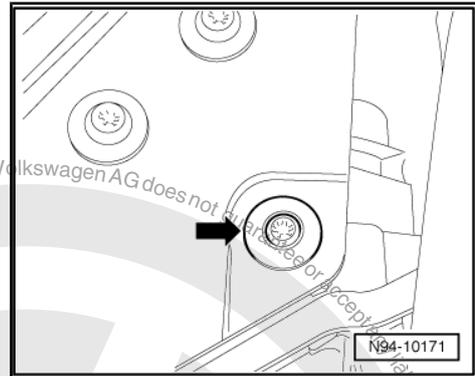
- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

Removing

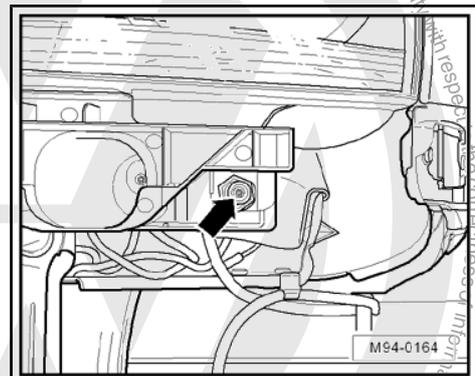
- Unclip the connector -arrow- and detach it.
- Remove front bumper ⇒ General body repairs, exterior; Rep. gr. 63 .



- Remove bolt -arrow- from top of headlight.



- Remove bolt -arrow- from bottom left of headlight.





- Remove bolt -arrow- from bottom right of headlight.

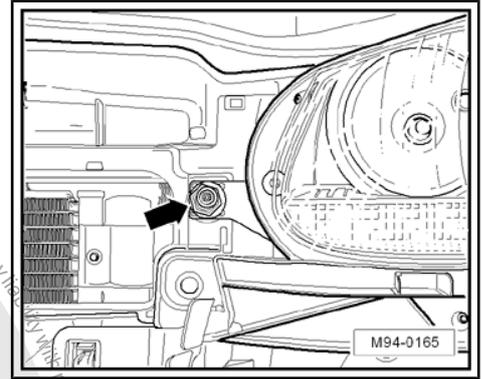
Installing

Carry out installation in the reverse sequence, noting the following:

- Tighten all threaded connections to specified torques
⇒ [page 214](#) .
- Check headlight installation position is central, i.e. shut lines/gaps are equal around headlight.

If the shut lines/gaps around the headlight are uneven, the installation position must be adjusted ⇒ [page 217](#) .

- Check headlight functions.
- Check headlight settings and adjust headlights if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .



1.3 Adjusting headlight installation position



Note

- ◆ *To adjust the installation position of the headlight, the front bumper does not have to be removed.*
- ◆ *The illustrations show the left headlight.*

If it transpires during checking of the installation position that the shut lines/gaps between headlight and body are uneven, the installation position must be adjusted.

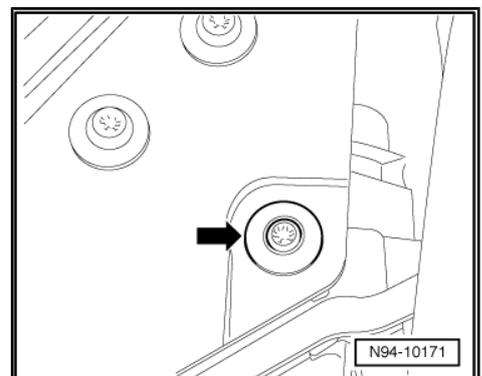


Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

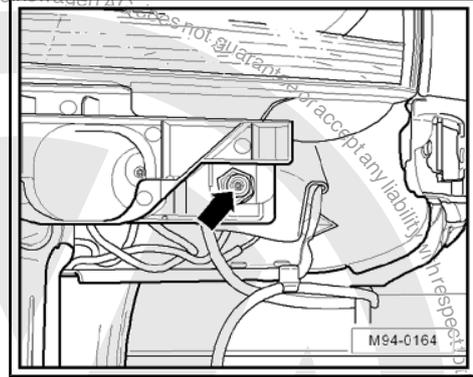
Procedure

- Remove the radiator grille ⇒ General body repairs, exterior; Rep. gr. 66 .
- Loosen screw -arrow- at top of headlight.

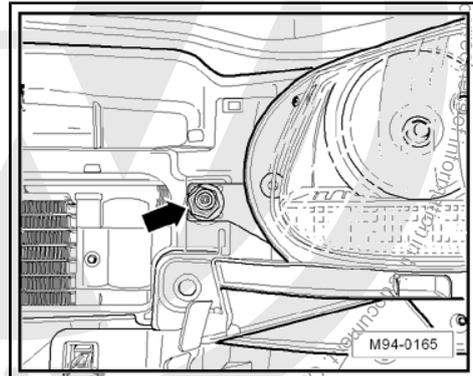




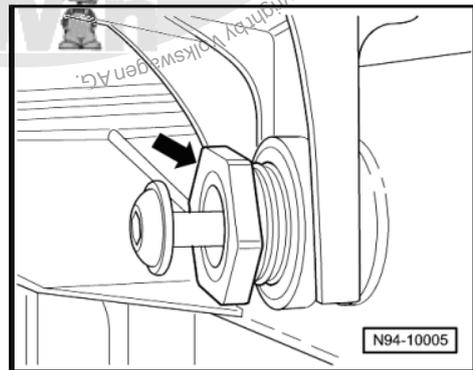
- Loosen screw -arrow- at bottom left of headlight.



- Loosen screw -arrow- at bottom right of headlight.



- Adjust flush fit with body by screwing in or screwing out adjustment bushing -arrow- at bottom left and bottom right of headlight.
- Tighten all threaded connections to specified torques
⇒ [page 214](#) .
- Check and readjust headlight to ensure gaps are even all round.
- Install the radiator grille ⇒ General body repairs, exterior; Rep. gr. 66 .
- Check headlight functions.
- Check headlight settings and adjust headlights if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .



1.4 Renewing bulbs

1.4.1 Renewing headlight dipped beam bulb



Note

The diagrams show renewal of the left headlight dipped beam bulb -M29- for the left headlight.



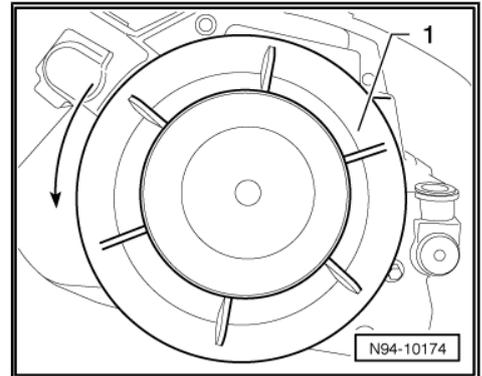
Caution

- ◆ Switch off ignition and all electrical consumers.
- ◆ Remove the ignition key.

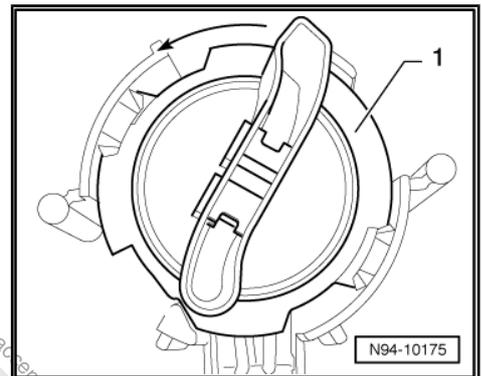


Removing

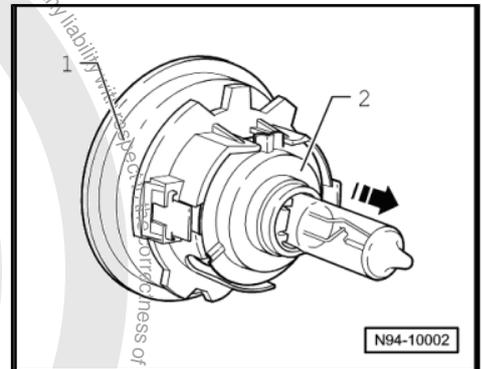
- Turn cover cap -1- in -direction of arrow- and remove.



- Turn bulb holder with dipped beam headlight bulb -M29- -1- in -direction of arrow- and remove from headlight.



- Pull left headlight dipped beam bulb -M29- -2- in -direction of arrow- out of bulb holder -1-.

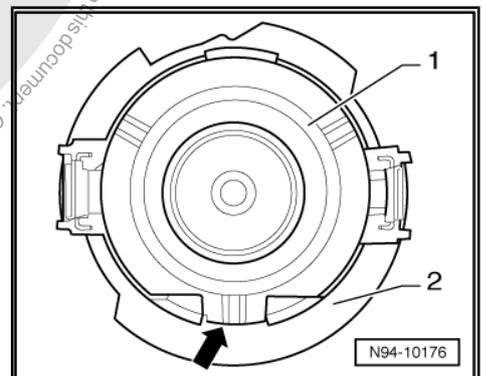


Installing

Caution

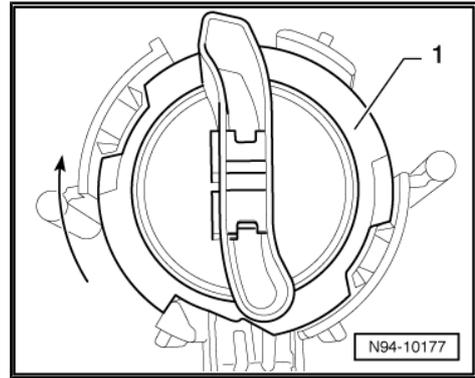
- ◆ *Do not touch glass envelope when fitting bulb. Fingers leave traces of grease on the glass envelope, which evaporate when the bulb is switched on and cause the glass envelope to cloud over.*
- ◆ *When installing cover cap, ensure that it seats properly. The ingress of water will lead to permanent damage to the headlight.*

- Insert left headlight dipped beam bulb -M29- -1- in bulb holder so that lug at left headlight dipped beam bulb -M29- is positioned in recess -arrow- of bulb holder -2-.

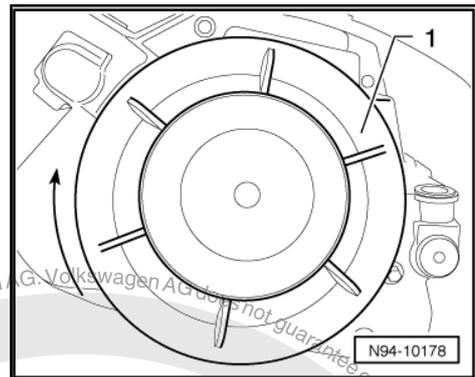




- Place bulb holder with left headlight dipped beam bulb -M29-
-1- in headlight and turn bulb holder with left headlight dipped
beam bulb -M29- in -direction of arrow-.



- Insert cover cap -1- in recess on headlight and turn cover cap
in direction of -arrow- to secure.
- Check headlight functions.
- Check headlight settings and adjust headlights if necessary
=> Maintenance ; Booklet 20.1 ; Descriptions of work .



1.4.2 Renewing headlight main beam bulb



Note

The diagrams show renewal of the left headlight main beam bulb
-M30- for the left headlight.

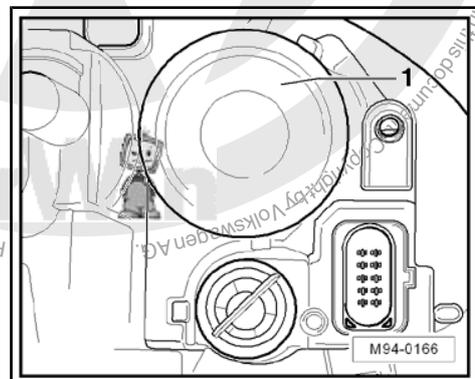


Caution

- ◆ Switch off ignition and all electrical consumers.
- ◆ Remove the ignition key.

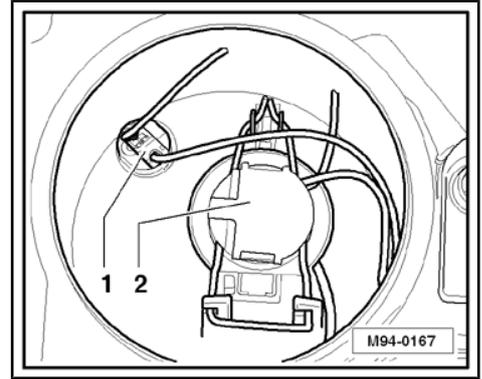
Removing

- Remove cover cap -1-.

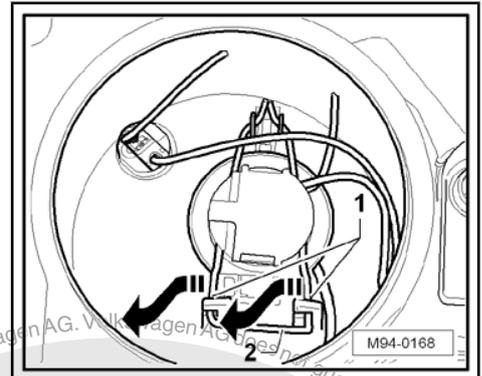




- Disconnect connector -2-.



- Push retaining clip -2- in -direction of arrow- under locking lugs -1- and lift up retaining clip -2-.

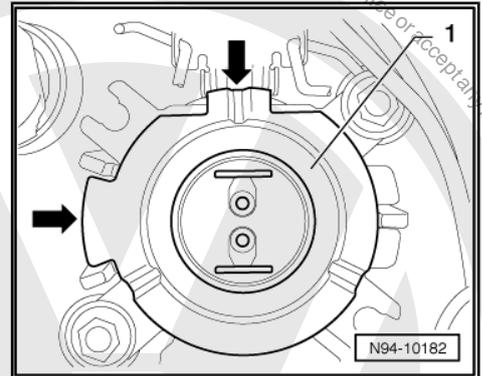


- Take left headlight main beam bulb -M30- -1- out of headlight.

Installing

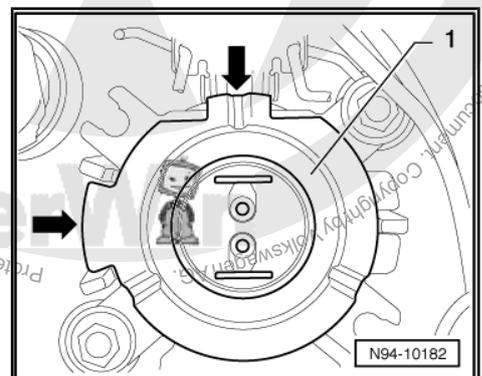
⚠ Caution

- ◆ *Do not touch glass envelope when fitting bulb. Fingers leave traces of grease on the glass envelope, which evaporate when the bulb is switched on and cause the glass envelope to cloud over.*
- ◆ *When installing cover cap, ensure that it seats properly. The ingress of water will lead to permanent damage to the headlight.*



Carry out installation in the reverse sequence, noting the following:

- Place left headlight main beam bulb -M30- -1- in recesses -arrows- of headlight.
- Check headlight functions.
- Check headlight settings and adjust headlights if necessary
 => Maintenance ; Booklet 20.1 ; Descriptions of work .





1.4.3 Renewing side light bulb



Note

The diagrams show renewal of the left side light bulb -M1- for the left headlight.

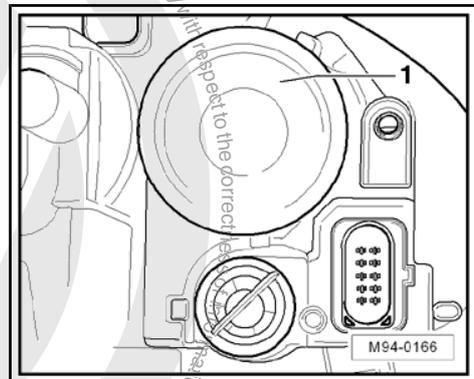


Caution

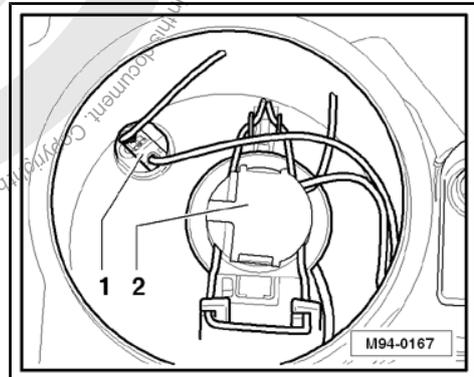
- ◆ Switch off ignition and all electrical consumers.
- ◆ Remove the ignition key.

Removing

- Remove cover cap -1-.



- As far as the wiring lengths allow, pull bulb holder -1- with left side light bulb -M1- out of reflector.





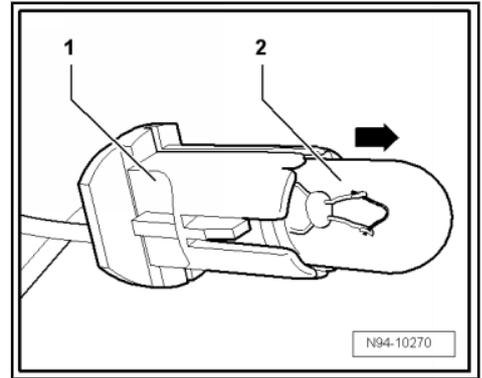
- Pull left side light bulb -M1- -2- in -direction of arrow- out of bulb holder -1-.

Installing



Caution

- ◆ **Do not touch glass envelope when fitting bulb. Fingers leave traces of grease on the glass envelope, which evaporate when the bulb is switched on and cause the glass envelope to cloud over.**
- ◆ **When installing cover cap, ensure that it seats properly. The ingress of water will lead to permanent damage to the headlight.**



Carry out installation in the reverse sequence, noting the following:

Check headlight functions.

- Check headlight settings and adjust headlights if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .

1.4.4 Renewing front turn signal bulb



Note

The illustrations show the renewal of the front left turn signal bulb -M5- for the left headlight.



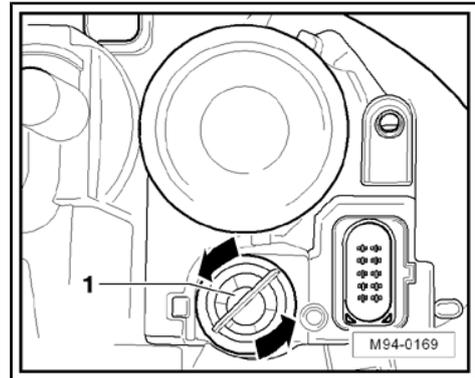
Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**



Removing

- Turn bulb holder with front left turn signal bulb -M5- -1- in direction of arrow and remove from headlight.
- Push front left turn signal bulb -M5- into bulb holder, turn front left turn signal bulb -M5- anti-clockwise and pull front left turn signal bulb -M5- out of bulb holder.



Installing



Caution

- ◆ *Do not touch glass envelope when fitting bulb. Fingers leave traces of grease on the glass envelope, which evaporate when the bulb is switched on and cause the glass envelope to cloud over.*
- ◆ *When installing cover cap, ensure that it seats properly. The ingress of water will lead to permanent damage to the headlight.*

Carry out installation in the reverse sequence, noting the following:

- Check headlight functions.
- Check headlight settings and adjust headlights if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .

1.5 Removing and installing headlight range control motor

⇒ [page 224](#)

⇒ [page 227](#)

⇒ [page 229](#)

1.5.1 Removing and installing headlight range control motor (Automotive Lighting)



Note

- ◆ *If control motors are removed and reinstalled or renewed, the headlight adjustment must be checked and the headlights adjusted ⇒ Maintenance ; Booklet 20.1 ; Description of work .*
- ◆ *The illustrations show the renewal of the headlight range control motor -V49- on the right headlight. If the left headlight range control motor -V48- is removed and installed, two assembly openings with predetermined breaking points must be opened to gain access to the bolts (these are not shown on the following illustrations).*



Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

Removing

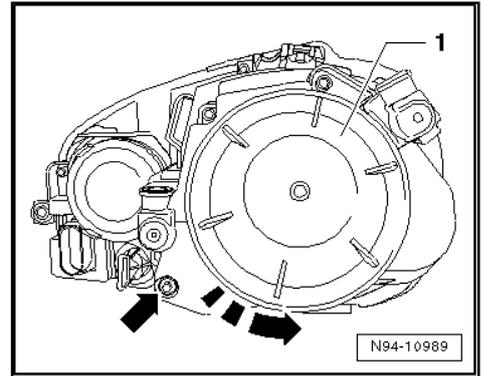
- Remove headlight ⇒ [page 215](#) .



- Turn cap -1- in -direction of arrow- and remove.

i Note

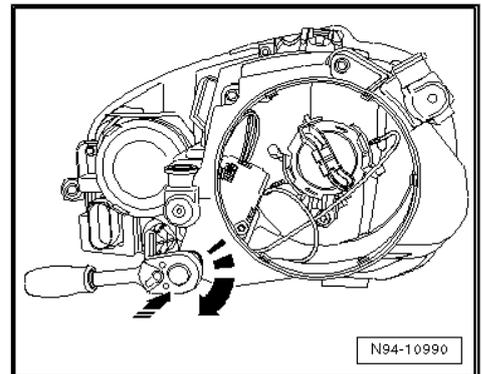
To gain access to the second bolt on the right headlight range control motor -V49- , break open the assembly opening at the predetermined breaking point -arrow- on the back of the headlight housing. This opening must be sealed on completion of repairs with separately available sealing plug.



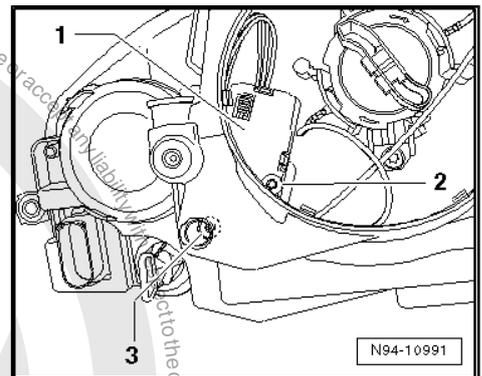
- Fit a socket on the plastic hexagon on the back of the headlight housing.
- Press and turn the plastic hexagon out of the headlight housing to break open the assembly opening.

i Note

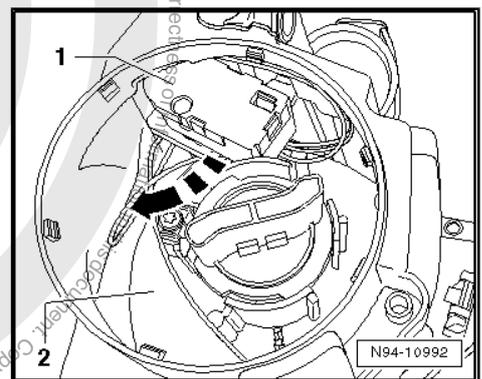
The broken open sealing piece must not remain in the headlight. Remove it from the headlight housing.



- Unscrew bolts -2- and -3- from right headlight range control motor -V49- -1-.

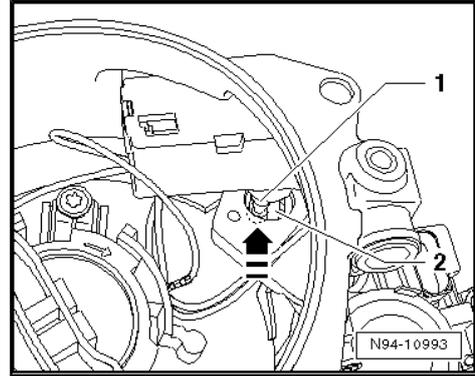


- Lift dipped beam reflector -2- in headlight slightly and turn the right headlight range control motor -V49- -1- in -direction of arrow- on to stop.





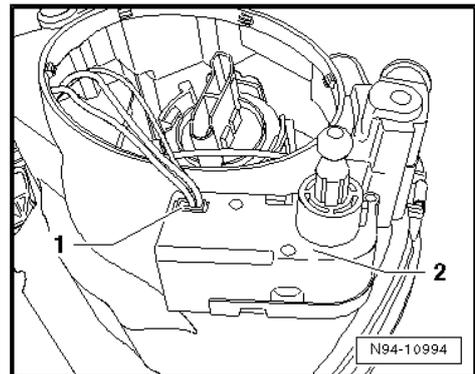
- Lift dipped beam reflector in headlight slightly and turn the ball head of the right headlight range control motor -V49- -1- so that it can be slid out of the ball head mounting -2- in -direction of arrow- to the rear.
- Take the right headlight range control motor -V49- out of the headlight as far as the connected wiring allows.



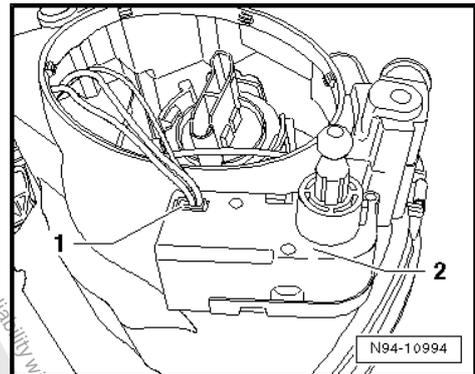
- Disconnect connector -1- and remove right headlight range control motor -V49- -2-.

Installing

Carry out installation in the reverse sequence, noting the following:

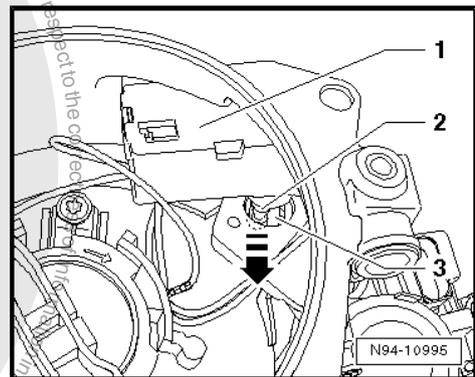


- Reconnect connector -1- on right headlight range control motor -V49- -2-.



- Insert right headlight range control motor -V49- -1- in headlight in position as shown in illustration.

Lift dipped beam reflector in headlight slightly and turn the ball head of the right headlight range control motor -V49- -2- so that it can be pushed into the ball head mounting -3- in -direction of arrow-.



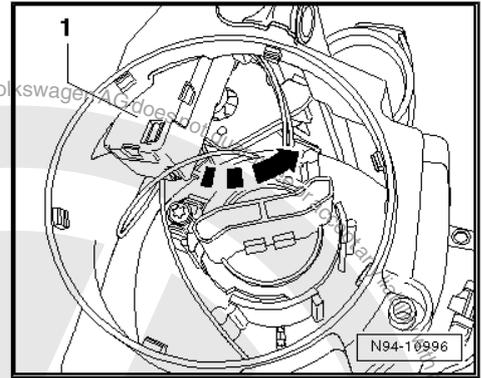


- Lift dipped beam reflector in headlight slightly and turn the right headlight range control motor -V49- -1- in -direction of arrow- on to stop.
- Insert both bolts into the right headlight range control motor -V49- and tighten, and install the cover cap.

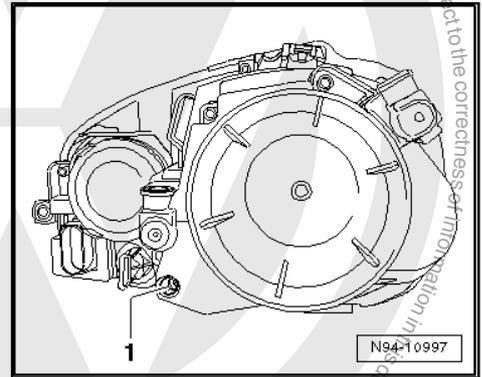


Caution

When installing cover cap, ensure cap is seated correctly. The ingress of water will lead to permanent damage to the headlight.



- Seal the broken-open assembly openings -1- using a separately ordered sealing plug => ETKA (electronic parts catalogue) .
- Check headlight functions.
- Check headlight settings and adjust headlights if necessary => Maintenance ; Booklet 20.1 ; Descriptions of work .



1.5.2 Removing and installing headlight range control motor (Hella)



Note

- ◆ *If control motors are removed and reinstalled or renewed, the headlight adjustment must be checked and the headlights adjusted => Maintenance ; Booklet 20.1 ; Description of work .*
- ◆ *The illustrations show the renewal of the headlight range control motor -V49- on the right headlight.*



Caution

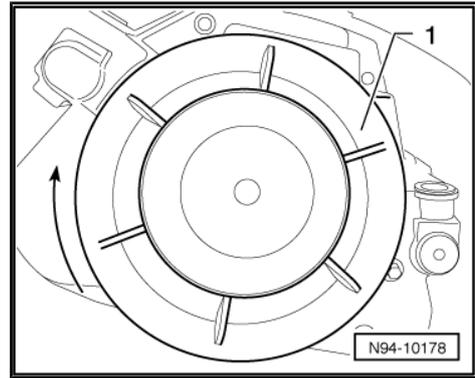
- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

Removing

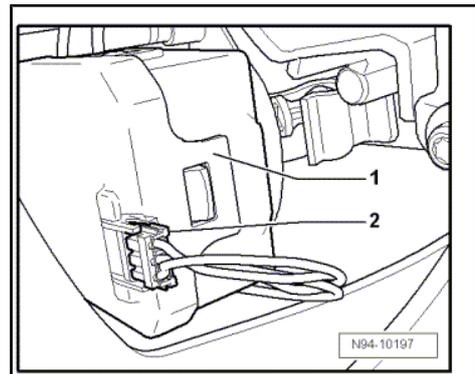
- Remove headlight => [page 215](#) .



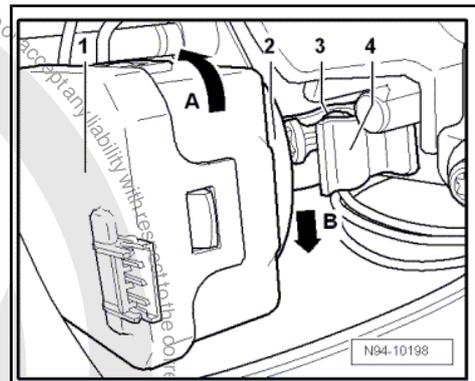
- Turn cover cap -1- in -direction of arrow- and remove.



- Pull off connector -2-.



- Turn right headlight range control motor -V49- -1- in direction of -arrow A- and pull it out slightly from its mounting -2-.
- Move right headlight range control motor -V49- -1- so that ball head -3- of right headlight range control motor -V49- can be pulled in direction of -arrow B- out of ball head mounting -4-.
- Take right headlight range control motor -V49- out of headlight housing.



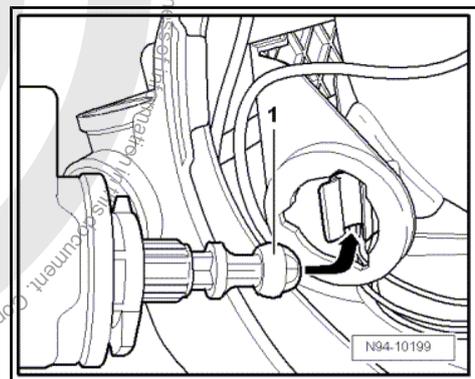
Installing

Carry out installation in the reverse sequence, noting the following:

- Carefully insert ball head -1- of hand headlight range control motor -V49- in ball head mounting -arrow-.

Caution

When installing cover cap, ensure cap is seated correctly. The ingress of water will lead to permanent damage to the headlight.



- Check headlight functions.
- Check headlight settings and adjust headlights if necessary.
=> Maintenance ; Booklet 20.1; Descriptions of work



1.5.3 Removing and installing headlight range control motor (Visteon)

Note

- ◆ If control motors are removed and reinstalled or renewed, the headlight adjustment must be checked and the headlights adjusted ⇒ Maintenance ; Booklet 20.1 ; Description of work .
- ◆ The illustrations show the renewal of the left headlight range control motor -V48- for the left headlight.

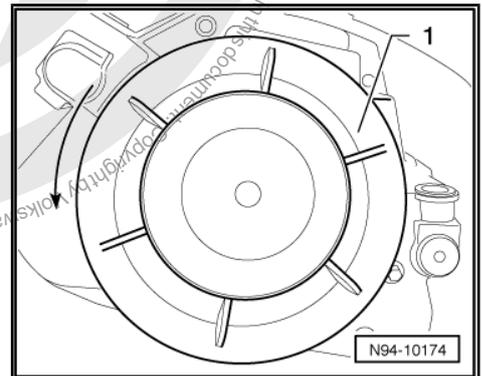


Caution

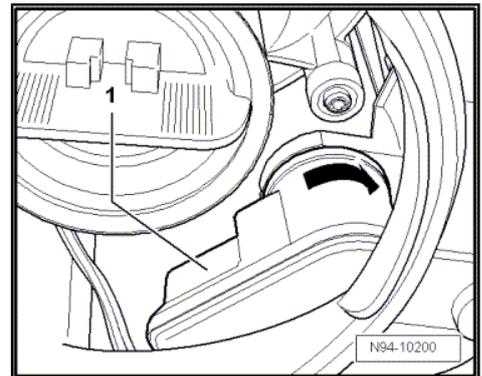
- ◆ Switch off ignition and all electrical consumers.
- ◆ Remove the ignition key.

Removing

- Remove headlight [page 215](#) .
- Turn cover cap -1- in direction of arrow- and remove.

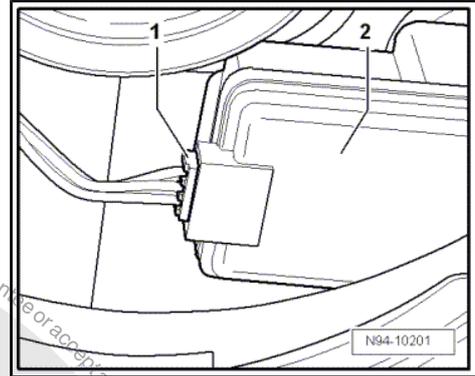


- Turn left headlight range control motor -V48- -1- in direction of -arrow-.





- Pull off connector -1-.

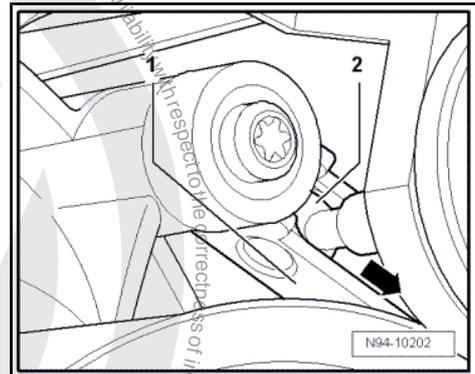


- Move left headlight range control motor -V48- so that ball head -2- of left headlight range control motor -V48- can be pulled in direction of -arrow- out of ball head cup -1-.
- Take left headlight range control motor -V48- out of headlight housing.

Installing

Carry out installation in the reverse sequence, noting the following:

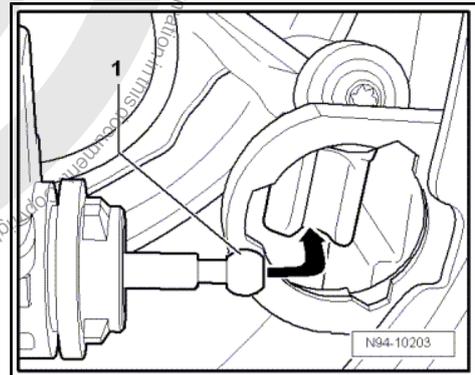
- Carefully insert ball head of left headlight range control motor -V48- -1- in ball head cup -arrow-.



 **Caution**

When installing cover cap, ensure cap is seated correctly. The ingress of water will lead to permanent damage to the headlight.

- Check headlight functions.
- Check headlight settings and adjust headlights if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .





1.6 Repairing headlight retaining tabs

If the upper headlight retaining tab -1-, the outer headlight retaining tab -2- or the lower headlight retaining tab -3- is damaged or has broken off, it can be replaced by installing the repair kit. There is no need to renew the entire headlight.



Note

- ◆ Check that there is no further damage to the headlight that would make installation of the repair kit unnecessary.
- ◆ Two different repair kits are available for the left and right headlights ⇒ ETKA (electronic parts catalogue).
- ◆ Each repair kit includes the upper, the outer and the lower headlight retaining tabs, four screws, a panel nut (already fitted on the upper retaining tab), adjustment bushes (one each already fitted on the outer and lower retaining tabs).

Repairing upper retaining tab ⇒ [page 231](#) .

Repairing outer retaining tab ⇒ [page 232](#) .

Repairing lower retaining tab ⇒ [page 232](#) .

1.6.1 Repairing upper retaining tab



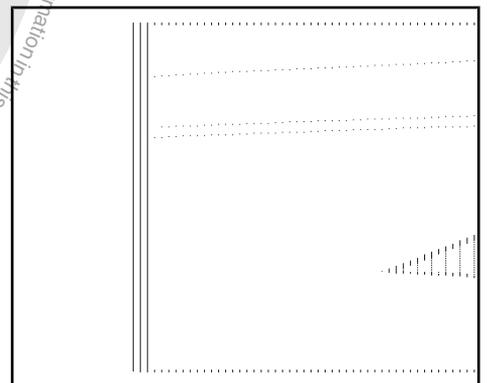
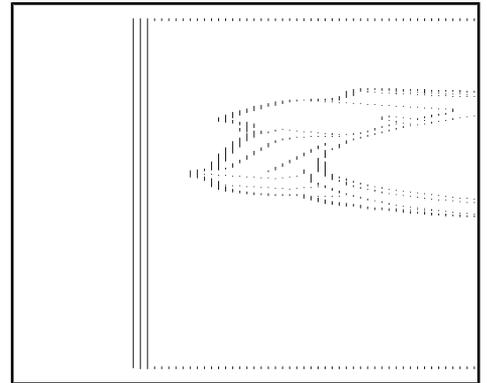
Caution

- ◆ Switch off ignition and all electrical consumers.
- ◆ Remove the ignition key.

Procedure

Remove headlight ⇒ [page 215](#) .

- Remove existing headlight retaining tab -1- completely from headlight.





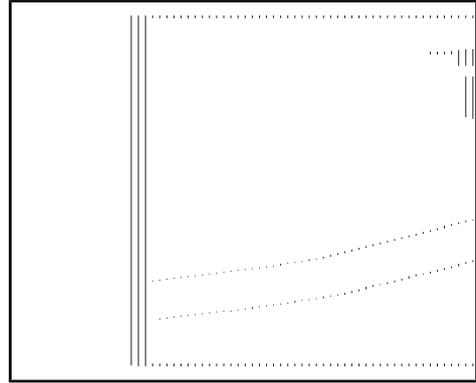
- Form-fit the new retaining tab -2- on the base of the retaining tab on the headlight -4- and tighten the screw -3-.



Note

The panel nut -1- is already pre-assembled on the new retaining tab -2-.

- Install headlight ⇒ [page 215](#) .
- Check headlight settings and adjust headlights if necessary ⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .



1.6.2 Repairing outer retaining tab

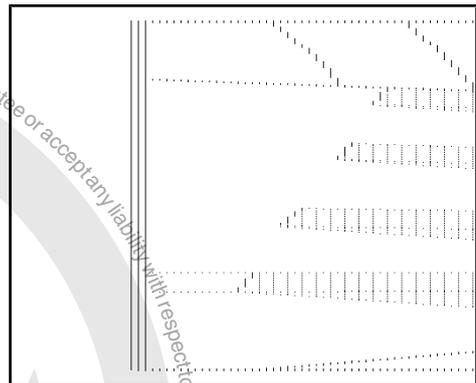


Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

Procedure

- Remove headlight ⇒ [page 215](#) .
- Remove existing headlight retaining tab -arrow- completely from headlight.



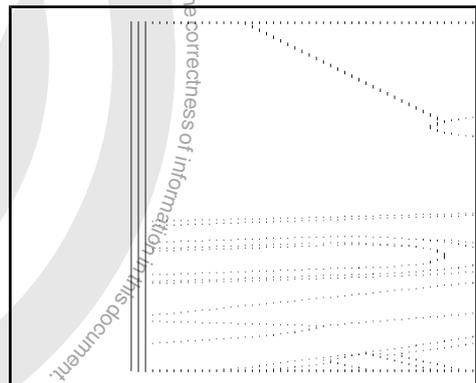
- Form-fit the new retaining tab -3- on the base of the retaining tab on the headlight -1- and tighten the screw -2-.



Note

The adjustment bush -4- is already pre-assembled on the new retaining tab -3-.

- Install headlight ⇒ [page 215](#) .
- Check headlight settings and adjust headlights if necessary ⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .



1.6.3 Repairing lower retaining tab



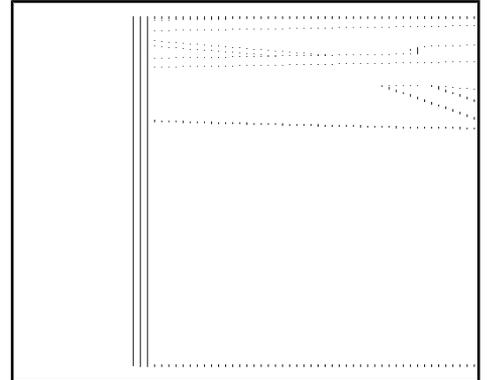
Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*



Procedure

- Remove headlight ⇒ [page 215](#) .
- Remove existing headlight retaining tab -arrow- completely from headlight.



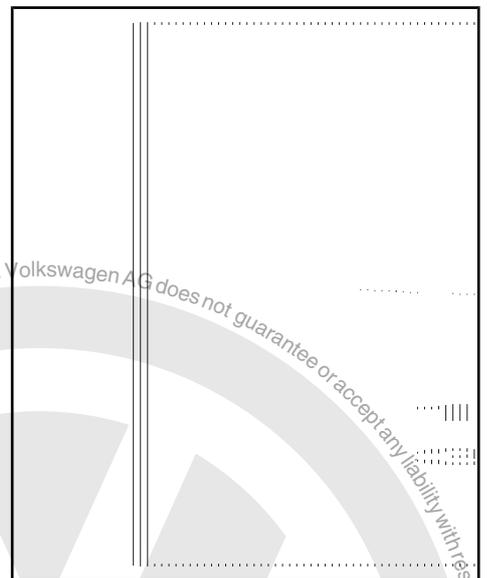
- Form-fit the new retaining tab -3- on the base of the retaining tab on the headlight -1- and tighten the screw -2-.
- Now tighten the screw -5- on the rear side.



Note

The adjustment bush -4- is already pre-assembled on the new retaining tab -3-.

- Install headlight ⇒ [page 215](#) .
- Check headlight settings and adjust headlights if necessary ⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .



1.7 Converting headlights for use when driving on the left or right



Note

- ◆ To avoid dazzling oncoming traffic with asymmetrical lights, both headlights should be converted to the direction of traffic (driving on the left or right) relevant to the country in which the vehicle is being driven.
- ◆ The corresponding headlight conversion set consists of two sections of film.
- ◆ Conversion of the headlights is not designed as a permanent conversion for other countries. It is only suitable as a „tourist solution“ for a short stay abroad.
- ◆ Both headlights of a vehicle must always be converted.
- ◆ The information on „right“ and „left“ on the masking film always relates to the direction of travel when looking forwards from inside the vehicle.



1.7.1 Converting headlights designed for driving on the right to driving on the left



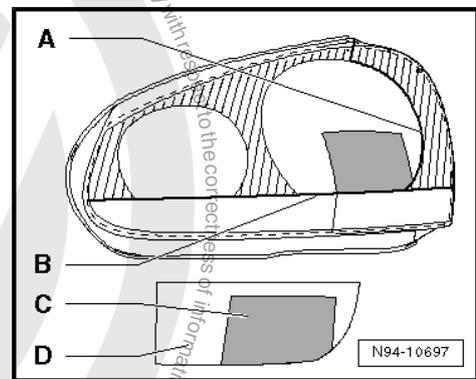
Note

- ◆ The headlight conversion set comprises two pieces of film.
- ◆ Please note the different part numbers for the headlight conversion sets from right to left-hand traffic and from left to right-hand traffic.
- ◆ Clean headlight lens before converting.

- Turn light switch to position „0“.
- Clean headlight lens.

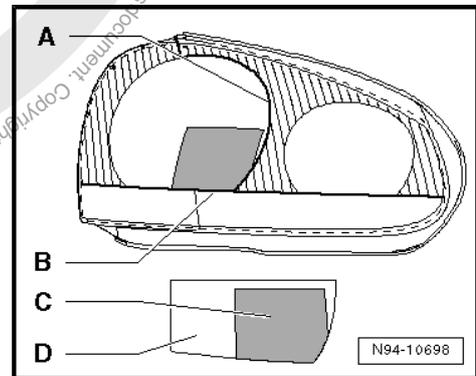
Left headlight:

- Remove protective film on back of assembly film -D- in area -C- only.
- Align positioning film -D- with the bottom edge to line -B- on the lens of the headlight.
- Align positioning film -D- at the same time with its radius to line -A- on the lens of the headlight.
- Push down in area -C- on the headlight lens.
- Carefully pull application film -D- off the lens of the headlight again.
- The masking film -C- remains on the headlight lens.



Right headlight:

- Remove protective film on back of assembly film -D- in area -C- only.
- Align positioning film -D- with the bottom edge to line -B- on the lens of the headlight.
- Align positioning film -D- at the same time with its radius to line -A- on the lens of the headlight.
- Push down in area -C- on the headlight lens.
- Carefully pull application film -D- off the lens of the headlight again.
- The masking film -C- remains on the headlight lens.



Note

- ◆ Remove any remaining adhesive using alcohol-based or alcohol and water-based cleaning fluid. For example, a cloth soaked with isopropyl alcohol
- ◆ Customers should be informed of how to remove residual adhesive after detaching the masking section.



1.7.2 Converting headlights designed for driving on the left to driving on the right



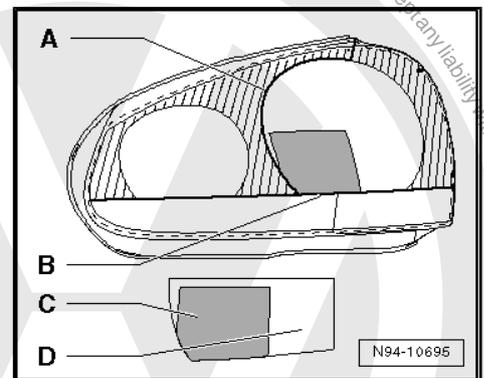
Note

- ◆ *The headlight conversion set comprises two pieces of film.*
- ◆ *Please note the different part numbers for the headlight conversion sets from right to left-hand traffic and from left to right-hand traffic.*
- ◆ *Clean headlight lens before converting.*
- ◆ *Pull off adhesive film from headlight lens and remove residual adhesive from headlight.*

- Turn light switch to position „0“.
- Clean headlight lens.

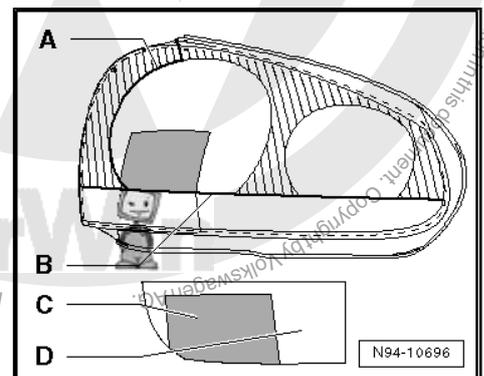
Left headlight:

- Remove protective film on back of assembly film -D- in area -C- only.
- Align positioning film -D- with the bottom edge to line -B- on the lens of the headlight.
- Align positioning film -D- at the same time with its radius to line -A- on the lens of the headlight.
- Push down in area -C- on the headlight lens.
- Carefully pull application film -D- off the lens of the headlight again.
- The masking film -C- remains on the headlight lens.



Right headlight:

- Remove protective film on back of assembly film -D- in area -C- only.
- Align positioning film -D- with the bottom edge to line -B- on the lens of the headlight.
- Align positioning film -D- at the same time with its radius to line -A- on the lens of the headlight.
- Push down in area -C- on the headlight lens.
- Carefully pull application film -D- off the lens of the headlight again.
- The masking film -C- remains on the headlight lens.



Note

- ◆ *Remove any remaining adhesive using alcohol-based or alcohol and water-based cleaning fluid. For example, a cloth soaked with isopropyl alcohol*
- ◆ *Customers should be informed of how to remove residual adhesive after detaching the masking section.*

1.8 Adjusting headlights

- Check headlight settings and adjust headlights if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .



2 Headlights with halogen bulbs (from MY2009)

2.1 General description



Note

- ◆ *Before working on headlights, always switch off the headlights and remove the ignition key.*
- ◆ *When dealing with complaints, it is absolutely essential that the function and operation of the lighting system are first understood.*

Additional information:

⇒ Operating instructions

The vehicle is fitted with headlights from two different manufacturers:

- ◆ Hella
- ◆ Valeo

Removal and installation of the headlights are the same except for removal and installation of the headlight range control motors and the cap behind the dipped beam bulb.

Fault detection and fault display

The onboard supply control unit is equipped with self-diagnosis.

For fault finding, use vehicle diagnosis, testing and information system -VAS 5051B- in "Guided fault finding" mode.

2.2 Assembly overview



Note

- ◆ *The assembly overview shows both control motor variants of headlight manufacturers Hella ⇒ [Item 5 \(page 237\)](#) and Valeo ⇒ [Item 6 \(page 237\)](#) since their removal and installation are different.*
- ◆ *The assembly overview shows both cover-cap variants of headlight manufacturers Hella ⇒ [Item 3 \(page 237\)](#) and Valeo ⇒ [Item 4 \(page 237\)](#) since their removal and installation are different.*



1 - Cover cap

2 - Cover cap

3 - Cover cap

- Only manufacturer Hella ⇒ [page 241](#)

4 - Cover cap

- Only manufacturer Valeo ⇒ [page 241](#)

5 - Left headlight range control motor -V48- / right headlight range control motor -V49-

- Manufacturer Hella
- Removing and installing ⇒ [page 247](#)

6 - Left headlight range control motor -V48- / right headlight range control motor -V49-

- Manufacturer: Valeo
- Removing and installing ⇒ [page 249](#)

7 - Bulb holder with grip

8 - Left headlight dipped beam bulb -M29- / right headlight dipped beam bulb -M31-

- Bulb: H7 12 V/55 W
- Renewing ⇒ [page 218](#)

9 - Headlight

- Removing and installing ⇒ [page 238](#)
- Adjusting headlight installation position ⇒ [page 240](#)
- Repairing headlight securing tabs ⇒ [page 251](#)
- Converting for driving on left/right ⇒ [page 254](#)

10 - Guide

11 - Front end support part

12 - Bolt

- 5 Nm

13 - Left headlight main beam bulb -M30- / right headlight main beam bulb -M32-

- Bulb: 12 V 15/55 W
- Renewing ⇒ [page 220](#)

14 - Left side light bulb -M1- / right side light bulb -M3-

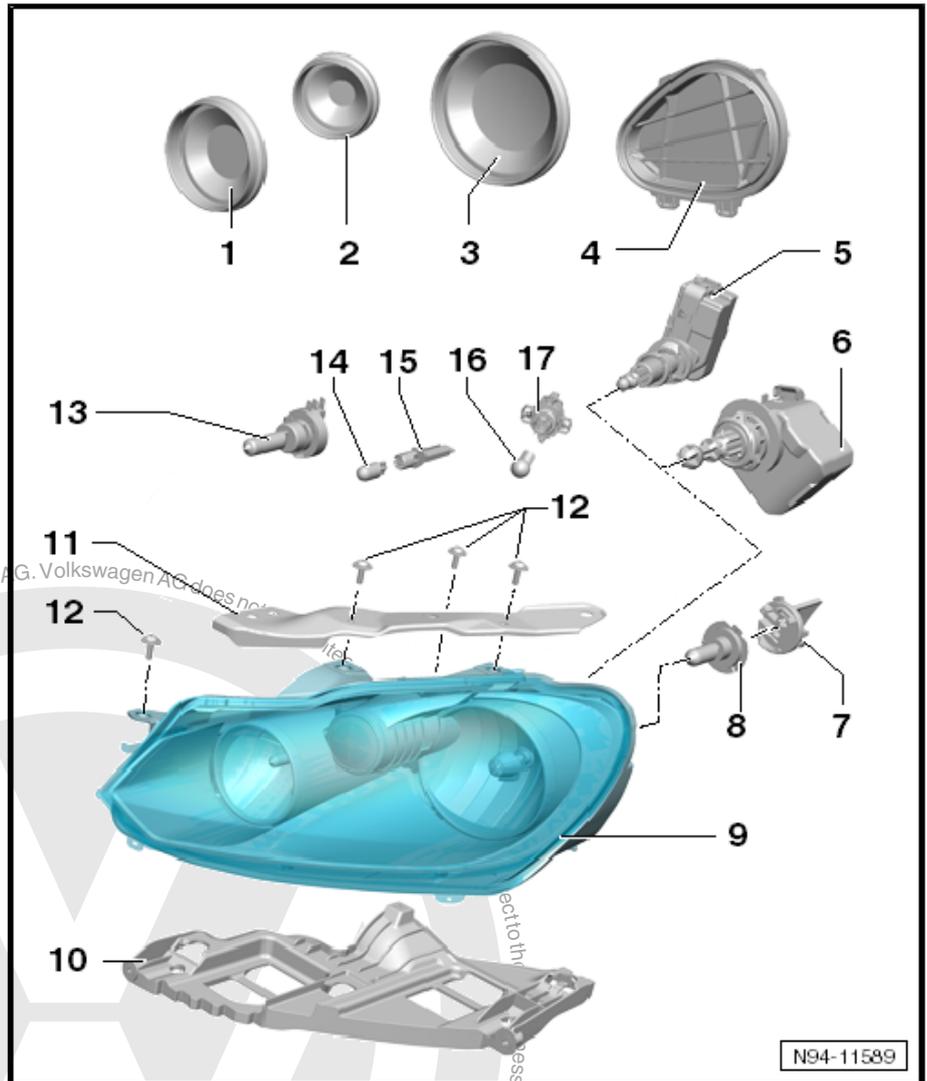
- Bulb: 12 V/5 W
- Renewing ⇒ [page 222](#)

15 - Bulb holder with grip

16 - Front left turn signal bulb -M5- / front right turn signal bulb -M7-

- Bulb: 12 V/24 W
- Renewing ⇒ [page 223](#)

17 - Bulb holder with grip

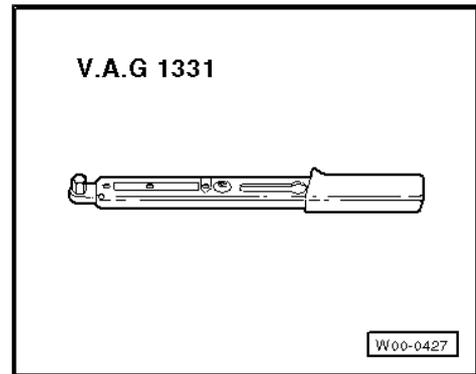




2.3 Removing and installing headlight

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-



Note

- ◆ *You do not have to disconnect the earth wire of the battery - A- .*
- ◆ *The vehicle is fitted with headlights from two different manufacturers; removal and installation of both headlight versions are identical.*
- ◆ *Illustrations show removal and installation of the left headlight. Removal and installation of the right headlight are carried out in the same way.*
- ◆ *Check headlight settings and adjust headlights if necessary
→ Maintenance ; Booklet 20.1 ; Descriptions of work .*

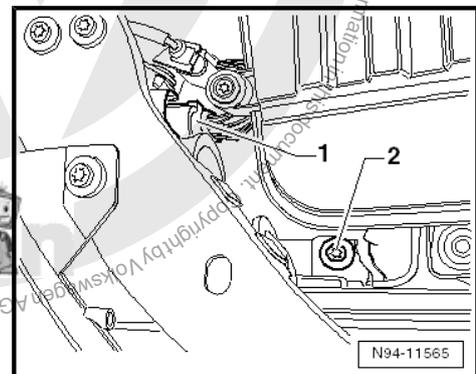


Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

Removing

- Remove the radiator grille ⇒ General body repairs, exterior;
Rep. gr. 66 .
- Remove front bumper cover ⇒ General body repairs, exterior;
Rep. gr. 63 .
- Release and disconnect multi-pin connector -1-.
- Remove bolt -2- on inner part of headlight.

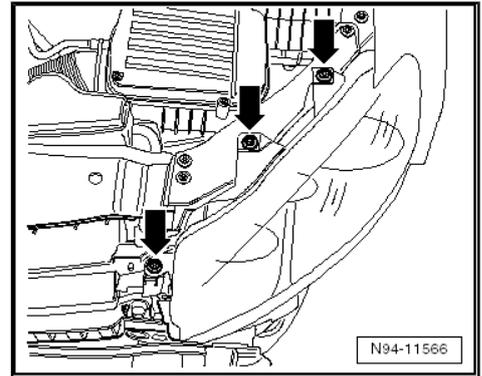




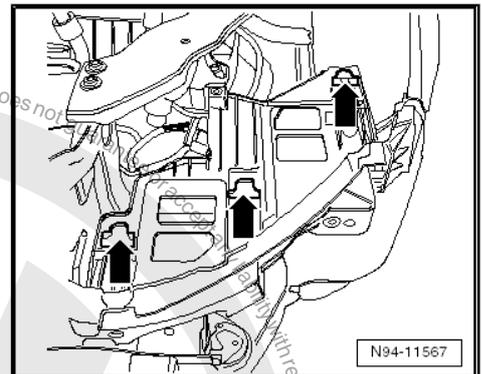
- Unscrew the three bolts -arrows-.
- Pull headlight forwards and straight out of body aperture.

Installing

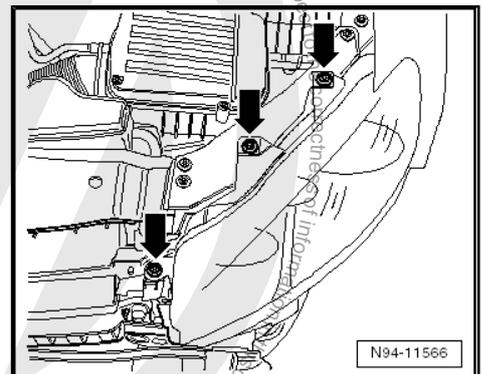
Carry out installation in the reverse sequence, noting the following:



- Insert headlight with the three guides on underside into mountings -arrows- on guide and push into body aperture.



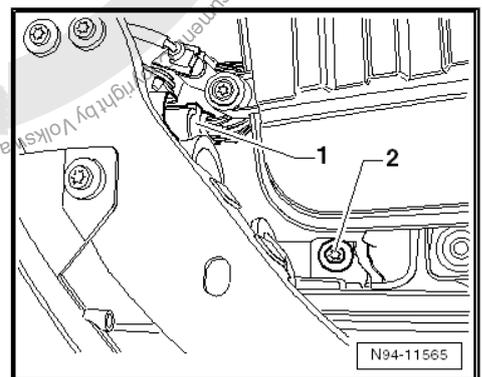
- First, screw in the three bolts -arrows-.



- Then, screw in bolt -2- on rear of headlight.
- Tighten all threaded connections to specified torques => [page 236](#) .
- Check headlight installation position is central, i.e. shut lines/gaps are equal around headlight.

If the shut lines/gaps around the headlight are uneven, the installation position must be adjusted => [page 217](#) .

- Check headlight functions.
- Check headlight settings and adjust headlights if necessary => Maintenance ; Booklet 20.1 ; Descriptions of work .





2.4 Adjusting headlight installation position



Note

- ◆ To adjust the installation position of the headlight, the front bumper does not have to be removed.
- ◆ The illustrations show the left headlight.

If it transpires during checking of the installation position that the shut lines/gaps between headlight and body are uneven, the installation position must be adjusted.

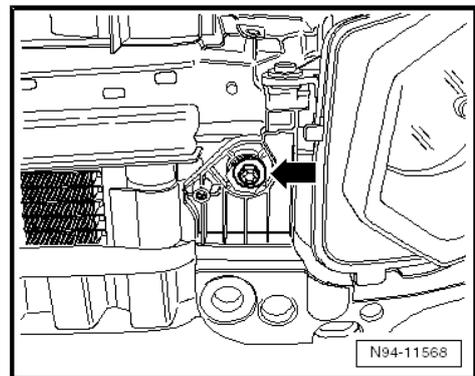
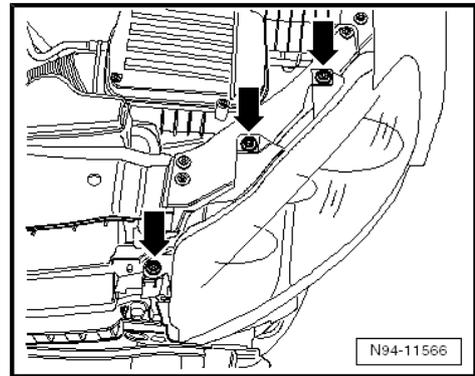
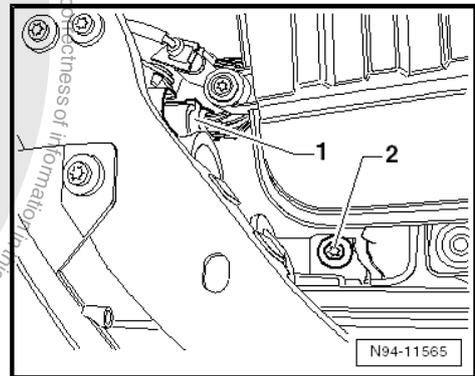
Switch off ignition and all electrical consumers and remove ignition key.

Remove the radiator grille ⇒ General body repairs, exterior; Rep. gr. 66 .

Loosen bolt -2- on rear of headlight.

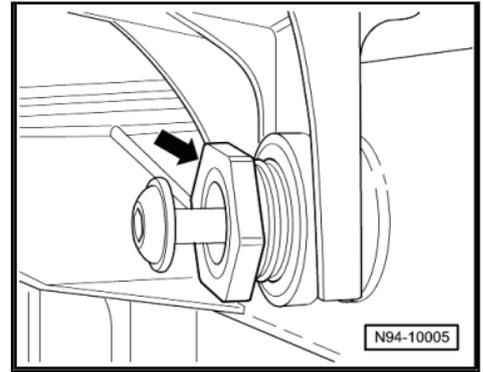
Loosen the three bolts -arrows-.

Loosen screw -arrow- at bottom of headlight.





- Adjust shut lines/gaps to body by pushing in or pulling out alignment bush -arrow- on headlight.
- Tighten all threaded connections to specified torques
=> page 236 .
- Check and readjust headlight to ensure gaps are even all round.
- Install the radiator grille => General body repairs, exterior; Rep. gr. 66 .
- Check headlight functions.
- Check headlight settings and adjust headlights if necessary
=> Maintenance ; Booklet 20.1 ; Descriptions of work .



2.5 Renewing bulbs

2.5.1 Renewing headlight dipped beam bulb



Note

- ◆ The headlight does not have to be removed to change the bulb.
- ◆ The diagrams show renewal of the left headlight dipped beam bulb -M29- for the left headlight.



Caution

- ◆ Switch off ignition and all electrical consumers.
- ◆ Remove the ignition key.

Removing

Only headlight manufacturer Hella:

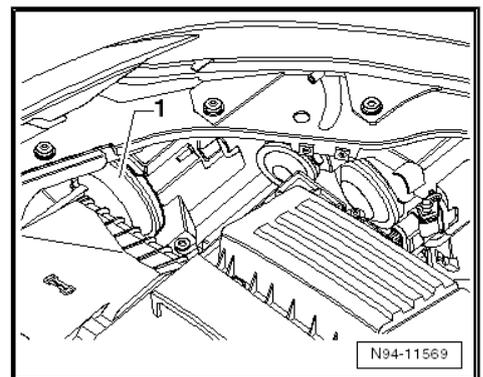
- Remove cover cap -1-.

Only headlight manufacturer Valeo:



Note

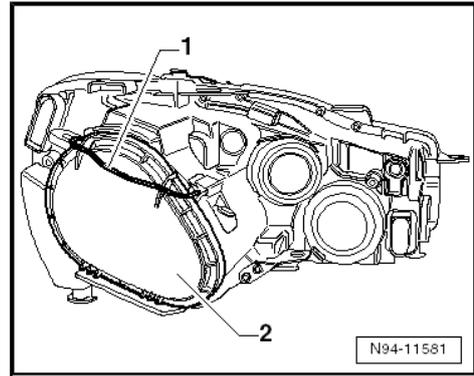
- ◆ For reasons of clarity, headlight is shown removed in the following illustrations.
- ◆ The headlight does not have to be removed to change the bulb.



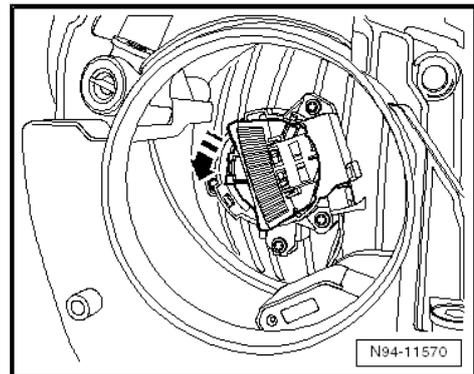


- Pull clip -1- upwards and remove cover cap -2- from rear of headlight.

Continuation for all vehicles:



- Turn bulb holder with left headlight dipped beam bulb -M29- in direction of -arrow- and remove from headlight.



- Pull left headlight dipped beam bulb -M29- -2- in -direction of arrow- out of bulb holder -1-.

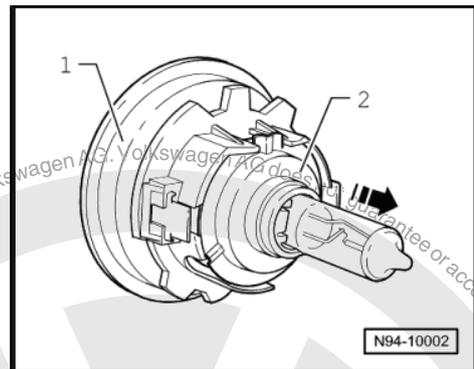
Bulb: 12 V/55 W

Installing



Caution

- ◆ *Do not touch glass envelope when fitting bulb. Fingers leave traces of grease on the glass envelope, which evaporate when the bulb is switched on and cause the glass envelope to cloud over.*
- ◆ *When installing cover cap, ensure that it seats properly. The ingress of water will lead to permanent damage to the headlight.*



- Check headlight functions.
- Check headlight settings and adjust headlights if necessary
=> Maintenance ; Booklet 20.1 ; Descriptions of work .



- Turn bulb holder -1- in direction of -arrow- and pull it out of headlight together with left headlight main beam -M30- / left daytime running light bulb -L174- .



Note

The left headlight main beam bulb -M30- / left daytime running light bulb -L174- is permanently attached to the bulb holder and cannot be renewed separately.

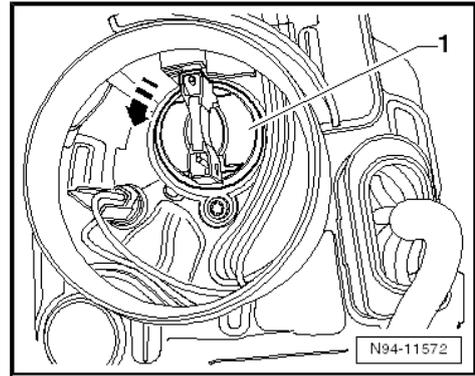
Bulb: 12 V 15/55 W

Installing



Caution

- ◆ Do not touch glass envelope when fitting bulb. Fingers leave traces of grease on the glass envelope, which evaporate when the bulb is switched on and cause the glass envelope to cloud over.
- ◆ When installing cover cap, ensure that it seats properly. The ingress of water will lead to permanent damage to the headlight.



Carry out installation in the reverse sequence, noting the following:

- Check headlight functions.
- Check headlight settings and adjust headlights if necessary
→ Maintenance ; Booklet 20.1 ; Descriptions of work.

2.5.3 Renewing side light bulb



Note

- ◆ The headlight does not have to be removed to change the bulb.
- ◆ The diagrams show renewal of the left side light bulb -M1- for the left headlight.



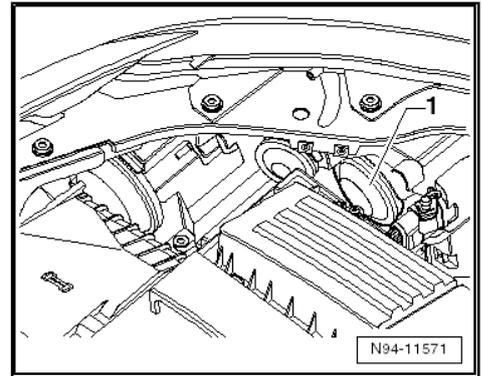
Caution

- ◆ Switch off ignition and all electrical consumers.
- ◆ Remove the ignition key.

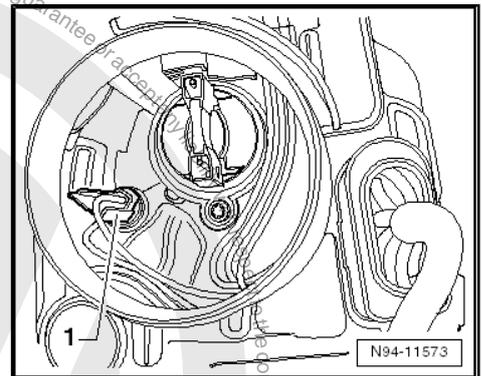


Removing

- Remove cover cap -1-.



- Taking connected wiring length into consideration, pull bulb holder -1- together with left side light bulb -M1- backwards out of reflector.



- Pull left side light bulb -M1- -2- in -direction of arrow- out of bulb holder 1-.

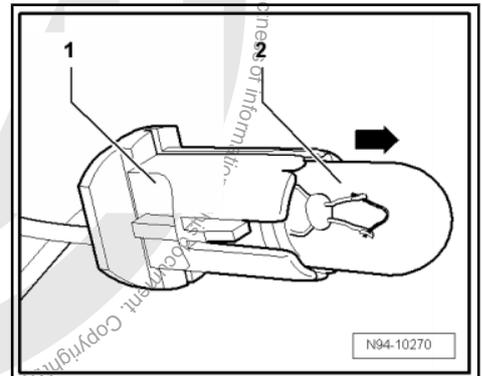
Bulb: wedge-base bulb 12 V/5 W

Installing



Caution

- ◆ *Do not touch glass envelope when fitting bulb. Fingers leave traces of grease on the glass envelope, which evaporate when the bulb is switched on and cause the glass envelope to cloud over.*
- ◆ *When installing cover cap, ensure that it seats properly. The ingress of water will lead to permanent damage to the headlight.*



Carry out installation in the reverse sequence, noting the following:

- Check headlight functions.

2.5.4 Renewing front turn signal bulb



Note

- ◆ *The headlight does not have to be removed to change the bulb.*
- ◆ *The illustrations show the renewal of the front left turn signal bulb -M5- for the left headlight.*

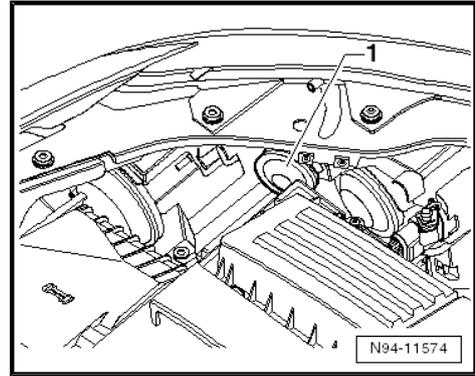


Caution

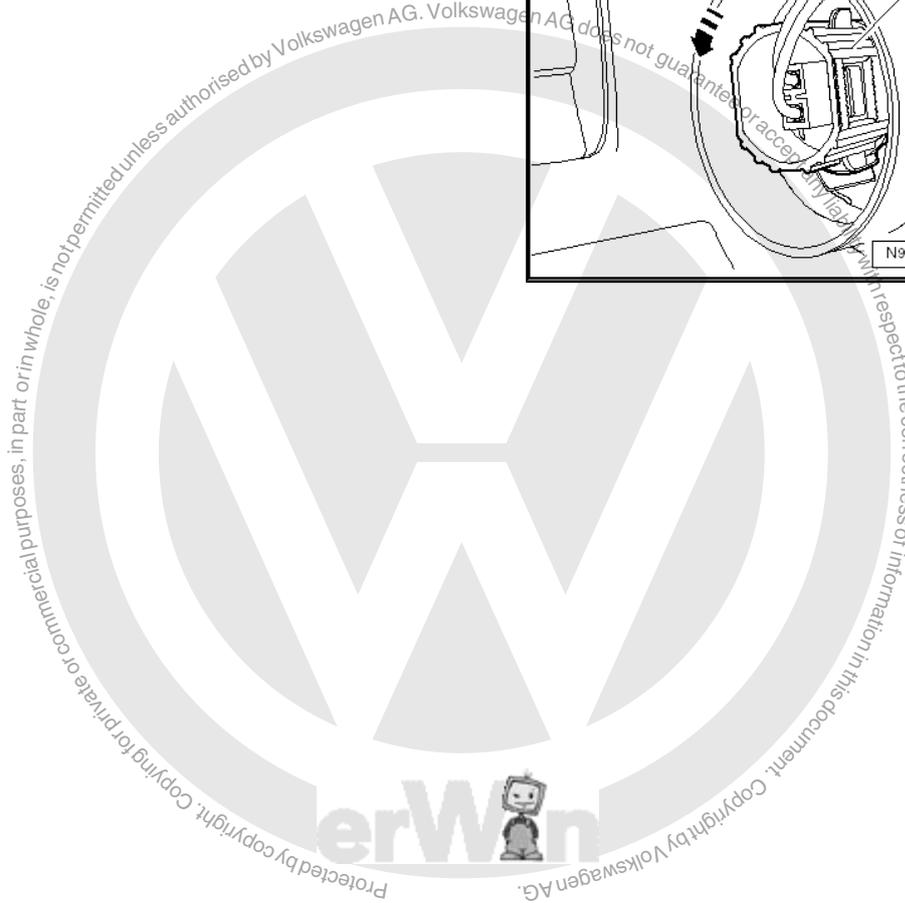
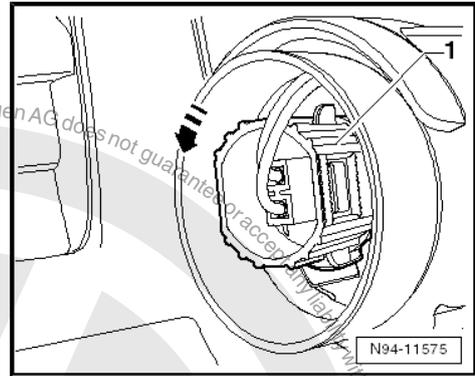
- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

Removing

- Remove cover cap -1-.



- Turn bulb holder -1- in direction of -arrow- and pull left front turn signal bulb -M5- backwards out of headlight.





- Press lock button -arrow- and pull left front turn signal bulb -M5- -1- upwards out of bulb holder.

i Note

The left front turn signal bulb -M5- is permanently attached to the bulb holder and cannot be dismantled.

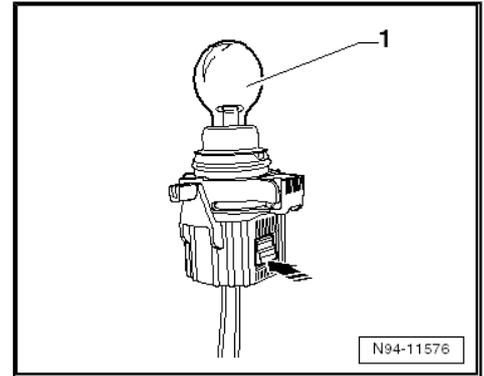
Bulb: 12 V/24 W

Installing



Caution

- ◆ *Do not touch glass envelope when fitting bulb. Fingers leave traces of grease on the glass envelope, which evaporate when the bulb is switched on and cause the glass envelope to cloud over.*
- ◆ *When installing cover cap, ensure that it seats properly. The ingress of water will lead to permanent damage to the headlight.*



Carry out installation in the reverse sequence, noting the following:

i Note

- ◆ *To lock the bulb holder, there are two locking lugs of different lengths in the reflector.*
 - ◆ *Insert bulb holder together with left front turn signal bulb -M5- into reflector so that the longer locking lug points upwards.*
- Check headlight functions.

2.6 Removing and installing headlight range control motor

2.6.1 Removing and installing (Hella)

i Note

- ◆ *If control motors are removed and reinstalled or renewed, the headlight adjustment must be checked and the headlights adjusted => Maintenance ; Booklet 20.1 ; Description of work .*
- ◆ *The illustrations show the renewal of the left headlight range control motor -V48- for the left headlight.*
- ◆ *The renewal of the headlight range control motor -V49- for the right headlight is carried out in the same way.*



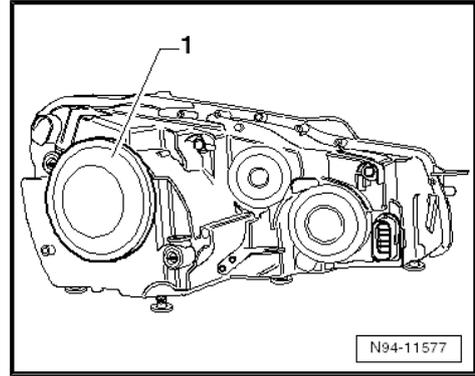
Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

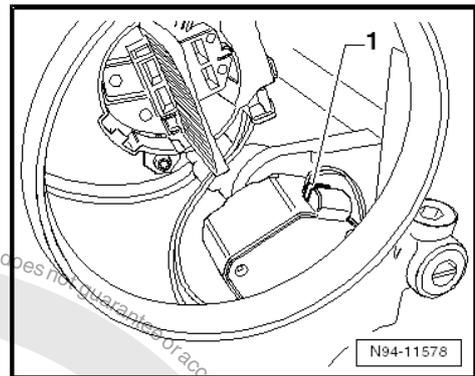


Removing

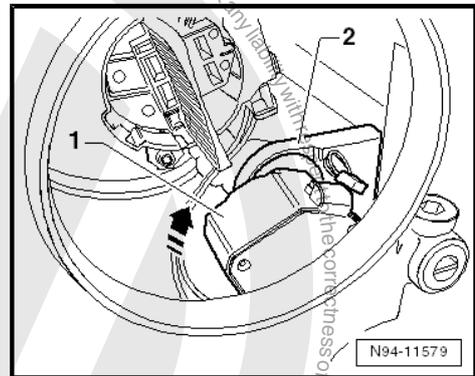
- Remove headlight => [page 215](#) .
- Remove cover cap -1-.



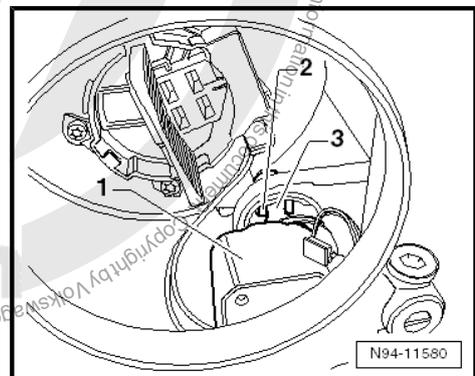
- Detach connector -1- from left headlight range control motor 2 -V48- .



- Turn left headlight range control motor -V48- -1- in direction of -arrow- to stop and pull it slightly backwards out of mounting -2-.



- Tilt left headlight range control motor -V48- -1- so that ball head -3- can be swivelled downwards out of the head mounting -2-.
- Take left headlight range control motor -V48- out of headlight housing.



Installing

Carry out installation in the reverse sequence, noting the following:

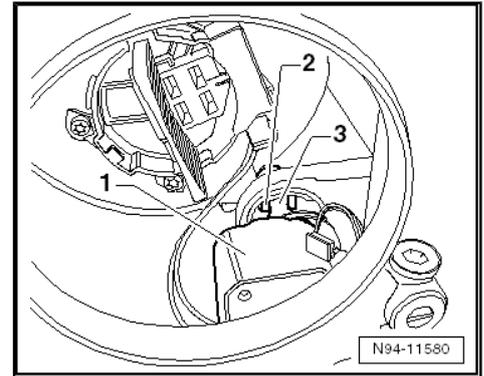
- Install left headlight range control motor -V48- into headlight.
- Reconnect connector.



- Carefully swivel ball head -3- from below in ball head mounting -2-.
- Lock left headlight range control motor -V48- -1- by turning it anti-clockwise to stop.

Caution

When installing cover cap, ensure cap is seated correctly. The ingress of water will lead to permanent damage to the headlight.



- Check headlight functions.
- Adjust headlights.
- Check headlight settings and adjust headlights if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .

2.6.2 Removing and installing (Valeo)

Note

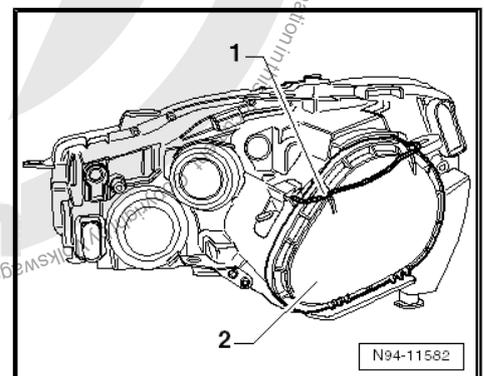
- ◆ *If control motors are removed and reinstalled or renewed, the headlight adjustment must be checked and the headlights adjusted ⇒ Maintenance ; Booklet 20.1 ; Description of work .*
- ◆ *The illustrations show the renewal of the headlight range control motor -V49- on the right headlight.*
- ◆ *The renewal of the left headlight range control motor -V48- for the left headlight is carried out in the same way.*

Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

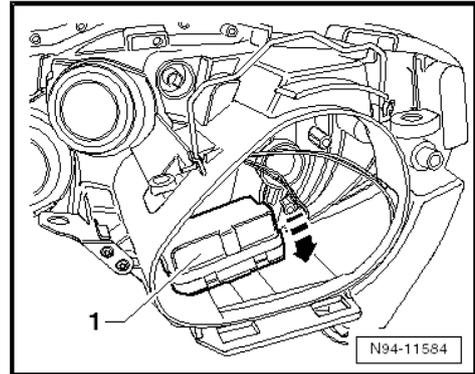
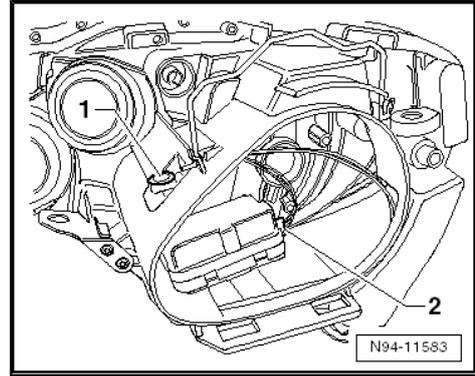
Removing

- Remove headlight → [page 215](#) .
- Pull clip -1- upwards and remove cover cap -2- from rear of headlight.





- Turn adjuster screw -1- for vertical adjustment of dipped beam headlight completely in the following direction:
 - ◆ Left headlight - anti-clockwise
 - ◆ Right headlight - clockwise
- Then lift adjuster screw -1- slightly with a suitable screwdriver and pull it upwards out of headlight housing.
- Disconnect connector -2- from right headlight range control motor -V49- .
- Swivel right headlight range control motor -V49- -1- to unlock in direction of -arrow- to stop.

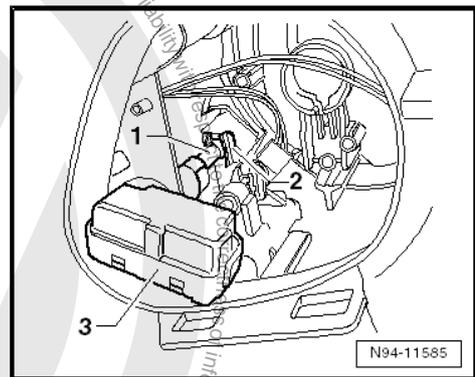
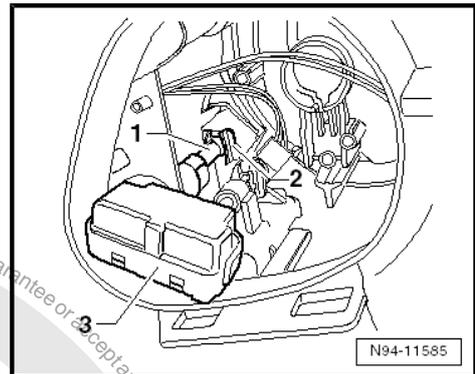


- Tilt right headlight range control motor -V49- -3- so that ball head -1- can be swivelled upwards out of ball head mounting -2-.
- Take right headlight range control motor -V49- out of headlight housing.

Installing

Carry out installation in the reverse sequence, noting the following:

- Install right headlight range control motor -V49- into headlight.
- Reconnect connector.
- Carefully swivel ball head -1- from above in ball head mounting -2-.
- Lock right headlight range control motor -V49- -3- by turning it anti-clockwise to stop.



Note

When inserting adjuster screw for vertical adjustment of dipped beam headlight, ensure that O-ring is present and in the right position.

- Insert adjuster screw for vertical adjustment of dipped beam headlight in headlight housing again.



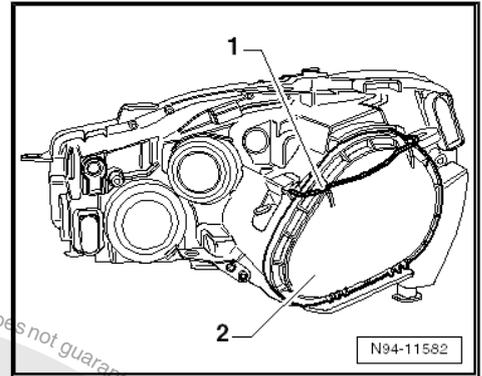
Caution

When installing cover cap, ensure cap is seated correctly. The ingress of water will lead to permanent damage to the headlight.





- Fit cover cap -2- and secure it with strap -1-.
- Check headlight functions.
- Adjust headlights.
- Check headlight settings and adjust headlights if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .

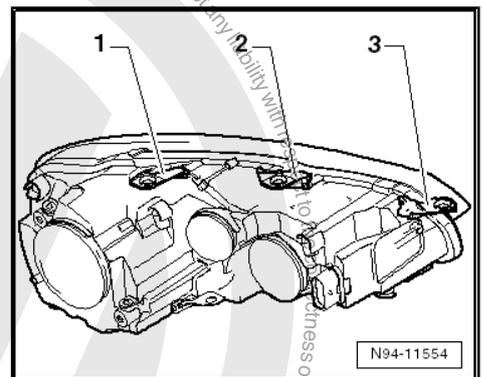


2.7 Repairing headlight securing tabs

If one or more headlight retaining tabs are damaged or broken off, they can be renewed by installing the repair kit. There is no need to renew the entire headlight.

Overview of installation locations of repair tabs

- 1 - Outer repair tab
- 2 - Centre repair tab
- 3 - Inner repair tab



Note

- ◆ Check that there is no further damage to the headlight that would make installation of the repair kit unnecessary.
- ◆ Two different repair kits are available for the left and right headlights ⇒ ETKA (electronic parts catalogue) .
- ◆ Each repair kit includes the outer, the centre and the inner headlight retaining tab and the associated bolts/screws.
- ◆ The following illustrations show the repair of the retaining tabs on the right headlight. Repairs on the right headlight are carried out in the same way.

Repairing outer retaining tab ⇒ [page 251](#) .

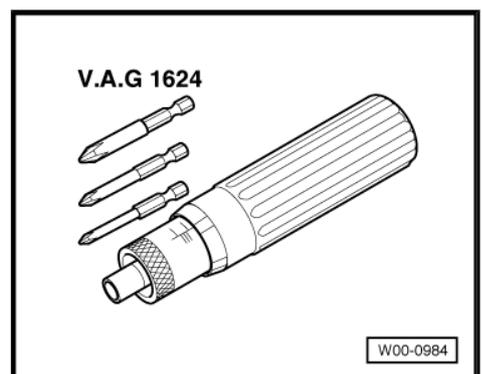
Repairing centre retaining tab ⇒ [page 252](#) .

Repairing inner retaining tab ⇒ [page 253](#) .

2.7.1 Repairing outer retaining tab

Special tools and workshop equipment required

- ◆ Torque screwdriver -V.A.G 1624-



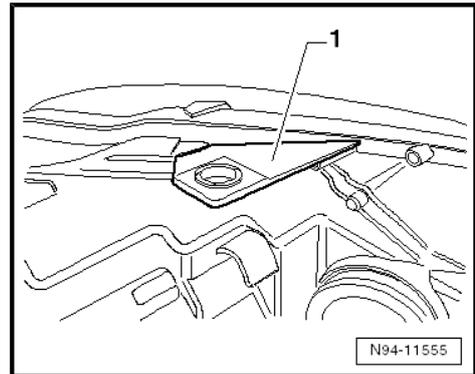


Caution

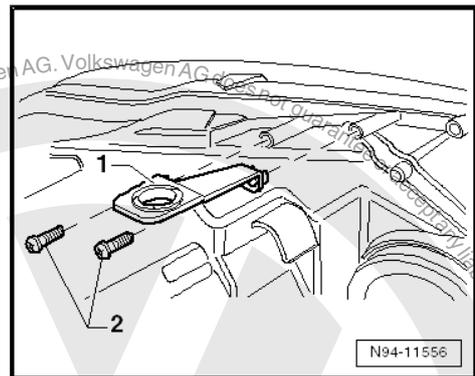
- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

Procedure

- Remove headlight ⇒ [page 215](#) .
- Remove remains of old headlight retaining tab -1-.



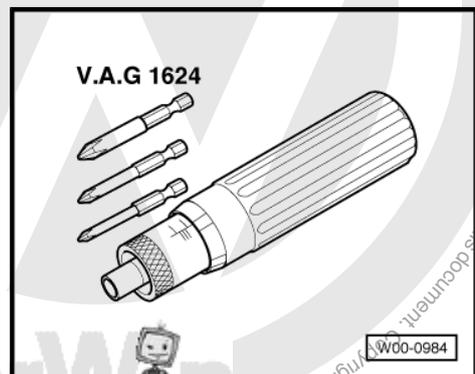
- Form-fit new retaining tab -1- on base of retaining tab at headlight and tighten bolt -2- to 1.0 Nm.
- Install headlight ⇒ [page 215](#) .
- Check headlight settings and adjust headlights if necessary ⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .



2.7.2 Repairing centre retaining tab

Special tools and workshop equipment required

- ◆ Torque screwdriver -V.A.G 1624-



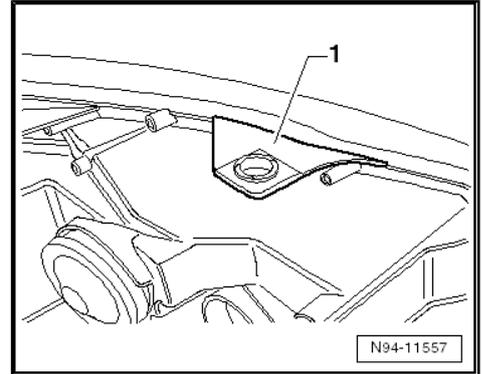
Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

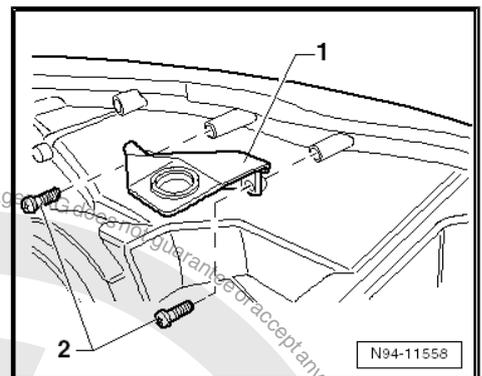


Procedure

- Remove headlight ⇒ [page 215](#) .
- Remove remains of old headlight retaining tab -1-.



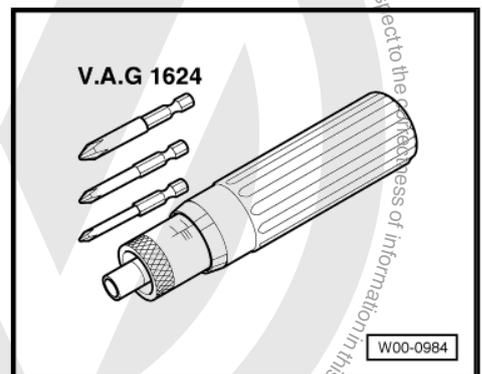
- Form-fit new retaining tab -1- on base of retaining tab at headlight and tighten bolt -2- to 1.0 Nm.
- Install headlight ⇒ [page 215](#) .
- Check headlight settings and adjust headlights if necessary ⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .



2.7.3 Repairing inner retaining tab

Special tools and workshop equipment required

- ◆ Torque screwdriver -V.A.G 1624-



Caution

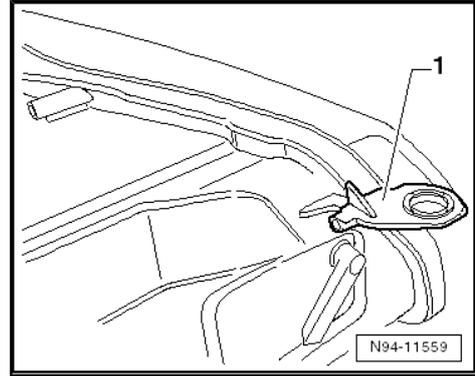
- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

Procedure

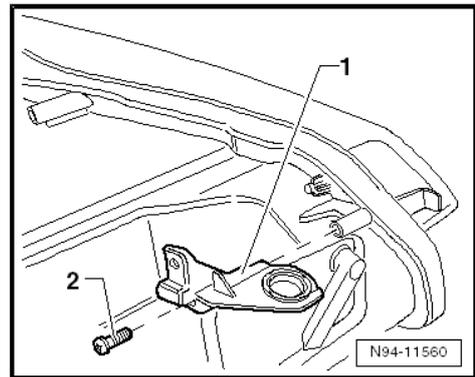
- Remove headlight ⇒ [page 215](#) .



- Remove remains of old headlight retaining tab -1-.



- Form-fit new retaining tab -1- on base of retaining tab at headlight and tighten bolt -2- to 1.0 Nm.
- Install headlight => [page 215](#) .
- Check headlight settings and adjust headlights if necessary
=> Maintenance ; Booklet 20.1 ; Descriptions of work .



2.8 Converting headlights for use when driving on the left or right



Note

- ◆ *To avoid dazzling oncoming traffic with asymmetrical lights, both headlights should be converted to the direction of traffic (driving on the left or right) relevant to the country in which the vehicle is being driven.*
- ◆ *The corresponding headlight conversion set consists of two sections of film.*
- ◆ *Conversion of the headlights is not designed as a permanent conversion for other countries. It is only suitable as a „tourist solution“ for a short stay abroad.*
- ◆ *Both headlights of a vehicle must always be converted.*
- ◆ *The details „right“ and „left“ on the masking film always refer to the direction of travel when looking forwards from inside the vehicle.*



2.8.1 Converting headlights designed for driving on the right to driving on the left



Note

- ◆ The headlight conversion set comprises two pieces of film.
- ◆ Please note the different part numbers for the headlight conversion sets from right to left-hand traffic and from left to right-hand traffic.
- ◆ Clean headlight lens before converting.
- ◆ After pulling off adhesive film from headlight lens, remove residual adhesive from headlight lens.

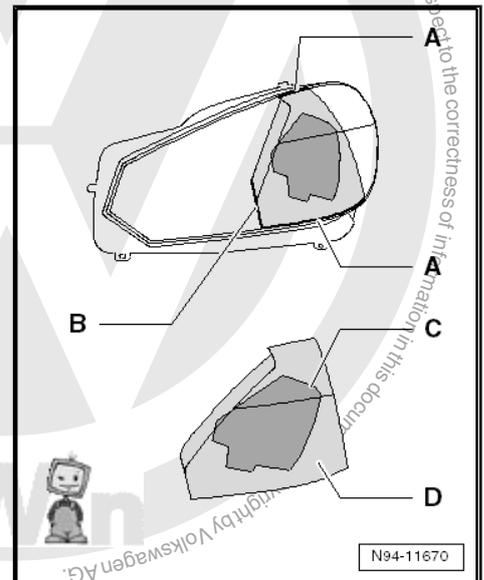
Procedure

- Turn light switch to position „0“.
- Clean headlight lens.

Left headlight:

- Remove protective film on back of assembly film -D- in area -C- only.
- Align top and bottom of assembly film -D- with upper and lower edge -A- of headlight lens.
- Align assembly film -D- simultaneously with line -B- on line of headlight lens.
- Push down in area -C- on headlight lens.
- Carefully pull assembly film -D- off headlight lens again.
- Masking film -C- remains on headlight lens.

Right headlight:



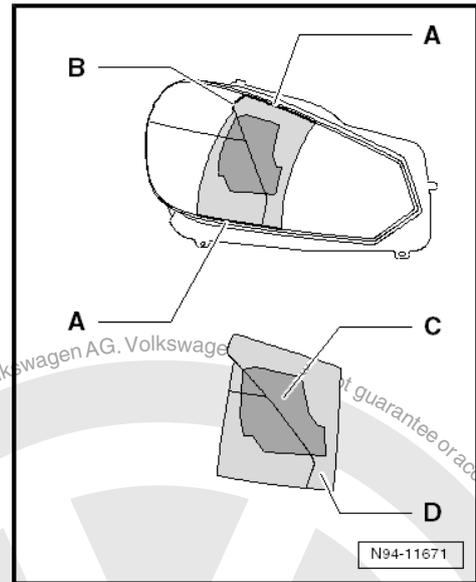


- Remove protective film on back of assembly film -D- in area -C- only.
- Align top and bottom of assembly film -D- with upper and lower edge -A- of headlight lens.
- Align assembly film -D- simultaneously with line -B- on line of headlight lens.
- Push down in area -C- on headlight lens.
- Carefully pull assembly film -D- off headlight lens again.
- Masking film -C- remains on headlight lens.



Note

- ◆ Remove any remaining adhesive using alcohol-based or alcohol and water-based cleaning fluid. For example a cloth soaked with isopropyl alcohol.
- ◆ Customers should be informed of how to remove residual adhesive after detaching the masking section.



2.8.2 Converting headlights designed for driving on the left to driving on the right



Note

- ◆ The headlight conversion set comprises two pieces of film.
- ◆ Please note the different part numbers for the headlight conversion sets from right to left-hand traffic and from left to right-hand traffic.
- ◆ Clean headlight lens before converting.
- ◆ After pulling off adhesive film from headlight lens, remove residual adhesive from headlight lens.

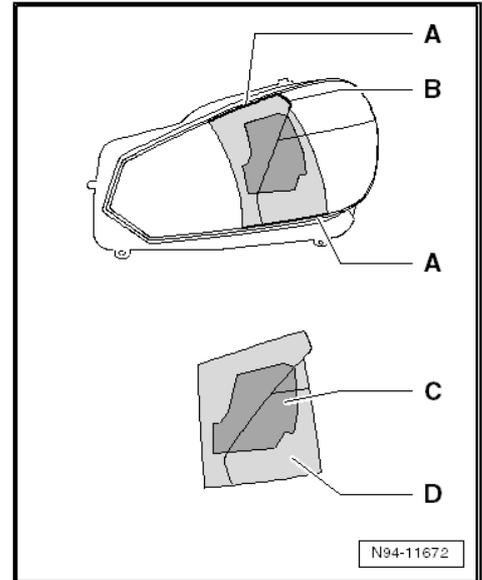
Procedure

- Turn light switch to position „0“.
- Clean headlight lens.



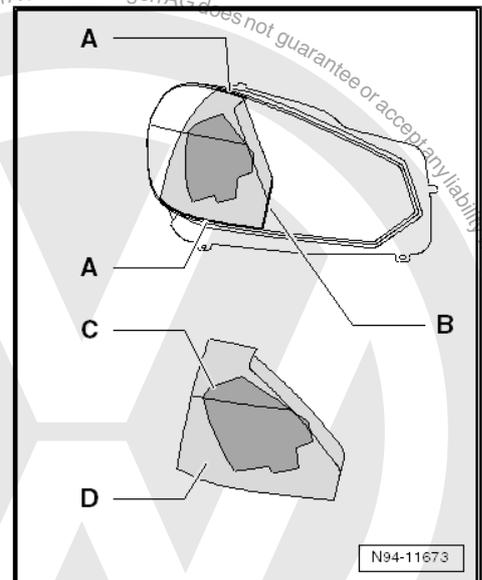
Left headlight:

- Remove protective film on back of assembly film -D- in area -C- only.
- Align top and bottom of assembly film -D- with upper and lower edge -A- of headlight lens.
- Align assembly film -D- simultaneously with line -B- on line of headlight lens.
- Push down in area -C- on headlight lens.
- Carefully pull assembly film -D- off headlight lens again.
- Masking film -C- remains on headlight lens.



Right headlight:

- Remove protective film on back of assembly film -D- in area -C- only.
- Align top and bottom of assembly film -D- with upper and lower edge -A- of headlight lens.
- Align assembly film -D- simultaneously with line -B- on line of headlight lens.
- Push down in area -C- on headlight lens.
- Carefully pull assembly film -D- off headlight lens again.
- Masking film -C- remains on headlight lens.



Note

- ◆ Remove any remaining adhesive using alcohol-based or alcohol and water-based cleaning fluid. For example a cloth soaked with isopropyl alcohol.
- ◆ Customers should be informed of how to remove residual adhesive after detaching the masking section.

2.9 Adjusting headlights

Adjust headlight with halogen bulbs ⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .





3 Headlights with gas discharge bulbs (up to MY2009)



Note

- ◆ *Before working on headlights with gas discharge bulbs, always switch off headlights and remove ignition key.*
- ◆ *The automatic headlight range control on headlights with gas discharge bulbs is equipped with self-diagnosis.*
- ◆ *When dealing with complaints, it is absolutely necessary to understand the functions and the operation of the lighting system ⇒ Operating instructions .*
- ◆ *Additional information ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*

Fault detection and fault display

Automatic headlight range control and onboard supply control unit -J519- are equipped with self-diagnosis.

For fault finding, use vehicle diagnosis, testing and information system -VAS 5051B- in „Guided fault finding“ mode.

3.1 Operation and safety notes for gas discharge bulbs



WARNING

- ◆ *Never change bulbs if you are not familiar with the appropriate procedures, safety precautions and tools.*

- If repairs are to be made to the headlights with gas discharge bulbs, observe the following:
 - ◆ Notes on dangerous high voltage/currents ⇒ [page 258](#)
 - ◆ Notes on pressure/temperature/radiation/arcs ⇒ [page 259](#)
 - ◆ Assembly notes for gas discharge bulbs ⇒ [page 260](#)
 - ◆ Disposal regulations for gas discharge bulbs ⇒ [page 260](#)

Special tools and workshop equipment required

- ◆ Safety goggles
- ◆ Gloves

Notes on dangerous high voltage/currents



WARNING

Control units for light systems, connectors and components pertaining to bulb holders conduct lethally high voltage.

Operating the control unit and the starter unit is permitted only with the bulb fitted.



WARNING

- **Switch off ignition and all electrical consumers and remove ignition key.**
- **When working on headlight system, ensure that there is no voltage in any components, including the dissipation of residual voltage after the headlights are switched off.**
- **Residual voltage can be dissipated by turning the dipped beams on and then off again after withdrawing the ignition key.**
- **When working on the headlight system, ensure that the lights cannot be switched on.**

Notes on pressure/temperature/radiation/arcs



WARNING

- ◆ **Within the glass envelope of a gas discharge bulb, pressure can range from between 7 bar (cold) and 100 bar (hot). Temperatures can reach up to 700 degrees Celsius on the glass bulb.**
- ◆ **Should the glass envelope explode, there is a risk of injury from burning.**
- ◆ **Always wear safety goggles and gloves when removing and installing gas discharge bulbs!**



WARNING

- **The bulbs may be operated in the headlight housing only (protection against contact due to very hot bulbs, absorption of UV radiation, avoidance of dazzling light, protection against explosion).**
- **The glass envelope of the bulbs can be very hot - danger of burns!**
- **Avoid looking directly into the beam, as the UV rays from the gas discharge bulb are about 2.5 times greater than normal halogen bulbs.**
- **Avoid looking into the light beam (danger of glare); vision may be impaired for a substantial time.**



WARNING

- **Avoid contact with burst glass envelopes.**
- **H7 bulbs and gas discharge bulbs (xenon and bi-xenon) are under pressure and can explode while being changed - danger of injury.**
- **Always wear safety goggles and gloves when removing and installing gas discharge bulbs!**



Repair notes for gas discharge bulbs



Caution

- ◆ *Before renewing a bulb, always switch off the concerned electrical consumer.*
- ◆ *Switch off ignition and all electrical consumers and remove ignition key.*
- ◆ *Do not touch the glass envelope with bare fingers; use a clean cloth glove. When the light bulb is switched on, the heat would vaporise the oil of the finger prints which would then settle on the reflector, impairing the brightness of the headlight.*
- ◆ *A light bulb must always be renewed with a bulb of the same sort. The designation appears on the base of the bulb or on the glass envelope.*
- ◆ *Properly engage connector during installation and ensure tight seating of the connection.*

Disposal regulations for gas discharge bulbs



WARNING

- *Gas discharge bulbs must be disposed of as hazardous waste; never dispose of gas discharge bulbs via household waste system.*
- *Gas discharge bulbs contain metallic mercury (Hg) and traces of thallium; never destroy these bulbs.*
- *These components must be recycled in the correct manner according to national law.*
- *Only dispose of in containers intended for this purpose at an authorised collection point.*





3.2 Assembly overview

Note

After any measures which could affect the headlight setting, the headlight setting must be checked and the headlights adjusted ⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .

1 - Vent hose

- On headlight

2 - Left headlight range control motor -V48- / right headlight range control motor -V49-

- Manufacturer AL (Automotive Lighting)

3 - Bolt

- 2 Nm

4 - Cover cap

5 - Starter unit for gas discharge bulbs -N195-

6 - Bulb retainer

7 - Left gas discharge (xenon) bulb -L13- / right gas discharge (xenon) bulb -L14-

- Type: D2S 35 W
- Notes on safety ⇒ [page 258](#)
- Renewing ⇒ [page 262](#)

8 - Bolt

- 4 Nm

9 - Headlight

- Removing and installing ⇒ [page 215](#)
- Adjusting headlight installation position ⇒ [page 217](#)
- Repairing headlight securing tabs ⇒ [page 276](#)
- Converting for driving on left/right ⇒ [page 277](#)

10 - Control unit for headlight range control -J431-

- Removing and installing ⇒ [page 272](#)
- Coding ⇒ [page 274](#)

11 - Front left vehicle level sender -G78-

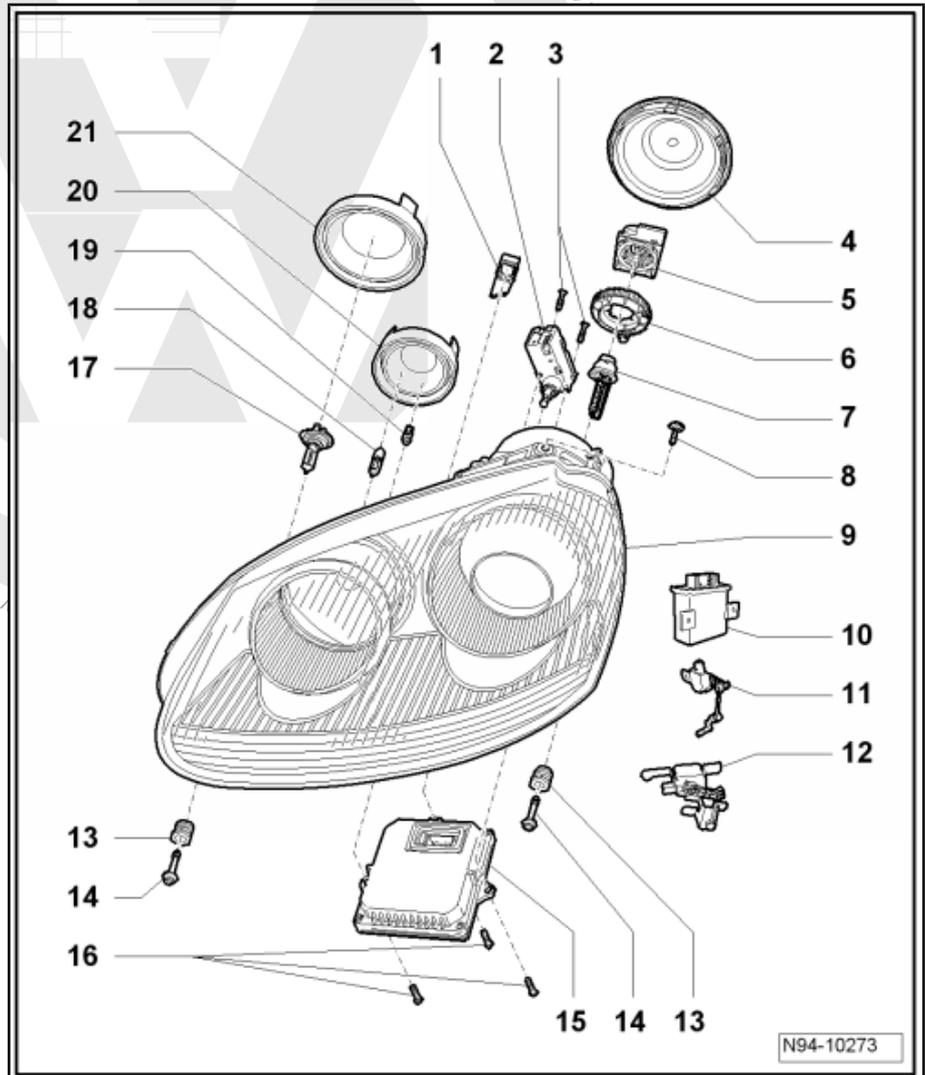
- Removing and installing ⇒ [page 275](#)
- Checking ⇒ [page 275](#)

12 - Rear left vehicle level sender -G76-

- Removing and installing ⇒ [page 275](#)
- Checking ⇒ [page 275](#)

13 - Adjustment bush

- Adjusting headlight installation position ⇒ [page 217](#)





14 - Bolt

- 4 Nm

15 - Left gas discharge bulb control unit -J343- / right gas discharge bulb control unit -J344-

- Not capable of self-diagnosis
- Removing and installing ⇒ [page 271](#)

16 - Bolt

- 2 Nm

17 - Left headlight main beam bulb -M30- / right headlight main beam bulb -M32-

- Bulb: H7U 12 V/55 W
- Renewing ⇒ [page 264](#)

18 - Front left turn signal bulb -M5- / front right turn signal bulb -M7-

- Bulb: H2 WLL 12 V/21 W
- Renewing ⇒ [page 267](#)

19 - Left side light bulb -M1- / right side light bulb -M3-

- Bulb: W 12 V/5 W
- Renewing ⇒ [page 266](#)

20 - Cover cap

21 - Cover cap

3.3 Removing and installing headlight

Removing and installing headlights ⇒ [page 215](#) .

Observe safety notes for gas discharge bulbs ⇒ [page 258](#) .

3.4 Adjusting headlight installation position

Adjusting headlight installation position ⇒ [page 217](#) .

3.5 Renewing bulbs

3.5.1 Renewing gas discharge bulb



Note

The diagrams show renewal of left gas discharge (xenon) bulb - L13- for the left headlight.



Caution

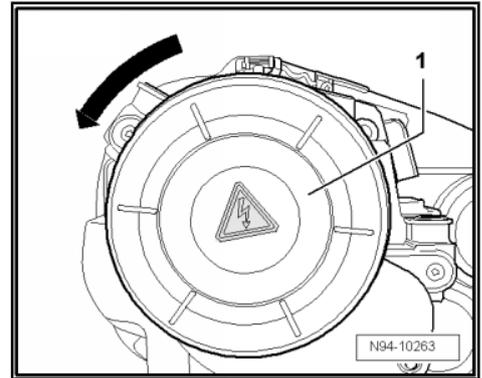
- ◆ Switch off ignition and all electrical consumers.
- ◆ Remove the ignition key.
- ◆ Observe safety notes for gas discharge bulbs ⇒ [page 258](#) .

Removing

- Remove headlight ⇒ [page 262](#) .



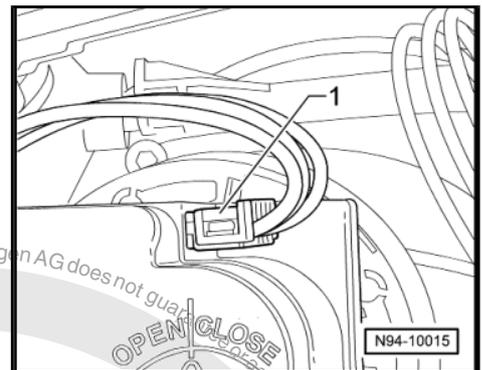
- Turn cover cap -1- in -direction of arrow- and remove.



- Pull off connector -1-.

i Note

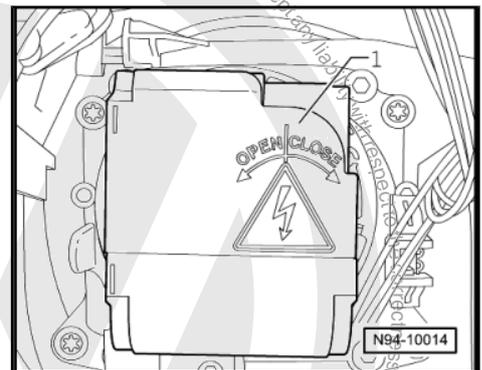
The connector is ejected automatically when the gas discharge bulb starter unit -N195- is removed.



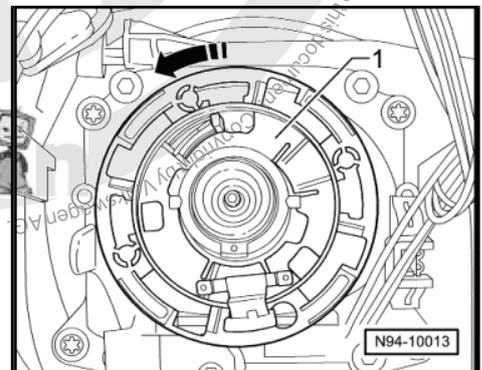
- Turn gas discharge light starter unit -N195- -1- in direction of lettering „OPEN“ and pull gas discharge light starter unit -N195- off headlight.

! WARNING

- ◆ *In the bulb glass of the left gas discharge bulb -L13-, pressures can range from between 7 bar (cold) and 100 bar (hot). Temperatures can reach up to 700 degrees Celsius on the glass bulb.*
- ◆ *Should the glass envelope explode, there is a risk of injury from burning.*
- ◆ *Always wear safety goggles and gloves when removing and installing left gas discharge (xenon) bulb -L13- .*



- Turn bulb retainer -1- in direction of -arrow- and remove bulb retainer.





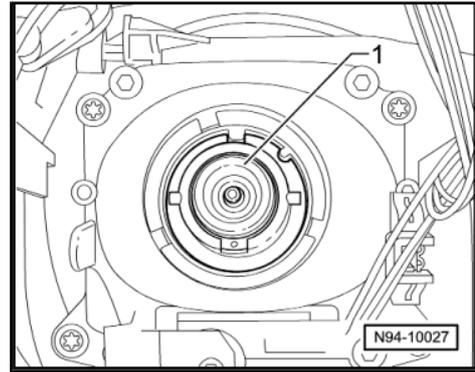
- Carefully pull left gas discharge (xenon) bulb -L13- -1- out of mounting.

Installing



Caution

- ◆ *Do not touch glass envelope when fitting right gas discharge (xenon) bulb -L13-. Fingers leave traces of grease on the glass envelope, which evaporate when the left gas discharge (xenon) bulb -L13- is switched on and cause the glass envelope to cloud over.*
- ◆ *Ensure glass envelope of left gas discharge (xenon) bulb -L13- is not stressed mechanically. The glass envelope is extremely sensitive and is also under a high internal pressure.*
- ◆ *Avoid looking directly into the collimated beam as the UV radiation from the left gas discharge (xenon) bulb -L13- is about 2.5 times higher than from normal halogen bulbs.*
- ◆ *When installing cover cap, ensure that it seats properly. The ingress of water will lead to permanent damage to the headlight.*



Carry out installation in the reverse sequence, noting the following:

- Check headlight functions.
- Check headlight settings and adjust headlights if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .

If a headlight with automatic range control is removed, the basic setting of the headlights is always to be checked after installation
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .

3.5.2 Renewing headlight main beam bulb



Note

The following diagrams show renewal of the left headlight main beam bulb -M30- for the left headlight.



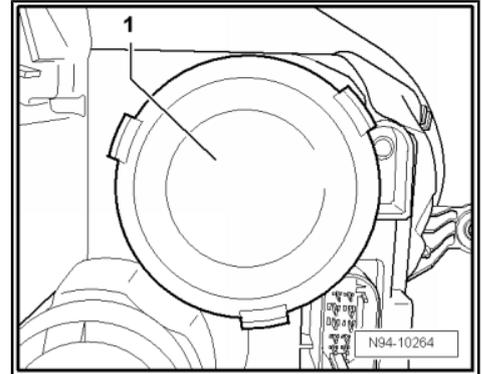
Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

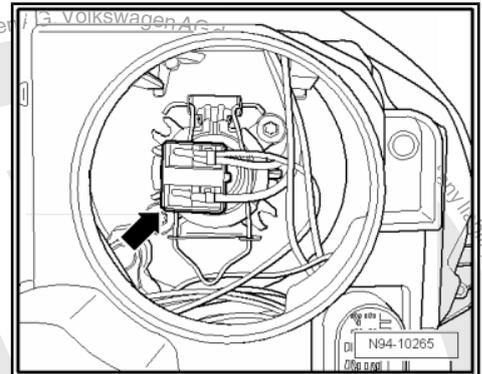


Removing

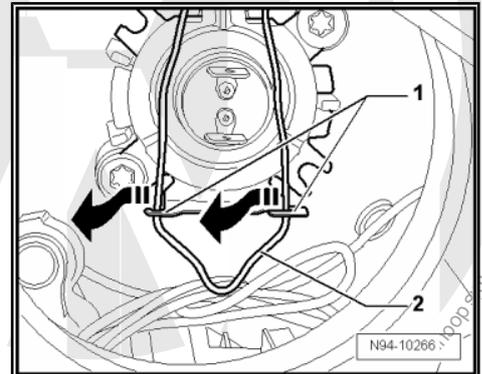
- Remove cover cap -1-.



- Pull off connector -arrow-.



- Push retaining clip -2- in -direction of arrow- under locking lugs -1- and lift up retaining clip -2-.



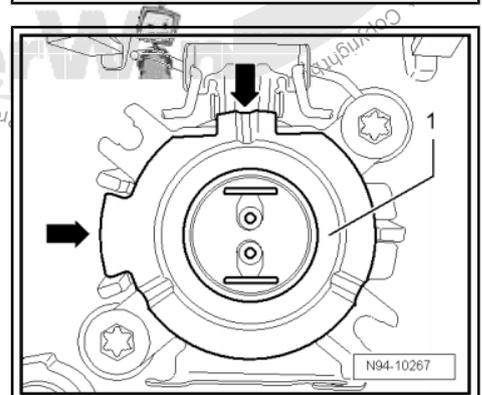
- Take left headlight main beam bulb -M30- -1- out of headlight.

Installing



Caution

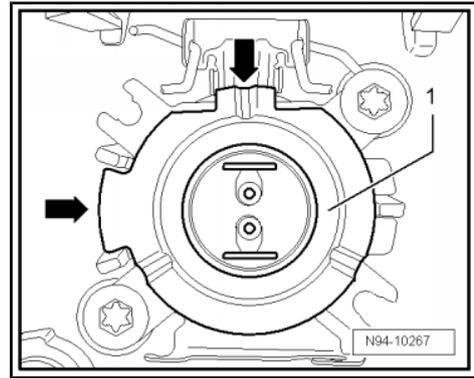
- ◆ *Do not touch glass envelope when fitting bulb. Fingers leave traces of grease on the glass envelope, which evaporate when the bulb is switched on and cause the glass envelope to cloud over.*
- ◆ *When installing cover cap, ensure that it seats properly. The ingress of water will lead to permanent damage to the headlight.*



Carry out installation in the reverse sequence, noting the following:



- Place left headlight main beam bulb -M30- -1- in recesses -arrows- of headlight.
- Check headlight functions.
- Check headlight settings and adjust headlights if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .



3.5.3 Renewing side light bulb



Note

The following diagrams show renewal of the left side light bulb -M1- of the left headlight.

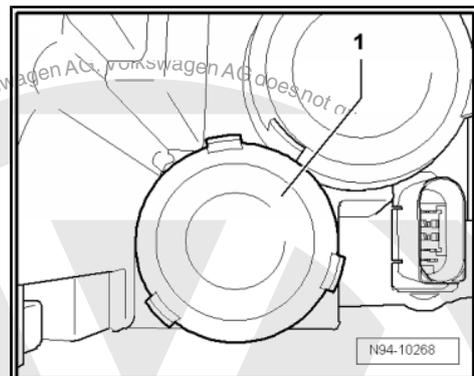


Caution

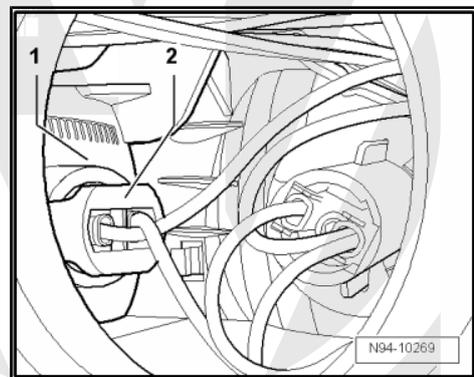
- ◆ Switch off ignition and all electrical consumers.
- ◆ Remove the ignition key.

Removing

- Remove cover cap -1-.



- Pull bulb holder -2- with left side light bulb -M1- out of reflector -1- (be careful not to stretch wiring).





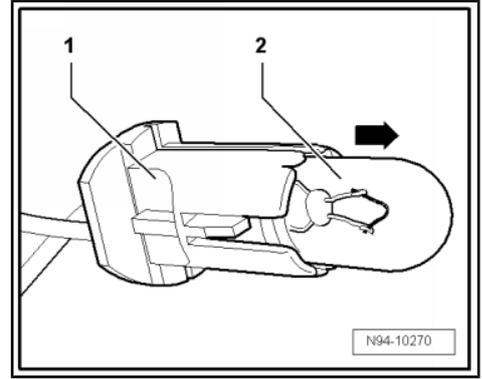
- Pull left side light bulb -M1- -2- in -direction of arrow- out of bulb holder -1-.

Installing



Caution

- ◆ *Do not touch glass envelope when fitting bulb. Fingers leave traces of grease on the glass envelope, which evaporate when the bulb is switched on and cause the glass envelope to cloud over.*
- ◆ *When installing cover cap, ensure that it seats properly. The ingress of water will lead to permanent damage to the headlight.*



Carry out installation in the reverse sequence, noting the following:

- Check headlight functions.
- Check headlight settings and adjust headlights if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .

3.5.4 Renewing front turn signal bulb



Note

The following diagrams show the renewal of the front left turn signal bulb -M5- for the left headlight.

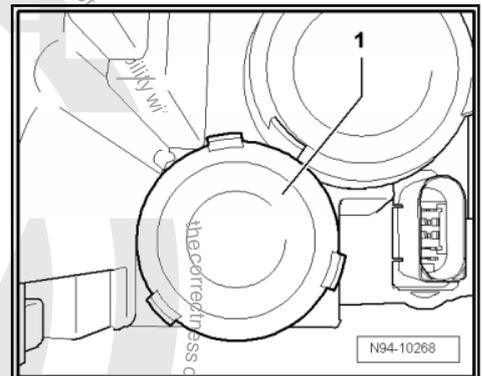


Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

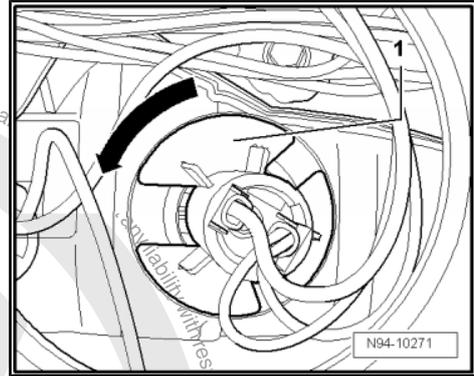
Removing

- Remove cover cap -1-.

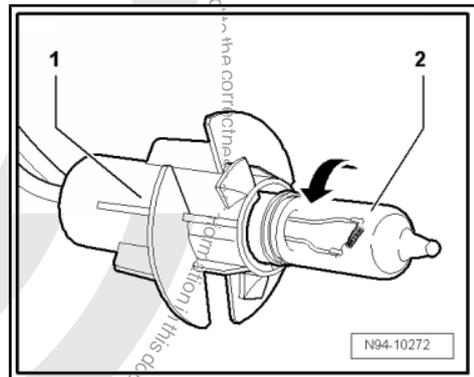




- Turn bulb holder -1- with front left turn signal bulb -M5- in -direction of arrow- and remove from reflector (be careful not to stretch wiring).



- Push front left turn signal bulb -M5- -2- down in bulb holder -1- and turn front left turn signal bulb -M5- -2- in -direction of arrow-.
- Pull front left turn signal bulb -M5- -2- out of bulb holder -1-.



Installing



Caution

- ◆ *When installing cover cap, ensure that it seats properly. The ingress of water will lead to permanent damage to the headlight.*
- ◆ *Do not touch glass envelope when fitting bulb. Fingers leave traces of grease on the glass envelope, which evaporate when the bulb is switched on and cause the glass envelope to cloud over.*

Carry out installation in the reverse sequence, noting the following:

- Check headlight functions.
- Check headlight settings and adjust headlights if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .

3.6 Removing and installing headlight range control motor



Note

- ◆ *If control motors are removed and reinstalled or renewed, the headlight adjustment must be checked and the headlights adjusted ⇒ Maintenance ; Booklet 20.1 ; Description of work .*
- ◆ *The illustrations show the renewal of the left headlight range control motor -V48- for the left headlight.*



Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

Removing

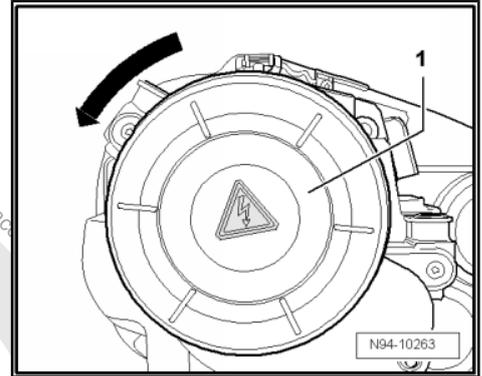
- Remove headlight ⇒ [page 262](#) .



- Turn cover cap -1- in -direction of arrow- and remove.

i Note

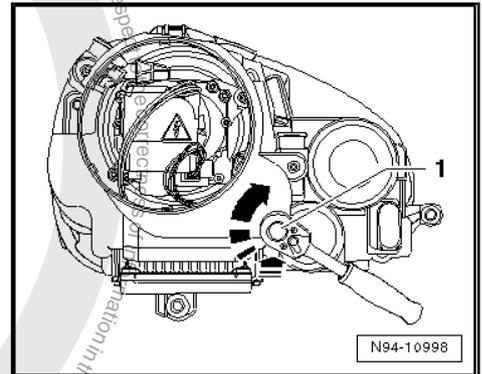
To gain access to the second bolt of the left headlight range control motor -V48- , break open the assembly opening at the predetermined breaking point on the back of the headlight housing. This opening must be sealed on completion of repairs with separately available sealing plug.



- Fit a socket -1- on the plastic hexagon on the back of the headlight housing.
- Press and turn the plastic hexagon out of the headlight housing to break open the assembly opening.

i Note

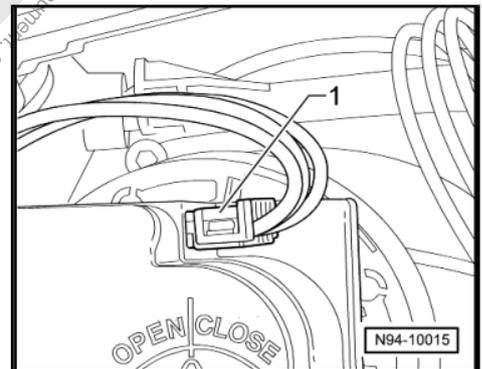
The broken open sealing piece must not remain in the headlight. Remove it from the headlight housing.



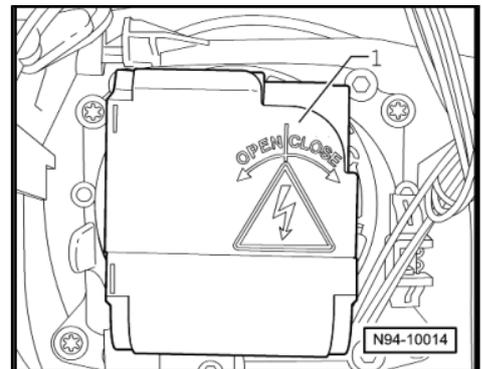
- Turn gas discharge light starter unit -N195- -1- in direction of starter unit lettering „OPEN“ onto stop.

i Note

Connector -1- is automatically ejected when the igniter for gas discharge lamps -N195- is turned in direction of „OPEN“ onto stop.

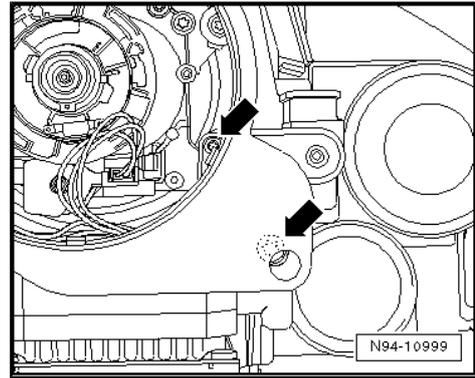


- Pull off gas discharge light starter unit -N195- straight backwards from headlight

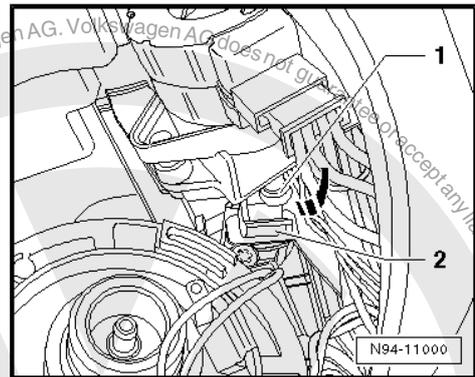




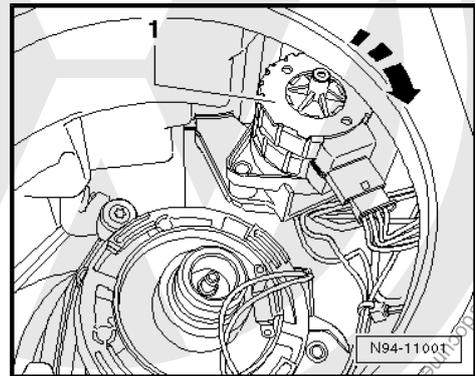
- Remove both bolts -arrows- for headlight range control unit .



- Lift dipped beam reflector in headlight slightly and turn the left headlight range control motor -V48- so that the ball head -1- can be slid out of the ball head mounting -2- in -direction of arrow-.



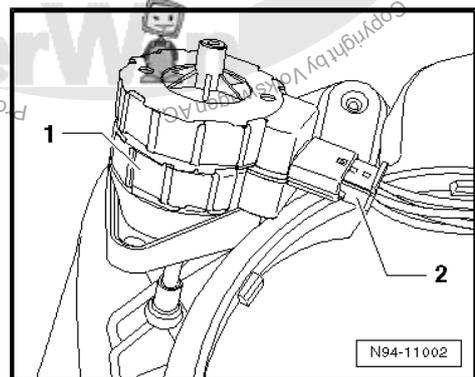
- Lower the reflector in the headlight again, lift the left headlight range control motor -V48- -1- slightly and turn it in -direction of arrow-.
- Take the left headlight range control motor -V48- out of the headlight housing as far as the connected wiring allows.



- Disconnect connection -2- and remove left headlight range control motor -V48- -1-.

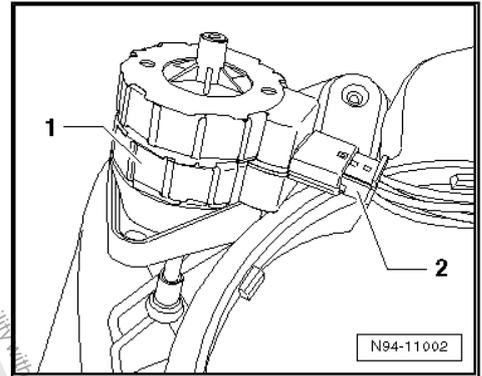
Installing

Carry out installation in the reverse sequence, noting the following:

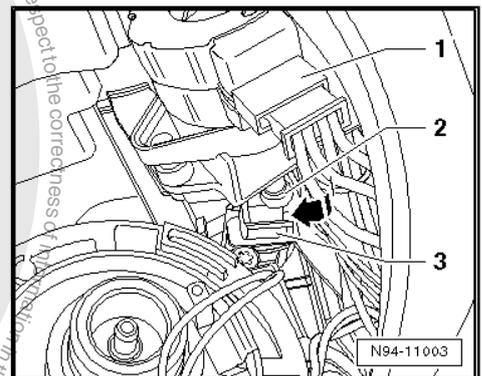




- Reconnect connector -2- on headlight range control motor -1-.

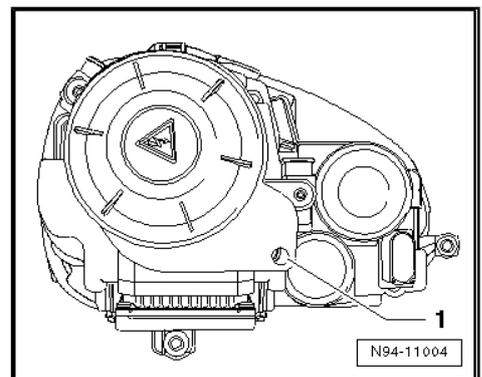


- Insert left headlight range control motor -V48- -1- in headlight in position as shown in illustration.
- Lift dipped beam reflector in headlight slightly and turn the ball head -2- of the left headlight range control motor -V48- so that it can be pushed into the ball head mounting -3- in -direction of arrow-.
- Screw in both bolts for left headlight range control motor - V48- .



Caution
 When installing cap, ensure that it seats properly. The ingress of water will lead to permanent damage to the headlight.

- Tighten all threaded connections to specified torques
 => [page 261](#)
- Install gas discharge light starter unit -N195- and screw on the cap.
- Seal the broken-open assembly openings -1- using a separately ordered sealing plug => ETKA (electronic parts catalogue) .
- Check headlight functions.
- Check headlight settings and adjust headlights if necessary
 => Maintenance ; Booklet 20.1 ; Descriptions of work .



3.7 Removing and installing gas discharge light control unit

Note

- ◆ Left gas discharge bulb control unit -J343- / right gas discharge bulb control unit -J344- is not capable of self-diagnosis.
- ◆ The illustrations show renewal of the left gas discharge bulb control unit -J343- on the left-hand headlight.



Caution

- ◆ Switch off ignition and all electrical consumers.
- ◆ Remove the ignition key.

Removing

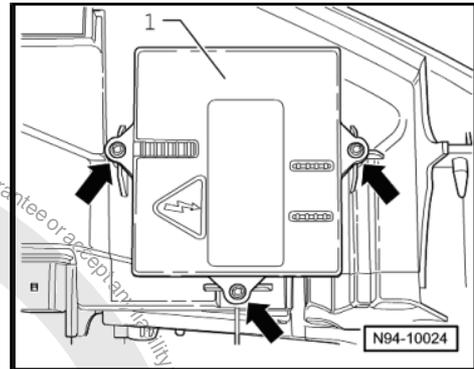
- Remove headlight ⇒ [page 262](#) .
- Unscrew bolts -arrows- of left gas discharge bulb control unit -J343- -1-.



Note

For removal of the left gas discharge bulb control unit -J343- , there is no need to remove any connectors. The connector is fixed on the headlight and is automatically separated when the left gas discharge bulb control unit -J343- is removed.

- Remove left gas discharge bulb control unit -J343- -1- from headlight.



Installing



Caution

Ensure that the seal is seated correctly when installing the left gas discharge bulb control unit -J343- . The ingress of water will lead to permanent damage to the headlight.

Carry out installation in the reverse sequence, noting the following:

- Tighten all threaded connections to specified torques ⇒ [page 261](#)
- Check headlight functions.
- Carry out headlight basic setting ⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .

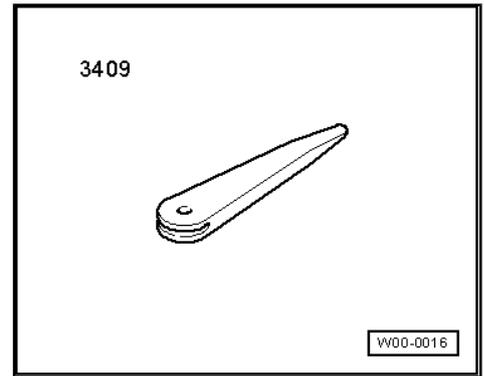
3.8 Control unit for headlight range control - J431-

3.8.1 Removing and installing control unit for headlight range control -J431-

Special tools and workshop equipment required



◆ Removal wedge -VAS 3409-

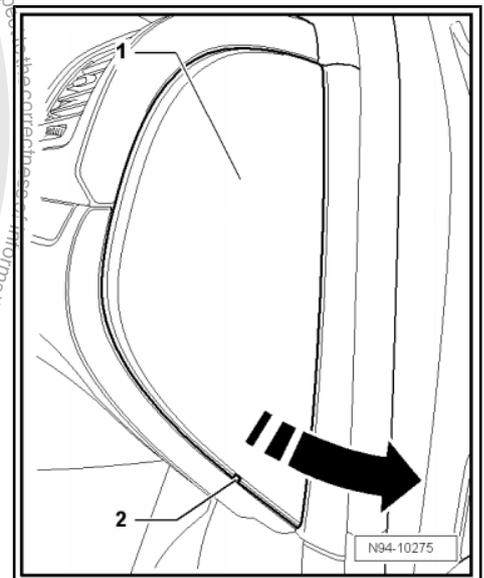


Caution

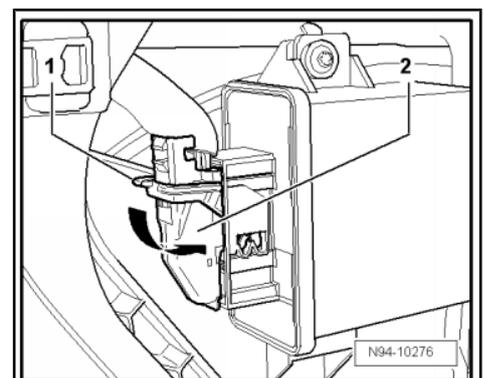
- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**
- ◆ **When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.**

Removing

- Remove side cover -1- of dash panel by inserting removal wedge -VAS 3409- or a suitable screwdriver in recess -2- and levering off side cover -1- in direction of -arrow-.



- Release retaining clip -1- in direction -arrow- and pull connector -2- off control unit for headlight range control -J431- .





- Unscrew bolt -arrow- and take control unit for headlight range control -J431- -1- off bracket -2-.

Installing

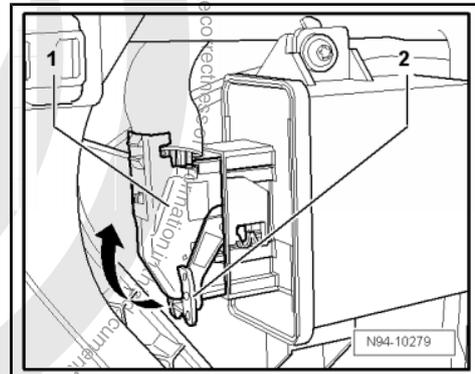
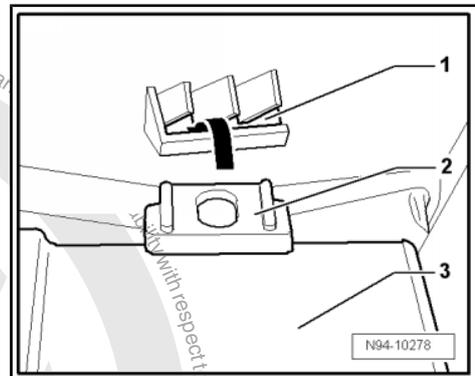
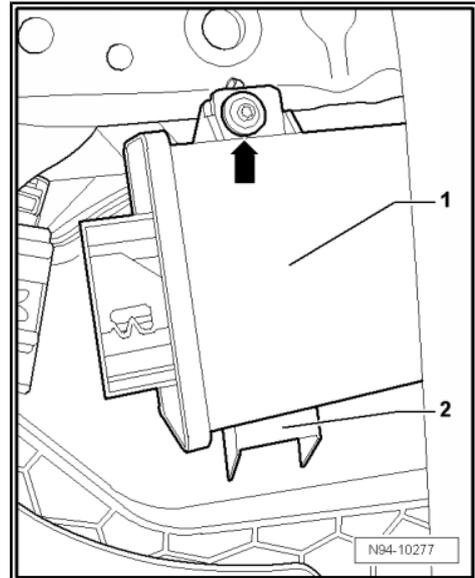
Carry out installation in the reverse sequence, noting the following:

- Place control unit for headlight range control -J431- -3- with locking lug -2- in bracket -1-

- Lock the connector -1- by pressing retaining clip -2- in direction of -arrow-.

- Tighten all threaded connections to specified torques
⇒ [page 261](#) .

After installing a new headlight range control control unit -J431- , the control unit must be coded ⇒ [page 274](#) .

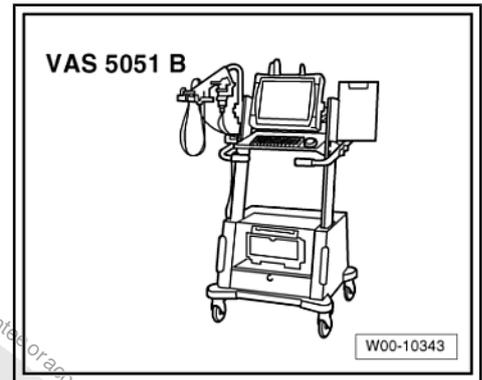


3.8.2 Coding control unit for headlight range control -J431-

Special tools and workshop equipment required



- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system -VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On-Board Diagnosis capable systems
 - ◆ Automatic headlight range control
 - ◆ Automatic headlight range control functions
 - ◆ Coding automatic headlight range control

Once the control unit for headlight range control -J431- has been coded, a headlight basic setting must be carried out ⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .

3.9 Vehicle level sender

There is a front left vehicle level sender -G78- located on the front axle and a rear left vehicle level sender -G76- on the rear axle.

If front left vehicle level sender -G78- / rear left vehicle level sender -G76- is renewed, check values ⇒ [page 275](#) and carry out basic setting of headlights ⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .

If the values from front left vehicle level sender -G78- / rear left vehicle level sender -G76- are outside the specified tolerance, basic headlight setting cannot be carried out.

3.9.1 Removing and installing vehicle level sender

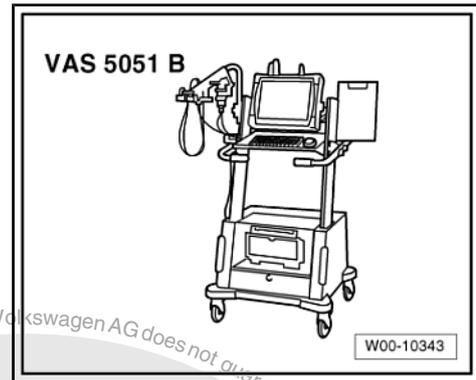
The vehicle level senders are part of the adaptive suspension system. Removal and installation of vehicle level sender ⇒ Running gear, axles, steering; Rep. gr. 43 .

3.9.2 Checking vehicle level sender

Special tools and workshop equipment required



- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



The front left vehicle level sender -G78- / rear left vehicle level sender -G76- transmit the longitudinal inclination angle of the vehicle by way of signals to the control unit for headlight range control -J431- .

A check is made as to whether the rear left vehicle level sender -G76- / front left vehicle level sender -G78- supply the control unit for headlight range control -J431- with plausible signals.

No entry is stored in the control unit for cornering light and headlight range control -J431- in the following instances:

- ◆ In the case of incorrectly installed front left vehicle level sender -G78- / rear left vehicle level sender -G76-
- ◆ For mechanical damage to front left vehicle level sender -G78- / rear left vehicle level sender -G76-
- ◆ Vehicle suspension has been modified (lowered).



Note

If the values from front left vehicle level sender -G78- / rear left vehicle level sender -G76- are outside the specified tolerance, basic headlight setting cannot be carried out.

Procedure

- Connect vehicle diagnosis, testing and information system -VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **[GoTo]** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Automatic headlight range control
 - ◆ Automatic headlight range control functions
 - ◆ Checking vehicle level sender

3.10 Repairing headlight securing tabs

Repairing headlight securing tabs ⇒ [page 231](#) .



3.11 Converting headlights for use when driving on the left or right

To avoid dazzling oncoming traffic with the asymmetrical lights, both headlights should be converted (driving on the left or right) for the country in which the vehicle is being driven.

Note

- ◆ Before working on gas discharge headlights, always switch off the headlights and remove the ignition key.
- ◆ The procedure for converting the headlights is the same for both sides and is described as follows using the left headlight as an example.

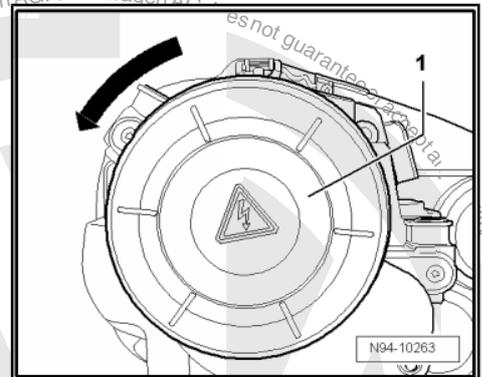
Procedure

- Remove headlight => [page 262](#) .
- Turn cover cap -1- in -direction of arrow- and remove.



WARNING

- ◆ Within the glass envelope of a gas discharge bulb, pressure can range from between 7 bar (cold) and 100 bar (hot). Temperatures can reach up to 700 degrees Celsius on the glass bulb. The reflector is equally as hot.
- ◆ There is a risk of injury from burning.
- ◆ Always allow the headlight to cool for a sufficient period of time.



- Push control lever -1- in desired position - A- or -B-.

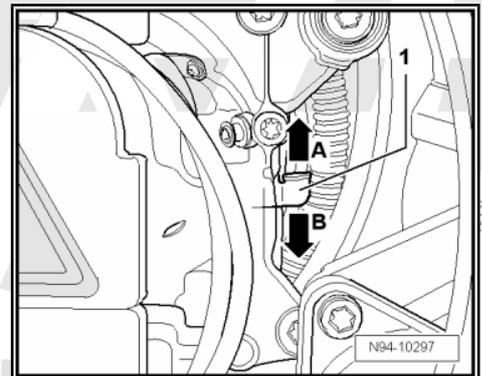
Control lever -1- up: driving on left -A-

Control lever -1- down: driving on right -B-



Caution

When installing cover cap, ensure cap is seated correctly. The ingress of water will lead to permanent damage to the headlight.



- Seal headlight housing using cover cap and secure in place by applying twisting motion.
- Install headlight => [page 262](#) .
- Check headlight functions.
- Check headlight settings and adjust headlights if necessary => Maintenance ; Booklet 20.1 ; Descriptions of work .

3.12 Adjusting headlights

Adjusting headlights with gas discharge bulb => Maintenance ; Booklet 20.1 ; Descriptions of work .



4 Headlights with gas discharge bulbs and cornering lights (from MY2010)

4.1 General description



Note

- ◆ *Before working on headlight with gas discharge lights and cornering lights, always switch off the headlights and remove the ignition key.*
- ◆ *When dealing with complaints, it is absolutely essential that the function and operation of the lighting system are first understood.*
- ◆ *Additional information:*

⇒ Operating instructions

⇒ Self-study programme No. 335 ; The Cornering Light System

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

Observe safety notes for gas discharge bulbs ⇒ [page 258](#) .

General description

The headlights with gas discharge bulbs and a cornering light have a „bi-xenon“ feature.

With conventional xenon headlights, the gas discharge bulbs only generate the dipped beam. The „bi-xenon“ feature makes it possible to generate both the dipped beam and the main beam with „one“ gas discharge bulb. To achieve this, an electromechanical adjuster (left headlight screen adjustment solenoid -N395- / right headlight screen adjustment solenoid -N396-) uncovers the screened area of the dipped beam on actuation of the main beam function, thus producing main beam light distribution.

This means that with „bi-xenon“ headlights the main beam is always automatically adjusted together with the dipped beam.

The headlights with gas discharge bulbs and cornering lights do not have an „additional main beam“.

The cornering light has the following features:

- ◆ Swivelling main and dipped beams (dynamic cornering lights): at vehicle speeds in excess of 10 km/h and steering turned.
- ◆ Cornering light bulb (static cornering light): when turning into tight bends (bend radius smaller than 500 m) or when turning a corner at vehicle speeds of less than 50 km/h

Fault detection and fault display

Automatic headlight range control, cornering lights and onboard supply control unit are equipped with self-diagnosis.

For fault finding, use vehicle diagnosis, testing and information system -VAS 5051B- in „Guided fault finding“ mode.



i Note

The bulb failure -K170- warning lamp flashes in the dash panel insert if the headlight range control or the variable front lighting has a fault.

4.2 Assembly overview

1 - Cover cap

2 - Cover cap

3 - Front left turn signal bulb -M5- / front right turn signal bulb -M7-

- Bulb: PSY 12 V/24 W
- Renewing ⇒ [page 284](#)

4 - Left side light bulb -M1- / right side light bulb -M3-

- Bulb: wedge-base bulb 12 V/5 W
- Renewing ⇒ [page 286](#)

5 - Left headlight range control motor -V48- / right headlight range control motor -V49-

- Removing and installing ⇒ [page 292](#)
- Checking ⇒ [page 292](#)

6 - Left gas discharge (xenon) bulb -L13- / right gas discharge (xenon) bulb -L14-

- Bulb: D1S 12 V/35 W
- Notes on safety ⇒ [page 258](#)
- Renewing ⇒ [page 282](#)

7 - Headlight

- Removing and installing ⇒ [page 280](#)
- Adjusting headlight installation position ⇒ [page 282](#)
- Repairing headlight securing tabs ⇒ [page 296](#)
- Converting for driving on left/right ⇒ [page 294](#)

8 - Left headlight starter for gas discharge bulb -J426- / right headlight starter for gas discharge bulb -J427-

- Removing and installing ⇒ [page 287](#)

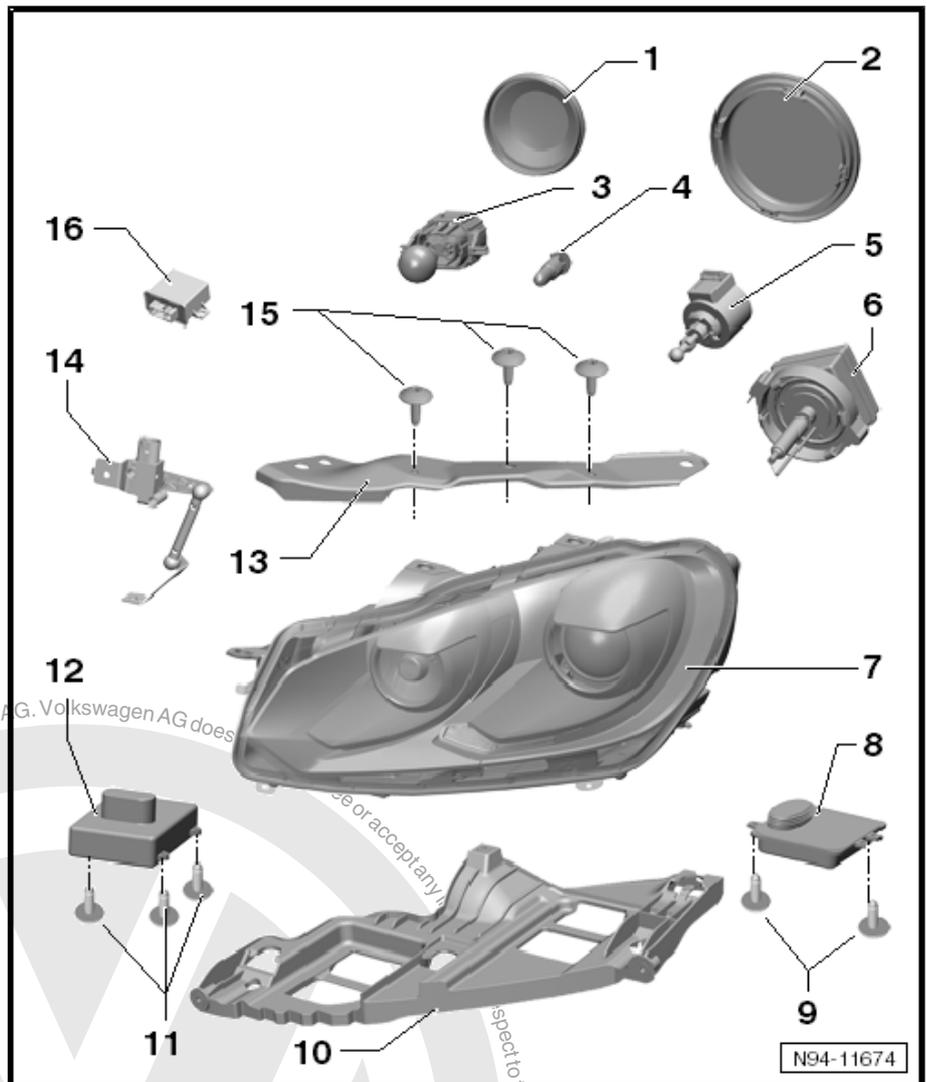
9 - Bolt

- 1.4 Nm

10 - Guide

11 - Bolt

- 1.4 Nm





12 - Power output module for left headlight -J667- / power output module for right headlight -J668-

13 - Front end support part

14 - Vehicle level sender

- ❑ Removing and installing ⇒ [page 294](#)

15 - Bolts

- ❑ 5 Nm

16 - Headlight range control unit -J431-

- ❑ 1.5 Nm
- ❑ Removing and installing ⇒ [page 290](#)
- ❑ Coding ⇒ [page 291](#)

4.3 Removing and installing headlight

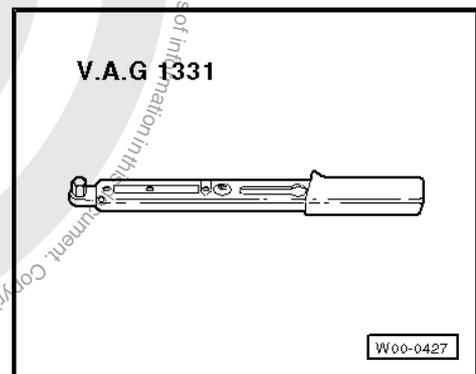


Note

- ◆ *You do not have to disconnect the earth wire of the battery - A- .*
- ◆ *Illustrations show removal and installation of the left headlight. Removal and installation of the right headlight are carried out in the same way.*
- ◆ *If a headlight is removed, it should always be adjusted following installation ⇒ Maintenance ; Booklet 20.1 ; Description of work*

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1331-



Caution

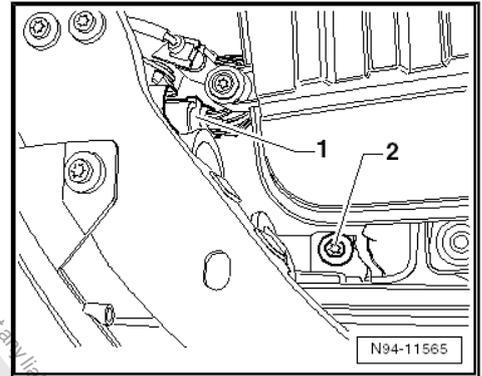
- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

Removing

- Remove the radiator grille ⇒ General body repairs, exterior;
Rep. gr. 66 .
- Remove front bumper cover ⇒ General body repairs, exterior;
Rep. gr. 63 .



- Release and disconnect multi-pin connector -1-.
- Remove bolt -2- on inner part of headlight.

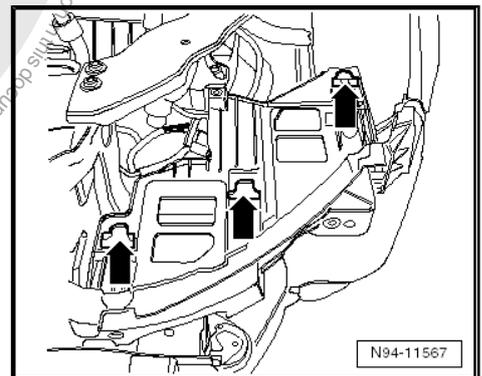
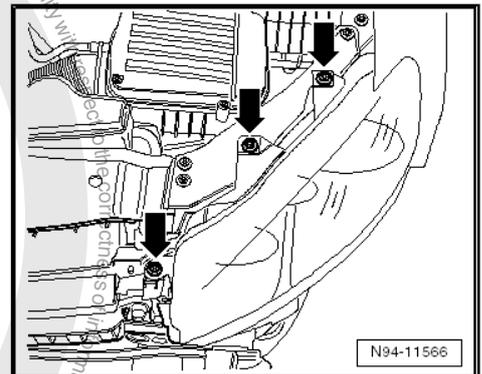


- Unscrew the three bolts -arrows-.
- Pull headlight forwards and straight out of body aperture.

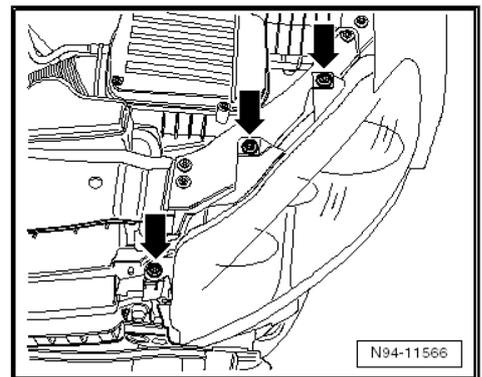
Installing

Carry out installation in the reverse sequence, noting the following:

- Insert headlight with the three guides on underside into mountings -arrows- on guide and push into body aperture.



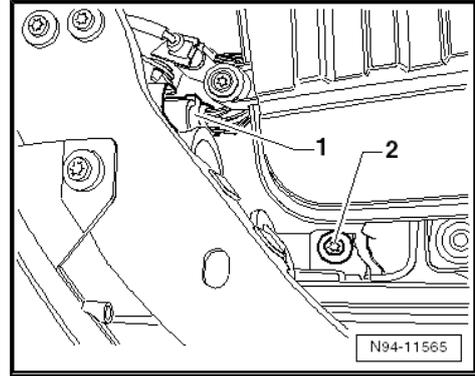
- First, screw in the three upper bolts -arrows-.





- Then, screw in bolt -2- on rear of headlight.
- Tighten all threaded connections to specified torques
⇒ [page 279](#) .
- Check headlight functions.
- Check headlight installation position is central, i.e. shut lines/
gaps are equal around headlight.

If the shut lines/gaps around the headlight are uneven, the installation position must be adjusted ⇒ [page 282](#) .



Note

If a headlight with gas discharge bulbs is removed or realigned to the bodywork, the basic setting of the headlight must always be performed and the headlight settings checked after reinstalling or realigning.

- Check headlight settings and adjust headlights if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .

4.4 Adjusting headlight installation position

Installation position is corrected for headlights with gas discharge bulbs and cornering light in same way as for headlights with halogen bulbs. Adjusting headlight installation position ⇒ [page 217](#)

4.5 Renewing bulbs

4.5.1 Renewing gas discharge bulb



WARNING

- ◆ *Within the glass envelope of a gas discharge bulb, pressure can range from between 7 bar (cold) and 100 bar (hot). Temperatures can reach up to 700 degrees Celsius on the glass bulb.*
- ◆ *Should the glass envelope explode, there is a risk of injury from burning.*
- ◆ *Always wear safety goggles and gloves when removing and installing gas discharge bulbs!*
- ◆ *Observe safety notes for gas discharge bulbs
⇒ [page 258](#) .*



Note

The following diagrams show renewal of left gas discharge bulb -L13- in left headlight. Right gas discharge bulb -L14- in right headlight is renewed in the same way.



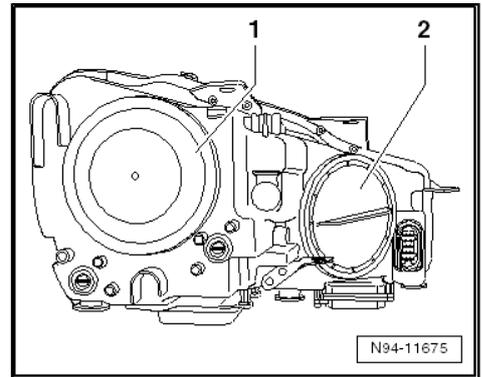
Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

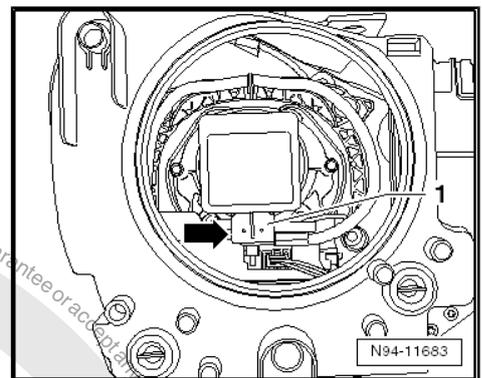


Removing

- Remove headlight ⇒ [page 280](#) .
- Pull cover cap -1- off headlight back.



- Unlock connector -1- by pressing button on side -arrow- and pull it off downwards.





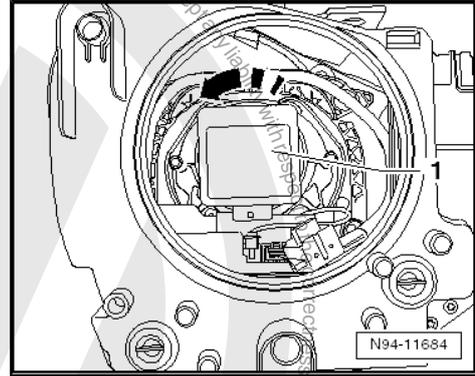
- Turn left gas discharge bulb -L13- -1- in -direction of arrow- and carefully pull it backwards out of reflector.

Installing



Caution

- ◆ *Do not touch glass envelope when fitting right gas discharge (xenon) bulb -L13-. Fingers leave traces of grease on the glass envelope, which evaporate when the left gas discharge (xenon) bulb -L13- is switched on and cause the glass envelope to cloud over.*
- ◆ *Ensure glass envelope of left gas discharge (xenon) bulb -L13- is not stressed mechanically. The glass envelope is extremely sensitive and is also under a high internal pressure.*
- ◆ *Avoid looking directly into the collimated beam as the UV radiation from the left gas discharge (xenon) bulb -L13- is about 2.5 times higher than from normal halogen bulbs.*
- ◆ *When installing cover cap, ensure that it seats properly. The ingress of water will lead to permanent damage to the headlight.*



Carry out installation in the reverse sequence, noting the following:

- Check headlight functions.
- Check headlight settings and adjust headlights if necessary
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .

If a headlight with automatic range control is removed, the basic setting of the headlights is always to be checked after installation
⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .

4.5.2 Renewing turn signal bulb



Note

- ◆ *The headlight does not have to be removed to change the bulb.*
- ◆ *The following illustrations show how to change the front right turn signal bulb -M7- in the right headlight.*



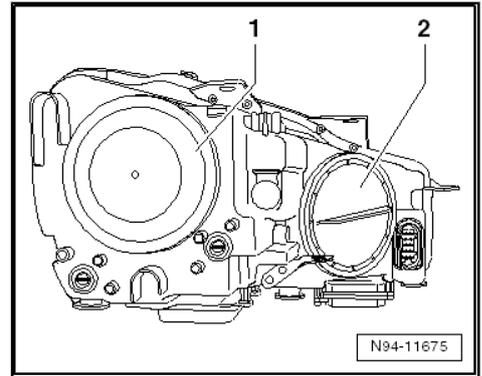
Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

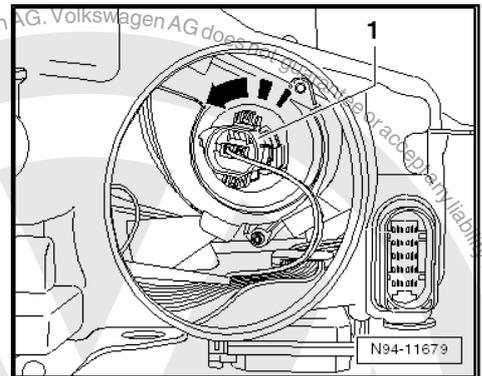


Removing

- Release cover cap -2- by turning it anti-clockwise and remove.



- Turn bulb holder -1- in -direction of arrow- and pull it backwards out of reflector together with front right turn signal bulb -M7- .

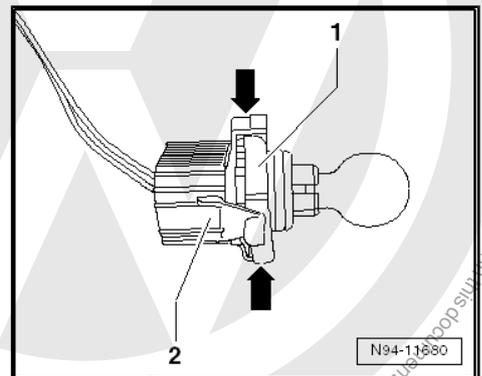


- Press locks -arrows- and pull right front turn signal bulb -M7- -1- out of bulb holder -2-.



Note

The right front turn signal bulb -M7- is permanently attached to the bulb holder and cannot be dismantled.



Installing



Caution

- ◆ **When installing cover cap, ensure that it seats properly. The ingress of water will lead to permanent damage to the headlight.**
- ◆ **Do not touch glass envelope when fitting bulb. Fingers leave traces of grease on the glass envelope, which evaporate when the bulb is switched on and cause the glass envelope to cloud over.**

Carry out installation in the reverse sequence, noting the following:

- Check headlight functions.



4.5.3 Renewing side light bulb



Note

- ◆ The headlight does not have to be removed to change the bulb.
- ◆ The following diagrams show renewal of the left side light bulb -M1- in the left headlight.

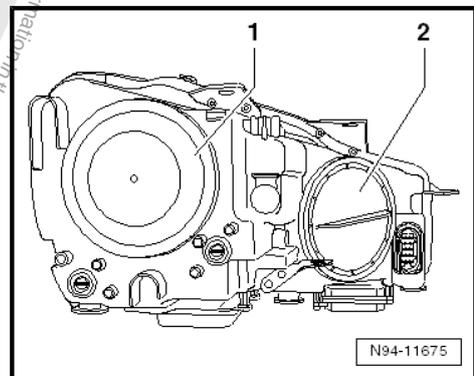


Caution

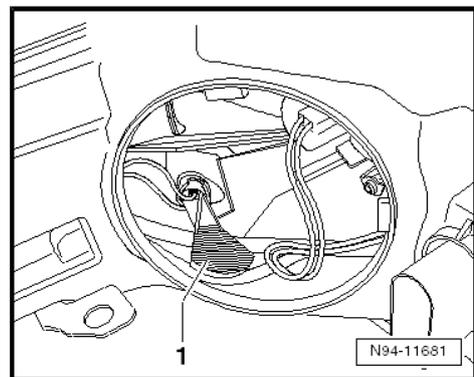
- ◆ Switch off ignition and all electrical consumers.
- ◆ Remove the ignition key.

Removing

Release cover cap -2- by turning it anti-clockwise and remove.



- Taking connected wiring lengths into consideration, pull bulb holder -1- together with left side light bulb -M1- out of reflector.





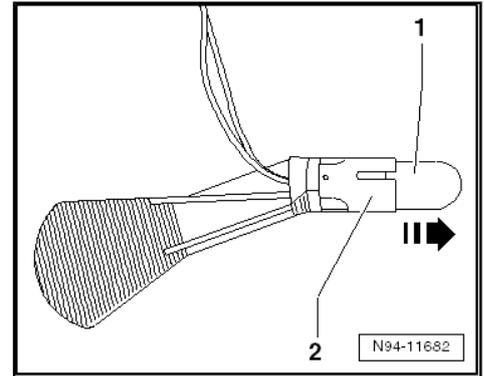
- Pull left side light bulb -M1- -1- in -direction of arrow- out of bulb holder -2-.

Installing



Caution

- ◆ *When installing cover cap, ensure that it seats properly. The ingress of water will lead to permanent damage to the headlight.*
- ◆ *Do not touch glass envelope when fitting bulb. Fingers leave traces of grease on the glass envelope, which evaporate when the bulb is switched on and cause the glass envelope to cloud over.*



Carry out installation in the reverse sequence, noting the following:

- Check headlight functions.

4.6 Headlight starter for gas discharge bulb

The left headlight starter for gas discharge bulb -J426- / right headlight starter for gas discharge bulb -J427- is located on the underside of the respective headlight housing.

4.6.1 Removing and installing headlight starter for gas discharge bulb



Note

The following illustrations show removing or installation of right headlight starter for gas discharge bulb -J427- for the right headlight. Left headlight starter for gas discharge bulb -J426- in left headlight is removed and installed in same way.



Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

Removing

- Remove headlight ⇒ [page 280](#) .



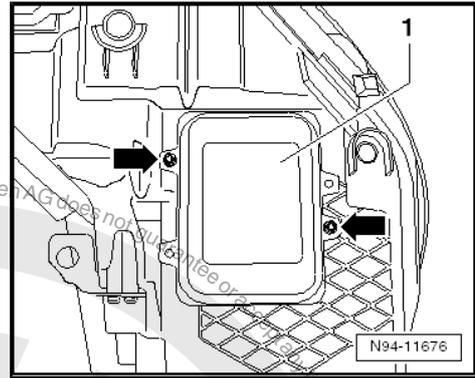
- Unscrew both bolts -arrows-.



Note

When right headlight starter for gas discharge bulb -J427- is pulled off from headlight housing, electrical connectors are simultaneously disconnected.

- Pull right headlight starter for gas discharge bulb -J427- -1- at right angles out of headlight housing.



Installing

Carry out installation in the reverse sequence, noting the following:



Caution

Ensure seal is seated correctly when installing right headlight starter for gas discharge bulb -J427-. The ingress of water will lead to permanent damage to the headlight.

- Tighten all threaded connections to specified torques
⇒ [page 279](#) .
- Check headlight functions.

4.7 Power output module for headlight

Power output module for left headlight -J667- / power output module for right headlight -J668- is located on the underside of the respective headlight housing.

4.7.1 Removing and installing power output module for headlight



Note

The following illustrations show removing or installation of the power output module for headlight -J668- for the right headlight. For the left headlight, removing or installation is carried out in the same way.



Caution

- ◆ Switch off ignition and all electrical consumers.
- ◆ Remove the ignition key.

Removing

- Remove headlight ⇒ [page 280](#) .



- Unscrew the three bolts -arrows-

i Note

When right power output module for headlight -J668- is pulled off from headlight housing, electrical connectors are simultaneously disconnected.

- Pull right power output module for headlight -J668- -1- at right angles out of headlight housing.

Installing

Carry out installation in the reverse sequence, noting the following:

! Caution

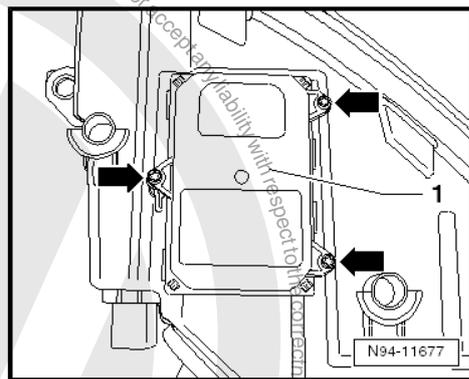
When installing right power output module for headlight -J668-, ensure that the seal is seated correctly. The ingress of water will lead to permanent damage to the headlight.

- Tighten all threaded connections to specified torques => [page 279](#) .

i Note

Control unit for headlight range control -J431- must be recoded if a new power output module for right headlight -J668- is installed => [page 291](#) . Then subsequently perform the basic setting of headlights => Maintenance ; Booklet 20.1 ; Descriptions of work .

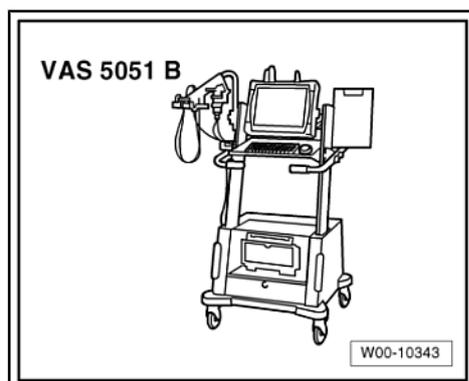
- Check headlight functions.



4.7.2 Checking power output module for headlight

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



The following procedure enables you to test the power output module for left headlight -J667- / power output module for right headlight -J668- .

Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .



- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **[GoTo]** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Automatic headlight range control_cornering light
 - ◆ Electrical components, automatic headlight range control
 - ◆ Power output module for headlight

4.8 Headlight range control unit -J431-

4.8.1 Removing and installing headlight range control unit -J431-

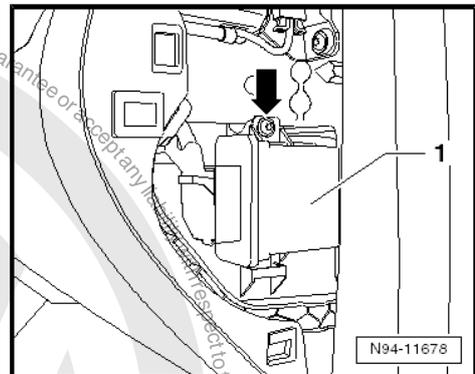


Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

Removing

- Remove the side dash panel cover on front passenger side ⇒ General body repairs, interior; Rep. gr. 68 .
- Unscrew bolt -arrow-.
- Remove headlight range control unit -J431- -1- from installation position taking connected wire length into account.





- Press locking lug -arrow- and swing arm -1- in direction of -arrow 2- and pull off connector.

Installing

Carry out installation in the reverse sequence, noting the following:

- Tighten all threaded connections to specified torques
=> [page 279](#) .



Note

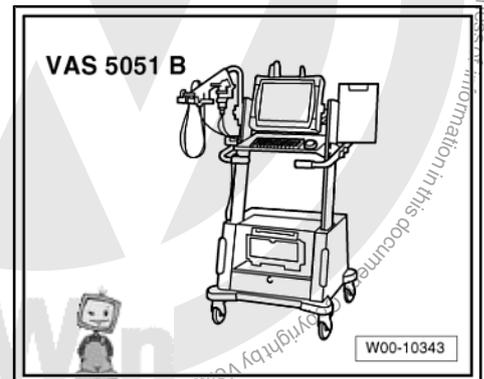
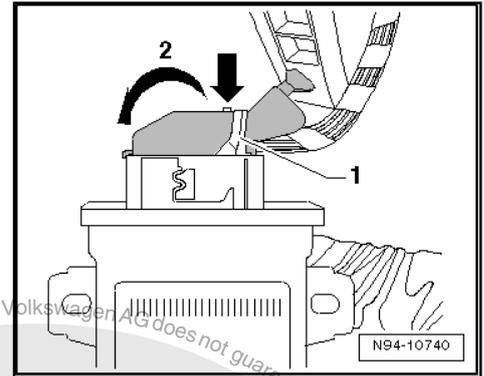
Headlight range control unit -J431- must be recoded if a new headlight range control unit -J431- is installed => [page 291](#) . Then perform the basic setting of headlights => Maintenance ; Booklet 20.1 ; Descriptions of work .

- Check headlight functions.
- Check headlight settings and adjust headlights if necessary
=> Maintenance ; Booklet 20.1 ; Descriptions of work .

4.8.2 Coding headlight range control unit - J431-

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



The following procedure enables you to code control unit for headlight range control -J431- .

Procedure

- Connect vehicle diagnosis, testing and information system -VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Automatic headlight range control, cornering lights
 - ◆ Headlight range control functions
 - ◆ Coding AFS headlight range control unit



4.9 Headlight range control motor

4.9.1 Removing and installing headlight range control motor

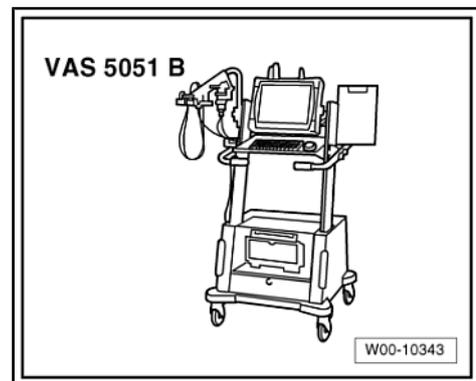
Headlight range control motor cannot be removed in headlights with gas discharge bulbs and cornering light.

The headlight must be renewed if the headlight range control motor is defective.

4.9.2 Checking headlight range control motor

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



The following components can be tested:

- ◆ Headlight range control motor, left -V48-
- ◆ Headlight range control motor, right -V49-

Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **[GoTo]** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Automatic headlight range control, cornering lights
 - ◆ Electrical components, automatic headlight range control
 - ◆ Headlight range control motor

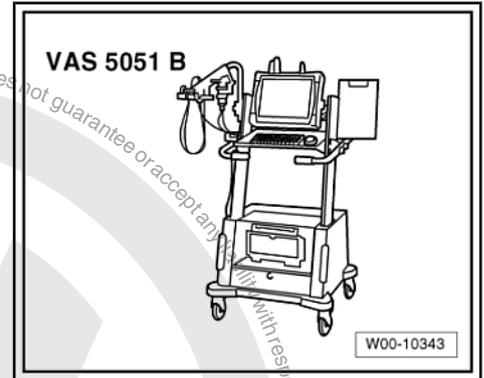
4.10 Swivel module position sensor

4.10.1 Checking swivel module position sensor

Special tools and workshop equipment required



◆ Vehicle diagnosis, testing and information system -VAS 5051B-



The following procedure enables you to test the left swivel module position sensor -G474- / right swivel module position sensor -G475- .

Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Automatic headlight range control, cornering lights
 - ◆ Electrical components, automatic headlight range control
 - ◆ Swivel module position sensor

4.11 Headlight screen adjustment solenoid

With conventional xenon headlights, the gas discharge bulbs only generate the dipped beam. The „bi-xenon“ features makes it possible to generate both the dipped beam and the main beam with „one“ gas discharge bulb. To achieve this, an electromechanical adjuster (left headlight screen adjustment solenoid -N395- / right headlight screen adjustment solenoid -N396-) uncovers the screened area of the dipped beam on actuation of the main beam function, thus producing main beam light distribution.

4.11.1 Removing and installing headlight screen adjustment solenoid

The headlight screen adjustment solenoid on left -N395- / headlight screen adjustment solenoid on right -N396- are located inside the respective headlight and can neither be individually renewed nor adjusted.

In the event of damage, the headlight must be renewed
⇒ [page 280](#) .

4.11.2 Testing headlight screen adjustment solenoid

The left headlight screen adjustment solenoid -N395- / right headlight screen adjustment solenoid -N395- can be checked using the final control diagnosis of the onboard supply control unit -J519- .



4.12 Vehicle level sender

4.12.1 Removing and installing vehicle level sender

The adaptive suspension system transmits the vehicle angle in the form of a signal to the automatic headlight range control. This signal is determined by the adaptive suspension control unit - J197- on the basis of signal input from all vehicle level senders.

The vehicle level senders are part of the adaptive suspension system. Removal and installation of vehicle level sender ⇒ Running gear, axles, steering; Rep. gr. 43 .

4.13 LED module for daytime running light and side light

4.13.1 Removing and installing LED module for daytime running light and side light

The left LED module for daytime running light and side light -L176- and the right LED module for daytime running light and side light -L177- are located inside the respective headlight and cannot be renewed individually.

In the event of damage, the headlight must be renewed
⇒ [page 280](#)

4.14 Converting headlights for use when driving on the left or right

4.14.1 Converting headlights for use when driving on the left or right



Note

- ◆ *Before working on gas discharge headlights, always switch off the headlights and remove the ignition key.*
- ◆ *The procedure for converting the headlights is the same for both sides and is described in the following for the right headlight.*



Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

Procedure

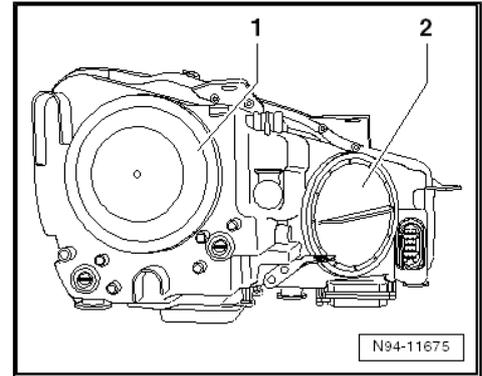
- Remove headlight ⇒ [page 280](#) .



- Remove cover cap -1-.

! WARNING

- ◆ *Within the glass envelope of a gas discharge bulb, pressure can range from between 7 bar (cold) and 100 bar (hot). Temperatures can reach up to 700 degrees Celsius on the glass bulb. The reflector is therefore hot as well.*
- ◆ *There is a risk of injury from burning.*
- ◆ *Always allow the headlight to cool for a sufficient period of time.*



- Turn the regulator -2- in desired direction with an appropriate cross-head screwdriver.

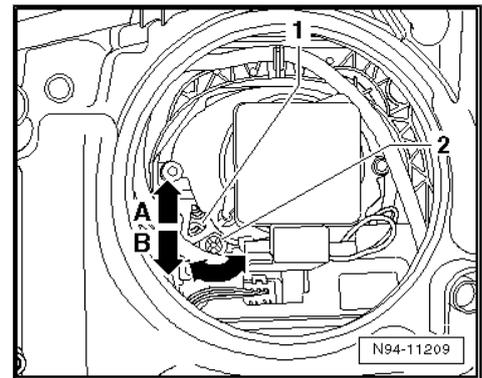
Lever -1- moves then into position - A- or -B-.

Lever -1- up = driving on left -A-

Lever -1- down = driving on right -B-

! Caution

When installing cover cap, ensure cap is seated correctly. The ingress of water will lead to permanent damage to the headlight.

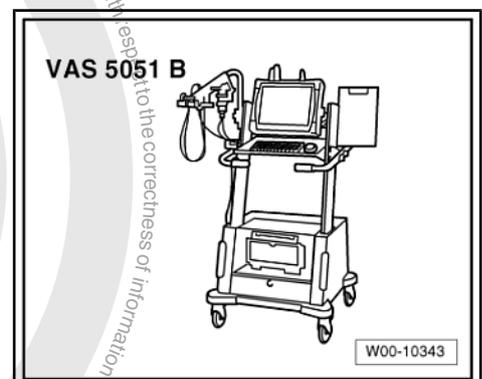


- Lock headlight housing with cover cap again.
- Install headlight => [page 280](#) .
- Deactivating cornering light => [page 295](#) .
- Check headlight functions.
- Check headlight settings and adjust headlights if necessary => Maintenance ; Booklet 20.1 ; Descriptions of work .
- Convert second headlight in the same way.

4.14.2 Deactivating cornering light function when converting headlights

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



If the headlights with gas discharge bulbs and cornering lights are converted to the direction of traffic (driving on the left or right) relevant to the country in which the vehicle is being driven using



an adjusting lever, the cornering light function (AFS) must be deactivated.

Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/Component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Automatic headlight range control, cornering lights
 - ◆ Headlight range control functions
 - ◆ Conversion between right-hand/left-hand traffic

4.15 Repairing headlight securing tabs

If one or more headlight retaining tabs are damaged or broken off, they can be renewed by installing the repair kit. There is no need to renew the entire headlight.



Note

- ◆ *Check that there is no further damage to the headlight that would make installation of the repair kit unnecessary.*
- ◆ *Two different repair kits are available for the left and right headlights ⇒ ETKA (electronic parts catalogue) .*
- ◆ *Each repair kit includes the outer, the centre and the inner headlight retaining tab and the associated bolts/screws.*

Repair of headlight retaining tabs on headlights with gas discharge bulbs and cornering light in same way as for headlights with halogen bulbs. Repairing headlight securing tabs

⇒ [page 231](#)

4.16 Adjusting headlights

Adjusting headlights with gas discharge bulbs and cornering lights ⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .



5 Fog lights

Fault detection and fault display

The onboard supply control unit is equipped with self-diagnosis.

For fault finding, use vehicle diagnosis, testing and information system -VAS 5051B- in „Guided fault finding“ mode.

5.1 Assembly overview - fog lights (up to MY2009)

1 - Front bumper

2 - Vent hose

3 - Left fog light bulb -L22- /
right fog light bulb -L23-

- Bulb: H11 12 V/55 W
- Removing and installing
⇒ [page 300](#)

4 - Fog light housing

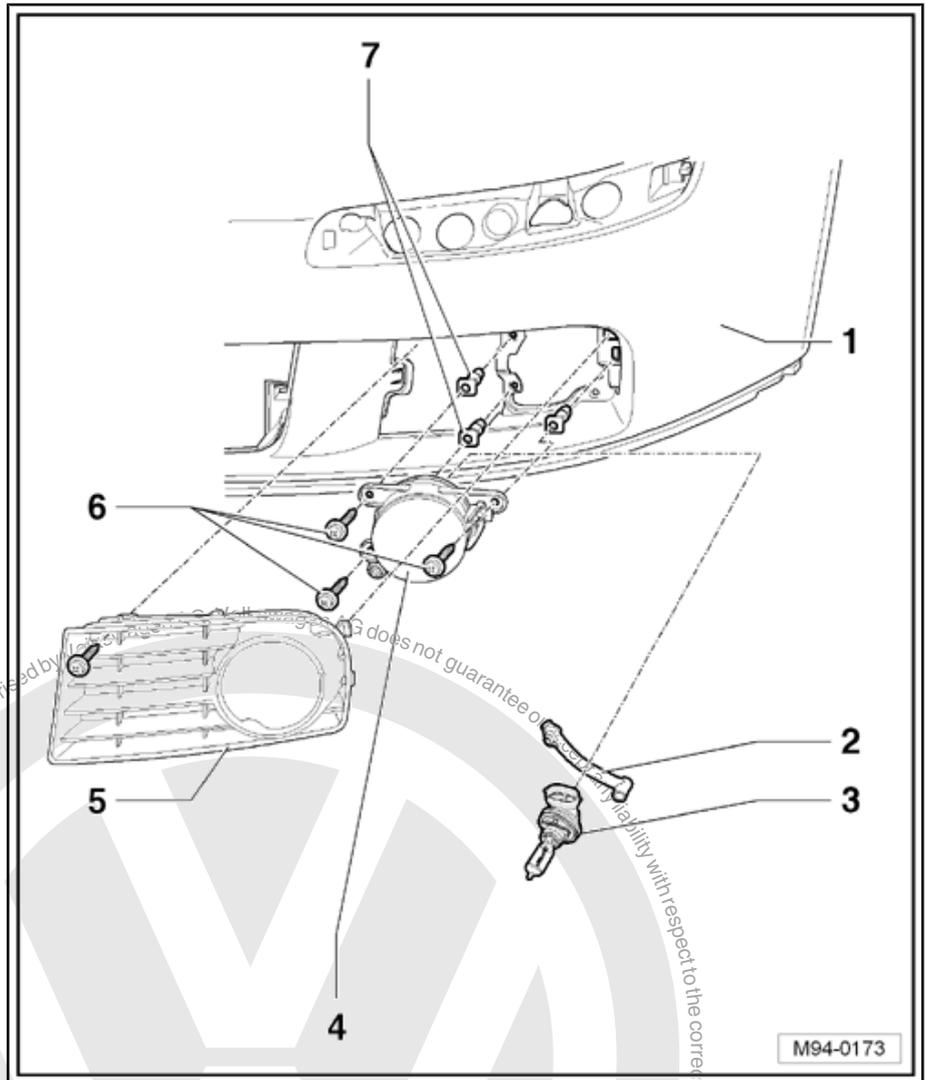
- Removing and installing
⇒ [page 298](#)

5 - Cover cap

6 - Bolt

- 1.5 Nm

7 - Spreader nut





5.2 Assembly overview - fog lights (from MY2010)

1 - Front bumper cover

2 - Fog light housing

- ❑ Removing and installing
⇒ [page 299](#)

3 - Bolt

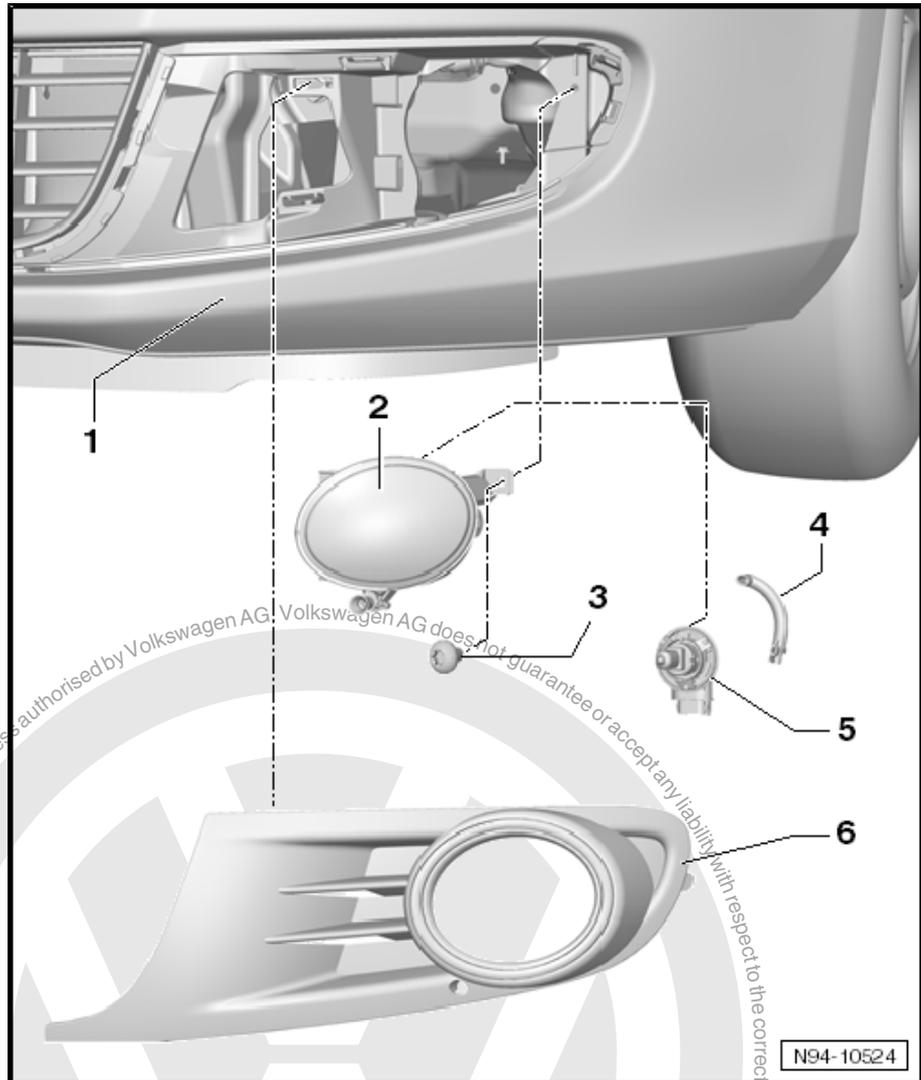
- ❑ 2 Nm

4 - Vent hose

5 - Left fog light bulb -L22- /
right fog light bulb -L23- / left
cornering light bulb -L148- /
right cornering light bulb -
L149-

- ❑ Bulb: HB4 12 V/51 W
- ❑ Removing and installing
⇒ [page 300](#)

6 - Cover cap



5.3 Removing and installing fog lights (up to MY2009)



Note

The illustrations show removal and installation for the left fog light.



Caution

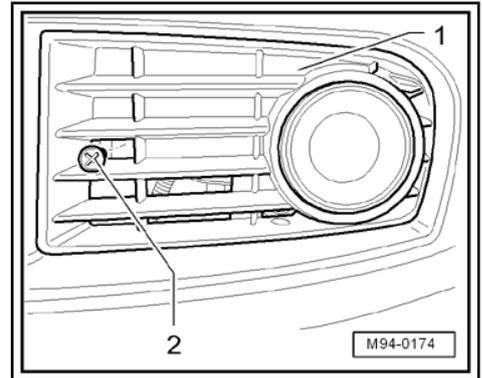
- ◆ Switch off ignition and all electrical consumers
- ◆ Remove the ignition key.

Removing

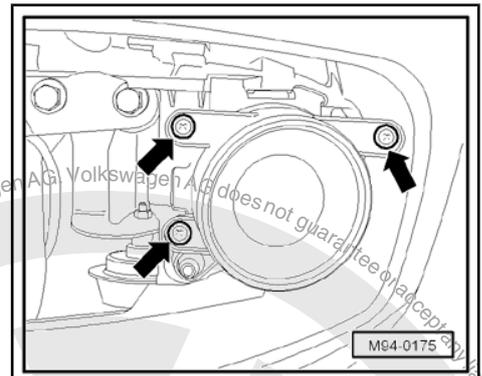
- Remove bolt -2-.



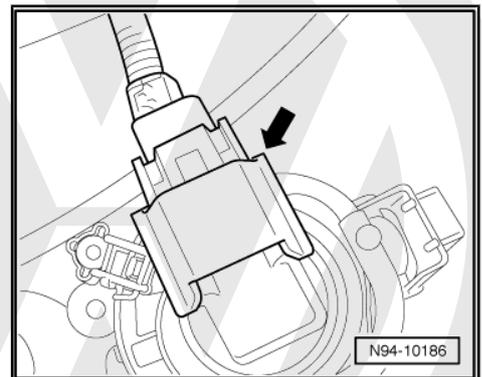
- Unclip cover cap -2- from retainers.



- Remove bolts -arrows-.



- Pull fog light housing out of bumper and disconnect connector -arrow-.



Installing

Carry out installation in the reverse sequence, noting the following:

- Tighten all threaded connections to specified torques
=> [page 297](#) .
- Check function of headlight.
- Check fog light settings and adjust => Maintenance ; Booklet 20.1 ; Descriptions of work .

5.4 Removing and installing fog lights (from MY2010)



Note

The illustrations show removal and installation for the left fog light.



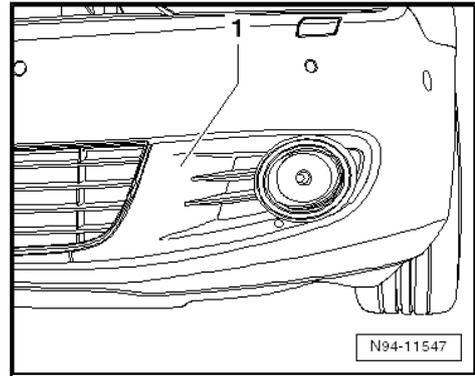
Caution

- ◆ Switch off ignition and all electrical consumers
- ◆ Remove the ignition key.

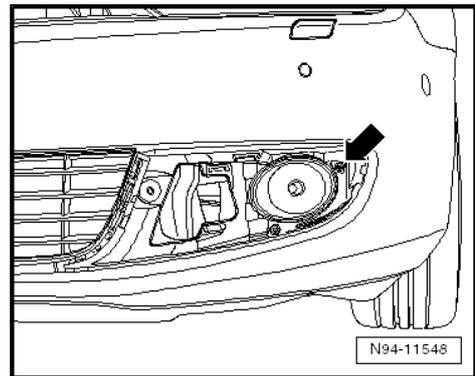


Removing

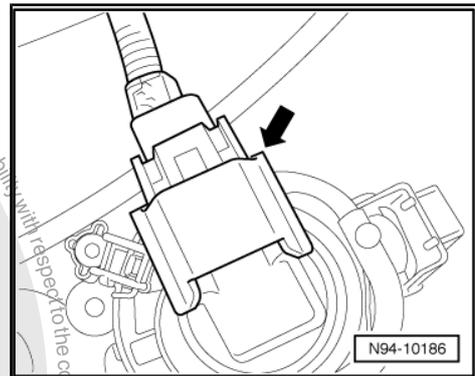
- Unclip cover cap -1- from retainers.



- Unscrew bolt -arrow-.



- Swing fog light housing out of bumper cover taking connected wiring length into consideration.
- Release and disconnect connector -arrow- and remove fog light housing.



Installing

Carry out installation in the reverse sequence, noting the following:

- Tighten all threaded connections to specified torques ⇒ [page 298](#) .
- Check function of headlight.
- Check fog light settings and adjust ⇒ Maintenance ; Booklet 20.1 ; Descriptions of work .

5.5 Removing and installing fog light/cornering light bulb



Note

The illustration shows removal and installation on left fog light.

Removing

- Remove fog light ⇒ [page 298](#) .



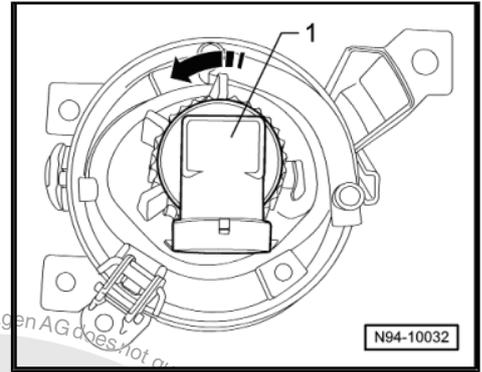
- Turn bulb holder with bulb -1- in direction of -arrow- and remove from fog light.

The bulb is permanently attached to the bulb holder and cannot be renewed separately.

Installing

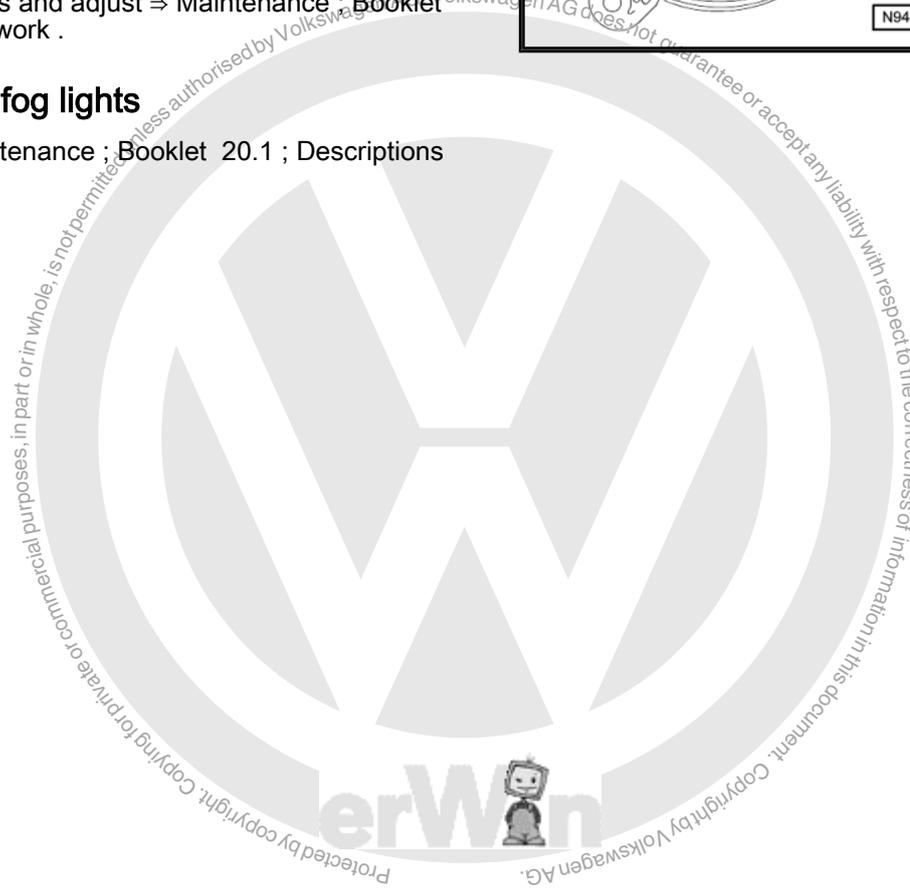
Carry out installation in the reverse sequence, noting the following:

- Check function of headlight.
- Check fog light settings and adjust => Maintenance ; Booklet 20.1 ; Descriptions of work .



5.6 Adjusting fog lights

Adjusting fog light => Maintenance ; Booklet 20.1 ; Descriptions of work





6 Bulb for turn signal repeater light and entry light in exterior mirror

General description

The driver side turn signal repeater bulb in exterior mirror -L131- / passenger side turn signal repeater bulb in exterior mirror -L132- (side-mounted turn signals) are integrated in the exterior mirror housings.

In addition, there is one driver side entry light in exterior mirror -W52- / front passenger side entry light in exterior mirror -W53- in each of the exterior mirror housings, which illuminate the entry area around the open driver and front passenger door in the dark.

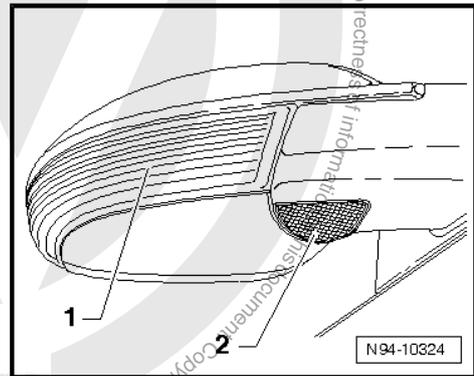
1 - Driver side turn signal repeater bulb in exterior mirror -L131- / passenger side turn signal repeater bulb in exterior mirror -L132-

2 - Driver side entry light in exterior mirror -W52- / front passenger side entry light in exterior mirror -W53-

Fault detection and fault display

The onboard supply control unit is equipped with self-diagnosis.

For fault finding, use vehicle diagnosis, testing and information system -VAS 5051B- in „Guided fault finding“ mode.



6.1 Removing and installing turn signal bulb

The driver side turn signal repeater bulb in exterior mirror -L131- / passenger side turn signal repeater bulb -L132- are installed in the left/right exterior mirror housing respectively.

In the event of damage, the complete driver side turn signal lamp in exterior mirror -L131- / passenger side turn signal lamp in exterior mirror -L132- must be renewed.



Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

Removing

- Remove driver side turn signal repeater bulb in exterior mirror -L131- / passenger side turn signal repeater bulb in exterior mirror -L132- ⇒ General body repairs, exterior; Rep. gr. 66

Installing

- Install driver side turn signal repeater bulb in exterior mirror -L131- / passenger side turn signal repeater bulb in exterior mirror -L132- ⇒ General body repairs, exterior; Rep. gr. 66

6.2 Removing and installing entry light in exterior mirror

The driver side entry light in exterior mirror -W52- / front passenger side entry light in exterior mirror -W53- are installed in the left and right exterior mirror housing respectively.

There is no need to remove exterior mirror to remove and install driver side entry light in exterior mirror -W52- / front passenger side entry light in exterior mirror -W53- .

The procedure for removal and installation of the driver side entry light in exterior mirror -W52- and front passenger side entry light



in exterior mirror -W53- is the same and is therefore described for one side only.

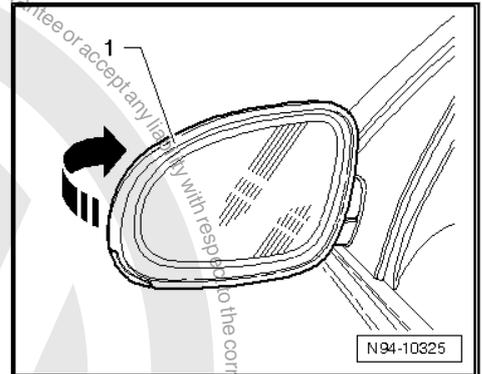


Caution

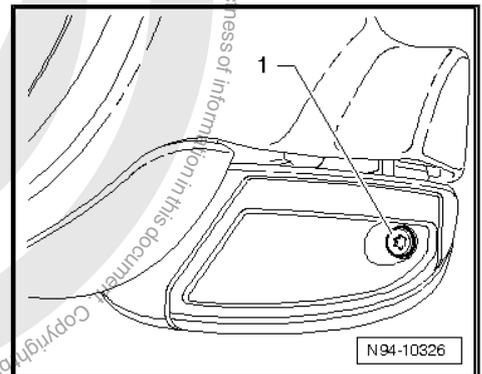
- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

Removing

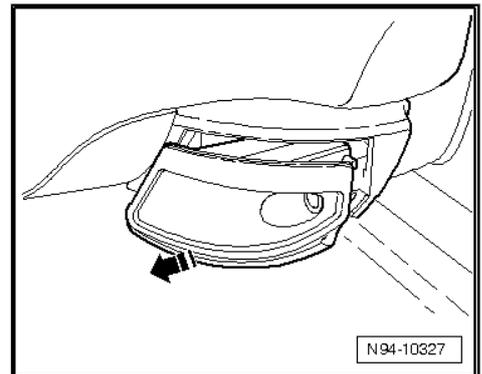
- Fold exterior mirror -1- forwards in -direction of arrow-.



- Remove bolt -1-.



- Unclip driver side entry light in exterior mirror -W52- from exterior mirror in -direction of arrow- and pull it out as far as the wiring allows.





- Pull bulb holder -2- in -direction of arrow- out of housing -1- of driver side entry light in exterior mirror -W52- .

Renewing bulb:

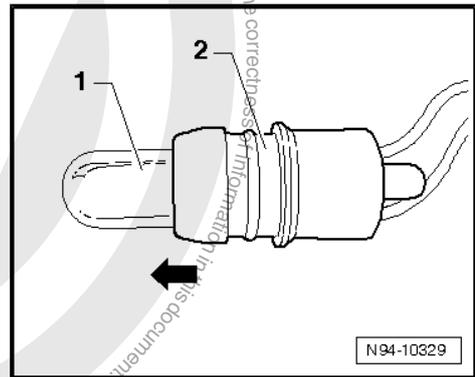
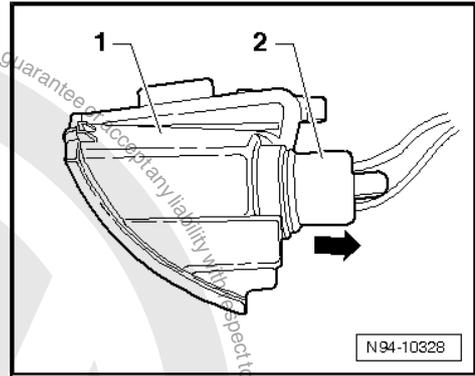
- Pull push-fit bulb -1- in -direction of arrow- out of bulb holder -2-.

Push-fit bulb: 12 V/6 W

Installing

Carry out installation in the reverse sequence, noting the following:

- Following installation, check operation of exterior mirrors.





7 Removing and installing front side marker light in front bumper

The front left side marker bulb -M33- / front right side marker bulb -M34- are renewed in exactly the same way.

Removing

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 .
- Release side marker light -1- by pushing locking lug in -direction of arrow-.
- Pull bulb holder -2- out of side marker light.

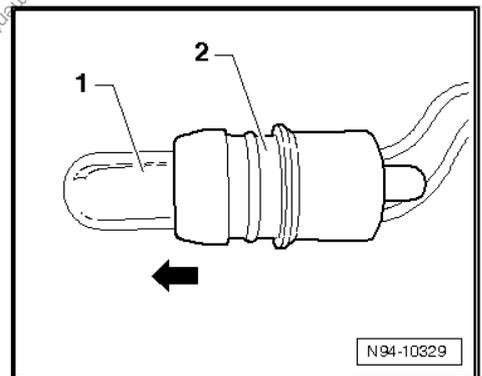
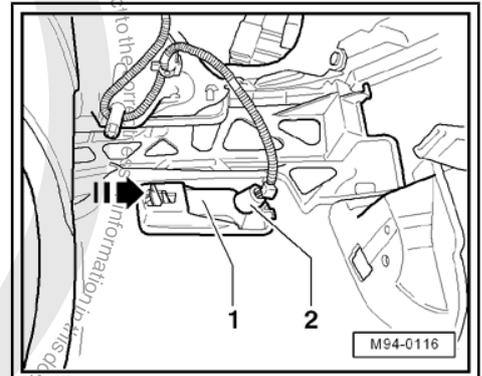
Renewing front left side marker bulb -M33- / front right side marker bulb -M34- :

- Pull front left side marker bulb -M33- -1- in direction of arrow out of bulb holder -2-.

Installing

Carry out installation in the reverse sequence, noting the following:

- Following installation, carry out functional check.





8 Rear side marker bulb (USA/Canada only)

The function of the rear side marker light -M12- is taken over by the left tail light bulb -M4- / right tail light bulb -M2- .





9 Tail lights

9.1 Assembly overview - tail light in side panel (bulbs) - saloon

1 - Nut

- ❑ 3.5 Nm

2 - Left brake light bulb -M9- / right brake light bulb -M10-

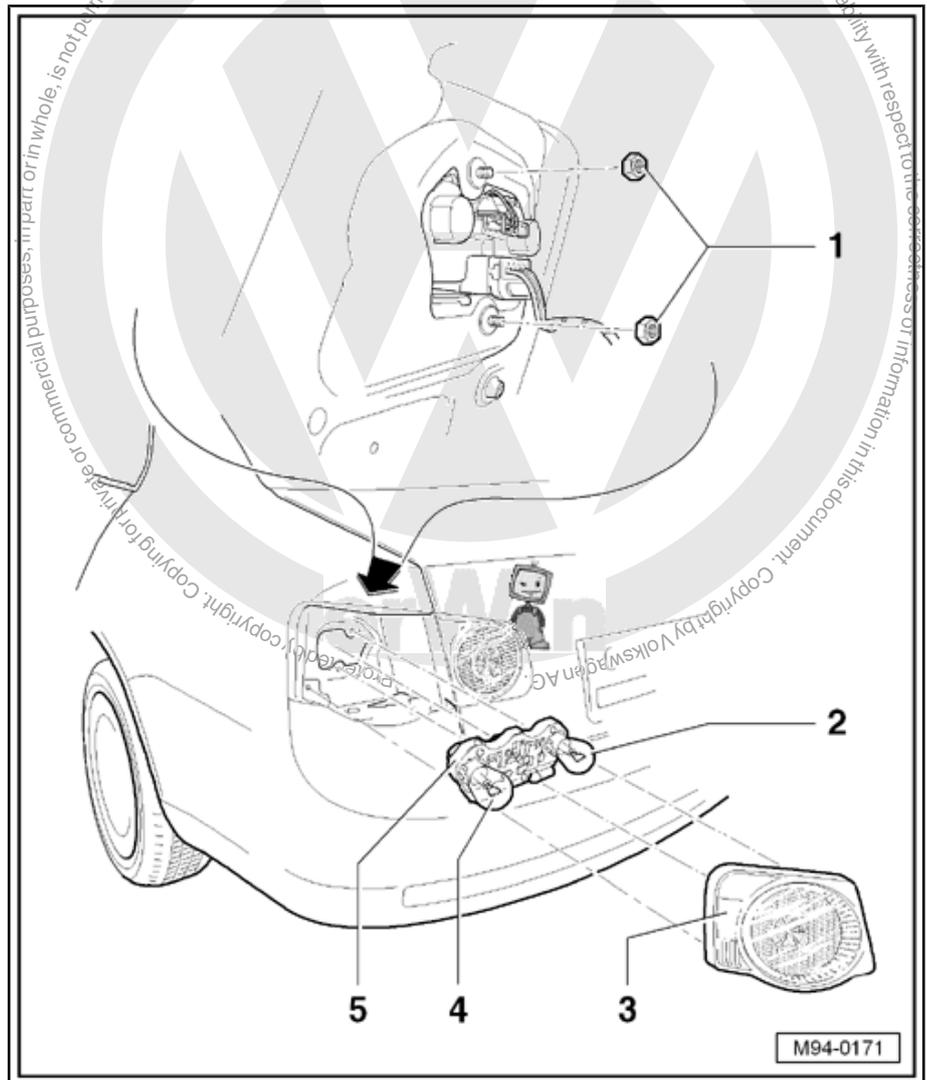
3 - Tail light housing in side panel

- ❑ Contains LED module
for daytime running light
and side light
- ❑ Removing and installing
⇒ [page 307](#)

4 - Rear left turn signal bulb - M6- / rear right turn signal bulb -M8-

5 - Bulb carrier

- ❑ Removing and installing
⇒ [page 308](#)



9.2 Removing and installing tail light in side panel (bulbs) - saloon



Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

Removing

- Push side panel trim to the side.

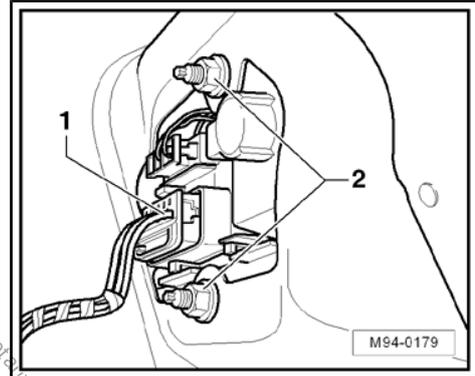


- Pull off connector -1-.
- Unscrew securing nuts -2- from tail light in lower part of side panel.
- Remove tail light.

Installing

Carry out installation in the reverse sequence, noting the following:

- Tighten all threaded connections to specified torques
=> [page 307](#).



Note

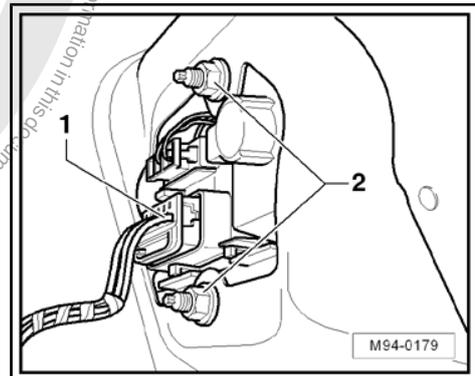
Tail light connector in side panel must be „heard“ to engage when reconnecting.

- When installation is complete, check gap/shut lines of tail light to body.

9.3 Removing and installing tail light bulb carrier in side panel - saloon

Removing

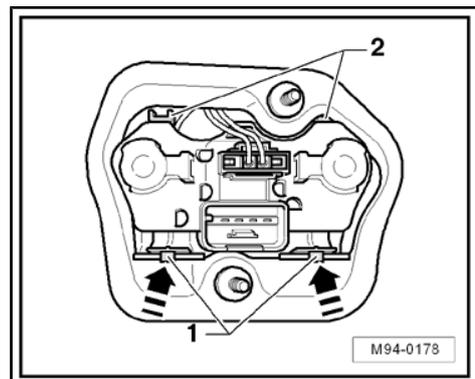
- Pull off connector -1-.



- Unclip fastening tabs -1- -in direction of arrow- and unhook bulb carrier from tail light housing -2-.

Installing

Installation is carried out in reverse order of removal.





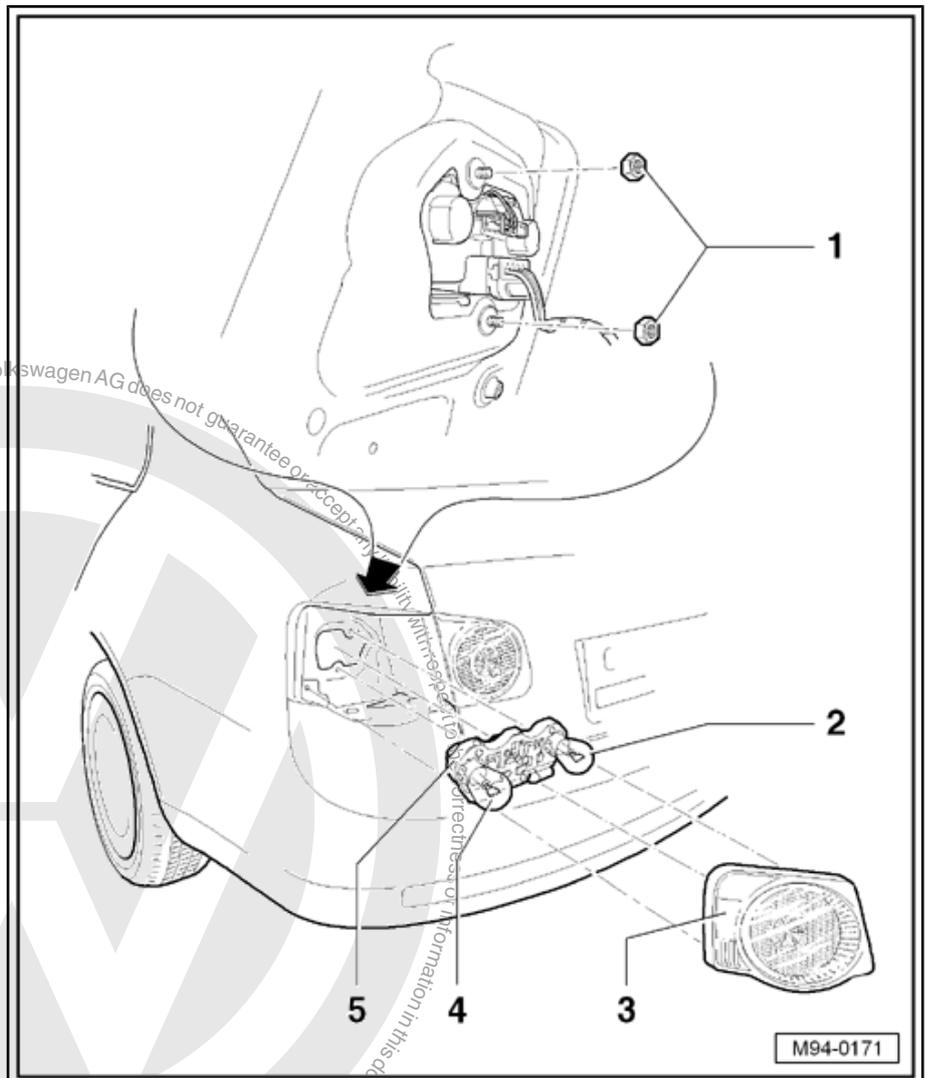
9.4 Tail light in side panel (LED) - saloon

1 - Nut

- 3.5 Nm

2 - Tail light in side panel

- Removing and installing
⇒ [page 309](#)



9.5 Removing and installing tail light in side panel (LED) - saloon

The tail light in the side panel with LED cannot be dismantled further. It comprises the following components:

- ◆ Left tail light bulb -M4- / right tail light bulb -M2-
- ◆ Left brake and tail light bulb -M21- / right brake and tail light bulb -M22-
- ◆ Rear left turn signal bulb -M6- / rear right turn signal bulb -M8-



Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

Removing

- Push side panel trim to the side.

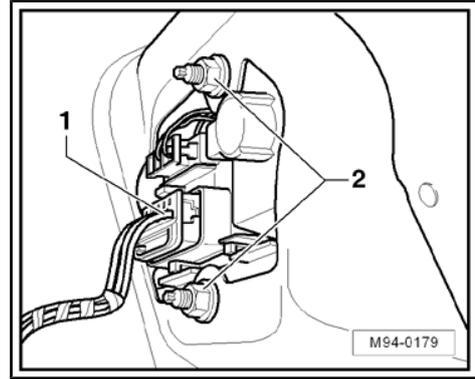


- Pull off connector -1-.
- Unscrew nuts -2- from tail light in lower part of side panel.
- Remove tail light.

Installing

Carry out installation in the reverse sequence, noting the following:

- Tighten all threaded connections to specified torques
=> [page 309](#) .



Note

- ◆ Tail light connector in side panel must be „heard“ to engage when reconnecting.
- ◆ Connector is locked correctly when locking tab is pressed down again!
- When installation is complete, check gap/shut lines of tail light to body.

9.6 Assembly overview - tail light in rear lid - saloon

1 - Nut

- 3.5 Nm

2 - Bulb carrier

- Removing and installing
=> [page 311](#)

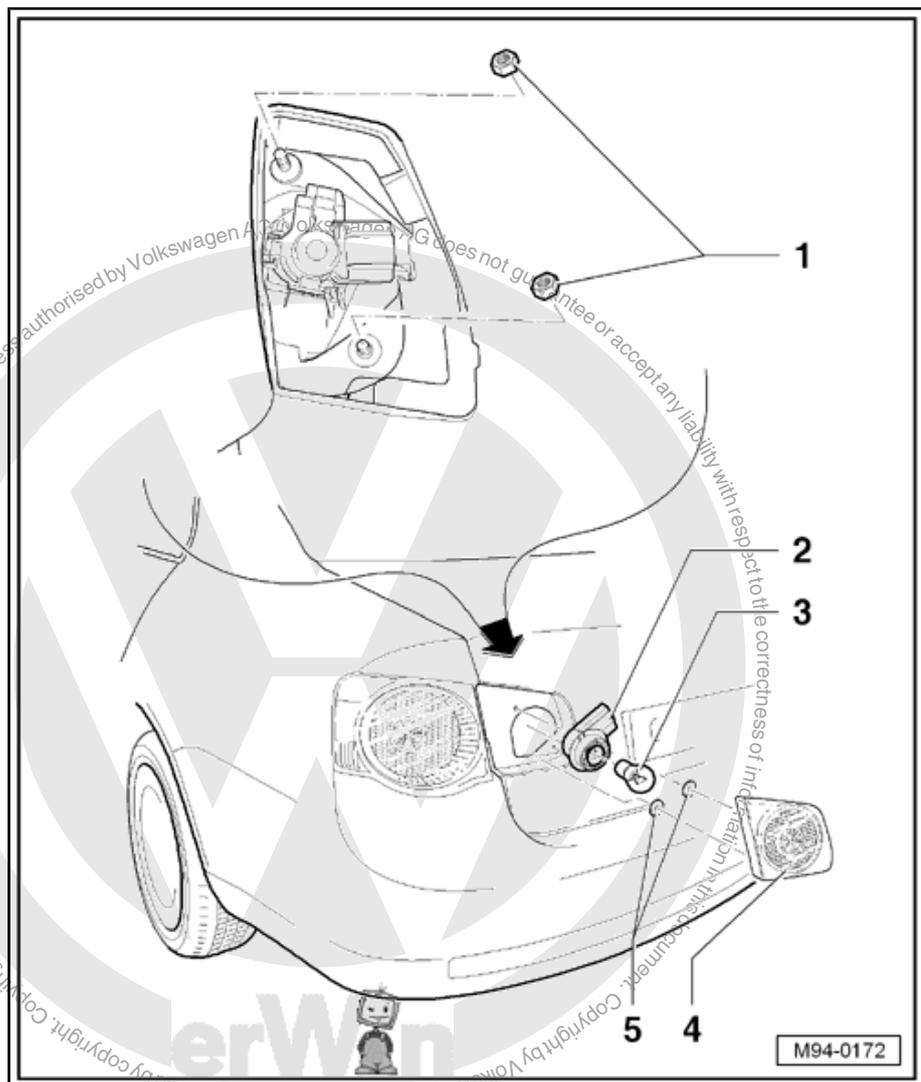
3 - Left reversing light bulb - M16- / left reversing light bulb -L46- / right reversing light bulb -M17-

- Bulb: P 12 V/21 W

4 - Tail light housing in rear lid

- Removing and installing
=> [page 311](#)

5 - Washer





9.7 Removing and installing tail light in rear lid - saloon



Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

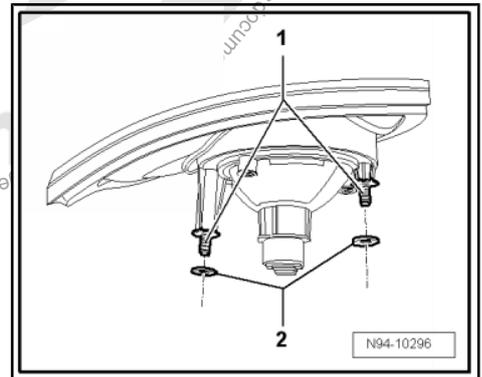
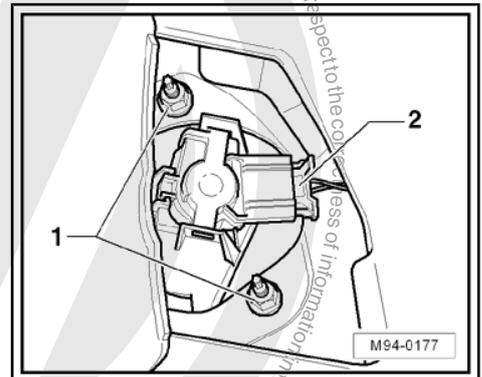
Removing

- Unclip service cover from trim in rear lid.
- Pull off connector -2-.
- Unscrew nuts -1- from tail light in rear lid.
- Remove tail light.

Installing

Carry out installation in the reverse sequence, noting the following:

- Fix washer -2- before fitting to raised section (dome) -1- using a drop of adhesive (Loctite) to prevent it from falling into the cavity of the vehicle body.
- Place washers -2- on raised section (dome) -1-.
- Tighten all threaded connections to specified torques
⇒ [page 310](#).
- When installation is complete, check gap/shut lines of tail light to body.



9.8 Removing and installing tail light bulb holder in rear lid - saloon



Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

Removing

- Unclip service cover from trim in rear lid.

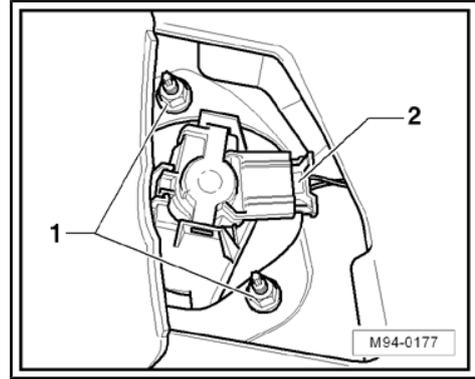


- Pull off connector -2-.



Note

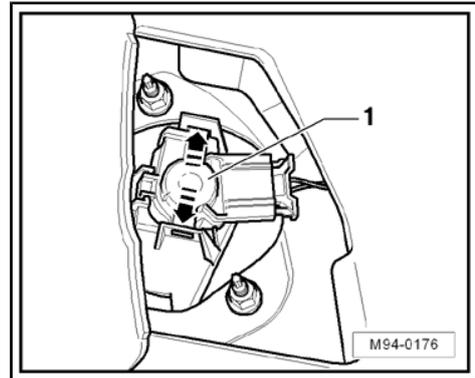
The lower trim of the rear lid need not be removed. For illustration purposes, the lower trim of the rear lid is not shown in the following picture.



- Release both lugs -in direction of arrow- and take out bulb carrier -1-.

Installing

Installation is carried out in reverse order of removal.





9.9 Assembly overview - tail light - Variant

1 - Nut

- 3.5 Nm

2 - Left brake light bulb -M9- / right brake light bulb -M10-

3 - Right tail light bulb -M2- / left tail light bulb -M4-

4 - Tail light housing

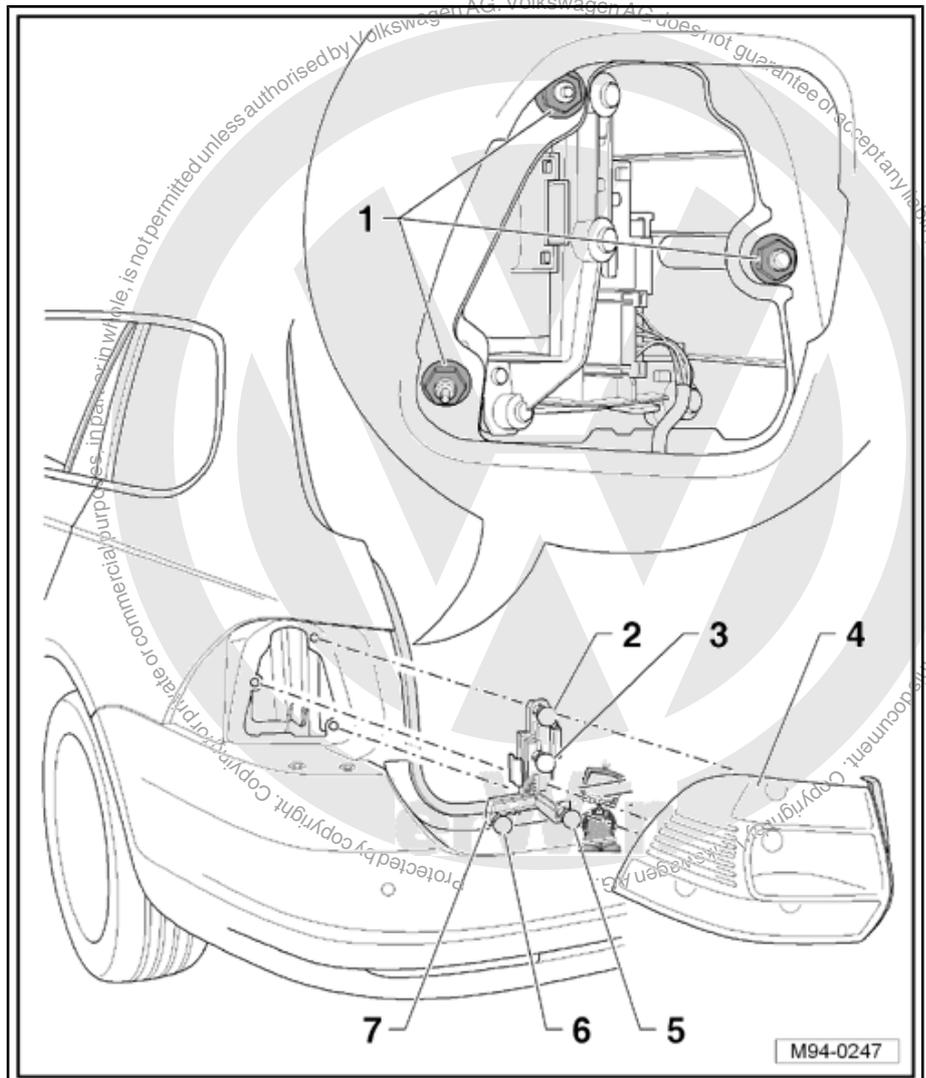
- Removing and installing
⇒ [page 313](#)

5 - Rear fog light bulb -L20- / right reversing light bulb -M17-

6 - Rear left turn signal bulb - M6- / rear right turn signal bulb -M8-

7 - Bulb carrier

- Removing and installing
⇒ [page 314](#)



9.10 Removing and installing tail light - Variant



Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

Removing

- Push side panel trim/cover to the side.



- Disconnect connector -3-.
- Unscrew nuts -2- and -4- for tail light -1-.
- Remove tail light -1-.

Installing

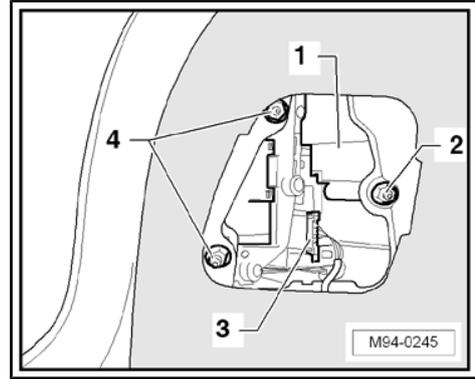
Carry out installation in the reverse sequence, noting the following:

- Tighten all threaded connections to specified torques
=> [page 313](#) .

Note

Tail light connector in side panel should engage „audibly“.

- When installation is complete, check gap/shut lines of tail light to body.



9.11 Removing and installing tail light bulb holder - Variant

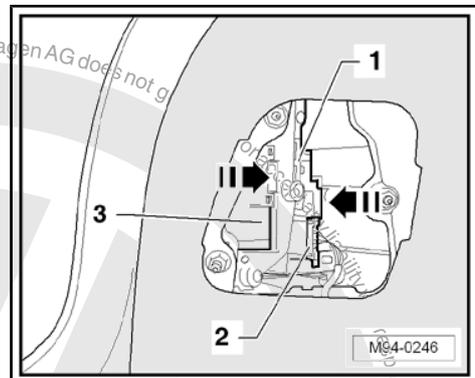


Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

Removing

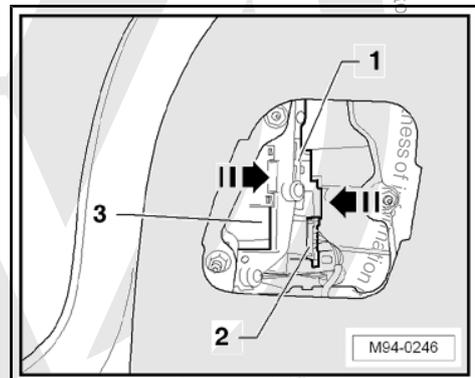
- Push side panel trim/cover to the side.
- Disconnect connector -2-.



- Unclip fastening tabs -in direction of arrow- and unhook bulb carrier -1- from tail light housing -3-.

Installing

Installation is carried out in reverse order of removal.





10 Removing and installing number plate lights



Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

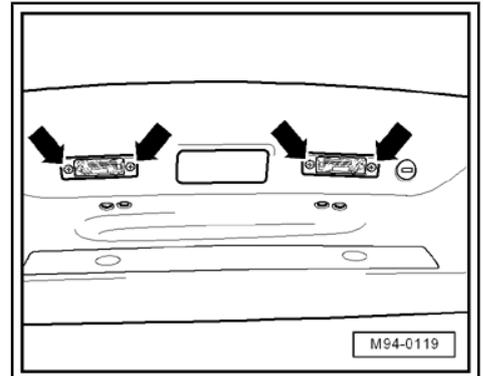
Removing

- Remove screws -arrows- from left number plate light -X4- .
- Remove lens with left number plate light -X4- .

Bulb: festoon C 12 V/5 W

Installing

Installation is carried out in reverse order of removal.





11 Additional brake lights

11.1 Removing and installing additional brake light bulb -M25- - saloon



Note

- ◆ *Failure of LEDs in additional brake lights:*
- ◆ *The individual LEDs in the additional brake lights are comprised in groups of four LEDs and are supplied with current in groups.*
- ◆ *The additional brake light is designed in such a way that the legal requirements are still met in the event that one LED group fails.*
- ◆ *If a further LED group fails, these requirements are no longer met according to the legislator.*
- ◆ *Due to the failure of one LED group, the intact LEDs are placed under increased strain; it must be anticipated that further LED groups will soon fail.*
- ◆ *If more than four individual LEDs in the additional brake light have failed, the additional brake light must be renewed (repair measure).*



Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

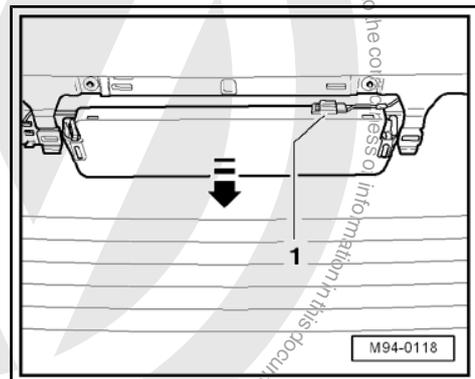
Removing

- Remove strip roof leading edge ⇒ General body repairs, interior; Rep. gr. 70 .
- Disconnect connector 1-.
- Push high-level brake light bulb -M25- -in direction of arrow- to rear window.

Installing

Carry out installation in the reverse sequence, noting the following:

- When installing additional brake light bulb -M25- , ensure the seal is seated correctly.



11.2 Removing and installing additional brake light bulb -M25- - estate

The additional brake light bulb -M25- is located in the roof spoiler over the rear window.

The illumination of high-level brake light bulb -M25- is provided by LEDs.

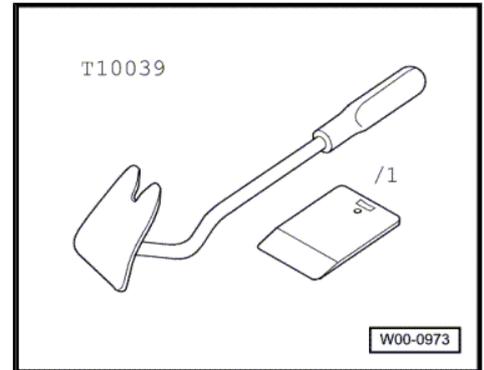
The additional brake light bulb -M25- cannot be dismantled.



In the event of damage, the complete additional brake light bulb -M25- must be renewed.

Special tools and workshop equipment required

- ◆ Removal wedge -T10039/1-

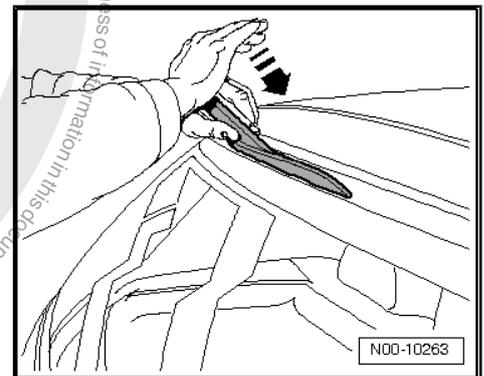


Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**
- ◆ **When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -T10039/1-, removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.**
- ◆ **Ensure the seal is not damaged when removing the additional brake light bulb -M25-.**

Removing

- Insert removal wedge -T10039/1- between upper edge of high-level brake light bulb -M25- and roof spoiler.
- Press additional brake light bulb -M25- downwards using removal wedge -T10039/1- and unclip upper retaining lugs of additional brake light bulb -M25- towards rear.
- Then pull the additional brake light bulb -M25- to rear out of opening in the roof spoiler, as far as the connected wiring allows.





- Release and disconnect connector -1- and remove additional brake light bulb -M25- -2-.

Installing

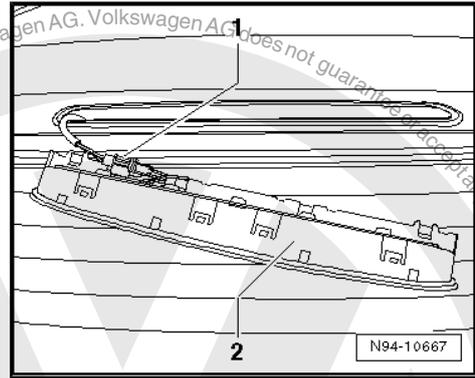
Carry out installation in the reverse sequence, noting the following:



Note

Ensure when installing the additional brake light bulb -M25- that the seal is seated correctly. The seal must not form loops or be damaged.

- Clip the additional brake light bulb -M25- back into the roof spoiler starting at the lower edge.





12 Steering column switch



Caution

When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed => [page 4](#) .



Note

- ◆ *When a new steering column electronics control unit -J527- is installed, it must be coded => [page 327](#) .*
- ◆ *In the event of faults in the steering column switch, the coding of the steering column electronics control unit -J527- must be checked => [page 327](#) .*

Fault detection and fault display

The steering column electronics control unit -J527- is equipped with self-diagnosis.

For fault finding, use vehicle diagnosis, testing and information system -VAS 5051B- in „Guided fault finding“ mode.





12.1 Assembly overview - steering column switch

1 - Turn signal switch

- ❑ Consists of turn signal switch -E2- / headlight dipper/flasher switch -E4- / cruise control switch -E45-
- ❑ The illustration shows the „turn signal switch“ with no cruise control system switch -E45-
- ❑ Removing and installing ⇒ [page 324](#)

2 - Steering column switch base

- ❑ Removing and installing ⇒ [page 326](#)

3 - Windscreen wiper switch - E-

- ❑ Removing and installing ⇒ [page 324](#)

4 - Bolt

- ❑ 1 Nm

5 - Steering column electronics control unit -J527-

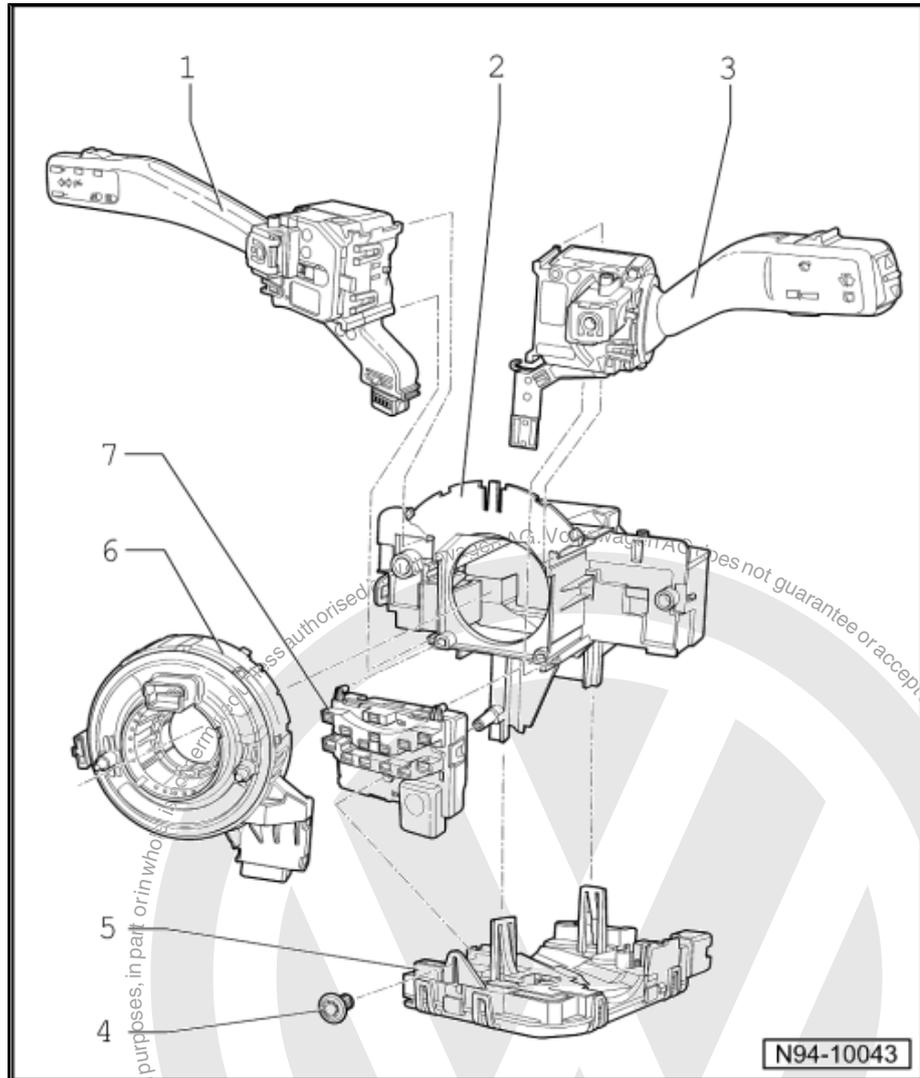
- ❑ Removing and installing ⇒ [page 321](#)
- ❑ Coding ⇒ [page 327](#)
- ❑ Final control diagnosis ⇒ [page 328](#) .

6 - Airbag coil connector and return ring with slip ring -F138-

- ❑ Removing and installing ⇒ [page 322](#)

7 - Steering angle sender -G85-

- ❑ Removing and installing ⇒ [page 323](#)
- ❑ Basic setting ⇒ [page 328](#)



12.2 Removing and installing steering column switch



Caution

When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#) .



Note

When removing steering column switch, make sure that no chips get into steering column switch while drilling open the shear-head bolts.

Removing

For removal of the complete steering column switch with the base, the switch is dismantled and the steering lock housing is also removed. For assembly of the steering lock housing, new shear bolts are required. Even if just one component of the steering column switch is removed or renewed, the sequence described as follows must be adhered to.

- Disconnect battery -A- ⇒ [page 4](#) .
- Remove steering wheel ⇒ General body repairs, interior; Rep. gr. 69 .
- Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 68 .

Remove components of steering column switch in the following sequence:

- ◆ Steering column electronics control unit -J527- ⇒ [page 321](#)
- ◆ Airbag coil connector and return ring with slip ring -F138- ⇒ [page 322](#)
- ◆ Steering angle sender -G85- ⇒ [page 323](#)
- ◆ Turn signal switch -E2- ⇒ [page 324](#)
- ◆ Windscreen wiper switch -E- ⇒ [page 324](#)
- ◆ Steering column switch base ⇒ [page 326](#)

Installing

Installation is carried out in reverse order of removal.

12.2.1 Removing and installing steering column electronics control unit -J527-

If a new steering column electronics control unit -J527- is installed, it must be coded ⇒ [page 327](#) .

In the event of faults in the steering column switch, the coding of the steering column electronics control unit -J527- must be checked ⇒ [page 327](#) .



Removing

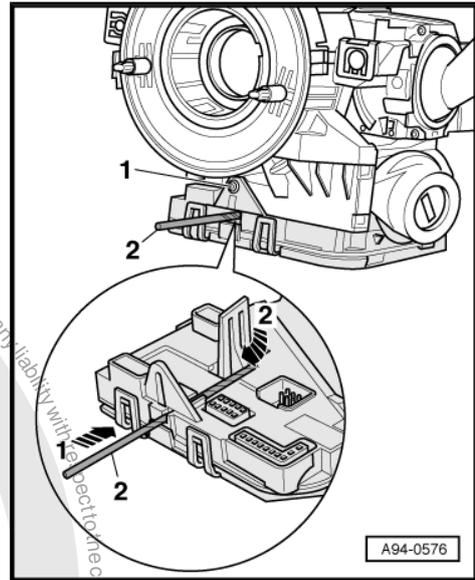
- Remove bolt -1-.



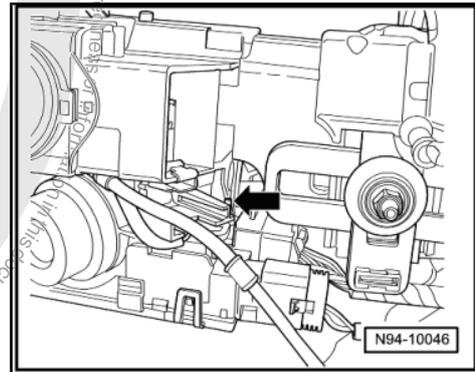
Caution

DO NOT attempt to remove steering column electronics control unit -J527- without releasing middle securing clip, as described in next step. Failure to do so would damage steering column electronics control unit -J527-.

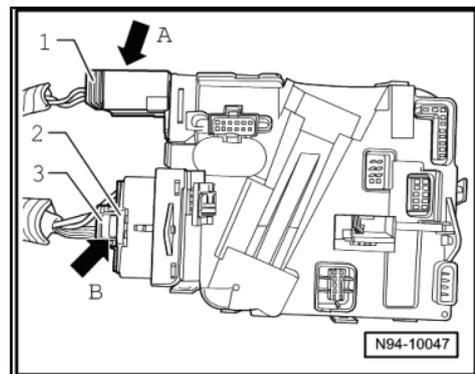
- Insert a piece of wire or a 2.5 mm Ø drill bit -2- approx. 45 mm into hole -arrow 1- in steering column electronics control unit -J527- to release locking tab -arrow 2-.



- Using a screwdriver, press against the rear retaining clip -arrow- of the control unit for steering column electronics -J527- .
- Carefully pull the steering column electronics control unit -J527- downwards off the steering column switch.



- Unclip -arrow A- connector -1- and disconnect from steering column electronics control unit -J527- .
- Pull locking bar -3- out of connector.
- Unclip -arrow B- connector -2- and disconnect from steering column electronics control unit -J527- .



Installing

Carry out installation in the reverse sequence, noting the following:

Ensure when fitting the connector that none of the pins become bent and that the connector can be heard to engage.

12.2.2 Removing and installing airbag coil connector and return ring with slip ring - F138-



WARNING

Airbag coil connector and return ring with slip ring -F138- should not be moved out of central position during removal and road wheels should be in „straight-ahead“ position.



Removing

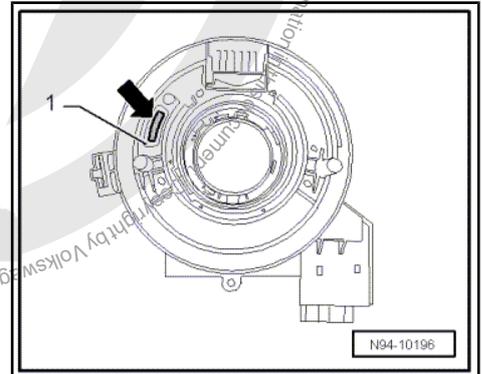
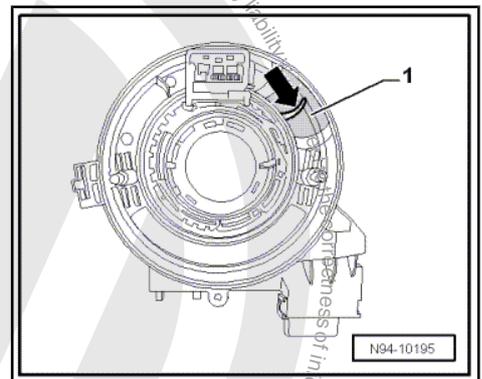
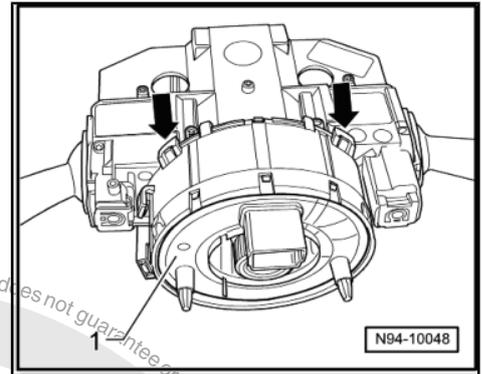
- Slightly lift the tabs -arrows- on airbag coil connector and return ring with slip ring -F138- -1- and pull airbag coil connector and return ring with slip ring -F138- backwards off steering column.

Installing

Carry out installation in the reverse sequence, noting the following:

When installing airbag coil connector and return ring with slip ring -F138- , make sure airbag coil connector and return ring with slip ring -F138- is in central position and wheels are in „straight-ahead“ position.

Central position of airbag coil connector and return ring with slip ring -F138- depends on manufacturer and is shown below:



- ◆ The coloured strip (black rectangles) -arrow- must be located in sight window -1-.
- ◆ The coloured strip (yellow) -arrow- must be in sight window -1-.



Note

If a new steering angle sender -G85- is installed, this procedure must be followed by a „basic setting“ => [page 328](#)

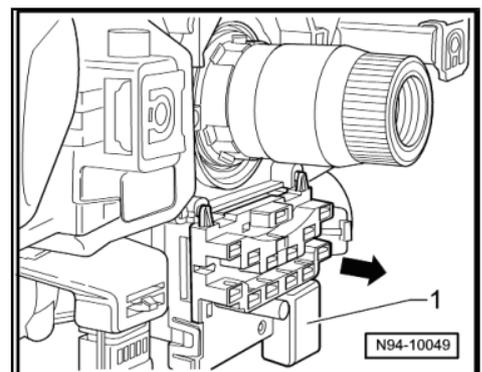
12.2.3 Removing and installing steering angle sender -G85-

Removing

- Pull the steering angle sender -G85- -1- backwards and away from the steering column switch -arrow-.

Installing

Installation is carried out in reverse order of removal.





12.2.4 Removing and installing turn signal switch

The „turn signal switch“ comprises the following components: turn signal switch -E2-, headlight dip/flasher switch -E4- and cruise control system switch -E45-



Note

For reasons of clarity, the steering column switch is shown with CCS switch -E45- in the illustration.

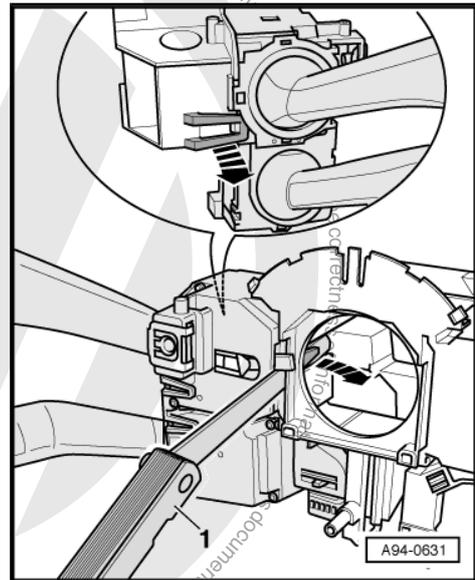
Removing

- Release retaining clips -arrows- using 1.0 mm feeler gauge -1- and take „turn signal switch“ off backwards.

Installing

Carry out installation in the reverse sequence, noting the following:

The „turn signal switch“ should be heard to engage.



12.2.5 Removing and installing windscreen wiper switch -E-

Removing



Note

For reasons of clarity, the steering column switch is shown in the removed state.

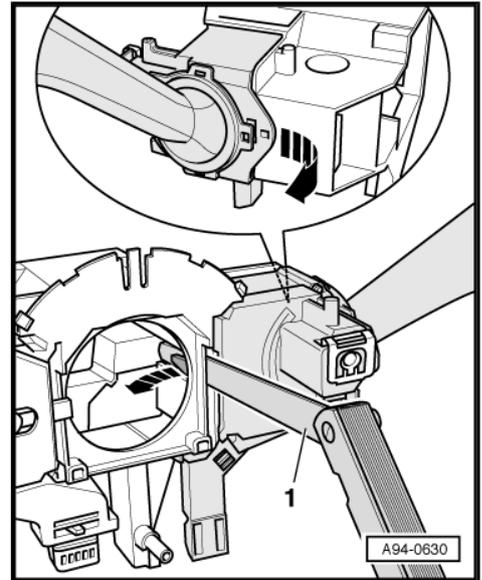


- Release retaining clips -arrows- using 1.0 mm feeler gauge -1- and take windscreen wiper switch -E- off backwards.

Installing

Carry out installation in the reverse sequence, noting the following:

The windscreen wiper switch -E- should be heard to engage.





12.2.6 Removing and installing steering column switch base



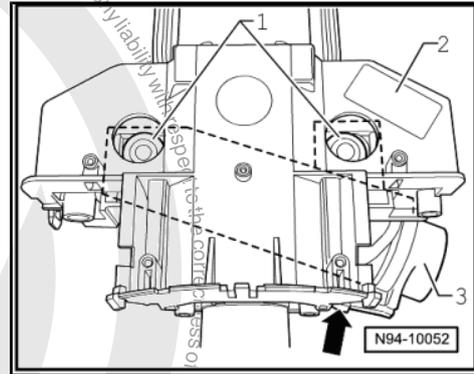
Note

To remove the steering column switch base -2-, the shear bolts of the steering lock housing must be drilled out. To reinstall, new shear-head bolts -1- are required ⇒ Parts catalogue (ETKA) .



Caution

- ◆ Ensure that the components mounted on the carrier have been removed before drilling out the shear-head bolts.
- ◆ The drilling operation can cause swarf to penetrate the adjacent components resulting in damage and/or malfunction!
- ◆ Keep to the specified sequence when removing components.
- ◆ When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#) .



Removing

- Disconnect battery -A- ⇒ [page 4](#) .

Remove the following components in sequence:

- Remove steering wheel ⇒ General body repairs, interior; Rep. gr. 69 .
- Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 68 .
- Remove steering column electronics control unit -J527- ⇒ [page 321](#) .
- Remove airbag coil connector and return ring with slip ring - F138- ⇒ [page 322](#) .
- Remove steering angle sender -G85- ⇒ [page 323](#) .
- Remove turn signal light switch -E2- ⇒ [page 324](#) .
- Remove windscreen wiper switch -E- ⇒ [page 324](#) .



- Separate connector -arrow- on reader coil -3-.

The base can be removed once all the components mounted to it have been removed:

- Drill out bolts -1- of steering lock housing -3-.



Note

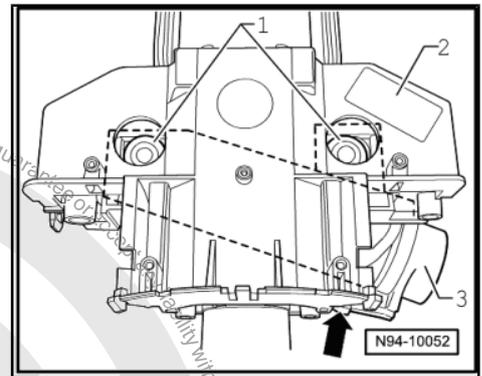
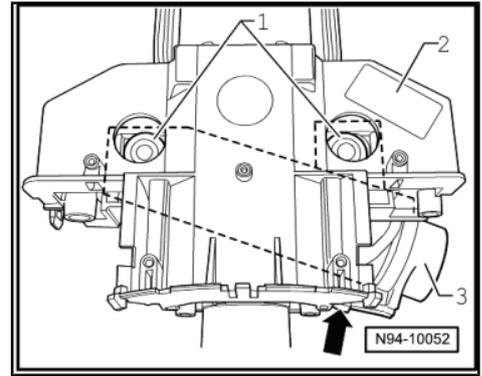
Bolts M8 -1-, core diameter 6.8 mm

- Pull steering lock housing and steering column switch base -2- backwards off steering column.
- Take steering lock housing off steering column switch base.

Installing

Carry out installation in the reverse sequence, noting the following:

- Place the steering lock housing into the steering column switch base.
- Push steering column switch base -2- as far as possible onto steering column.
- Fit connector -arrow- on reader coil -3-.
- Secure steering lock housing using new shear bolts -1- to steering column.
- Tighten shear bolts -1- until bolt heads shear off.



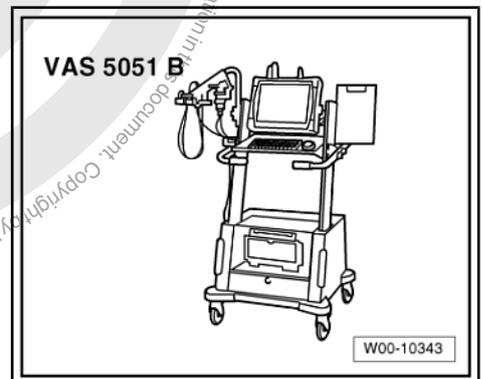
12.3 Steering column electronics control unit -J527-

Removing and installing steering column electronics control unit -J527- => [page 321](#) .

12.3.1 Coding steering column electronics control unit -J527-

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-





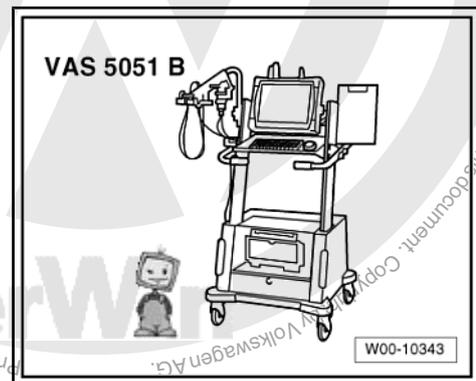
Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Steering wheel electronics
 - ◆ Steering wheel electronics functions
 - ◆ Coding steering wheel electronics control unit

12.3.2 Final control diagnosis steering column electronics control unit -J527-

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Steering wheel electronics
 - ◆ Steering wheel electronics functions
 - ◆ Steering wheel electronics final control diagnosis

12.4 Steering angle sender -G85-

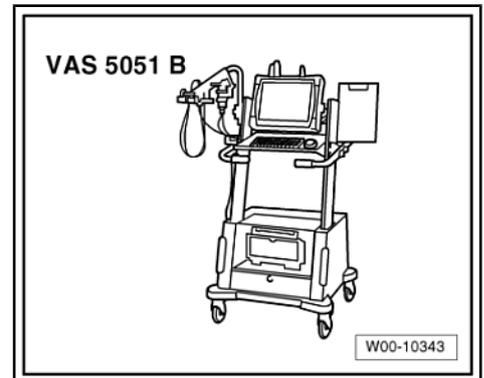
Removing and installing steering angle sender -G85-
⇒ [page 323](#) .



12.4.1 Basic setting of steering angle sender - G85-

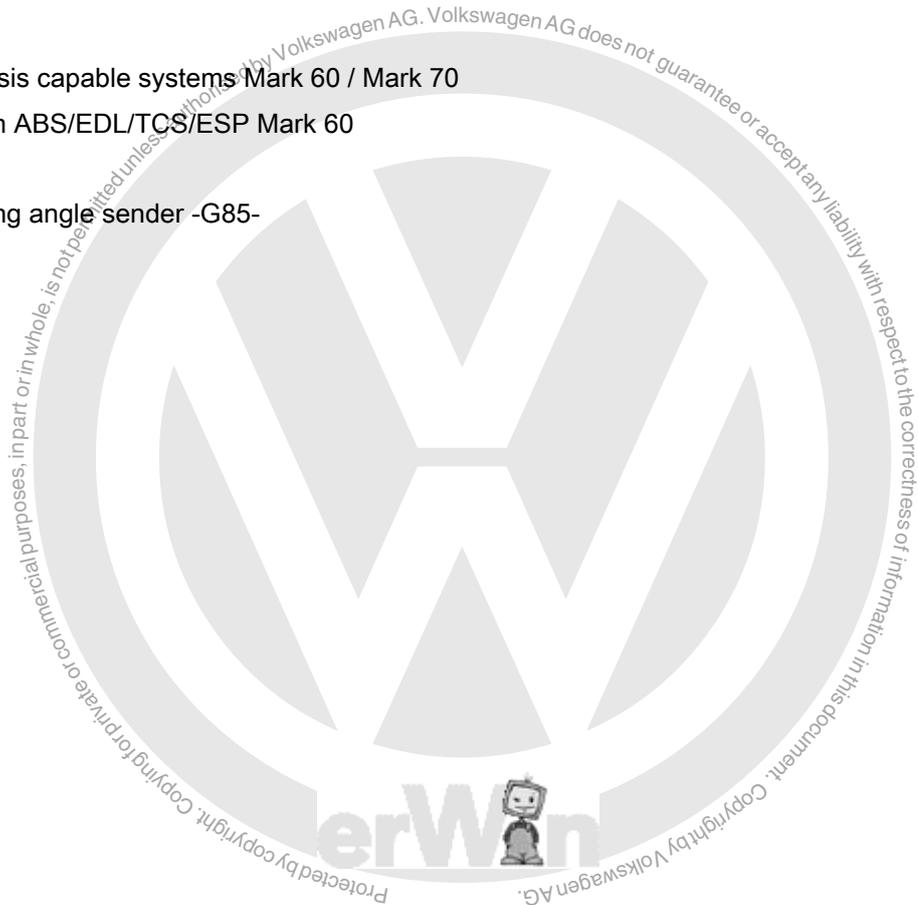
Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Running gear
 - ◆ Brake system
 - ◆ 01 - On Board Diagnosis capable systems Mark 60 / Mark 70
 - ◆ Anti-lock brake system ABS/EDL/TCS/ESP Mark 60
 - ◆ Functions
 - ◆ Basic setting of steering angle sender -G85-





13 Ignition/starter switch and lock cylinder

13.1 Removing and installing steering lock housing



Caution

When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#) .

The steering lock could be destroyed.

If the steering lock is actuated without lock cylinder, it will block and must be renewed.

The steering lock must not be actuated without lock cylinder.



Note

If the steering lock is to be removed, the steering column switch base must first be removed.

Removing

- Disconnect battery -A- ⇒ [page 4](#) .
- Remove steering column switch base ⇒ [page 326](#) .

13.2 Removing and installing lock cylinder



Caution

◆ *When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#) .*

◆ *The steering lock could be destroyed.*

◆ *If the steering lock is actuated without lock cylinder, it will block and must be renewed.*

◆ *The steering lock must not be actuated without lock cylinder.*

Removing

- Disconnect battery -A- ⇒ [page 4](#) .
- Remove steering wheel ⇒ General body repairs, interior; Rep. gr. 69 .
- Remove steering column trim ⇒ General body repairs, interior; Rep. gr. 68 .
- Remove steering column electronics control unit -J527- ⇒ [page 321](#) .
- Remove airbag coil connector and return ring with slip ring - F138- ⇒ [page 322](#) .
- Remove steering angle sender -G85- ⇒ [page 323](#) .



i Note

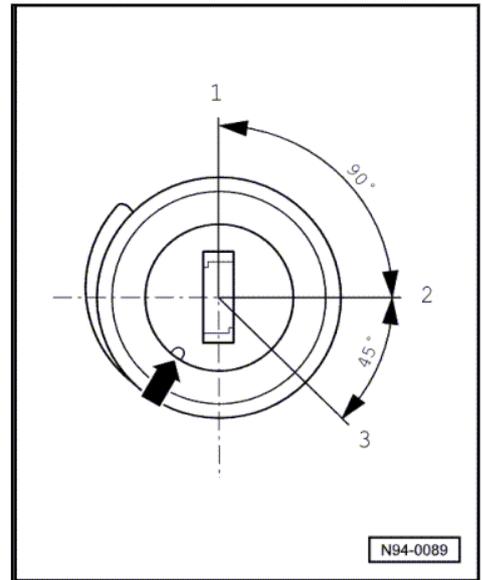
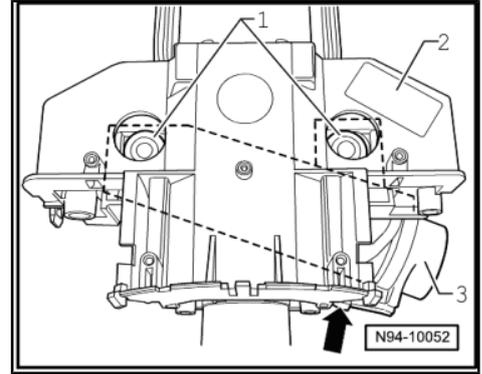
- ◆ There is no need to remove the switches in order to remove the lock cylinder.
- ◆ The immobiliser reader coil -D2- is secured to the lock cylinder and cannot be changed individually.

– Pull connector -arrow- off immobiliser reader coil -D2-.

– Insert ignition key in lock cylinder and turn to position „Drive“

Positions for key in lock cylinder:

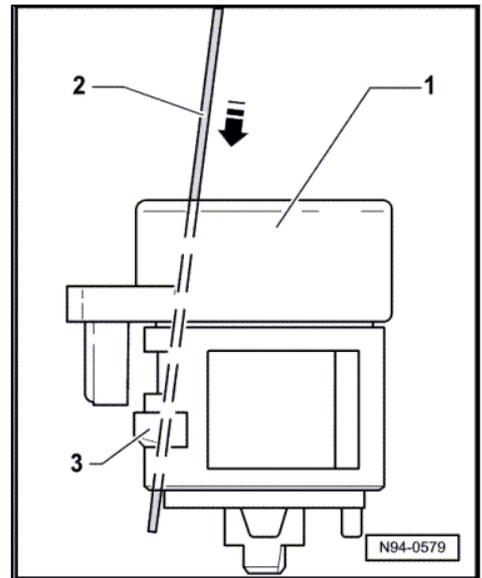
- 1 - Position „Stop“
- 2 - Position „Drive“
- 3 - Position „Start“



i Note

For reasons of clarity, the lock cylinder is shown in the following illustration without ignition key.

- Insert steel wire (Ø 1.2 mm) into hole -arrow- adjacent to ignition key.
- Using steel wire -2- release -arrow- locking lever -3- of lock cylinder -1-.
- Pull lock cylinder -1- out of steering lock housing.





Installing



Note

For reasons of clarity, the ignition key is not shown in the following illustration.

- Insert ignition key in lock cylinder -1- and turn to position „Drive“.
- Using steel wire -2- release -arrow- locking lever -3- of lock cylinder -1-.
- Place lock cylinder -1- in steering lock housing.

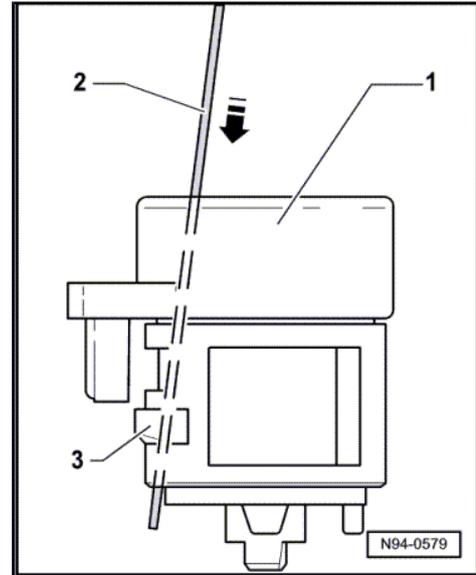


Note

The connection for the immobiliser reader coil -D2- must be inserted in the guide on the steering lock housing.

- Pull steel wire -2- out of lock cylinder -1- and check lock cylinder is seated correctly in the steering lock housing.
- Fit connector to immobiliser reader coil -D2- .

Further installation is performed in reverse sequence.



13.3 Removing and installing ignition/starter switch -D-



Caution

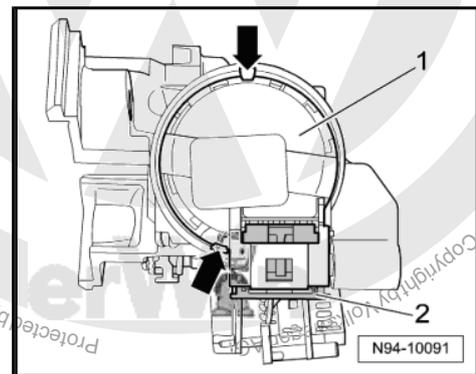
When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#) .

Removing

- Disconnect battery -A- ⇒ [page 4](#) .
- Detach connector -2- from ignition/starter switch -D- -1-.
- Release ignition/starter switch -D- using small screwdriver -arrows-.
- Pull ignition/starter switch -D- -1- out of steering lock housing.

Installing

- Insert ignition/starter switch -D- in steering lock housing until it can be heard to engage.





- Insert ignition key in lock cylinder and turn to position „Drive“.



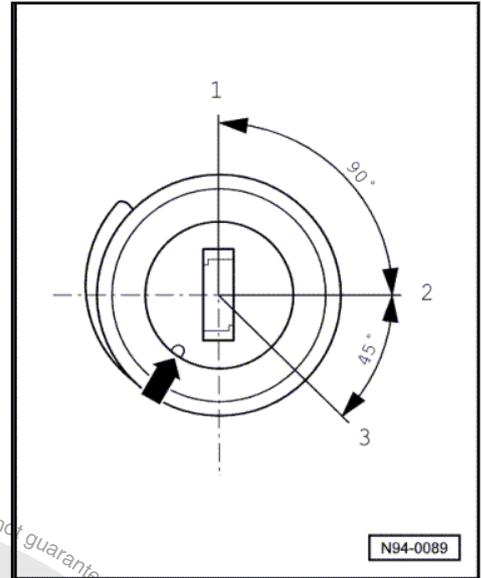
Note

The key must be in the „Drive“ position.

Positions for key in lock cylinder:

- 1 - Position „Stop“
- 2 - Position „Drive“
- 3 - Position „Start“

- Install all parts in reverse order of removal.



13.3.1 Removing and installing ignition key withdrawal lock solenoid -N376-

The ignition key withdrawal lock solenoid -N376- is located very close to the ignition starter key.



Note

To remove ignition key on vehicles with an automatic gearbox, always move selector lever to position „P“ first then switch off ignition. Otherwise the ignition key withdrawal lock solenoid -N376- will inhibit the removal of the ignition key.

Removing

- Remove steering column electronics control unit -J527- ⇒ [page 321](#) .
- Release fastener -2- using a suitable screwdriver.
- Pull ignition key withdrawal lock solenoid -N376- -1- in direction of arrow and out of its mounting.
- The electrical connection will be disconnected automatically.

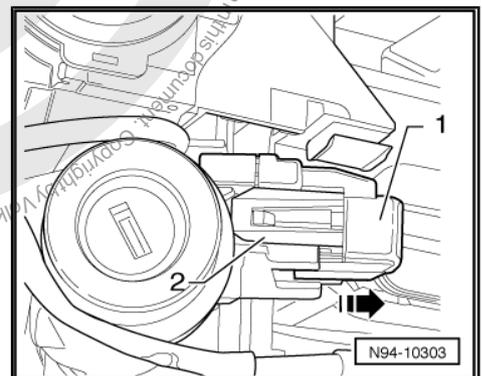
Installing

- Carry out installation in the reverse sequence, noting the following:



Note

After reconnecting the battery -A- , carry out final control diagnosis to activate ignition key withdrawal lock solenoid -N376- ⇒ [page 328](#) .





14 Parking aid

14.1 General description

When dealing with complaints, it is absolutely necessary to understand the functions and the operation of the parking aid ⇒ Operating instructions .

The parking aid system supports the driver during parking manoeuvres by indicating the distance from the rear of the vehicle to the obstacle by way of acoustic signals.

A 4-channel and a 8-channel parking aid system are available.

The 4-channel parking aid system consists of:

- ◆ Parking aid control unit -J446-
- ◆ Rear parking aid warning buzzer -H15-
- ◆ Rear left centre parking aid sender -G204-
- ◆ Parking aid sender, rear left, inner -G334-
- ◆ Parking aid sender, rear right, inner -G335-
- ◆ Rear right centre parking aid sender -G205-



Note

- ◆ *It is possible that the first software version of the parking aid control unit -J446- may display various sender designations due to the various levels of software. In this case allocation is as follows:*
- ◆ *Rear centre left parking aid sender -G204- is rear left parking aid sender -G203-*
- ◆ *Rear left inner parking aid sender -G334- is rear centre left parking aid sender -G204-*
- ◆ *Rear right inner parking aid sender -G335- is rear centre right parking aid sender -G205-*
- ◆ *Rear centre right parking aid sender -G205- is rear right parking aid sender -G206-*

The 8-channel parking aid system consists of:

- ◆ Parking aid control unit -J446-
- ◆ Front left parking aid sender -G255-
- ◆ Front centre left parking aid sender -G254-
- ◆ Front centre right parking aid sender -G253-
- ◆ Front right parking aid sender -G252-
- ◆ Rear left parking aid sender -G203-
- ◆ Rear centre left parking aid sender -G204-
- ◆ Rear centre right parking aid sender -G205-
- ◆ Rear right parking aid sender -G206-
- ◆ Front parking aid warning buzzer -H22-
- ◆ Rear parking aid warning buzzer -H15-
- ◆ Parking aid button -E266-



Functioning

To switch on, press, with ignition on, parking aid button -E266- or engage reverse gear. To switch off, press parking aid button - E266- again (parking aid warning lamp -K136- goes out) or drive forwards with a speed over about 15 km/h.

A brief audible signal is given and the parking aid warning lamp - K136- lights up when the parking aid system is ready. If a fault is detected, a continuous audible signal is given for 5 seconds and the parking aid warning lamp flashes -K136- .

The intervals between the warning signals become proportionally shorter as the distance decreases. At distances of less than 30 cm the warning signals merge into a continuous tone. Special situation: reversing parallel to a wall: no warning signal.

Fault detection and fault display

The parking aid system is equipped with self-diagnosis.

For fault finding, use vehicle diagnosis, testing and information system -VAS 5051B- in „Guided fault finding“ mode.

To check parking aid system as a whole, perform final control diagnosis ⇒ [page 354](#) .

14.2 Assembly overview - 4-channel parking aid

1 - Rear parking aid warning buzzer -H15-

- Saloon: under rear shelf
- Variant: behind right side luggage compartment trim
- Saloon: removing and installing ⇒ [page 351](#)
- Variant: removing and installing ⇒ [page 351](#)

2 - Parking aid control unit - J446-

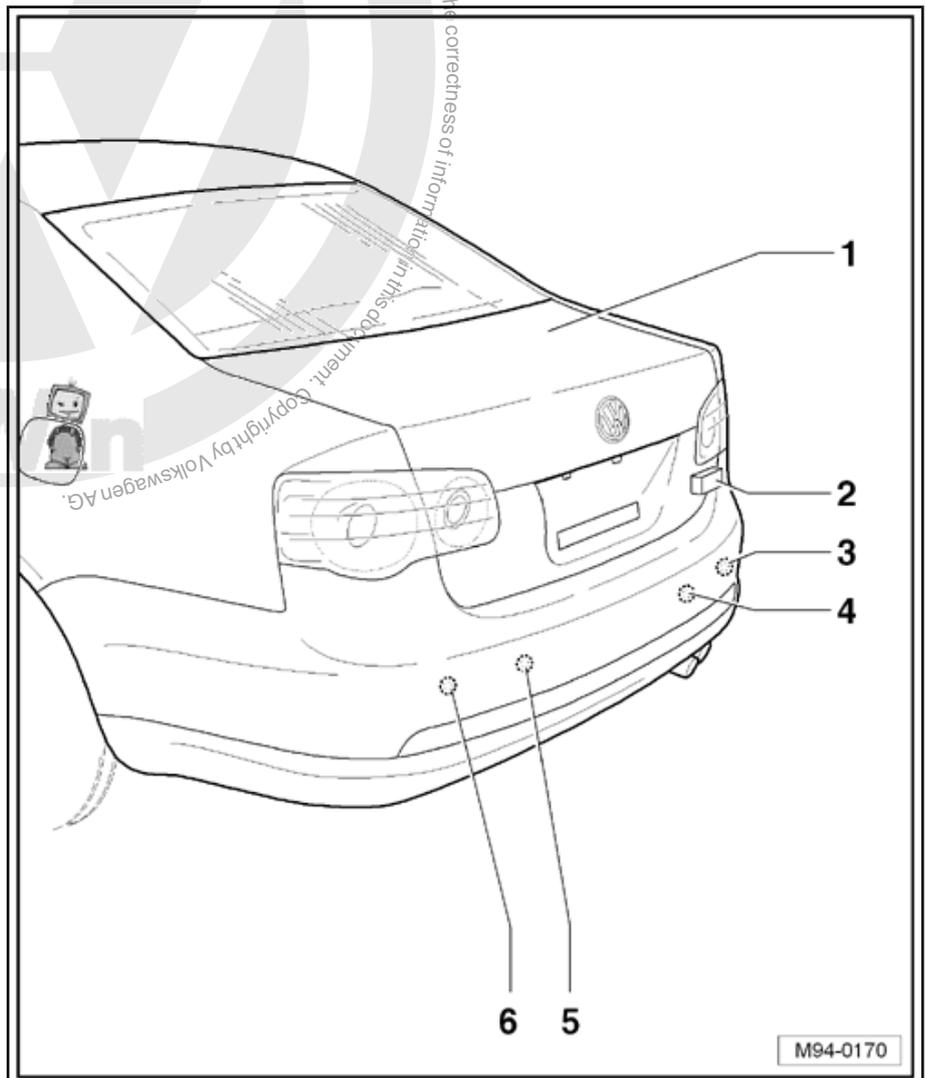
- Behind right side luggage compartment trim
- Saloon: removing and installing ⇒ [page 338](#)
- Variant: removing and installing ⇒ [page 338](#)
- Coding ⇒ [page 341](#)
- Adjusting optical display ⇒ [page 341](#)

3 - Rear right centre parking aid sender -G205-

- In rear bumper cover
- Removing and installing ⇒ [page 342](#)
- Renew sender and sender holder in the event of repair ⇒ [page 347](#) .

4 - Parking aid sender, rear right, inner -G335-

- In rear bumper cover





- Removing and installing
⇒ [page 342](#)
- Renew sender and sender holder in the event of repair ⇒ [page 347](#)

5 - Parking aid sender, rear left, inner -G334-

- In rear bumper cover
- Removing and installing ⇒ [page 342](#)
- Renew sender and sender holder in the event of repair ⇒ [page 347](#) .

6 - Rear left centre parking aid sender -G204-

- In rear bumper cover
- Removing and installing ⇒ [page 342](#)
- Renew sender and sender holder in the event of repair ⇒ [page 347](#) .



Note

- ◆ *It is possible that the first software version of the parking aid control unit -J446- may display various sender designations due to the various levels of software. In this case allocation is as follows:*
- ◆ *Rear centre left parking aid sender -G204- is rear left parking aid sender -G203-*
- ◆ *Rear left inner parking aid sender -G334- is rear centre left parking aid sender -G204-*
- ◆ *Rear right inner parking aid sender -G335- is rear centre right parking aid sender -G205-*
- ◆ *Rear centre right parking aid sender -G205- is rear right parking aid sender -G206-*



14.3 Assembly overview - 8-channel parking aid

1 - Parking aid senders in rear bumper cover

- Rear left parking aid sender -G203-
- Rear centre left parking aid sender -G204-
- Rear centre right parking aid sender -G205-
- Rear right parking aid sender -G206-
- Removing and installing ⇒ [page 342](#)
- Checking ⇒ [page 350](#)
- Renewing ⇒ [page 349](#)
- Renew sender and sender holder in the event of repair ⇒ [page 347](#) .

2 - Rear parking aid warning buzzer -H15-

- Saloon: removing and installing ⇒ [page 351](#)
- Variant: removing and installing ⇒ [page 351](#)
- Adjusting volume ⇒ [page 352](#)
- Adjusting pitch ⇒ [page 352](#)

3 - Parking aid button -E266-

- In centre console next to gear lever
- Removing and installing ⇒ [page 418](#)
- Checking ⇒ [page 355](#)

4 - Parking aid control unit -J446-

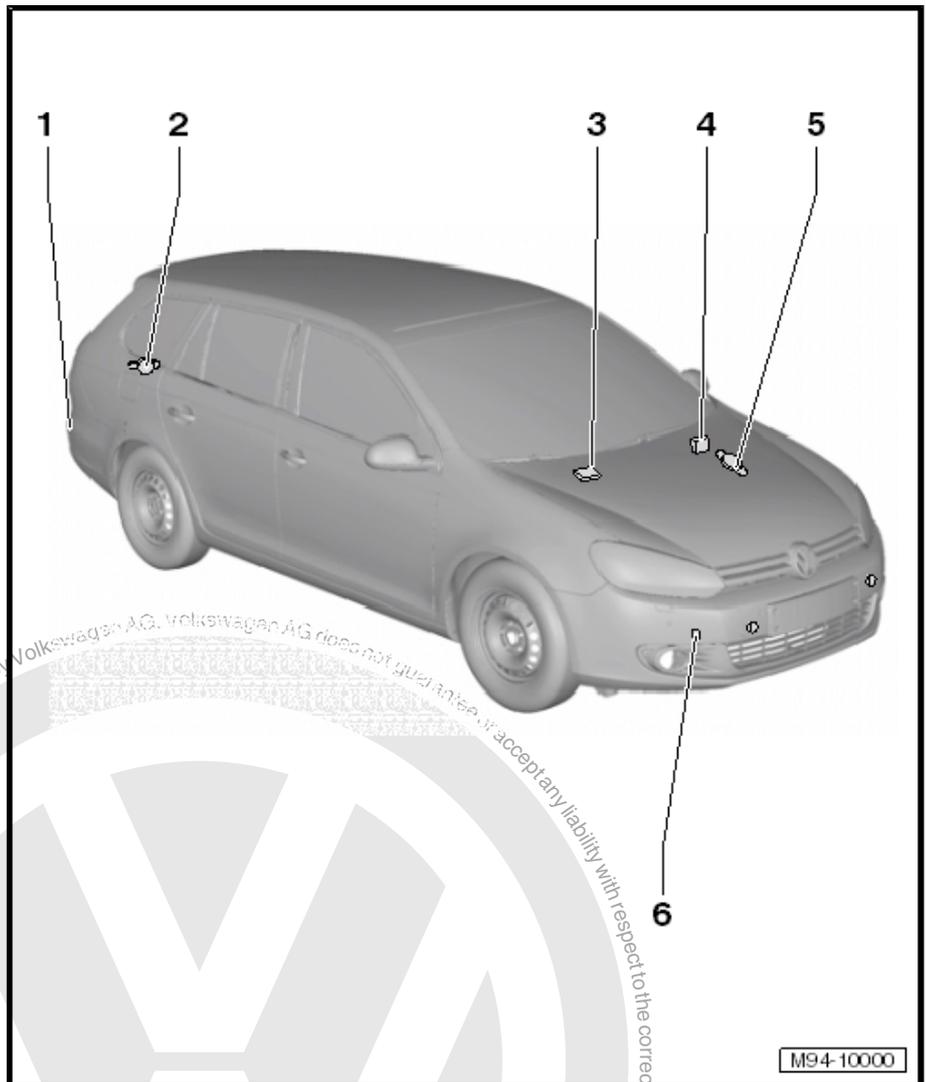
- Above relay carrier in driver's footwell
- Removing and installing (left-hand drive vehicle) ⇒ [page 339](#)
- Removing and installing (right-hand drive vehicle) ⇒ [page 340](#)
- Coding ⇒ [page 341](#)
- Adjusting optical display ⇒ [page 341](#)
- Final control diagnosis ⇒ [page 354](#) .

5 - Front parking aid warning buzzer -H22-

- Removing and installing ⇒ [page 353](#)
- Adjusting volume ⇒ [page 353](#)
- Adjusting pitch ⇒ [page 354](#)

6 - Sender for parking aid in front bumper cover

- Front left parking aid sender -G255-
- Front centre left parking aid sender -G254-
- Front centre right parking aid sender -G253-
- Front right parking aid sender -G252-
- Removing and installing ⇒ [page 345](#)





- ❑ Checking ⇒ [page 350](#)
- ❑ Renewing ⇒ [page 349](#)
- ❑ Renew sender and sender holder in the event of repair ⇒ [page 347](#) .

14.4 Removing and installing parking aid control unit -J446- (4-channel) - saloon

The parking aid control unit -J446- is located behind the right luggage compartment side trim panel.

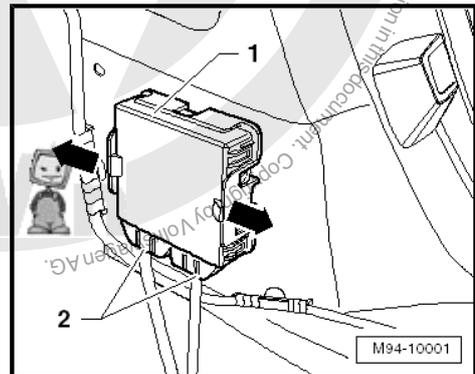


Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

Removing

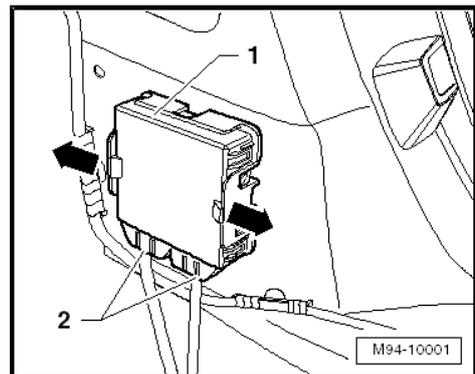
- Remove right luggage compartment side trim panel ⇒ General body repairs, interior; Rep. gr. 70 .
- Remove connector -2- on parking aid control unit -J446- -1-.



- Press locking lugs -arrows- of bracket outwards and remove parking aid control unit -J446- -1- from bracket.

Installing

Installation is carried out in reverse order of removal.



14.5 Removing and installing parking aid control unit -J446- (4-channel) - estate

The parking aid control unit -J446- is located behind the right luggage compartment side trim panel.



Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

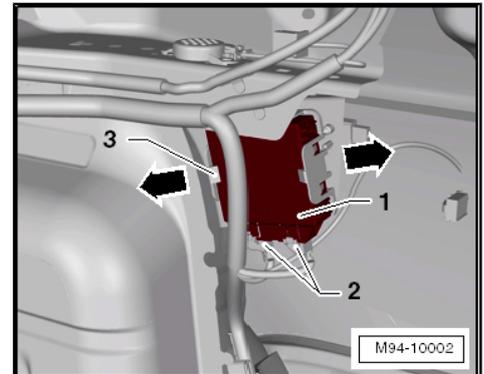


Removing

- Remove right luggage compartment side trim panel ⇒ General body repairs, interior; Rep. gr. 70 .
- Remove connector -2- on parking aid control unit -J446- -1-.
- Press locking lugs -arrows- of bracket -3- outwards and remove parking aid control unit -J446- -1- from bracket -3-.

Installing

Installation is carried out in reverse order of removal.



14.6 Removing and installing parking aid control unit -J446- (8-channel)

The parking aid control unit -J446- is located in the driver's footwell, above the relay carrier.

14.6.1 Removing and installing parking aid control unit -J446- (left-hand drive vehicle)

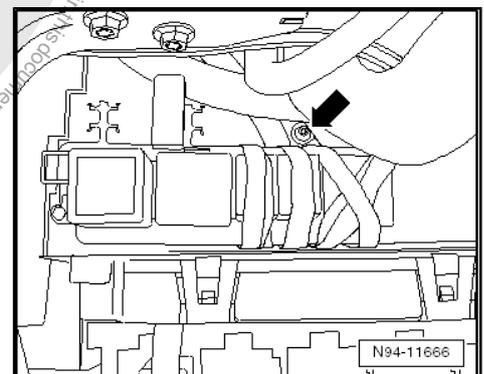
The parking aid control unit -J446- is located in the driver's footwell, above the relay carrier.

 **Caution**

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

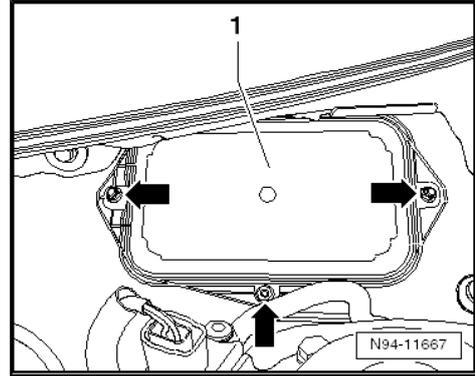
Removing

- Remove trim in driver's footwell ⇒ General body repairs, interior; Rep. gr. 68 .
- Remove securing screw -arrow- for parking aid control unit -J446- above relay carrier.
- Remove windscreen wiper system ⇒ [page 183](#) .





- Remove the three nuts -arrows- and remove cover -1-.

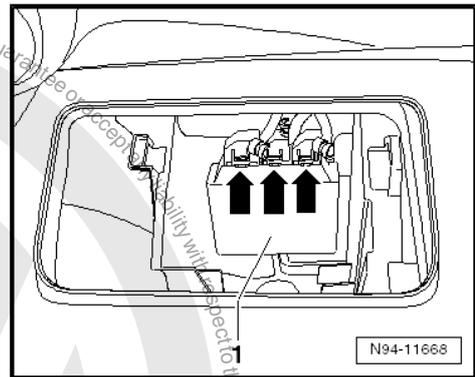


- Detach the three connectors -arrows- and remove the parking aid control unit -J446- -1- upwards out of bracket.

Installing

Install in the reverse order of removal. When doing this, note the following:

- Tighten bolt of parking aid control unit -J446- to 1.5 Nm.



14.6.2 Removing and installing parking aid control unit -J446- (right-hand drive vehicle)

The parking aid control unit -J446- is located in the driver's footwell, above the relay carrier.



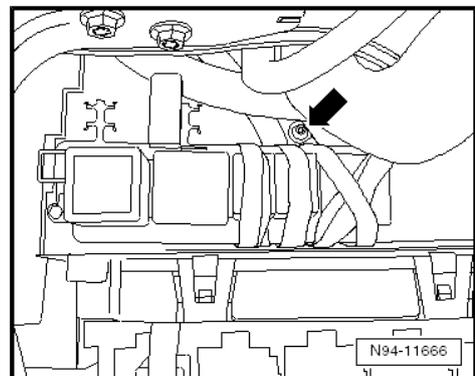
Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**



Removing

- Remove trim in driver's footwell => General body repairs, interior; Rep. gr. 68 .
- Remove securing screw -arrow- for parking aid control unit -J446- above relay carrier.
- Remove data bus diagnostic interface -J533- => [page 452](#) .



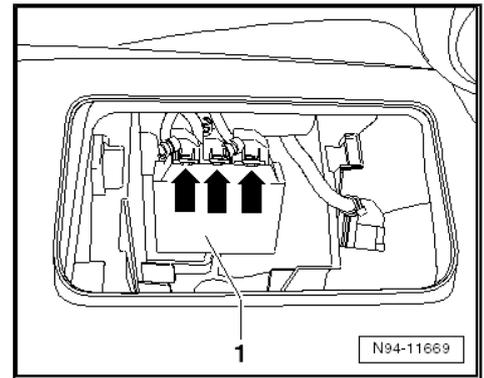


- Detach the three connectors -arrows- and remove the parking aid control unit -J446- -1- upwards out of bracket.

Installing

Install in the reverse order of removal. When doing this, note the following:

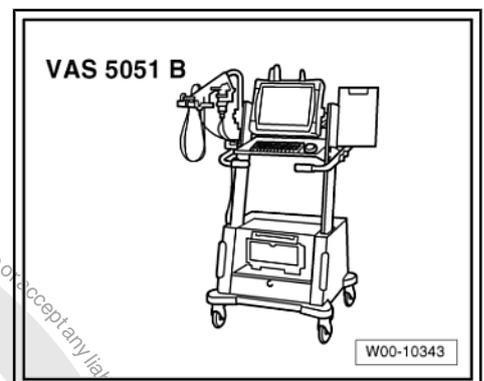
- Tighten bolt of parking aid control unit -J446- to 1.5 Nm.



14.7 Coding parking aid control unit -J446-

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure:

- Connect vehicle diagnosis, testing and information system - VAS-5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ Parking aid
 - ◆ Parking aid functions
 - ◆ Coding parking aid

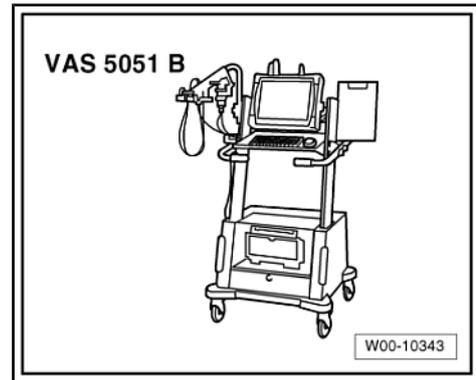
14.8 Adjust optical display

Special tools and workshop equipment required





- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



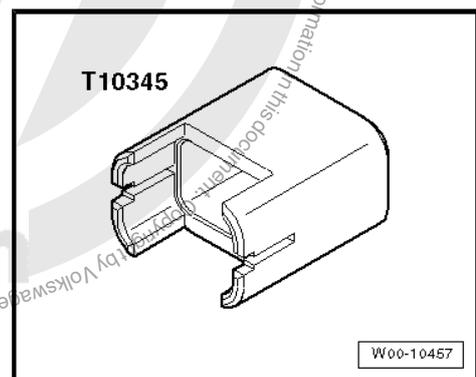
Procedure

- Connect vehicle diagnosis, testing and information system VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ Parking aid
 - ◆ Parking aid functions
 - ◆ Adjust optical display

14.9 Removing and installing rear parking aid senders

Special tools and workshop equipment required

- ◆ Release tool -T10345-



Senders in rear bumper cover:

- ◆ Rear left centre parking aid sender -G204-
- ◆ Parking aid sender, rear left, inner -G334-
- ◆ Parking aid sender, rear right, inner -G335-
- ◆ Rear right centre parking aid sender -G205-



Note

- ◆ *It is possible that the first software version of the parking aid control unit -J446- may display various sender designations due to the various levels of software. In this case allocation is as follows:*
- ◆ *Rear centre left parking aid sender -G204- is rear left parking aid sender -G203-*
- ◆ *Rear left inner parking aid sender -G334- is rear centre left parking aid sender -G204-*
- ◆ *Rear right inner parking aid sender -G335- is rear centre right parking aid sender -G205-*
- ◆ *Rear centre right parking aid sender -G205- is rear right parking aid sender -G206-*

The removal and installation procedure is the same for all senders and is therefore described here for just one sender.



Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

Removing

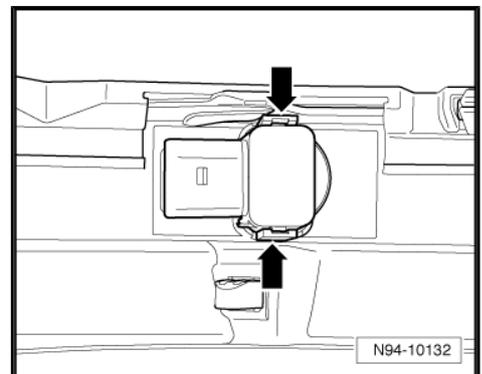
- Remove rear bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 .



Caution

- ◆ **The order for removing the senders must be adhered to under all circumstances.**
- ◆ **The sender may otherwise be damaged. Hairline cracks may occur if too much force is applied to the sender, causing the sender to fail.**
- ◆ **First remove sender from bracket and then disconnect sender connector.**

- Release locking lugs -arrows- using release tool -T10345- and pull sender with connector still joined out of bumper cover.





- Disconnect connector -arrow- when removed.

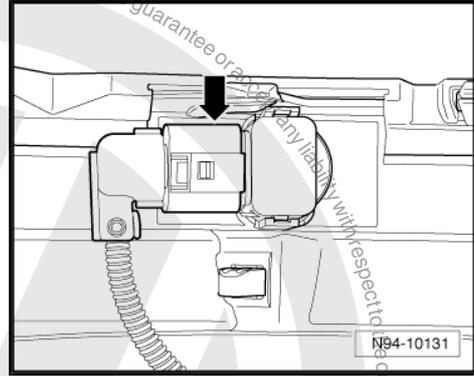
Installing

Install in the reverse order of removal. When doing this, note the following:



Caution

- ◆ *Expanding the isolation ring must be avoided under all circumstances.*
- ◆ *Function problems may occur if a damaged isolation ring is used.*
- ◆ *Renew damaged isolation rings.*



Note

- ◆ *Senders are available in different forms and must be assigned to respective fitting location in bumper cover.*
- ◆ *When installing senders, note position of electrical connections of senders.*

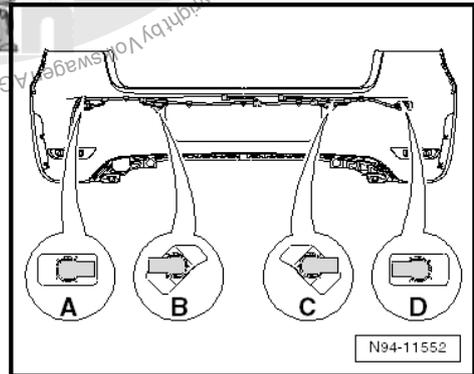
Assignment of parking aid senders on inside of rear bumper cover:

- A - RL - right outer
- B - RRC - right centre
- C - RLC - left centre
- D - RL - left outer

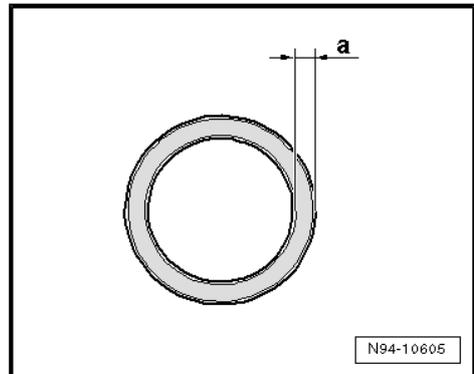


Note

- ◆ *When mounting the sender, ensure that the isolation ring (black silicone ring) is correctly mounted on the sender head and does not ride or roll up on insertion into the sender holder.*
- ◆ *During installation, both locking lugs of sender must engage audibly into sender holder.*



- After installing the sender, check that the sender is correctly seated in the bracket. Visible on the outer side of the bumper, dimension -a- of the ring gap between the sender head and the sender holder must be even all around.





14.10 Removing and installing front parking aid senders

Note

- ◆ *The following illustrations show the removal and installation of the front left parking aid sender.*
- ◆ *The removal and installation of the other parking aid senders are carried out in the same way.*
- ◆ *Both exterior front left parking aid sender -G255- and front right parking aid sender -G252- can also be removed through installation aperture of fog light. Depending on equipment, remove either front cover in bumper cover or fog light => [page 297](#).*



Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

Removing

- Remove front bumper cover => General body repairs, exterior; Rep. gr. 63 .



Caution

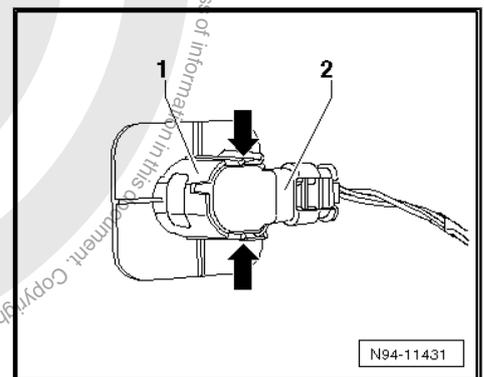
- ◆ **The order for removing the senders must be adhered to under all circumstances.**
- ◆ **The sender may otherwise be damaged. Hairline cracks may occur if too much force is applied to the sender, causing the sender to fail.**
- ◆ **First remove sender from bracket and then disconnect sender connector.**

- Push fasteners -arrows- on sender holder -1- outwards.
- Pull sender -2- with connected wiring backwards out of sender holder.



Note

- ◆ *When removing the sender, ensure the isolation ring (black silicone ring) on the sender head does not remain in the sender or become lost.*
- ◆ *Expanding the isolation ring must be avoided under all circumstances.*





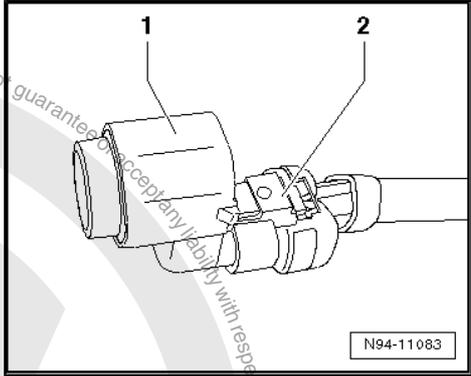
- Detach connector -2- and remove sender -1-.

Installing

Install in the reverse order of removal. When doing this, note the following:

Caution

- ◆ *Expanding the isolation ring must be avoided under all circumstances.*
- ◆ *Function problems could occur if an incorrect or damaged isolation ring is used.*
- ◆ *Renew damaged isolation rings and always ensure that the correct isolation ring is fitted.*

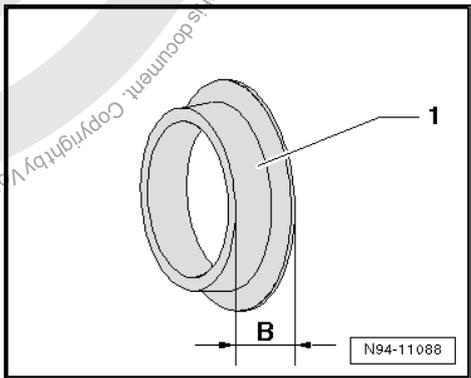


Note

As the front parking aid senders have sender heads of different lengths, isolation rings of different heights are also installed.

- Check whether the correct isolation ring is installed on the sender head.

Type of sender	Isolation ring height dimension -B-
Front parking aid senders	5.7 mm



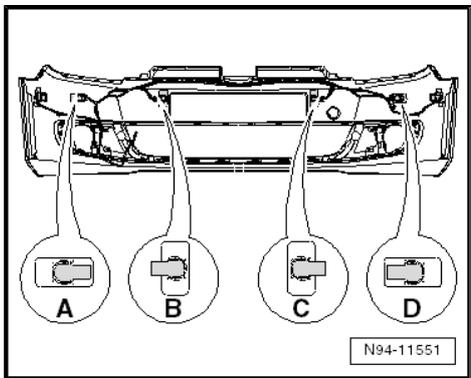
- Renew the sender isolation ring -1-.
- Assign senders to correct fitting location in bumper cover.

Note

- ◆ *Senders are available in different forms and must be assigned to respective fitting location in bumper cover.*
- ◆ *When installing senders, note position of electrical connections of senders.*

Assignment of parking aid sender on inside of rear bumper cover:

- A - left outer
- B - left centre
- C - right centre
- D - right outer



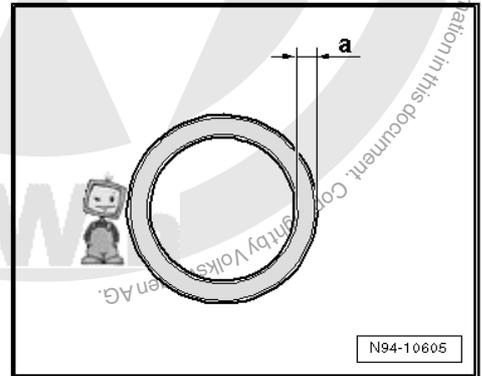
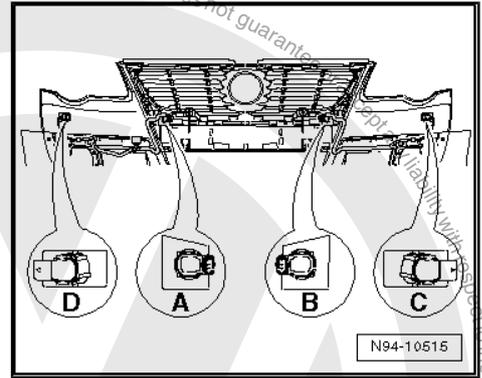


Assigning the sender holder to location on inside of front bumper cover, from model year 2011:

- A - left centre (in radiator grille)
- B - right centre (in radiator grille)
- C - right outer
- D - left outer

Note

- ◆ *When mounting the sender, make sure that the isolation ring is correctly mounted on the sender head and does not ride or roll up on insertion into the sender holder.*
- ◆ *Both locking lugs of sender holder must audibly engage when installing the sender.*
- After installing the sender, check that the sender is correctly seated in the bracket. Visible on the outer side of the bumper, dimension -a- of the ring gap between the sender head and bumper cover must be even all around.



14.11 Bonding sender holder in bumper cover

14.11.1 Bonding sender holder in bumper cover

The bonding process for the sender retainers in the front and rear bumper covers is performed in the same manner. The bonding area on the inside of the bumper cover is marked as a field around the punched hole to assist in aligning the sender retainer during the bonding process. Ensure that the material temperature of the bumper cover and the sender holder lies between 15 ° and 25 °.

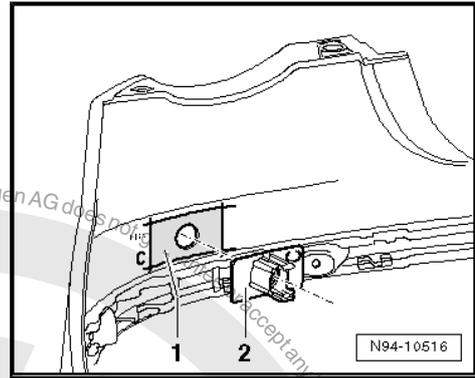


- Clean the marked bonding areas -1- on the inside of the bumper cover thoroughly with isopropanol (isopropyl alcohol).
- Apply adhesion promoter „Scotchmount 4298“ evenly to marked bonding area -1-
- Allow adhesion promoter to flash-off for approx. 5 minutes.
- Note correct position for bonding the sender holder

Front bumper cover ⇒ [page 346](#)

Rear bumper cover ⇒ [page 344](#)

- Peel both protective foils off bonding surface of sender holder -2- until a grey surface appears.
- Align sender retainer -2- in marked bonding area -1- so that a uniform edge of approx. 3 mm is created.



Note

Ensure that the cut-out for the sender connector in the sender holder is pointing in the correct direction as shown in the respective allocation. The sender wiring is too short if the sender holder is fitted incorrectly.

- Press sender holder -2- onto bumper cover for approx. 10 seconds using a high pressure.



Note

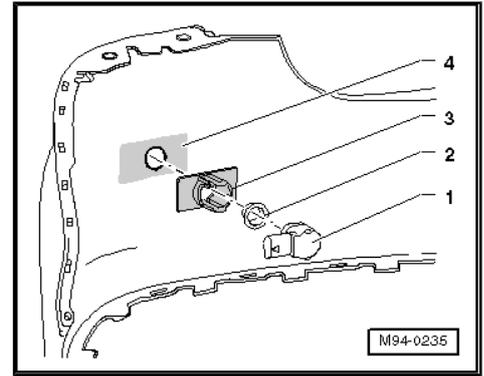
The pressure and the period are critical for the bonding properties!

14.11.2 Bonding sender holder in radiator grille

Ensure when bonding the sender retainer in the radiator grille that the sender retainer is aligned centrally in the punched hole in the radiator grille as the sender holder does not have a shoulder. If the sender holder is not aligned exactly centrally in the punched hole in the radiator grille the isolation ring (black silicone ring) will be under pressure from the sender ring, once installed. This may adversely affect the function of the parking aid system. Ensure the material temperature of the radiator grille and the sender holder lies between 15 °C and 25 °C.



- Clean the bonding area on the inside of the radiator grille thoroughly with isopropanol (isopropyl alcohol).
- 1- Parking aid senders
- 2- Decoupling ring
- 3- Sender holder
- 4- Bonding surface on inside of bumper
- Apply adhesion promoter „Scotchmount 4298“ evenly to bonding area around punched hole.
- Allow adhesion promoter to flash-off for approx. 5 minutes.
- Note correct position for bonding the sender holder.



Front bumper cover => [page 347](#)

- Insert sender -1- into sender holder -3- until both locking devices audibly engage.
- Peel both protective foils off bonding surface of sender holder -3- until a grey surface appears.
- Align sender head exactly centrally in punched hole in radiator grille.

i Note

If the sender head is not aligned exactly centrally in the punched hole in the radiator grille, the isolation ring (black silicone ring) will be under pressure from the sender ring, once installed, which may adversely affect the function of the parking aid system.

- Firmly press sender holder onto radiator grille for approx. 10 seconds.

i Note

The pressure and the period are critical for the bonding properties!

14.12 Renewing parking aid senders

If a new parking aid sender is installed, the sender head must be first painted in the colour of the bumper cover. The following prerequisites must be adhered to when painting the senders to ensure the function of the parking aid system is not adversely affected.

Painting senders

- Remove isolation ring (black silicone ring) from new sender head.



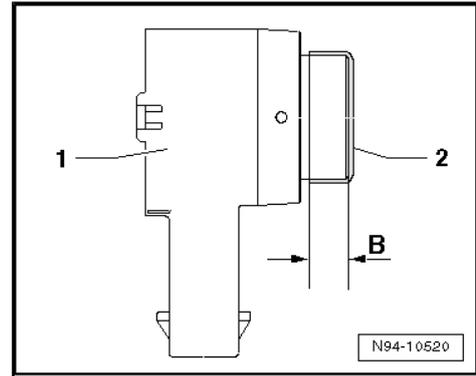
- Degrease black sender head -1- in area to be painted -2- with isopropanol (isopropyl alcohol).
- Paint sender in area to be painted -2- in colour of bumper cover.



Note

Dimension -B- for the painted area must not exceed 3 mm (plus maximum 2 mm).

- Fit isolation ring (black silicone ring) on sender head again once paint has dried.



Caution

- ◆ *Expanding the isolation ring must be avoided under all circumstances.*
- ◆ *Function problems may occur if a damaged isolation ring is used.*
- ◆ *Renew damaged isolation rings.*

14.13 Testing parking aid senders

This function can be used to check the following components via the parking aid control unit -J446- :

- ◆ Front left parking aid sender -G255-
- ◆ Front centre left parking aid sender -G254-
- ◆ Front centre right parking aid sender -G253-
- ◆ Front right parking aid sender -G252-
- ◆ Rear left parking aid sender -G203-
- ◆ Rear centre left parking aid sender -G204-
- ◆ Rear centre right parking aid sender -G205-
- ◆ Rear right parking aid sender -G206-

Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ Parking aid
 - ◆ Electrical components
 - ◆ Parking aid senders





14.14 Removing and installing rear parking aid warning buzzer -H15- - saloon

Rear parking aid warning buzzer -H15- is attached to panel of rear shelf. It is accessible from the luggage compartment.



Caution

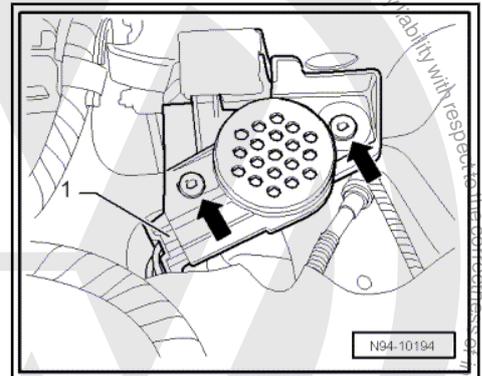
- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

Removing

- Disconnect connector -1-.
- Loosen expansion rivet -arrows- and remove rear parking aid warning buzzer -H15- from bracket.

Installing

Installation is carried out in reverse order of removal.



14.15 Removing and installing rear parking aid warning buzzer -H15- - estate

The rear parking aid warning buzzer -H15- is located behind the rear right luggage compartment side panel trim near the seat belt mounting.



Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

Removing

- Remove right luggage compartment side trim panel ⇒ General body repairs, interior; Rep. gr. 70 .
- Disconnect connector -2-.
- Remove spreader rivet -arrows- and remove rear parking aid warning buzzer -H15- -1-.

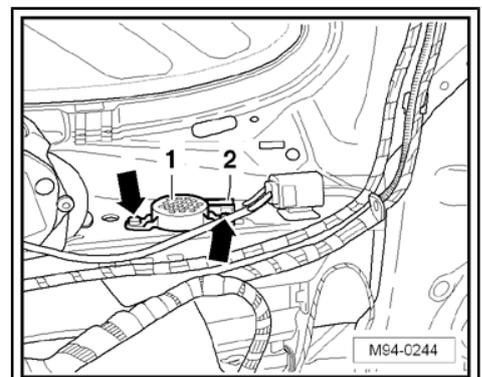
Installing

Installation is carried out in reverse order of removal.



Note

Coding, basic setting and adaptation are not necessary if the rear parking aid warning buzzer -H15- is renewed.

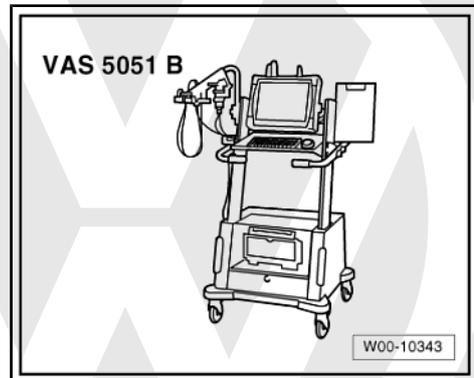




14.16 Adjusting rear parking aid warning buzzer -H15- volume

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



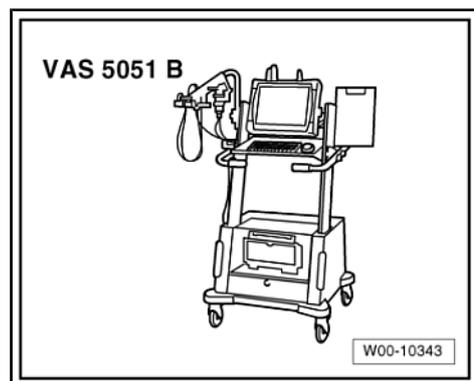
Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ Parking aid
 - ◆ Parking aid functions
 - ◆ Adjusting volume of rear parking aid warning buzzer

14.17 Adjusting rear parking aid warning buzzer pitch -H15-

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:



- ◆ Body
- ◆ General body repairs
- ◆ Parking aid
- ◆ Parking aid functions
- ◆ Adjusting pitch of rear parking aid warning buzzer

14.18 Removing and installing front parking aid warning buzzer -H22-

The front parking aid warning buzzer -H22- is located under the dash panel in the driver's footwell and is secured on the console for relay carrier.



Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

Removing

- Remove trim in driver's footwell ⇒ General body repairs, interior; Rep. gr. 68 .
- Release both spreader rivets -arrows-.
- Detach connector -1- and remove front parking aid warning buzzer -H22- -2- from vehicle.

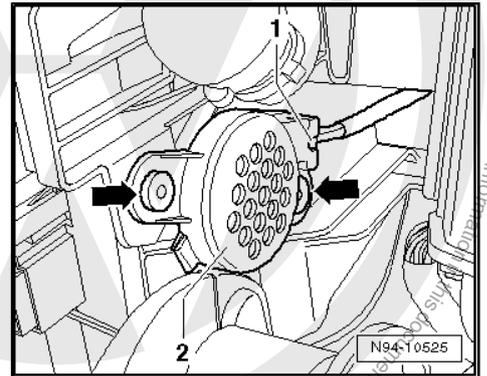
Installing

Installation is carried out in reverse order of removal.



Note

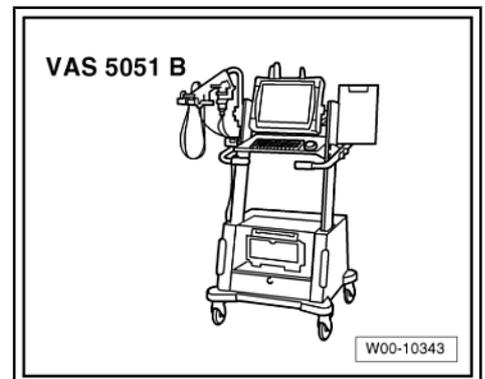
Coding, basic setting and adaption are not necessary if the front parking aid warning buzzer -H22- is renewed.



14.19 Adjusting front parking aid warning buzzer -H22- volume

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



This function can be used to adjust the volume of the front parking aid warning buzzer -H22- .



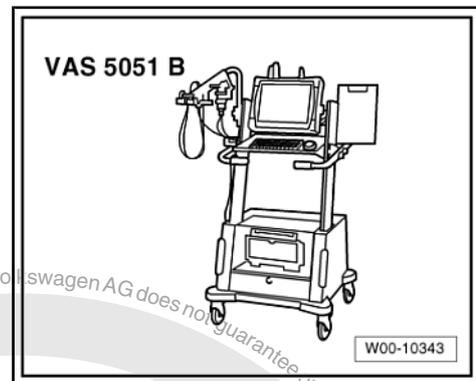
Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ Park assist steering
 - ◆ Park assist steering functions
 - ◆ Adjusting volume of front parking aid warning buzzer

14.20 Adjusting front parking aid warning buzzer pitch -H22-

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



This function can be used to adjust the pitch of the front parking aid warning buzzer -H22- .

Procedure

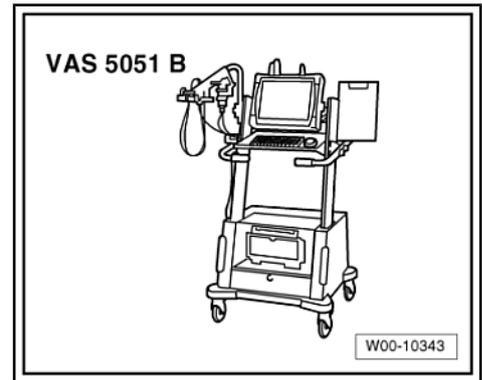
- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ Park assist steering
 - ◆ Park assist steering functions
 - ◆ Adjusting pitch of front parking aid warning buzzer

14.21 Parking aid final control diagnosis

Special tools and workshop equipment required



- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



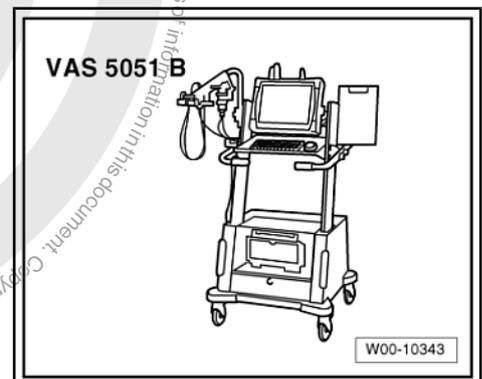
Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ Parking aid
 - ◆ Parking aid functions
 - ◆ Parking aid final control diagnosis

14.22 Checking parking aid button -E266-

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ Parking aid
 - ◆ Electrical components of parking aid



◆ Parking aid button





15 Park assist steering

15.1 General description



Note

- ◆ *When handling complaints, it is essential to understand the function and operation of the park assist steering system.*
- ◆ *Additional information ⇒ Owner's Manual*

Functioning

The park assist steering supports the driver when reversing into a parallel parking space on the driver or passenger side. When the park assist steering is activated and the vehicle drives by at a speed of less than 35 km/h, the side of the road is measured by ultrasonic sensors searching for a suitable parking space. Once a parking space has been reliably detected, the park assist steering requests the driver to continue passing by the parking space until the vehicle is in a position from which rapid parking is possible. When reverse gear is engaged, the park assist steering undertakes lateral guidance of the vehicle by actuating the EPS (electronic power steering) and steers the vehicle into the parking space in one movement along a calculated, nominal path. The driver maintains operation of the pedals (accelerator, clutch, brake) and longitudinal vehicle guidance, and therefore determines the parking speed. During the parking process, the park assist steering sensors are used together with the parking aid senders to monitor proximity.

The following conditions lead to abortion of the parking process with park assist steering:

- ◆ The park assist steering system is switched off via the park assist steering button -E581- .
- ◆ Ignition is switched off
- ◆ Parking speed too high (greater than 7 km/h)
- ◆ Steering intervention by driver during parking process
- ◆ Disengagement of reverse gear
- ◆ Vehicle standstill time limit exceeded (approx. 30 seconds)
- ◆ ESP switched off or ESP intervention
- ◆ TCS intervention
- ◆ Trailer on the vehicle
- ◆ Front parking aid is switched on.
- ◆ Sensors detect a status which endangers secure determination of the vehicle position.
- ◆ System malfunction



WARNING

- ◆ *Responsibility during parking is borne by the driver.*
- ◆ *The park assist steering system cannot replace the driver's attentiveness.*
- ◆ *The sensors have blind spots, in which persons and objects can not be registered.*
- ◆ *Pay particular attention to small children and animals, as these are not always detected by the sensors.*

The park assist steering system consists of:

- ◆ Park assist steering control unit -J791-
- ◆ Front left sender for park assist steering on left side of vehicle -G568-
- ◆ Front left parking aid sender -G255-
- ◆ Front centre left parking aid sender -G254-
- ◆ Front centre right parking aid sender -G253-
- ◆ Front right parking aid sender -G252-
- ◆ Front right sender for park assist steering on right side of vehicle -G569-
- ◆ Front parking aid warning buzzer -H22-
- ◆ Park assist steering button -E581-
- ◆ Parking aid button -E266-

Fault detection and fault display:

The park assist steering system is equipped with self-diagnosis.

For fault finding, use vehicle diagnosis, testing and information system -VAS 5051B- in „Guided fault finding“ mode.

To check the park assist steering system as a whole, perform final control diagnosis [page 362](#) .



15.2 Assembly overview - park assist steering

1 - Front left sender for park assist steering on left side of vehicle -G568-

- In front bumper cover
- Removing and installing ⇒ [page 363](#)
- Checking ⇒ [page 365](#)
- Renewing ⇒ [page 366](#)
- Renew sender and sender holder in the event of repair ⇒ [page 347](#) .

2 - Front left parking aid sender -G255-

- In front bumper cover
- Removing and installing ⇒ [page 363](#)
- Checking ⇒ [page 365](#)
- Renew sender and sender holder in the event of repair ⇒ [page 347](#) .

3 - Front centre left parking aid sender -G254-

- In front bumper cover
- Removing and installing ⇒ [page 363](#)
- Checking ⇒ [page 365](#)
- Renew sender and sender holder in the event of repair ⇒ [page 347](#) .

4 - Front centre right parking aid sender -G253-

- In front bumper cover
- Removing and installing ⇒ [page 363](#)
- Checking ⇒ [page 365](#)
- Renew sender and sender holder in the event of repair ⇒ [page 347](#) .

5 - Front right parking aid sender -G252-

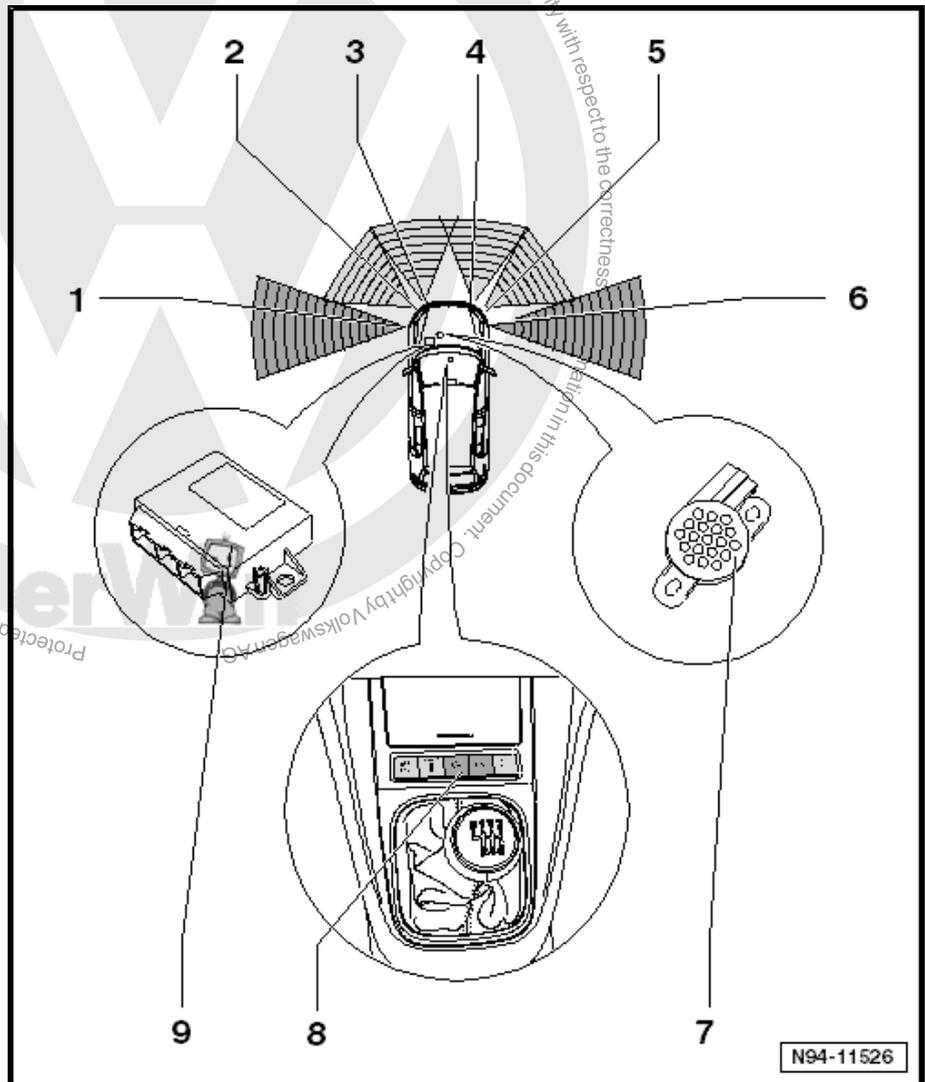
- In front bumper cover
- Removing and installing ⇒ [page 363](#)
- Checking ⇒ [page 365](#)
- Renew sender and sender holder in the event of repair ⇒ [page 347](#) .

6 - Front right sender for park assist steering on right side of vehicle -G569-

- In front bumper cover
- Removing and installing ⇒ [page 363](#)
- Checking ⇒ [page 365](#)
- Renewing ⇒ [page 366](#)
- Renew sender and sender holder in the event of repair ⇒ [page 347](#) .

7 - Front parking aid warning buzzer -H22-

- In driver's footwell, on relay carrier of dash panel





- Removing and installing ⇒ [page 367](#)
- Adjusting volume ⇒ [page 368](#)
- Adjusting pitch ⇒ [page 368](#)

8 - Parking aid button -E266- / park assist steering button -E581-

- In centre console storage compartment next to gear lever
- Removing and installing ⇒ [page 418](#)
- Checking park assist steering button -E581- ⇒ [page 370](#)
- Checking parking aid button -E266- ⇒ [page 371](#)

9 - Park assist steering control unit -J791-

- In driver's footwell, above relay carrier
- Removing and installing (left-hand drive vehicle) ⇒ [page 360](#)
- Removing and installing (right-hand drive vehicle) ⇒ [page 361](#)
- Coding ⇒ [page 362](#)
- Final control diagnosis ⇒ [page 362](#) .

15.3 Park assist steering control unit -J791-

The park assist steering control unit -J791- is located in the driver's footwell, above the relay carrier. In vehicles with parking aid, the parking aid functions are simultaneously controlled by the park assist steering control unit -J791- (parking aid control unit -J446-).

15.3.1 Removing and installing park assist steering control unit -J791- (left-hand drive vehicle)

The park assist steering control unit -J791- is located in the driver's footwell, above the relay carrier.

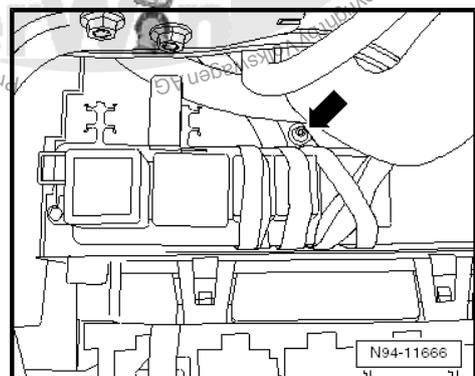


Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

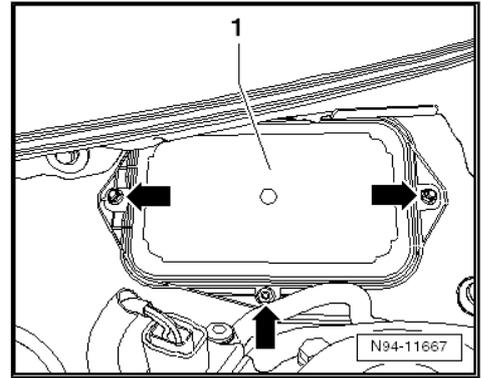
Removing

- Remove trim in driver's footwell ⇒ General body repairs, interior; Rep. gr. 68 .
- Remove securing screw -arrow- for park assist steering control unit -J791- above relay carrier.
- Remove windscreen wiper system ⇒ [page 183](#) .





- Remove the three nuts -arrows- and remove cover -1-.

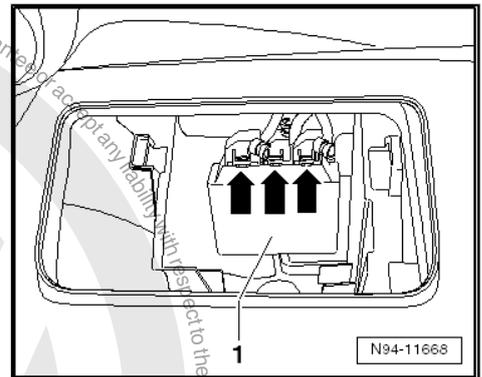


- Detach the three connectors -arrows- and remove the park assist steering control unit -J791- -1- upwards out of bracket.

Installing

Install in the reverse order of removal. When doing this, note the following:

- Tighten bolt of park assist steering control unit -J791- to 1.5 Nm.



15.3.2 Removing and installing park assist steering control unit -J791- (right-hand drive vehicle)

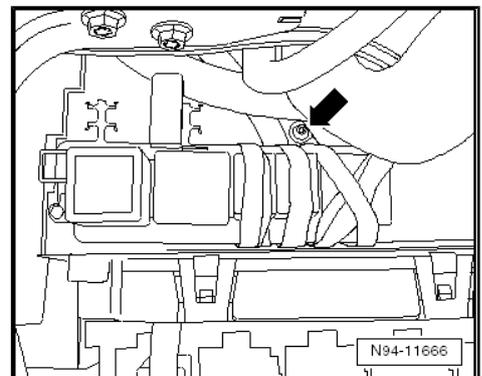
The park assist steering control unit -J791- is located in the driver's footwell, above the relay carrier.

Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

Removing

- Remove trim in driver's footwell ⇒ General body repairs, interior; Rep. gr. 68 .
- Remove securing screw -arrow- for park assist steering control unit -J791- above relay carrier.
- Remove data bus diagnostic interface -J533- ⇒ [page 452](#) .



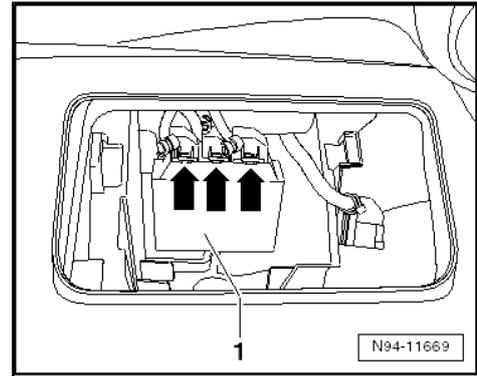


- Detach the three connectors -arrows- and remove the park assist steering control unit -J791- -1- upwards out of bracket.

Installing

Install in the reverse order of removal. When doing this, note the following:

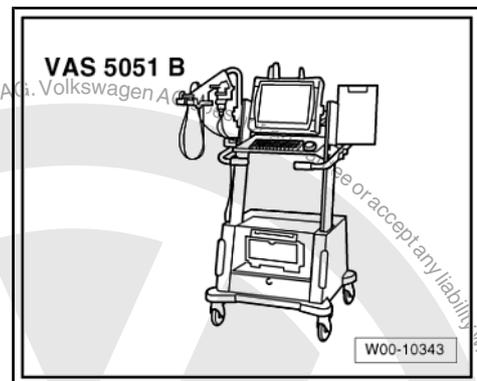
- Tighten bolt of park assist steering control unit -J791- to 1.5 Nm.



15.3.3 Coding park assist steering control unit -J791-

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

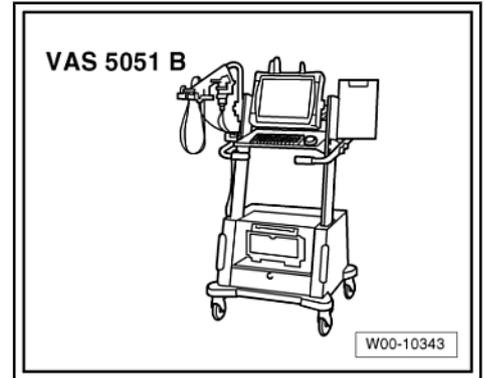
- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ Park assist steering
 - ◆ Park assist steering functions
 - ◆ Coding park assist steering

15.3.4 park assist steering control unit -J791- final control diagnosis

Special tools and workshop equipment required



- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system -VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GO TO** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ Park assist steering
 - ◆ Park assist steering functions
 - ◆ Park assist steering final control diagnosis

15.4 Park assist steering senders

Park assist steering senders are installed in front bumper cover. The two park assist steering senders are mounted at the outermost, lateral positions of the bumper cover, and are used to measure proximity during the parking process, together with the parking aid senders.

The following park assist steering senders are located in the front bumper cover:

- ◆ Front left sender for park assist steering on left side of vehicle -G568-
- ◆ Front right sender for park assist steering on right side of vehicle -G569-

15.4.1 Removing and installing park assist steering senders



Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

Removing

- Remove front bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 .



Caution

- ◆ *The order for removing the senders must be adhered to under all circumstances.*
- ◆ *The sender may otherwise be damaged. Hairline cracks may occur if too much force is applied to the sender, causing the sender to fail.*
- ◆ *First remove sender from bracket and then disconnect sender connector.*

- Push fasteners -arrows- on sender holder -1- outwards.
- Pull sender -2- with connected wiring backwards out of sender holder.



Note

- ◆ *When removing the sender, make sure that the isolation ring (black silicone ring) on the sender head does not remain in the sender or become lost.*
- ◆ *Expanding the isolation ring must be avoided under all circumstances.*

- Detach connector -2- and remove sender -1-.

Installing

Install in the reverse order of removal. When doing this, note the following:



Caution

Function problems could occur if an incorrect or damaged isolation ring is used.

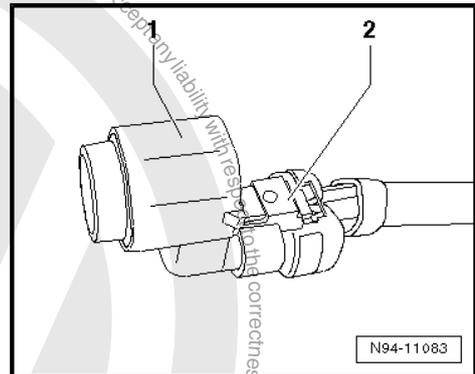
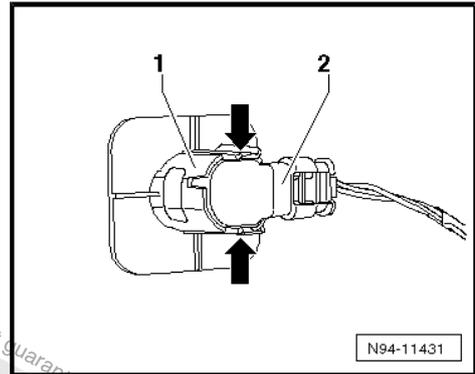
Expanding the isolation ring must be avoided under all circumstances.

Renew damaged isolation rings and always ensure that the correct isolation ring is fitted.



Note

As the front parking aid sender and the park assist steering senders have sender heads of different lengths, isolation rings of different heights are also installed.





- Check whether the correct isolation ring is installed on the sender head.

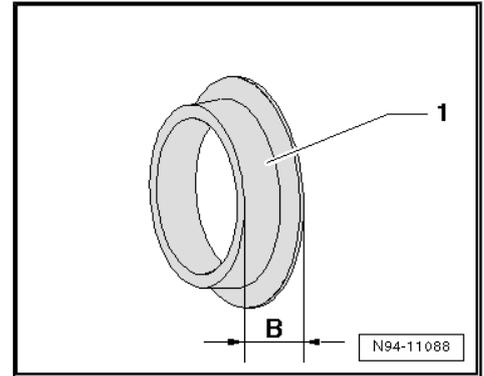
Type of sender	Isolation ring height dimension -B-
Front parking aid senders	5.7 mm
Park assist steering senders	9.05 mm

- Renew the sender isolation ring -1-.



Note

When installing senders, note position of electrical connections of senders.



Assignment of senders on inside of front bumper cover:

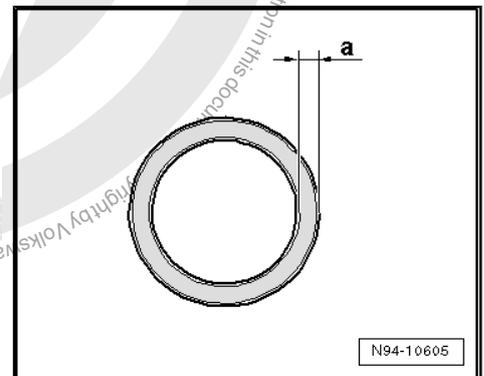
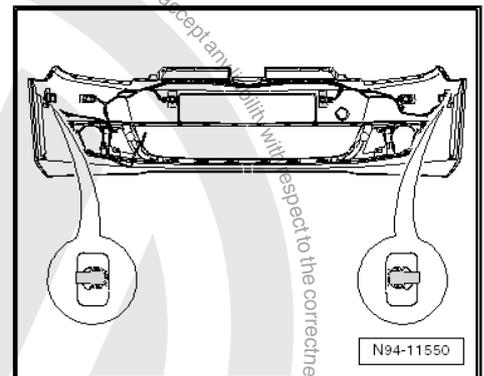
A - FLS - bracket for front left sender for park assist steering on left side of vehicle -G568-

B - FRS - bracket for front right sender for park assist steering on right side of vehicle -G569-



Note

- ◆ When mounting the sender, make sure that the isolation ring is correctly mounted on the sender head and does not ride or roll up on insertion into the sender holder.
 - ◆ Both locking lugs of sender holder must audibly engage when installing the sender.
- After installing the sender, check that the sender is correctly seated in the bracket. Visible on the outer side of the bumper, dimension -a- of the ring gap between the sender head and bumper cover must be even all around.

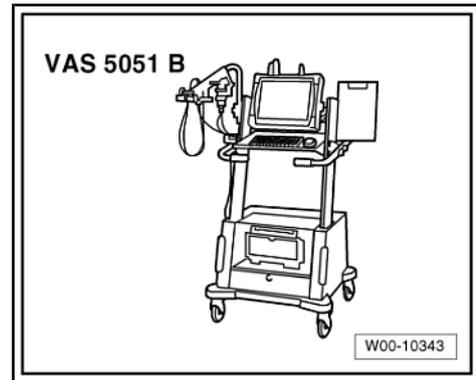


15.4.2 Checking parking aid sender/park assist steering sender

Special tools and workshop equipment required



- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



This function can be used to check the following components via the park assist steering control unit -J791- :

- ◆ Rear left parking aid sender -G203-
- ◆ Rear centre left parking aid sender -G204-
- ◆ Rear centre right parking aid sender -G205-
- ◆ Rear right parking aid sender -G206-
- ◆ Front left sender for park assist steering on left side of vehicle -G568-
- ◆ Front left parking aid sender -G255-
- ◆ Front centre left parking aid sender -G254-
- ◆ Front centre right parking aid sender -G253-
- ◆ Front right parking aid sender -G252-
- ◆ Front right sender for park assist steering on right side of vehicle -G569-

Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ Park assist steering
 - ◆ Park assist steering electrical components
 - ◆ Parking aid sender/park assist steering sender

15.5 Renewing park assist steering sender

If a new park assist steering sender is installed, the sender head must be first painted in the colour of the bumper cover. The following prerequisites must be adhered to when painting the senders to ensure the function of the parking aid system is not adversely affected.

15.5.1 Painting senders

- Remove isolation ring (black silicone ring) from new sender head.



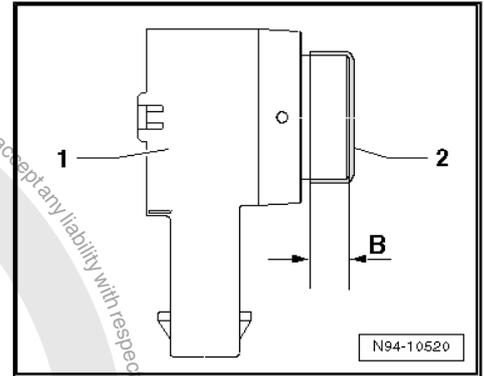
- Degrease black sender head -1- in area to be painted -2- with isopropanol (isopropyl alcohol).
- Paint sender in area to be painted -2- in colour of bumper cover.



Note

Dimension -B- for the painted area must not exceed 3 mm (plus maximum 2 mm).

- Fit isolation ring (black silicone ring) on sender head again once paint has dried.



Caution

- ◆ *Expanding the isolation ring must be avoided under all circumstances.*
- ◆ *Function problems may occur if a damaged isolation ring is used.*
- ◆ *Renew damaged isolation rings.*

15.6 Front parking aid warning buzzer -H22-

The front parking aid warning buzzer -H22- is located in the driver side footwell, behind the left dash panel relay carrier.

15.6.1 Removing and installing front parking aid warning buzzer -H22-

The front parking aid warning buzzer -H22- is located under the dash panel in the driver's footwell and is secured on the console for relay carrier.



Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

Removing

- Remove trim in driver's footwell ⇒ General body repairs, interior; Rep. gr. 68 .
- Release both spreader rivets -arrows-.
- Release and disconnect connector -1- and remove front parking aid warning buzzer -H22- -2- from vehicle.

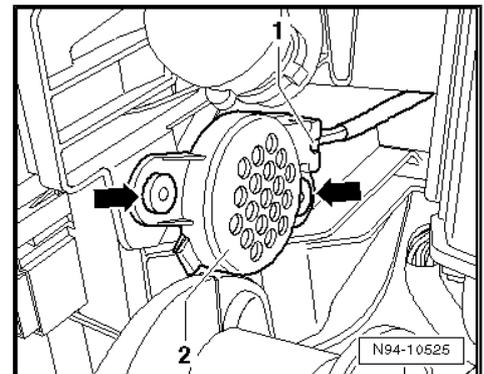
Installing

Installation is carried out in reverse order of removal.



Note

Coding, basic setting and adaption are not necessary if the front parking aid warning buzzer -H22- is renewed.

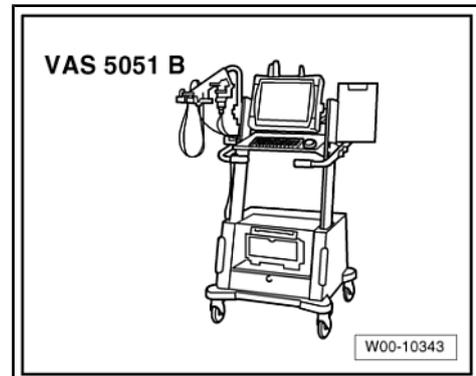




15.6.2 Adjusting front parking aid warning buzzer -H22- volume

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



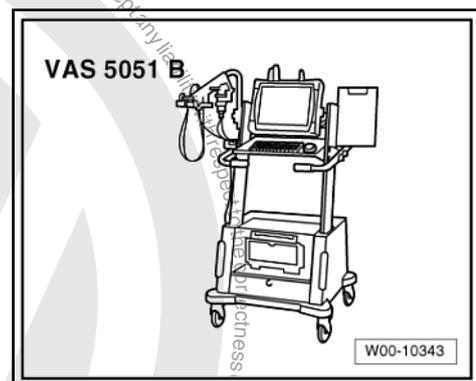
Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ Park assist steering
 - ◆ Park assist steering functions
 - ◆ Adjusting volume of front parking aid warning buzzer

15.6.3 Adjusting front parking aid warning buzzer pitch -H22-

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:



- ◆ Body
- ◆ General body repairs
- ◆ Park assist steering
- ◆ Park assist steering functions
- ◆ Adjusting pitch of front parking aid warning buzzer

15.7 Rear parking aid warning buzzer -H15-

On vehicles with park assist steering, the parking aid functions are controlled by the park assist steering control unit -J791-. For this reason, adaptations to the rear parking aid warning buzzer -H15- are carried out via the park assist steering control unit -J791-.

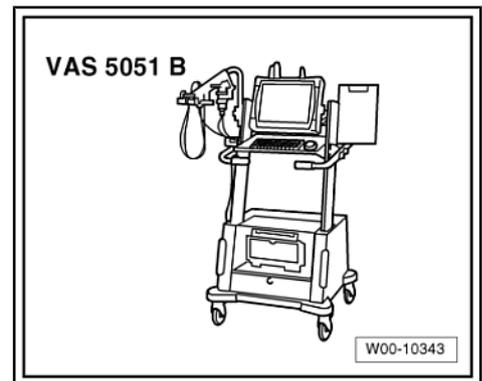
15.7.1 Removing and installing rear parking aid warning buzzer -H15-

Removing and installing rear parking aid warning buzzer -H15-
⇒ [page 351](#)

15.7.2 Adjusting rear parking aid warning buzzer -H15- volume

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

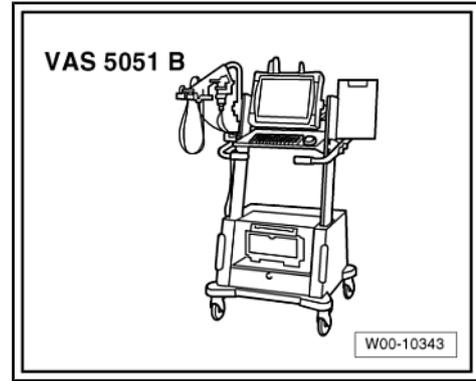
- Connect vehicle diagnosis, testing and information system -VAS 5051B-.
- In vehicle diagnosis, testing and information system -VAS 5051B-, select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ Park assist steering
 - ◆ Park assist steering functions
 - ◆ Adjusting volume of rear parking aid warning buzzer

15.7.3 Adjusting rear parking aid warning buzzer pitch -H15-

Special tools and workshop equipment required



- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ Park assist steering
 - ◆ Park assist steering functions
 - ◆ Adjusting pitch of rear parking aid warning buzzer

15.8 Park assist steering/parking aid button

The park assist steering button -E266- / parking aid button -E581- are located in the centre console storage compartment in front of the gear lever. The buttons cannot be disassembled.

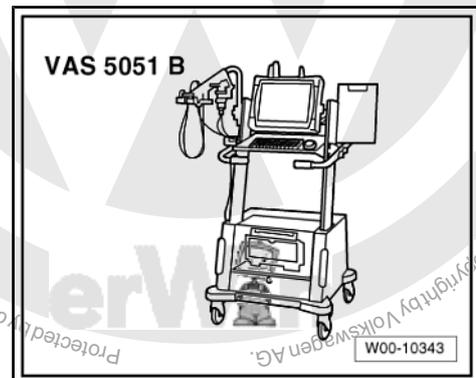
15.8.1 Removing and installing parking aid/ park assist steering button

Removal and installation of the buttons are carried out in the same way for all buttons in the centre console storage compartment and are described in chapter ⇒ [page 418](#) .

15.8.2 Checking park assist steering button - E581-

Special tools and workshop equipment required:

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-





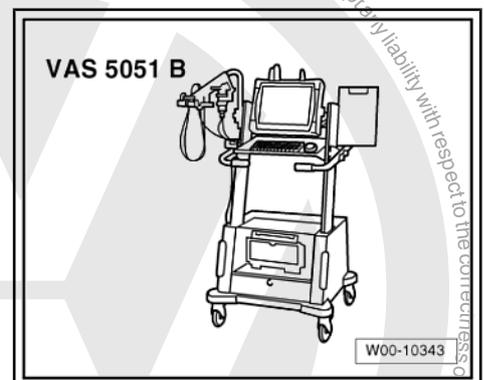
Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ Park assist steering
 - ◆ Park assist steering electrical components
 - ◆ Park assist steering button

15.8.3 Checking parking aid button -E266-

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ Park assist steering
 - ◆ Park assist steering electrical components
 - ◆ Parking aid button



16 Reversing camera system

16.1 General description



Note

- ◆ *When handling complaints, it is essential to understand the function and operation of the reversing camera system.*
- ◆ *Additional information ⇒ Owner's Manual*

Functioning

The reversing camera system supports the driver during reversing by providing the driver with an image of the traffic situation behind the vehicle on the radio/navigation system display. The system is available as an option.

The system is activated when reverse gear is engaged, even if the radio/navigation system is switched off.

The reversing camera system consists of the following components:

- ◆ Reversing camera -R189-
- ◆ Control unit with display unit for radio and navigation -J503-
- ◆ Steering wheel with steering angle sender -G85-



Note

Installation of an additional number plate carrier is not permissible on vehicles with reversing camera system as this would impair the function of the reversing camera. The light of the number plate could also be impaired.

Fault detection and fault display

The reversing camera system is equipped with self-diagnosis.

For fault finding, use vehicle diagnosis, testing and information system -VAS 5051B- in „Guided fault finding“ mode.



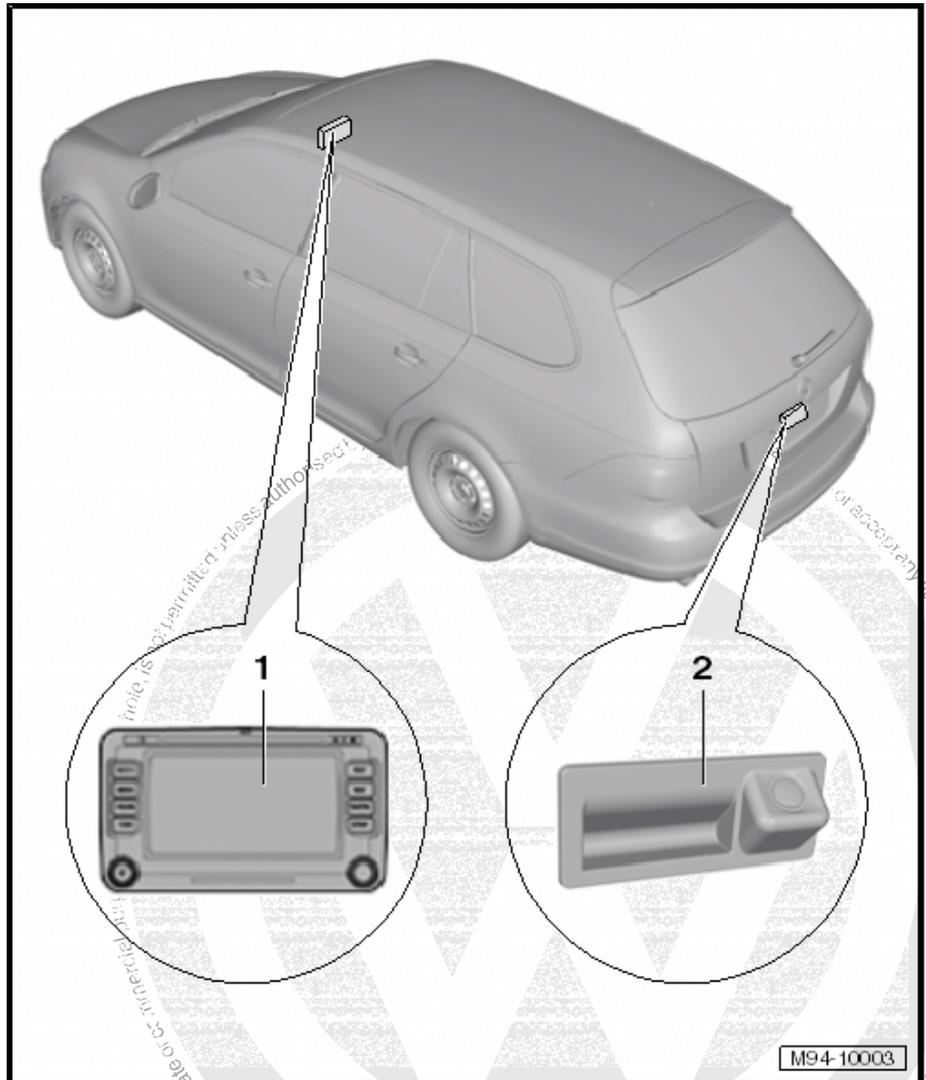
16.2 Assembly overview – reversing camera system

1 - Control unit with display unit for radio and navigation -J503-

- ❑ In centre console at front.
- ❑ Removing and installing
⇒ Communication;
Rep. gr. 91

2 - Reversing camera -R189-

- ❑ In handle button of rear lid
- ❑ Removing and installing
⇒ [page 373](#)
- ❑ Specified torque of nuts:
6 Nm
- ❑ Calibrating reversing camera system
⇒ [page 375](#)



16.3 Removing and installing reversing camera -R189-

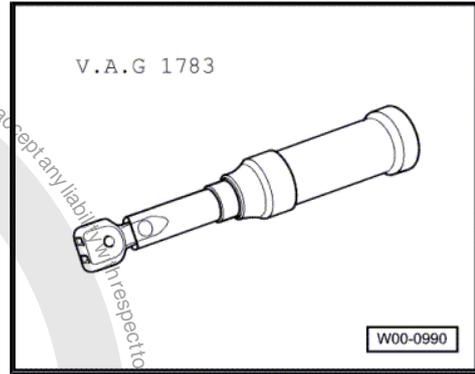
The reversing camera -R189- is installed in the handle button of the rear lid. To remove reversing camera -R189- , first remove handle button from rear lid. The reversing camera -R189- can then be removed from handle button.

16.3.1 Removing and installing handle button with reversing camera -R189-

Special tools and workshop equipment required



- ◆ Torque wrench -V.A.G 1783-



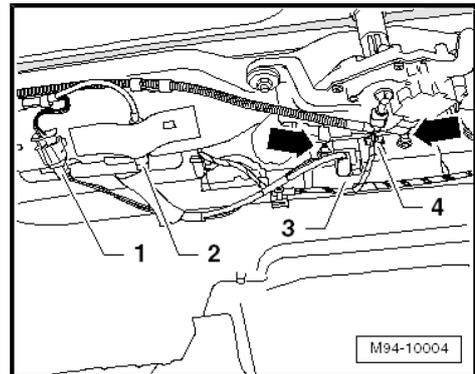
Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

Removing

Remove trim of rear lid ⇒ General body repairs, interior; Rep. gr. 70 .

- Open wire bracket from wiring harness of reversing camera -R189- in connector area and remove both wires.
- Disconnect connectors -1- and -2-.



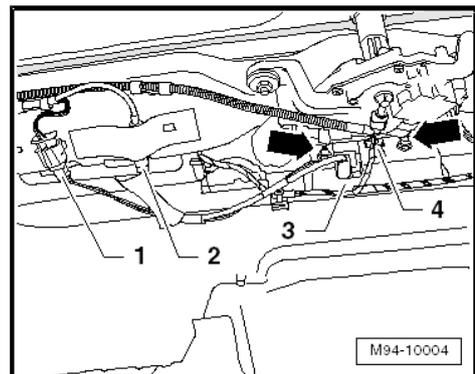
- Remove both nuts -arrows-.
- Detach connector -4-.
- Remove the handle button with reversing camera -R189- -3- from rear lid.

Remove reversing camera -R189- from handle button
⇒ [page 375](#) .

Installing

Install in the reverse order of removal. When doing this, note the following:

- Tighten all threaded connections to specified torques
⇒ [page 373](#) .
- Secure wiring of reversing camera -R189- with wiring retainer to avoid rattling.
- After installation, clean reversing camera -R189- lens with a lint-free cloth.
- Recalibrate system ⇒ [page 375](#) .

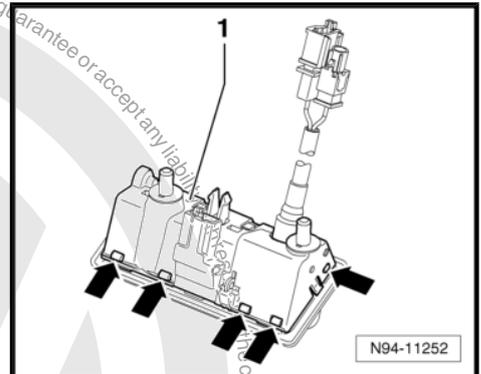




16.3.2 Removing and installing reversing camera -R189- from handle button

Removing

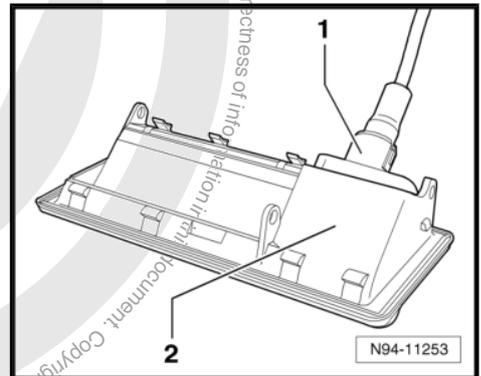
- Release locking lugs -arrows- and remove housing -1-.



- Pull reversing camera -R189- -1- out of lower part of handle button -2-.

Installing

Installation is carried out in reverse order of removal.



16.4 Calibrating reversing camera system

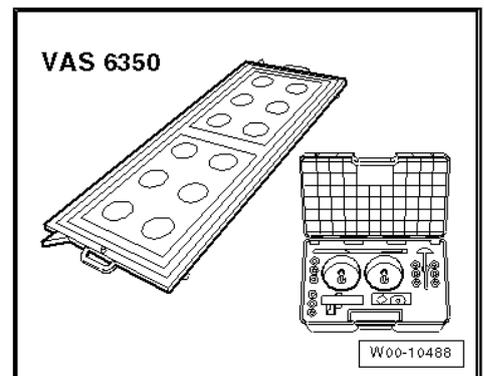
Reversing camera -R189- system may have to be recalibrated following repair work on the vehicle. In detail, this is the case after:

- ◆ Removing and installing reversing camera -R189-
- ◆ Accident repairs on rear lid
- ◆ After vehicle alignment
- ◆ Repairs to front or rear axle

Extensive preliminary work is required before actual calibration can be carried out using vehicle diagnosis, testing and information system -VAS 5051B-. This is described in the following.

Special tools and workshop equipment required

- ◆ Calibration unit -VAS 6350-





16.4.1 Preparatory measures for calibration

To carry out calibration, vehicle must be positioned on a firm, level surface. It is not permissible for anybody to be inside vehicle during measurement. Vehicle must not be moved during measurement, and opening and closing vehicle doors is prohibited.

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- Set steering wheel sender -G85- to 0 position (wheels straight ahead).

Overview of measuring setup

1 - Wheel centre mounting - VAS 6350/1-

2 - Wheel centre mounting - VAS 6350/1-

3 - Right bracket

- Spacing laser -VAS 6350/2- mounting

4 - Linear laser -VAS 6350/3-

- Switching on and off => Owner's manual

5 - Plastic foot

- Three on underbody
- Adjustable for setting the horizontal position

6 - Spacing laser -VAS 6350/2-

- Notes on operation => Owner's manual

7 - Spirit level on calibration unit

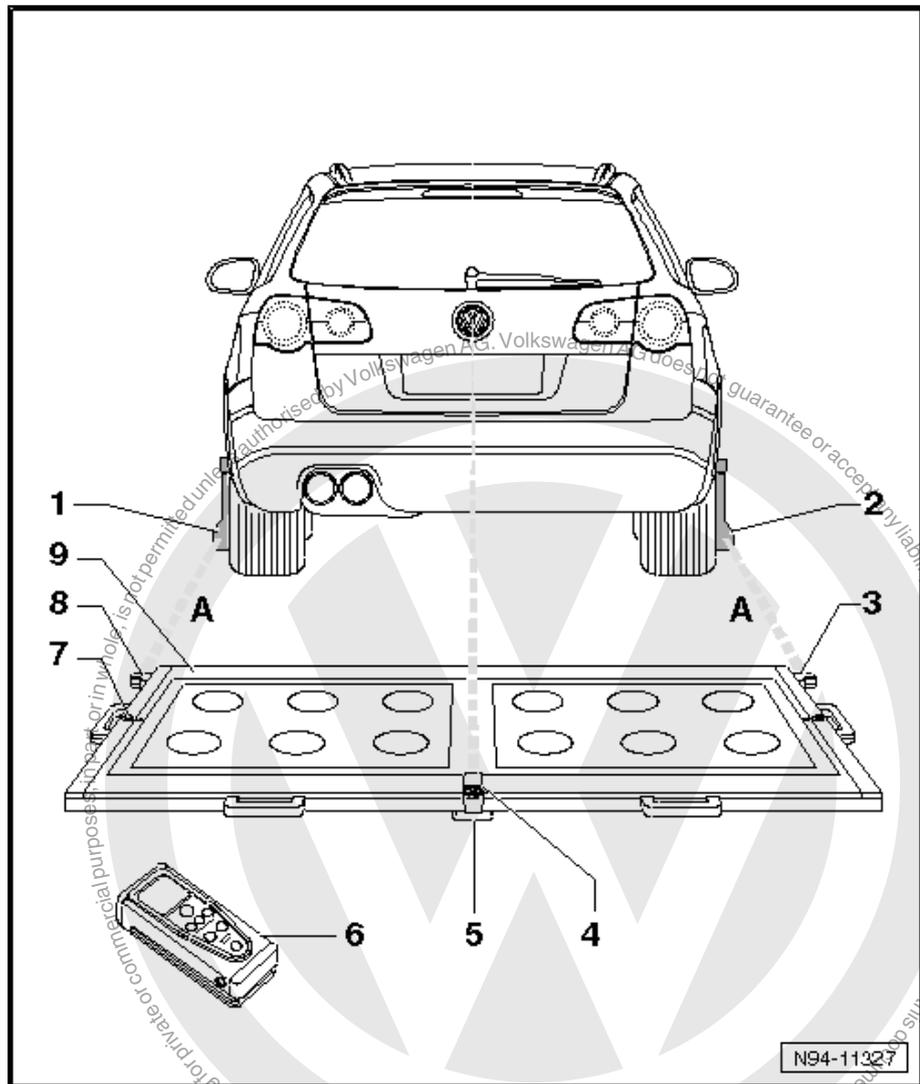
- For checking horizontal position

8 - Left bracket

- Spacing laser -VAS 6350/2- mounting

9 - Calibration unit -VAS 6350/4-

- Distance between angle of calibration unit -VAS 6350/4- and wheel centre mounting -VAS 6350/1- : 1.20 m to 1.70 m -dimension A-



Assembling, setting-up calibration unit -VAS 6350/4-

- Secure three wheel bolt adapters in each hole circle of wheel centre mounting -VAS 6350/1- .
- Position paddles on both wheel centre mountings -VAS 6350/1- and secure with clamping bolts.



- Insert wheel centre mountings -VAS 6350/1- into wheel bolts of rear wheels. Wheel centre mountings -VAS 6350/1- are positioned and secured in the adapters by the »O-rings«.

i Note

Set wheel centre mountings -VAS 6350/1- against wheels so that no »theft-inhibiting wheel bolts« are connected to wheel bolt adapters.

- Use clamp nuts to adjust paddles so that they move freely just above the floor.

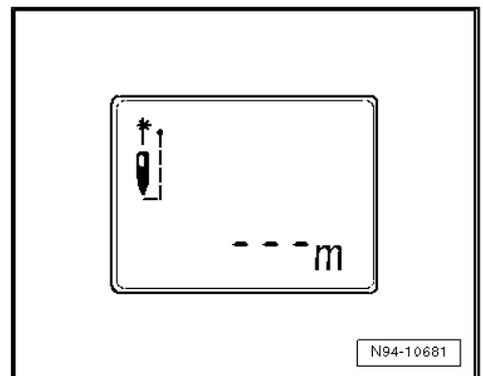
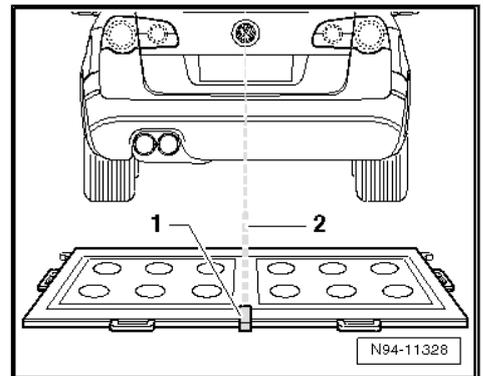
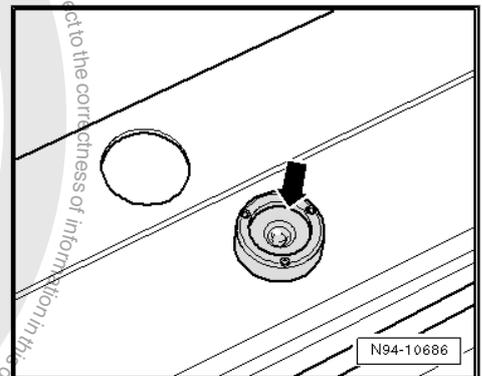
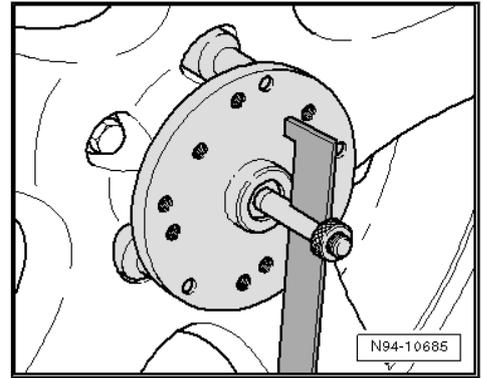
Make sure the paddles can move freely.

- Position calibration device -VAS 6350/4- behind vehicle at a distance of 1.20 m to 1.70 m to the angle brackets of the calibration device -VAS 6350/4- and the paddles on the wheel centre mountings -VAS 6350/1- , see -dimension A- [-> Item 9 \(page 376\)](#) .

Position the calibration device -VAS 6350/4- horizontally. Do this by turning the plastic feet under the calibration unit -VAS 6350/4- until the air bubble in the spirit level is precisely in the centre of the indicator -arrow-.

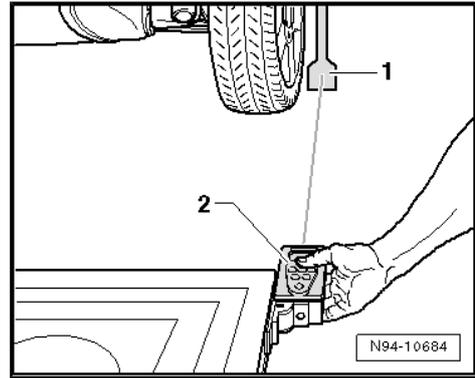
- Switch on the linear laser -VAS 6350/3- on calibration unit -VAS 6350/4- -1- and align the entire calibration unit -VAS 6350/4- so that the laser beam -2- hits the rear end of the vehicle centrally above the VW logo.

- Switch on the spacing laser -VAS 6350/2- with the ON button. The following display appears and the laser is activated:



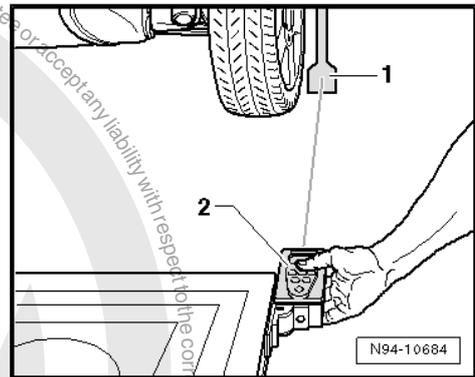


- Hold spacing laser -VAS 6350/2- -2- as shown in illustration flush against bracket on one side of calibration unit -VAS 6350/4- so that spacing laser -VAS 6350/2- lies firmly against bracket.



- Make sure that laser beam of from spacing laser -VAS 6350/2- hits lower, enlarged part of paddle -1-.

If this is not the case, adjust paddles accordingly on wheel mounting -VAS 6350/1- using clamping bolts.



- Hold spacing laser -VAS 6350/2- in bracket on calibration device -VAS 6350/4- while laser beam is visible on paddle. Now briefly press the **ON** button to measure distance. The following appears in the display:

The distance is shown on the display in „metres“.

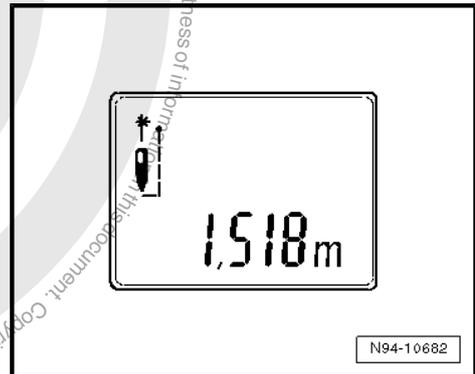
- Note the measured value.
- Repeat measuring process in same manner for other rear wheel on other side of calibration unit -VAS 6350/4- .

Measured distance value must be identical on both sides. If value is not identical, adjust calibration unit -VAS 6350/4- until values on both sides are identical.

When adjusting the calibration unit -VAS 6350/4- , ensure that the laser beam of the linear laser -VAS 6350/3- continues to hit the vehicle centrally above the VW logo and that the spirit level indicator remains in the centre. Adjust accordingly if required.

The distance measured must be entered in „millimetres“ in the vehicle diagnostic, testing and information system -VAS 5051B- during calibration.

Calibrate reversing camera system => [page 378](#) .

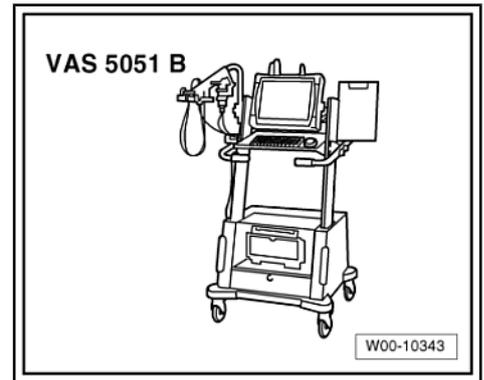


16.4.2 Calibrating reversing camera system

Special tools and workshop equipment required



- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



i Note

*Note the points regarding preparatory work for calibration
⇒ [page 376](#) .*

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On board diagnostic capable system
 - ◆ Reversing camera system
 - ◆ Reversing camera functions
 - ◆ Carry out reversing camera calibration

From this point on, guidance during the calibration process will be provided by the vehicle diagnosis, testing and information system VAS 5051B- .



17 Removing and installing trailer socket -U10-

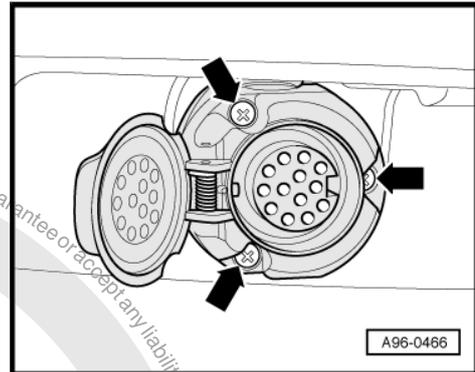


Caution

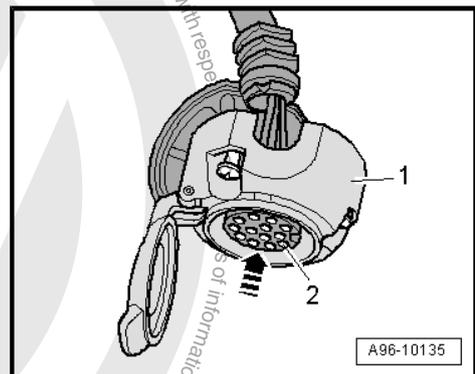
- ◆ Switch off ignition and all electrical consumers.
- ◆ Remove the ignition key.

Removing

- Remove bolts -arrows-.
- Remove trailer socket -U10- from retaining plate.



- Push connectors -2- in -direction of arrow- out of trailer socket -U10- -1-.



- Unlock securing tabs -arrows- and then unlock retaining clips -1- and -3- to -5-.
- Remove holding cage from connectors -2-.

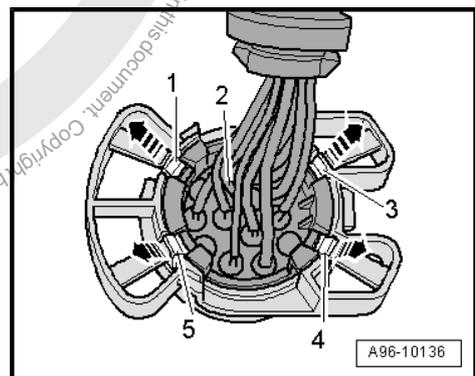
Installing

Carry out installation in the reverse sequence, noting the following:



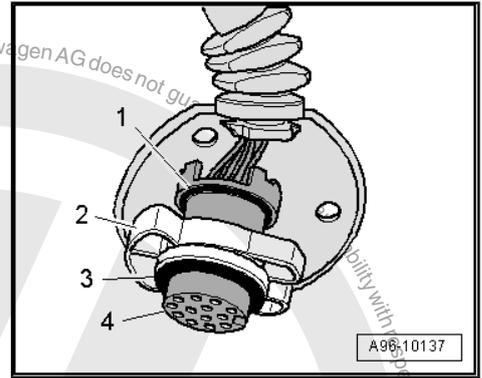
Note

Be especially careful that seals -1- and -3- are not damaged.



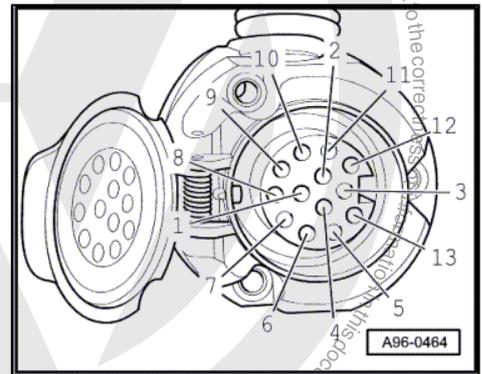


- Push connectors -4- in until they can be heard to engage in holding cage -2-.



Pin assignment of trailer socket -U10-

- 1 - Terminal LTS (left turn signal)
- 2 - Terminal NSL (rear fog lamp)
- 3 - Terminal 31
- 4 - Terminal RTS (right turn signal)
- 5 - Terminal 58R (right tail light)
- 6 - Terminal 54 (brake light)
- 7 - Klemme 58L (left tail light)
- 8 - Terminal RF (reversing light)
- 9 - Terminal 15
- 10 - Reserved for terminal 30
- 11 - Reserved for terminal 31
- 12 - Not assigned
- 13 - Terminal 31





96 – Lights, bulbs, switches - interior

1 Lights and switches in engine compartment



Note

Jetta, Bora and Golf Variant do not have an engine compartment light -W27- .

1.1 Removing and installing bonnet contact switch -F266-

The bonnet contact switch -F266- is integrated in the bonnet lock and cannot be replaced as a single item.

If there is a defect, the complete lid lock must be renewed ⇒
General body repairs, exterior; Rep. gr. 55 .



2 Lights and switches in dash panel

2.1 Removing and installing light switch - E1-

The following components are integrated into the light switch - E1- :

- ◆ Fog light switch -E7-
- ◆ Rear fog light switch -E18-
- ◆ Bulb for illumination of light switch -L9-

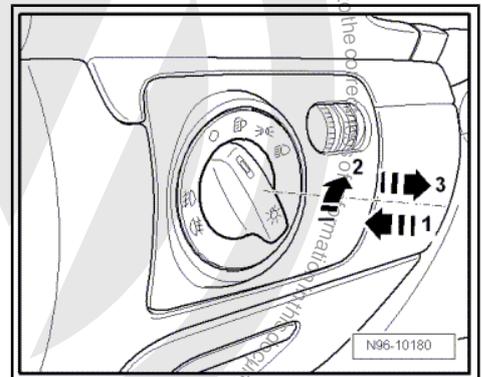


Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*
- ◆ *When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.*

Removing

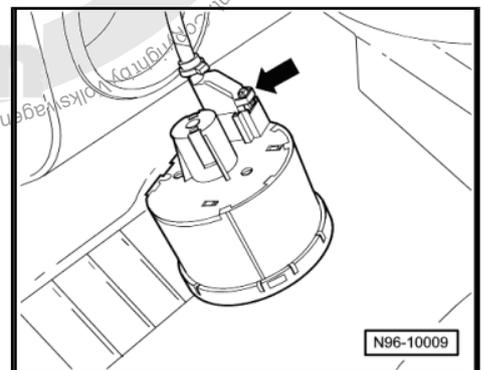
- Turn rotary grip of light switch -E1- to position „0“.
- Push in rotary grip of light switch -E1- -arrow 1- and turn it slightly to the right -arrow 2-.
- Hold rotary knob in this position and pull on rotary knob to remove light switch -E1- from dash panel -arrow 3-.



- Disconnect connector -arrow-.

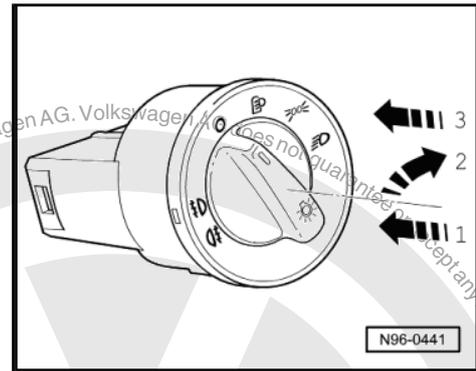
Installing

- Fit connector to light switch -E1- .





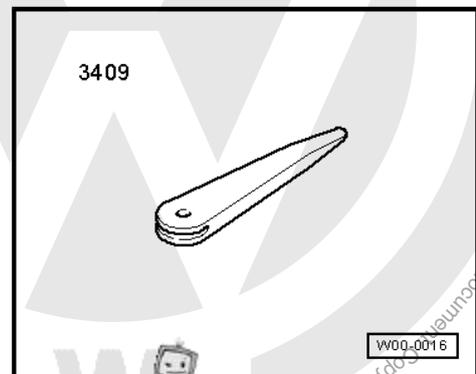
- Hold light switch -E1- , press in rotary knob of light switch -E1- -arrow 1- and turn slightly to right -arrow 2-.
- Hold rotary grip in this position and insert light switch -E1- into dash panel -arrow 3- using rotary grip.
- Turn grip of light switch to position „0“, release and engage light switch -E1- .



2.2 Removing and installing glove compartment light -W6-

Special tools and workshop equipment required

- ◆ Removal wedge -VAS 3409-

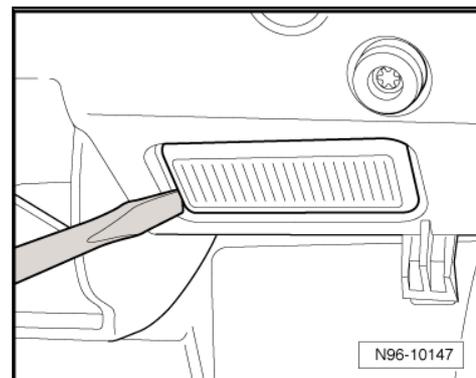


Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*
- ◆ *When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.*

Removing

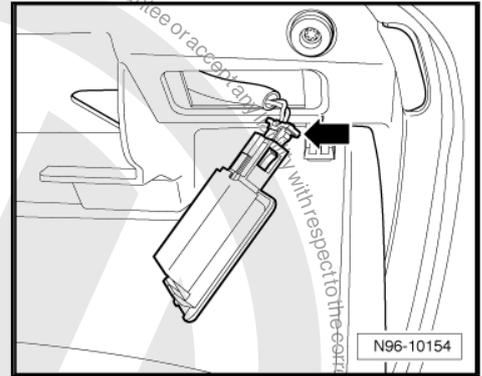
- Open glove box.
- Use removal wedge -VAS 3409- to carefully prise out glove compartment light -W6- .



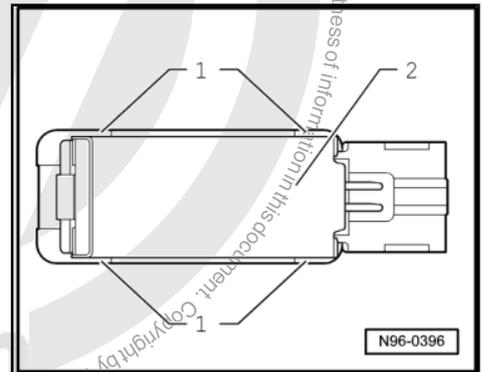


- Disconnect connector -arrow-.

Renewing bulb:



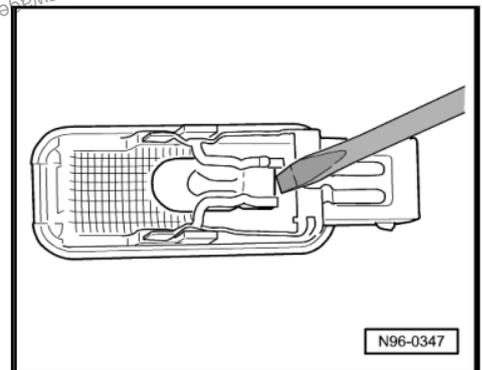
- Release locking lugs -1- and remove heat shield -2- from lens of glove compartment light -W6- .



- Carefully lever bulb out of holder.
- Renew glass-base bulb (12 V/5 W).

Caution

- ◆ *Do not touch glass envelope when fitting bulb. Fingers leave traces of grease on the glass envelope, which evaporate when the bulb is switched on and cause the glass envelope to cloud over.*



Installing

Install in the reverse order of removal. When doing this, note the following:

- Check function of glove compartment switch -E26- . When the lid is closed, the glove compartment light -W6- should not be on.

2.3 Removing and installing glove compartment light switch -E26-

The switch for glove compartment light -E26- can be found at the rear of the glove compartment.

Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

Removing

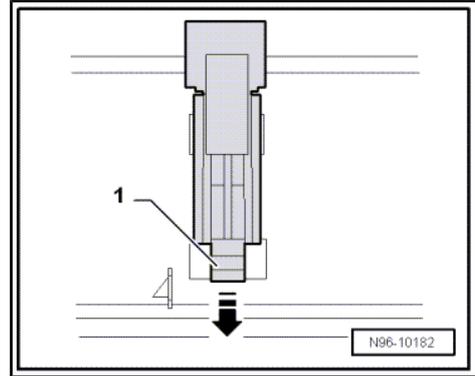
- Remove glove compartment ⇒ General body repairs, interior; Rep. gr. 68 .



- Release locking lug -1- and push glove compartment light switch -E26- out of guide rail -arrow-.

Installing

Installation is carried out in reverse order of removal.



2.4 Removing and installing regulator for switch and instrument illumination -E20-

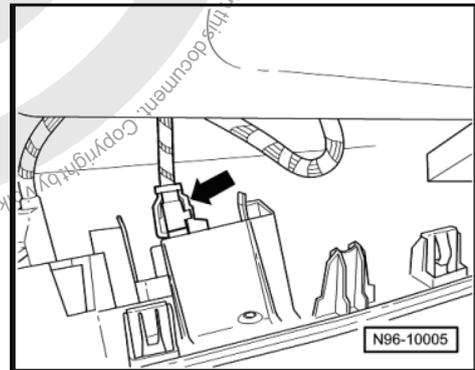


Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**
- ◆ **When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.**

Removing

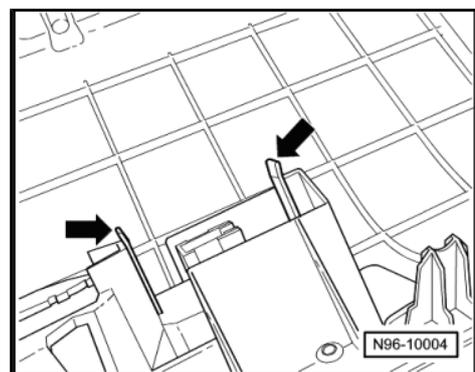
- Remove light switch -E1- ⇒ [page 383](#) .
- Removing driver side storage compartment ⇒ General body repairs, interior; Rep. gr. 68 .
- Disconnect connector -arrow-.



- Release locking lugs -arrows- and remove regulator for switch and instrument illumination -E20- .

Installing

Installation is carried out in reverse order of removal.





2.5 Removing and installing warning lamp for airbag deactivated on front passenger side -K145-



WARNING

*Comply with the safety precautions when working on the airbag
⇒ General body repairs, interior; Rep. gr. 69 .*

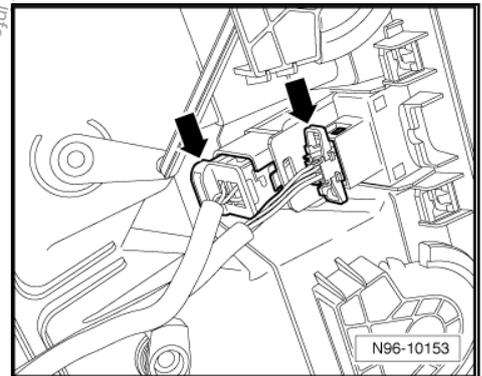


Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**
- ◆ **When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409- , screwdriver) are used to lever out those components using commercially available masking tape.**

Removing

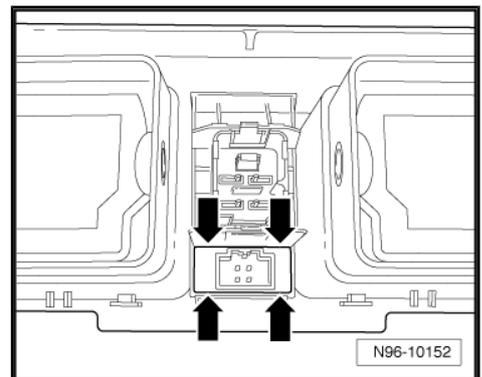
- Remove centre vents ⇒ Heating, air conditioning system; Rep. gr. 80 .
- Disconnect connectors -arrows-.



- Release locking lugs -arrows- and remove airbag warning lamp from passenger side -K145- .

Installing

Installation is carried out in reverse order of removal.





2.6 Removing and installing hazard warning light switch -E3-

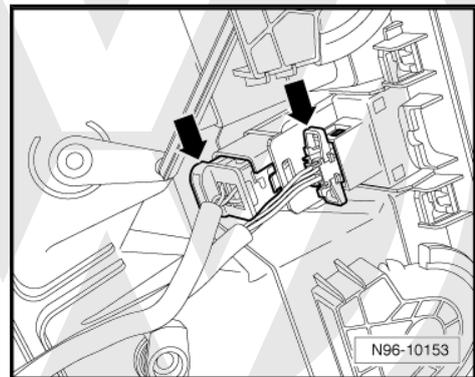


Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*
- ◆ *When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.*

Removing

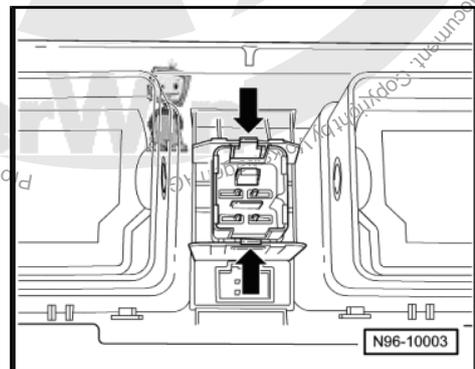
- Remove centre vents ⇒ Heating, air conditioning system; Rep. gr. 80 .
- Disconnect connectors -arrows-.



- Release locking lugs -arrows- and remove hazard warning light switch -E3- .

Installing

Installation is carried out in reverse order of removal.



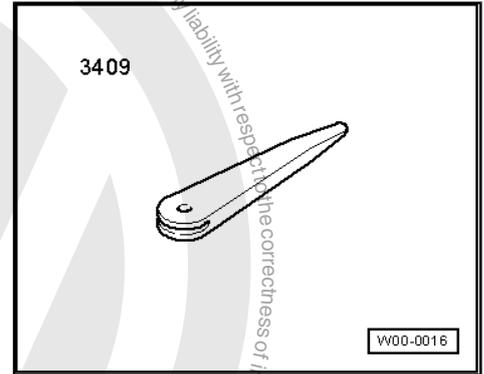
2.7 Removing and installing footwell lights

Left footwell light -W9- / right footwell light -W10- are removed and installed in same way and description is only given for one.

Special tools and workshop equipment required



◆ Removal wedge -VAS 3409-

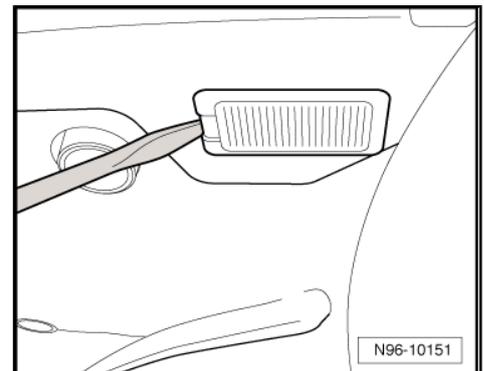


Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**
- ◆ **When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.**

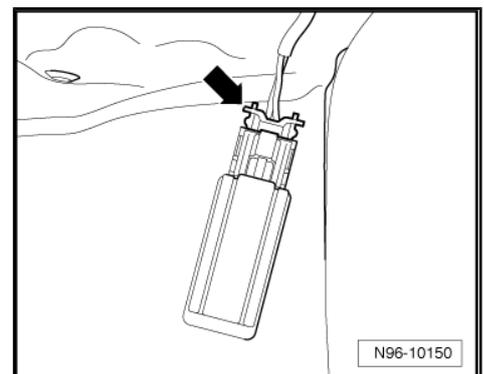
Removing

- Use removal wedge -VAS 3409- to prise left footwell light -W9- out of trim beneath dash panel.



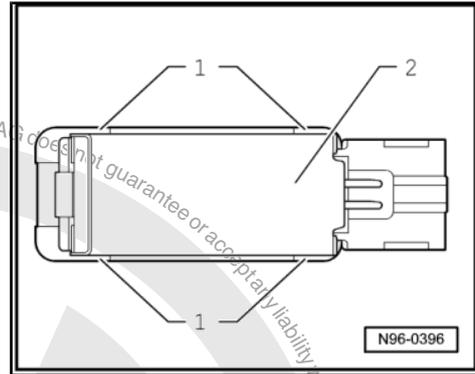
- Disconnect connector -arrow-.

Renewing bulb:





- Release locking lugs -1- and remove heat shield -2- from lens of footwell light on left -W9- .

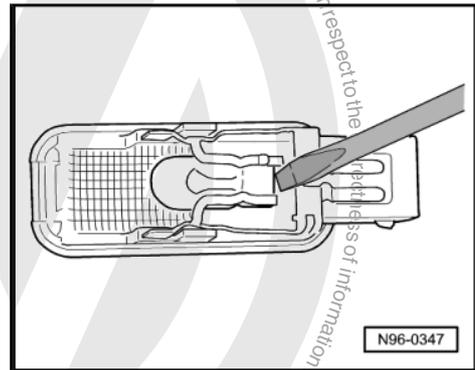


- Carefully lever bulb out of holder.
- Renew glass-base bulb (12 V/5 W).



Caution

- ◆ *Do not touch glass envelope when fitting bulb. Fingers leave traces of grease on the glass envelope, which evaporate when the bulb is switched on and cause the glass envelope to cloud over.*



Installing

Installation is carried out in reverse order of removal.

2.8 Removing and installing key operated switch to deactivate front passenger side airbag -E224-



WARNING

*Comply with the safety precautions when working on the airbag
⇒ General body repairs, interior; Rep. gr. 69 .*



Caution

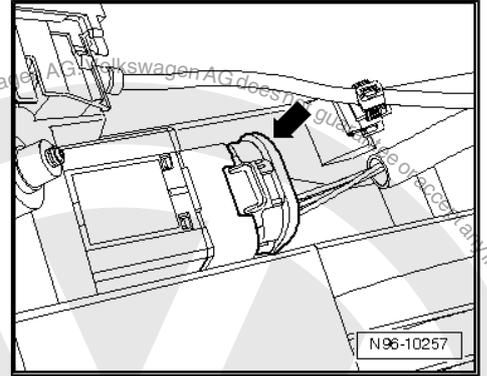
- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

Removing

- Remove glove compartment ⇒ General body repairs, interior; Rep. gr. 68 .



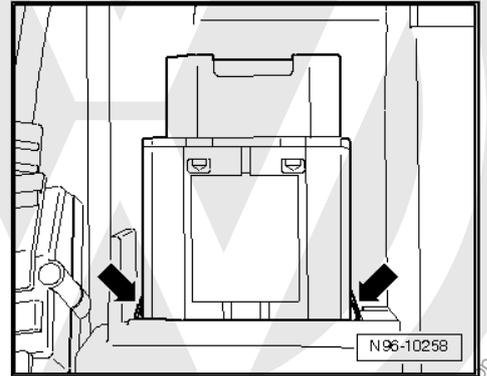
- Disconnect connector -arrow-.



- Release locking lugs -arrows- and remove front passenger side airbag deactivation key switch -E224- .

Installing

Installation is carried out in reverse order of removal.





3 Lights and switches in front doors and B-pillar

3.1 Removing and installing window regulator switch in front passenger door - E107-



Note

The window regulator switch in front passenger door -E107- has an integrated button illumination bulb -L76- , which cannot be replaced separately.

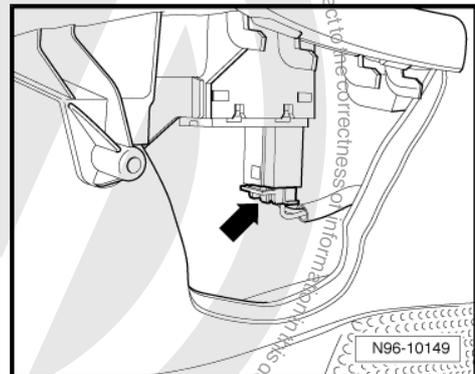


Caution

- ◆ Switch off ignition and all electrical consumers.
- ◆ Remove the ignition key.
- ◆ When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409- , screwdriver) are used to lever out those components using commercially available masking tape.

Removing

- Remove upper part of handle recess from door handle => General body repairs interior; Rep. gr. 70 .
- Disconnect connector -arrow-.

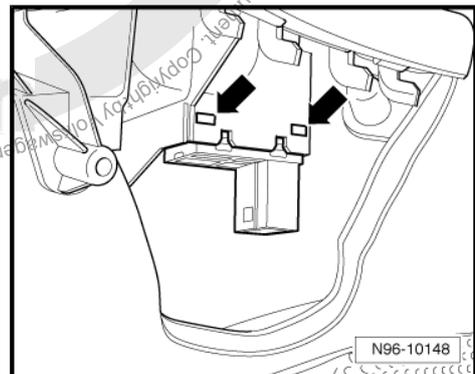


- Release the four locking lugs -arrows- and remove window regulator switch in front passenger door -E107- from installation frame.

Installing

Installation is carried out in reverse order of removal.

- When installing, make sure you hear the four locking lugs click into place.





3.2 Removing and installing switch module for mirror adjustment on driver side

Mirror adjustment switch module - driver side (depending on equipment)

- ◆ Mirror adjustment switch -E43-
- ◆ Mirror adjustment changeover switch -E48-
- ◆ Exterior mirror heater button -E231-
- ◆ Fold-in mirror switch -E263-
- ◆ Mirror adjustment switch illumination bulb -L78-

The above mentioned components cannot be renewed individually.

- In case of a defect, renew switch module for mirror adjustment - driver side.



Caution

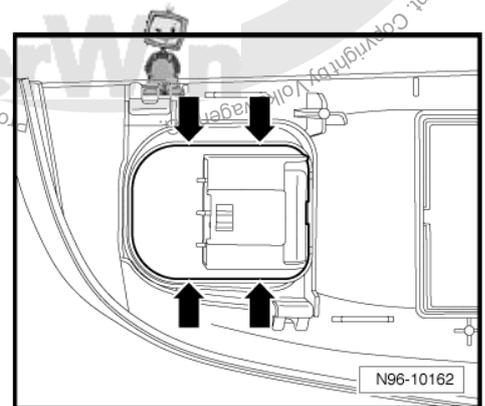
- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*
- ◆ *When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.*

Removing

- Remove switch module for window regulator - driver side
⇒ [page 395](#) .
- Unclip installation frame of switch out of trim.
- Release locking lugs -arrows- and remove the switch module from the installation frame.

Installing

Installation is carried out in reverse order of removal.



3.3 Removing and installing driver side interior locking button for central locking system -E308-



Note

The driver side interior locking button for central locking system -E308- has an integrated button illumination bulb -L76-, which cannot be replaced separately.

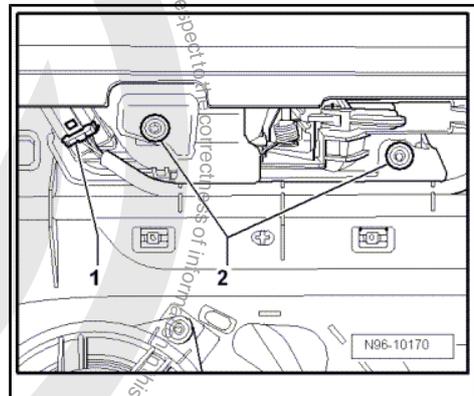


Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**
- ◆ **When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.**

Removing

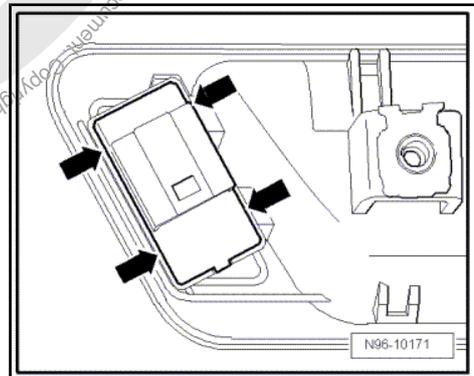
- Remove door trim ⇒ General body repairs, interior; Rep. gr. 70 .
- Detach connector -1- and remove bolts -2-.
- Remove inside door handle together with driver side interior locking button for central locking system -E308- out of door trim.



- Release locking lugs -arrows- and remove driver side interior central locking button -E308- from installation frame.

Installing

Installation is carried out in reverse order of removal.



3.4 Components - front door locks

Door lock - driver side (depending on equipment)

- ◆ Driver door contact switch -F2-
- ◆ Driver side central locking lock unit -F220-
- ◆ Driver door central locking motor -V56-
- ◆ Driver door central locking deadlock function motor -V161-

Door lock - front passenger side (depending on equipment)

- ◆ Front passenger door contact switch -F3-
- ◆ Front passenger side central locking lock unit -F221-
- ◆ Front passenger side central locking motor -V57-
- ◆ Front passenger door central locking deadlock function motor -V162-



The above mentioned components cannot be renewed individually.

- In case of a defect, renew respective door lock => General body repairs, exterior; Rep. gr. 57 .

3.5 Removing and installing switch module for driver side window regulator

Window regulator components - driver page (4 doors)

- ◆ Front left window regulator switch -E40-
- ◆ Rear left window regulator switch, in driver door -E53-
- ◆ Rear right window regulator switch, in driver door -E55-
- ◆ Front right window regulator switch, in driver door -E81-
- ◆ Childproof lock button -E318-
- ◆ Button illumination bulb -L76-

Window regulator components - driver page (2 doors)

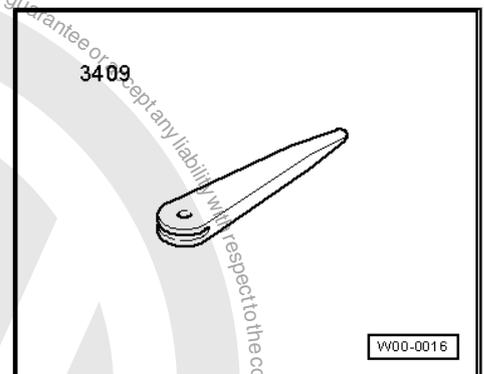
- ◆ Front left window regulator switch -E40-
- ◆ Front right window regulator switch, in driver door -E81-
- ◆ Button illumination bulb -L76-

The above mentioned components cannot be renewed individually.

- In case of a defect, renew corresponding switch module.

Special tools and workshop equipment required

- ◆ Removal wedge -VAS 3409-



Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**
- ◆ **When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.**

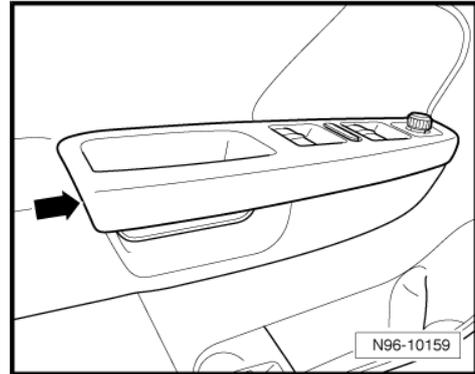


Caution

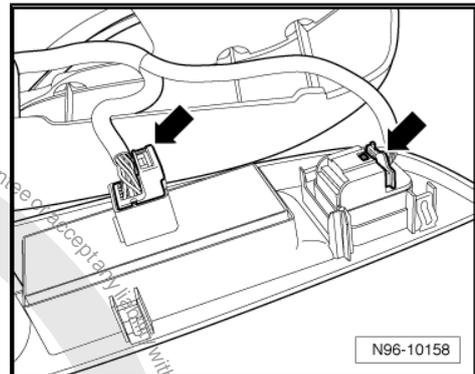
DO NOT attempt to prise or lift off front part of installation frame (in area of switches) from door trim. This will damage switches! Prise or lever installation frame from behind only, as shown by -arrow-.

Removing

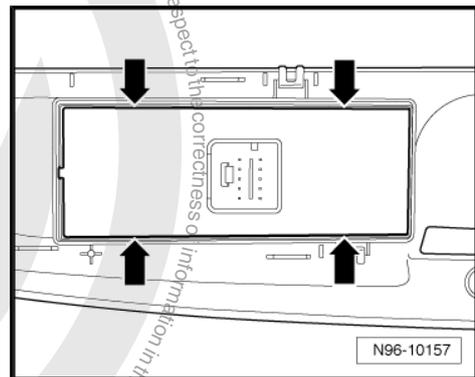
- Use removal wedge -VAS 3409- to carefully prise mounting frame out of door trim -arrow-.



- Disconnect connectors -arrows-.



- Release locking lugs -arrows- and remove the switch module from the installation frame.



Installing

Installation is carried out in reverse order of removal.

3.6 Removing and installing remote release button for fuel filler flap and rear lid - E463-



Note

The remote release button for fuel filler flap and rear lid -E463- has an integrated button illumination bulb -L76-, which cannot be replaced separately.

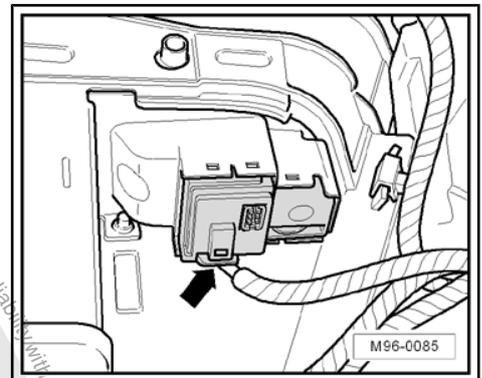


Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*
- ◆ *When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.*

Removing

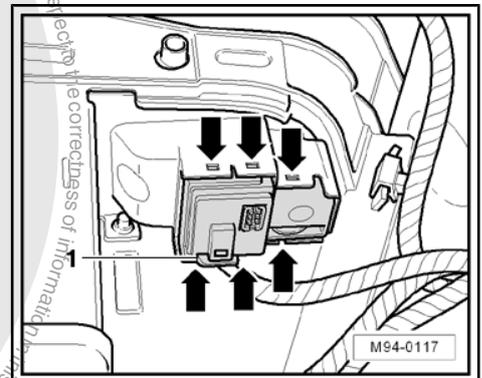
- Remove door trim ⇒ General body repairs, interior; Rep. gr. 70 .
- Disconnect connector -arrow-.



Release locking lugs -arrows- and remove remote release button for fuel filler flap and rear lid -E463- from door trim panel.

Installing

Installation is carried out in reverse order of removal.



3.7 Removing and installing interior monitoring/vehicle inclination deactivation switch

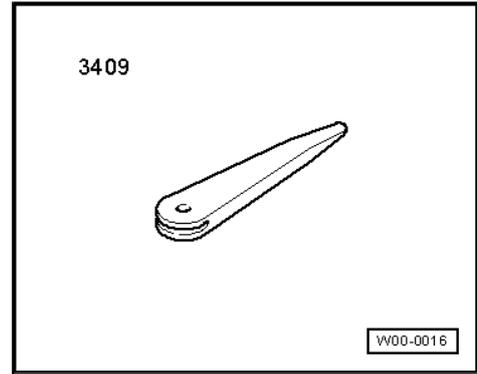
The interior monitoring deactivation switch -E267- / deactivation button for vehicle inclination sender -E360- are combined in one unit and installed in trim of B-pillar at bottom.

The shape of the switch has been changed from model year 2007 onwards.

Special tools and workshop equipment required



◆ Removal wedge -VAS 3409-

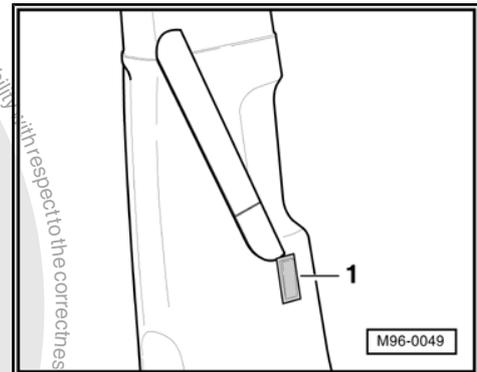


Caution

- ◆ Switch off ignition and all electrical consumers.
- ◆ Remove the ignition key.
- ◆ When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.

Removing

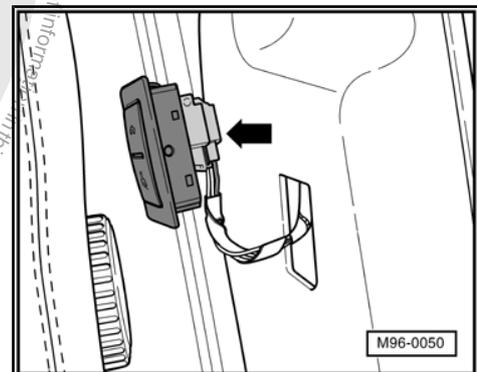
- Use removal wedge -VAS 3409- to unclip switch -1- from trim:



Disconnect connector -arrow-

Installing

Installation is carried out in reverse order of removal.



3.8 Removing and installing central locking deadlock function warning lamp -SAFE-K133-

The central locking deadlock function warning lamp -SAFE- - K133- is located near to the exterior mirror in the driver's door trim.



3.8.1 Removing and installing central locking deadlock function warning lamp -SAFE- -K133-

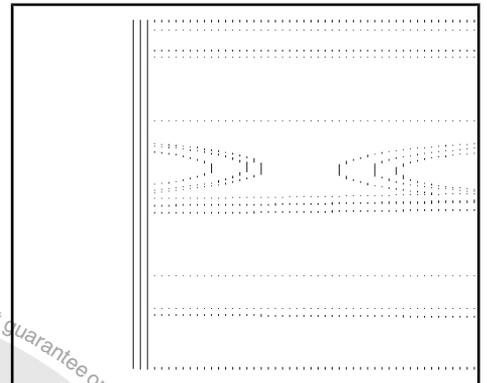


Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*
- ◆ *When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.*

Removing

- Remove driver side front door trim ⇒ General body repairs, interior; Rep. gr. 70 .
- Unclip central locking deadlock function warning lamp -SAFE- -K133- -1- by pressing locking lugs together -arrows- and remove from door trim panel.

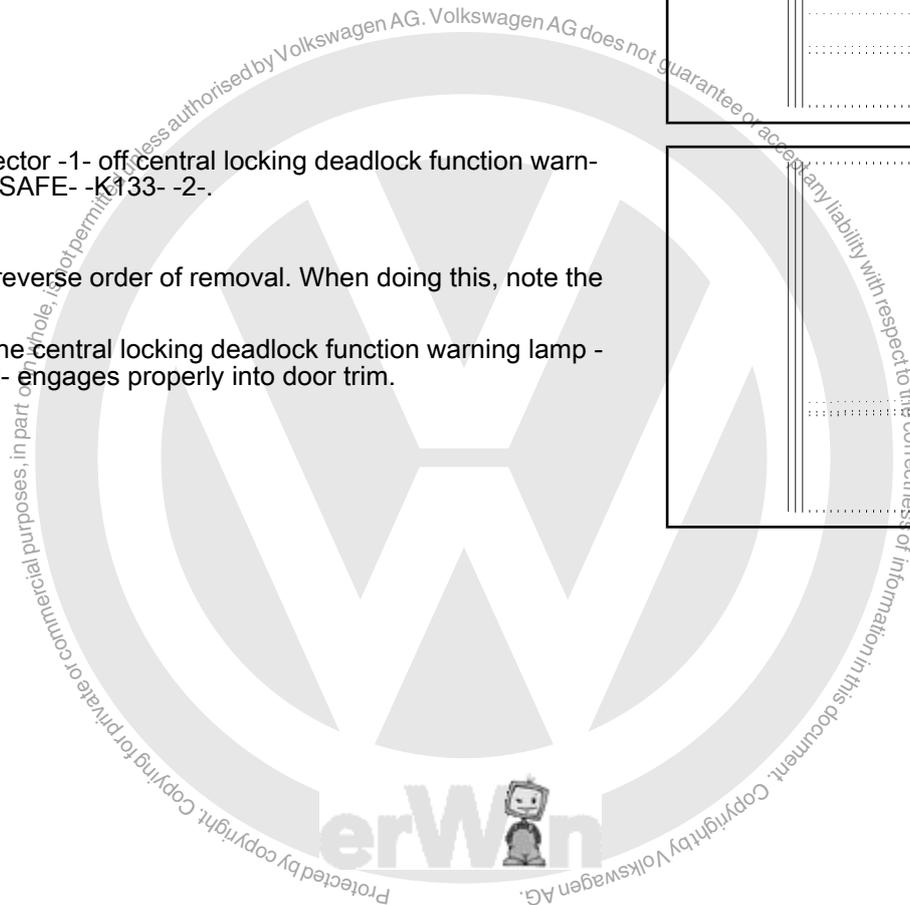
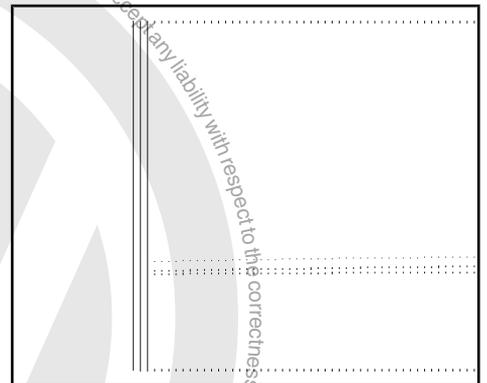


- Pull connector -1- off central locking deadlock function warning lamp -SAFE- -K133- -2-.

Installing

Install in the reverse order of removal. When doing this, note the following:

Ensure that the central locking deadlock function warning lamp -SAFE- -K133- engages properly into door trim.





4 Lights and switches in rear doors

4.1 Components - rear door locks

Rear left door lock (depending on equipment)

- ◆ Rear left door contact switch -F10-
- ◆ Rear left central locking lock unit -F222-
- ◆ Rear left door central locking motor, lock -V214-
- ◆ Rear left door central locking deadlock function motor -V163-

Rear right door lock (depending on equipment)

- ◆ Rear right door contact switch -F11-
- ◆ Rear right central locking lock unit -F223-
- ◆ Rear right door central locking motor, lock -V215-
- ◆ Rear right door central deadlock function locking motor -V164-

The above mentioned components cannot be renewed individually.

- Renew corresponding door lock ⇒ General body repairs, exterior; Rep. gr. 58 .

4.2 Removing and installing rear window regulator switch in door

The procedure for removal and installation of rear left window regulator switch, in door -E52- / rear right window regulator switch, in door -E54- is the same and is therefore described for one only.

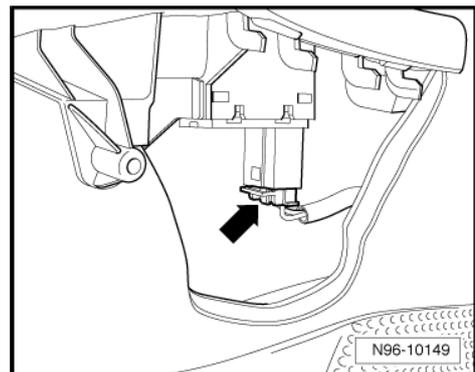


Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**
- ◆ **When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409- , screwdriver) are used to lever out those components using commercially available masking tape.**

Removing

- Remove upper part of handle recess from door handle ⇒ General body repairs, interior; Rep. gr. 70 .
- Disconnect connector -arrow-



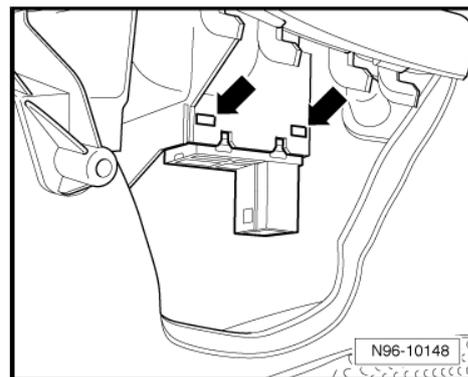


- Release the four locking lugs -arrows- and remove rear left window regulator switch, in door -E52- from installation frame.

Installing

Installation is carried out in reverse order of removal.

- When installing, make sure you hear the four locking lugs click into place.





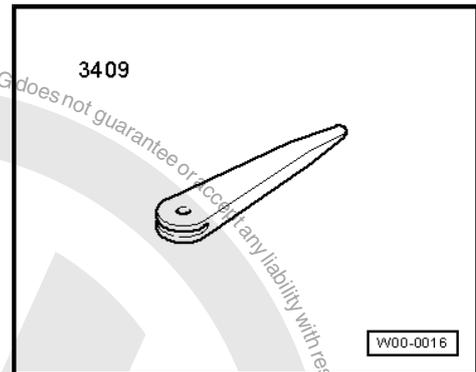
5 Lights and switches in luggage compartment

5.1 Removing and installing luggage compartment light -W3-

The luggage compartment light -W3- is located in luggage compartment cover on right side.

Special tools and workshop equipment required

- ◆ Removal wedge -VAS 3409-

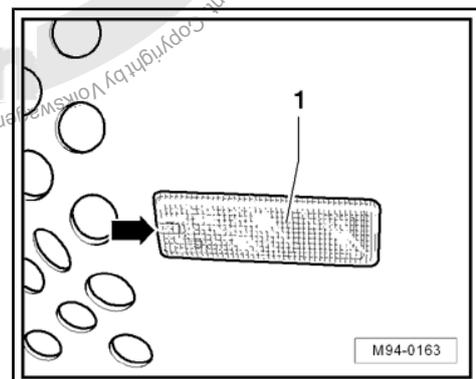


Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*
- ◆ *When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.*

Removing

- Lever luggage compartment light -W3- -1- out of luggage compartment trim using removal wedge -VAS 3409- -arrow-.





- Disconnect connector -arrow-.

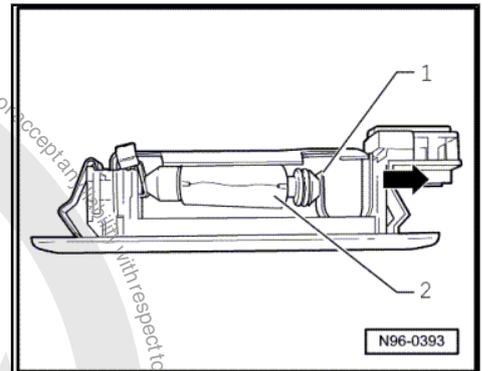
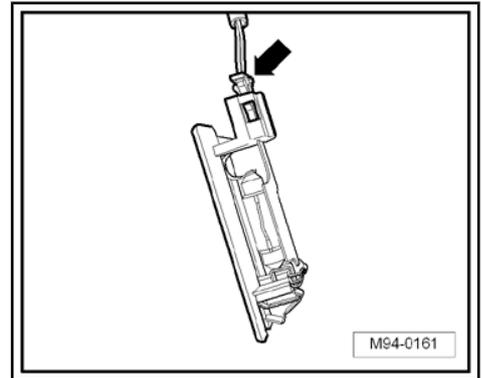
Renewing bulb:

- Press contact plate -1- of luggage compartment light -W3- outwards and remove festoon bulb -2- from bulb holder.
- Renew festoon bulb (12 V/ 10 W).



Caution

- ◆ *Do not touch glass envelope when fitting bulb. Fingers leave traces of grease on the glass envelope, which evaporate when the bulb is switched on and cause the glass envelope to cloud over.*



Installing

Installation is carried out in reverse order of removal.

5.2 Removing and installing rear lid lock unit -F256-

The rear lid lock unit -F256- is integrated into the rear lid lock and cannot be renewed individually.

If the rear lid lock unit -F256- is found to be defective, the entire rear lid lock must always be renewed.

- Renew tailgate lock => General body repairs, exterior; Rep. gr. 55 .





6 Lights and switches in roof trim

6.1 Front interior light -W1- (without sun-roof)

The following components are built into the front interior light -W1- :

- ◆ Front interior light -W1-
- ◆ Left centre reading light -W39-
- ◆ Right centre reading light -W40-

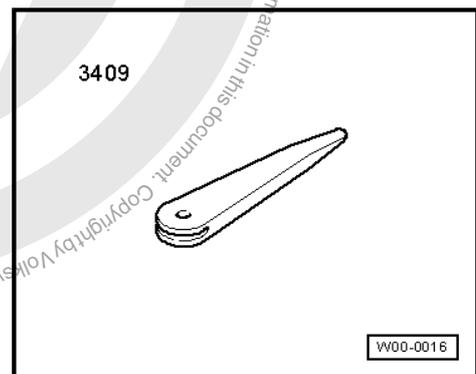
Components cannot be renewed individually. Complete front interior light -W1- must be renewed.

- Renew front interior light -W1- => [page 404](#) .

6.1.1 Removing and installing front interior light -W1-

Special tools and workshop equipment required

- ◆ Removal wedge -VAS 3409-



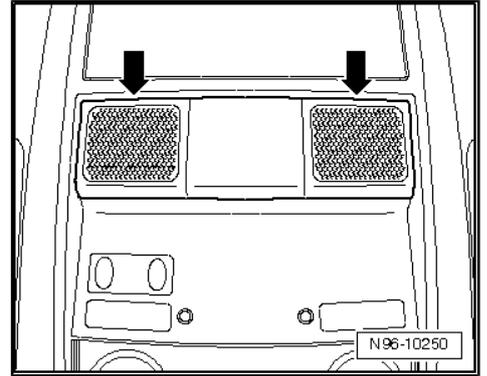
Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*
- ◆ *When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.*

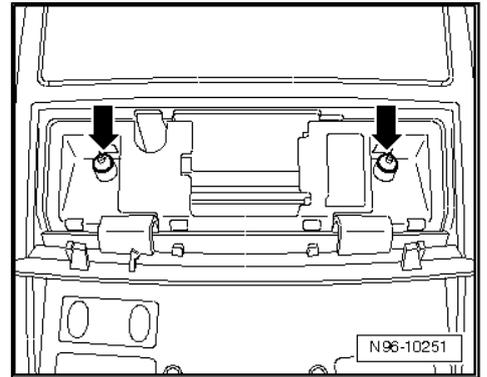


Removing

- Use removal wedge -VAS 3409- to carefully prise trim out of front interior light -W1- -arrows-.



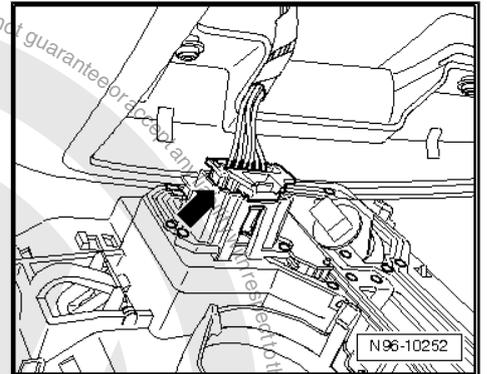
- Remove bolts -arrows-.
- Remove front interior light -W1- out of console in moulded headliner.



- Disconnect connectors -arrows-.

Installing

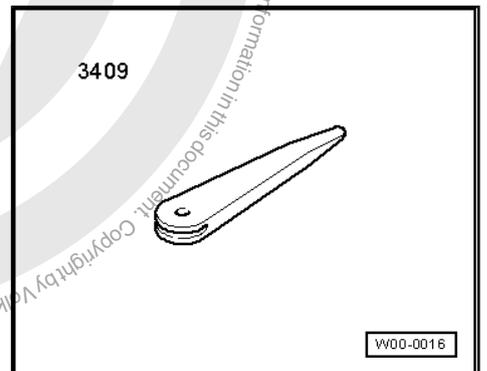
Installation is carried out in reverse order of removal.



6.1.2 Removing and installing bulb of front interior light -W1-

Special tools and workshop equipment required

- ◆ Removal wedge -VAS 3409-



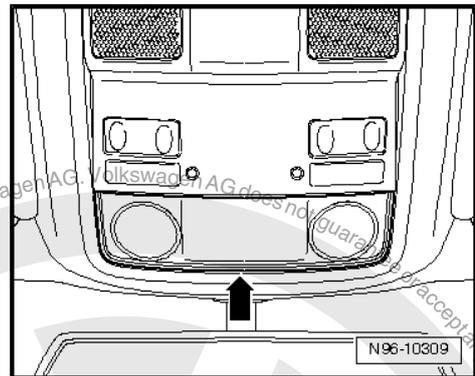


Caution

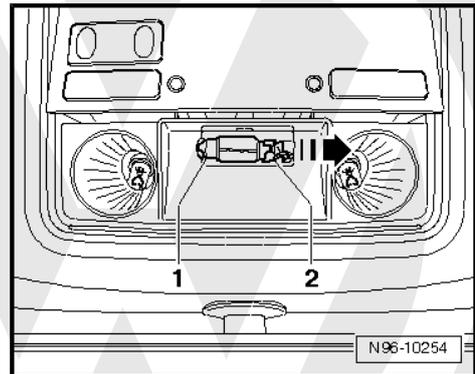
- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*
- ◆ *When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.*

Removing

- Use removal wedge -VAS 3409- to carefully prise lens out of front interior light -W1- -arrow-.



- Press contact plate -1- of front interior light -W1- to side -arrow- and remove festoon bulb -2-, together with contact plate, from front interior light -W1- .

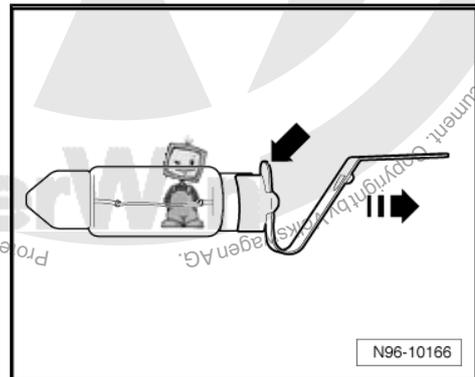


- Pull contact plate -arrow- off defective festoon bulb.
- Fit contact plate onto new festoon bulb (12 V/10 W).



Caution

- ◆ *Do not touch glass envelope when fitting bulb. Fingers leave traces of grease on the glass envelope, which evaporate when the bulb is switched on and cause the glass envelope to cloud over.*



Installing

Installation is carried out in reverse order of removal.

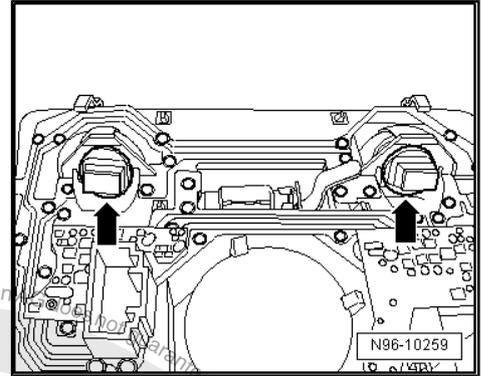
6.1.3 Removing and installing centre reading lights

Left centre reading light -W39- / right centre reading light -W40- are removed and installed in same way and description is only given for one.



Removing

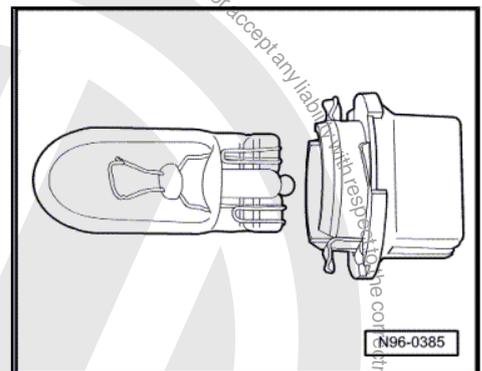
- Remove front interior light -W1- ⇒ [page 404](#) .
- Turn bulb holder -arrows- of left centre reading light -W39- by 90° to the left.
- Remove bulb holder together with bulb out of left centre reading light -W39- .



- Carefully pull glass-base bulb out of bulb holder.
- Renew glass-base bulb (12 V/5 W).

 **Caution**

◆ *Do not touch glass envelope when fitting bulb. Fingers leave traces of grease on the glass envelope, which evaporate when the bulb is switched on and cause the glass envelope to cloud over.*



Installing

Installation is carried out in reverse order of removal.

6.2 Front interior light -W1- (with sunroof)

The following components are built into the front interior light -W1- :

- ◆ Front interior light -W1-
- ◆ Left centre reading light -W39-
- ◆ Right centre reading light -W40-
- ◆ Sunroof switch -E8-

Components cannot be renewed individually. Complete front interior light -W1- must be renewed.

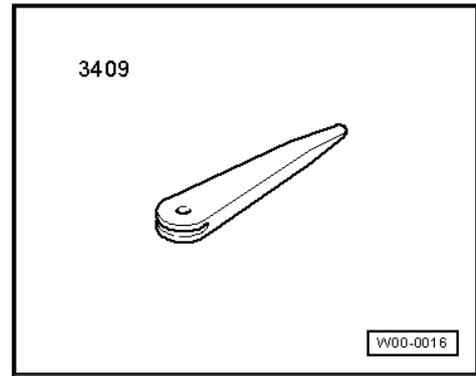
- Renew front interior light -W1- ⇒ [page 407](#) .

6.2.1 Removing and installing front interior light -W1-

Special tools and workshop equipment required



◆ Removal wedge -VAS 3409-

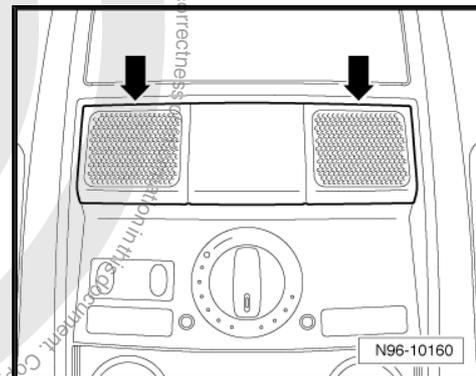


Caution

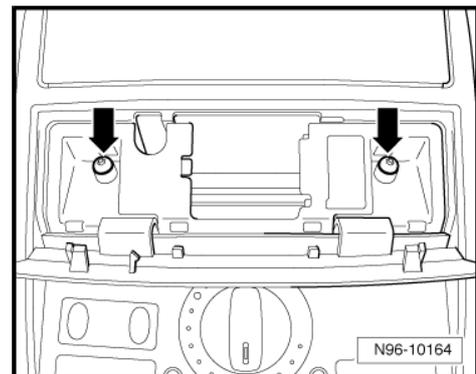
- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**
- ◆ **When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.**

Removing

- Use removal wedge -VAS 3409- to carefully prise trim out of front interior light -W1- -arrows-.



- Remove bolts -arrows-.
- Remove front interior light -W1- out of console in moulded headliner.

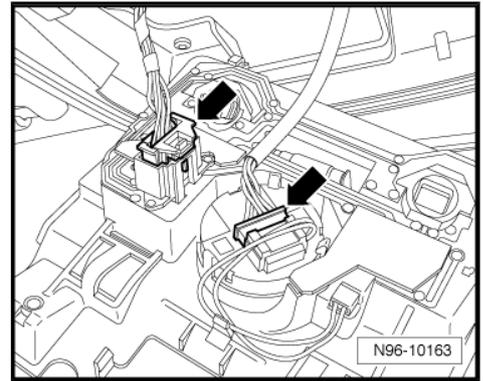




- Disconnect connectors -arrows-.

Installing

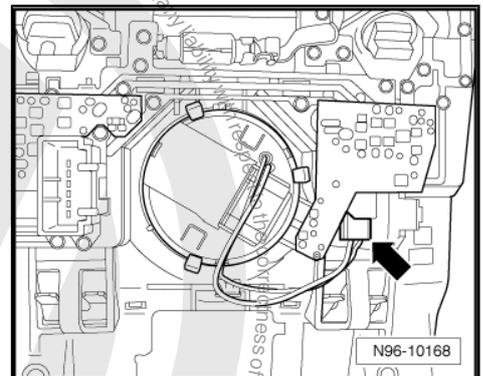
Installation is carried out in reverse order of removal.



6.2.2 Removing and installing sliding sunroof switch -E8-

Removing

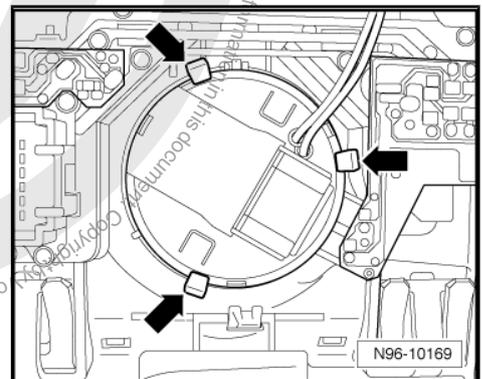
- Remove front interior light -W1- ⇒ [page 407](#) .
- Disconnect connector -arrow-.



- Release locking lugs -arrows- and remove sunroof switch -E8- from installation frame.

Installing

Installation is carried out in reverse order of removal.

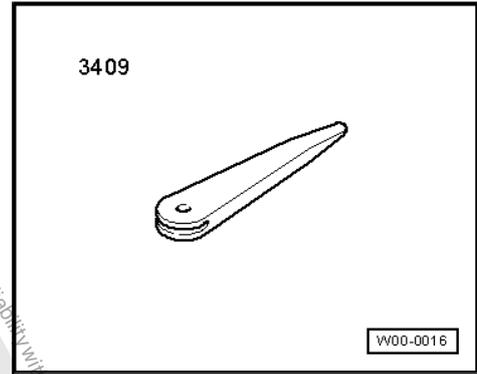


6.2.3 Removing and installing bulb of front interior light -W1-

Special tools and workshop equipment required



◆ Removal wedge -VAS 3409-

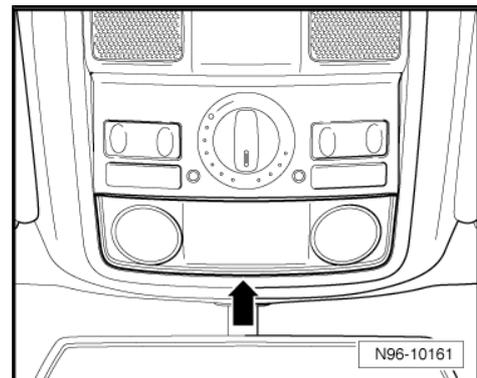


Caution

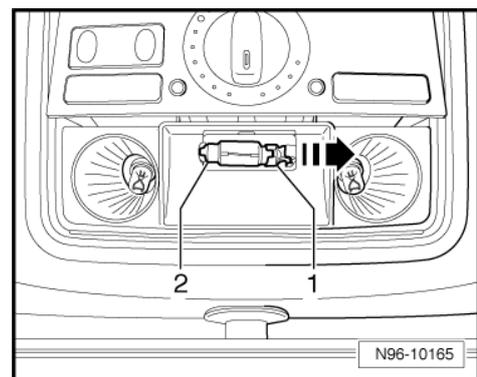
- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*
- ◆ *When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.*

Removing

- Use removal wedge -VAS 3409- to carefully prise lens out of front interior light -W1- -arrow-.



- Press contact plate -1- of front interior light -W1- to side -arrow- and remove festoon bulb -2-, together with contact plate, from front interior light -W1- .

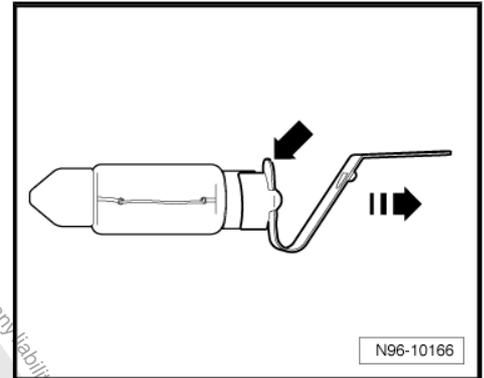




- Pull contact plate -arrow- off defective festoon bulb.
- Fit contact plate onto new festoon bulb (12 V/10 W).

Caution

◆ *Do not touch glass envelope when fitting bulb. Fingers leave traces of grease on the glass envelope, which evaporate when the bulb is switched on and cause the glass envelope to cloud over.*



Installing

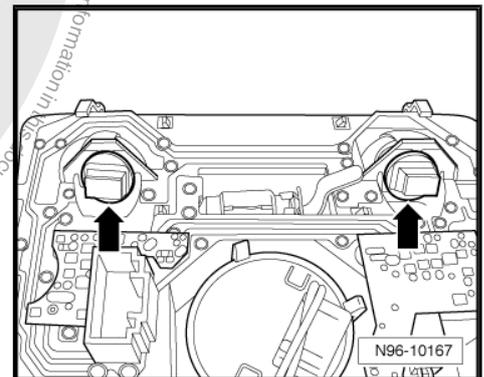
Installation is carried out in reverse order of removal.

6.2.4 Replacing centre reading light

Left centre reading light -W39- / right centre reading light -W40- are removed and installed in same way and description is only given for one.

Removing

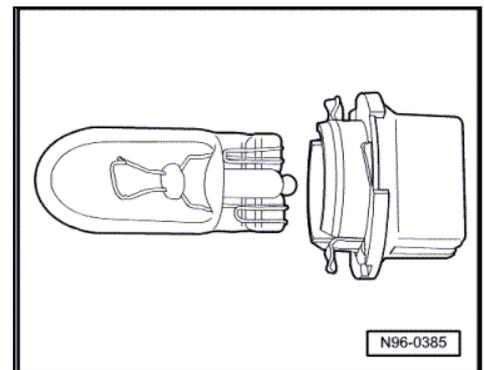
- Remove front interior light -W1- ⇒ [page 407](#) .
- Turn bulb holder -arrows- of left centre reading light -W39- by 90° to the left.
- Remove bulb holder together with bulb out of left centre reading light -W39- .



- Carefully pull glass-base bulb out of bulb holder.
- Renew glass-base bulb (12 V/5 W).

Caution

◆ *Do not touch glass envelope when fitting bulb. Fingers leave traces of grease on the glass envelope, which evaporate when the bulb is switched on and cause the glass envelope to cloud over.*



Installing

Installation is carried out in reverse order of removal.

6.3 Rear interior light -W45- (vehicles without anti-theft alarm)

The following components are built into the rear interior light -W45- :

- ◆ Rear interior light -W45-
- ◆ Rear left reading light -W11-
- ◆ Rear right reading light -W12-



Components cannot be renewed individually. Complete rear interior light -W45- must be renewed.

- Renew rear interior light -W45- => [page 412](#) .

6.3.1 Removing and installing rear interior light -W45-

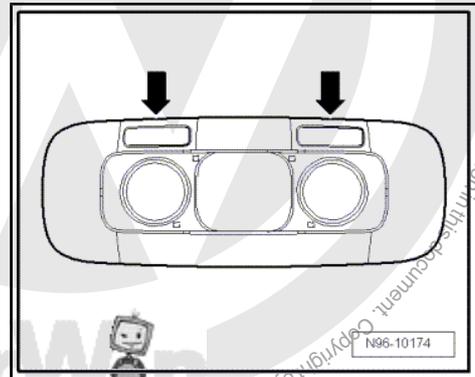


Caution

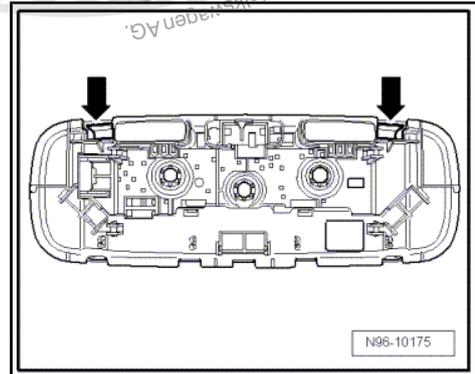
- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**
- ◆ **When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.**

Removing

- Release locking lugs -arrows- and remove trim with lens from rear interior light -W45- .



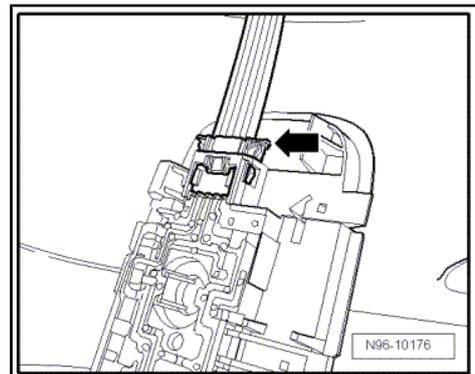
- Release locking lugs -arrows- and remove rear interior light W45- from moulded headliner.



- Disconnect connector -arrow-.

Installing

Installation is carried out in reverse order of removal.

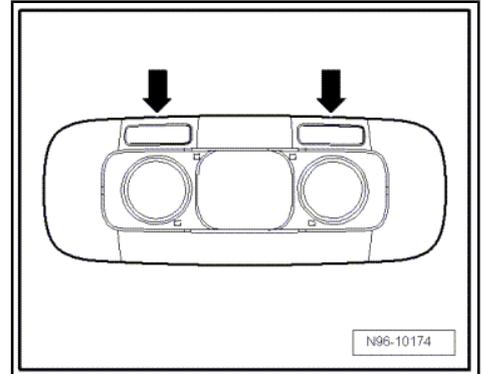




6.3.2 Renewing bulb of rear interior light - W45-

Removing

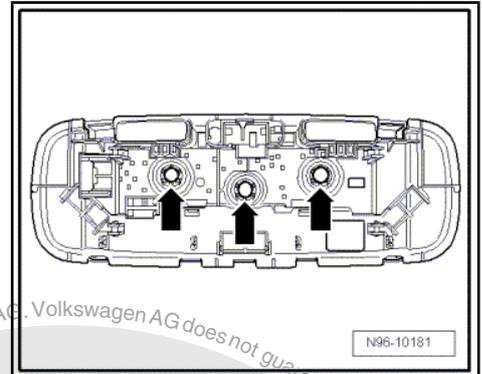
- Release locking lugs -arrows- and remove trim with lens from rear interior light -W45- .



- Carefully pull glass-base bulb out of holder -arrows-.
- Renew glass-base bulb (12 V/5 W).

 **Caution**

◆ *Do not touch glass envelope when fitting bulb. Fingers leave traces of grease on the glass envelope, which evaporate when the bulb is switched on and cause the glass envelope to cloud over.*



Installing

Installation is carried out in reverse order of removal.

6.4 Rear interior light -W45- (vehicles with anti-theft alarm) up to MY2009

The following components are built into the rear interior light -W45- :

- ◆ Rear interior light -W45-
- ◆ Rear left reading light -W11-
- ◆ Rear right reading light -W12-
- ◆ Anti-theft alarm ultrasonic sensor -G209-

Components cannot be renewed individually. Complete rear interior light -W45- must be renewed.

Anti-theft alarm ultrasonic sensor -G209- is not allowed to be moved from its preset position.

- Renew rear interior light -W45- ⇒ [page 414](#) .



6.4.1 Removing and installing rear interior light -W45-



Note

- ◆ If the rear interior light -W45- is removed, the anti-theft alarm system must be deactivated => [page 430](#) (up to MY2009).
- ◆ The anti-theft alarm ultrasonic sensor -G209- must not be moved from its preset position (up to MY2009).

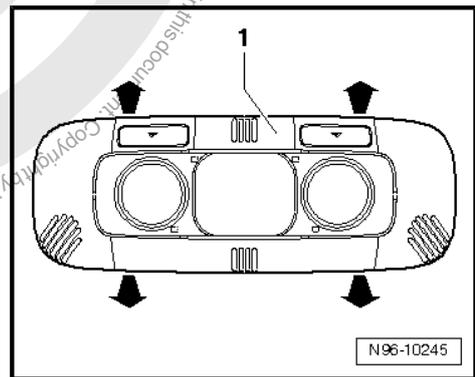


Caution

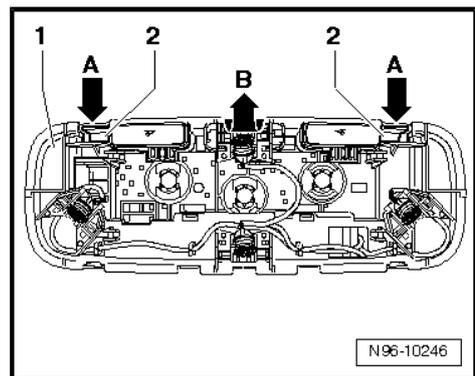
- ◆ Switch off ignition and all electrical consumers.
- ◆ Remove the ignition key.
- ◆ When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.

Removing

- Pull entire trim panel -1- (with lens and reflectors) vertically downwards -arrows- out of rear interior light -W45- .



- Press both locking lugs -2- in -direction of arrow A- and remove entire rear interior light -W45- -1- in -direction of arrow B- from moulded headliner.

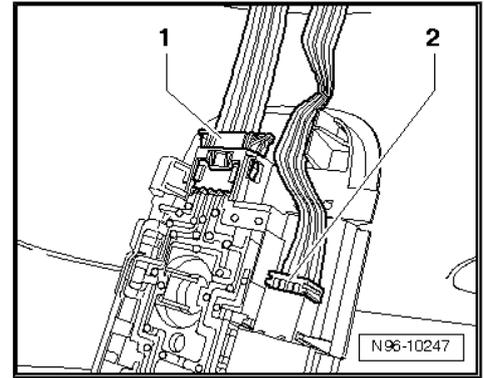




- Disconnect connectors -1- and -2-.

Installing

Installation is carried out in reverse order of removal.



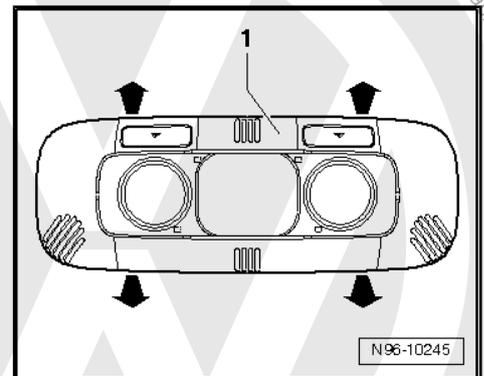
6.4.2 Renewing bulb of rear interior light - W45-

Note

- ◆ *The anti-theft alarm system must be deactivated when the rear interior light -W45- bulbs are replaced => [page 430](#) (up to MY2009).*
- ◆ *The anti-theft alarm ultrasonic sensor -G209- must not be moved from its preset position (up to MY2009).*

Removing

- Switch off ignition and all electrical consumers.
- Pull entire trim panel -1- (with lens and reflectors) vertically downwards out of rear interior light -W45- .

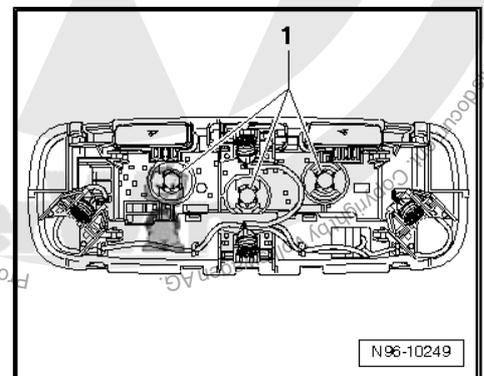


- Pull glass-base bulb to be removed (12-V/5 W) -1- from bulb holder.



Caution

- ◆ *Do not touch glass envelope when fitting bulb. Fingers leave traces of grease on the glass envelope, which evaporate when the bulb is switched on and cause the glass envelope to cloud over.*



Installing

Installation is carried out in reverse order of removal.

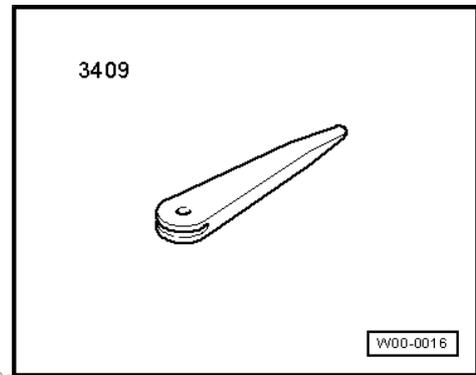


6.5 Removing and installing illuminated vanity mirrors

The procedure for removing and installing front passenger side illuminated vanity mirror -W14- / driver side illuminated vanity mirror -W20- is the same and is described for one only.

Special tools and workshop equipment required

- ◆ Removal wedge -VAS 3409-

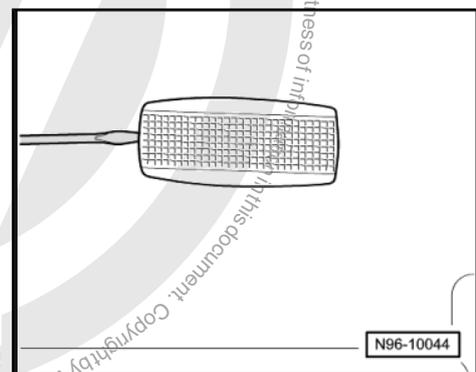


Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*
- ◆ *When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.*

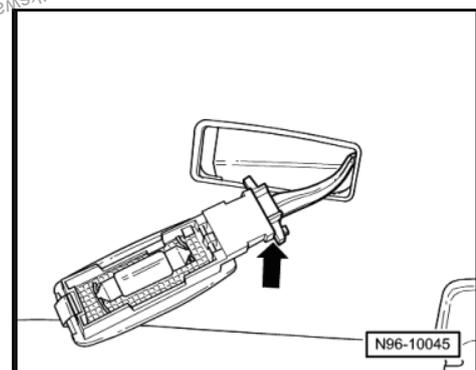
Removing

- Use removal wedge -VAS 3409- to prise front passenger side illuminated vanity mirror -W14- carefully out of roof trim.



- Disconnect connector -arrow-.

Renewing bulb:



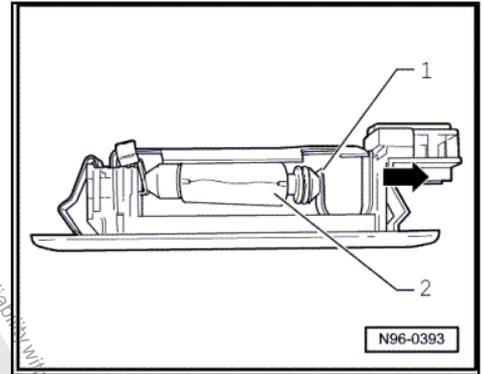


- Push contact plate -1- of front passenger side illuminated vanity mirror -W14- in direction of arrow and remove festoon bulb -2- from bulb holder.
- Renew festoon bulb (12 V/ 5 W).



Caution

- ◆ *Do not touch glass envelope when fitting bulb. Fingers leave traces of grease on the glass envelope, which evaporate when the bulb is switched on and cause the glass envelope to cloud over.*



Installing

Installation is carried out in reverse order of removal.

6.6 Removing and installing garage door operating unit -E284-

Garage door operating unit -E284- is installed in sun visor on driver side.

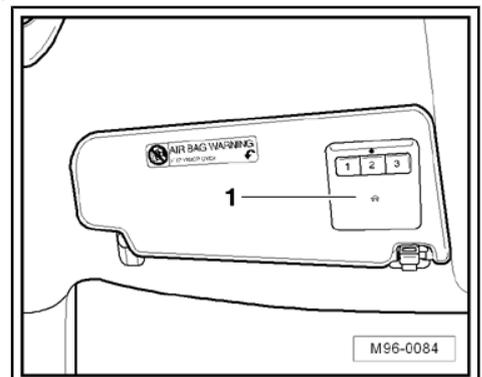
Sun visor and garage door operating unit -E284- can only be renewed together.

Removing

- Remove sun visor on driver side together with garage door operating unit -E284- -1- → General body repairs, interior; Rep. gr. 68 .

Installing

Installation is carried out in reverse order of removal.





7 Lights and switches in centre console

7.1 Buttons in centre console storage compartment

Buttons in centre console storage compartment (depending on equipment)

- ◆ TCS and ESP button -E256-
- ◆ Shock absorber damping adjustment button -E387-
- ◆ Park assist steering button -E581-
- ◆ Parking aid button -E266-
- ◆ Tyre pressure monitor display button -E492-
- ◆ Fuel selection switch (petrol, gas) -E395-



Note

The procedure for removal and installation is the same for all buttons in the centre console storage compartment and is therefore described for just one button.

7.2 Removing and installing buttons in centre console storage compartment



Note

The procedure for removal and installation is the same for all buttons in the centre console storage compartment and is therefore described for just one button (TCS and ESP button -E256-).



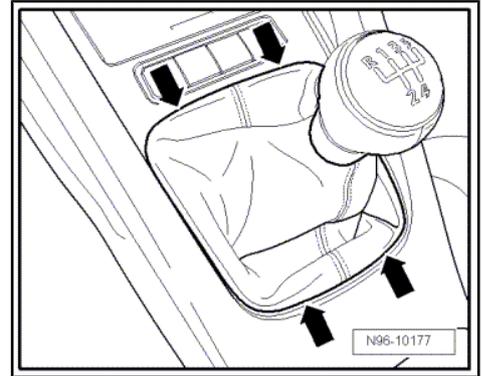
Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**
- ◆ **When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.**

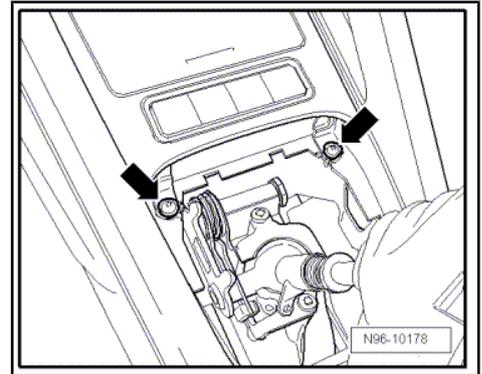


Removing

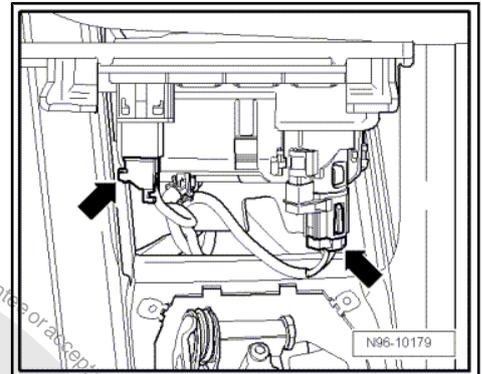
- Carefully lever gear lever gaiter out of centre console -arrows-.



- Remove bolts -arrows-.
- Remove mounting frame together with ashtray out of centre console.



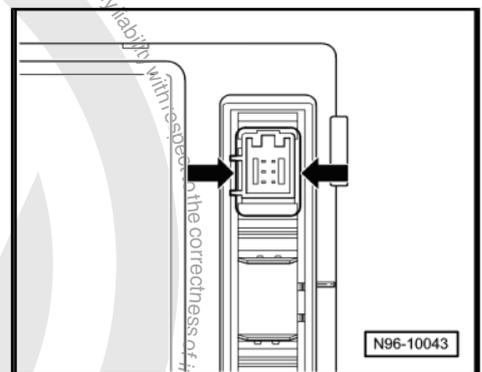
- Disconnect connectors -arrows-.



- Release locking lugs -arrows- and remove TCS and ESP button -E256- from installation frame.

Installing

Installation is carried out in reverse order of removal.





7.3 Removing and installing AC/DC converter with socket

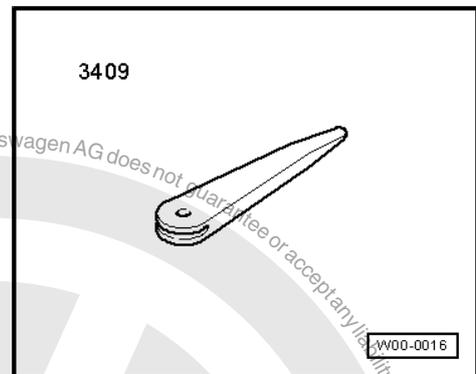


WARNING

- ◆ *Capacitors are located in AC/DC converter with socket, 12 V - 230 V-U13- / AC/DC converter with socket, 12 V - 115 V-U27- , and these capacitors can be charged with a residual voltage.*
- ◆ *There is a danger of an electric shock.*
- ◆ *Under no circumstances open housing of AC/DC converter with socket, 12 V - 230 V-U13- / AC/DC converter with socket, 12 V - 115 V-U27- .*

Special tools and workshop equipment required

- ◆ Removal wedge -3409-

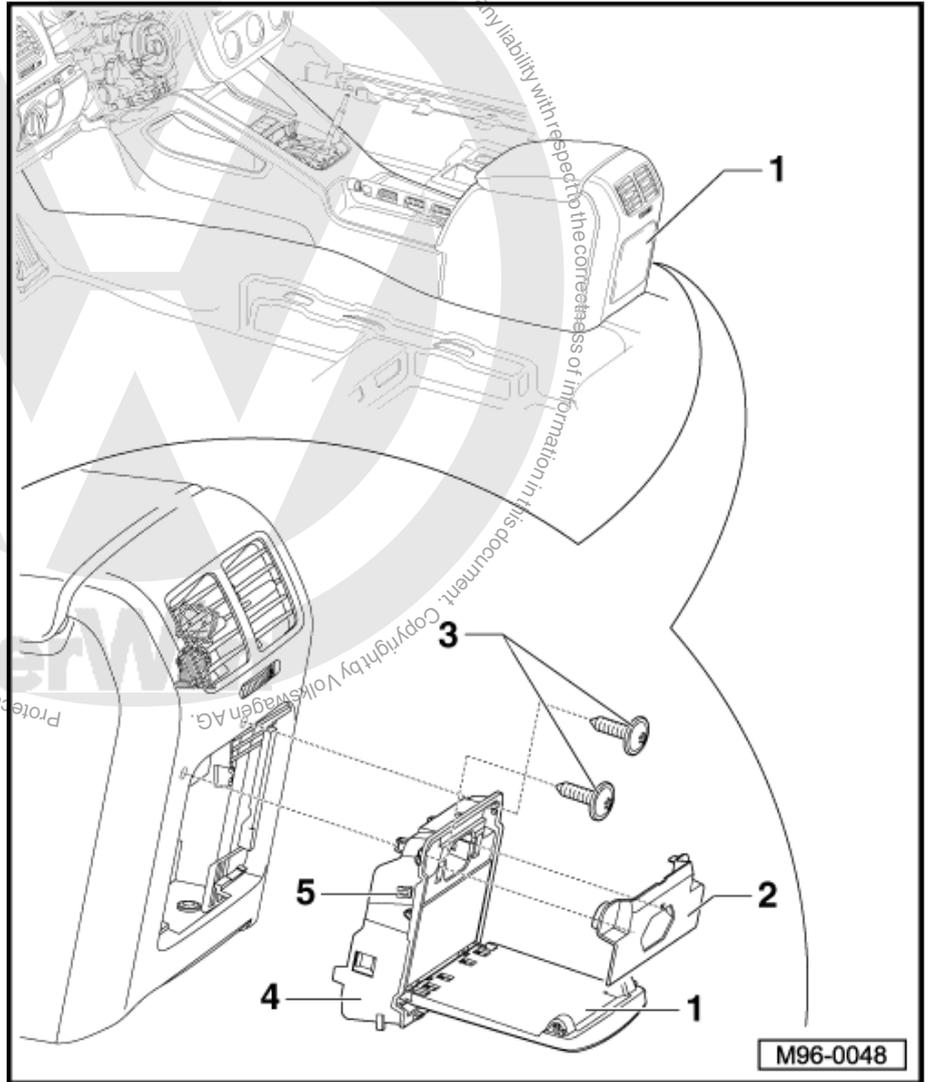


Caution

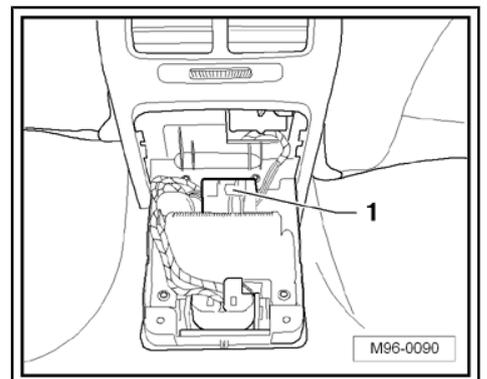
- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*
- ◆ *When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.*
- ◆ *The connector, wiring and 230 V socket must never be repaired.*
- ◆ *The complete unit must be replaced if the connector, wiring and 230 V socket or the AC/DC converter are defective.*

Removal

- Open folding cover -1-.
- Use removal wedge -VAS 3409- to remove socket cover -2-, it is clipped in on both sides of socket.
- Remove two screws -3- (1.5 Nm).
- Remove inner socket unit -4-. Both side brackets -5- must be released for this.



- Unclip connector -1- and pull out plug connector.

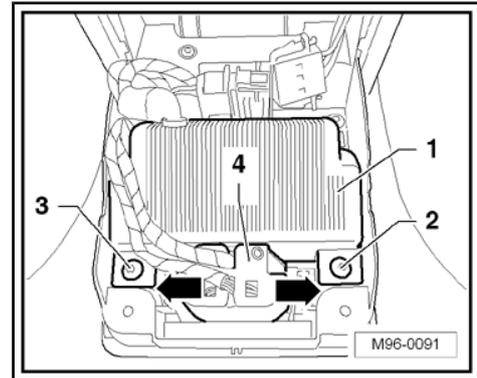




- Release electric socket -4- at locking lugs -arrows- and pull electric socket out.
- Remove two screws -2 and 3-.
- Pull out converter -1-.

Installing

Installation is carried out in the reverse sequence.





8 immobiliser

General description

The vehicle features a fourth-generation immobiliser.

New features of the forth-generation immobiliser:

- ◆ It is no longer possible to adapt components of other brands for use in VW vehicles.
- ◆ The ignition keys are pre-programmed at the manufacturer with a base code. This base code contains a specific manufacturer's code. The keys can be taught into a vehicle only if programmed with the correct manufacturer's mode.

Fault detection and fault display

The immobiliser is equipped with self-diagnosis.

For fault finding, use vehicle diagnosis, testing and information system -VAS 5051B- in „Guided fault finding“ mode.

8.1 Removing and installing immobiliser control unit -J362-

The immobiliser control unit -J362- is integrated in the dash panel insert. In the event of failure of immobiliser control unit -J362- , the complete dash panel insert must be renewed.

Renewing dash panel insert ⇒ [page 173](#) .

8.2 immobiliser reader coil -D2-

The immobiliser reader coil -D2- is joined to the ignition switch and cannot be renewed individually.

Removing and installing ignition switch ⇒ [page 332](#) .

8.3 Ignition key

Removing and installing battery of ignition key with remote control ⇒ General body repairs, exterior; Rep. gr. 57 .

Removing and installing radio container (transmission unit for remote control central locking) of ignition key ⇒ General body repairs, exterior; Rep. gr. 57 .

8.3.1 Ignition key - variable code transponder

The variable code transponder in the ignition key cannot be replaced.

The ignition key must always be replaced if the variable code transponder is defective.



Note

- ◆ *If an ignition key is replaced or a further ignition key is required, the new ignition key must always be adapted to the immobiliser ⇒ [page 424](#) .*
- ◆ *If the radio container (transmission unit for remote controlled central locking) of the ignition key is also replaced, it must be adapted to the convenience system (up to MY2009) ⇒ [page 425](#) .*

8.3.2 Loss of the ignition key

All ignition keys are pre-coded to a specific vehicle in the factory and can only be adapted to this vehicle. The relevant vehicle



identification number must be specified when re-ordering ignition keys. The new keys must subsequently be adapted to the immobiliser control unit -J362- .



Note

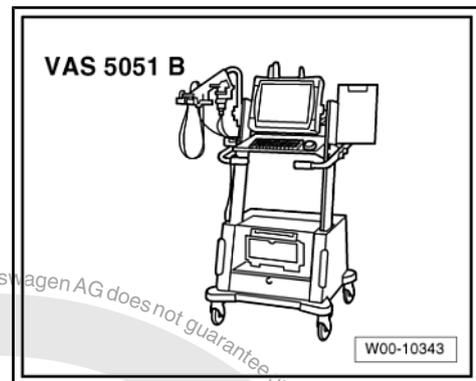
Before removing lock set or control units „New identity on renewing all components“ function must be called up => [page 426](#) .

Adapting ignition key => [page 424](#) , => [page 425](#)

8.3.3 Adapting ignition keys to the immobiliser

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **[GoTo]** button, select „Functions/component“ and the following menu options in succession:

Up to MY2009

- ◆ Body
- ◆ Electrical system
- ◆ 01 - On Board Diagnosis capable systems
- ◆ Immobiliser
- ◆ immobiliser 4A download
- ◆ Adapt key

From MY2010

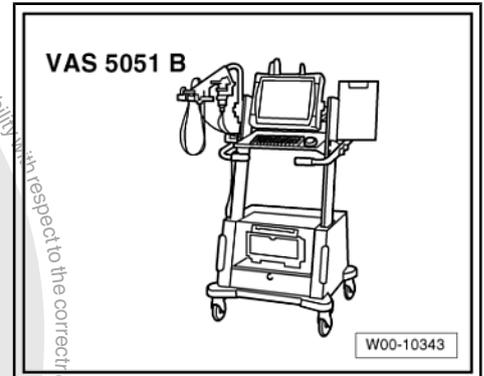
- ◆ Body
- ◆ Electrical system
- ◆ 01 - On Board Diagnosis capable systems
- ◆ immobiliser 4C download
- ◆ Functions
- ◆ Adapt key



8.3.4 Adapting ignition keys to the convenience system (up to MY2009)

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



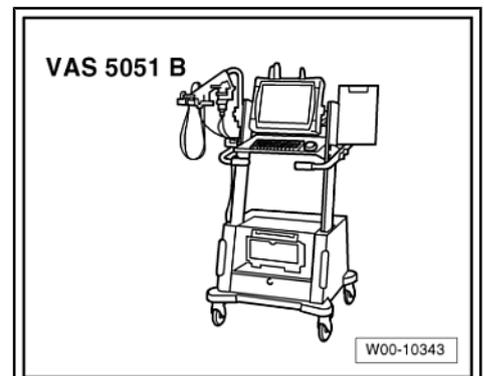
Procedure

- Connect vehicle diagnosis, testing and information system -VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
 - Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Convenience system
 - ◆ Functions of convenience system central control unit
 - ◆ Adapt and check key with radio remote control

8.3.5 Checking ignition key with remote control (from MY2010)

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system -VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.

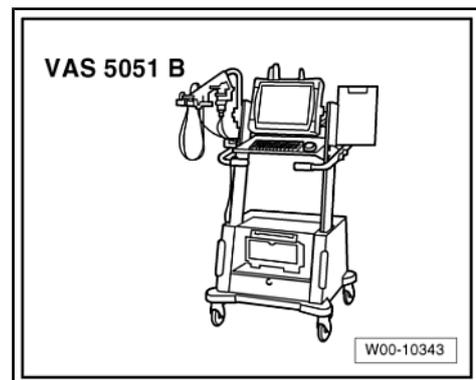


- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Onboard supply control unit
 - ◆ Functions
 - ◆ Check ignition key with remote control

8.3.6 New identity on renewing all components

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

This program performs all the processes required for a reconstruction/reinitialisation of all immobiliser components.

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:

Up to MY2009.

- ◆ Body
- ◆ Electrical system
- ◆ 01 - On Board Diagnosis capable systems
- ◆ immobiliser 4A download
- ◆ Functions
- ◆ New identity

From MY2010

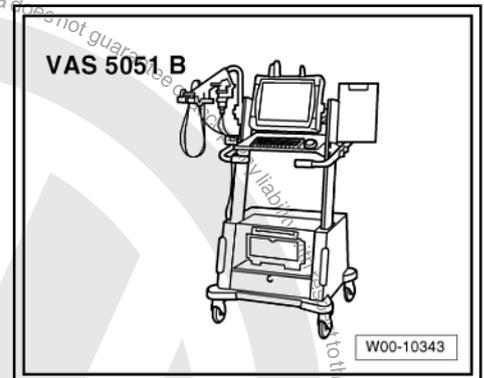
- ◆ Body
- ◆ Electrical system
- ◆ 01 - On Board Diagnosis capable systems
- ◆ immobiliser 4C download
- ◆ Functions
- ◆ New identity



8.3.7 Online system test

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



The following processes are performed with this test program:

- ◆ System test for online connection
- ◆ Check of user authorization
- ◆ Test for correct online connection to Volkswagen database

This requires an online connection for the vehicle diagnostic, testing and information system -VAS 5051B-

Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“ .
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:

Up to MY2009.

- ◆ Body
- ◆ Electrical system
- ◆ 01 - On Board Diagnosis capable systems
- ◆ immobiliser 4A download
- ◆ Functions
- ◆ Online system test

From MY2010

- ◆ Body
- ◆ Electrical system
- ◆ 01 - On Board Diagnosis capable systems
- ◆ immobiliser 4C download
- ◆ Functions
- ◆ Online system test



9 Anti-theft alarm (ATA)

General description

Up to MY2009

The functions of the anti-theft alarm are integrated into the convenience system central control unit -J393- .

From MY2010

The functions of the anti-theft alarm are integrated in the onboard supply control unit -J519- .

After renewal of the onboard supply control unit -J519- , the anti-theft alarm must be adapted ⇒ [page 455](#) .

Fault detection and fault display

The anti-theft alarm system is equipped with self-diagnosis.

For fault finding, use vehicle diagnosis, testing and information system -VAS 5051B- in „Guided fault finding“ mode.

Additional information:

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

⇒ Operating manual

9.1 Assembly overview



Note

The components of the anti-theft alarm (ATA) is dependent on the vehicle equipment.



1 - Alarm horn -H12-

- In front right wheel housing
- Removing and installing
⇒ [page 435](#)

2 - Front passenger door contact switch -F3-

- In front passenger side central locking lock unit -F221-
- Removing and installing
⇒ General body repairs, exterior; Rep. gr. 57 .

3 - Anti-theft alarm system sensor -G578-

- Contains vehicle inclination sender -G384- / interior monitoring sensor -G273-
- In the roof console
- Removing and installing
⇒ [page 432](#)

4 - Interior monitoring deactivation switch -E267-

- in B-pillar trim on driver side
- Removing and installing
⇒ [page 397](#)

5 - Driver door contact switch -F2-

- In driver side central locking lock unit -F220-
- Removing and installing
⇒ General body repairs, exterior; Rep. gr. 57 .

6 - Rear lid lock unit -F256-

- Removing and installing ⇒ [page 403](#)

7 - Coding rear left door control unit -J388-

- In rear left door
- Removing and installing ⇒ Glazing, window regulator; Rep. gr. 64

8 - Driver door control unit -J386-

- In driver door
- Removing and installing ⇒ Glazing, window regulator; Rep. gr. 64

9 - Removing and installing central locking deadlock function warning lamp -SAFE- -K133-

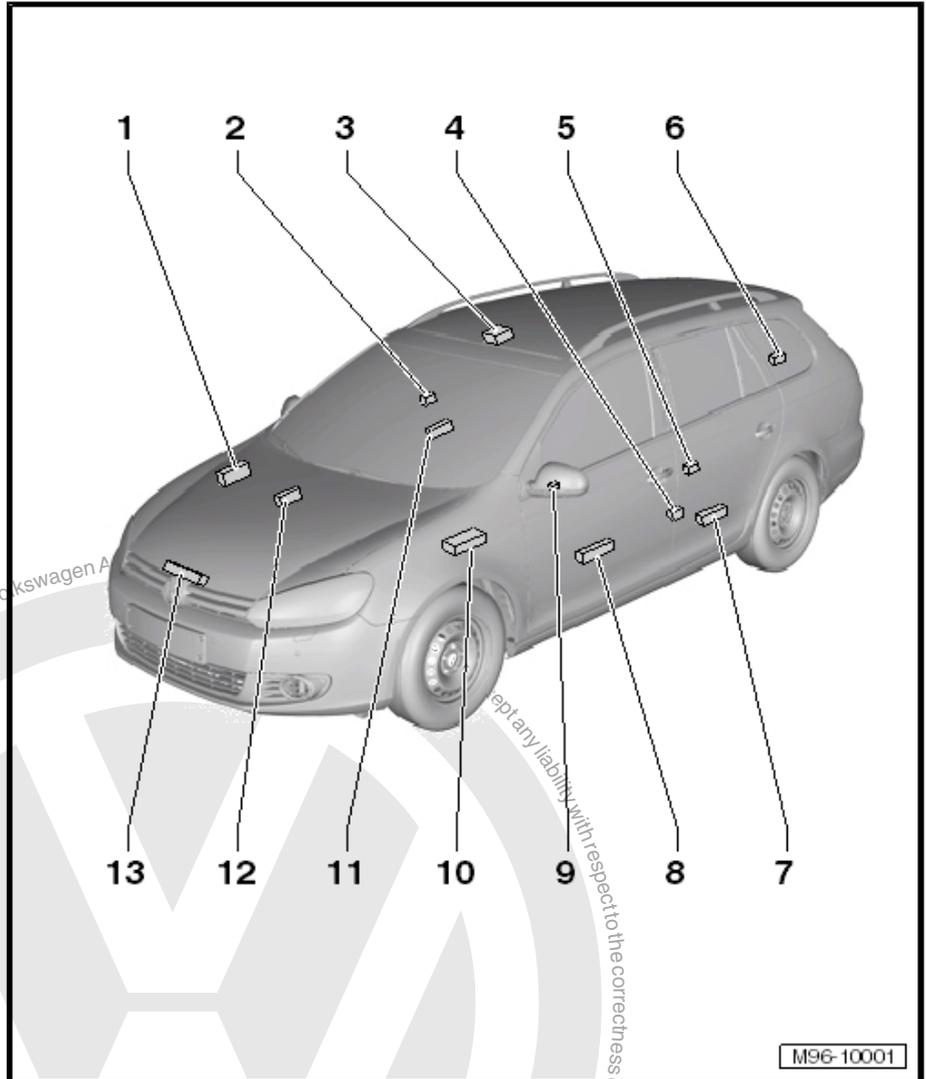
- In driver door trim
- Removing and installing ⇒ [page 399](#)

10 - Onboard supply control unit -J519-

- In driver's footwell under dash panel
- Contains central locking and anti-theft alarm system aerial -R47-
- Removing and installing (up to MY2009) ⇒ [page 452](#)
- Removing and installing (from MY2010) ⇒ [page 452](#)

11 - Coding rear right door control unit -J389-

- In rear right door





- Removing and installing ⇒ Glazing, window regulator; Rep. gr. 64

12 - Front passenger door control unit -J387-

- In front passenger door
- Removing and installing ⇒ Glazing, window regulator; Rep. gr. 64

13 - Contact switch for bonnet -F266-

- In lid lock
- Removing and installing ⇒ [page 382](#)

9.2 Activating and deactivating anti-theft alarm system

Activating anti-theft alarm:

The anti-theft alarm is switched on automatically when the vehicle is locked. The anti-theft alarm is then immediately primed.



Note

To stop the anti-theft alarm system triggering an alarm unnecessarily, close all windows and doors before locking vehicle.

Deactivating anti-theft alarm:

Anti-theft alarm system is deactivated if

- ◆ vehicle is unlocked using unlock button on remote control
- ◆ the ignition is switched on
- ◆ the interior monitoring deactivation switch -E267- has been operated

Unlock the vehicle mechanically (emergency open):

- Unlock the driver door.

The anti-theft alarm system remains active, although no alarm is triggered.

- Switch on ignition within 15 seconds.



Note

If you do not switch on the ignition, the alarm will trigger after 15 seconds.

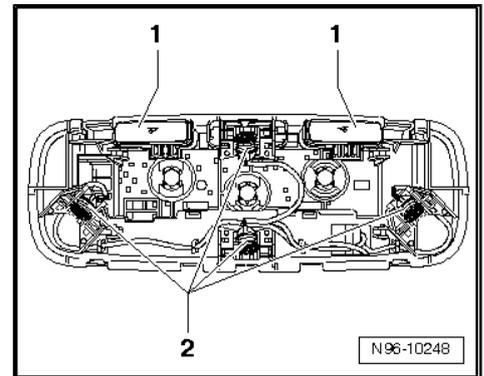
When the ignition is switched on, the electronic immobiliser detects a valid vehicle key and deactivates the anti-theft alarm.



9.3 Removing and installing ultrasonic sensor (rear interior light) (up to MY2009)

The anti-theft alarm ultrasonic sensor -G209-, comprising four individual sensors -2-, wiring and a control element on the back of the rear interior light -W45- cannot be replaced individually. The rear interior light -W45- must be replaced complete.

Removing and installing rear interior light -W45- (vehicles with anti-theft alarm) ⇒ [page 414](#) .

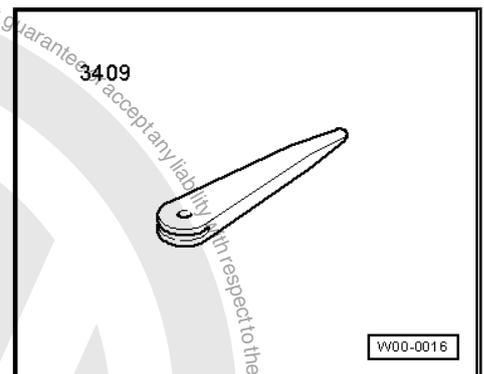


9.4 Removing and installing ultrasonic sensor (rear left-hand side of roof) (up to MY2009)

From model year 2007 onwards, vehicle inclination sender -G384- and anti-theft alarm ultrasonic sensor -G209- are installed in one unit on rear left side of roof.

Special tools and workshop equipment required

- ◆ Removal wedge -VAS 3409-



Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*
- ◆ *When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.*



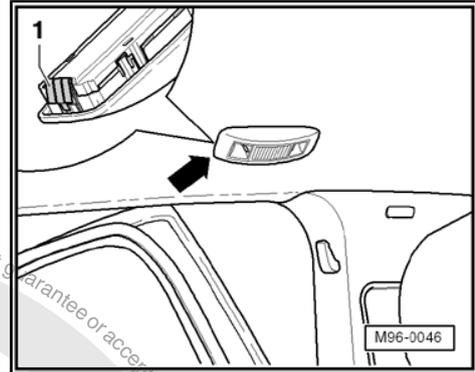
Removing

- Use removal wedge -VAS 3409- to unclip anti-theft alarm ultrasonic sensor -G209- -arrow-.



Note

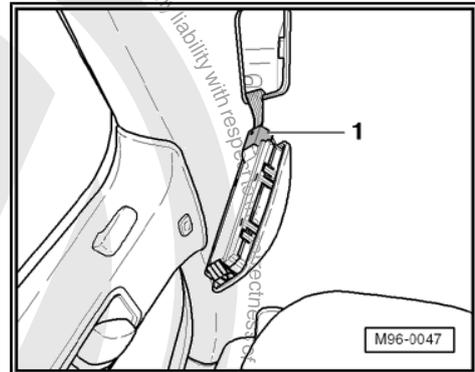
Clip -1- which holds anti-theft alarm ultrasonic sensor -G209- in place has three legs. Press three legs of clip to release anti-theft alarm ultrasonic sensor -G209- , otherwise anti-theft alarm ultrasonic sensor -G209- will not come out.



- Pull off anti-theft alarm ultrasonic sensor -G209- .
- Detach connector -1- from anti-theft alarm ultrasonic sensor -G209- .

Installing

Installation is carried out in reverse order of removal.



9.5 Anti-theft alarm sensor -G578- (from MY2010)



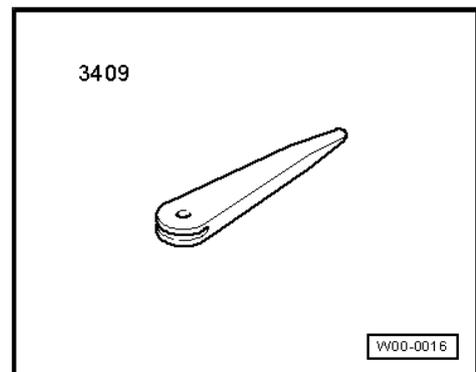
Note

- ◆ The anti-theft alarm sensor -G578- includes the vehicle inclination sender -G384- and the interior monitoring sensor -G273- (two sensors).
- ◆ The anti-theft alarm sensor -G578- cannot be dismantled.

9.5.1 Removing and installing anti-theft alarm sensor -G578-

Special tools and workshop equipment required

- ◆ Removal wedge -3409-





Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*
- ◆ *When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.*

Removing

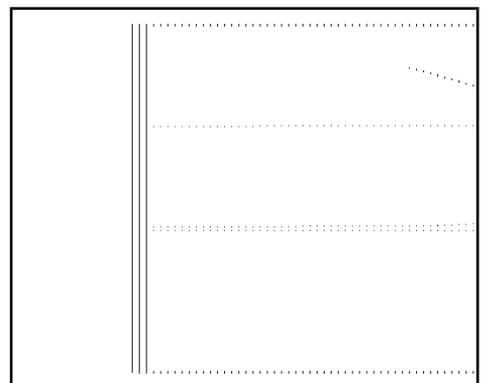
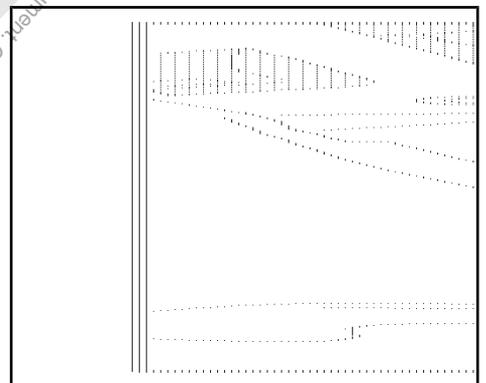
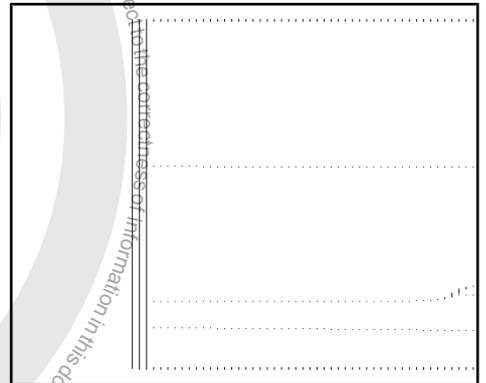
- Remove front interior light -W1- .
- ◆ Vehicles with sunroof ⇒ [page 407](#)
- ◆ Vehicles with no sunroof ⇒ [page 404](#)
- Remove screws -arrows A-, release locking lugs -arrows B- and remove console from moulded headliner in -direction of arrow C-.

- Detach connector -2- from interior monitor send and receive module 1 -G303- -1-.
- Release interior monitor send and receive module 1 -G303- -1- at fasteners -arrows-

- Release the sensor fasteners and take the sensors and the interior monitor send and receive module 1 -G303- out of the moulded headlining.

Installing

Installation is carried out in reverse order of removal.





9.6 Removing and installing vehicle inclination sender -G384- (up to 2006)

Vehicle inclination sender -G384- (from 2007) ⇒ [page 431](#)

The vehicle inclination sender -G384- -arrow- is located on the right beneath the dash panel, behind the front passenger's airbag.



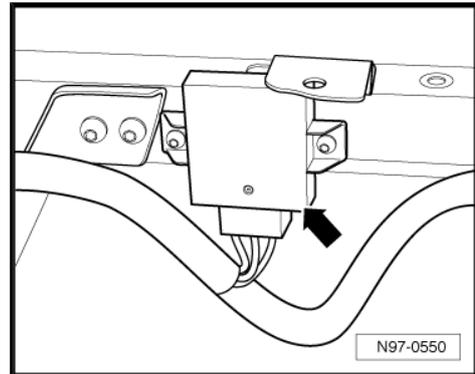
Note

The anti-theft alarm system must be deactivated before vehicle inclination sender -G384- is removed ⇒ [page 430](#) .



Caution

- ◆ Switch off ignition and all electrical consumers.
- ◆ Remove the ignition key.

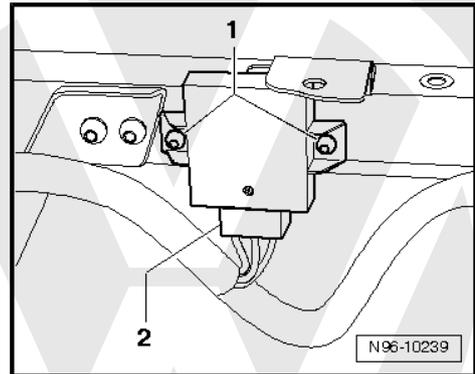


Removing

- Remove glove compartment ⇒ General body repairs, interior; Rep. gr. 68 .
- Unscrew bolts -1- and remove vehicle inclination sensor -G384- from bracket.
- Detach connector -2- from vehicle level sender -G384- .

Installing

Installation is carried out in reverse order of removal.



9.7 Vehicle inclination sender -G384- (from MY2010)



Note

- ◆ The anti-theft alarm sensor -G578- includes the vehicle inclination sender -G384- and the interior monitoring sensor -G273- (two sensors).
- ◆ The anti-theft alarm sensor -G578- cannot be dismantled.

Removing and installing anti-theft alarm sensor -G578- ⇒ [page 432](#) .



9.8 Interior monitoring sensor -G273- (from MY2010)



Note

- ◆ The anti-theft alarm sensor -G578- includes the vehicle inclination sender -G384- and the interior monitoring sensor -G273- (two sensors).
- ◆ The anti-theft alarm sensor -G578- cannot be dismantled.

Removing and installing anti-theft alarm sensor -G578-
⇒ [page 432](#) .

9.9 Central locking and anti-theft alarm system aerial -R47-

Up to MY2009

The central locking and anti-theft alarm system aerial -R47- is routed from the convenience system central control unit -J393- to the A-pillar on left in the main wiring harness.

The central locking and anti-theft alarm system aerial -R47- cannot be repaired as this would adversely affect the reception quality.

In the event of damage, it is necessary to replace the central locking and anti-theft alarm system aerial -R47- .

From MY2010

The central locking and anti-theft alarm system aerial -R47- receives the signals from the remote control and passes them to the onboard supply control unit -J519- .

The central locking and anti-theft alarm system aerial -R47- is integrated in the onboard supply control unit -J519- and cannot be replaced individually.

Additional information:

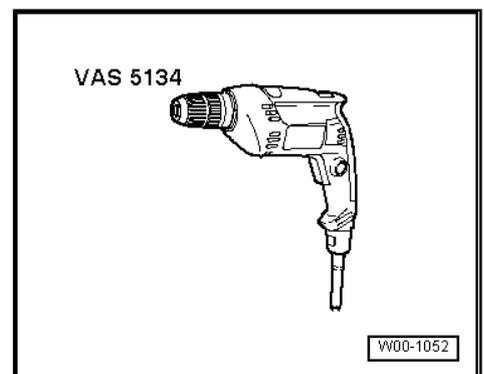
⇒ Current flow diagrams, Electrical fault finding and Fitting locations

9.10 Removing and installing alarm horn - H12-

The alarm horn -H12- is located on the right at the A-pillar in the wing.

Special tools and workshop equipment required

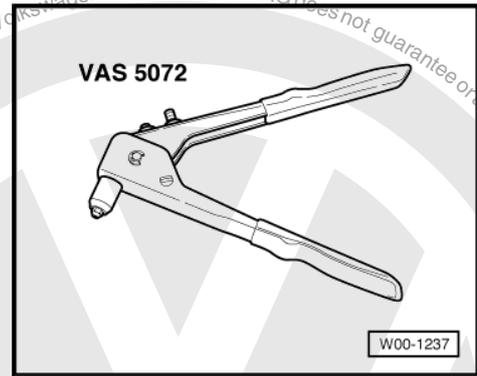
- ◆ Drill -VAS 5134-



- ◆ Twist drill bit \varnothing 6 mm



- ◆ Pop rivet pliers -VAS 5072-



Note

The anti-theft alarm must be deactivated before removing the alarm horn -H12- → [page 430](#) .

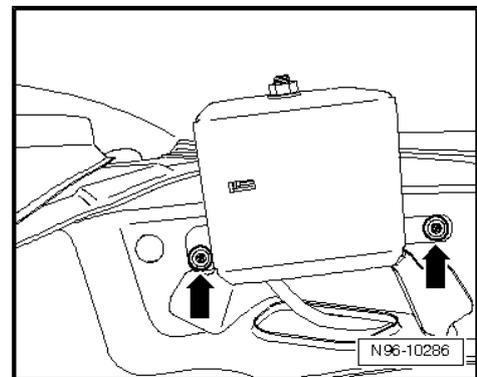


Caution

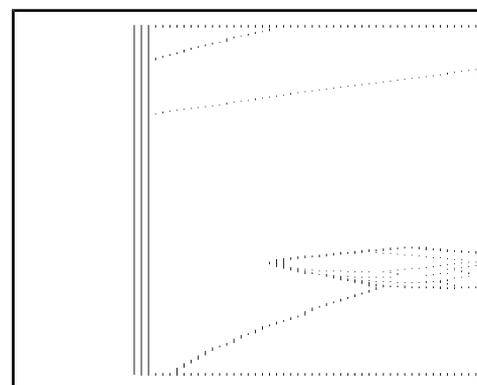
- ◆ Switch off ignition and all electrical consumers.
- ◆ Remove the ignition key.

Removing

- Remove front right wheel housing liner ⇒ General body repairs, interior; Rep. gr. 66 .
- Use drill -VAS 5134- and a drill bit (∅ 6 mm) to drill out both pop rivets -arrows-.



- Release connector -1- by opening the cover -2- using a small screwdriver and remove the alarm horn -H12- -3- from the wheel housing.





- Remove remains of pop rivets -arrow- from body holes.

Installing



Note

Remove all metal swarf produced by drilling.

- Perform necessary corrosion protection measures ⇒ General Information; Body Repairs, General Body Repairs .



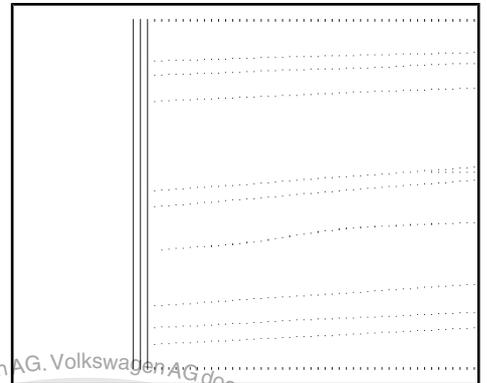
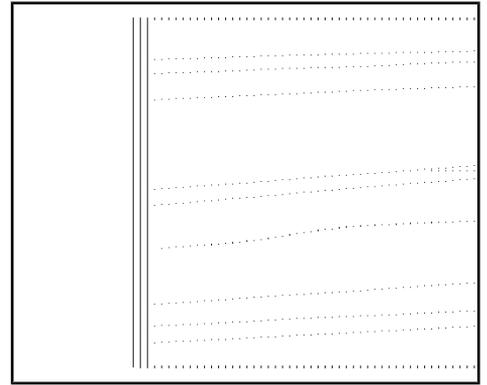
Note

For reasons of clarity, the alarm horn -H12- is not shown in the following illustration, therefore the connector is shown disconnected.

- Guide clip -2- of alarm horn -H12- into aperture in body -1-.
- Secure alarm horn -H12- using new pop rivets.
- Install front right wheel housing liner ⇒ General body repairs, interior; Rep. gr. 66 .

Testing the alarm horn -H12- :

The alarm horn -H12- can be checked using final control diagnosis of convenience system central control unit -J393- ⇒ [page 475](#) .





10 Horn

10.1 Removing and installing treble horn - H2- / bass horn -H7-

The treble horn -H2- / bass horn -H7- are actuated in parallel by the onboard supply control unit -J519- .

Treble horn -H2- / bass horn -H7- are installed on the left and right next to the longitudinal members.

Treble horn -H2- / bass horn -H7- are installed and removed in same way.

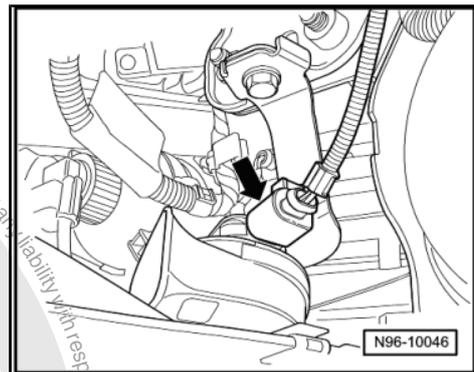


Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

Removing

- Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 .
- Disconnect connector -arrow-.



- Remove screw -arrow- and take out treble horn -H2- .

Installing

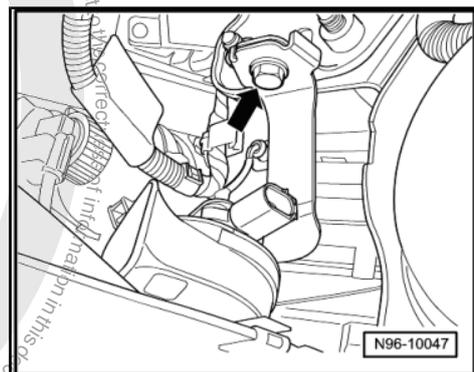
Installation is carried out in reverse order of removal.



Note

When installing, position the horn so it is not in contact with adjacent components.

- Tighten bracket bolt on longitudinal member to 20 Nm.



10.2 Checking treble horn -H2- / bass horn -H7-

Treble horn -H2- / bass horn -H7- can be checked in final control diagnosis of onboard supply control unit -J519- ⇒ [page 453](#) .



97 – Wiring

1 Vehicle diagnosis, testing and information systems

All the instructions and information for this manual are found in the workshop manual „Electrical System, General Information“. A link to this workshop manual is not possible at present for technical reasons. Please select the workshop manual „Electrical System, General Information“ manually in ELSA.



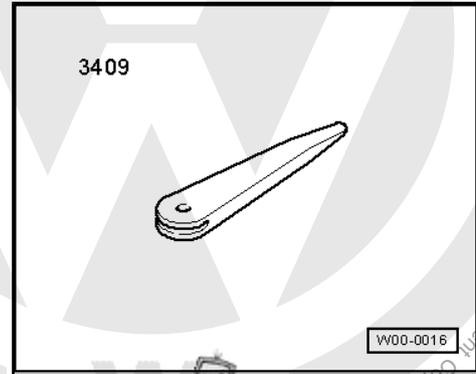


2 Removing and installing fuse holder

2.1 Removing and installing fuse holder on left of dash panel

Special tools and workshop equipment required

- ◆ Removal wedge -VAS 3409-



Caution

When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#) .



Caution

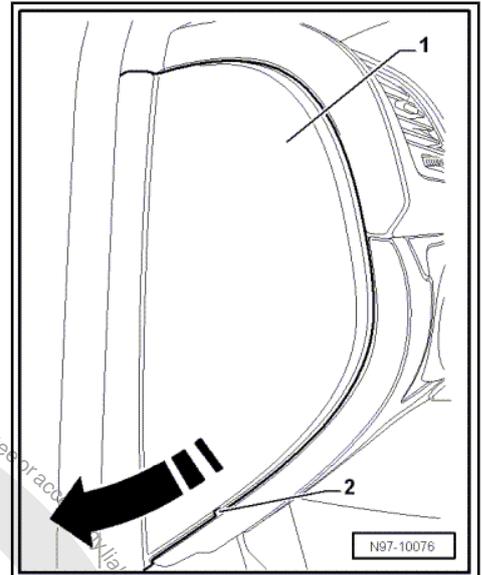
- ◆ *When removing and installing components that are in view (switches, covers, trim), mask off areas where tools (removal wedge -VAS 3409-, screwdriver) are used to lever out those components using commercially available masking tape.*

Removing

- Disconnect battery -A- ⇒ [page 4](#) .
- Remove storage compartment on driver side ⇒ General body repairs, interior; Rep. gr. 68 .



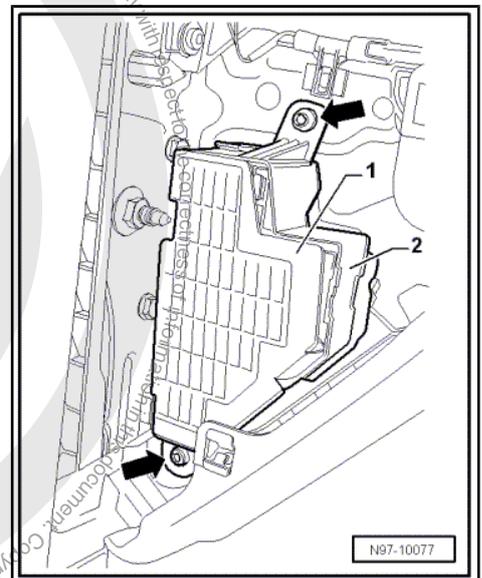
- Remove side cover -1- of dash panel by inserting removal wedge -VAS 3409- in recess -2- and levering off side cover -1- in -direction of arrow-.



- Remove fuse assignment card -1- out of fuse holder -2-.
- Remove bolts -arrows- and guide out fuse holder -1- towards interior (be careful not to stretch wiring).

Installing

Installation is carried out in reverse order of removal.





3 Removing and installing relay carrier

3.1 Removing and installing relay carrier on left beneath dash panel

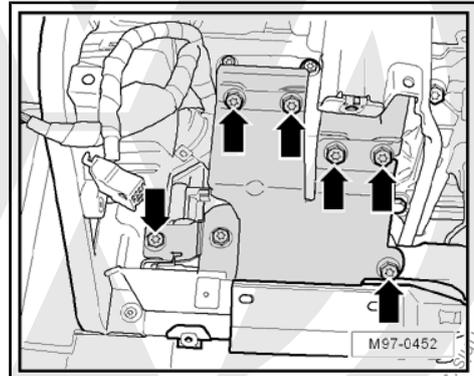


Caution

When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#) .

Removing

- Disconnect battery -A- ⇒ [page 4](#) .
- Remove storage compartment on driver side ⇒ General body repairs, interior; Rep. gr. 68 .
- Unscrew bolts -arrows- for bracket.

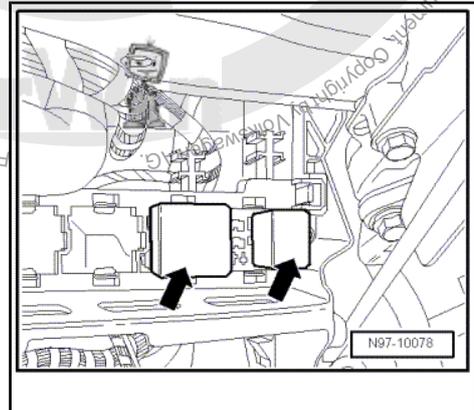


- Pull relays -arrows- out of relay carrier.

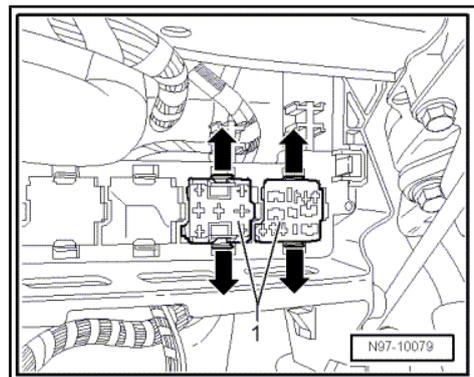


Note

The number of relays depends on the vehicle equipment level.



- Unclip locking lugs in direction of -arrow- outwards and then push connectors -1- through relay carrier.



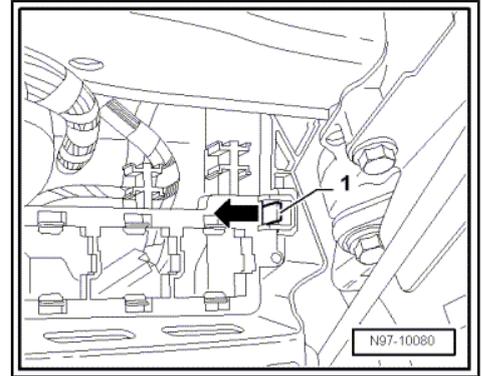


- Release locking lug -1- of relay carrier in direction of -arrow- and take out relay carrier.

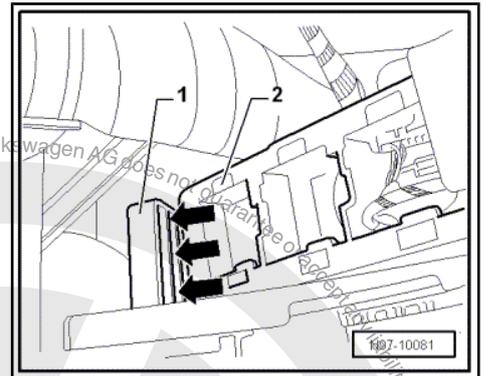
Installing

Carry out installation in the reverse sequence, noting the following:

- First clip connectors in relay carrier.



- Place relay carrier -2- in guide -1- and clip relay carrier in place.



3.2 Removing and installing relay carrier on onboard supply control unit -J519- (up to MY2009)

Note

- ◆ *The onboard supply control unit -J519- and the relay carrier attached to the onboard supply control unit -J519- located on left of dash panel form one unit and cannot be separated.*
- ◆ *If the onboard supply control unit -J519- is to be renewed, the procedure => [page 455](#) for reading the codes stored in the onboard supply control unit -J519- must always be carried out.*



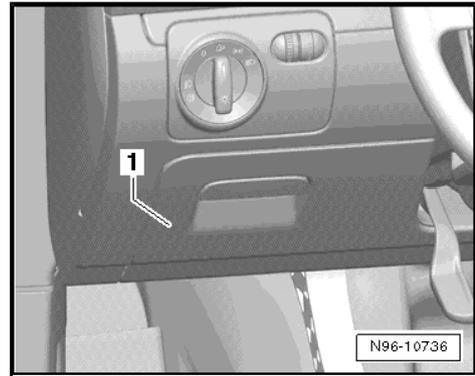
Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*



Removing

- Remove storage compartment -1- on driver side ⇒ General body repairs, interior; Rep. gr. 68 .

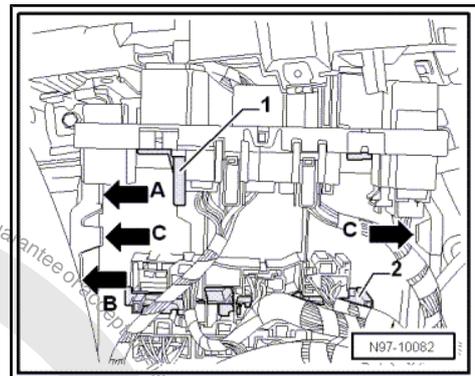


- Push locking catch -1- of relay carrier plug-in connector on onboard supply control unit -J519- in -direction of arrow A-.
- Push locking catch -2- of plug-in connector of onboard supply control unit -J519- in direction of -arrow B-.



Note

The plug-in connector of onboard supply control unit -J519- and of relay carrier on onboard supply control unit -J519- can only be pulled off after the locking catches have been moved to the „OPEN“ position.



- Detach all connectors of onboard supply control unit -J519- and of relay carrier on onboard supply control unit -J519- .



Note

The number of connectors depends on the vehicle equipment level.

- Unclip onboard supply control unit -J519- and of relay carrier on onboard supply control unit -J519- from retainers -arrows C-
- Pull onboard supply control unit -J519- and of relay carrier on onboard supply control unit -J519- downwards and to rear out of holder.

Installing

Carry out installation in the reverse sequence, noting the following:



Note

The locking catches cannot be placed in the „CLOSED“ position until all connectors are „fitted“ correctly.



3.3 Removing and installing relay carrier on onboard supply control unit -J519- (from MY2010)

Note

The relay carrier on the onboard supply control unit -J519- is clipped under the onboard supply control unit -J519- and can be removed.

Caution

- ◆ Switch off ignition and all electrical consumers.
- ◆ Remove the ignition key.

Removing

- Remove trim in driver's footwell ⇒ General body repairs, interior; Rep. gr. 68 .
- Remove left footwell light -W9- ⇒ [page 388](#) .

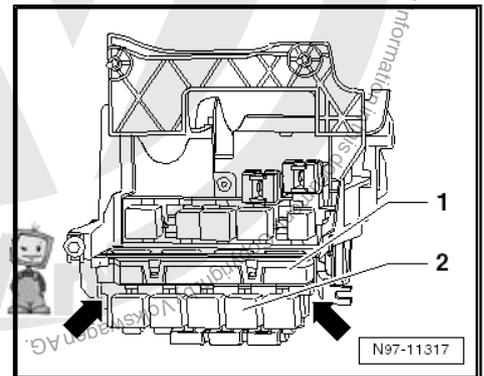
Note

The wiring of the left footwell light and of the diagnostic connector can remain connected.

- Remove knee airbag in driver's footwell ⇒ General body repairs, interior; Rep. gr. 69 .
- Remove the metal beam above the knee airbag ⇒ General body repairs, interior; Rep. gr. 70 .
- Release both locking lugs -arrows- and pull relay carrier -2-counter to direction of travel, backwards, out of onboard supply control unit -J519- -1-.
- Taking connected wiring length into consideration swing relay carrier downwards and unclip relay.

Installing

Installation is carried out in the reverse sequence.





4 Electronics boxes

4.1 Removing and installing electronics box on left side of engine compartment

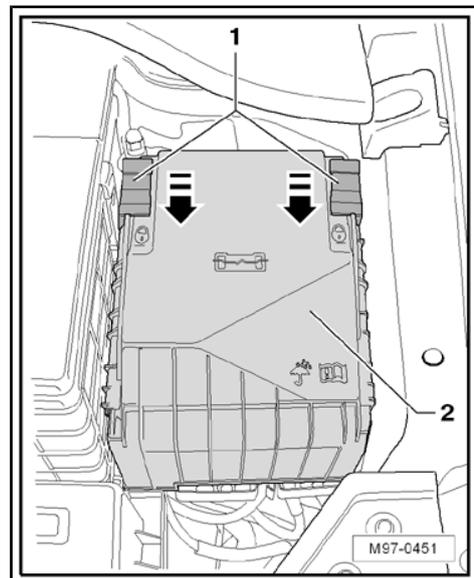


Caution

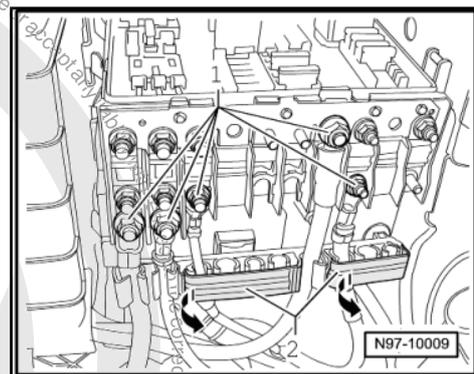
When battery -A- is disconnected and reconnected, the procedure described in the workshop manual must be strictly observed ⇒ [page 4](#) .

Removing

- Disconnect battery -A- ⇒ [page 4](#) .
- Push safety clip -1- in direction of -arrow- and remove cover from electronics box -2- upwards.



- Remove nuts -1-
- Open -arrows- covers -2- of cable guides on electronics box.
- Remove wiring from stud connections.
- Unclip wiring from cable guides.



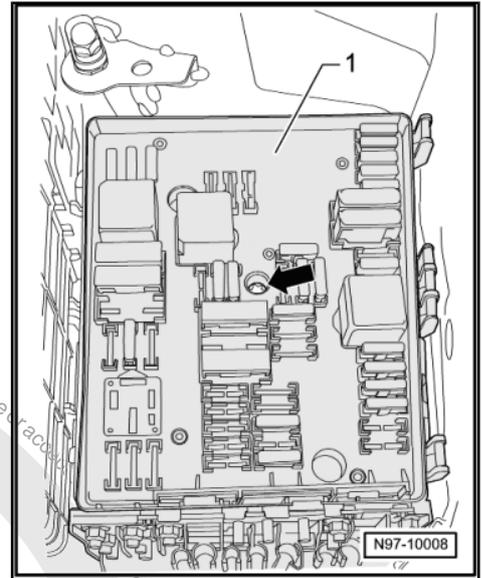


- Undo and remove central bolt -arrow- from E-box -1-.

i Note

Removing the central bolt -arrow- causes the E-box -1- to be pushed upwards off the E-box mounting.

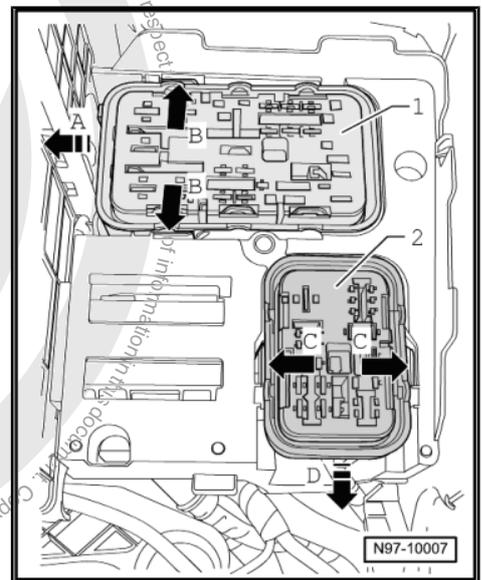
- Pull electronics box -1- upwards off bracket of electronics box.



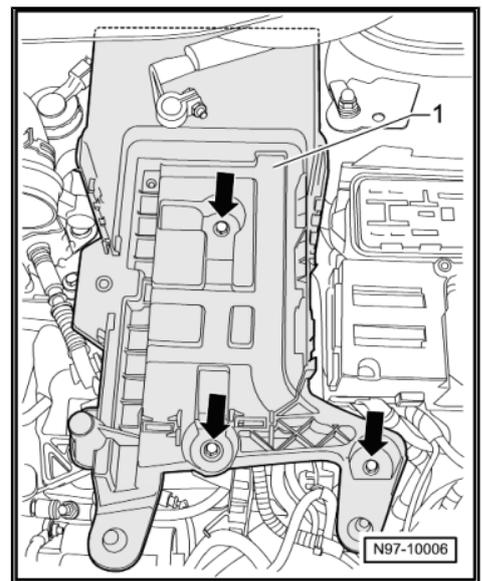
i Note

For removal of the flat contact housing -1-, the air filter housing (on vehicles with diesel engine only), the battery -A- and the battery tray must be removed.

- If necessary, remove air filter housing.
- Remove battery -A- => [page 4](#) .

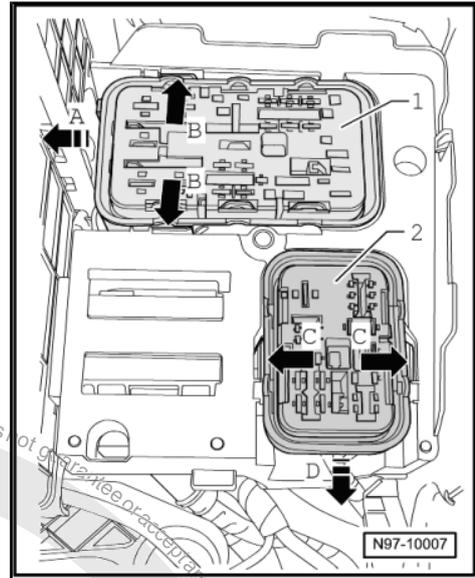


- Remove bolts -arrows- for battery tray -1-.
- Take battery tray -1- out of vehicle.





- Press tabs apart on bracket of electronics box -arrows B- and slide flat contact housing -1- sideways -arrow A- out of bracket of electronics box.
- Press tabs apart on bracket of electronics box -arrows C- and slide flat contact housing -2- forwards -arrow D- out of bracket of electronics box.

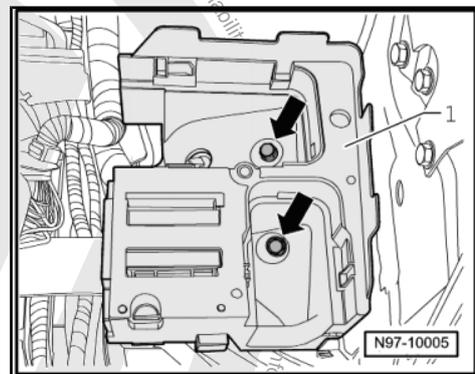


- Remove securing nuts -arrows- from bracket of E-box -1-.



Note

The installation of an additional relay carrier depends entirely on the vehicle equipment.

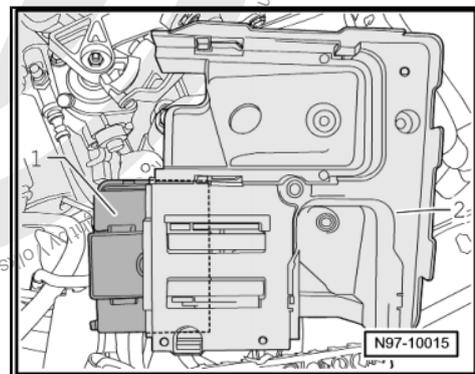


- Pull bracket of electronics box -1- upwards off studs (be careful not to stretch wiring of additional relay carrier).
- Unclip additional relay carrier -1- sideways out of bracket of electronics box -2-.
- Take bracket of electronics box -2- out of vehicle.

Installing

Carry out installation in the reverse sequence, noting the following:

- Tighten threaded connections to specified torques
=> [page 507](#) .



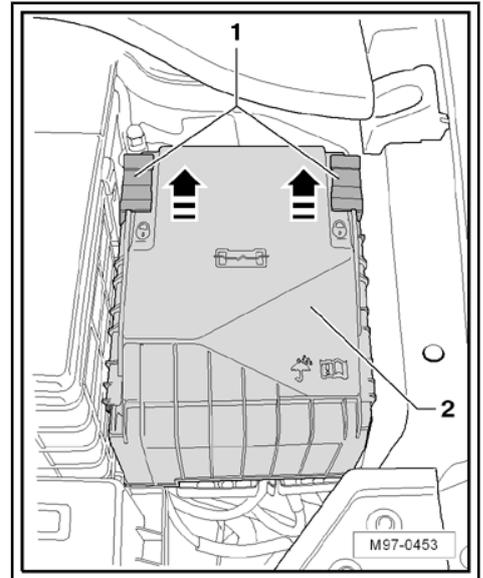


- Mount cover -2- on E-box and push safety clip -1- in direction of -arrow- until cover -2- engages.



Note

Then check whether the cover -2- of the electronics box is engaged correctly.





5 Control units

5.1 Onboard supply control unit -J519-

General description

The onboard supply control unit -J519- and the relay carrier attached to the onboard supply control unit -J519- located on left of dash panel form one unit and cannot be separated (up to MY2009).

The relay carrier on the onboard supply control unit -J519- is clipped under the onboard supply control unit -J519- and can be removed (from MY2010).

Additional information:

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

⇒ Operating manual

The onboard supply control unit -J519- has the following functions in the vehicle:

Up to MY2009

- ◆ Electrical load management
- ◆ Exterior light control
- ◆ Turn signal control
- ◆ Rear window wiper
- ◆ Heated rear window
- ◆ Interior light control
- ◆ Ambient lighting
- ◆ Terminal control
- ◆ Dimmers, instrument lighting
- ◆ Fuel pump presupply
- ◆ Alternator stand-by
- ◆ Horn

From MY2010

- ◆ Electrical load management
- ◆ Exterior light control
- ◆ Turn signal control
- ◆ Wipe/wash windscreen and rear window
- ◆ Headlight washer system
- ◆ Rain and light sensor
- ◆ Heated windscreen and rear window
- ◆ Interior light control
- ◆ Terminal control
- ◆ Dimmers of instrument lighting
- ◆ Footwell lights
- ◆ Fuel pump presupply



- ◆ Alternator stand-by
- ◆ Horn
- ◆ Hazard warning light
- ◆ Release control
- ◆ Control of the central locking system
- ◆ Actuation of the front and rear door control units
- ◆ Activation of the rear lid unlocking function
- ◆ Activation of the fuel filler flap unlocking function
- ◆ Activation of the anti-theft alarm (ATA)
- ◆ Activation of the immobiliser
- ◆ Activation of the entry and start authorisation

The following functions can be adapted:

Up to MY2009

- ◆ Adapting coming home time ⇒ [page 461](#)
- ◆ Adapting leaving home time ⇒ [page 461](#)
- ◆ Adapting switch-off time of heated rear window ⇒ [page 456](#)
- ◆ Adapting footwell light dimmer value ⇒ [page 463](#)
- ◆ Coding/decoding daytime running lights ⇒ [page 456](#)
- ◆ Setting load management
- ◆ Setting „active time“ for headlight washer system ⇒ [page 455](#)

From MY2010

- ◆ Adapting acoustic feedback when unlocking ⇒ [page 457](#)
- ◆ Adapting acoustic feedback when locking ⇒ [page 458](#)
- ◆ Adapting turn signal cycles for lane change flash ⇒ [page 458](#)
- ◆ Adapting automatic unlocking on removing ignition key ⇒ [page 459](#)
- ◆ Adapting automatic locking at 15 km/h ⇒ [page 460](#)
- ◆ Adapting confirmation of convenience closing ⇒ [page 460](#)
- ◆ Adapting coming home time ⇒ [page 461](#)
- ◆ Adapting leaving home time ⇒ [page 461](#)
- ◆ Adapting ATA delay on opening driver door
- ◆ Adapting unlocking of individual doors ⇒ [page 462](#)
- ◆ Adapting sensitivity of interior monitoring
- ◆ Adapting sensitivity of inclination sensor
- ◆ Deactivating factory mode ⇒ [page 463](#)
- ◆ Adapting footwell light dimmer value ⇒ [page 463](#)
- ◆ Adapting convenience operation via remote control ⇒ [page 464](#)
- ◆ Adapting country setting for intelligent alarm horn
- ◆ Adapting visual feedback when locking ⇒ [page 464](#)
- ◆ Adapting remote control unit key ⇒ [page 465](#)



- ◆ Final control diagnosis ⇒ [page 453](#) .



Note

- ◆ *It depends on the fitted optional equipment whether or not the above-mentioned adaptations can be carried out.*
- ◆ *If the onboard supply control unit -J519- is to be renewed, the procedure ⇒ [page 455](#) for reading the codes stored in the onboard supply control unit -J519- must always be carried out.*

Fault detection and fault display

The on-board supply control unit -J519- is equipped with self-diagnosis.

For fault finding, use vehicle diagnosis, testing and information system -VAS 5051B- in „Guided fault finding“ mode.

5.1.1 Removing and installing onboard supply control unit -J519- (up to MY2009)



Note

If the onboard supply control unit -J519- is to be renewed, the procedure ⇒ [page 455](#) for reading the codes stored in the onboard supply control unit -J519- must always be carried out.

Removing

The onboard supply control unit -J519- is removed in the same way as is the relay carrier on onboard supply control unit -J519- on left of dash panel ⇒ [page 443](#) .

Installing

The onboard supply control unit -J519- is installed in the same way as is the relay carrier on onboard supply control unit -J519- on left of dash panel ⇒ [page 443](#) .

5.1.2 Removing and installing onboard supply control unit -J519- (from MY2010)



Note

- ◆ *The relay carrier on the onboard supply control unit -J519- is clipped under the onboard supply control unit -J519- and can be removed.*
- ◆ *If the onboard supply control unit -J519- is to be renewed, the procedure ⇒ [page 455](#) for reading the codes stored in the onboard supply control unit -J519- must always be carried out.*
- ◆ *The following illustrations show removal on a LHD vehicle. Removal and installation of onboard supply control unit -J519- on an RHD vehicle are performed using the corresponding mirror-image procedure.*

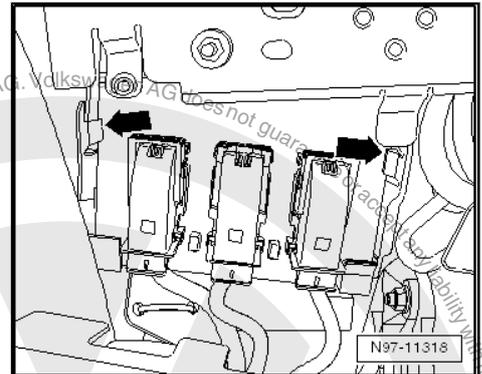


Caution

- ◆ *Switch off ignition and all electrical consumers.*
- ◆ *Remove the ignition key.*

Removing

- Remove relay carrier from onboard supply control unit -J519-
=> [page 445](#) .
- Release and disconnect the three connectors.
- Press both catches -arrows- and swing onboard supply control unit -J519- slightly downwards.
- Pull onboard supply control unit -J519- downwards and counter to direction of travel out of holder.



Installing

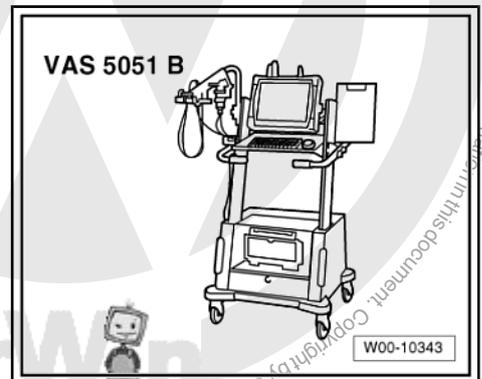
Carry out installation in the reverse sequence, noting the following:

- Insert onboard supply control unit -J519- with rear into bracket first and then push it upwards until it engages audibly.

5.1.3 Onboard supply control unit -J519- final control diagnosis

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Note

Whether the components named below can be checked depends on the fitted equipment options.

The following components and functions can be checked by the final control diagnosis for the onboard control unit -J519- :

- ◆ Left sidelight bulb -M1- / right sidelight bulb -M3- / left tail light bulb -M4- / right tail light bulb -M2-
- ◆ Left headlight dipped beam bulb -M29- / right headlight dipped beam bulb -M31-
- ◆ Left daytime running light bulb -L174- / right daytime running light bulb -L175-
- ◆ Left headlight main beam bulb -M30- / right headlight main beam bulb -M32-



- ◆ Left dip beam screen motor -V294- / right dip beam screen motor -V295-
- ◆ Left fog light bulb -L22- / right fog light bulb -L23-
- ◆ Right reversing light bulb -M17- / left reversing light bulb -M16-
- ◆ Left brake light bulb -M9- / right brake light bulb -M10- / additional brake light bulb -M25-
- ◆ Rear left fog light bulb -L46- / rear right fog light bulb -L47-
- ◆ Front left turn signal bulb -M5- / rear left turn signal bulb -M6-
- ◆ Front right turn signal bulb -M7- / rear right turn signal bulb -M8-
- ◆ Number plate light -X-
- ◆ Dimmed interior light
- ◆ Instrument lighting of all keys and switches and the dash panel insert
- ◆ Terminal 30 voltage supply relay -J317-
- ◆ LED heated rear window / heated rear window
- ◆ LED heated exterior mirrors / heated exterior mirrors
- ◆ Release of sliding/tilting sunroof
- ◆ Release of seat heating
- ◆ Fuel pump relay -J17-
- ◆ Headlight washer system relay -J39- / headlight washer system pump -V41-
- ◆ Windscreen wipers
- ◆ Wiper module change direction point
- ◆ Washer pump -V5-
- ◆ Dual tone horn relay -J4- / treble horn -H2- / bass horn -H7-
- ◆ Left cornering light bulb -L148- / right cornering light bulb -L149-
- ◆ Heated windscreen -Z2-
- ◆ Luggage compartment lock

Procedure

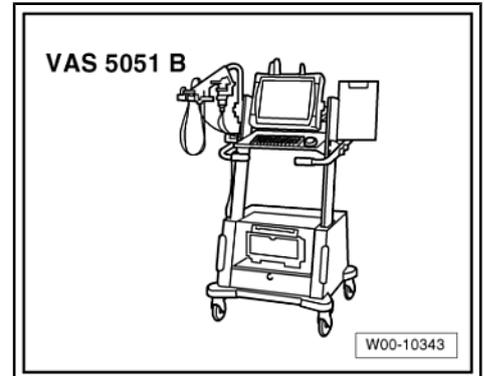
- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“
- Using  button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Onboard supply control unit
 - ◆ Functions
 - ◆ Onboard supply control unit final control diagnosis



5.1.4 Coding onboard supply control unit - J519-

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



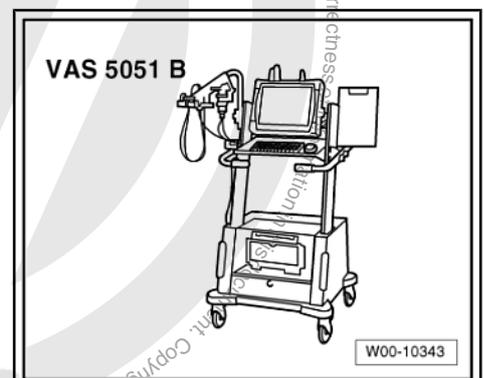
Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Onboard supply control unit
 - ◆ Functions
 - ◆ Code onboard supply control unit online

5.1.5 Adapting headlight washer system (up to MY2009)

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

The „active time“ of the headlight washer system can be variably adjusted to between 0 and 12.75 seconds.

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .

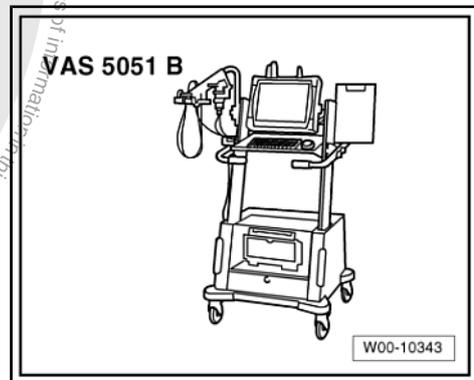


- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **[GoTo]** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Onboard supply control unit
 - ◆ Functions - onboard supply control unit
 - ◆ Adapting headlight washer system

5.1.6 Adapting switch-off time of headlight washer system (up to MY2009)

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



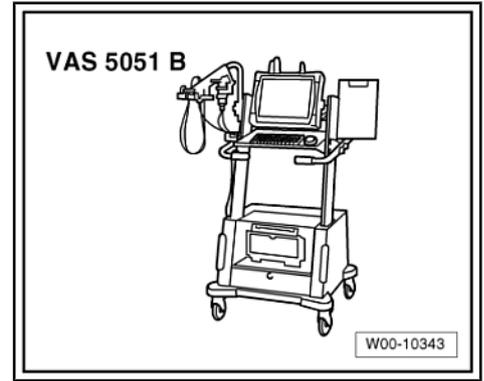
- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **[GoTo]** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Onboard supply control unit
 - ◆ Functions
 - ◆ Adapt switch-off time of heated rear window

5.1.7 Coding/decoding daytime running light (up to MY2009)

Special tools and workshop equipment required



- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



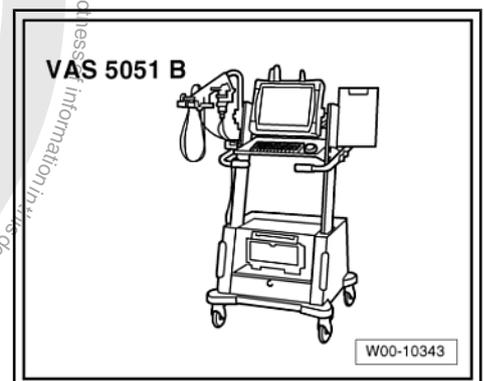
- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:

- ◆ Body
- ◆ Electrical system
- ◆ 01 - On Board Diagnosis capable systems
- ◆ Onboard supply control unit
- ◆ Functions
- ◆ Coding/decoding daytime running lights

5.1.8 Adapting acoustic feedback when unlocking

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



⇒ Operating manual

Main beam can be switched on or off by the automatic headlight control.

Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:

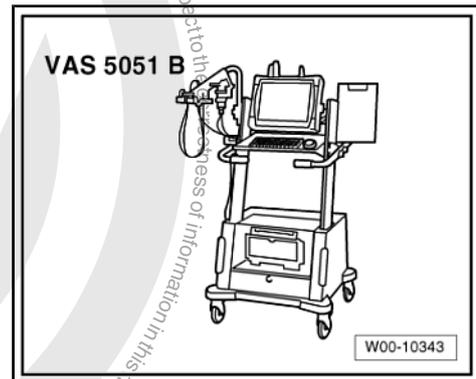


- ◆ Body
- ◆ Electrical system
- ◆ 01 - On Board Diagnosis capable systems
- ◆ Onboard supply control unit
- ◆ Functions
- ◆ Adapt acoustic feedback when unlocking

5.1.9 Adapting acoustic feedback when locking

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

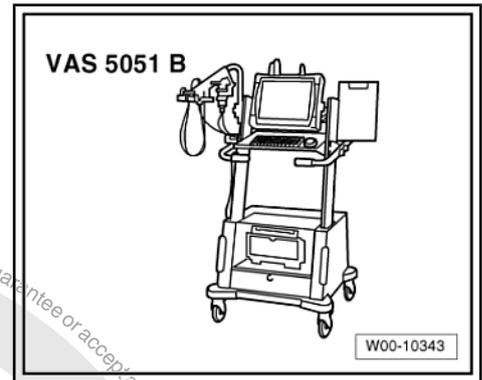
- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Onboard supply control unit
 - ◆ Functions
 - ◆ Adapting acoustic feedback when locking

5.1.10 Adapting turn signal cycles for lane change flash

Special tools and workshop equipment required



- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



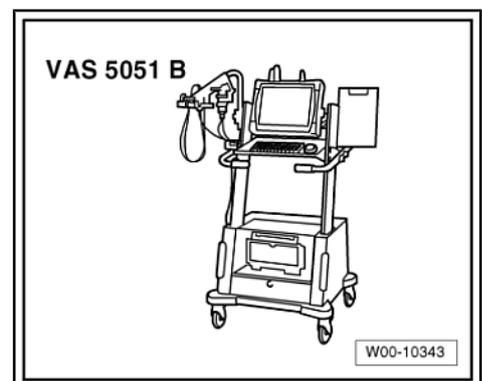
Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Onboard supply control unit
 - ◆ Functions
 - ◆ Adapt turn signal cycles for lane change flash

5.1.11 Adapting automatic unlocking on removing ignition key

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system

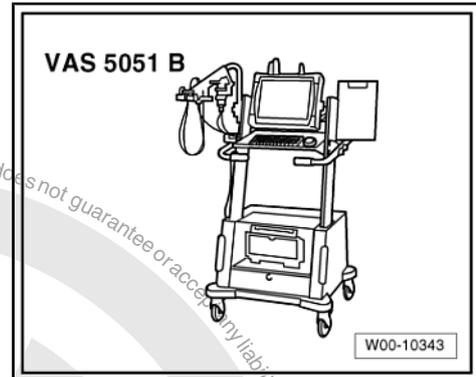


- ◆ 01 - On Board Diagnosis capable systems
- ◆ Onboard supply control unit
- ◆ Functions
- ◆ Automatic unlocking on removing ignition key

5.1.12 Adapting automatic locking at 15 km/h

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



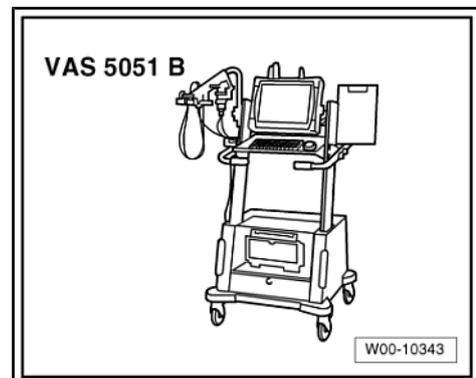
Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Onboard supply control unit
 - ◆ Functions
 - ◆ Adapting automatic locking at 15 km/h

5.1.13 Adapting confirmation of convenience closing

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-





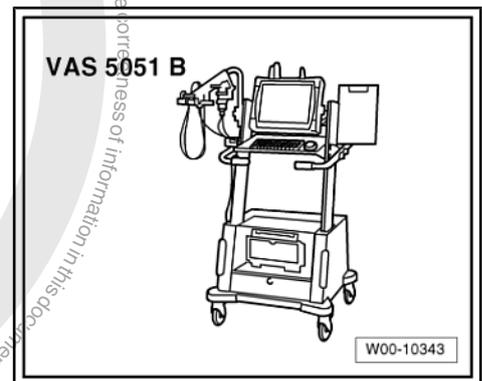
Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Onboard supply control unit
 - ◆ Functions
 - ◆ Adapt confirmation of convenience closing

5.1.14 Adapting coming home time

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Coming home: duration of lighting time on leaving the vehicle.

The lighting time of the coming home function can be adjusted between 0 and 120 seconds.

Procedure

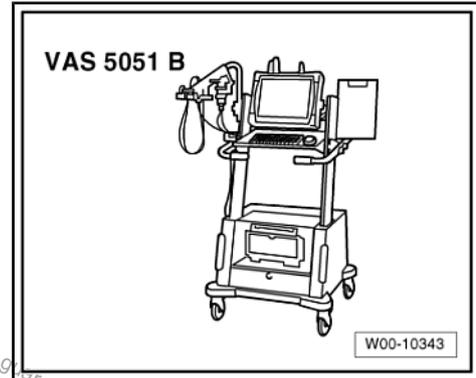
- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Onboard supply control unit
 - ◆ Functions
 - ◆ Adapt coming home time

5.1.15 Adapting leaving home time

Special tools and workshop equipment required



- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Leaving home: duration of lighting time on opening the vehicle.

The lighting time of the leaving home function can be adjusted between 0 and 120 seconds.

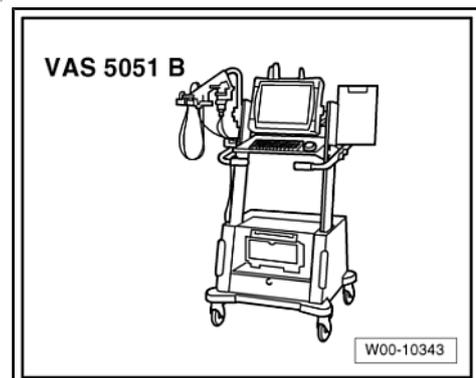
Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B-
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Onboard supply control unit
 - ◆ Functions
 - ◆ Adapt leaving home time

5.1.16 Adapting unlocking of individual doors

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:

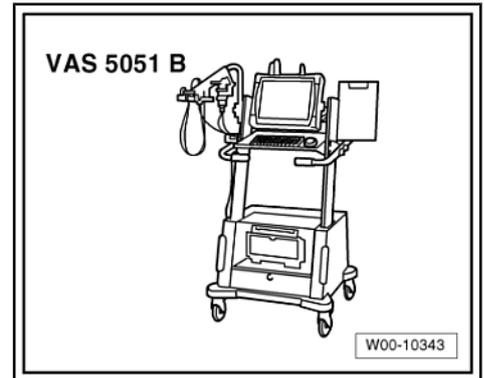


- ◆ Body
- ◆ Electrical system
- ◆ 01 - On Board Diagnosis capable systems
- ◆ Onboard supply control unit
- ◆ Functions
- ◆ Adapt unlocking of individual doors

5.1.17 Deactivating factory mode

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

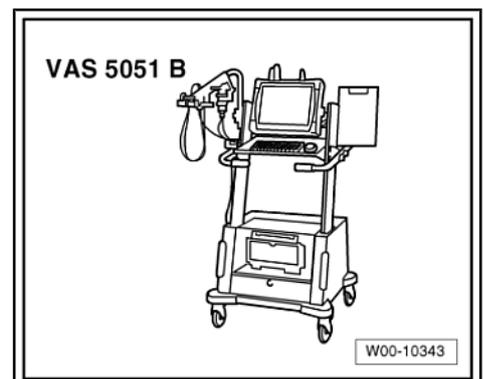
- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:

- ◆ Body
- ◆ Electrical system
- ◆ 01 - On Board Diagnosis capable systems
- ◆ Onboard supply control unit
- ◆ Functions
- ◆ Deactivate factory mode

5.1.18 Adapting footwell light dimmer value

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-





The footwell lighting dimmer can be adjusted at various levels.

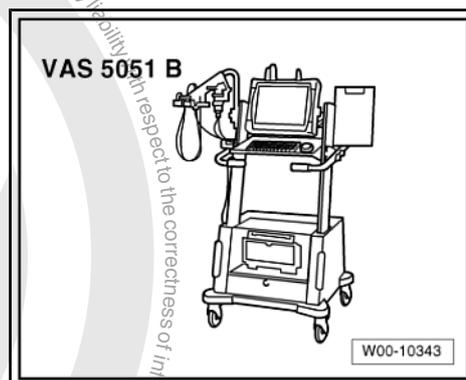
Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **[GoTo]** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Onboard supply control unit
 - ◆ Functions
 - ◆ Adapting footwell light dimmer value

5.1.19 Adapting convenience operation via remote control

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

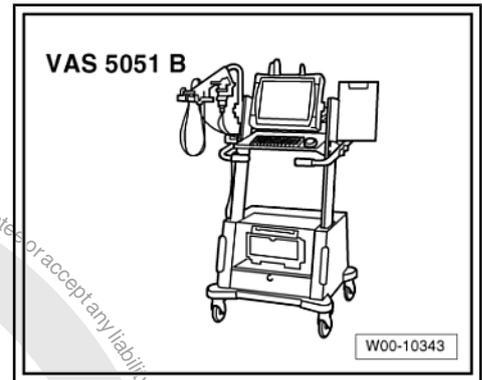
- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **[GoTo]** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Onboard supply control unit
 - ◆ Functions
 - ◆ Adapt convenience operation via remote control

5.1.20 Adapting visual feedback when locking

Special tools and workshop equipment required



- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



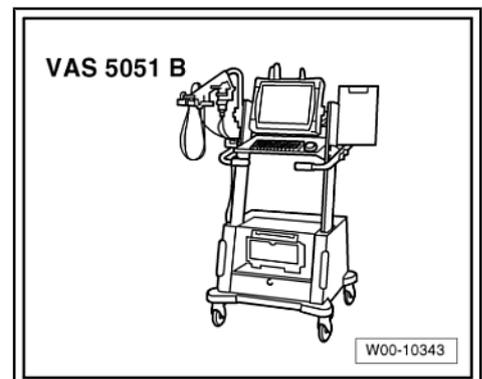
Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Onboard supply control unit
 - ◆ Functions
 - ◆ Visual feedback when locking

5.1.21 Adapting remote control key

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems

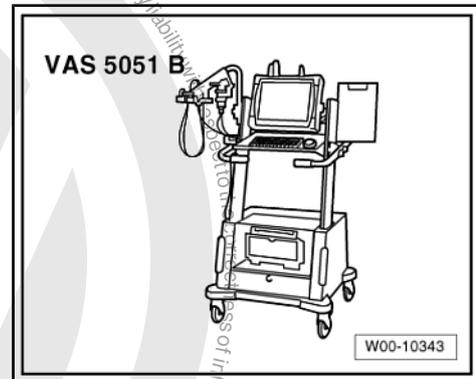


- ◆ Onboard supply control unit
- ◆ Functions
- ◆ Adapt remote control key

5.1.22 Checking remote control unit key

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



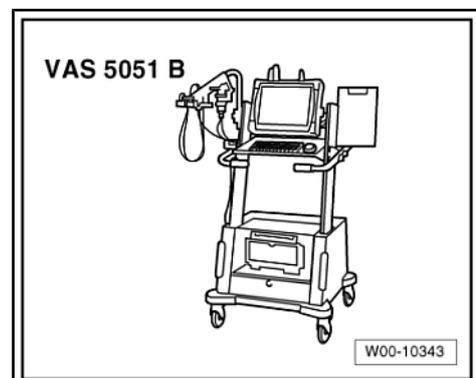
Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Onboard supply control unit
 - ◆ Functions
 - ◆ Check remote control unit key

5.1.23 Coding rain and light sensor -G397-

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .

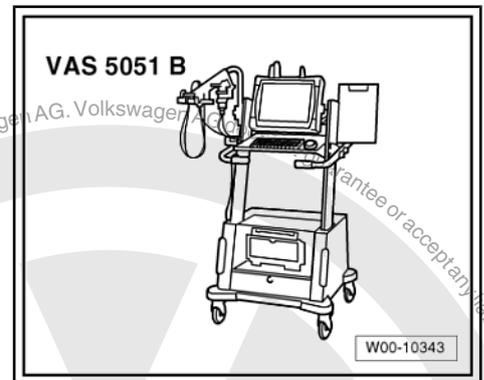


- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Onboard supply control unit
 - ◆ Functions
 - ◆ Code rain/light sensor

5.1.24 Adapting sensitivity of interior monitoring system

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system -VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Onboard supply control unit
 - ◆ Functions
 - ◆ Adapt sensitivity of interior monitoring

5.2 Data bus diagnostic interface -J533-

General description

The data bus diagnostic interface -J533- is designed as a separate control unit. It is responsible for the following in the vehicle:

- ◆ Exchange of data between the CAN data bus systems „powertrain CAN data bus“, „convenience CAN data bus“ and „infotainment CAN data bus“.



- ◆ Conversion of diagnostic data from CAN data bus systems to K lead and visa versa, so that data can be used by vehicle diagnostic, testing and information system -VAS 5051A- .

If the data bus diagnostic interface -J533- is to be removed, the procedure ⇒ [page 468](#) must always be performed to read out the codes stored in the unit.

Fault detection and fault display

The data bus diagnostic interface -J533- is equipped with self-diagnosis.

For fault finding, use vehicle diagnosis, testing and information system -VAS 5051B- in „Guided fault finding“ mode.

Additional information:

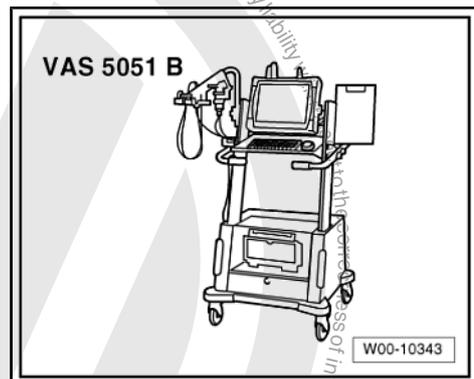
⇒ Current flow diagrams, Electrical fault finding and Fitting locations

⇒ Operating manual

5.2.1 Renewing data bus diagnostic interface -J533-

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system -VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **[GoTo]** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Data bus diagnostic interface
 - ◆ Data bus diagnostic interface functions
 - ◆ Renewing data bus diagnostic interface

5.2.2 Removing and installing data bus diagnostic interface -J533- (left-hand drive vehicle)

The data bus diagnostic interface -J533- is located in the driver's footwell, on the right, next to the steering column.



i Note

Prior to removal of the data bus diagnostic interface -J533-, always perform the procedure ⇒ [page 468](#) to read out the codes stored in the unit.

! Caution

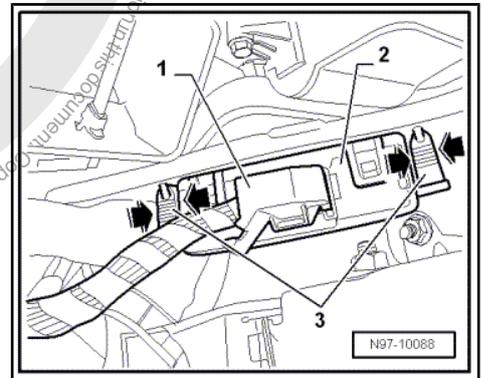
- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

Removing

- Remove driver's's footwell cover ⇒ General body repairs, interior; Rep. gr. 68 .
- Release and detach connector -1- from data bus diagnostic interface -J533- -2-.
- Press securing pins -3- together -arrows- and push out of holes.

Installing

Installation is carried out in reverse order of removal.



5.2.3 Removing and installing data bus diagnostic interface -J533- (right-hand drive vehicle)

The data bus diagnostic interface -J533- is located in the driver side footwell, above the relay carrier.

i Note

Before removing data bus diagnostic interface -J533-, it is essential that the work procedure ⇒ [page 468](#) for reading out the codes stored in the data bus diagnostic interface -J533- is carried out.

! Caution

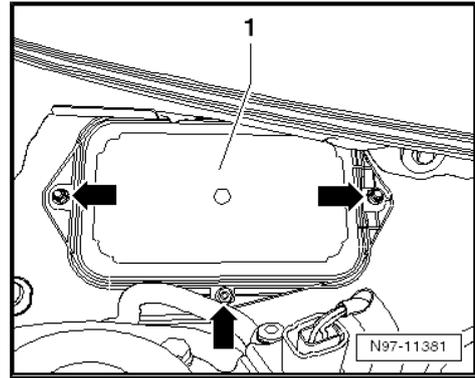
- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

Removing

- Remove windscreen wiper system ⇒ [page 183](#) .



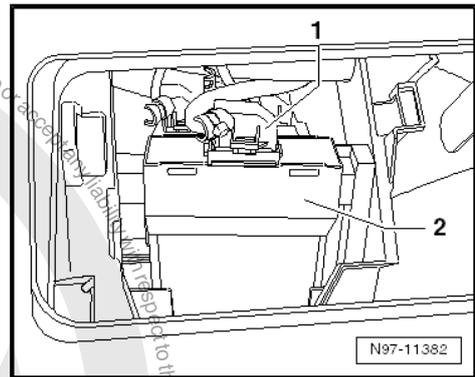
- Remove the three nuts -arrows- and remove cover -1-.



- Release and disconnect connector -1-.
- Press control unit guides apart slightly on either side and pull data bus diagnostic interface -J533- upwards out of bracket.

Installing

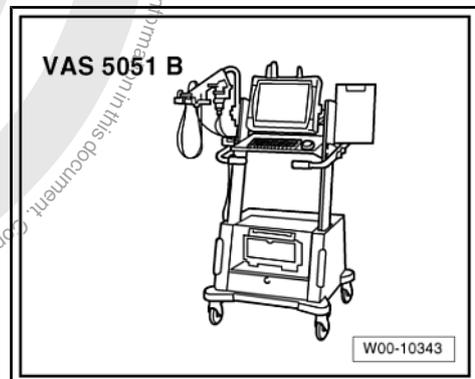
Installation is carried out in reverse order of removal.



5.2.4 Coding data bus diagnostic interface - J533-

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Data bus diagnostic interface
 - ◆ Data bus diagnostic interface functions

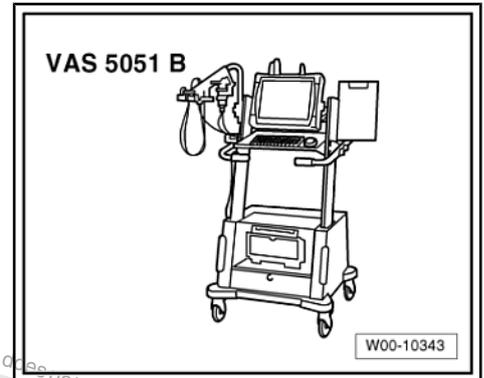


- ◆ Code data bus diagnostic interface

5.2.5 Checking bus activity

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Using this test it is possible to check to see if the individual drive busses (powertrain, convenience and infotainment) have changed to the sleep mode.

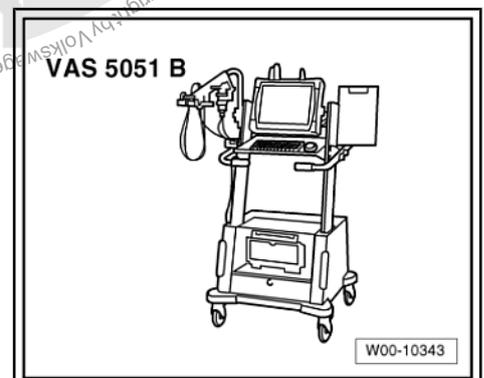
Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Data bus diagnostic interface
 - ◆ Data bus diagnostic interface functions
 - ◆ Check bus activity

5.2.6 Checking bus participants

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Using this test it is possible to check the status of the connection from the data bus diagnostic interface -J533- to another bus node.



Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using GoTo button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ Electrical system
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Data bus diagnostic interface
 - ◆ Data bus diagnostic interface functions
 - ◆ Check bus participants

5.3 Convenience system central control unit -J393-

General description

The convenience system control unit -J393- is responsible for the following in the vehicle:

- ◆ Sliding/tilting sunroof control (release instruction)
- ◆ Power window control (release instruction)
- ◆ Central locking control
- ◆ Anti-theft alarm system control
- ◆ Radio-wave receiver
- ◆ Rear lid lock
- ◆ Convenience operation

Some of the above mentioned functions can be adapted
⇒ [page 474](#) .

Fault detection and fault display

The convenience system central control unit -J393- is equipped with self-diagnosis.

For fault finding, use vehicle diagnosis, testing and information system -VAS 5051B- in „Guided fault finding“ mode.

Additional information:

- ◆ ⇒ Operating manual
- ◆ ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

5.3.1 Removing and installing convenience system central control unit -J393-



Caution

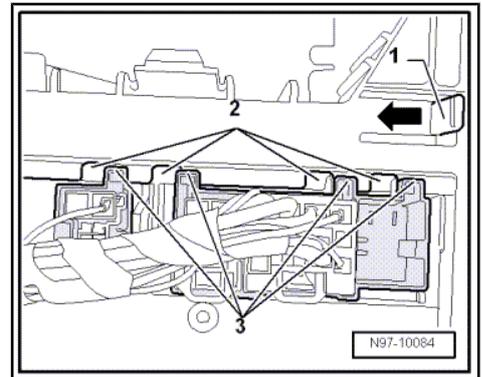
- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**





Removing

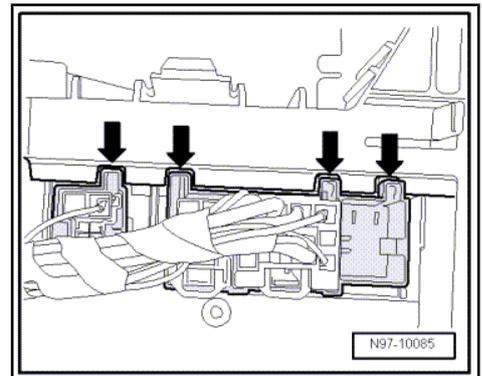
- Remove glove compartment → General body repairs, interior; Rep. gr. 68 .
- Pull locking lug -1- of retainer for convenience system central control unit -J393- in -direction of arrow- and push convenience system central control unit -J393- until recesses -2- are positioned over recesses -3-.



i Note

The connectors can only be released and detached once the recesses -arrows- of the connector and bracket are aligned with each other precisely.

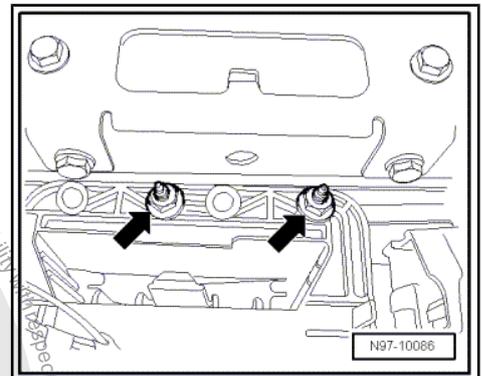
- Detach connectors from central control unit of convenience system -J393- .



i Note

The number of connectors depends on the vehicle equipment level.

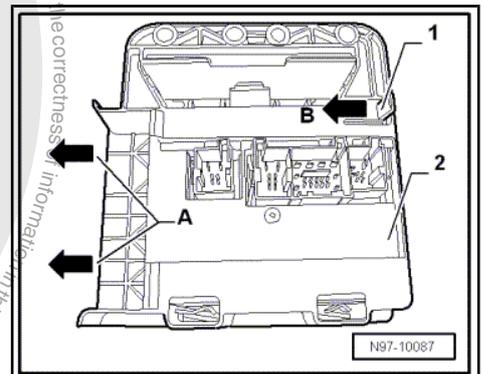
- Remove securing nuts -arrows-
- Remove bracket with central convenience system control unit -J393- .



- Pull retaining lug -1- in -direction of arrow B- and push central convenience system control unit -J393- -2- in -direction of arrow A- out of bracket.

Installing

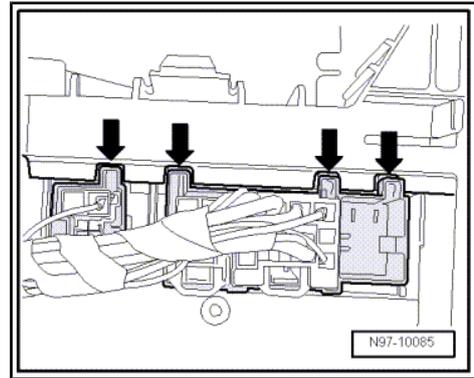
Carry out installation in the reverse sequence, noting the following:





The connectors can only be plugged in and locked once the recesses -arrows- of the connector and bracket are aligned with each other precisely.

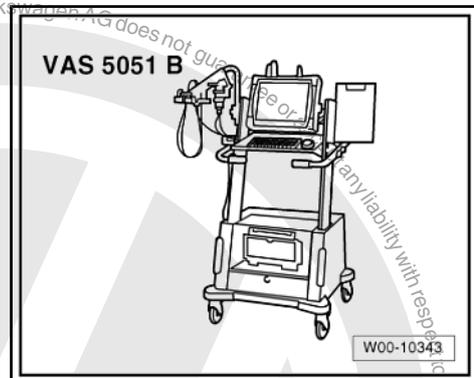
If a new convenience system central control unit -J393- has been installed, it must be coded => [page 474](#) .



5.3.2 Coding convenience system central control unit -J393- (up to MY2009)

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

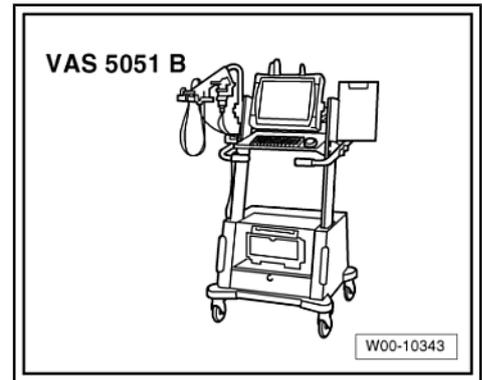
- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Convenience system
 - ◆ Functions of convenience system central control unit
 - ◆ Code convenience system central control unit

5.3.3 Adapting components - convenience system central control unit -J393- (up to MY2009)

Special tools and workshop equipment required



- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



The following functions can be adapted:

- ◆ Activating/deactivating „single door opening“
- ◆ Activating/deactivating „automatic locking at speeds greater than 15 km/h“
- ◆ Activating/deactivating „automatic unlocking when ignition key is removed“
- ◆ Activating/deactivating „country settings for intelligent alarm horn“
- ◆ Activating/deactivating „battery monitoring system (sounder)“
- ◆ Activating/deactivating „convenience actuation via radio remote control unit“
- ◆ Activating/deactivating „anti-theft alarm system - alarm delay when driver's door is opened“
- ◆ „Sensitivity of tilt angle sensor“
- ◆ „Sensitivity of interior monitoring system“

Procedure

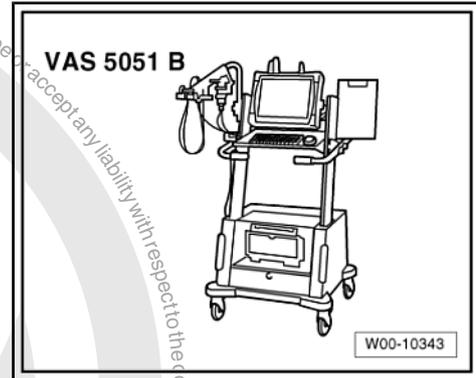
- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Convenience system
 - ◆ Functions of convenience system central control unit

5.3.4 Final control diagnosis - convenience system central control unit -J393- (up to MY2009)

Special tools and workshop equipment required



- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



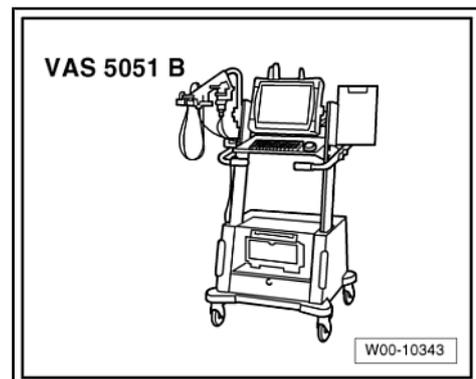
Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Convenience system
 - ◆ Functions of convenience system central control unit
 - ◆ Final control diagnosis

5.3.5 Reading alarm sources of anti-theft alarm (up to MY2009)

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs



- ◆ 01 - On Board Diagnosis capable systems
- ◆ Convenience system
- ◆ Functions of convenience system central control unit
- ◆ Read alarm sources of anti-theft alarm

5.4 Driver door control unit -J386-

General description

The driver door control unit -J386- and the driver side window regulator motor -V147- are contained in one unit and cannot be replaced individually.

If the driver door control unit -J386- or the driver side window regulator motor -V147- are replaced, then the work procedure „Coding driver door control unit“ must be subsequently performed ⇒ [page 477](#) .

Additional information:

- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ⇒ Operating manual

5.4.1 Removing and installing driver door control unit -J386-

Removing and installing driver door control unit -J386- ⇒ General body repairs, exterior; Rep. gr. 64 .



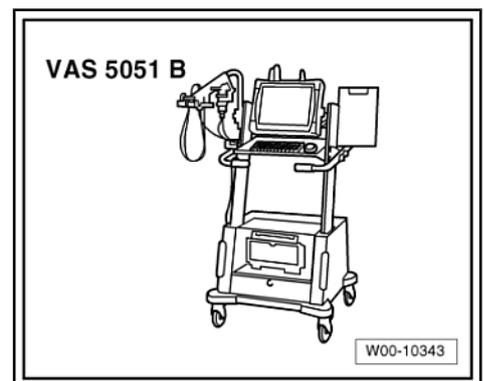
Note

If the driver door control unit -J386- or the driver side window regulator motor -V147- are replaced, then the work procedure „Coding driver door control unit“ must be subsequently performed ⇒ [page 477](#) .

5.4.2 Coding driver door control unit -J386-

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“ .
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:



- ◆ Body
- ◆ General body repairs
- ◆ Driver door electronics
- ◆ Functions of driver door control unit
- ◆ Code driver door control unit

5.5 Front passenger door control unit -J387-

General description

The front passenger door control unit -J387- and the front passenger side window regulator motor -V148- are contained in one unit and cannot be replaced individually.

If the front passenger door control unit -J387- or the front passenger side window regulator motor -V148- are replaced, then the work procedure „Coding front passenger door control unit“ must be subsequently performed ⇒ [page 478](#) .

Additional information:

⇒ Current flow diagrams, Electrical fault finding and Fitting locations

⇒ Operating manual

5.5.1 Removing and installing front passenger door control unit -J387-

Removing and installing passenger door control unit -J387- ⇒
General body repairs, exterior; Rep. gr. 64 .



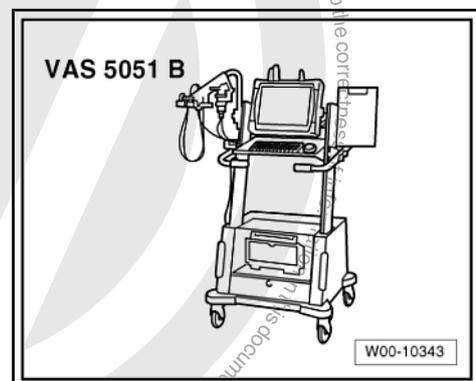
Note

If the front passenger door control unit -J387- or the front passenger side window regulator motor -V148- are replaced, then the work procedure „Coding front passenger door control unit“ must be subsequently performed ⇒ [page 478](#) .

5.5.2 Coding front passenger door control unit -J387-

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.



– Using **GoTo** button, select „Functions/component“ and the following menu options in succession:

- ◆ Body
- ◆ General body repairs
- ◆ Front passenger door electronics
- ◆ Functions of front passenger door control unit
- ◆ Coding front passenger door control unit

5.6 Coding rear left door control unit -J388-

General description

The rear left door control unit -J388- and the rear left window regulator motor -V26- are contained in one unit and cannot be replaced individually.

If the rear left door control unit -J388- or the rear left window regulator motor -V26- are replaced, then the work procedure „Coding rear left door control unit“ must be subsequently performed
⇒ [page 479](#) .

Additional information:

- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ⇒ Operating manual

5.6.1 Removing and installing rear left door control unit -J388-

Removing and installing rear left door control unit -J388- ⇒ General body repairs, exterior; Rep. gr. 64 .



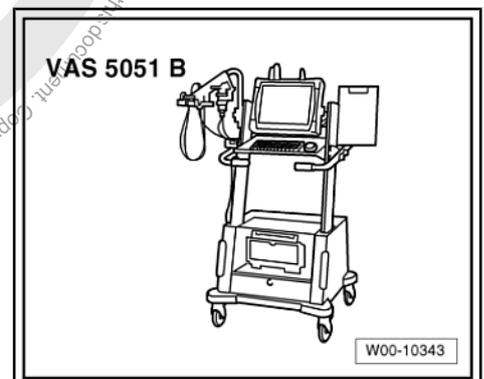
Note

*If the rear left door control unit -J388- or the rear left window regulator motor -V26- are replaced, then the work procedure „Coding rear left door control unit“ must be subsequently performed
⇒ [page 479](#) .*

5.6.2 Coding rear left door control unit -J388-

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .



- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **[GoTo]** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ Rear left door electronics
 - ◆ Function of rear left door control unit
 - ◆ Coding rear left door control unit

5.7 Coding rear right door control unit -J389-

General description

The rear right door control unit -J389- and the rear right window regulator motor -V27- are contained in one unit and cannot be replaced individually.

If the rear right door control unit -J389- or the rear right window regulator motor -V27- are replaced, then the work procedure „Coding rear right door control unit“ must be subsequently performed ⇒ [page 480](#) .

Additional information:

- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ⇒ Operating manual

5.7.1 Removing and installing rear right door control unit -J389-

Removing and installing rear right door control unit -J389- ⇒ General body repairs, exterior, Rep. gr. 64 .



Note

If the rear right door control unit -J389- or the rear right window regulator motor -V27- are replaced, then the work procedure „Coding rear right door control unit“ must be subsequently performed ⇒ [page 480](#) .

5.7.2 Coding rear right door control unit -J389-

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-





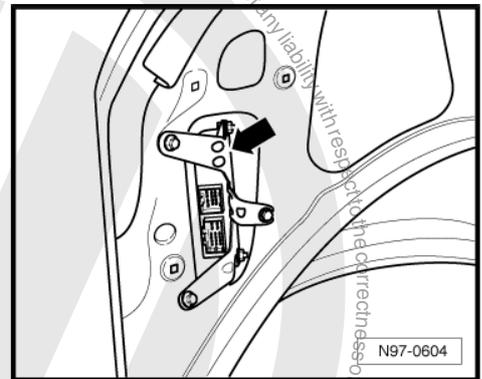
Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using GoTo button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ Rear right door electronics
 - ◆ Functions of rear right door control unit
 - ◆ Coding rear right door control unit

5.8 Trailer detector control unit -J345-

The trailer detector control unit -J345- -arrow- is located behind the left luggage compartment side panel trim.

Up to MY2009.



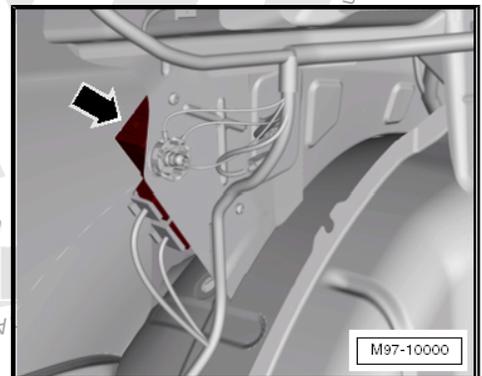
From MY2010

General description

Check trailer detector control unit -J345- using socket tester - V.A.G 1537/A- .

The trailer detector control unit -J345- detects „trailer operation“ from a power draw of minimum 5 W and transmits this information to various control units via the CAN data bus. „Trailer operation“ can only be detected if at least turn signal indicators or side marker lights are switched on.

The trailer detector control unit -J345- is supplied with information (light control) from the onboard supply control unit -J519- and convenience system central control unit -J393- via the CAN data bus.



Fault detection and fault display

The trailer detector control unit -J345- is equipped with self-diagnosis.

For fault finding, use vehicle diagnosis, testing and information system -VAS 5051B- in „Guided fault finding“ mode.

Additional information:

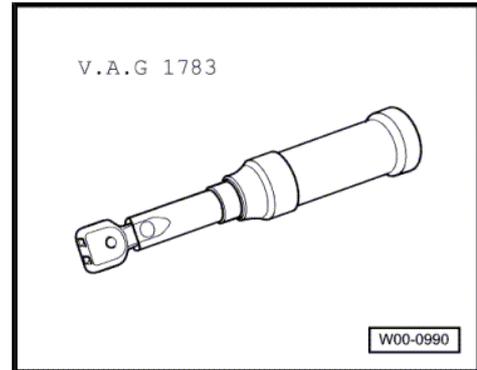
- ◆ ⇒ Operating manual
- ◆ ⇒ Current flow diagrams, Electrical fault finding and Fitting locations



5.8.1 Removing and installing trailer detector control unit -J345- (up to MY2009)

Special tools and workshop equipment required

- ◆ Torque wrench -V.A.G 1783-



Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

Removing

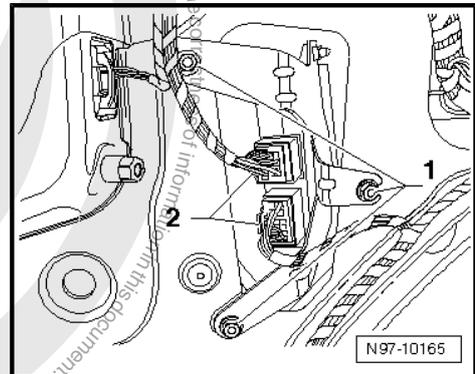
- Remove left luggage compartment side trim panel ⇒ General body repairs, interior; Rep. gr. 70 .
- Detach connectors -2-.



Note

The number of connectors at the trailer detector control unit -J345- may differ from the illustration, depending on vehicle equipment.

- Remove bolts -1- and take trailer detector control unit -J345- together with bracket out of vehicle.
- Remove bolts -arrows- and detach trailer detector control unit -J345- from bracket.

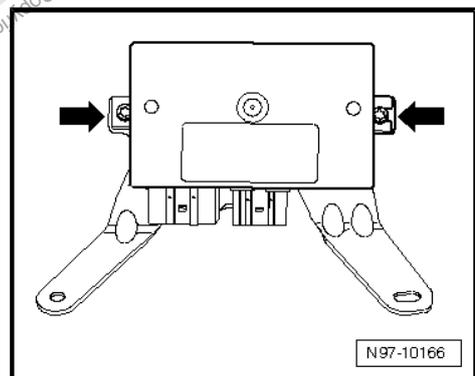


Installing

Carry out installation in the reverse sequence, noting the following:

- Tighten threaded connections to specified torques ⇒ [page 507](#) .

Following installation, a new trailer detector control unit -J345- must be encoded ⇒ [page 483](#) .





5.8.2 Removing and installing trailer detector control unit -J345- (from MY2010)



Caution

- ◆ **Switch off ignition and all electrical consumers.**
- ◆ **Remove the ignition key.**

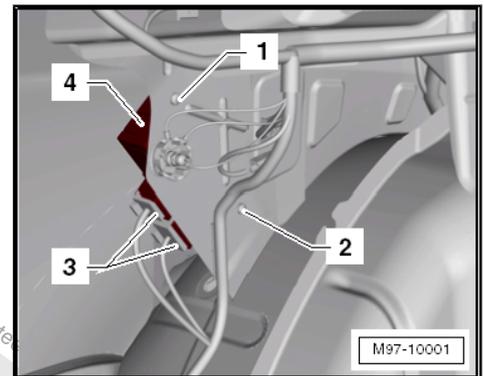
Removing

- Remove left luggage compartment side trim panel ⇒ General body repairs, interior; Rep. gr. 70 .
- Undo bolts -1- and -2- and take trailer detector control unit -J345- -4- off plate.
- Disconnect the connectors -3- for the trailer detector control unit -J345- -4-.

Installing

Carry out installation in the reverse sequence, noting the following:

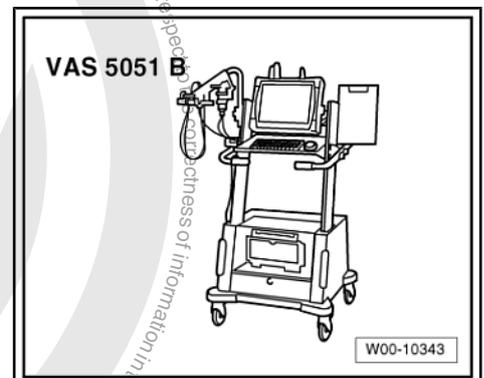
Following installation, a new trailer detector control unit -J345- must be encoded ⇒ [page 484](#) .



5.8.3 Coding trailer detector control unit -J345- (up to MY2009)

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system -VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo!** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ 01 - On Board Diagnosis capable systems
 - ◆ Trailer detector

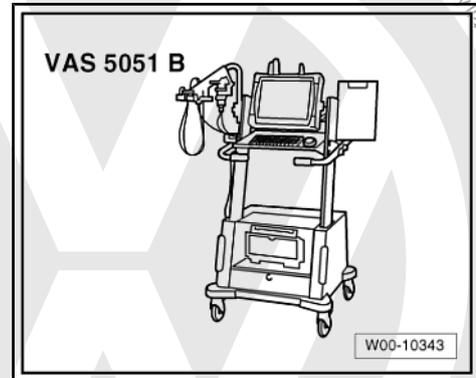


- ◆ Functions
- ◆ Trailer detector control unit -J345-

5.8.4 Coding trailer detector control unit - J345- (from MY2010)

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



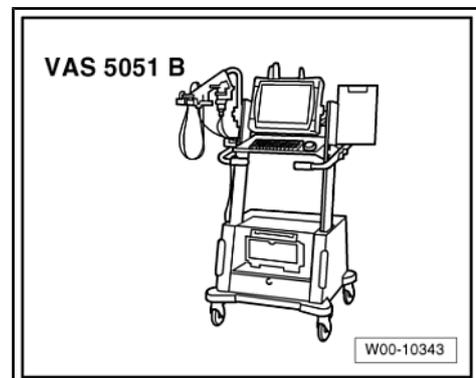
Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ Trailer detector
 - ◆ Functions
 - ◆ Code trailer detector control unit

5.8.5 Adapting software - trailer detector control unit -J345- (from MY2010)

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



This test programme provides support when renewing or retrofitting immobiliser control unit.



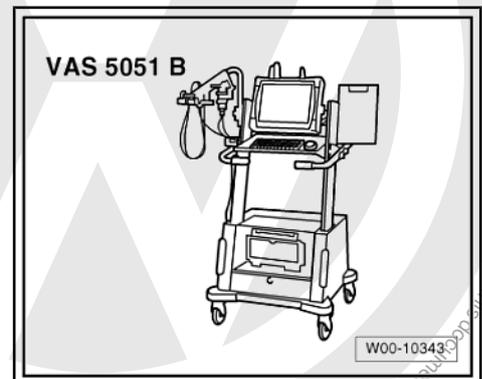
Procedure

- Connect vehicle diagnosis, testing and information system - VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ Trailer detector
 - ◆ Functions
 - ◆ Adapt immobiliser control unit software

5.8.6 Trailer detector control unit -J345- final control diagnosis

Special tools and workshop equipment required

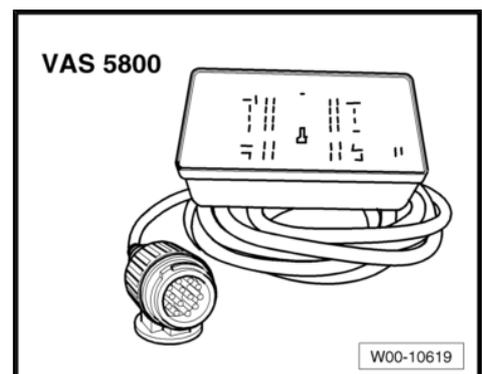
- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



- ◆ Socket tester -V.A.G 1537/A-



- ◆ Trailer socket tester -VAS 5800-





The trailer detector control unit -J345- only detects „trailer operation“ as of a power draw of at least 5 W.

The socket tester -V.A.G 1537/A- will become too warm after some minutes of use and will switch itself off. The socket tester -V.A.G 1537/A- will function again without problem after it has cooled down.

Procedure

- Connect vehicle diagnosis, testing and information system -VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:
 - ◆ Body
 - ◆ General body repairs
 - ◆ 01 - On Board Diagnostic capable systems (up to MY2009)
 - ◆ Trailer detector
 - ◆ Functions
 - ◆ Trailer detector control unit - final control diagnosis

5.9 Garage door operation control unit - J530-

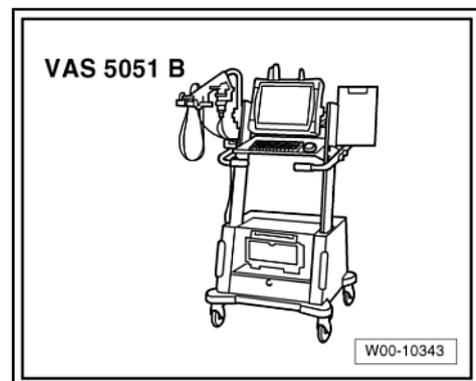
5.9.1 Removing and installing garage door operation control unit -J530-

- Removing and installing garage door operation control unit - J530- => [page 417](#) .

5.9.2 Checking garage door operating unit - E284- (up to MY2009)

Special tools and workshop equipment required

- ◆ Vehicle diagnosis, testing and information system -VAS 5051B-



Procedure

- Connect vehicle diagnosis, testing and information system -VAS 5051B- .
- In vehicle diagnosis, testing and information system -VAS 5051B- , select „Guided fault finding“.
- Using **GoTo** button, select „Functions/component“ and the following menu options in succession:



- ◆ Body
- ◆ Electrical system
- ◆ 01 - On Board Diagnosis capable systems
- ◆ Onboard supply control unit
- ◆ Switch button
- ◆ Garage door operating unit





6 Wiring harness and connector repairs

All the instructions and information for this manual are found in the workshop manual „Electrical System, General Information“. A link to this workshop manual is not possible at present for technical reasons. Please select the workshop manual „Electrical System, General Information“ manually in ELSA.





7 Removing and installing engine wiring harness

⇒ [page 489](#)

⇒ [page 490](#)

⇒ [page 491](#)

⇒ [page 497](#)

7.1 Operation and safety notes



Note

Before beginning renewal of a wiring harness, first rectify the cause of the damage (sharp edges on a body part, defective consumer, corrosion).

- When performing installation work on engine wiring harness, observe the following:



Caution

- ◆ *The procedure described in the workshop manual must be strictly observed when disconnecting and reconnecting the battery -A- .*
- ◆ *If a wire or a glow plug connector is damaged, the complete wiring harness including connector will have to be renewed (connectors cannot be renewed separately).*



DANGER!

- ◆ *Follow safety precautions when working on the diesel injection system ⇒ 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 23 .*
- ◆ *Note rules on cleanliness ⇒ 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 23 .*

These instructions must always be complied with before and during work!



WARNING

Please note the following points during all assembly work, in particular in the engine compartment, due to the narrow installation conditions:

- ◆ *Lines of all kinds (fuel, hydraulic fluid, activated charcoal container system, coolant and refrigerant, brake fluid, vacuum) and electric cables must be routed so as to restore original line/cable routing.*
- ◆ *Make sure there is adequate clearance from all moving or hot components.*



7.2 Installation notes



Note

- ◆ Additional information on interfaces and connectors for individual components:
- ◆ ⇒ Current flow diagrams, Electrical fault finding and Fitting locations

Engine control unit -J623- connector installation notes



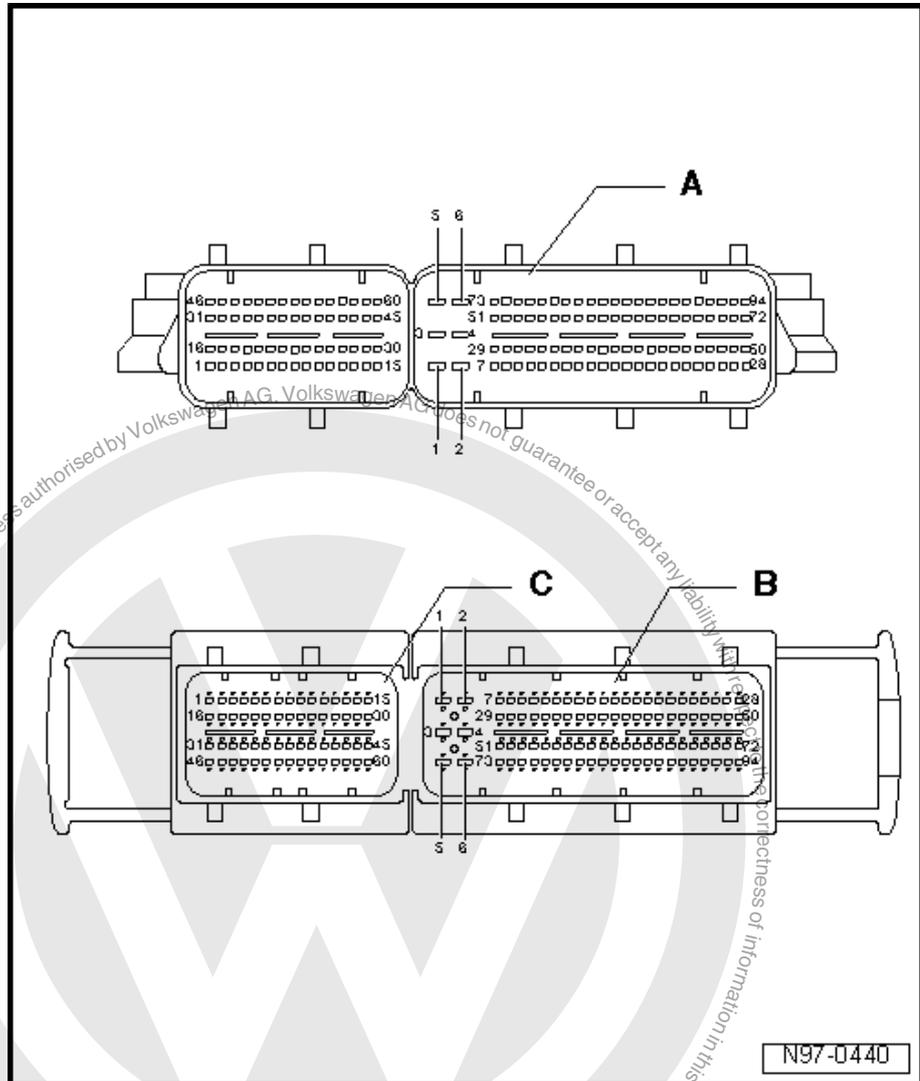
Note

Illustration shows 154-pin plug connection.

A -
Engine control unit -J623- ,
154-pin

B - 94-pin connector

C - 60-pin connector





Installation note on heat insulation:

- Push heat insulation -1- in direction of arrow -A- onto component -3-.
- Lock pushbutton -2- in direction of arrow -B-.

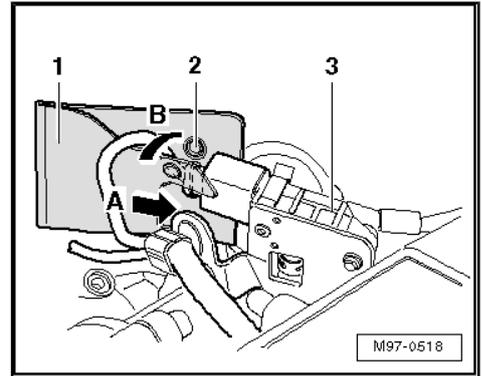
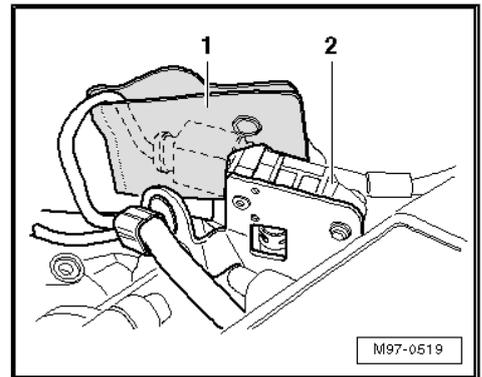
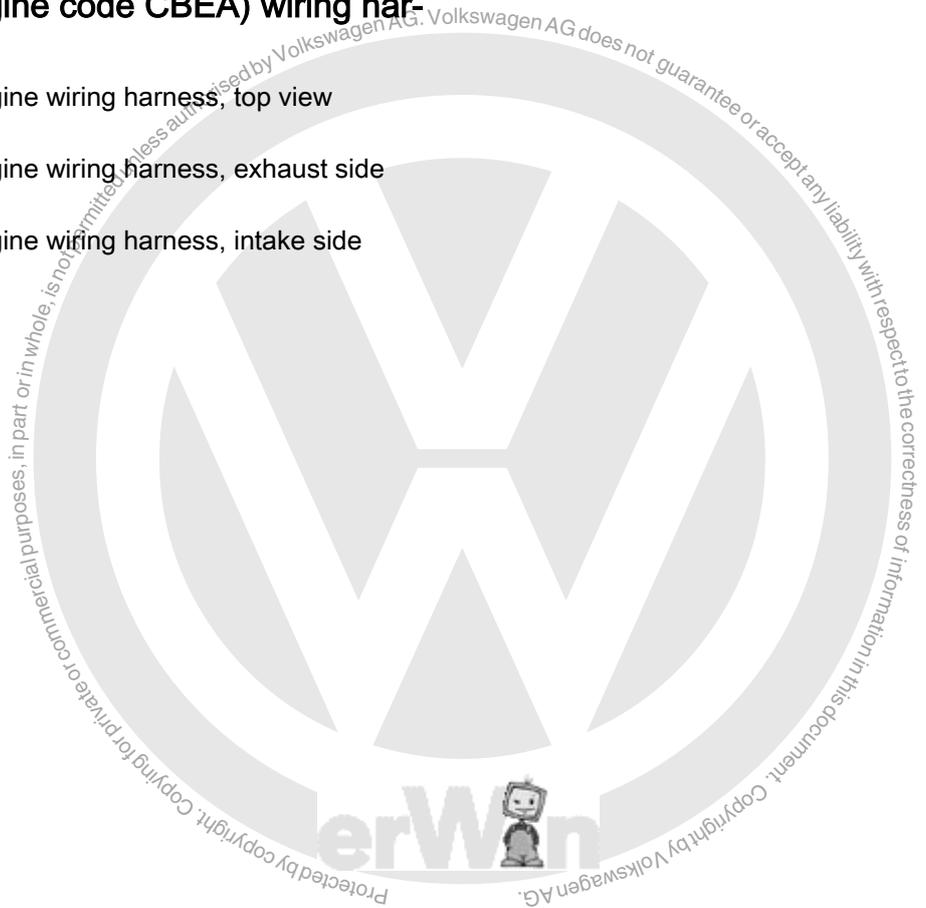


Illustration shows correct seating of heat insulation -1- on component -2-.



7.3 Assembly overview - 2.0 TDI engine /CR engine (engine code CBEA) wiring harness

- ◆ Assembly overview - engine wiring harness, top view
=> [page 492](#)
- ◆ Assembly overview - engine wiring harness, exhaust side
=> [page 495](#)
- ◆ Assembly overview - engine wiring harness, intake side
=> [page 496](#)





7.3.1 Assembly overview - engine wiring harness, top view

1 - Injector connectors, 2-pin

2 - Heat insulation

- Note installation position => [page 491](#)
- Renew if damaged.

3 - Position sender for charge pressure positioner -G581- connector, 3-pin

- Note => 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 21

4 - Bracket to cylinder head

- For wiring harness

5 - Connector fuel pressure regulating valve -N276- , 2-pin

- Note => 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 23

6 - Fuel temperature sender -G81- connector, 2-pin

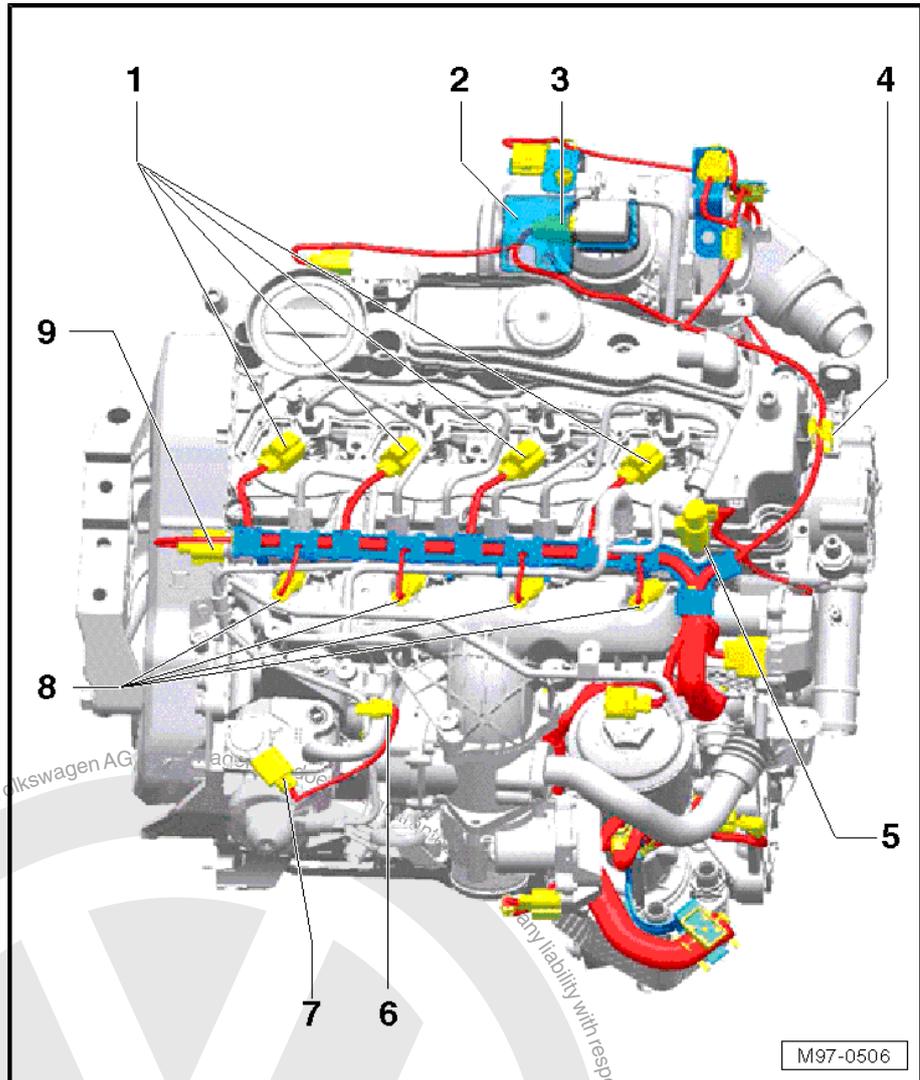
- Note => 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 23

7 - Fuel metering valve -N290- connector, 2-pin

- Note => 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 23

8 - Glow plug connectors

- Note => 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 28



M97-0506

Caution

Connector is surrounded by a protective sleeve, if damaged then protective sleeve can be renewed.

It is essential to comply with working sequence »Removing and installing glow plug connectors« => [page 492](#) !

9 - Fuel pressure sender -G247- connector, 3-pin

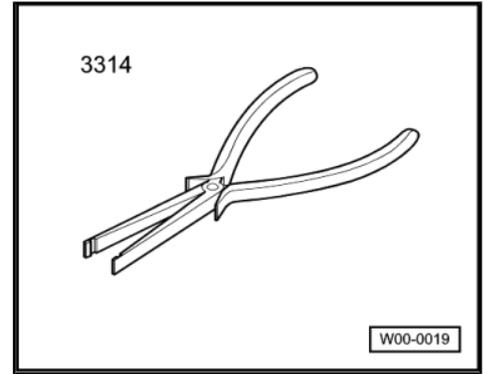
- Notes => 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 23

Removing and installing glow plug connectors

Special tools and workshop equipment required



◆ Pliers -3314-



Removing



Caution

Before removing glow plug connectors, note different installation depths of glow plugs on corresponding cylinders.

- Position pliers -3314- with groove in pliers -arrow A- on top collar of connector -arrow B- and press together slightly.



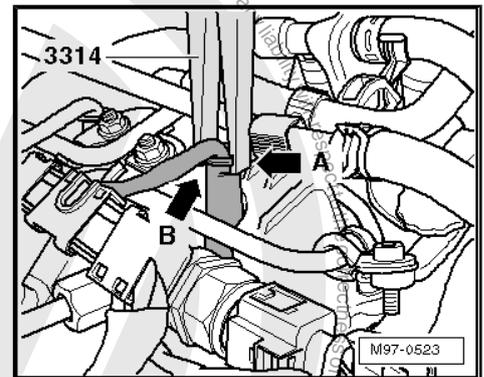
Caution

Position pliers -3314- so that cables are not touched or damaged.

Only use illustrated tool.

Other, unsuitable tools can damage connector.

If the connector is damaged upon disconnection, the complete wiring harness including the connector must be replaced. The connector cannot be renewed individually.



- Using pliers -3314- , carefully pull connector off glow plug in -direction of arrow-.



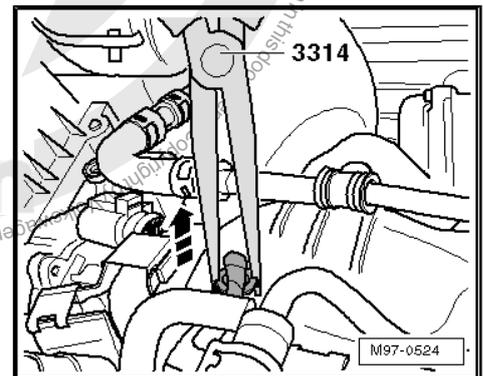
Caution

Do not jerk connector.

Cable of connector is not allowed to be damaged under any circumstances.

Do not press pliers -3314- together too firmly, otherwise connector will be damaged.

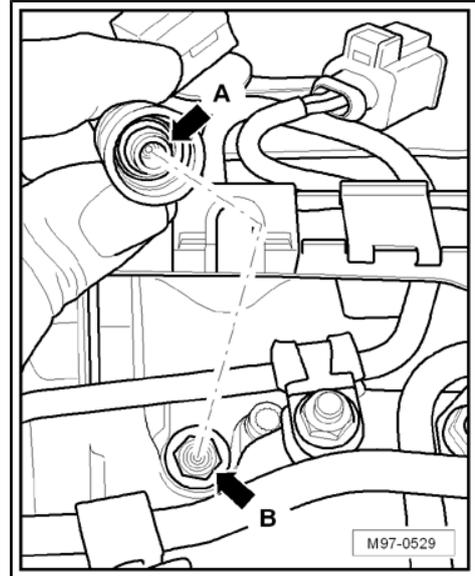
Connector is surrounded by a protective sleeve, if damaged then protective sleeve can be renewed.



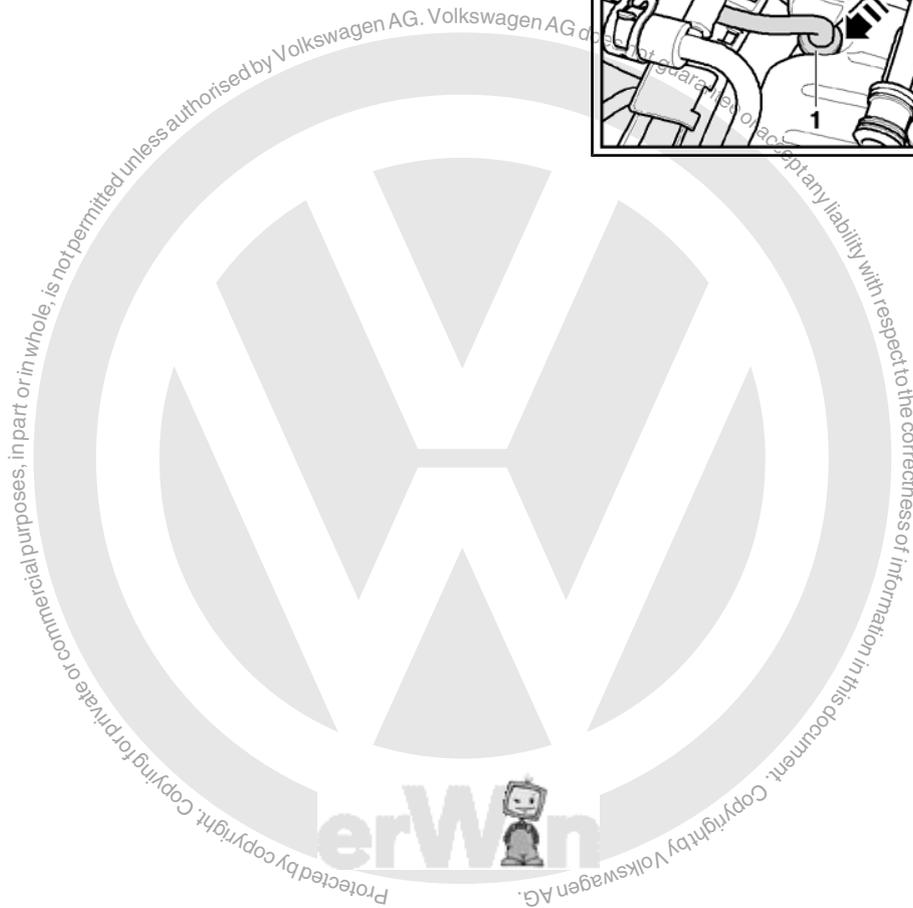
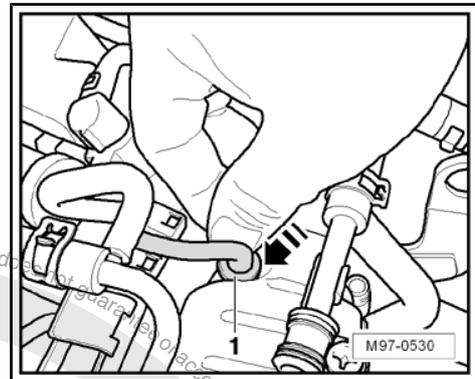
Installing



- Guide middle contact of connector -arrow A- by hand into socket of glow plug -arrow B-.



- Push glow plug connector -1- on by hand until it can be felt to engage.





7.3.2 Assembly overview - engine wiring harness, exhaust side

1 - Connector exhaust gas recirculation temperature sensor -G98-

- Note ⇒ 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 26

2 - Exhaust gas pressure sensor 2 -G451- connector, 3-pin

- Note installation position
- Note ⇒ 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 21

3 - Heat insulation

- Note installation position ⇒ [page 491](#)
- Renew if damaged.

4 - Connector exhaust gas recirculation valve 2 -N213-

- Note ⇒ 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 21

5 - Cable tie on control line

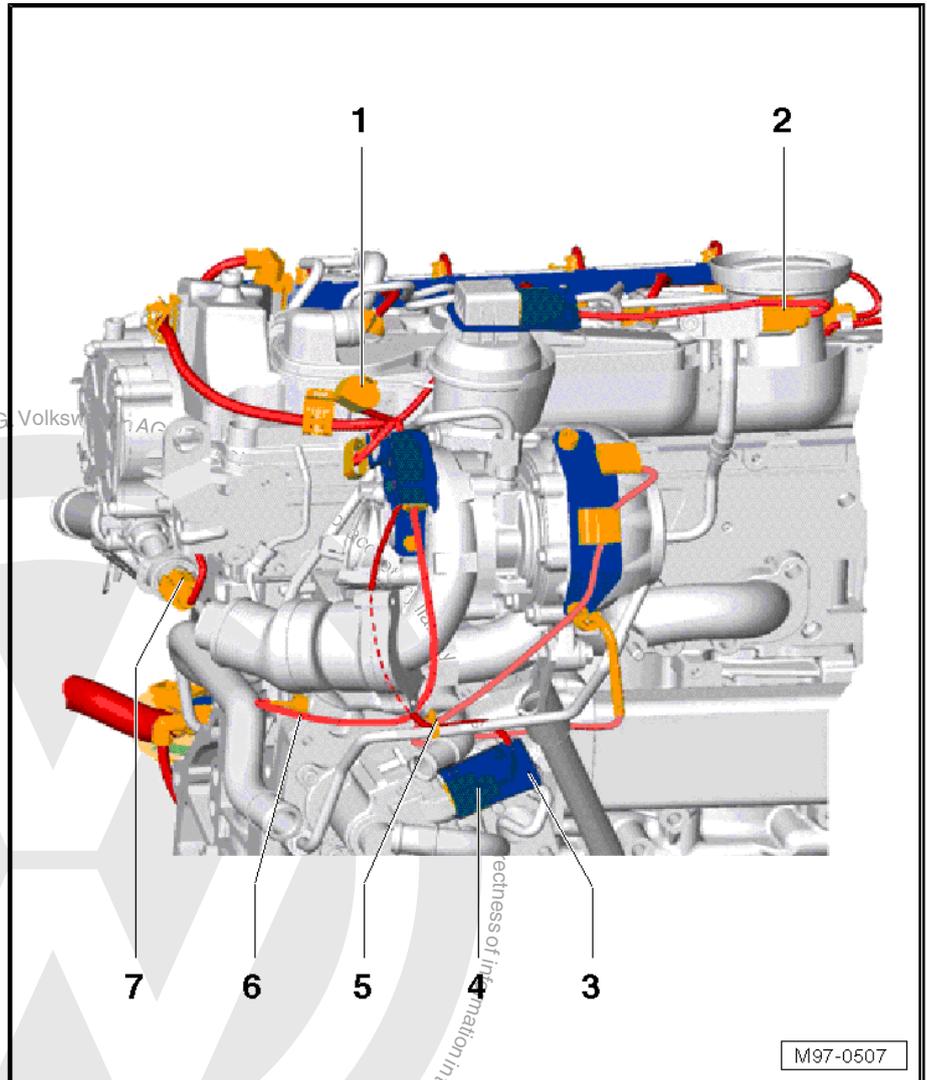
- Note ⇒ 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 26
- Note installation position
- Renew

6 - Exhaust gas recirculation temperature sensor -G98-

- Note ⇒ 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 26

7 - Coolant temperature sender -G62- , 2-pin

- Note ⇒ 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 15





7.3.3 Assembly overview - engine wiring harness, intake side

1 - Intake manifold flap motor - V157- connector, 5-pin

- ❑ Note ⇒ 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 23

2 - Throttle valve module - J338- connector, 50-pin

- ❑ Note ⇒ 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 23

3 - Insertion foot

- ❑ Note installation position

4 - Oil pressure switch -F1- connector, 1-pin

- ❑ Note ⇒ 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 17

5 - Bracket on oil filter bracket

- ❑ For wiring harness
- ❑ Note installation position

6 - Engine speed sender -G28- connector, 3-pin

- ❑ Note ⇒ 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 13

7 - Hall sender -G40- connector, 3-pin

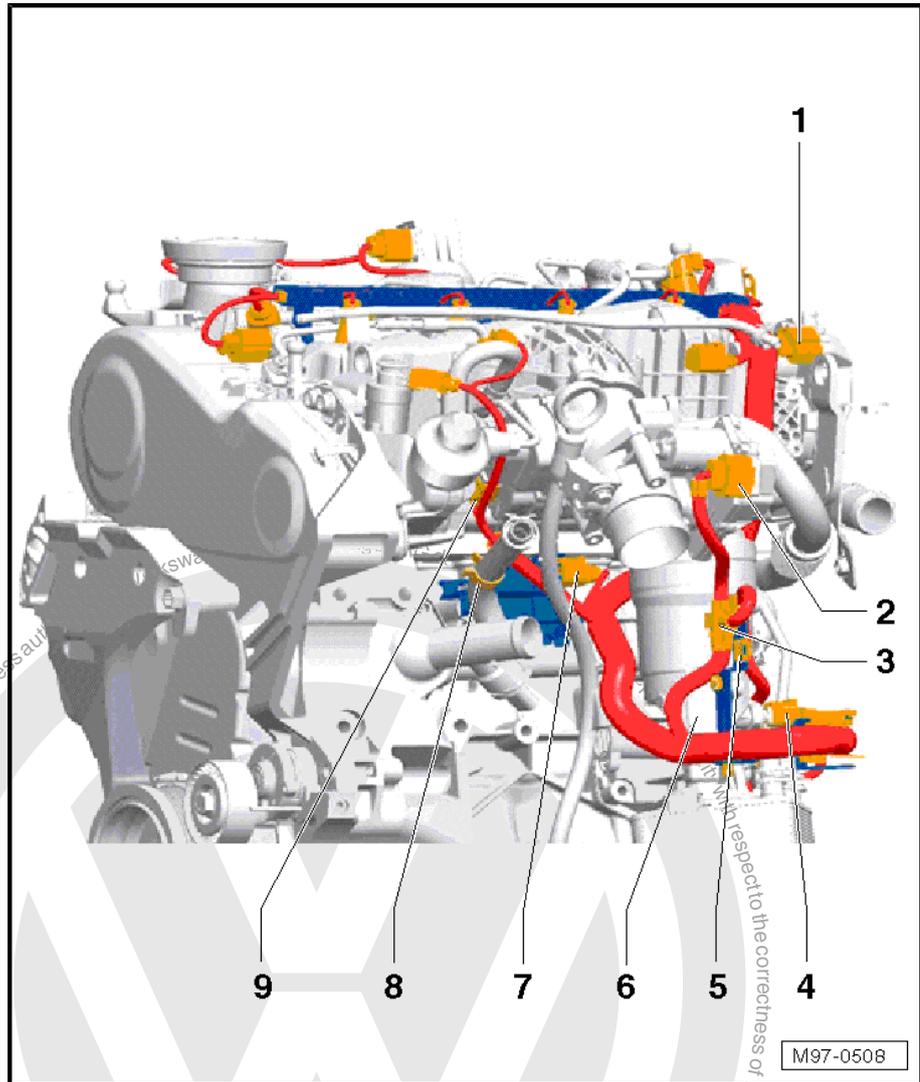
- ❑ Note ⇒ 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 15

8 - Engine speed sender -G28- bracket on cylinder head

- ❑ For wiring harness

9 - Mechanical exhaust gas recirculation valve -N18- connector, 6-pin

- ❑ Note ⇒ 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 23

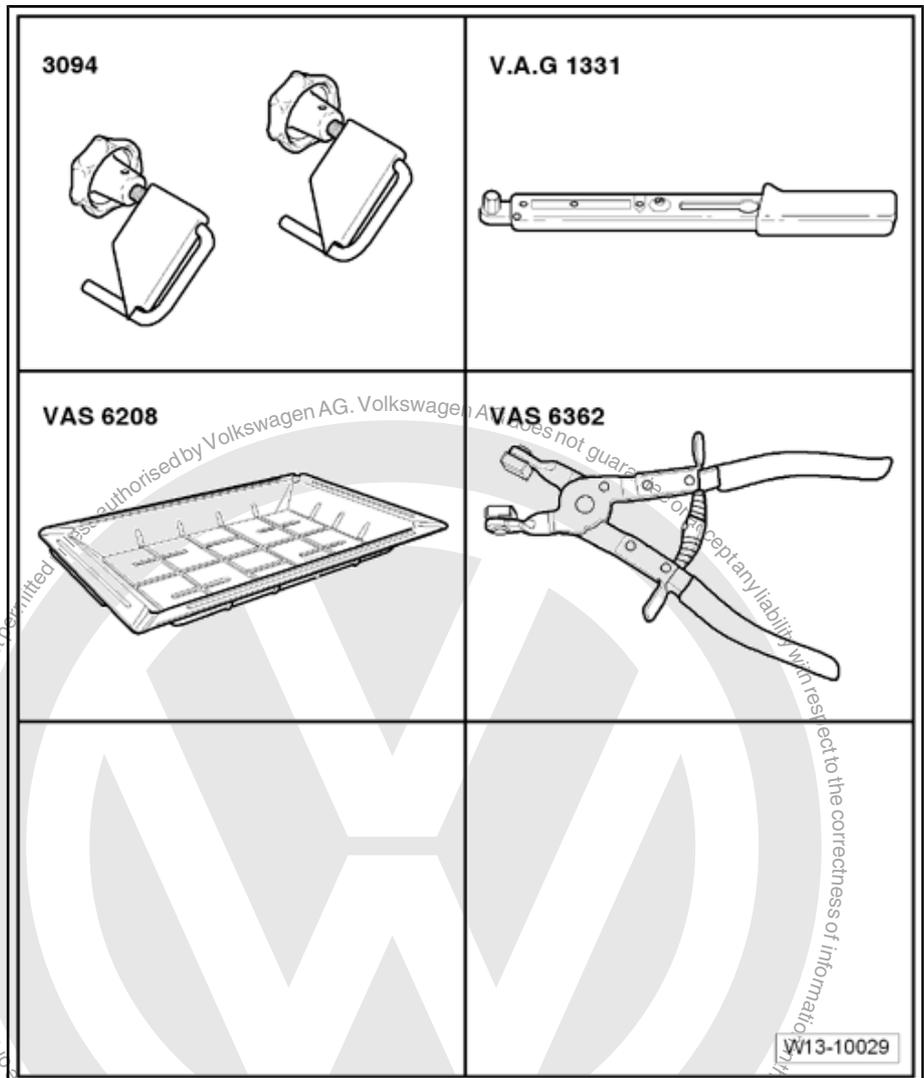




7.4 Removing and installing engine wiring harness, 2.0 I, TDI/CR engine (EC/CBEA)

Special tools and workshop equipment required

- ◆ Hose clamp up to Ø 25 mm -3094-
- ◆ Torque wrench -V.A.G 1331-
- ◆ Drip tray -VAS 6208-
- ◆ Spring-type clip pliers -VAS 6362-



Conditions

- Ignition switched off.
- Engine must be cold.

Procedure

- Before removal, interrogate error memory of all control units
 ⇒ Vehicle diagnostic, testing and information system
 VAS 5051 „Vehicle self-diagnosis“.
- Remove engine cover ⇒ 4-cyl. diesel engine (2.0 I engine, common rail); Rep. gr. 15 .



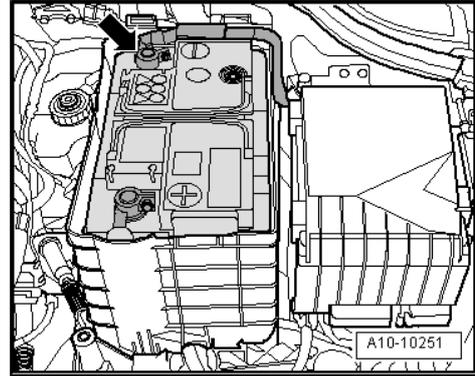
Caution

Risk of irreparable damage to electronic components when disconnecting battery -A- :

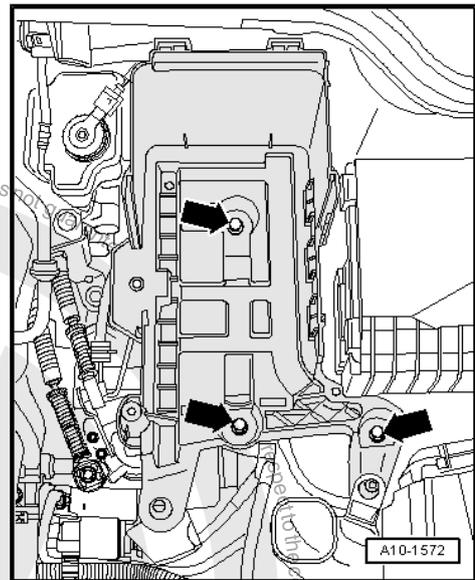
- ◆ **Comply with precautions when disconnecting battery -A- .**



- Disconnect earth cable -arrow- from battery -A- when ignition is switched off.
- Remove air filter housing => 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 23 .

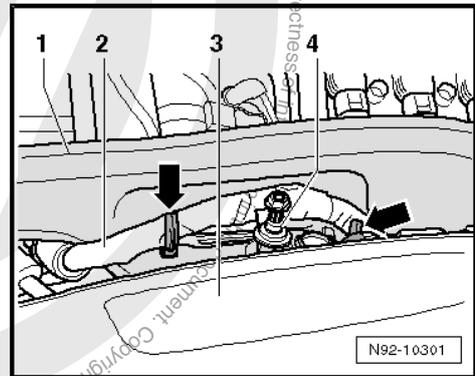


- Remove battery -A- and battery tray -arrows-.
- Remove windscreen wiper arms and plenum chamber cover => [page 183](#) .
- Remove bulkhead of plenum chamber.

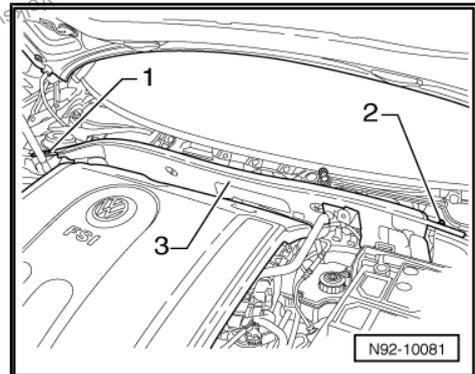


The following figure shows the wiring harness viewed from the windscreen with bonnet open.

- 1 - Bulkhead of plenum chamber
- 2 - Wiring harness
- 3 - Windscreen
- Unclip wiring harness -2- from attachments -arrows-.

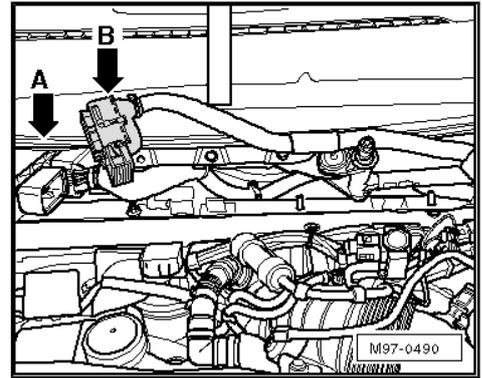


- Remove bolt -1- and nut -2- from bulkhead of plenum chamber -3-.
- Remove bulkhead of plenum chamber -3- upwards from vehicle.
- Remove engine control unit -J623- => 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 23 .

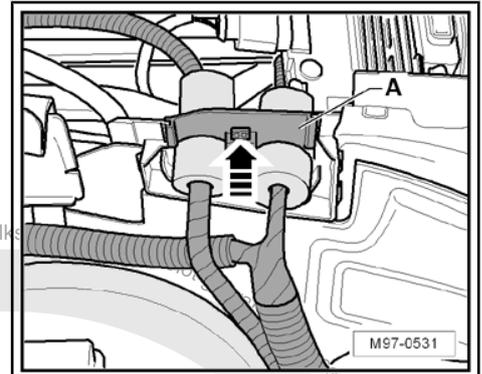




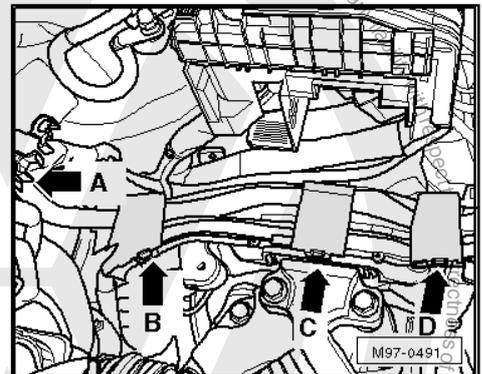
- Pull off connector -arrow B- on engine control unit -J623-
 -arrow A-.



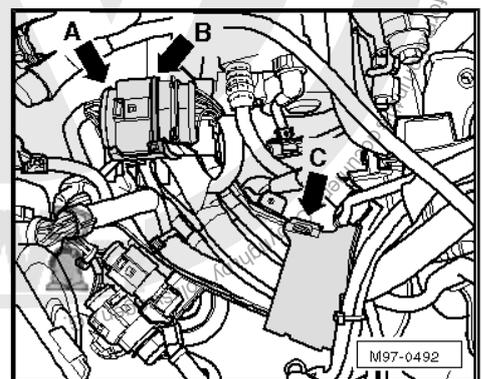
- Unlock feed-through for wiring harness -A- and retaining lug
 -arrow-.
- Pull off feed-through for wiring harness -A- upwards.



- Pull wiring harness out of bracket -arrow A-.
- Unclip cable guide in vicinity of gearbox mounting
 -arrows B to D-.

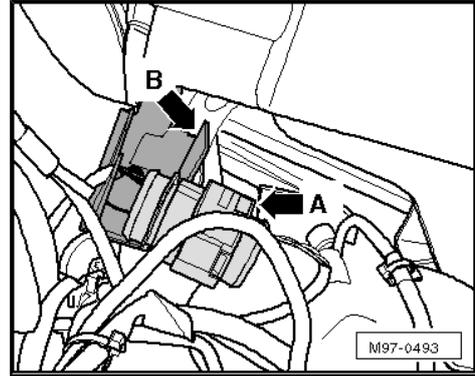


- Open cable tie of 14-pin connector, black, coupling point 1 in
 engine compartment, left -arrow B- and remove connector
 from bracket.
- Disconnect 14-pin connector, black, coupling point 1 in engine
 compartment, left -arrow A-.
- Unclip cable guide -arrow C-.





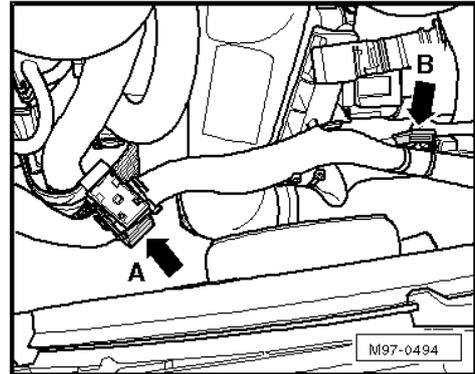
- Pull 10-pin connector near left headlight -arrow A- out of bracket -arrow B- and disconnect connector.



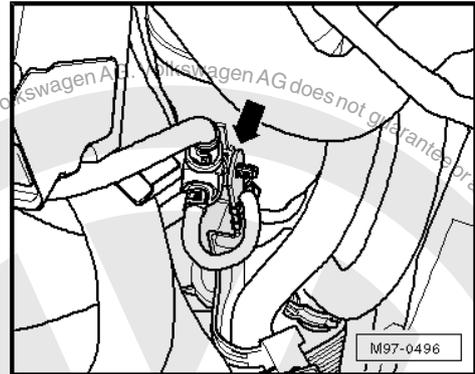
- Unlock insertion foot of wiring harness on starter bracket -B- -arrow B-.
- Unlock insertion foot of wiring harness on oil filter bracket -arrow A-.

Location => [Item 3 \(page 496\)](#) .

- Carefully pull wiring harness off brackets.

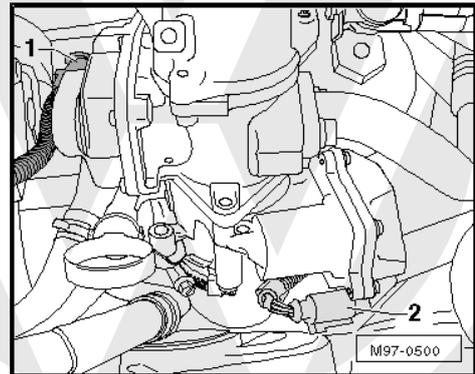


- Unlock retaining clip of wiring harness and pull off from oil filter bracket -arrow-.



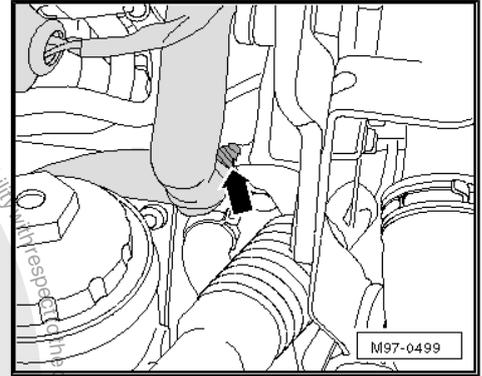
- Pull off connector from mechanical exhaust gas recirculation valve -N18- -1- and from throttle valve module -J338- -2-.

Location throttle valve module -J338- => [Item 2 \(page 496\)](#)



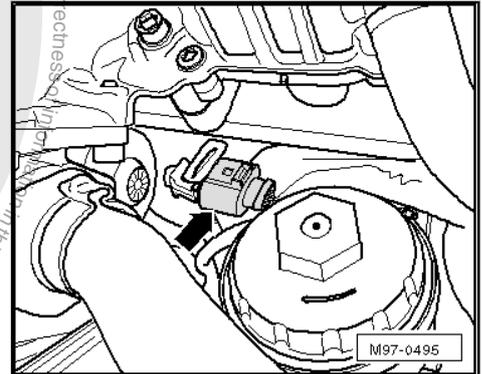


- Release retaining clip in vicinity of oil filter bracket -arrow-.



- Unlock connector from Hall sender -G40- and disconnect -arrow-.

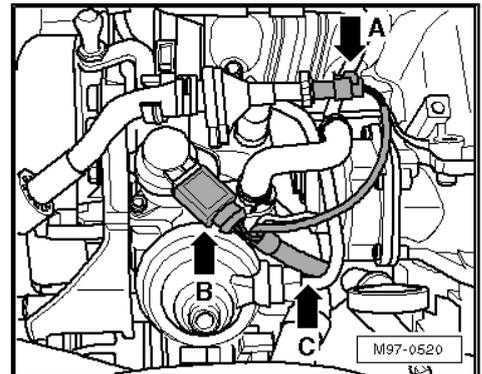
Location => [Item 7 \(page 496\)](#) .



- Pull off connector from fuel temperature sender -G81--1- and from fuel metering valve -N290- on high-pressure fuel pump -2-.

Installation position fuel metering valve -N290- => [Item 7 \(page 492\)](#) .

- Note the cable routing.
- Slide wiring harness out.



- Unlock connector from oil pressure switch -F1- and detach -arrow A-.

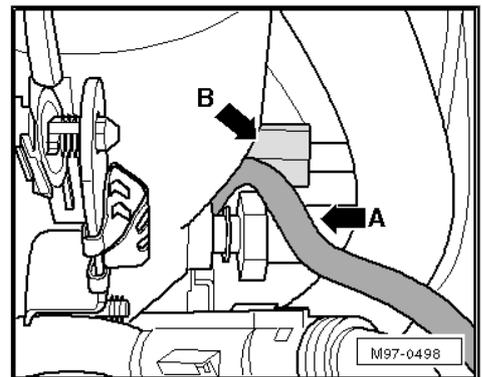
Location => [Item 4 \(page 496\)](#) .



Note

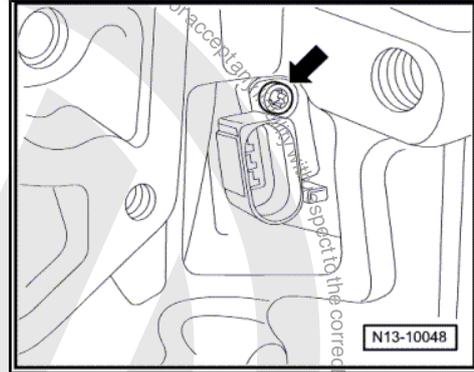
To unlock and disconnect plug connection from engine speed sender -G28-, it is necessary to remove and install oil filter bracket.

- Removing and installing oil filter bracket => 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 17 .





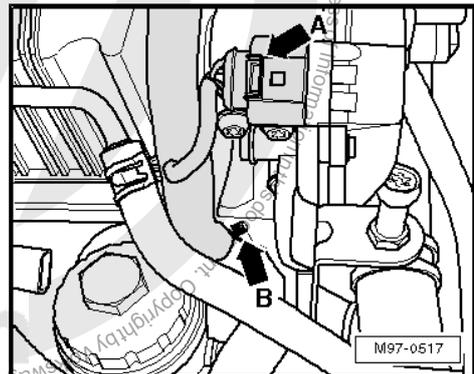
- Detach connector from engine speed sender -G28- -arrow-.



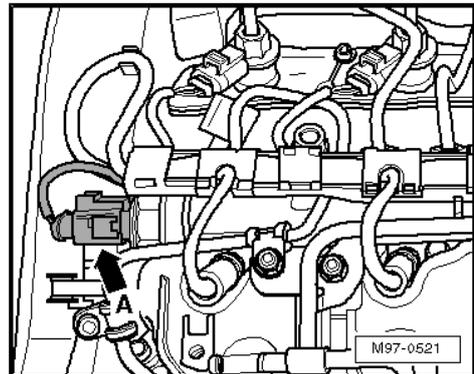
- Detach connector from intake manifold flap motor -V157- -arrow A-.

Installation location intake manifold flap motor -V157-
⇒ [Item 1 \(page 496\)](#)

- Pull wiring harness out of bracket -arrow B-.

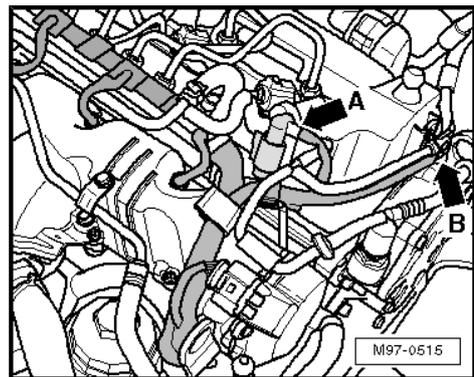


- Pull off connector from fuel pressure sender -G247- -arrow A-.
- Unclip wiring harness from bracket -arrow B-.
- Remove nut from fuel line -arrow D-.
- Pull cable guide off rail element (high-pressure accumulator) -arrow C-.



- Pull off connector from fuel pressure regulating valve -N276- -arrow A-.

Location ⇒ [Item 5 \(page 492\)](#) .

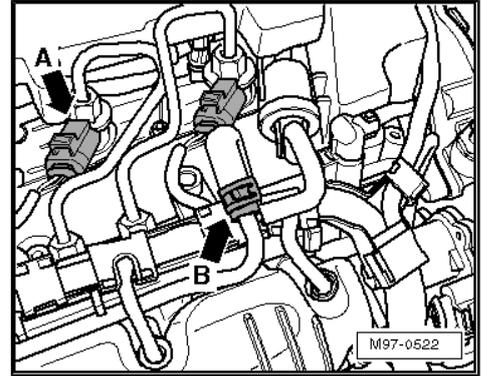




- Disconnect connector of all injectors -A-.

Installation position of injectors => [Item 1 \(page 492\)](#)

- Loosen spring-type clip -arrow B- with spring-type clip pliers -VAS 6362- and pull line off rail element (high-pressure accumulator).
- Pull off line -arrow C-.
- Prior to removal, clean return line connection on injectors (using commercially available cold cleaning agents).
- Dry the return line connections.
- Pull connectors off all glow plugs.



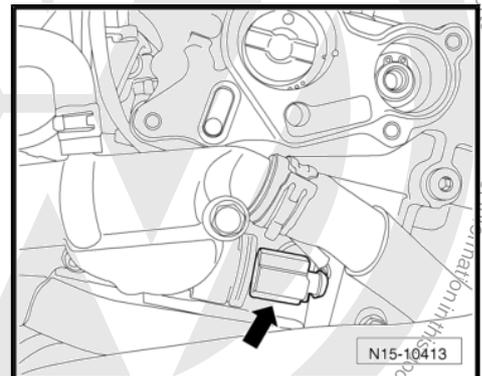
Caution

It is essential to comply with working sequence »Removing and installing glow plug connectors« => [page 492](#) !

Installation location of connectors from glow plugs
 => [Item 8 \(page 492\)](#)

- Pull wiring harness with cable guide off rail element and slide out wiring harness.
- Pull connector -arrow- off coolant temperature sender -G62- .

Location => [Item 7 \(page 495\)](#) .



- Slide out cable -arrows-.

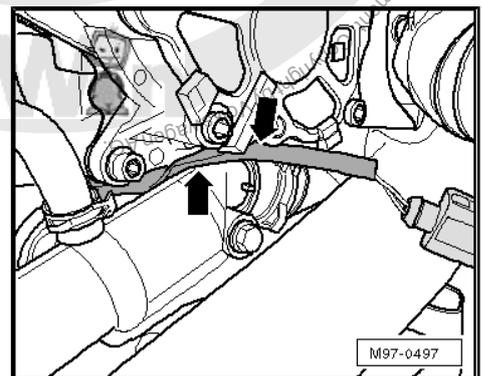
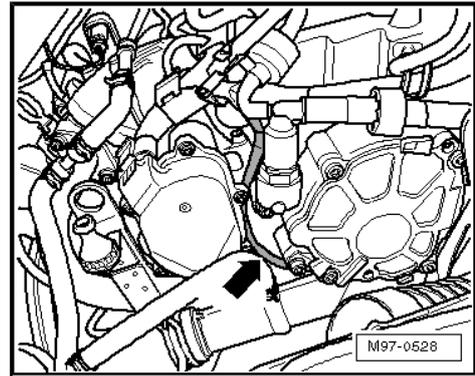


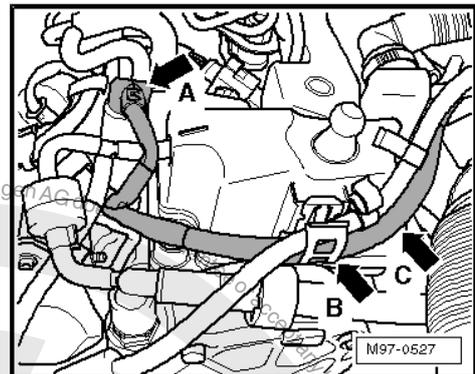


Illustration shows wiring harness for coolant temperature sender -G62- -arrow-.



-Arrow C- shows wiring harness to following components:

- ◆ Exhaust gas pressure sensor 2 -G451-
 - ◆ Position sender for charge pressure positioner -G581-
 - ◆ Exhaust gas recirculation valve 2 -N213-
 - ◆ Exhaust gas recirculation temperature sensor -G98-
- Slide out wiring harness from bracket -arrow B-

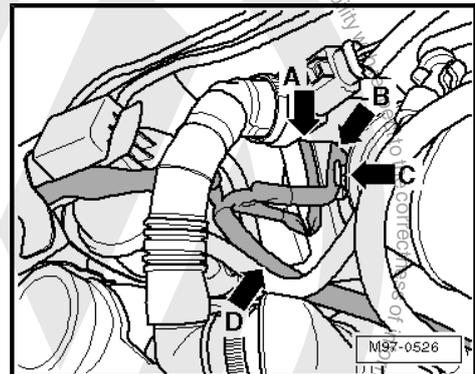


-Arrow D- wiring harness from „bracket on cylinder head cover“.
⇒ [page 504](#)

-Arrow A- wiring harness to exhaust gas recirculation temperature sensor -G98- .

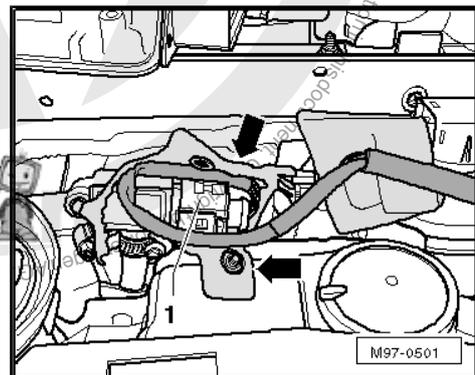
-Arrow B- wiring harness to exhaust gas recirculation valve 2 - N213-

-Arrow C- bracket for exhaust gas recirculation valve 2 -N213- cable.



- Clip on heat insulation -arrows- and pull off connector from exhaust gas pressure sensor 2 -G451- -1-.

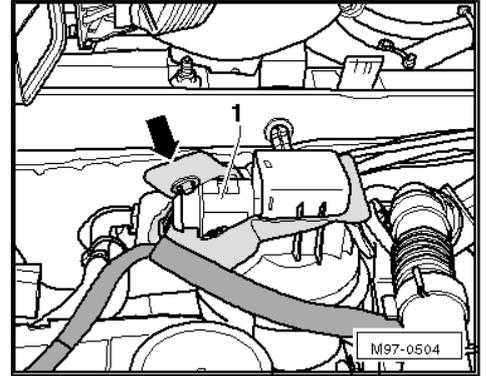
Installation position ⇒ [Item 2 \(page 495\)](#)



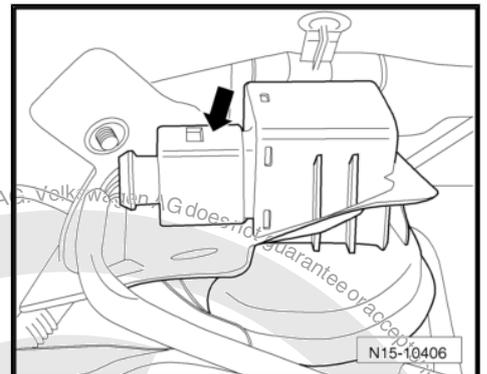


- Clip on heat insulation -arrow-.

Installation position => [Item 3 \(page 492\)](#)

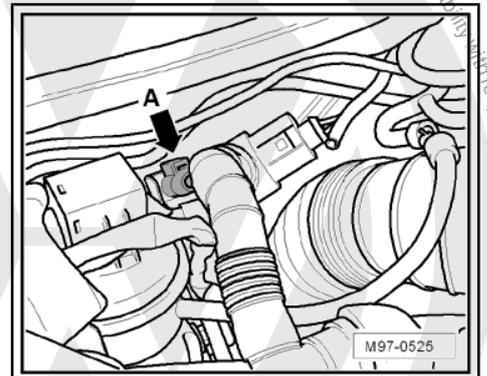


- Pull off connector from position sender for charge pressure positioner -G581- -arrow- on pressure socket from turbocharger and slide cable out of brackets.



- Pull off connector from exhaust gas recirculation temperature sensor -G98- -arrow A- and slide out cable.

Installation position of connector exhaust gas recirculation temperature sensor -G98- => [Item 1 \(page 495\)](#)





- Remove noise insulation => General body repairs, exterior; Rep. gr. 50 .
- Installation view shows vehicle from underneath:

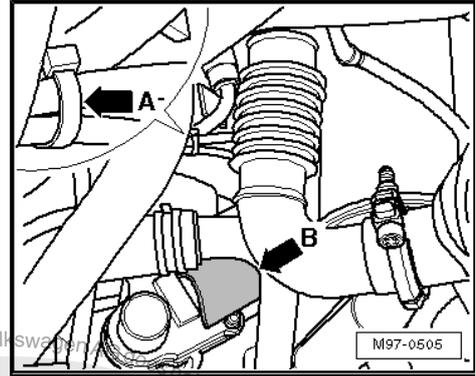


Note

Note installation position of cable routing and heat insulation!

Installation position exhaust gas recirculation valve 2 -N213-
=> [Item 4 \(page 495\)](#)

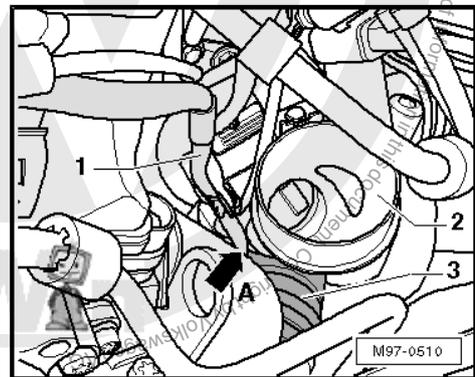
- Clip on heat insulation -arrow B- and push heat insulation off connector.
- Pull off connector from exhaust gas recirculation valve 2 - N213- .
- Separate cable tie -arrow A-.
- Installation view of engine compartment:
- Remove intake hose => 4-cyl. diesel engine (2.0 l engine, common rail); Rep. gr. 23 .



Note

Note installation position of cable routing before you slide out cable!

- Slide cable -1- out carefully between induction hood of turbocharger -2- and preheating hose -3- -arrow A-.
- Carefully remove entire wiring harness for engine from engine compartment.



Installing

Carry out installation in the reverse sequence, noting the following:



Caution

It is essential to comply with working sequence »Removing and installing glow plug connectors« => [page 492](#) !

Ensure all connectors are fitted securely.

Attach heat insulation mats in original installation position => [page 491](#) .

Always renew self-locking nuts, seals and securing clips.

Hose connections are secured with spring-type clips.

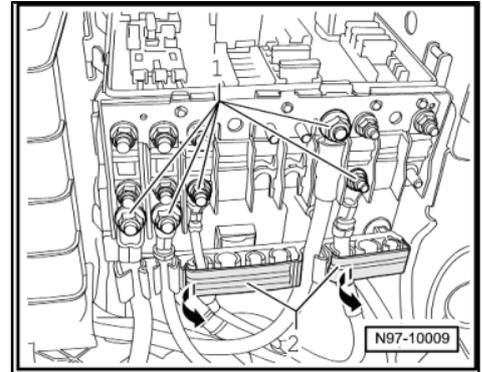
It is recommended that spring-type clips should be installed using spring-type clip pliers -VAS 6362- or hose clamp pliers -VAS 6340- .

Observe notes => [page 490](#) .



8 Specified torques for wires, lines and cables

8.1 Specified torques for E-box on left side of engine compartment



Threaded connections

Nuts -1-	M5	4 Nm
Nuts -1-	M6	6 Nm

Specified torques

8.2 Specified torques for trailer detector control unit -J345-

Threaded connections

Bolts securing bracket to body	2 Nm
Trailer detector control unit -J345- bolts on bracket	2 Nm

Specified torques