



Das Auto.

2014

Passat

**Quick Reference
Specification Book**

2014 Volkswagen Passat Quick Reference Specification Book

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GENERAL INFORMATION

Decimal and Metric Equivalents

Distance/Length

To calculate: mm x 0.03937 = in.

mm	in.	mm	in.	mm	in.	mm	in.
0.002	0.00008	0.01	0.0004	0.1	0.004	1	0.04
0.004	0.00016	0.02	0.0008	0.2	0.008	2	0.08
0.006	0.00024	0.03	0.0012	0.3	0.012	3	0.12
0.008	0.00031	0.04	0.0016	0.4	0.016	4	0.16
0.010	0.00039	0.05	0.0020	0.5	0.020	5	0.20
0.020	0.00079	0.06	0.0024	0.6	0.024	6	0.24
0.030	0.00118	0.07	0.0028	0.7	0.028	7	0.28
0.040	0.00157	0.08	0.0031	0.8	0.031	8	0.31
0.050	0.00197	0.09	0.0035	0.9	0.035	9	0.35
0.060	0.00236	0.10	0.0039	1.0	0.039	10	0.39
0.070	0.00276	0.20	0.0079	2.0	0.079	20	0.79
0.080	0.00315	0.30	0.0118	3.0	0.118	30	1.18
0.090	0.00354	0.40	0.0157	4.0	0.157	40	1.57
0.100	0.00394	0.50	0.0197	5.0	0.197	50	1.97
0.200	0.00787	0.60	0.0236	6.0	0.236	60	2.36
0.300	0.01181	0.70	0.0276	7.0	0.276	70	2.76
0.400	0.01575	0.80	0.0315	8.0	0.315	80	3.15
0.500	0.01969	0.90	0.0354	9.0	0.354	90	3.54
0.600	0.02362	1.00	0.0394	10.0	0.394	100	3.94
0.700	0.02756	2.00	0.0787	20.0	0.787		
0.800	0.03150	3.00	0.1181	30.0	1.181		
0.900	0.03543	4.00	0.1575	40.0	1.575		
1.000	0.03937	5.00	0.1969	50.0	1.969		
2.000	0.07874	6.00	0.2362	60.0	2.362		
3.000	0.11811	7.00	0.2756	70.0	2.756		
4.000	0.15748	8.00	0.3150	80.0	3.150		
5.000	0.19685	9.00	0.3543	90.0	3.543		
6.000	0.23622	10.00	0.3937	100.0	3.937		
7.000	0.27559	20.00	0.7874				
8.000	0.31496	30.00	1.1811				
9.000	0.35433	40.00	1.5748				
10.000	0.39370	50.00	1.9685				
20.000	0.78740	60.00	2.3622				
30.000	1.18110	70.00	2.7559				
40.000	1.57480	80.00	3.1496				
50.000	1.96850	90.00	3.5433				
60.000	2.36220	100.00	3.9370				
70.000	2.75591						
80.000	3.14961						
90.000	3.54331						
100.000	3.93701						

Tightening Torque

Nm-to-lb·ft (ft·lb)

To calculate: Nm x 0.738 = lb·ft

Nm	lb·ft (ft·lb)	Nm	lb·ft (ft·lb)	Nm	lb·ft (ft·lb)
10	7	55	41	100	74
11	8	56	41	105	77
12	9	57	42	110	81
13	10	58	43	115	85
14	10	59	44	120	89
15	11	60	44	125	92
16	12	61	45	130	96
17	13	62	46	135	100
18	13	63	46	140	103
19	14	64	47	145	107
20	15	65	48	150	111
21	15	66	49	155	114
22	16	67	49	160	118
23	17	68	50	165	122
24	18	69	51	170	125
25	18	70	52	175	129
26	19	71	52	180	133
27	20	72	53	185	136
28	21	73	54	190	140
29	21	74	55	195	144
30	22	75	55	200	148
31	23	76	56	205	151
32	24	77	57	210	155
33	24	78	58	215	159
34	25	79	58	220	162
35	26	80	59	225	166
36	27	81	60	230	170
37	27	82	60	235	173
38	28	83	61	240	177
39	29	84	62	245	181
40	30	85	63	250	184
41	30	86	63	260	192
42	31	87	64	270	199
43	32	88	65	280	207
44	32	89	66	290	214
45	33	90	66	300	221
46	34	91	67	310	229
47	35	92	68	320	236
48	35	93	69	330	243
49	36	94	69	340	251
50	37	95	70	350	258
51	38	96	71	360	266
52	38	97	72	370	273
53	39	98	72	380	280
54	40	99	73	390	288
55	41	100	74	400	295

Nm-to-lb-in (in·lb), kg·cm

To calculate: Nm x 8.85 = lb-in • Nm x 10.20 = kg·cm

Nm	lb-in (in·lb)	kg·cm	Nm	lb-in (in·lb)	kg·cm
1	9	10	26	230	265
2	18	20	27	239	275
3	27	31	28	248	286
4	35	41	29	257	296
5	44	51	30	266	306
6	53	61	31	274	316
7	62	71	32	283	326
8	71	82	33	292	337
9	80	92	34	301	347
10	89	102	35	310	357
11	97	112	36	319	367
12	106	122	37	327	377
13	115	133	38	336	387
14	124	143	39	345	398
15	133	153	40	354	408
16	142	163	41	363	418
17	150	173	42	372	428
18	159	184	43	381	438
19	168	194	44	389	449
20	177	204	45	398	459
21	186	214	46	407	469
22	195	224	47	416	479
23	204	235	48	425	489
24	212	245	49	434	500
25	221	255	50	443	510

N·cm-to-lb-in (in·lb), kg·cm

To calculate: N·cm x 0.089 = lb-in • N·cm x 0.102 = kg·cm

N·cm	lb-in (in·lb)	kg·cm	N·cm	lb-in (in·lb)	kg·cm
50	4	5	250	22	25
60	5	6	300	27	31
70	6	7	350	31	36
80	7	8	400	35	41
90	8	9	450	40	46
100	9	10	500	44	51
110	10	11	550	49	56
120	11	12	600	53	61
130	12	13	650	58	66
140	12	14	700	62	71
150	13	15	750	66	76
160	14	16	800	71	82
170	15	17	850	75	87
180	16	18	900	80	92
190	17	19	950	84	97
200	18	20	1000	89	102

kg·cm-to-lb·in (in·lb), N·cm

To calculate: $\text{kg}\cdot\text{cm} \times 0.868 = \text{lb}\cdot\text{in}$ • $\text{kg}\cdot\text{cm} \times 9.81 = \text{N}\cdot\text{cm}$

kg·cm	lb·in (in·lb)	N·cm		kg·cm	lb·in (in·lb)	N·cm
5	4	49		110	95	1079
6	5	59		120	104	1177
7	6	69		130	113	1275
8	7	78		140	122	1373
9	8	88		150	130	1471
10	9	98		160	139	1569
20	17	196		170	148	1667
30	26	294		180	156	1765
40	35	392		190	165	1863
50	43	490		200	174	1961
60	52	588		210	182	2059
70	61	686		220	191	2157
80	69	785		230	200	2256
90	78	883		240	208	2354
100	87	981		250	217	2452

Warnings and Cautions

WARNINGS

- Some repairs may be beyond your capability. If you lack the skills, tools and equipment, or a suitable workplace for any procedure described in this manual, we suggest you leave such repairs to an authorized dealer service department or other qualified shop.
- Do not reuse any fasteners that have become worn or deformed during normal use. Many fasteners are designed to be used only once and become unreliable and may fail when used a second time. This includes, but is not limited to, nuts, bolts, washers, self-locking nuts or bolts, circlips and cotter pins. Always replace these fasteners with new parts.
- Never work under a lifted car unless it is solidly supported on stands designed for the purpose. Do not support a car on cinder blocks, hollow tiles or other props that may crumble under continuous load. Never work under a car that is supported solely by a jack. Never work under the car while the engine is running.
- If you are going to work under a car on the ground, make sure the ground is level. Block the wheels to keep the car from rolling. Disconnect the battery negative (-) terminal (ground strap) to prevent others from starting the car while you are under it.

- Never run the engine unless the work area is well ventilated. Carbon monoxide kills.
- Remove rings, bracelets and other jewelry so they cannot cause electrical shorts, get caught in running machinery, or be crushed by heavy parts.
- Tie back long hair. Do not wear a necktie, a scarf, loose clothing, or a necklace when you work near machine tools or running engines. If your hair, clothing, or jewelry were to get caught in the machinery, severe injury could result.
- Do not attempt to work on your car if you do not feel well. You increase the danger of injury to yourself and others if you are tired, upset, or have taken medication or any other substance that may keep you from being fully alert.
- Illuminate your work area adequately but safely. Use a portable safety light for working inside or under the car. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel, vapors or oil.
- Use a suitable container to catch draining fuel, oil, or brake fluid. Do not use food or beverage containers that might mislead someone into drinking from them. Store flammable fluids away from fire hazards. Wipe up spills at once, but do not store oily rags which can ignite and burn spontaneously.
- Always observe good workshop practices. Wear goggles when you operate machine tools or work with battery acid. Wear gloves or other protective clothing whenever the job requires working with harmful substances.
- Greases, lubricants and other automotive chemicals contain toxic substances, many of which are absorbed directly through the skin. Read the manufacturer's instructions and warnings carefully. Use hand and eye protection. Avoid direct skin contact
- Disconnect the battery negative (-) terminal (ground strap) whenever you work on the fuel or electrical system. Do not smoke or work near heaters or other fire hazards. Keep an approved fire extinguisher handy.
- Friction materials (such as brake pads or shoes or clutch discs) contain asbestos fibers or other friction materials. Do not create dust by grinding, sanding, or cleaning with compressed air. Avoid breathing dust. Breathing any friction material dust can lead to serious diseases and may result in death.

(WARNINGS cont'd on next page)

WARNINGS *(cont'd)*

- Batteries give off explosive hydrogen gas during charging. Keep sparks, lighted matches and open flame away from the top of the battery. If hydrogen gas escaping from the cap vents is ignited, it ignites the gas trapped in the cells and causes the battery to explode.
- Connect and disconnect battery cables, jumper cables or a battery charger only with the ignition off. Do not disconnect the battery while the engine is running.
- Do not quick-charge the battery (for boost starting) for longer than one minute. Wait at least one minute before boosting the battery a second time.
- Do not allow battery charging voltage to exceed 16.5 volts. If the battery begins producing gas or boiling violently, reduce the charging rate. Boosting a sulfated battery at a high charging rate can cause an explosion.
- The A/C system is filled with chemical refrigerant, which is hazardous. The A/C system should be serviced only by trained technicians using approved refrigerant recovery/recycling equipment, trained in related safety precautions, and familiar with regulations governing the discharging and disposal of automotive chemical refrigerants.
- Do not expose any part of the A/C system to high temperatures such as open flame. Excessive heat increases system pressure and may cause the system to burst.
- Some aerosol tire inflators are highly flammable. Be extremely cautious when repairing a tire that may have been inflated using an aerosol tire inflator. Keep sparks, open flame or other sources of ignition away from the tire repair area. Inflate and deflate the tire at least four times before breaking the bead from the rim. Completely remove the tire from the rim before attempting any repair.
- Some cars are equipped with a Supplemental Restraint System (SRS) that automatically deploys airbags and pyrotechnic seat belt tensioners in the event of a frontal or side impact. These are explosive devices. Handled improperly or without adequate safeguards, they can be accidentally activated and cause serious injury.
- The ignition system produces high voltages that can be fatal. Avoid contact with exposed terminals and use extreme care when working on a car with the engine running or the ignition on.

- Place jack stands only at locations specified by manufacturer. The vehicle lifting jack supplied with the vehicle is intended for tire changes only. Use a heavy duty floor jack to lift the vehicle before installing jack stands.
- Battery acid (electrolyte) can cause severe burns. Flush contact area with water, seek medical attention.
- Aerosol cleaners and solvents may contain hazardous or deadly vapors and are highly flammable. Use only in a well ventilated area. Do not use on hot surfaces (such as engines or brakes).
- Do not remove coolant reservoir or radiator cap with the engine hot. Burns and engine damage may occur.

CAUTIONS

- If you lack the skills, tools and equipment, or a suitable workshop for any procedure described in this manual, we suggest you leave such repairs to an authorized dealer or other qualified shop.
- Before starting a job, make certain that you have all the necessary tools and parts on hand. Read all the instructions thoroughly and do not attempt shortcuts. Use tools appropriate to the work and use only replacement parts meeting original specifications. Makeshift tools, parts and procedures will not make good repairs.
- Use pneumatic and electric tools only to loosen threaded parts and fasteners. Never use these tools to tighten fasteners, especially on light alloy parts. Always use a torque wrench to tighten fasteners to the tightening torque specification listed.
- Be mindful of the environment and ecology. Before you drain the crankcase, find out the proper way to dispose of the oil. Do not pour oil onto the ground, down a drain, or into a stream, pond or lake. Dispose of in accordance with Federal, State and Local laws.
- The control module for the Anti-lock Brake System (ABS) cannot withstand temperatures from a paint-drying booth or a heat lamp in excess of 95°C (203°F) and should not be subjected to temperatures exceeding 85°C (185°F) for more than two hours.
- Before doing any electrical welding on cars equipped with ABS, disconnect the battery negative (-) terminal (ground strap) and the ABS control module connector.
- Always make sure the ignition is off before disconnecting battery.

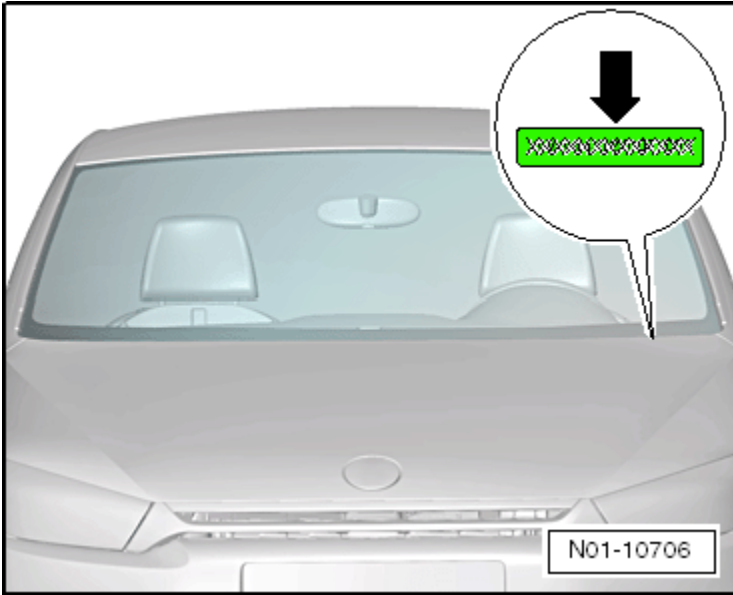
(CAUTIONS cont'd on next page)

CAUTIONS *(cont'd)*

- Label battery cables before disconnecting. On some models, battery cables are not color coded.
- Disconnecting the battery may erase fault code(s) stored in control module memory. Check for fault codes prior to disconnecting the battery cables.
- If a normal or rapid charger is used to charge the battery, disconnect the battery and remove it from the vehicle to avoid damaging paint and upholstery.
- Do not quick-charge the battery (for boost starting) for longer than one minute. Wait at least one minute before boosting the battery a second time.
- Connect and disconnect a battery charger only with the battery charger switched off.
- Sealed or “maintenance free” batteries should be slow-charged only, at an amperage rate that is approximately 10% of the battery’s ampere-hour (Ah) rating.
- Do not allow battery charging voltage to exceed 16.5 volts. If the battery begins producing gas or boiling violently, reduce the charging rate. Boosting a sulfated battery at a high charging rate can cause an explosion.

VEHICLE IDENTIFICATION

Vehicle Identification Number (VIN) Location



Vehicle
Identification

The VIN (➡) is on the left side of the vehicle in the area of the windshield wiper mount. It is visible from the outside.

VIN Decoder

2014 Volkswagen VIN Decoder (except Routan)

E = 2014

Sequential production number (position 12 - 17)

Country of origin	Manufacturer	Vehicle Type	Series	Engine	Restraint system	Model (7 & 8)	Check digit	Model year	Assembly plant	12	13	14	15	16	17	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
W	V	G	C	V	3	A	X	8	E	W	5	3	2	0	1	4

Series:

A* CC Sport w/Man Trans, Passat S, Tiguan w/Auto Trans

B* CC Sport/Sport w/Auto Trans, EOS Komfort/Sport w/Auto Trans, Jetta SE w/Spd Man, Passat SE Tiguan w/Auto Trans and 4 Motion

C* Golf 4dr w/Spd Manual, Passat SEL, Tiguan w/Man Trans

D* Golf 4dr w/Auto Trans, Jetta SE w/Auto Trans, Touareg V6 FSI/TDI R-Line

E* Touareg V6 FSI/TDI Hybrid

F* Beetle w/Spd Auto Trans, EOS Lux/Exec w/Auto Trans

G* CC V6 Exec w/Auto Trans and 4Motion, GTI 4dr w/Man Trans, Jetta SEL w/Spd Man Trans

H* Beetle 1.8T w/Spd Man Trans, CC V6 Exec w/Auto Trans, Beetle 2.5L w/Spd Manual, GTI 4dr w/Auto Trans

J* Beetle 1.8T w/Spd Auto Trans, Beetle 2.5L TDI w/Spd Auto Trans

K* Jetta SportWagen w/Spd Man Trans

L* Jetta SEL/TDI w/Auto Trans

M* Jetta SportWagen w/Spd Manual

N* Golf 4dr w/Spd Manual

P* Jetta SportWagen w/Spd Auto Trans

R* Beetle TDI w/Spd Man, CC Exec w/Auto Trans

S* Jetta TDI w/Spd Man

V* Beetle R-Line w/Spd Auto Trans

1* Jetta / S w/Spd Manual

2* Jetta / S w/Auto Trans

3* Jetta TDI w/Spd Man

4* Beetle R-Line w/Spd Manual, Jetta GLI w/Auto Trans

5* Beetle Conv. 1.8T w/Spd Auto Trans, Beetle Conv. 2.5L TDI w/Spd Auto Trans, Jetta GLI w/Spd Manual

6* Beetle Conv. TDI w/Spd Man Trans, Jetta Hybrid w/Auto Trans

7* Beetle Conv. R-Line w/Spd Auto Trans

8* Beetle Conv. R-Line w/Spd Man Trans

WWW = Europe - Pass. Car
VW = USA - Pass. Car
3W = Mexico - Pass. Car
WVG = Europe - S.U.V.

A3** = Passat
AH (F) = EOS
AJ (F) = Golf, GTI, Jetta, Jetta SportWagen
AN (C) = CC
AT = Beetle, Beetle Conv.
AX (S) = Tiguan
BP (P) = Touareg

C = Chattanooga **P** = Mosel
D = Bratislava **V** = Portugal
E = Emden **W** = Wolfsburg
M = Mexico

*** PZEV** = Partial Zero Emissions Vehicle
**** SULEV II** = Super Low Emissions Vehicle
******* 7 position US model characters are alphabetic beginning with 2010 MY. ROW model characters, where different, are listed in parenthesis (), for reference only.
******** Jetta and Jetta SportWagen models are identified by WMI code of **VW**. GTI and Golf models are identified by WMI code of **WV**.

See back page for NHTSA Code
 Calculate per NHTSA Code
 2014

October 30, 2013 (Rev 4)

2014 Restraint System:

A1 = Active-DriPass - Front Air Bag - DriPass
3 (Tiguan) = Advanced Front Air Bags + Side Impact Air Bags - Front + Side Curtain Air Bags + 4 Star Crash Rated
5 (Jetta Only) or **7 (Jetta SportWagen/CC/Passat)** = Advanced Front Air Bags + Side Impact Air Bags - Fr. + Side Curtain Air Bags
7 = (Beetle/Beetle Conv.) = Advanced Front Air Bags + Side Impact Air Bags - Front + 3 Star Crash Rated
8 (EOS Only) = Advanced Front Air Bags + Side Impact Air Bags - Front + Knee Air Bags - Front + Side Curtain Air Bags
9 (Touareg) = Advanced Front Air Bags + Side Impact Air Bags - Front + Side Curtain Air Bags

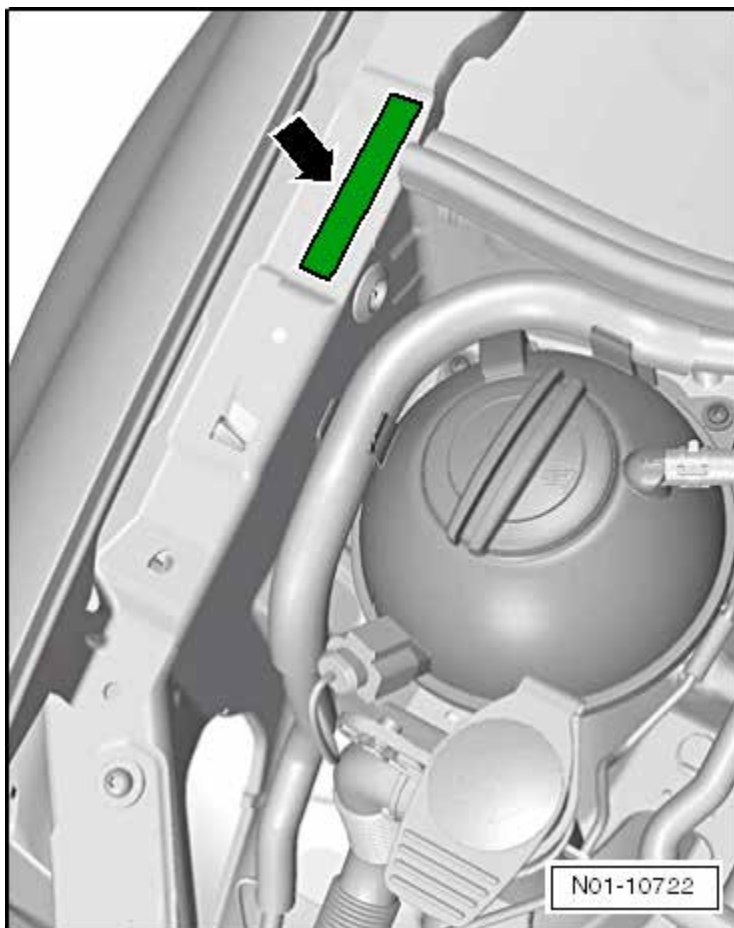
M = 1991
 N = 1992
 P = 1993
 R = 1994
 S = 1995
 T = 1996
 V = 1997
 W = 1998
 X = 1999
 Y = 2000
 1 = 2001
 2 = 2002
 3 = 2003
 4 = 2004
 5 = 2005
 6 = 2006
 7 = 2007
 8 = 2008
 9 = 2009
 A = 2010
 B = 2011
 C = 2012
 D = 2013
 E = 2014

Country of origin	Manufacturer	Vehicle Type	Series	Engine	Restraint system	Model (7 & 8)	Check digit	Model year	Assembly plant	12	13	14	15	16	17	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

Sequential Product Number

2014 Volkswagen VIN Decoder (except Routan)

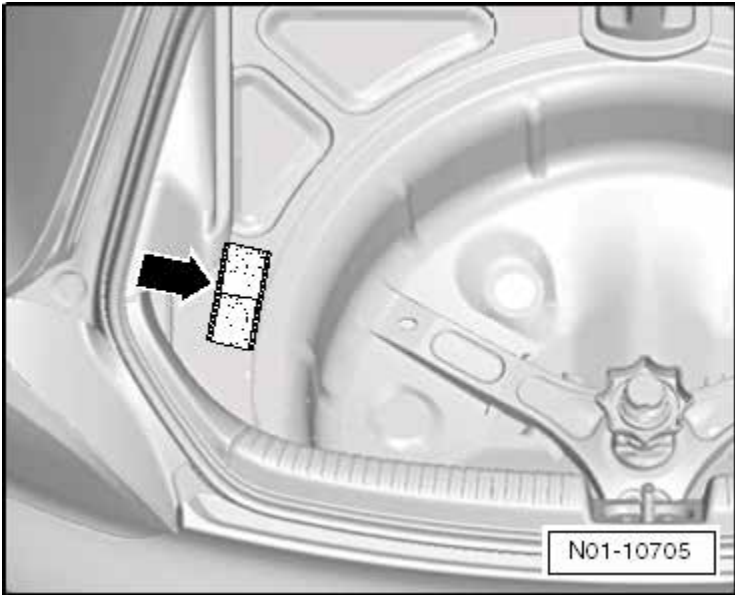
VIN on Longitudinal Member Extension



Vehicle
Identification

The Vehicle Identification Number (VIN) is located on the longitudinal member extension (➡).

Vehicle Data Label



The vehicle data label (➡) is located in the left rear of the vehicle in the spare wheel well. The vehicle data label is also in the customer's maintenance booklet.

SALES CODES

Engine Codes

CPKA, CPRA	1.8L 4-cylinder
CKRA	2.0L 4-cylinder Turbo Diesel (TDI)
CBTA/CBUA	2.5L 5-cylinder
CDVB	3.6L 6-cylinder

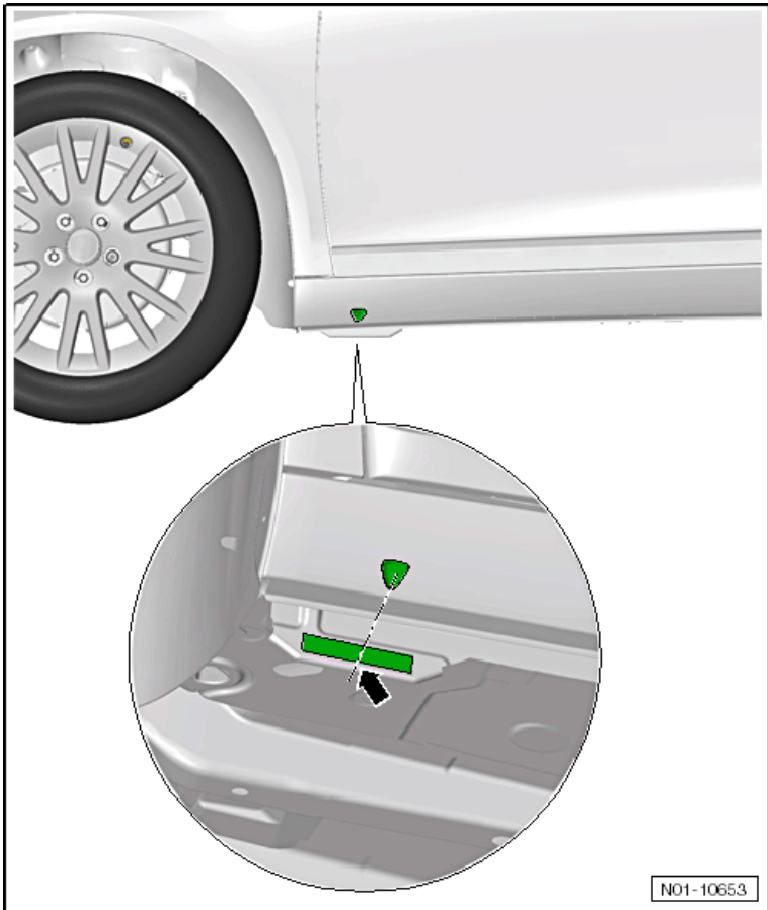
Transmission Codes

0A4	5-speed manual
02Q	6-speed manual
02E	6-speed Direct Shift Gearbox (DSG)
09G	6-speed automatic

VEHICLE LIFTING

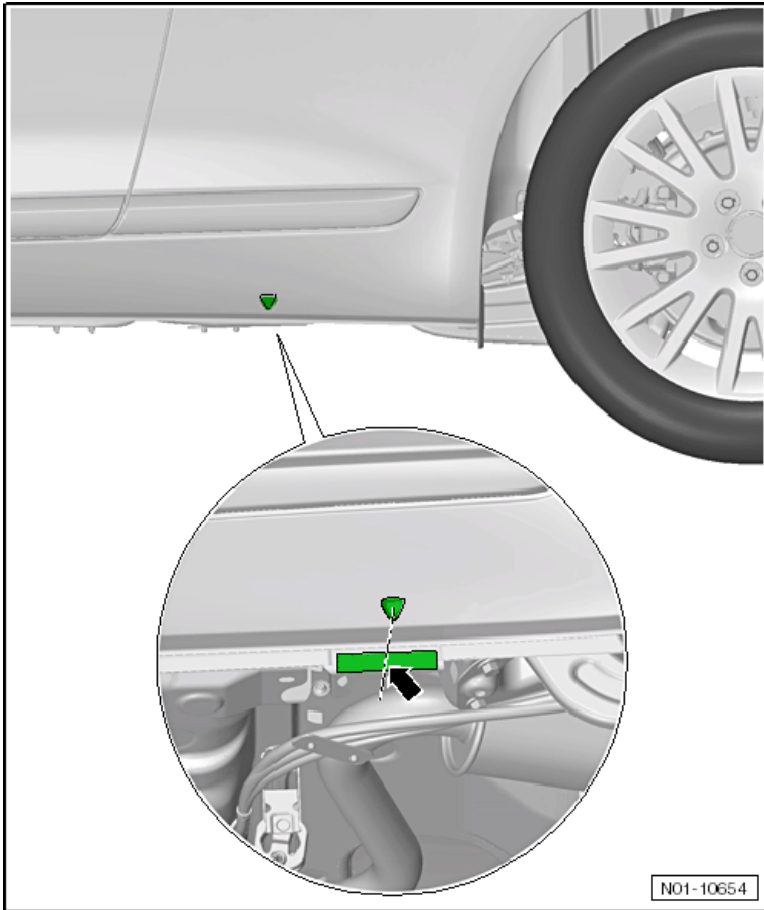
Hoist and Jack Mounting Points

Front



Position the support plate in the side member vertical reinforcement area (➡).

Rear



Position the support plate in the side member vertical reinforcement area (➡).



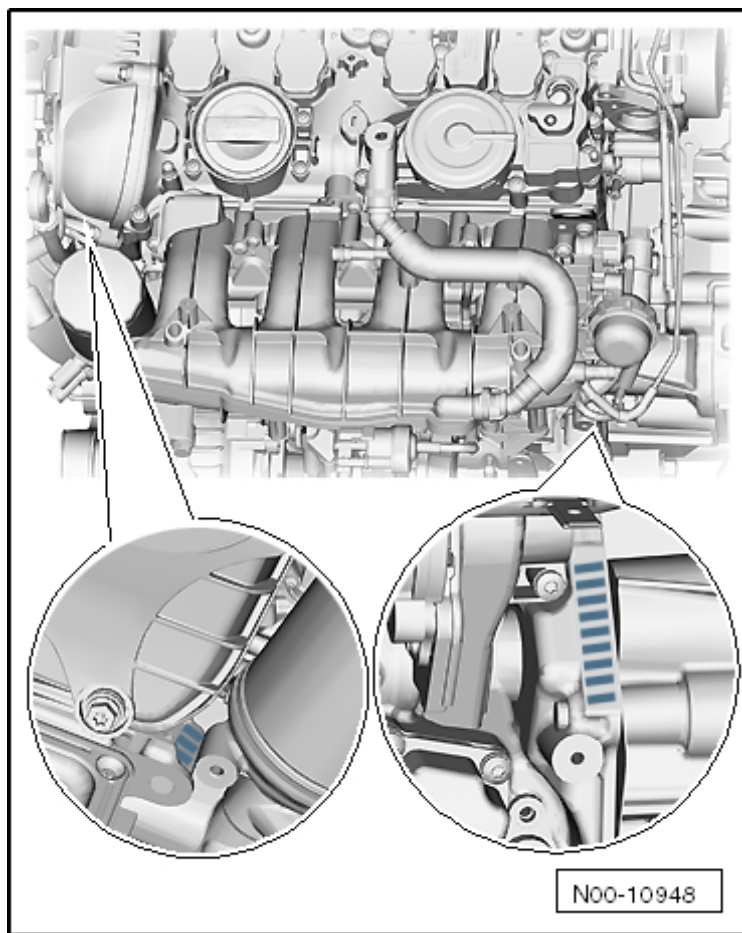
WARNING

Make sure the side member stiffener contacts the support plate of the lifting platform at center.

ENGINE MECHANICAL – 1.8L CPKA, CPRA

General, Technical Data

Engine Number Location



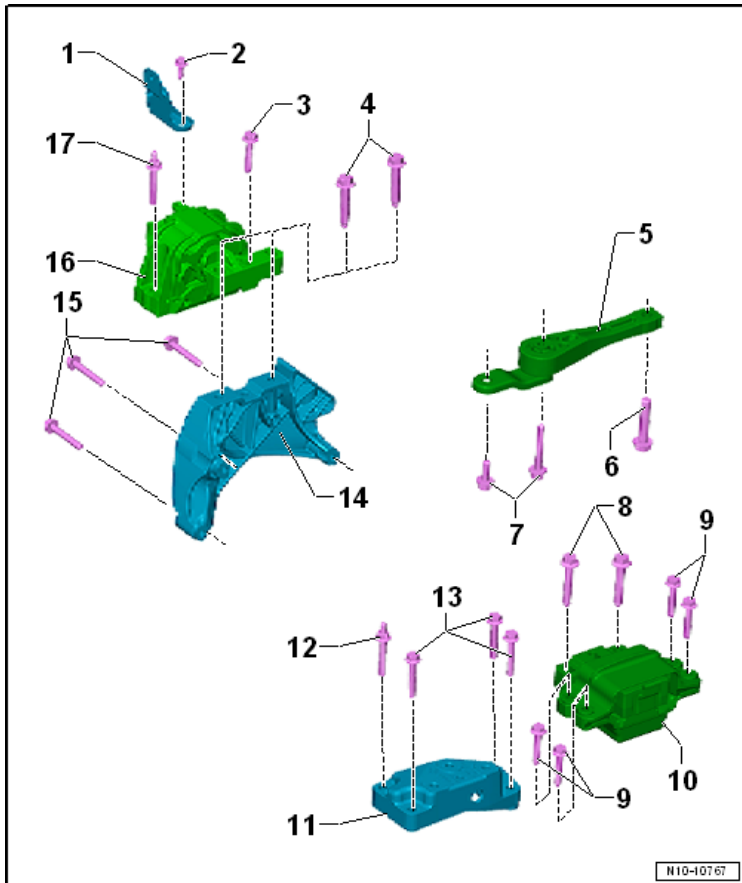
The engine number “engine code” and “serial number” are located at the engine/transmission joint. The engine code is also printed behind the oil filter on the cylinder block. There is also a label glued to the timing chain cover with the “engine code” and “serial number”. The first three digits describe the mechanical structure of the engine and are still stamped on the engine. The fourth digit describes the engine output and torque and depends on the engine control module. Four-digit engine codes are found on the type plate and vehicle data label. It can also be read via the engine control module.

Engine Data

Identification code		CPRA	CPKA
Emission values		PZEV SULEV	BIN 5 TIER 2
Displacement	liter	1.8	1.8
Output	kW at RPM	125 (at 4800 to 6200)	125 at 4800 to 6200
Torque	Nm at RPM	250 at 1500 to 4750	250 at 1500 to 4750
Bore	diameter mm	82.5	82.5
Stroke	mm	84.1	84.1
Valves per cylinder		4	4
Compression ratio		9.6:1	9.6:1
RON		95 unleaded (in exceptional cases, minimum 91 RON, but with reduced performance)	95 unleaded (in exceptional cases, minimum 91 RON, but with reduced performance)
Injection system/ignition system		TFSI/SIMOS 12	TFSI/SIMOS 12
Ignition sequence		1-3-4-2	1-3-4-2
Turbocharger		Turbocharger	Turbocharger
Variable valve timing		Yes (Intake)	Yes (Intake)
Secondary air injection (AIR)		Yes	Yes
Valves per cylinder		4	4
Oil pressure control		Yes	Yes

Engine Assembly – 1.8L CPKA, CPRA

Assembly Mounts Overview



1 - Bolt

- Tightening specification see Engine support - tightening specification and sequence below
- Engine support to engine
- Replace after removing

2 - Engine Mount

3 - Bolt

- 40 Nm + 90° turn
- Engine mount to body
- Replace after removing

4 - Bracket

5 - Bolt

- 20 Nm + 90° turn
- Bracket to engine mount and body
- Replace after removing

6 - Bolt

- 40 Nm + 90° turn
- Engine mount to body
- Replace after removing

7 - Bolt

- 60 Nm + 90° turn
- Engine mount to engine support
- Replace after removing

8 - Pendulum Support**9 - Bolt**

- Tightening specification, see Install the Pendulum Support below
- Replace after removing

10 - Bolt

- Tightening specification, see Install the Pendulum Support below
- Replace after removing

11 - Bolt

- 60 Nm + 90° turn
- Transmission mount to transmission support
- Replace after removing

12 - Bolt

- 40 Nm + 90° turn
- Transmission mount to body
- Replace after removing

13 - Transmission Mount

- The illustration shows the DSG transmission version

14 - Gearbox Support**15 - Bolt**

- Double Bolt
- Transmission support to transmission
- Tightening specification, see Manual Transmission or DSG Transmission

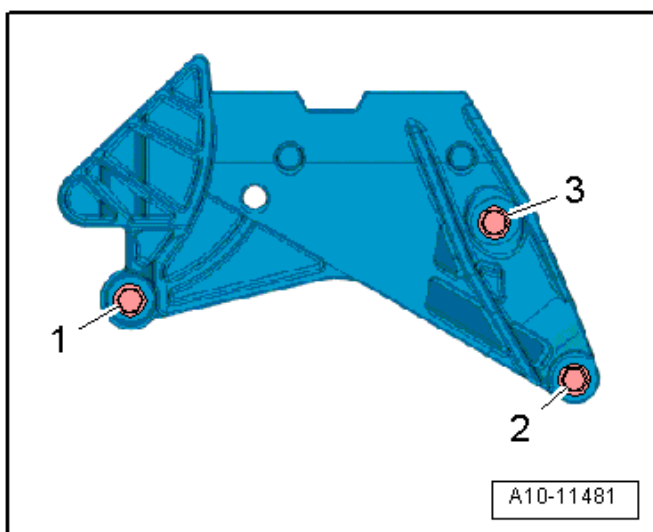
16 - Engine Mount

- Transmission support to transmission
- Tightening specification, see Manual Transmission or DSG Transmission

17 - Engine Support**Fastener Tightening Specifications**

Component	Fastener size	Nm
Bolts and nuts	M6	10
	M7	15
	M8	20
	M10	40
	M12	65

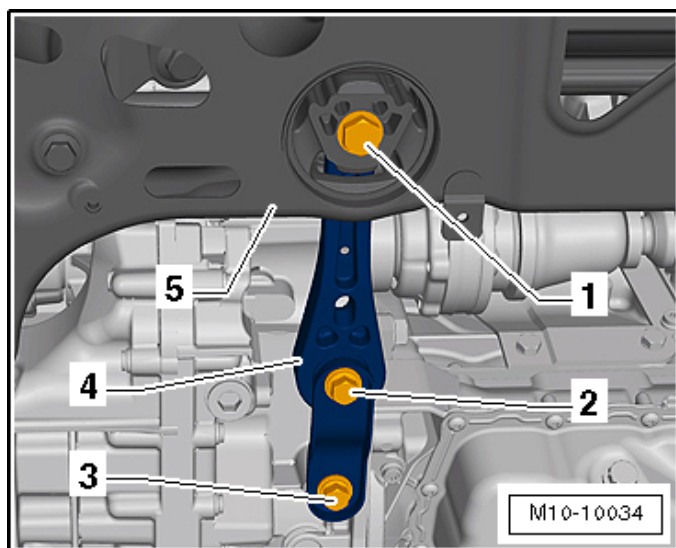
Engine Support - Tightening Specification and Sequence



Tighten the bolts in steps in the sequence -1- to -3-.

Stage	Bolts	Nm
1	-1- through -3-	7
2	-1- through -3-	40
3	-1- through -3-	Tighten 90° additional turn

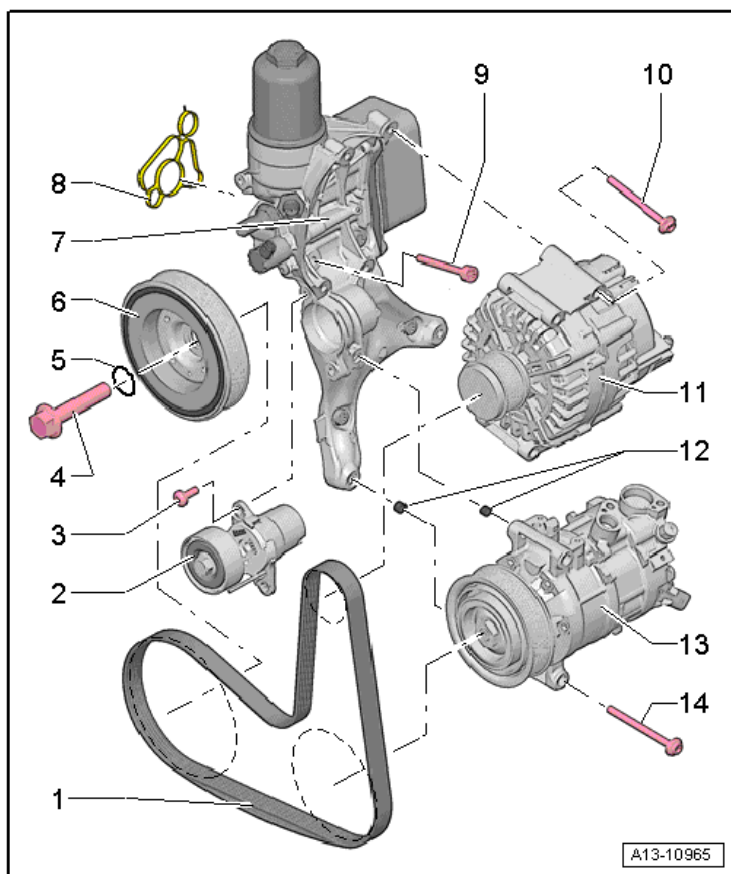
Install the Pendulum Support



Step	Component	Nm
1	Tighten bolts A ¹⁾	50 plus an additional 90° (¼ turn)
2	Tighten bolts B ¹⁾	50 plus an additional 90° (¼ turn)
3	Tighten bolts C ¹⁾	100 plus an additional 90° (¼ turn)

Crankshaft, Cylinder Block – 1.8L CPKA, CPRA

Cylinder Block Overview, Belt Pulley Side



1 - Ribbed Belt

2 - Ribbed Belt Tensioning Damper

3 - Bolt

- 8 Nm +45° turn
- Replace after removing

4 - Bolt

- 150 Nm + 90° turn
- Replace after removing
- Lubricate O-ring

5 - O-Ring

6 - Vibration Damper

7 - Auxiliary Components Bracket

8 - Seal

- Replace after removing

9 - Bolt

- Tightening specification, see Ribbed Belt Transmission Side Sealing Flange - Tightening Specifications and Sequence below

10 - Bolt

- Tightening specification, refer to Electrical Equipment

11 - Generator

12 - Alignment Sleeves

13 - A/C Compressor

14 - Bolt

- Tightening specification, refer to Heating, Ventilation and Air Conditioning

15 - Bolt

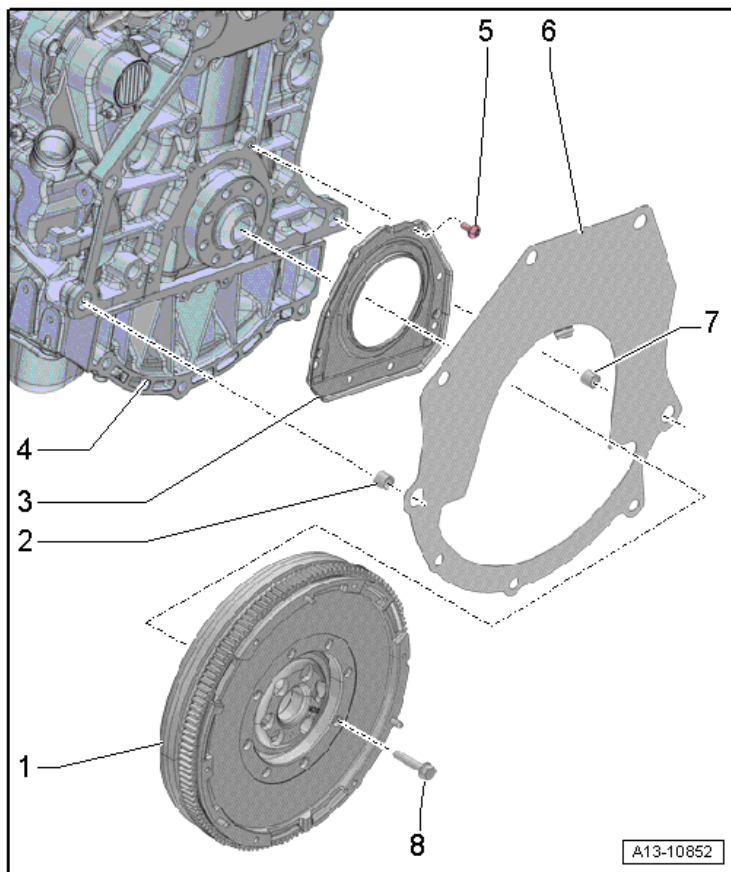
-
- Transmission support to transmission
- Tightening specification, see Manual Transmission or DSG Transmission

16 - Engine Mount

- Transmission support to transmission
- Tightening specification, see Manual Transmission or DSG Transmission

17 - Engine Support Cylinder Block Overview,

Cylinder Block Overview, Transmission Side



1 - Flywheel

2 - Alignment Sleeve

3 - Sealing Flange, Transmission Side

4 - Cylinder Block

5 - Bolt

- Tightening specification and sequence, see Ribbed Belt
Transmission Side Sealing Flange - Tightening Specifications and
Sequence below

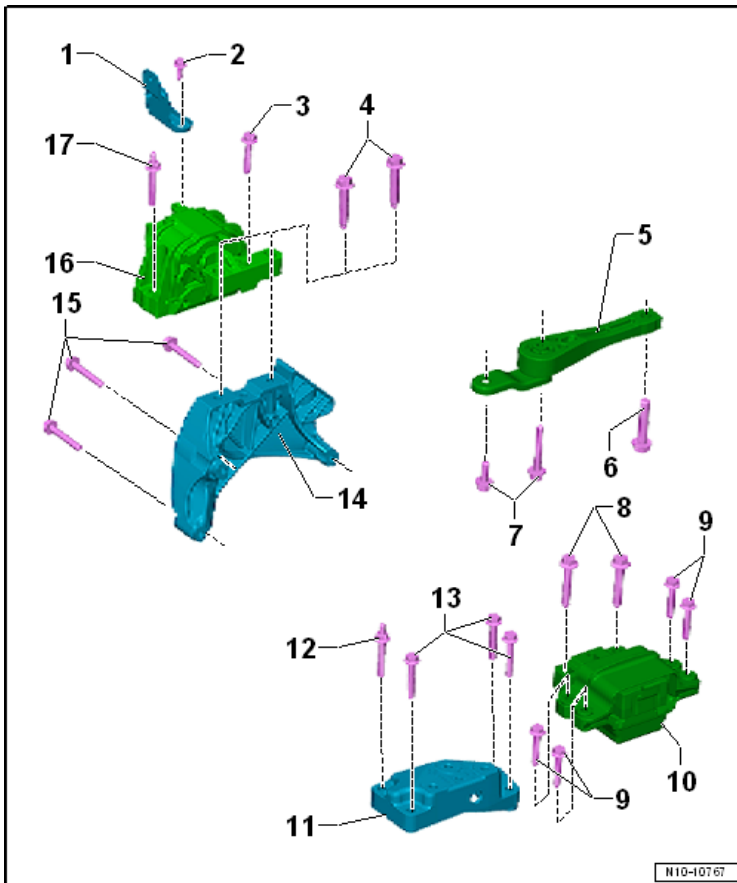
6 - Intermediate Plate

7 - Alignment Sleeve

8 - Bolt

- 60 Nm + 90° turn
- For dual-mass flywheel
- Replace after removing

Drive Plate Overview



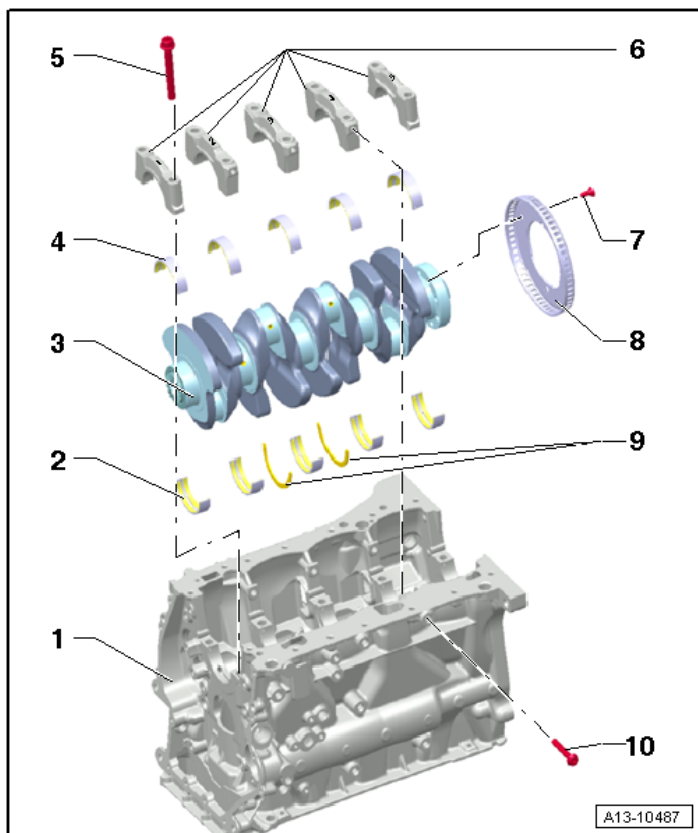
1 - Washer with Recessesg

2 - Shim

3 - Bolts

- 60 Nm + 90° turn (additional turning can occur in several stages).
- Replace after removing

Crankshaft Overview



1 - Cylinder Block

2 - Bearing Shell for Cylinder Block

3 - Crankshaft

4 - Bearing Shell for Bearing Cap

5 - Bolt

Replace after removing

Tightening specification and sequence, see Crankshaft, Tightening Sequence below

6 - Bearing Cap

7 - Bolt

10 Nm + 90° turn

Replace after removing

8 - Sensor Wheel

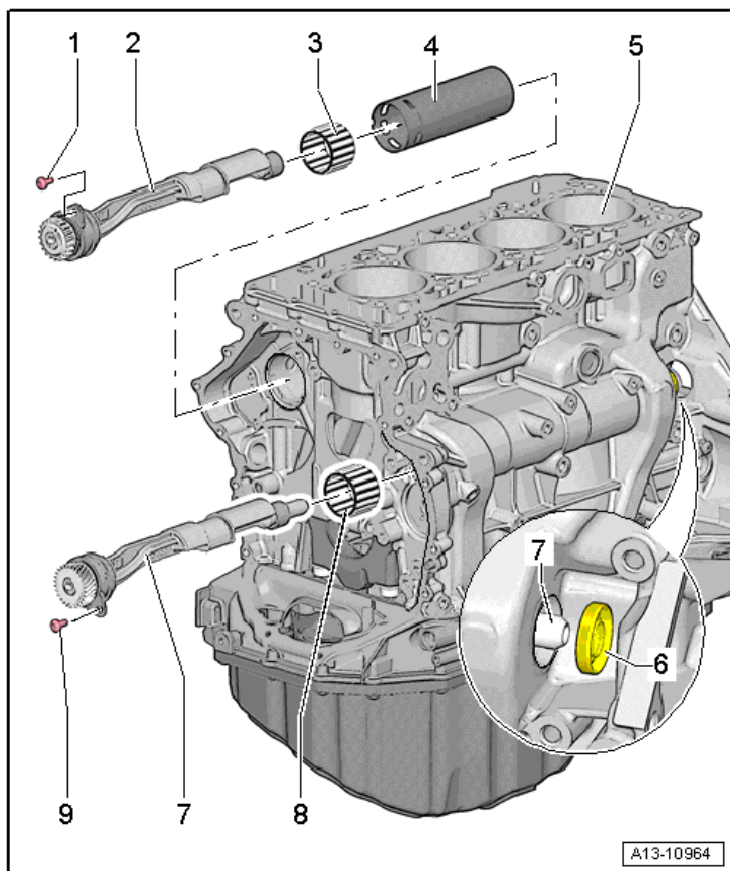
9 - Thrust Washers

10 - Bolt

Replace after removing

Tightening specification and sequence, see Crankshaft, Tightening Sequence below

Balance Shaft Overview



1 - Bolt

- 4 Nm + 45° turn
- Replace after removing

2 - Balance Shaft

- Exhaust side

3 - Needle Bearing Rim

4 - Pipe for the Balance Shaft

5 - Cylinder Block

6 - Balance Shaft Seal Intake Side

7 - Balance Shaft

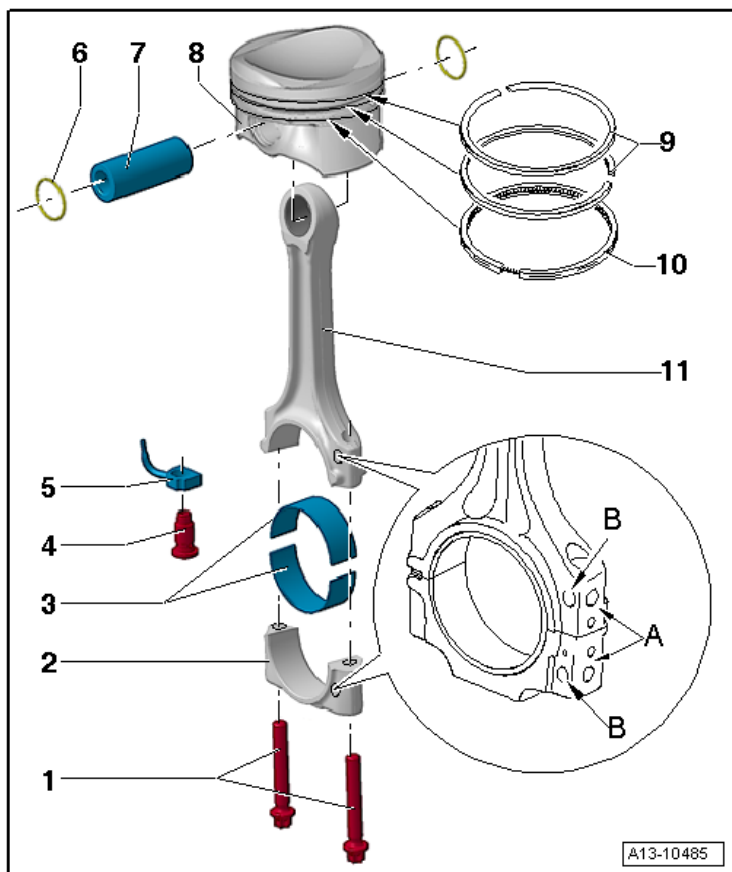
- Intake side

8 - Needle Bearing Rim

9 - 4 Nm + 45° turn

- Replace after removing
- Replace after removing

Pistons and Connecting Rods Overview



1 - Connecting Rod Bolts

- 45 Nm + 90° turn
- Replace after removing
- Lubricate the thread and contact surface.

2 - Connecting Rod Bearing Cap

- Exhaust side

3 - Bearing Shells

4 - Relief Valve

- 27 Nm

5 - Oil Spray Jet

6 - Locking Ring

7 - Piston Pin

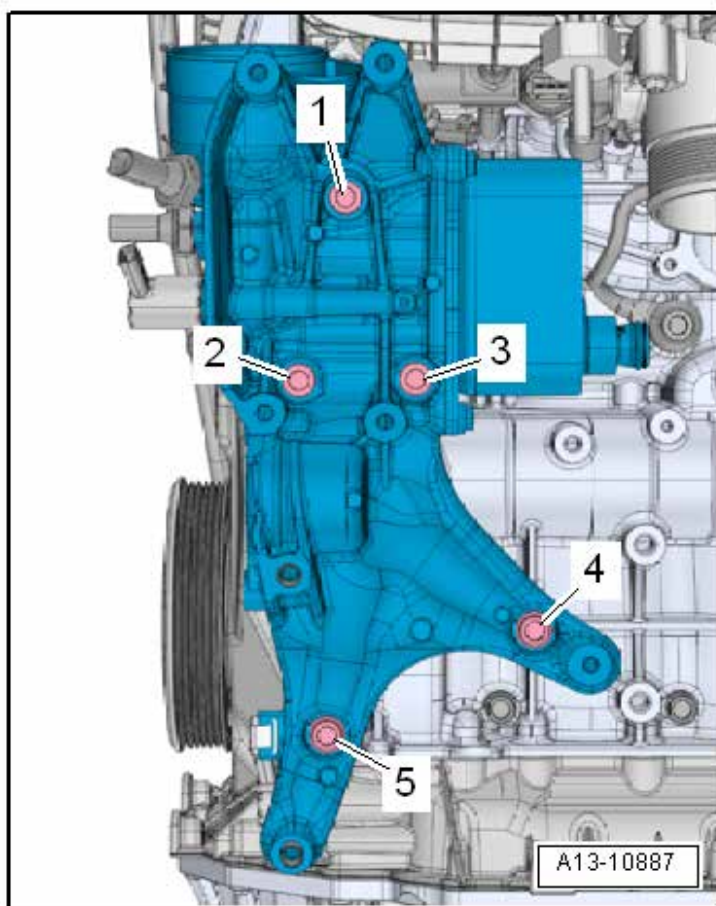
8 - Piston

9 - Compression Rings

10 - Oil Scraping Ring

11 - Connecting Rod

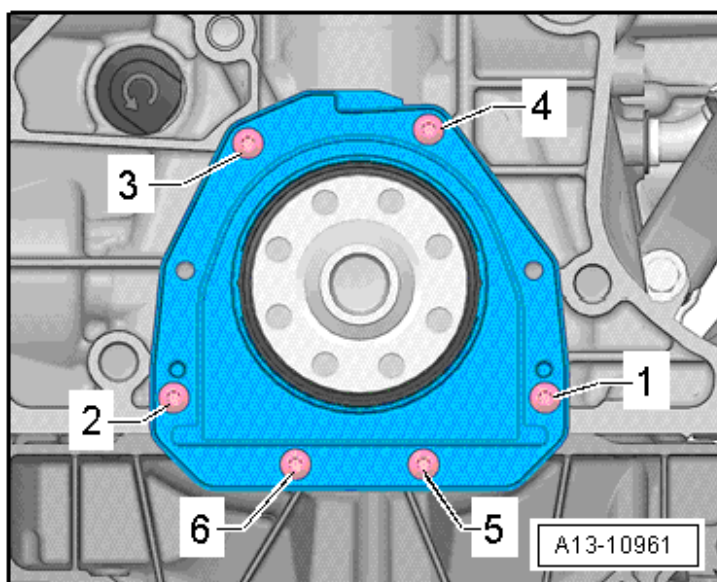
Accessory Assembly Bracket - Tightening Specifications And Tightening Sequence



Tighten the bolts in steps in the sequence -1- to -3-.

Stage	Bolts	Nm
1	-1- through -5-	Tighten by hand
2	-1- through -5-	Tighten to 20 Nm
3	-1- through -5-	Tighten 90° additional turn

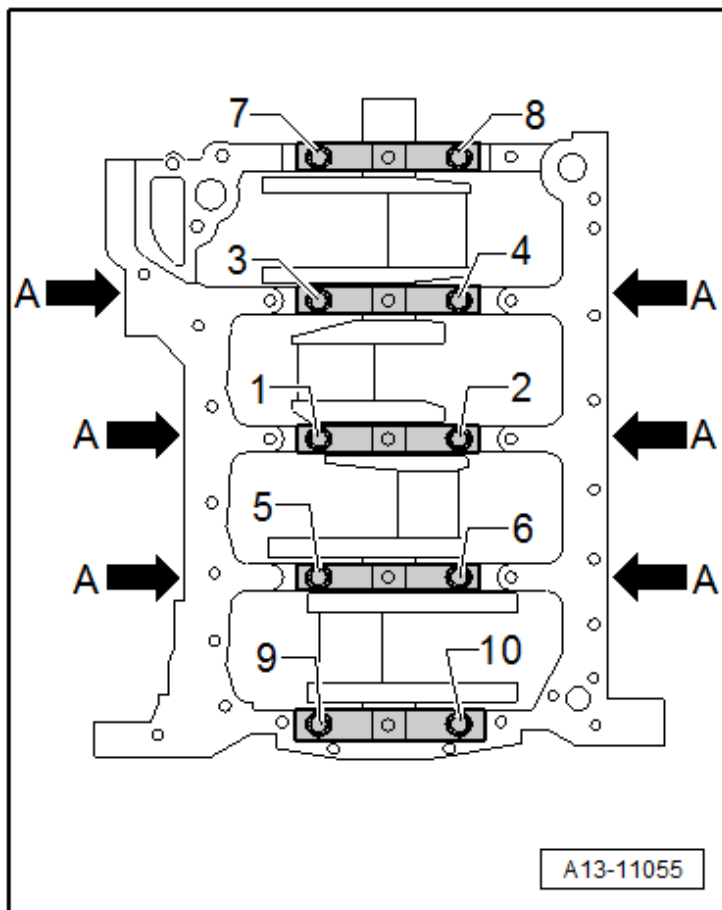
Ribbed Belt Transmission Side Sealing Flange - Tightening Specifications and Sequence



Tighten the bolts in steps in the sequence -1- to -6-.

Stage	Bolts	Nm
1	-1- through -6-	Tighten by hand
2	-1- through -6-	9

Crankshaft, Tightening Sequence



Tighten the bolts in steps in the sequence -1- to -10- and -arrows A-.

Stage	Bolts	Nm
1	-1- through -3-	Tighten by hand
2	-1- through -3-	Tighten to 65 Nm
3	-1- through -3-	Turn another 90° using a rigid wrench.
4	-Arrows A-	Tighten to 20 Nm
5	-Arrows A-	Turn another 90° using a rigid wrench.

Crankshaft Dimensions

Reconditioning dimension ¹⁾	Crankshaft bearing pin diameter	Connecting rod bearing pin diameter
Basic dimension	58.00	47.80

¹⁾ The preparation of worn crankshafts is not provided.

Piston and Cylinder Dimensions

Honing dimension in mm	Piston diameter ¹⁾	Cylinder bore diameter
Basic dimension	82.465	82.51

¹⁾ Measurement with coating (thickness = 0.02 mm). The coating wears off.

Piston Ring End Gaps

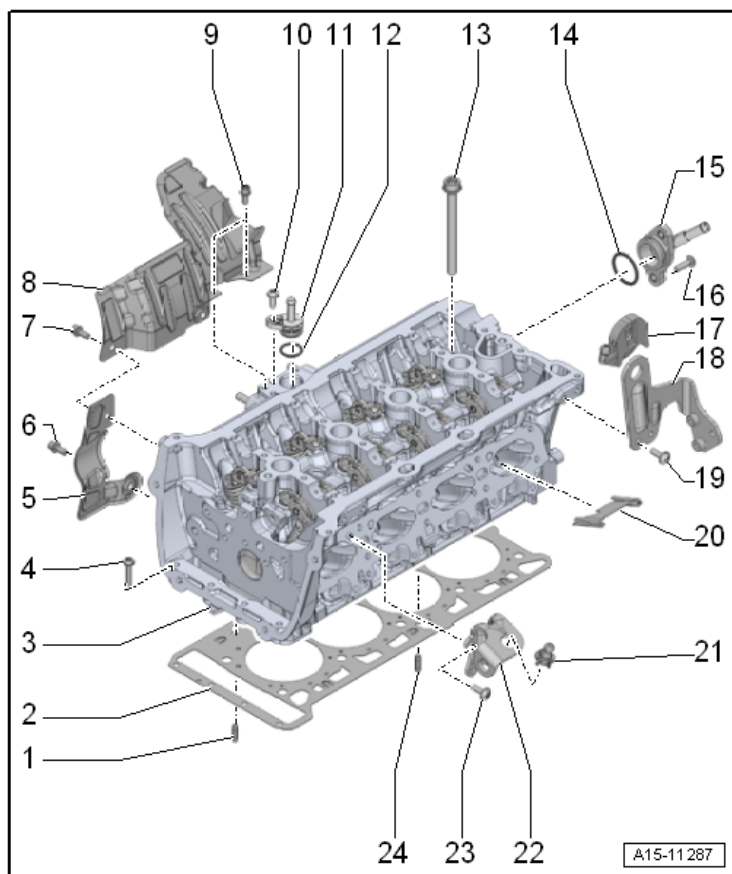
Piston ring gap dimensions in mm	New	Wear limit
Compression ring	0.20 to 0.40	0.80
Oil scraping ring	0.25 to 0.50	0.80

Piston Ring Clearance

Piston ring to groove clearance dimensions in mm	New	Wear limit
1 st compression ring	0.06 to 0.09	0.20
2 nd compression ring	0.03 to 0.06	0.15
Oil scraping ring	Cannot be measured	

Cylinder Head, Valvetrain – 1.8L CPKA, CPRA

Cylinder Head Overview



1 - Alignment Pin

2 - Cylinder Head Gasket

3 - Cylinder Head

4 - Bolt

- Replace after removing
- Procedure when loosening, see Loosening the Cylinder Head below
- Tightening specification, see Cylinder Head Tightening Sequence below

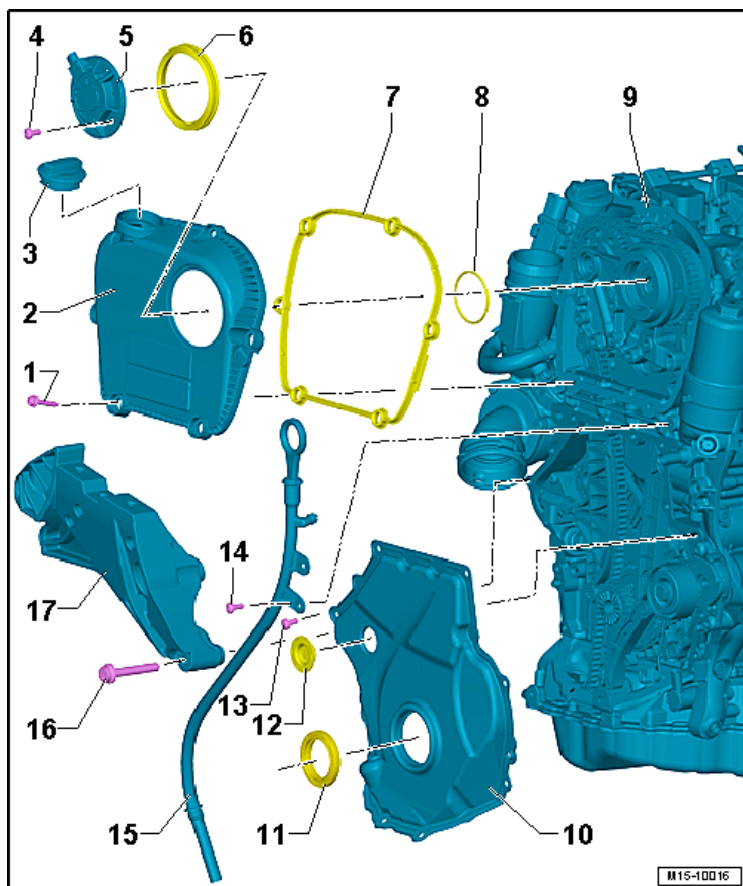
5 - Heat Shield

6 - Bolt

- 9 Nm

- 7 - Bolt**
 - 9 Nm
- 8 - Heat Shield**
- 9 - Bolt**
 - 9 Nm
- 10 - Bolt**
 - 9 Nm
- 11 - Connecting Piece**
- 12 - O-ring**
- 13 - Cylinder Head Bolt**
 - Procedure when loosening, see Loosening the Cylinder Head below
 - Tightening specification, see Cylinder Head Tightening Sequence below
- 14 - O-ring**
 - Coat with coolant
- 15 - Connecting Piece**
- 16 - Bolt**
 - 9 Nm
- 17 - Base Plate**
 - For engine cover
- 18 - Engine Lifting Eye**
- 19 - Bolt**
 - 8 Nm + 90° turn
 - Replace after removing
- 20 - Partition Plate**
- 21 - Ball Pin**
- 22 - Engine Lifting Eye**
- 23 - Bolt**
 - 8 Nm + 90° turn
 - Replace after removing
- 24 - Alignment Pin**

Timing Chain Cover Overview



1 - Bolt

- Tightening specification, see Timing Chain Guard Upper Cover - Tightening Sequence below

2 - Timing Chain Cover Upper Section

3 - Cover

4 - Bolt

- 4 Nm + 45° turn
- Replace after removing

5 - Camshaft Adjustment Valve 1 -N205-

6 - Seal

7 - Seal

8 - O-ring

9 - Engine

10 - Timing Chain Cover Lower Section

11 - Shaft Seal

12 - Plug

13 - Bolt

- Replace after removing
- Tightening sequence eight bolts, see Timing Chain Lower Cover Tightening Sequence below
- Tightening sequence 15 bolts, see Timing Chain Guard Lower Section - Tightening Sequence for 15 Bolts below

14 - Bolt

- 9 Nm

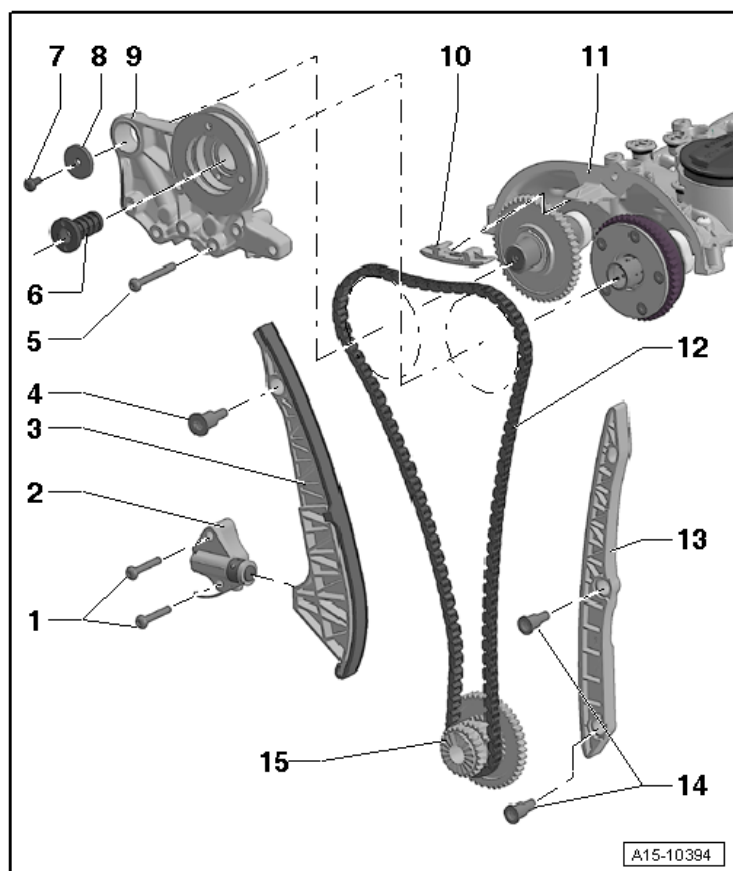
15 - Oil Dipstick Tube

16 - Bolt

- Tightening specification, see Assembly Mounts Overview

17 - Engine Support

Camshaft Timing Chain Overview



1 - Bolt

- 4 Nm + 90° turn
- Replace after removing

2 - Chain Tensioner

3 - Timing Chain Tensioning Rail

4 - Guide Pins

- 20 Nm

5 - Bolt

- 4 Nm + 180° turn
- Replace after removing

6 - Regulator Valve

- 35 Nm
- Left thread

7 - Bolt

- M6 Bolt - 8 Nm + 90° turn
- M8 Bolt - 20 Nm + 90° turn
- Replace after removing

8 - Washer

9 - Bearing Bracket

10 - Camshaft Timing Chain Guide Rail

11 - Camshaft Housing

12 - Camshaft Timing Chain

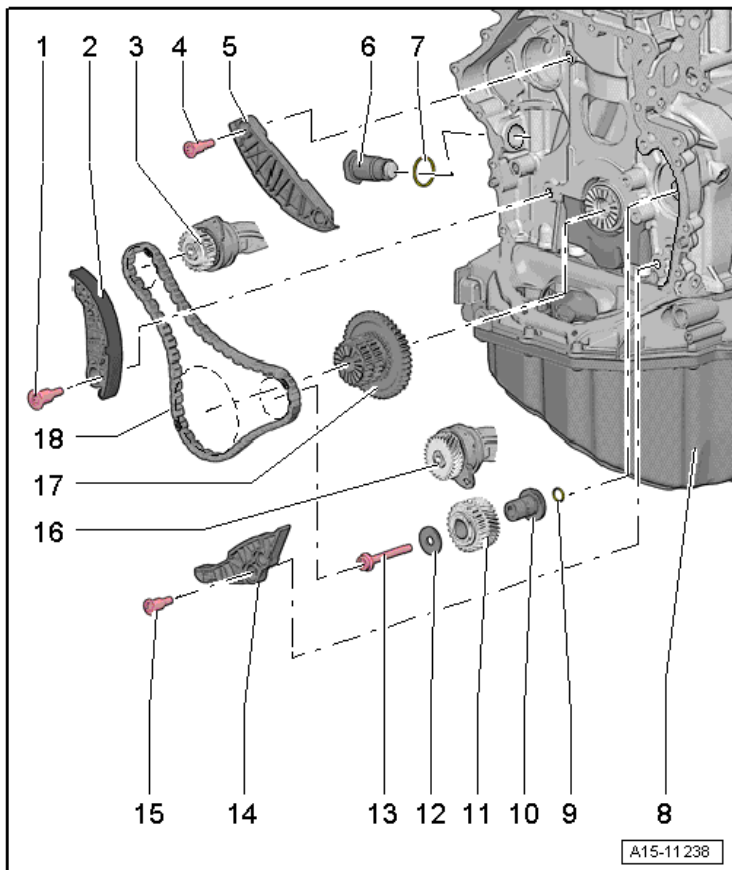
13 - Camshaft Timing Chain Guide Rail

14 - Guide Pins

- 20 Nm

15 - Three Stage Chain Sprocket

Balance Shaft Drive Chain Overview



1 - Guide Pins

- 20 Nm

2 - Tensioning Rail

3 - Balance Shaft

- Exhaust side

4 - Guide Pins

- 20 Nm

5 - Guide Rail

6 - Chain Tensioner

- 85 Nm
- Mount with locking compound see Parts Catalog.

7 - Bolt

- Seal

8 - Cylinder Block

9 - O-ring

10 - Mounting Pin

11 - Intermediate Sprocket

12 - Washer

13 - Bolt

- Tightening sequence, see Intermediate Sprocket Tightening Sequence below
- 20 Nm
- Replace after removing
- The intermediate sprocket must be replaced if the bolt is loosened.

14 - Guide Rail

15 - Guide Pins

- 20 Nm

16 - Balance Shaft

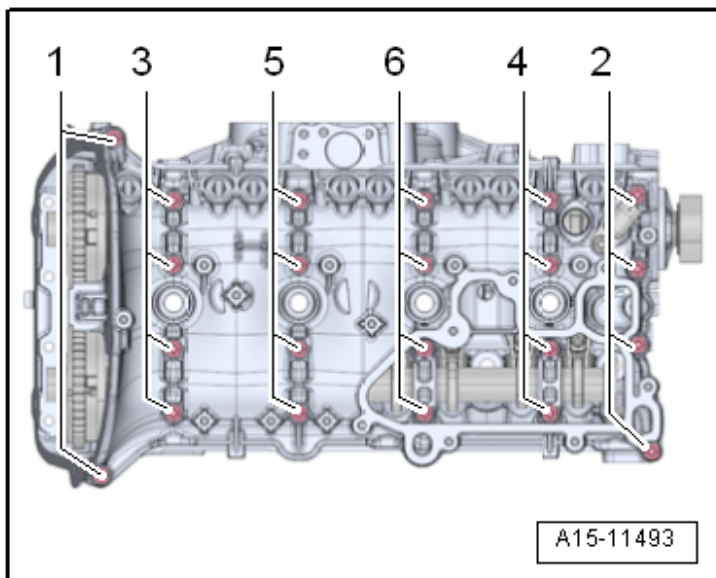
- Intake side

17 - Three Stage Chain Sprocket

18 - Balance Shaft Drive Chain

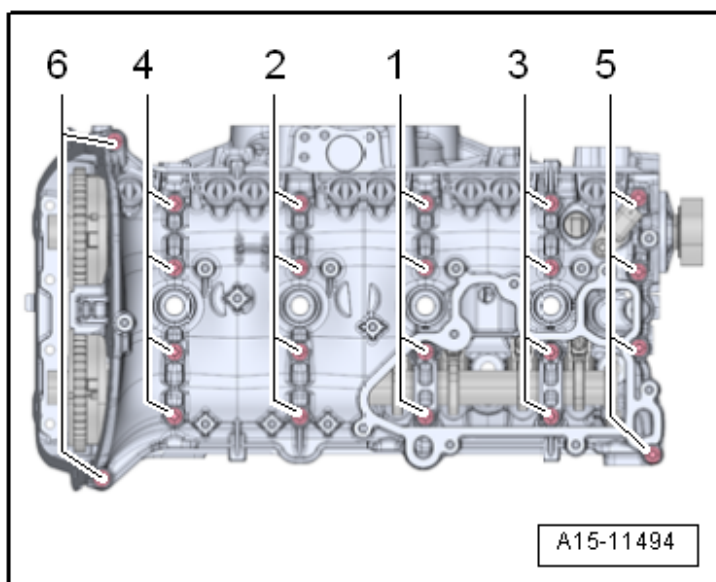
- 13 - O-ring**
 - Not installed
- 14 - Cam Adjustment Actuator**
 - Not installed
- 15 - Bolt**
 - Not installed
- 16 - Ball Pin**
 - 9 Nm
 - For engine cover
- 17 - Bracket**
- 19 - O-ring**
 - Coat with engine oil
 - Replace after removing
- 20 - Plug**
- 21 - Camshaft Position Sensor 3 -G300-**
 - Not installed
- 22 - Bolt**
 - Not installed
- 23 - O-ring**
 - Not installed
- 24 - Oil Separator**
- 25 - Bolt**
 - Tightening sequence, see Oil Separator - Tightening Sequence below
- 26 - Seal**
- 27 - Intake Camshaft**
- 28 - Alignment Pins**
- 29 - Vacuum Pump**
- 30 - Bolt**
 - 8 Nm + 180° turn
- 31 - Seal**
- 32 - Bolt**
 - Tightening specification, see Coolant Temperature Sensor Overview
- 33 - Engine Coolant Temperature Sensor -G62-**
- 34 - O-ring**
 - Replace
 - Coat with coolant
- 35 - O-ring**
 - Replace after removing
 - Coat with engine oil
- 36 - Camshaft Position Sensor -G40-**
- 37 - Bolt**
 - Tightening sequence, see Ignition System Overview
- 38 - Exhaust Valve**

Loosening the Cylinder Head Cover



Loosen the cylinder head cover in the following sequence: -1- to -6-.

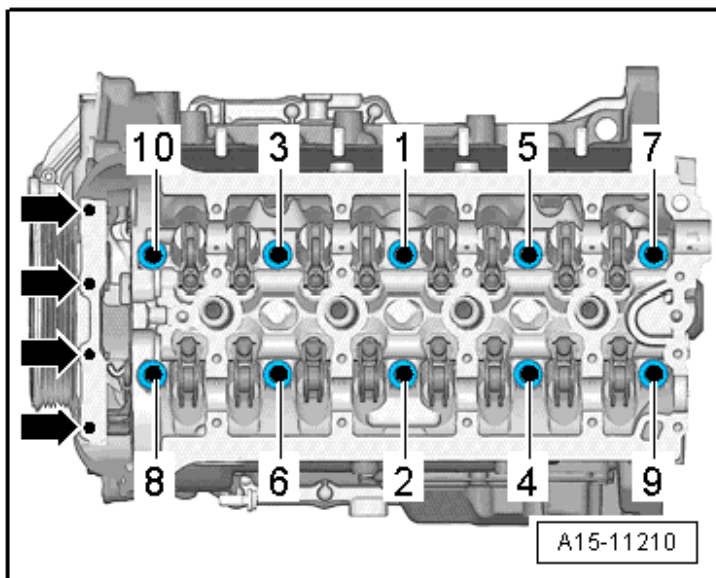
Cylinder Head Cover, Tightening Specifications and Sequence



Replace the bolts.

Step	Bolts	Tightening specification/additional turn
1	-1- through -6-	Install hand-tight in several stages
2	-1- through -6-	Tighten with torque wrench to 8 Nm
3	-1- through -6-	Tighten 90° further using a rigid wrench.

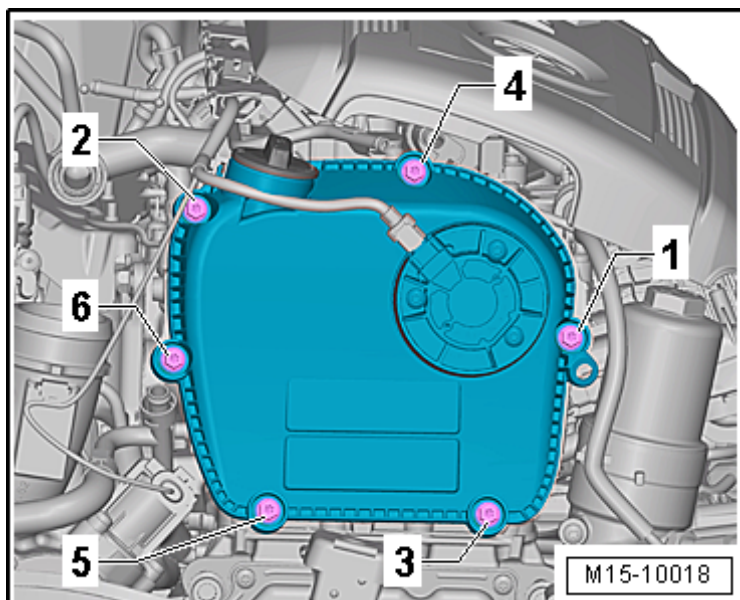
Cylinder Head Tightening Sequence



Tighten the cylinder head bolts in sequence -1- to -10- and -arrows-.

Step	Bolts	Tightening specification/additional turn
1	-1- through -10-	Tighten to 40 Nm
2	-1- through -10-	Tighten 90° further using a rigid wrench.
3	-1- through -10-	Tighten 90° further using a rigid wrench.
4	Bolts -arrows-	Tighten to 4 Nm
5	Bolts -arrows-	Tighten 90° further using a rigid wrench.

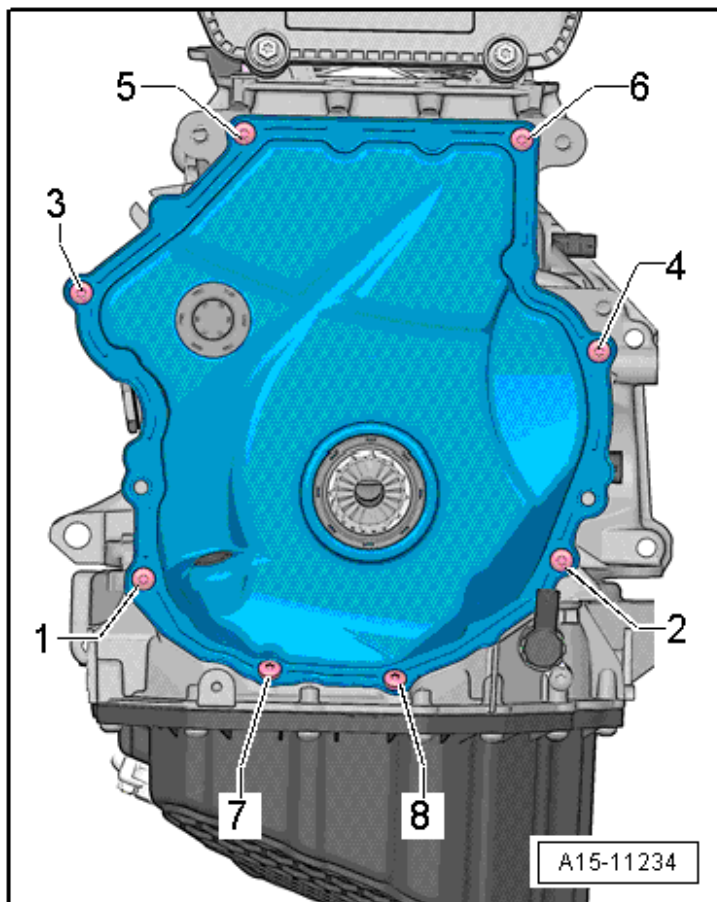
Timing Chain Guard Upper Cover - Tightening Sequence



Tighten the bolts -1- through -6- in the sequence shown:.

Step	Bolts	Tightening specification/additional turn
1	-1- through -6-	Hand tighten
2	-1- through -6-	Tighten to 9 Nm

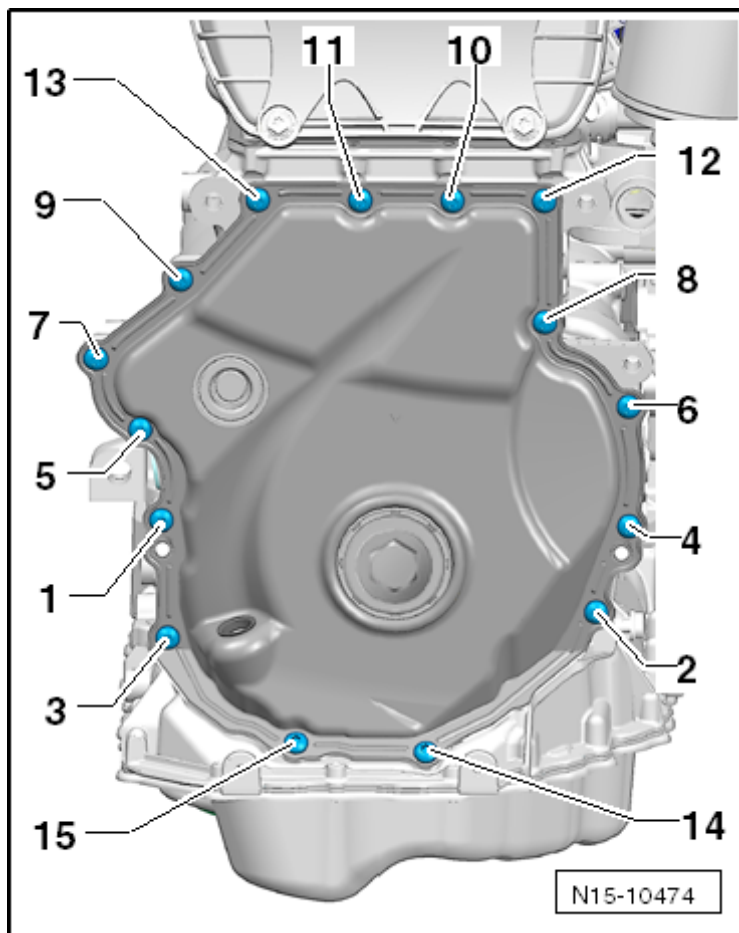
Timing Chain Lower Cover Tightening Sequence



Tighten the bolts -1- through -8- in 2 stages in the sequence shown:

Step	Bolts	Tightening specification/additional turn
1	-1- through -8-	Tighten to 9 Nm
2	-1- through -8-	Tighten 45° additional turn

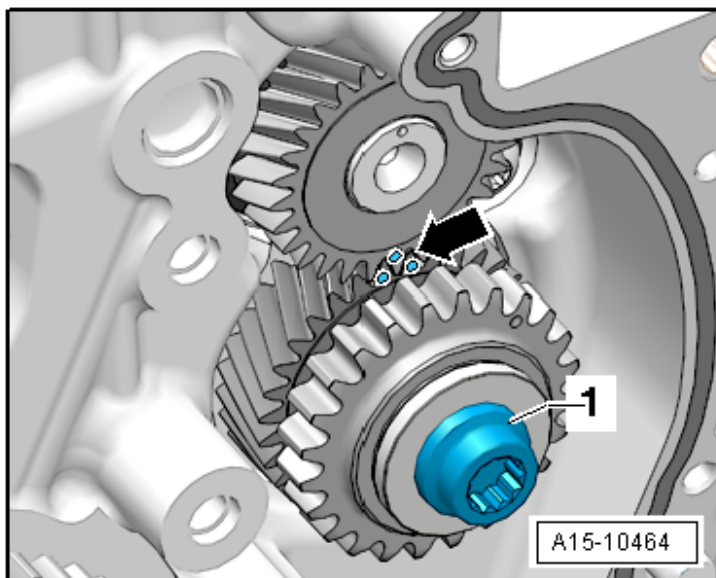
Timing Chain Guard Lower Section - Tightening Sequence for 15 Bolts



Tighten the bolts -1- through -15- in 2 stages in the sequence shown:

Step	Bolts	Tightening specification/additional turn
1	-1- through -15-	Tighten to 8 Nm
2	-1- through -15-	Tighten 45° additional turn

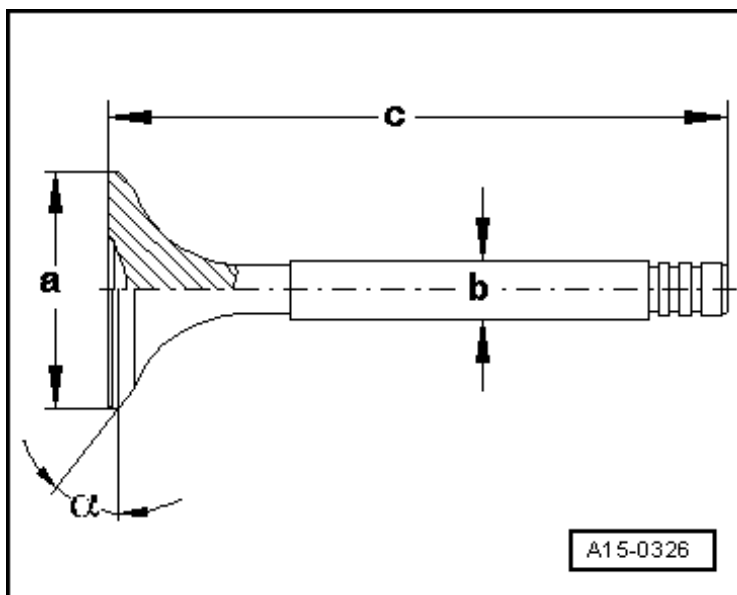
Intermediate Sprocket Tightening Sequence



Tighten the bolts -1- through -6- in the sequence shown..

Step	Bolts	Tightening specification/additional turn
1	-1-	Tighten to 10 Nm
2	-1-	The intermediate sprocket must not have any play. Loosen and tighten it again if necessary.
3	-1-	Tighten to 25 Nm
4	-1-	Tighten 90° further using a rigid wrench.

Valve Dimensions



Dimension		Intake valve	Exhaust valve
Diameter a	mm	33.85 ± 0.10	28.0 ± 0.1
Diameter b	mm	5.98 ± 0.01	5.96 ± 0.01
c	mm	104.0 ± 0.2	101.9 ± 0.2
α	\angle°	45	45

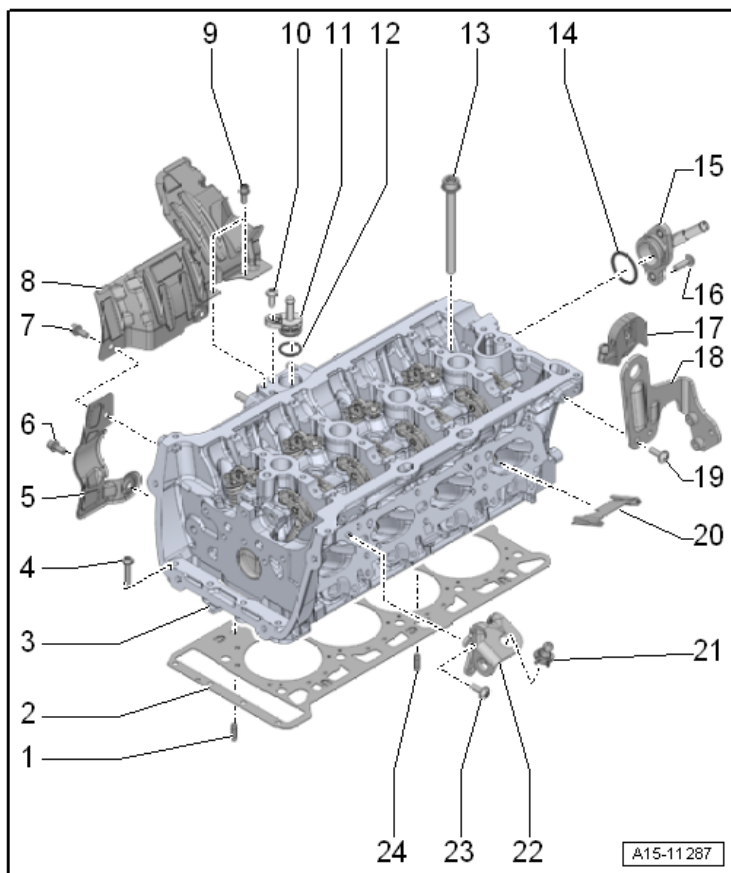
NOTE: Intake and exhaust valves must not be refaced by grinding. Only lapping is permitted.

Compression Pressures

New Bar positive pressure	Wear limit Bar positive pressure	Difference between cylinders Bar positive pressure
11.0 to 14.0	7.0	Maximum 3.0

Lubrication – 1.8L CPKA, CPRA

Oil Pan/Oil Pump Overview



1 - Nut

- 9 Nm

2 - Oil Level Thermal Sensor -G266-

3 - Seal

4 - Bolt

- Replace after removing
- Tightening specification, see Oil Pan Lower Section - Tightening sequence below

5 - Seal

6 - O-ring

- Coat with engine oil
- Replace after removing

7 - Bolt

- 4 Nm + 45° turn
- Replace after removing

8 - Intake Line

9 - O-ring

- Coat with engine oil
- Replace after removing

10 - Oil Pump

11 - Centering Sleeve

12 - O-ring

- Coat with engine oil
- Replace after removing

13 - Bolt

- Tightening specification, see Oil Pressure Switch/Oil Pressure Regulator Valve Overview

14 - Oil Pressure Regulation Valve -N428

15 - Chain Tensioner

16 - Oil Pump Drive Chain

17 - Bolt

- 9 Nm

18 - Cylinder Block

19 - Oil Pan Upper Section

- Tightening specification, see Oil Pan Upper Section - Tightening Sequence below

20 - Bolt

- Tightening specification, see Oil Pan Upper Section - Tightening Sequence below
- Replace after removing

21 - O-ring

- Coat with engine oil
- Replace after removing

22 - Bolt

- 4 Nm + 45° turn
- Replace after removing

23 - Oil Return Pipe

24 - Bolt

- 8 Nm + 45° turn
- Replace after removing

25 - Oil Baffle

26 - Bolt

- 4 Nm + 45° turn
- Replace after removing

27 - Oil Pan Lower Section

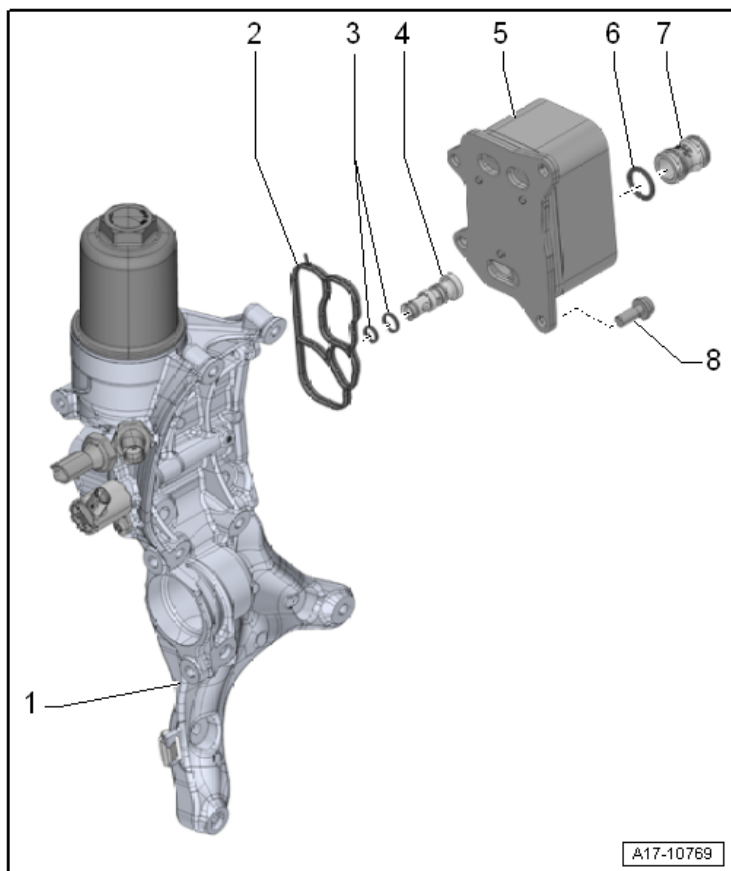
28 - Seal or O-Ring

- Coat O-ring with engine oil
- Replace after removing

29 - Oil Drain Plug or Sealing Plug

- Oil Drain Plug 30 Nm
- Tighten sealing plug all the way

Engine Oil Cooler Overview



1 - Auxiliary Components Bracket

2 - Seal

- Replace after removing

3 - O-rings

- Coat with engine oil
- Replace after removing

4 - Mechanical Switch Valve

5 - Engine Oil Cooler

6 - Seal

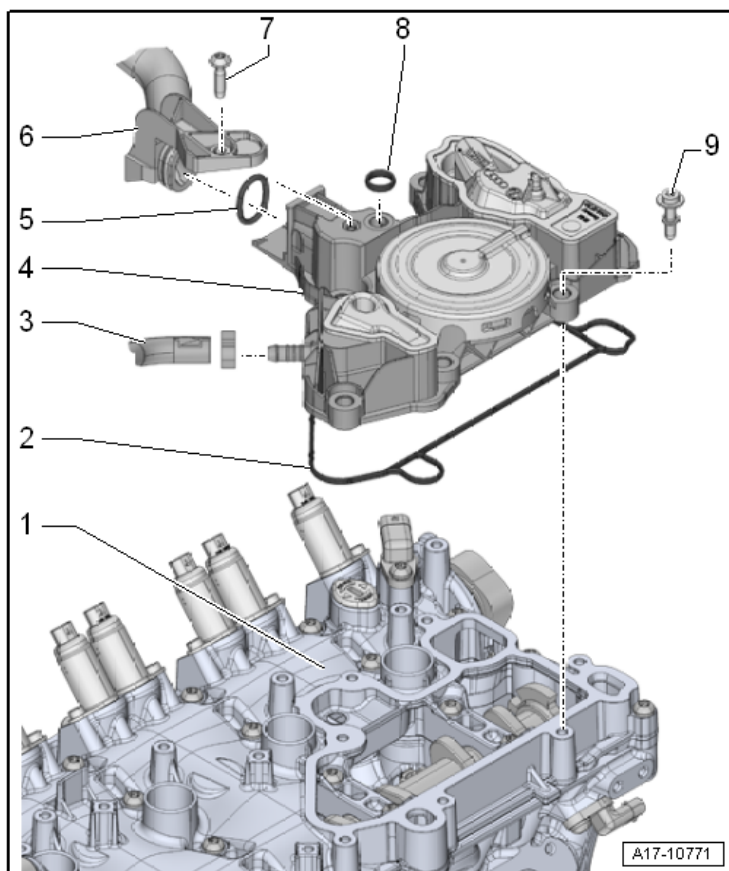
- Coat with coolant
- Replace after removing

7 - Connection

8 - Bolt

- 4 Nm + 45° turn
- Replace after removing

Crankcase Ventilation Overview



1 - Cylinder Head Cover

2 - Seal

- Replace after removing

3 - Hose

- To the EVAP Canister Purge Regulator Valve 1 -N80-

4 - Oil Separator

5 - Seal

- Replace after removing

6 - Hose

- To turbocharger

7 - Bolt

- 4 Nm

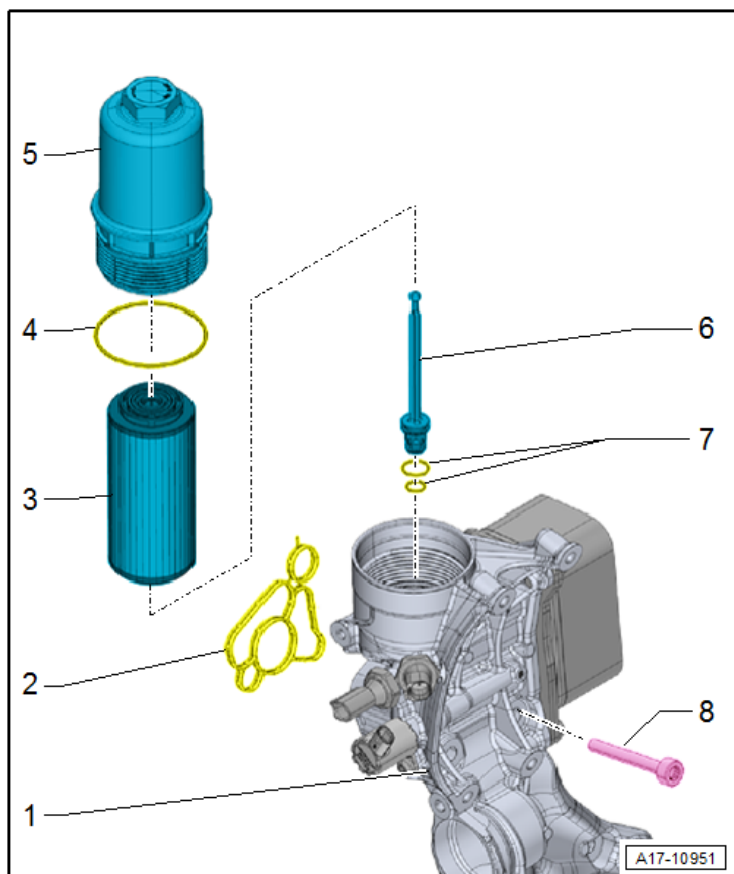
8 - Seal

- Replace after removing

9 - Bolt

- Tightening specification and sequence see Oil Separator - Tightening Sequence below

Oil Filter Overview



1 - Auxiliary Components Bracket

2 - Seal

- Replace after removing

3 - Oil Filter

4 - O-ring

- Coat with engine oil
- Replace after removing

5 - Oil Filter Housing Cap

- 25 Nm

6 - Oil Drain Supports

7 - O-rings

- Replace after removing

8 - Bolt

- Tightening specification and sequence, see Ribbed Belt Transmission Side Sealing Flange - Tightening Specifications and Sequence belowOil Filter Overview

9 - Reduced Oil Pressure Switch -F378-

- 20 Nm

10 - Seal

- Replace the seal with the oil pressure switch.

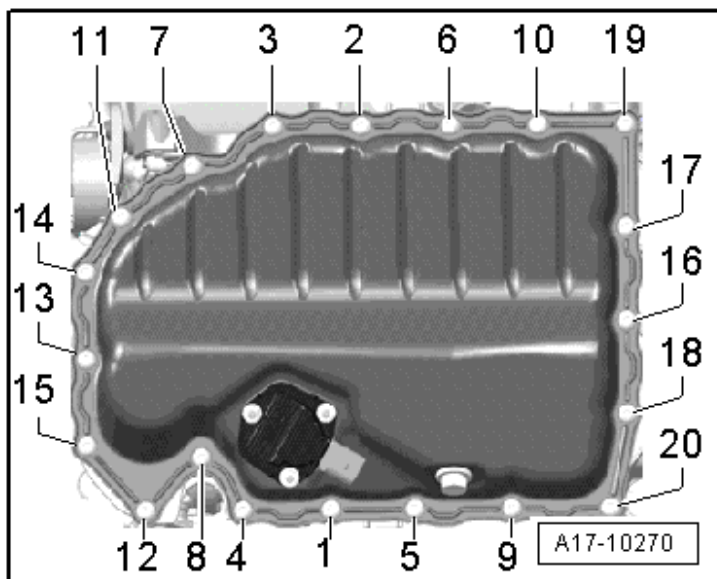
11 - Seal

- Not installed

12 - Oil Pressure Switch, Level 3 -F447-

- Not installed

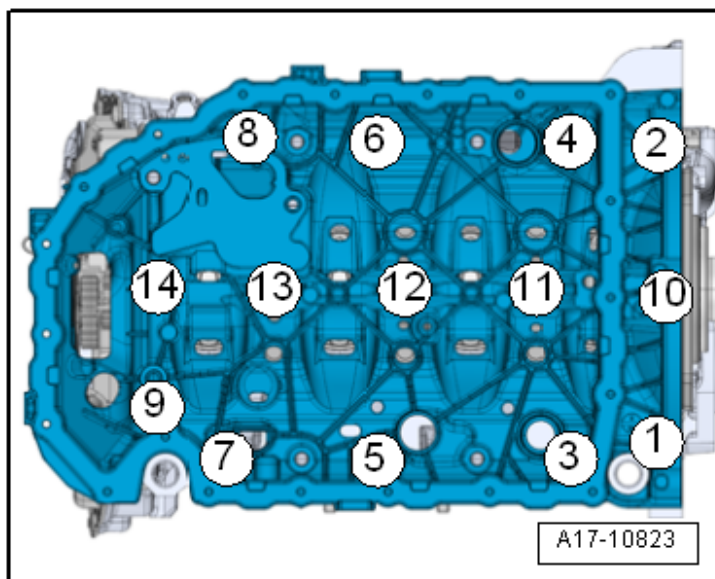
Oil Pan Lower Section - Tightening Sequence



Tighten the bolts -1- through -20- in two stages in the sequence shown:

Step	Bolts	Tightening specification/additional turn
1	-1- through -20-	Tighten to 8 Nm
2	-1- through -20-	Tighten 45° additional turn

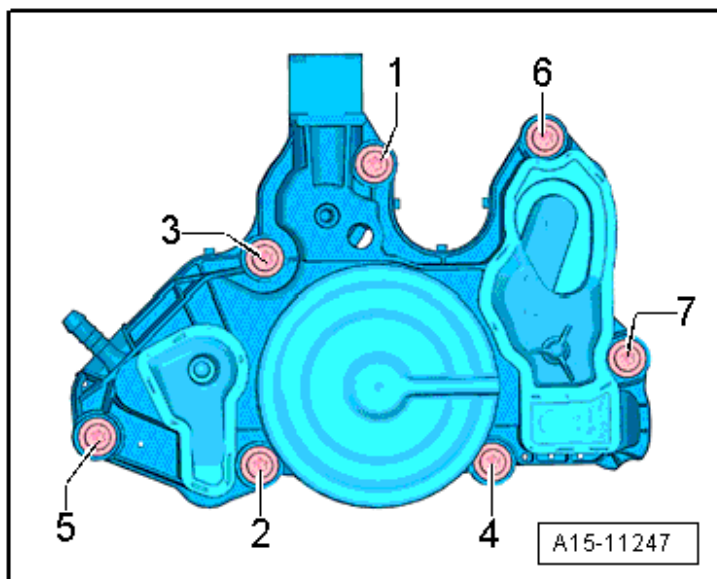
Oil Pan Upper Section - Tightening Sequence



Tighten the bolts -1- through -14- in the sequence shown:

Step	Bolts	Tightening specification/additional turn
1	-1- through -14-	Tighten to 8 Nm
2	-1- and -2-	Tighten 180° additional turn
3	-3- through -9-	Tighten 45° additional turn
4	-10-	Tighten 180° additional turn
5	-1- through -14-	Tighten 90° additional turn

Oil Separator - Tightening Sequence

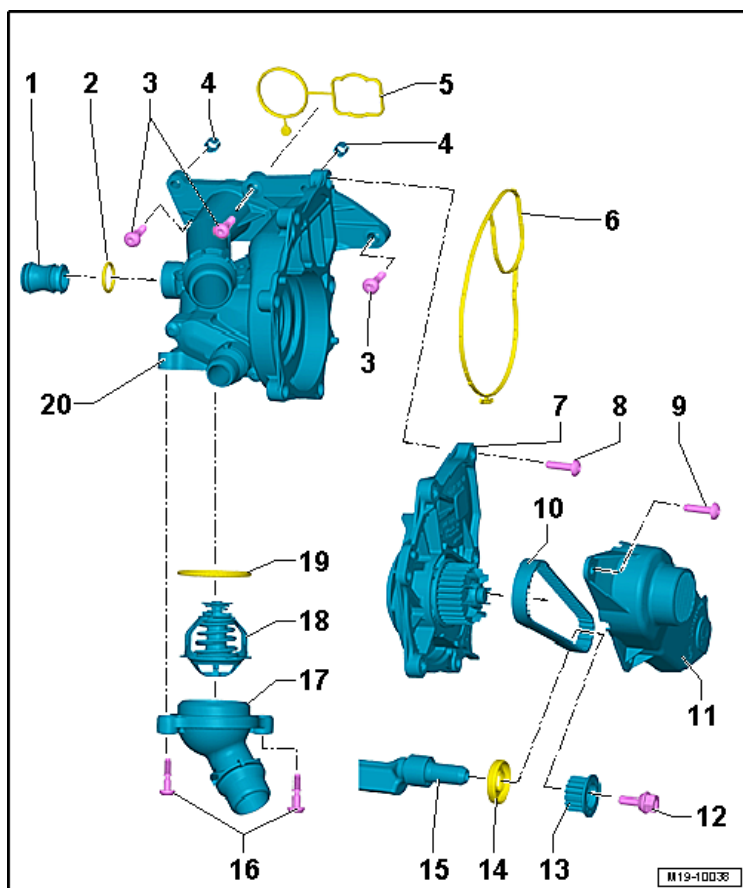


Tighten the bolts in the sequence -1- through -7-.

Bolts	Tightening specification/additional turn
-1- through -7-	Tighten to 9 Nm

Cooling System – 1.8L CPKA, CPRA

Coolant Pump/Thermostat Overview



1 - Connection

2 - O-ring

- Replace after removing
- Coat with coolant

3 - Bolt

- Tightening specification and sequence, see Thermostat - Tightening Specification and Tightening Sequence below

4 - Centering Pin

5 - Seal

- Replace after removing

6 - Seal

- Replace after removing

7 - Coolant Pump

8 - Bolt

- Tightening specification and sequence, see Coolant Pump - Tightening Specification and Sequence below

9 - Bolt

- 9 Nm

10 - Toothed Belt

11 - Tothed Belt Cover

12 - Bolt

- 10 Nm + 90° turn
- Left thread
- Replace after removing

13 - Drive Gear for Toothed Belt

14 - Balance Shaft Seal Intake Side

15 - Balance Shaft

16 - Bolt

- 9 Nm

17 - Connecting Piece

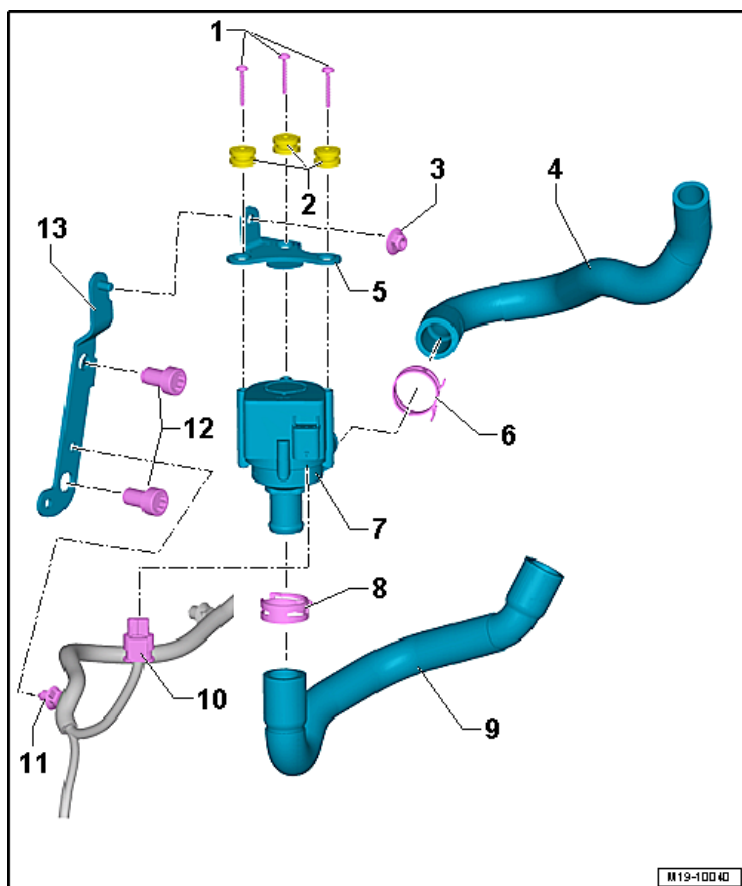
18 - Thermostat

19 - O-Ring

- Replace after removing

20 - Coolant Thermostat

Electric Coolant Pump Overview



1 - Bolt

□ 5 Nm

2 - Plastic Sockets

3 - Nut

□ 9 Nm

4 - Coolant Hose

5 - Bracket

□ 25 Nm

6 - Spring Clamp

7 - After-Run Coolant Pump -V51-

8 - Spring Clamp

9 - Coolant Hose

10 - Connector

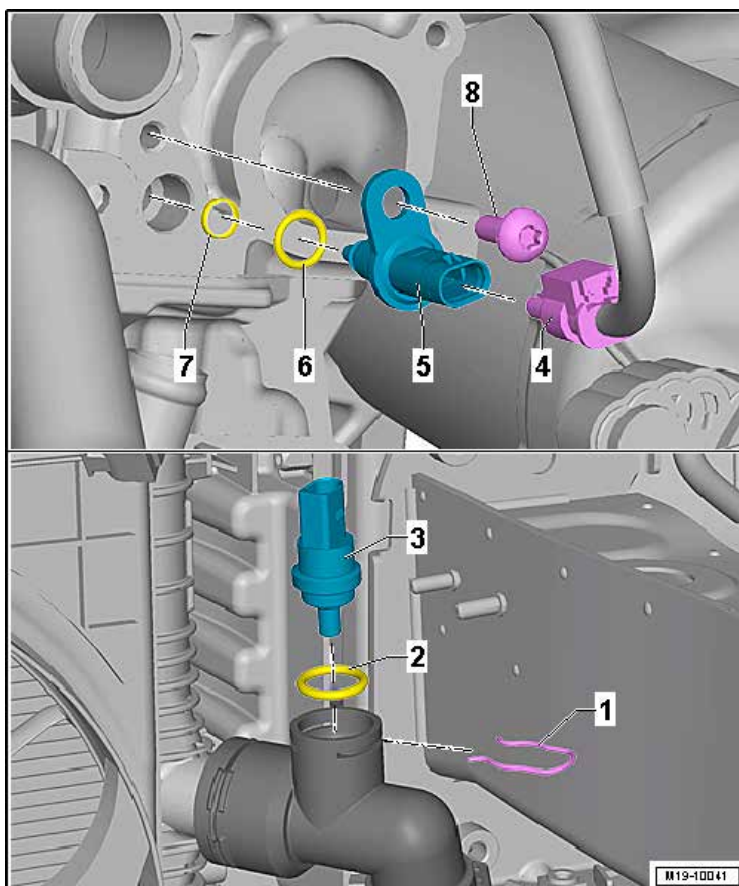
11 - Clip

12 - Bolt

□ 20 Nm

13 - Bracket

Coolant Temperature Sensor Overview



1 - Clamp

2 - O-ring

- Replace after removing

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

4 - Connector

5 - Engine Coolant Temperature Sensor -G62-

- 25 Nm

6 - O-ring

- Replace after removing
- Coat with coolant

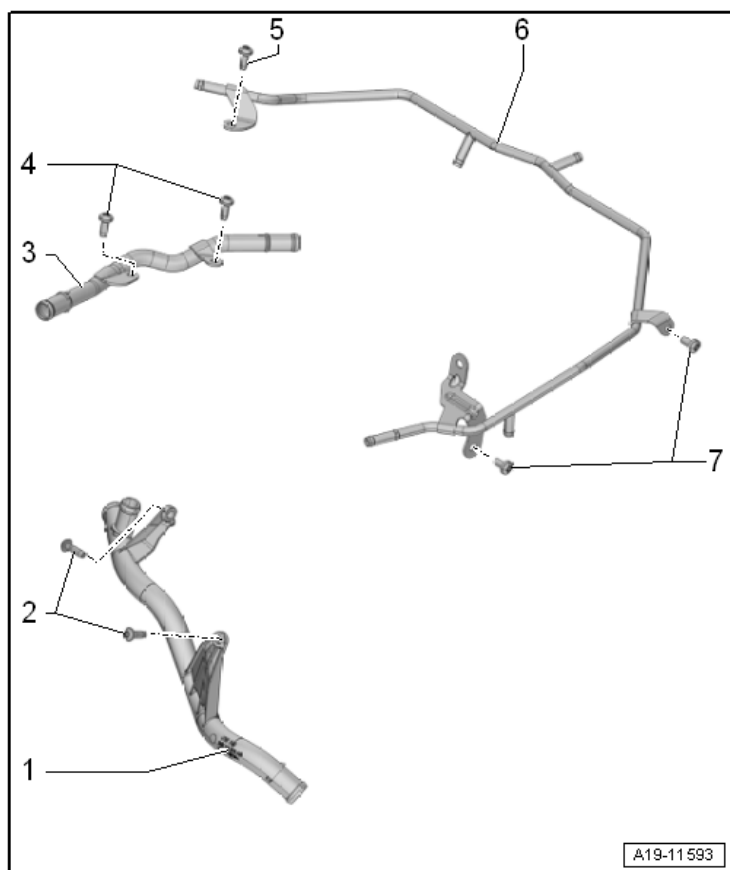
7 - O-rings

- Replace after removing
- Coat with coolant

8 - Bolt

- 4 Nm + 45° turn
- Replace after removing

Coolant Pipes Overview



1 - Front Coolant Pipe

2 - Bolt

6 Nm

3 - Upper Coolant Pipe

4 - Bolts

9 Nm

5 - Bolt

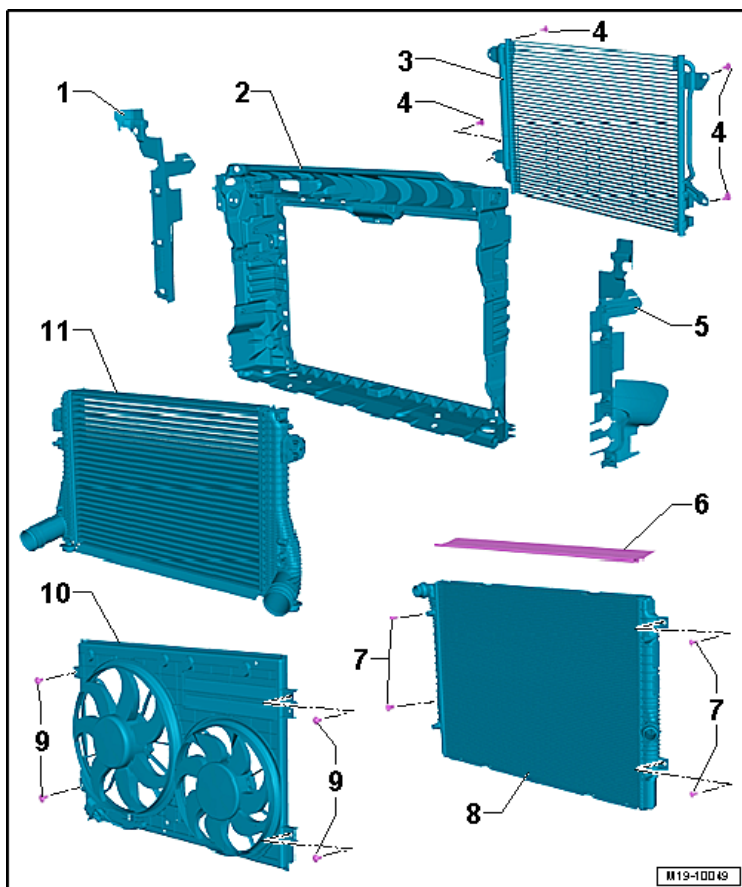
9 Nm

6 - Coolant Line

7 - Bolts

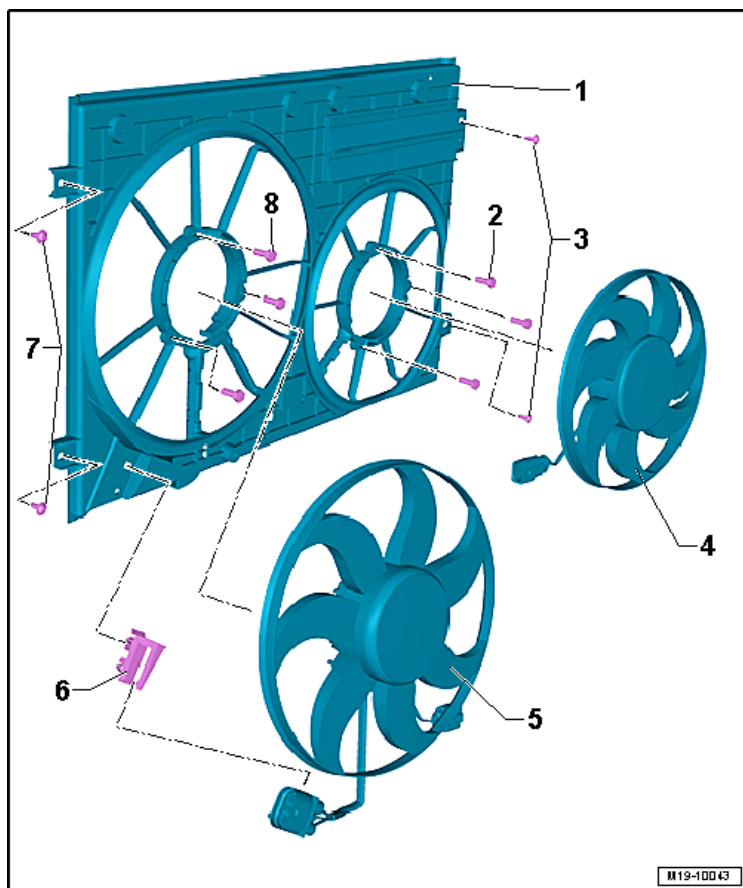
9 Nm

Radiator/Coolant Fan Overview



- 1 - Side Air Guide
- 2 - Lock Carrier
- 3 - Condenser
- 4 - Bolts
 - 8 Nm
- 5 - Side Air Guide
- 6 - Seal
- 7 - Bolts
 - 8 Nm
- 8 - Radiator
- 9 - Bolt
 - 8 Nm
- 10 - Shroud
- 11 - Charge Air Cooler

Fan Shroud and Radiator Fan Overview



1 - Fan Shroud

2 - Bolt

- 5 Nm
- Fan shroud to radiator

3 - Bolt

- Tightening specification, see Radiator/Coolant Fan Overview

4 - Coolant Fan 2 -V177-

5 - Coolant Fan -V7-

6 - Bracket

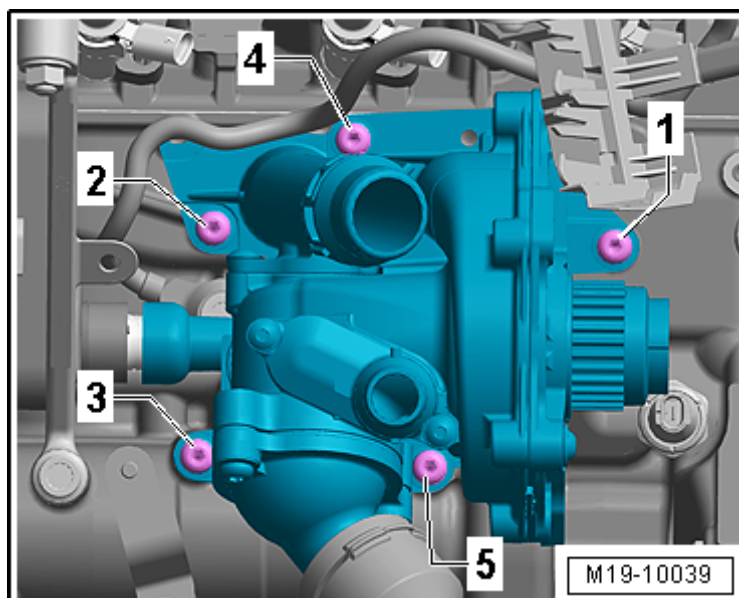
7 - Bolt

- Tightening specification, see Radiator/Coolant Fan Overview

8 - Bolt

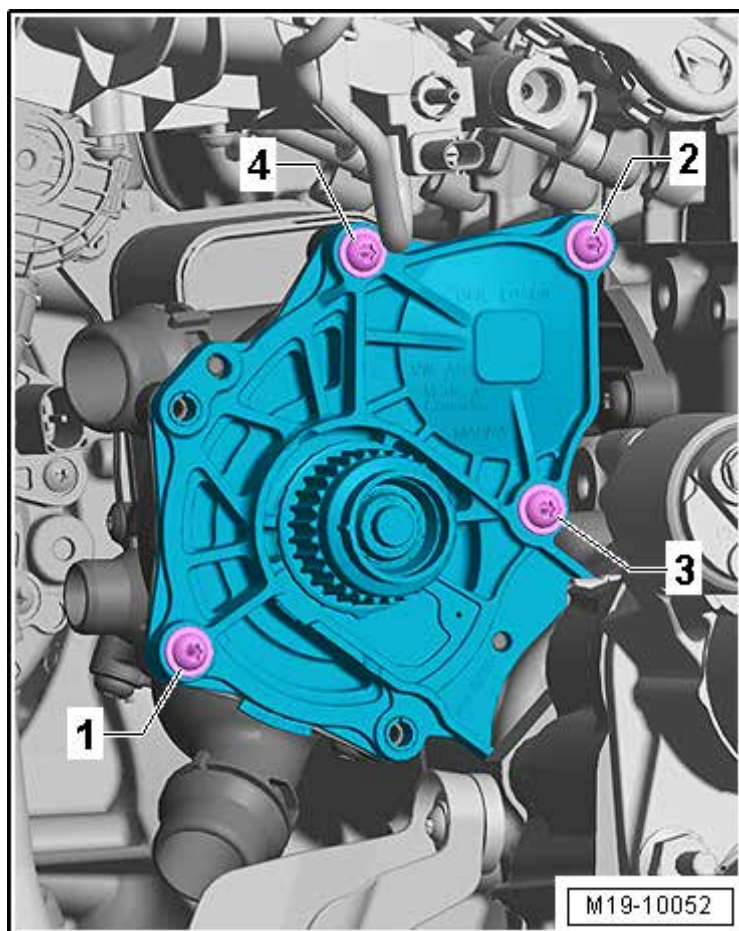
- 5 Nm

Thermostat - Tightening Specification and Tightening Sequence



Tightening sequence	Tightening specification
-1- through -5-	Tighten to 9 Nm

Coolant Pump - Tightening Specification and Sequence



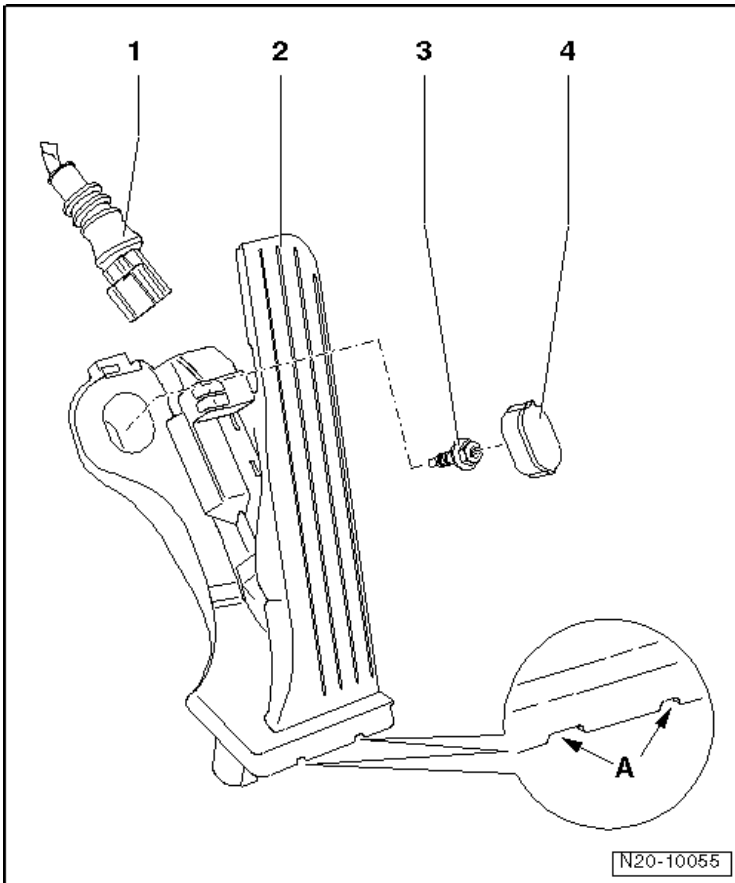
Tightening sequence	Tightening specification/additional turn
-1- through -4-	Tighten to 9 Nm

Fastener Tightening Specifications

Component	Nm
Auxiliary cooler nuts	25

Fuel Supply – 1.8L CPKA, CPRA

Accelerator Pedal Mechanism Overview



1 - Connector

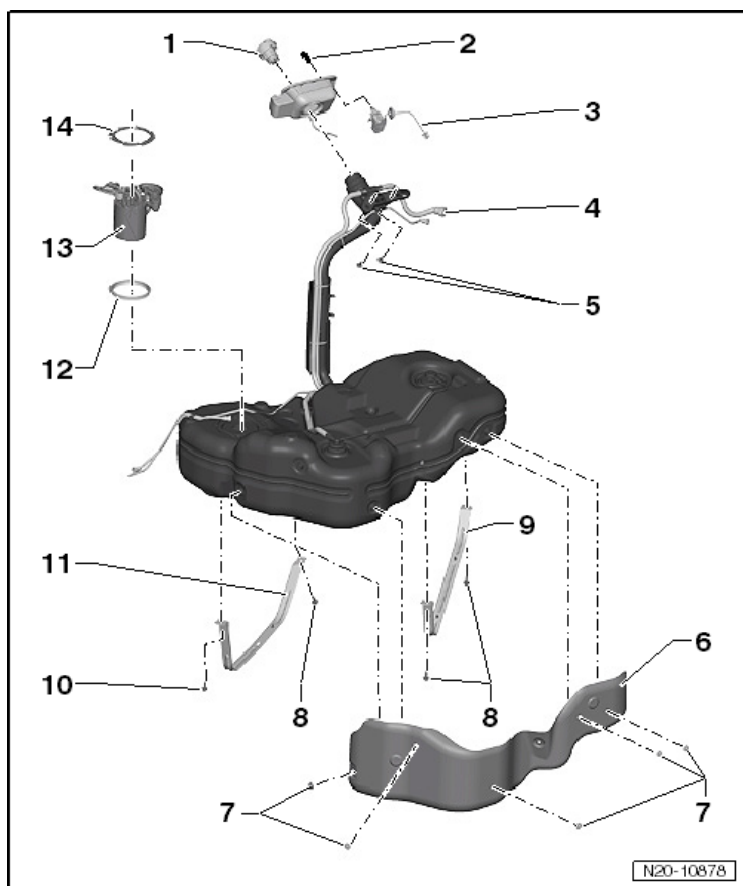
2 - Accelerator Pedal Position Sensor -G79- / Accelerator Pedal Position Sensor 2 -G185-

3 - Bolt

□ 10 Nm

4 - Cap

Fuel Tank and Attachments Overview



1 - Cap

2 - Bolt

Tightening specification, refer to Body Exterior

3 - Fuel Filler Door Unit with Fuel Filler Door Lock

4 - Ventilation Line

5 - Bolt

11 Nm

6 - Heat Shield

7 - Nut

2.5 Nm

8 - Bolt

25 Nm

Replace after removing

9 - Left Tensioning Strap

10 - Bolt

25 Nm

Replace after removing

11 - Right Tensioning Strap

12 - Seal

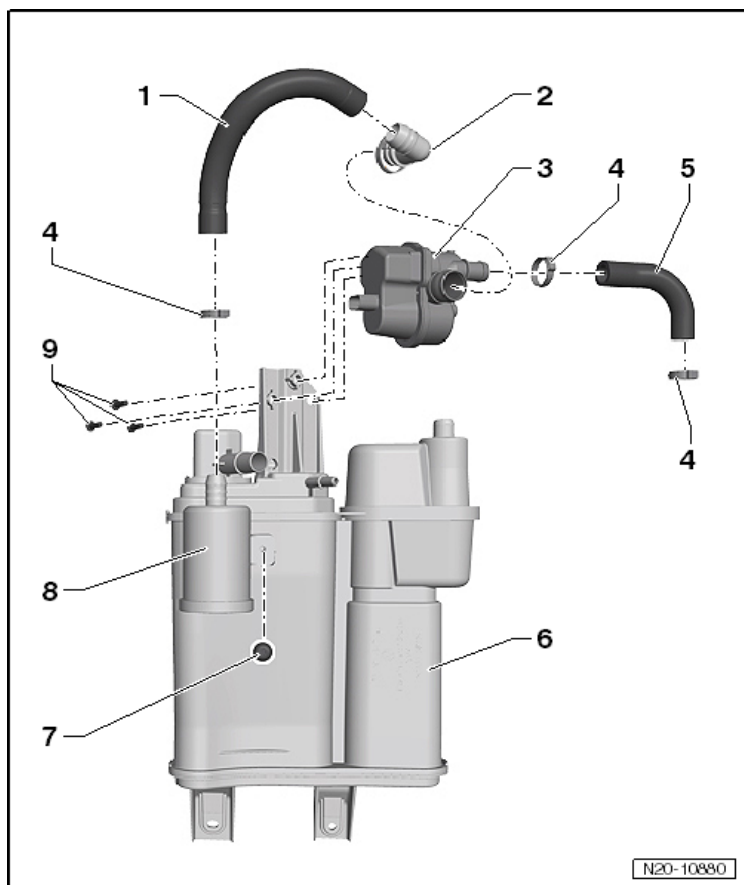
- Replace after removing

13 - Fuel Delivery Unit

14 - Lock Ring

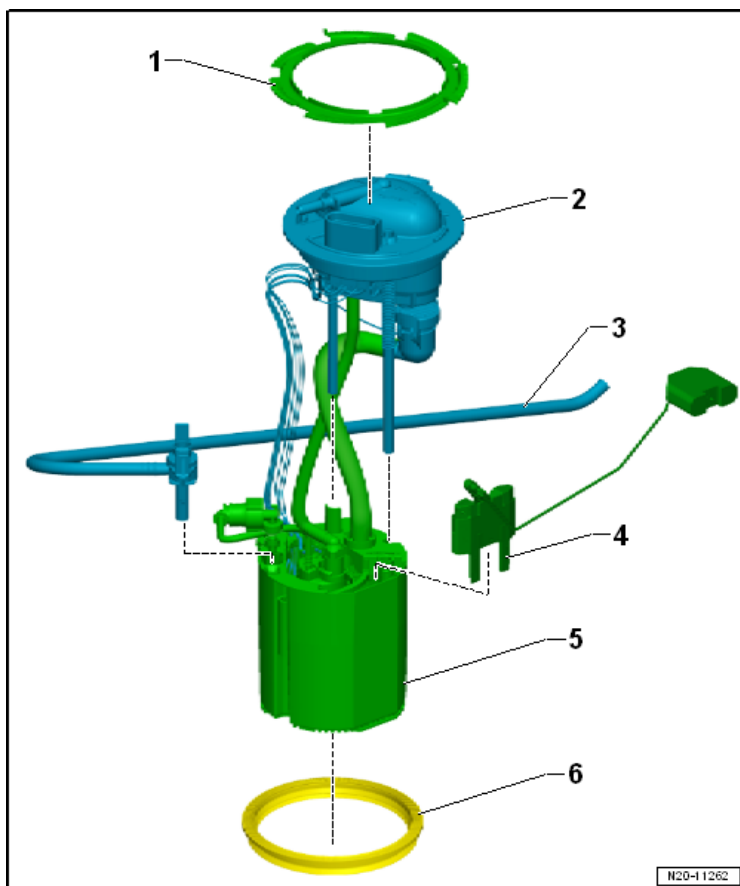
- 110 Nm

EVAP System Component Overview



- 1 - Connecting Hose
- 2 - Connecting Hose Connection
- 3 - Leak Detection Pump -V144-
- 4 - Hose Clamp
- 5 - Connecting Hose
- 6 - EVAP Canister
- 7 - Nut
 - 1.8 Nm
- 8 - Air Filter with Connecting Hose
- 9 - Bolt
 - 1.8 Nm

Fuel Delivery Unit/Fuel Level Sensor Assembly Overview



1 - Locking Ring

110 Nm

2 - Flange

3 - Intake Line

4 - Fuel Level Sensor -G-

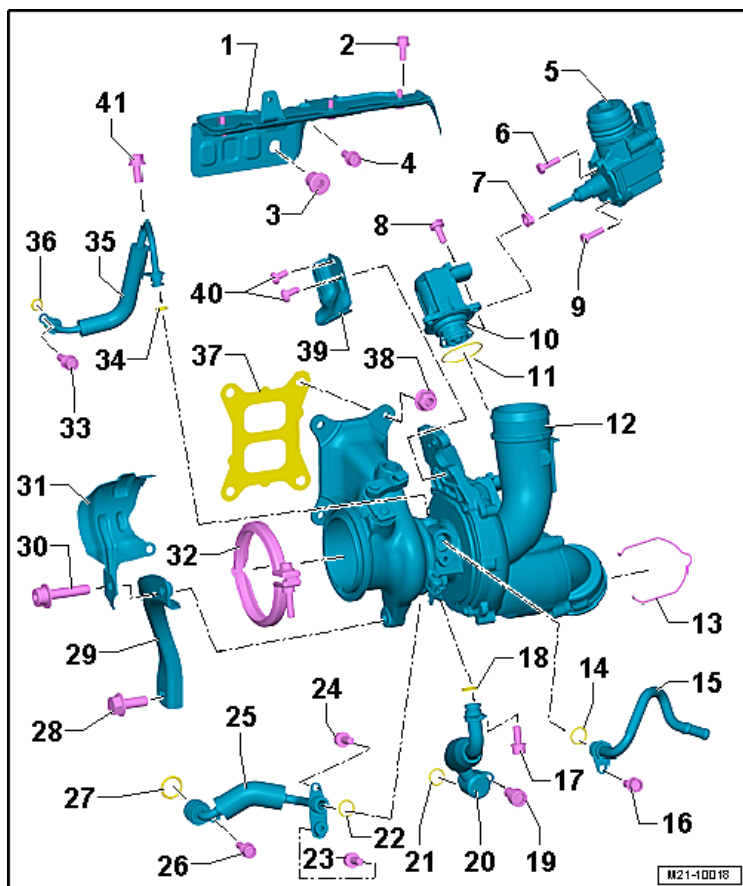
5 - Fuel Delivery Unit

6 - Seal

Replace

Turbocharger – 1.8L CPKA, CPRA

Turbocharger and Mahle Charge Pressure Actuator -V465- Overview



1 - Heat Shield

2 - Bolt

9 Nm

3 - Bolt

20 Nm

4 - Bolt

9 Nm

5 - Charge Pressure Actuator -V465-

6 - Bolt

Do not remove the Charge Pressure Actuator -V465-.

Replace turbocharger after loosening bolt.

7 - Nut

7 Nm

8 - Bolt

- 7 Nm

9 - Bolt

- Do not remove the Charge Pressure Actuator -V465-.
- Replace turbocharger after loosening bolt.

10 - Turbocharger Recirculation Valve -N249-

11 - O-ring

- Replace after removing

12 - Turbocharger

13 - Spring Clip

14 - O-ring

- Replace after removing

15 - Coolant Supply Line

16 - Bolt

- 9 Nm

17 - Bolt

- 9 Nm

18 - O-ring

- Replace after removing
- Coat with engine oil

19 - Bolt

- 25 Nm

20 - Oil Return Pipe

21 - O-ring

- Replace after removing
- Coat with engine oil

22 - O-ring

- Replace after removing
- Coat with coolant

23 - Bolt

- 9 Nm

24 - Bolt

- 9 Nm

25 - Coolant Supply Line

26 - Bolt

- 9 Nm

27 - O-ring

- Replace after removing
- Coat with coolant

28 - Bolt

- 30 Nm

29 - Support Brace

30 - Bolt

- 30 Nm
- Lubricate the thread with hot bolt paste before loosening and installing

31 - Heat Shield

Turbocharger and Mahle Charge Pressure Actuator -V465- Overview (*cont'd*)

32 - V-Clamp

- 15 Nm
- Replace after removing

33 - Bolt

- 9 Nm

34 - O-ring

- Coat with engine oil
- Replace after removing

35 - Oil Supply Line

36 - O-ring

- Coat with engine oil
- Replace after removing

37 - Seal

- Replace after removing

38 - Nut

- 25 Nm
- Replace after removing

39 - Heat Shield

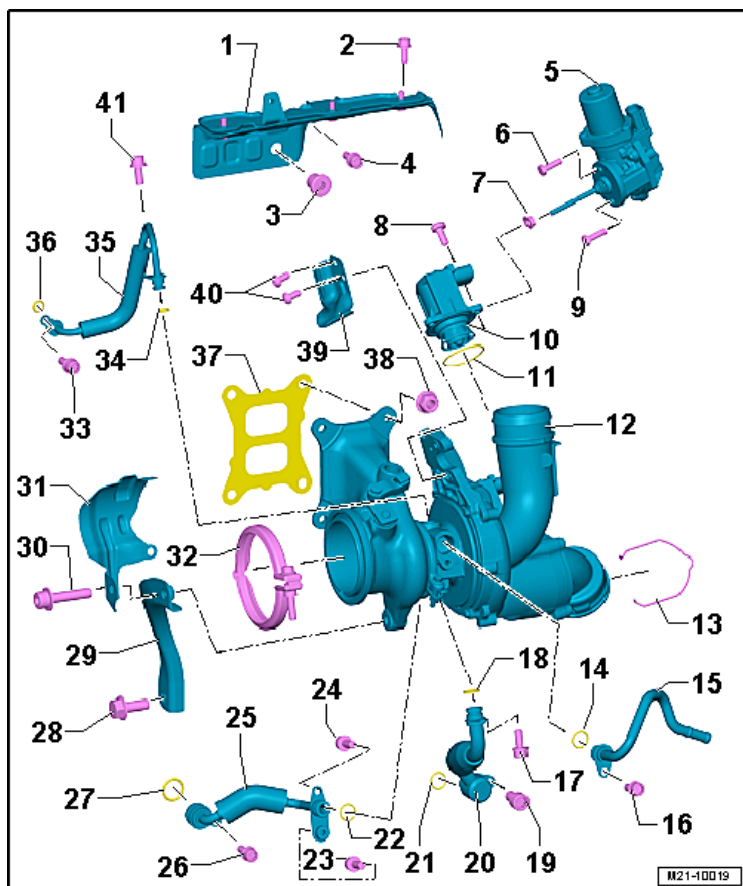
40 - Bolt

- 4.5 Nm

41 - Bolt

- 9 Nm

Turbocharger and Cooper Charge Pressure Actuator -V465- Overview



1 - Heat Shield

2 - Bolt

9 Nm

3 - Bolt

20 Nm

4 - Bolt

9 Nm

5 - Charge Pressure Actuator -V465-

6 - Bolt

Do not remove the Charge Pressure Actuator -V465-.

Replace turbocharger after loosening bolt.

7 - Nut

7 Nm

8 - Bolt

7 Nm

9 - Bolt

- Do not remove the Charge Pressure Actuator -V465-.
- Replace turbocharger after loosening bolt.

10 - Turbocharger Recirculation Valve -N249-**11 - O-ring**

- Replace after removing

12 - Turbocharger**13 - Spring Clip****14 - O-ring**

- Replace after removing

15 - Coolant Supply Line**16 - Bolt**

- 9 Nm

17 - Bolt

- 9 Nm

18 - O-ring

- Replace after removing
- Coat with engine oil

19 - Bolt

- 25 Nm

20 - Oil Return Pipe**21 - O-ring**

- Replace after removing
- Coat with engine oil

22 - O-ring

- Replace after removing
- Coat with coolant

23 - Bolt

- 9 Nm

24 - Bolt

- 9 Nm

25 - Coolant Supply Line**26 - Bolt**

- 9 Nm

27 - O-ring

- Replace after removing
- Coat with coolant

28 - Bolt

- 30 Nm

29 - Support Brace**30 - Bolt**

- 30 Nm
- Lubricate the thread with hot bolt paste before loosening and installing

31 - Heat Shield**32 - V-Clamp**

- 15 Nm
- Replace after removing

Turbocharger and Cooper Charge Pressure Actuator -V465- Overview (*cont'd*)

33 - Bolt

- 9 Nm

34 - O-ring

- Coat with engine oil
- Replace after removing

35 - Oil Supply Line

36 - O-ring

- Coat with engine oil
- Replace after removing

37 - Seal

- Replace after removing

38 - Nut

- 25 Nm
- Replace after removing

39 - Heat Shield

40 - Bolt

- 4.5 Nm

41 - Bolt

- 9 Nm

14 - Air Guide Pipe

15 - Bolt

□ 7 Nm

16 - Air Guide Pipe

17 - Bolt

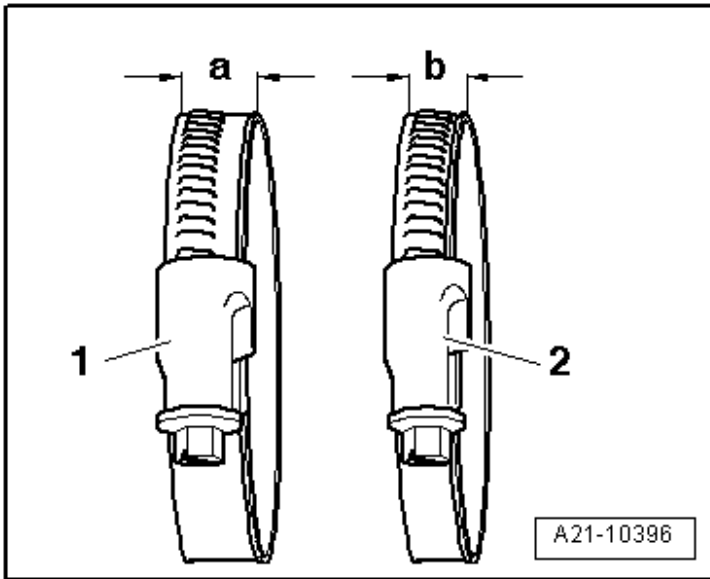
□ 7 Nm

18 - O-ring

19 - Charge Air Pressure Sensor -G31-

20 - Air Guide Hose

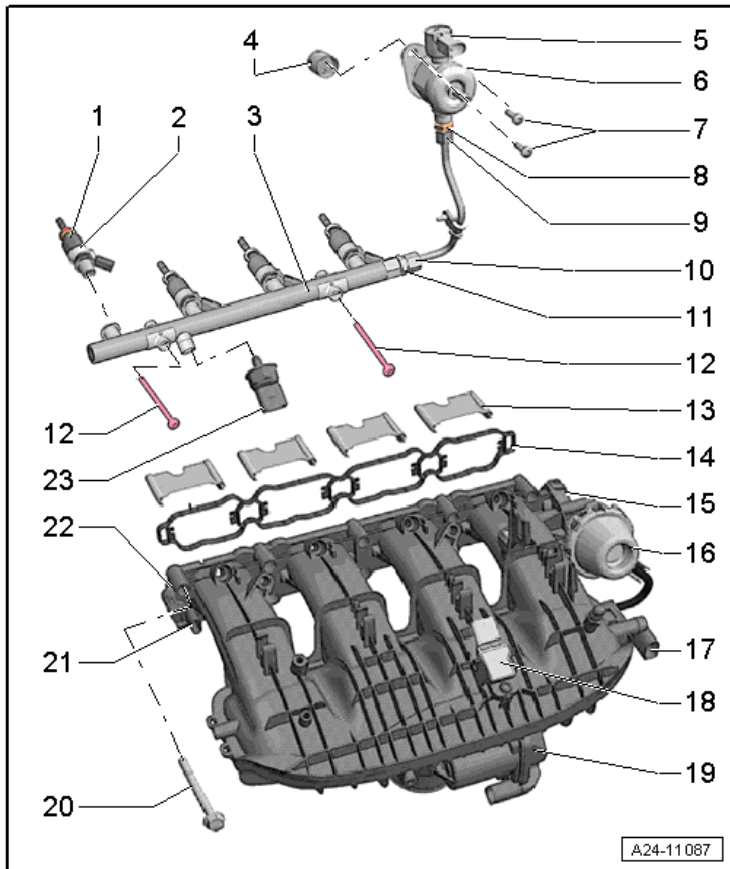
Air Guides with Screw-Type Clamps, Installing



Hose Clmap	Width	Tightening Specification
1	-a- = 13 mm wide	5.5 Nm
2	-b- = 9 mm wide	3 Nm

Multiport Fuel Injection – 1.8L CPKA, CPRA

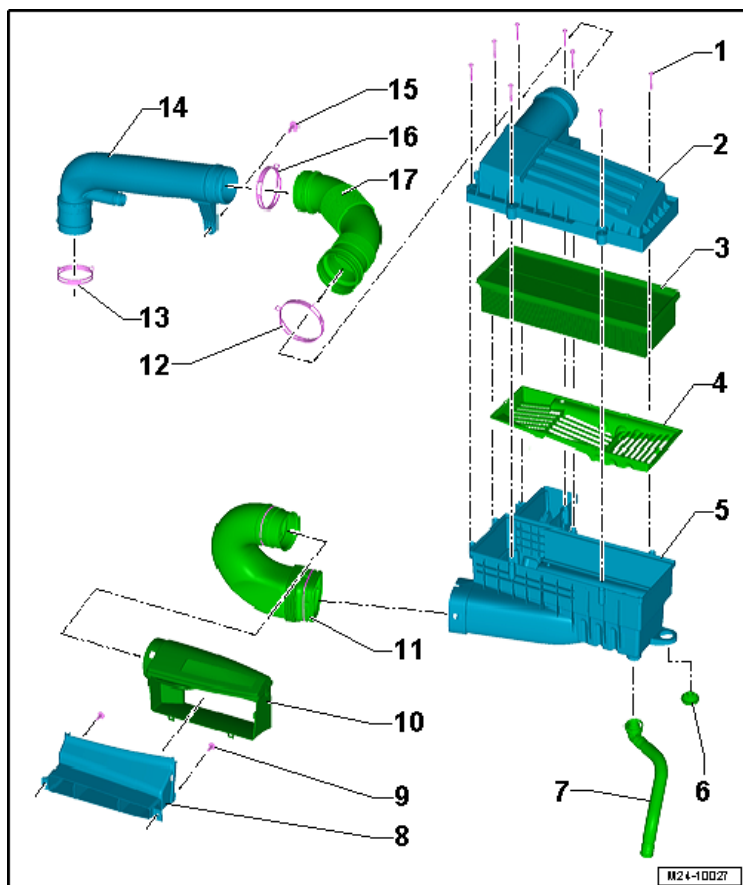
Fuel Rail with Fuel Injectors Overview



- 1 - Fuel Injector
- 2 - Support Ring
 - Replace after removing
- 3 - Fuel Rail for the-Fuel Injector
 - 9 Nm
- 4 - Roller Tappet
- 5 - Fuel Pressure Regulator Valve -N276-
- 6 - High Pressure Pump
- 7 - High Pressure Pump Bolts
 - 8 Nm + 90° turn
 - Replace after removing

- 8 - Fuel Supply Line Connection on the High Pressure Pump**
 - 40 Nm
 - Replace after removing
- 9 - Fuel Supply Line Union Nut**
 - 27 Nm
- 10 - Fuel Supply Line Union Nut**
 - 27 Nm
- 11 - Connections for the Fuel Supply Line on the Fuel Rail**
 - 40 Nm
 - Replace after removing
- 12 - Bolt**
 - 9 Nm
- 13 - Channel Separating Plate**
- 14 - Seal**
- 15 - Charge-Motion Valve Adjuster (Intake Manifold Flap)**
- 16 - Channel Separating Plate Vacuum Diaphragm (Intake Manifold Flaps)**
- 17 - Intake Manifold Runner Control Valve -N316-**
- 18 - Intake Air Temperature Sensor -G42- with Manifold Absolute Pressure Sensor -G71-**
 - 5 Nm
- 19 - Throttle Valve Control Module -J338-, EPC Throttle Drive -G186-**
 - 7 Nm
- 20 - Bolt for the Intake Manifold**
 - Tightening specification, see Intake Manifold Overview
- 21 - Intake Manifold Runner Position Sensor -G336-**
- 22 - Intake manifold**
- 23 - Fuel Pressure Sensor -G247-**
 - 27 Nm

Air Filter Housing Overview



1 - Bolt

□ 1.5 Nm

2 - Air Filter Housing Upper Section

3 - Filter

4 - Snow Screen

5 - Air Filter Housing Lower Section

□ Bolt 8 Nm

6 - Rubber Buffer

7 - Water Drain Hose

8 - Air Guide

9 - Bolt

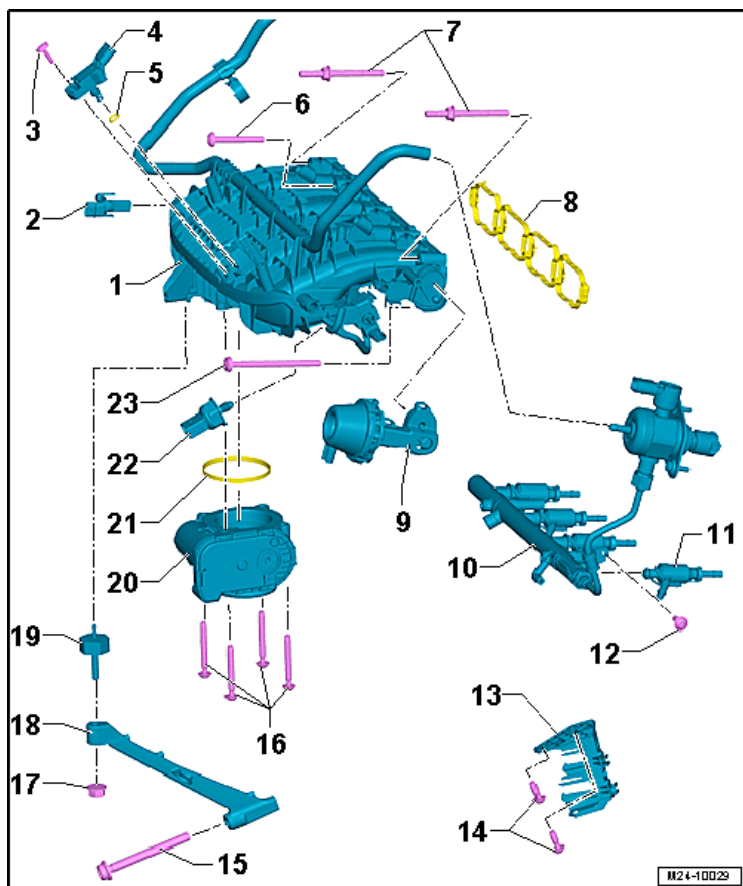
□ 3 Nm

10 - Intake Air Guide

11 - Intake Air Guide

- 12 - Spring Clamp**
- 13 - Spring Clamp**
- 14 - Connecting Pipe**
- 15 - Bolt**
 - 5 Nm
- 16 - Spring Clamp**
- 17 - Air Guide Hose**

Intake Manifold Overview



1 - Intake Manifold

2 - Intake Manifold Runner Position Sensor -G336-t

3 - Bolt

5 Nm

4 - Intake Air Temperature Sensor -G42- with Manifold Absolute Pressure Sensor -G71-

5 Nm

5 - O-ring

Replace after removing

6 - Bolt for the Intake Manifold

9 Nm

7 - Threaded Pin for Outer Intake Manifold

9 Nm

8 - Seal

9 - Channel Separating Plate Vacuum Diaphragm (Intake Manifold Flaps)

10 - Fuel Injector Fuel Rail

11 - Fuel Injectors

12 - Bolt

- 9 Nm
- High pressure line to intake manifold

13 - Bracket

14 - Bolt

- 5 Nm

15 - Bolt

- 20 Nm
- For the intake manifold bracket

16 - Bolt for Throttle Valve Control Module -J338-

- 7 Nm

17 - Nut for the Intake Manifold Support

- 10 Nm

18 - Intake Manifold Support

19 - Rubber Bushing

- 5 Nm

20 - Throttle Valve Control Module -J338-, EPC Throttle Drive -G186-,

21 - Seal

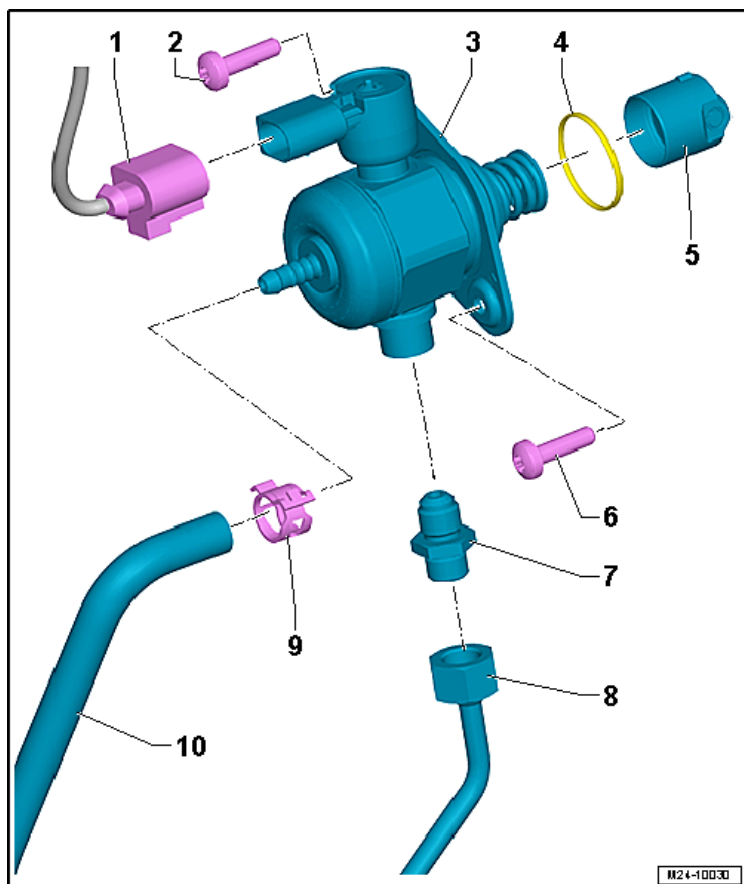
- Replace after removing

22 - Fuel Pressure Sensor -G247-

23 - Bolts

- 9 Nm
- Fuel rail to cylinder head

High Pressure Pump Overview



1 - Connector

2 - High Pressure Pump Bolt

- Tighten by hand
- 8 Nm + 90° turn
- Replace after removing

3 - High Pressure Pump

4 - O-ring

5 - Roller Tappet

6 - High Pressure Pump Bolt

- Tighten by hand
- 8 Nm + 90° turn
- Replace after removing

7 - Fuel Supply Line Connection

- 30 Nm
- Replace after removing

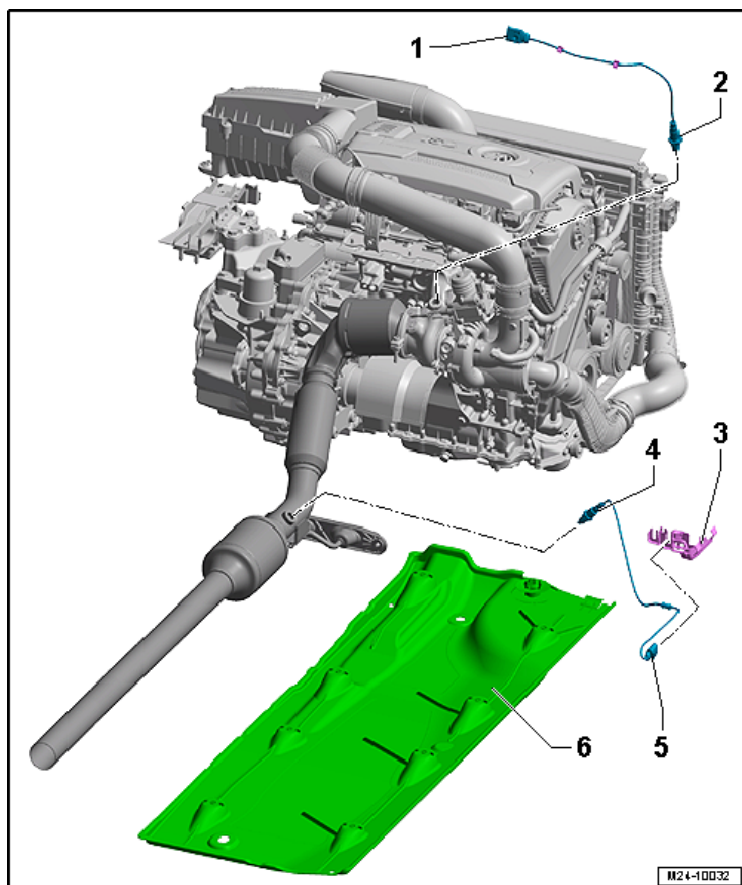
8 - Bolt

- 27 Nm
- Lubricate the fuel supply line ball with engine oil

9 - Spring Clamp

10 - Fuel Supply Line

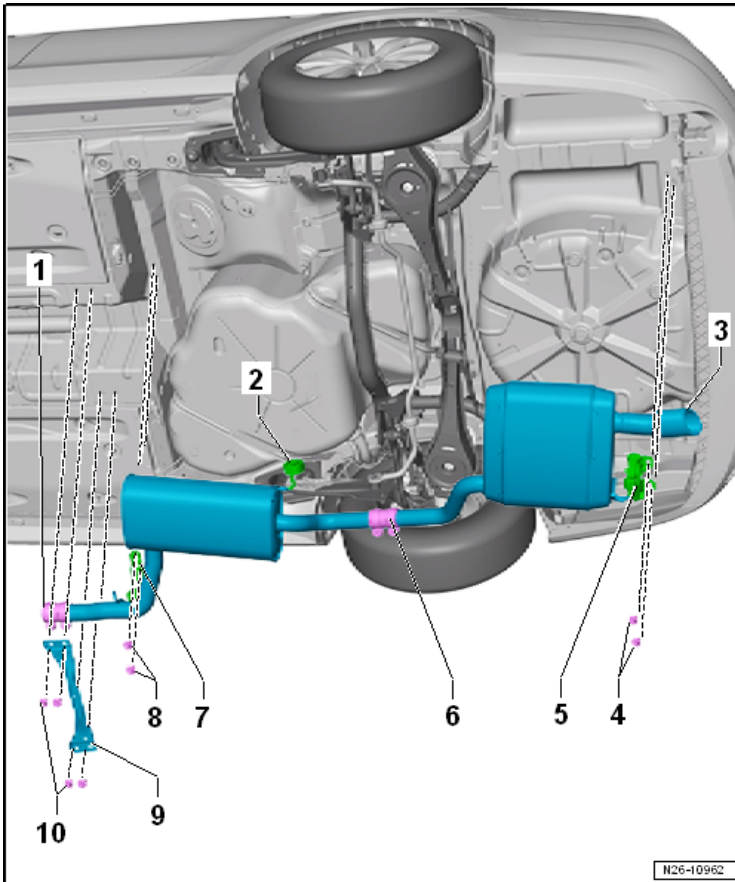
Heated Oxygen Sensor Overview, 2 Heated Oxygen Sensors



- 1 - Connector
- 2 - Heated Oxygen Sensor -G39- with Oxygen Sensor Heater -Z19-
□ 55 Nm
- 3 - Bracket
- 4 - Oxygen Sensor after Three Way Catalytic Converter -G130- with
Heater or Oxygen Sensor 1 after Catalytic Converter -Z29-
- 5 - Connector
- 6 - Underbody Trim

Exhaust System, Emission Controls – 1.8L CPKA, CPRA

Muffler Overview



1 - Exhaust Pipe with Rear Muffler

2 - Bolt

- 25 Nm
- Replace after removing

3 - Separating Point

4 - Mounting Strap

5 - Bolt

- Tightening specification, refer to Fuel Supply System

6 - Bolt

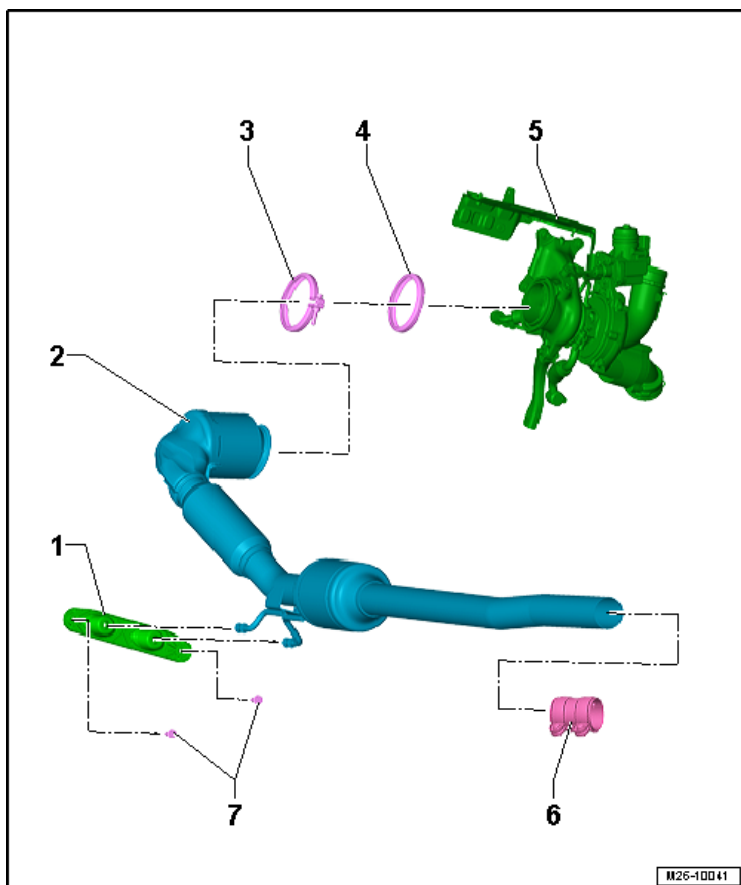
- Tightening specification, refer to Fuel Supply System

7 - Rear Tunnel Bridge

8 - Nut

- 20 Nm

Emissions Control Overview



1 - Bracket

2 - Catalytic Converter

3 - V-clamp

- Tightening specification, refer to Turbocharger Overview
- Replace after removing

4 - Seal

- Replace after removing

5 - Turbocharger

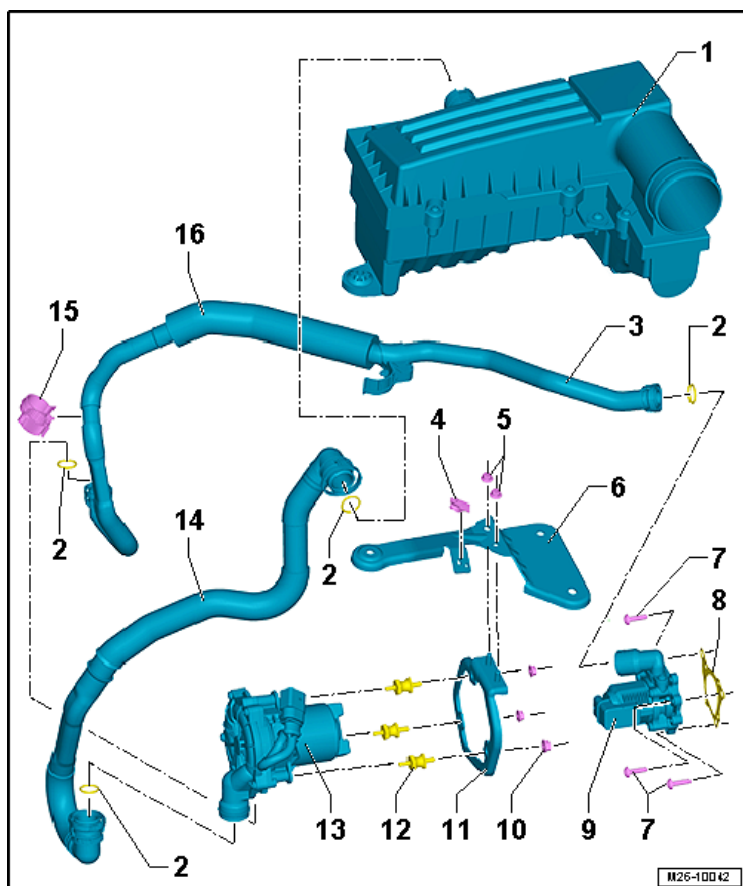
6 - Front Clamping Sleeve

- 30 Nm

7 - Bolt

- 23 Nm

Secondary Air Injection System Overview



1 - Air Filter Housing

2 - O-ring

- Coat with engine oil
- Replace after removing

3 - Connecting Line

4 - Bracket

5 - Nut

- 8 Nm

6 - Bracket

7 - Bolt

- 9 Nm

8 - Seal

9 - Secondary Air Injection Solenoid Valve

10 - Nut

- 8 Nm

11 - Bracket

12 - Rubber Bushing

13 - Secondary Air Injection Pump Motor

- Tightening specification, refer to Fuel Supply System

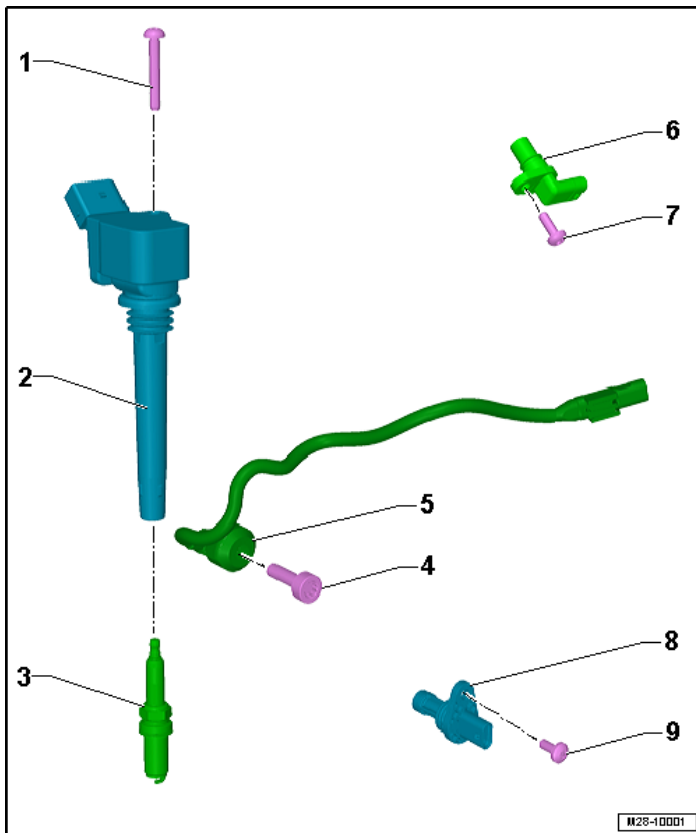
14 - Connecting Line

15 - Bracket

16 - Protection

Ignition/Glow Plug System – 1.8L CPKA, CPRA

Ignition System Overview



1 - Bolt

- 10 Nm

2 - Ignition Coil with Power Output Stage

3 - Spark Plug

- 30 Nm

4 - Bolt

- 20 Nm
- Replace after removing

5 - Knock Sensor 1 -G61-

6 - Camshaft Position Sensor -G40-

7 - Bolt

- 9 Nm

8 - Engine Speed Sensor -G28-

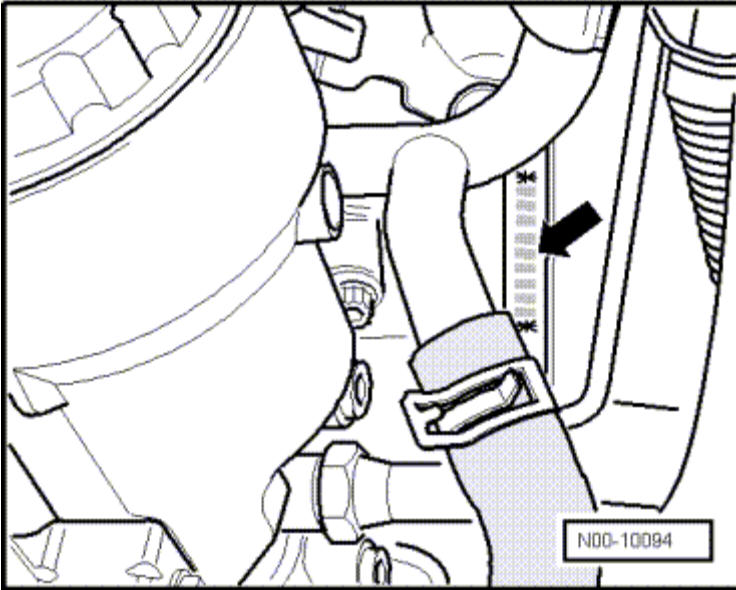
9 - Bolt

- 10 Nm

ENGINE MECHANICAL – 2.0L CKRA (TDI)

General, Technical Data

Engine Number Location



The engine number (engine code and serial number) (arrow) is located at the front of the engine/transmission joint. There is also a label on the toothed belt guard that shows the engine code and serial number. Engine codes beginning with C are four digits. The first 3 digits of the engine code indicate the displacement and the mechanical structure of the engine. They are stamped in the cylinder block, including the serial number. The fourth digit describes the engine output and torque.

Engine Data

Identification code		CKRA
Emission values in accordance with		BIN 5/LEV 2
Displacement	liter	2.0
Output	kW at RPM	103 @ 4000
Torque	Nm at RPM	320 @ 1500 to 2500
Bore	diameter mm	81.0
Stroke	mm	95.5
Valves per cylinder		4
Compression ratio		16.5
Fuel		Diesel
Ignition sequence		1-3-4-2
Balance shaft module		Yes
Catalytic converter		Yes
Exhaust Gas Recirculation (EGR)		Yes
Turbocharger, Supercharger		Yes
Charge Air Cooler (CAC)		Yes
Particulate filter		Yes

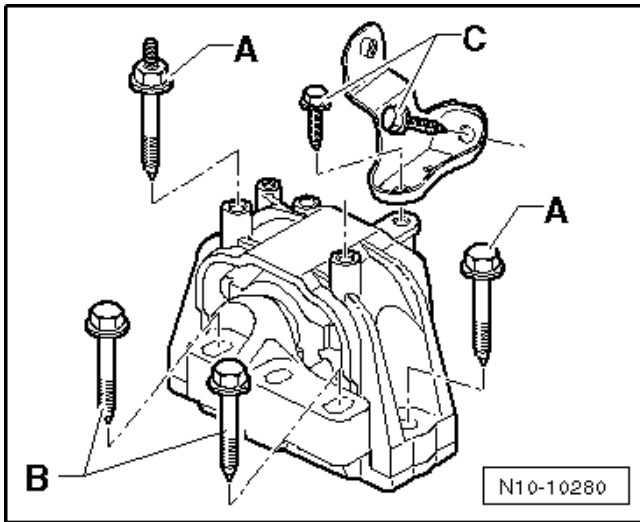
Engine Assembly – 2.0L CKRA (TDI)

Fastener Tightening Specifications

Component	Fastener size	Nm
Bolts and nuts	M6	10
	M7	15
	M8	25
	M10	40
	M12 ¹⁾	65

¹⁾ Tightening specification for a M12 collar bolt is 75 Nm.

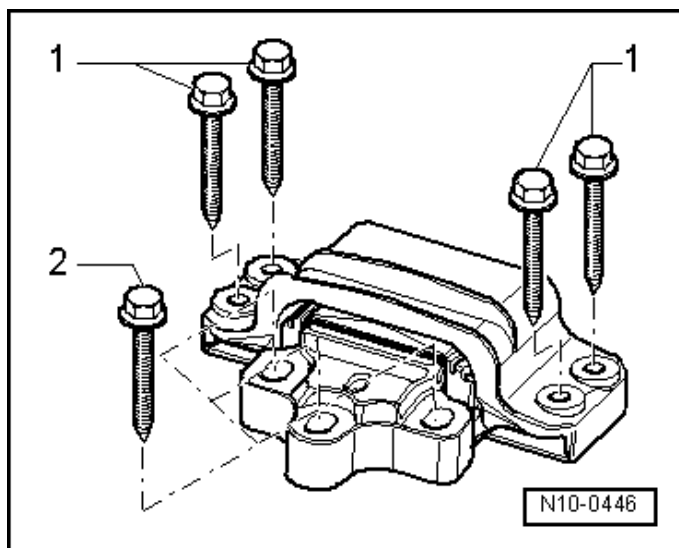
Engine Mount Tightening Specifications



Step	Component	Nm
1	Tighten bolts A ¹⁾	40 plus an additional 90° (¼ turn)
2	Tighten bolts B ¹⁾	60 plus an additional 90° (¼ turn)
3	Tighten bolts C ¹⁾	20 plus an additional 90° (¼ turn)

¹⁾ Replace fastener(s).

Transmission Mount Tightening Specifications



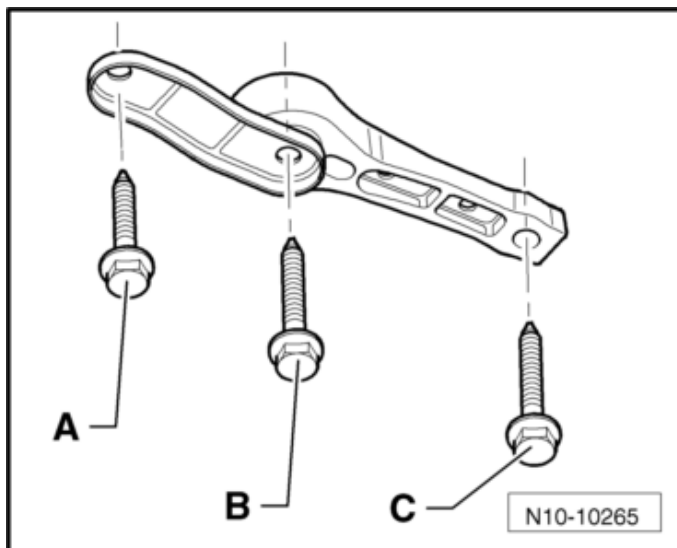
Step	Component	Nm
1	Tighten bolts 1 ¹⁾	40 plus an additional 90° (¼ turn)
2	Tighten bolts 2 ¹⁾	60 plus an additional 90° (¼ turn)

¹⁾ Replace fastener(s).

Fastener Tightening Specifications

Component	Nm
Accessory bracket-to-belt tensioner bolt ¹⁾	35
Accessory bracket-to-high pressure fuel pump bolt ¹⁾	20 plus an additional 90° (¼ turn)
Air conditioning compressor-to-accessory bracket bolt	45
Connecting rod cap-to-connecting rod bolt ¹⁾³⁾	30 plus an additional 90° (¼ turn)
Crankshaft bearing cap-to-cylinder block bolt ¹⁾	65 plus an additional 90° (¼ turn)
Crankshaft toothed belt gear-to-crankshaft bolt ¹⁾²⁾	120 plus an additional 90° (¼ turn)
Dual mass flywheel-to-crankshaft bolt ¹⁾	60 plus an additional 90° (¼ turn)
Engine speed sensor-to-sealing flange bolt	5
Generator-to-accessory bracket bolt	25
Oil spray jet-to-cylinder block bolt	27
Ribbed Belt Tensioner	35
Toothed belt idler pulley-to-cylinder block bolt ¹⁾	50 plus an additional 90° (¼ turn)
Toothed belt idler roller-to-cylinder block nut	20
Vibration damper-to-crankshaft bolt ¹⁾	10 plus an additional 90° (¼ turn)

Pendulum Support Tightening Specifications

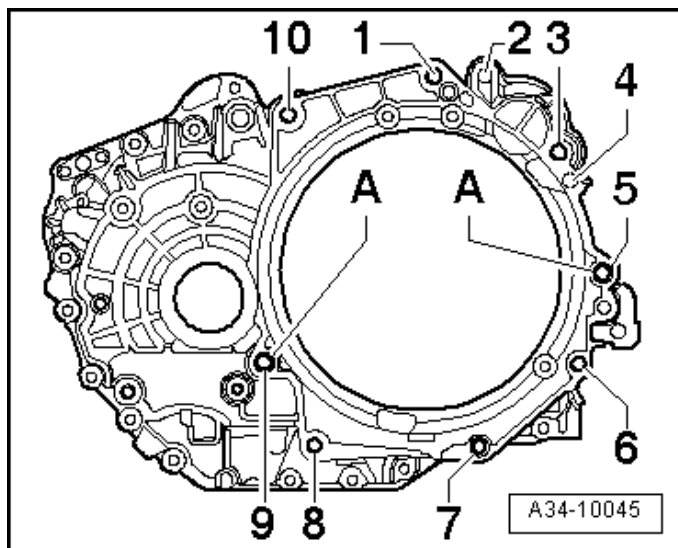


Step	Component	Nm
1	Tighten bolts A ¹⁾	50 plus an additional 90° (¼ turn)
2	Tighten bolts B ¹⁾	50 plus an additional 90° (¼ turn)
3	Tighten bolts C ¹⁾	100 plus an additional 90° (¼ turn)

¹⁾ Replace fastener(s).

Direct Shift Gearbox (DSG®) to Engine, Bolt Tightening Sequence and Specification

Engine –
2.0L CKRA (TDI)

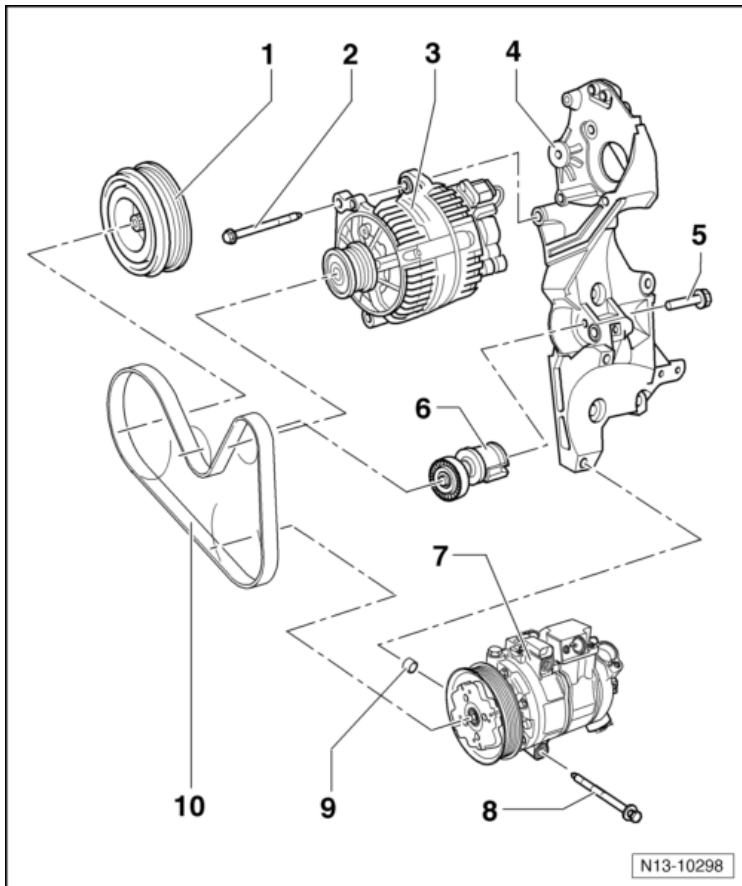


Item	Bolt	Nm
1, 3 and 10	M12 x 65	80
5	M12 x 65	80
6, 7 and 8	M10 x 50	40
9	M12 x 70	80
2 and 4	For starter, refer to Electrical Equipment	
A	Alignment sleeves for centering	

¹⁾ Replace fastener(s).

Crankshaft, Cylinder Block – 2.0L CKRA (TDI)

Ribbed Belt and Tensioner Overview



1 - Bolt

- 120 Nm + 90° turn
- Replace after removing

2 - Crankshaft Toothed Belt Gear

- Coat with engine oil
- Replace after removing

3 - Seal

4 - Sealing Flange

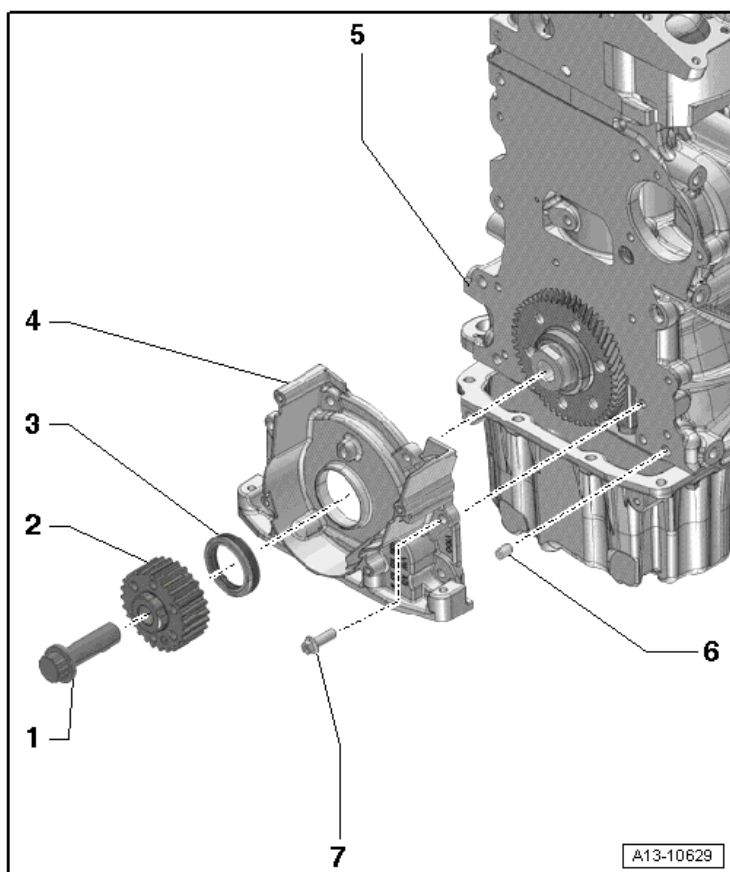
5 - Cylinder Block

6 - Alignment Pin

7 - Bolt

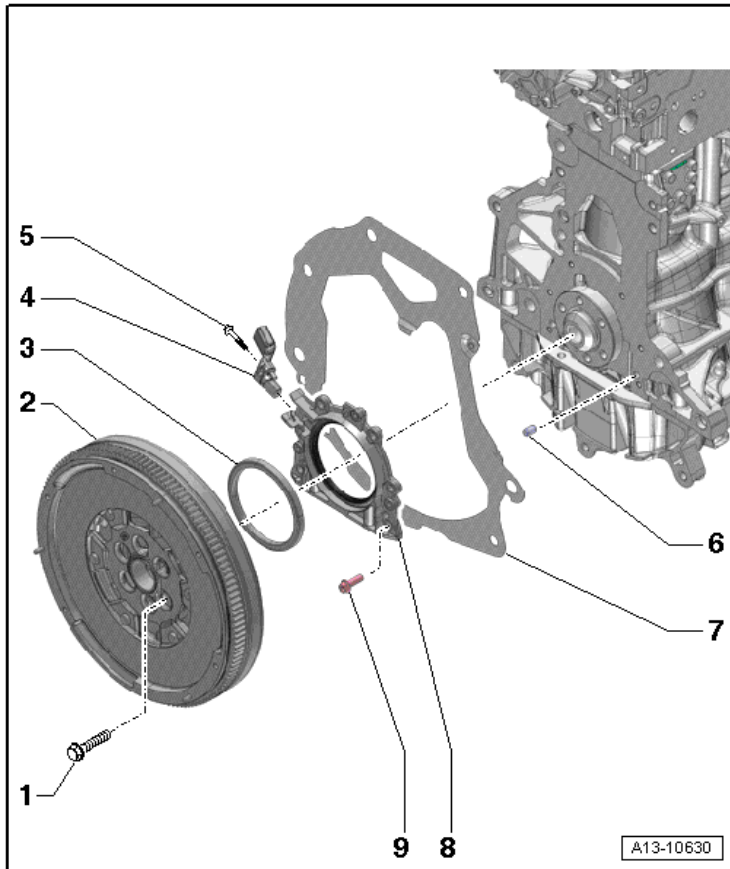
- Tightening sequence and specification, see Sealing Flange Bolt Tightening Sequence and Specification below

Sealing Flange Overview



- 1 - Air Filter Housing**
- 2 - O-ring**
 - Coat with engine oil
 - Replace after removing
- 3 - Connecting Line**
- 4 - Bracket**
- 5 - Nut**
 - 8 Nm
- 6 - Bracket**
- 7 - Bolt**
 - 9 Nm
- 8 - Seal**
- 9 - Secondary Air Injection Solenoid Valve**
- 10 - Nut**
 - 8 Nm
- 11 - Bracket**
- 12 - Rubber Bushing**

Dual Mass Flywheel and Sealing Flange Overview



1 - Bolt

- 60 Nm + 90° turn
- Replace after removing

2 - Dual Mass Flywheel

3 - Sensor Wheel

4 - Engine Speed Sensor -G28-

5 - Bolt

- 5 Nm

6 - Alignment Pin

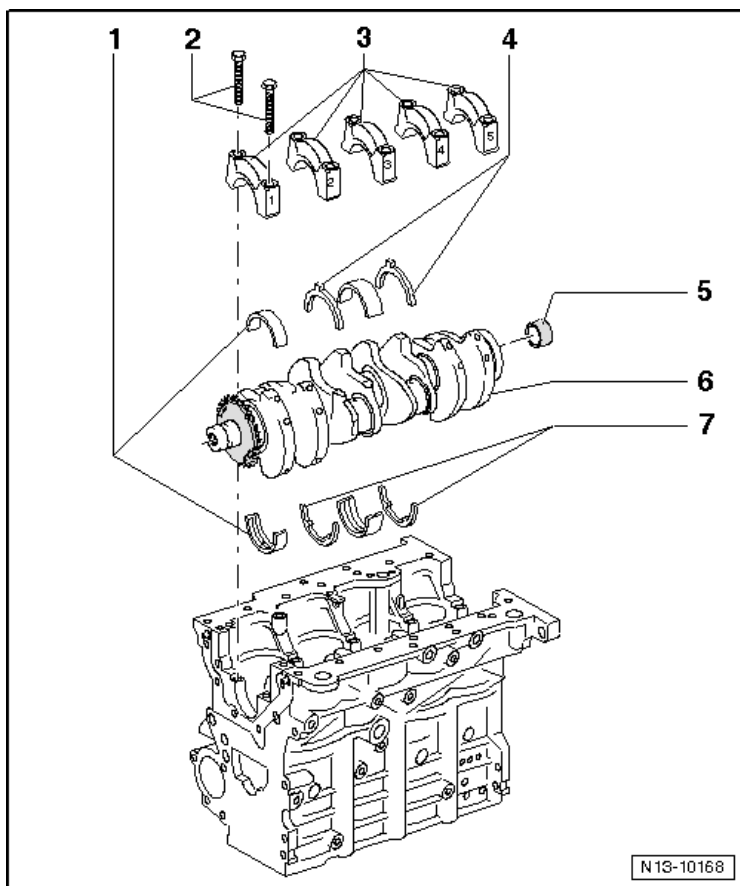
7 - Intermediate Plate

8 - Sealing Flange, Flywheel Side

9 - Bolt

- Tightening sequence and specification, see Sealing Flange Bolt Tightening Sequence and Specification below

Crankshaft Overview



1 - Bearing Shell

2 - Bolt

- 65 Nm + 90° turn
- Replace after removing

3 - Bearing Cap

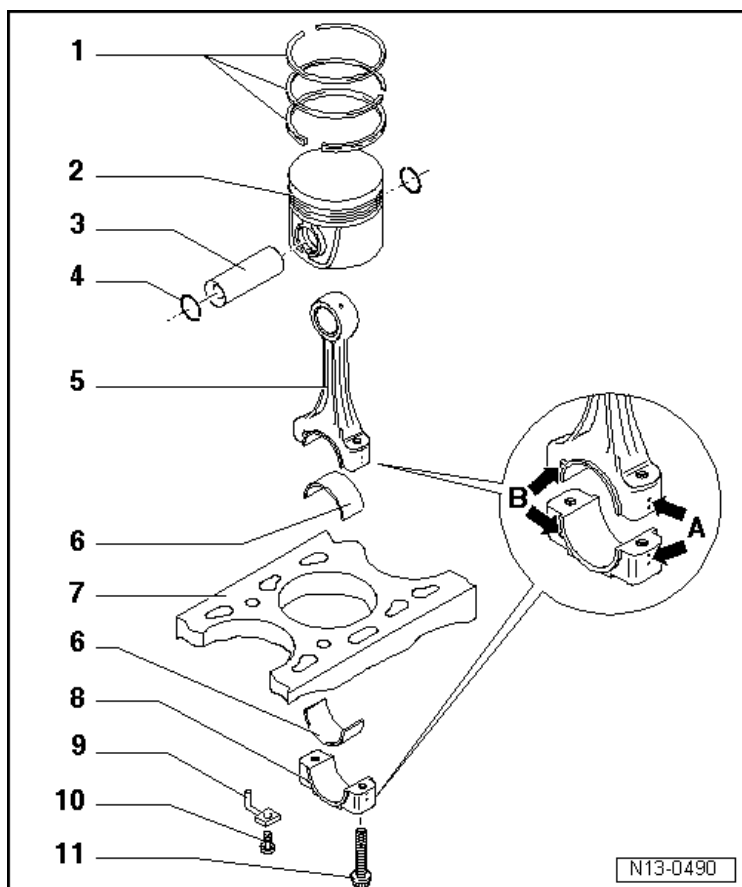
4 - Thrust Washer

5 - Needle Bearing

6 - Crankshaft

7 - Thrust Washer

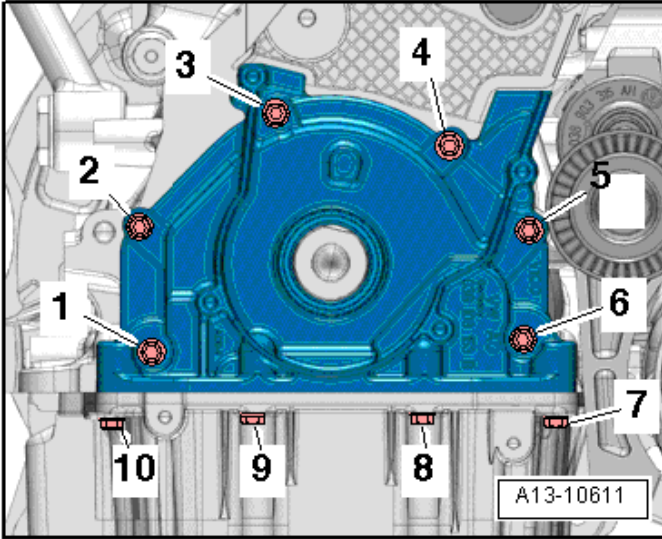
Pistons and Connecting Rod Overview



- 1 - Piston Rings
- 2 - Piston
- 3 - Piston Pin
- 4 - Lock Ring
- 5 - Connecting rod
- 6 - Bearing Shell
- 7 - Cylinder Block
- 8 - Connecting Rod Bearing Cap
- 9 - Oil Spray Jet
- 10 - Nut
 - 25 Nm
 - Install without sealant
- 11 - Bolt
 - 30 Nm + 90° turn
 - Replace after removing

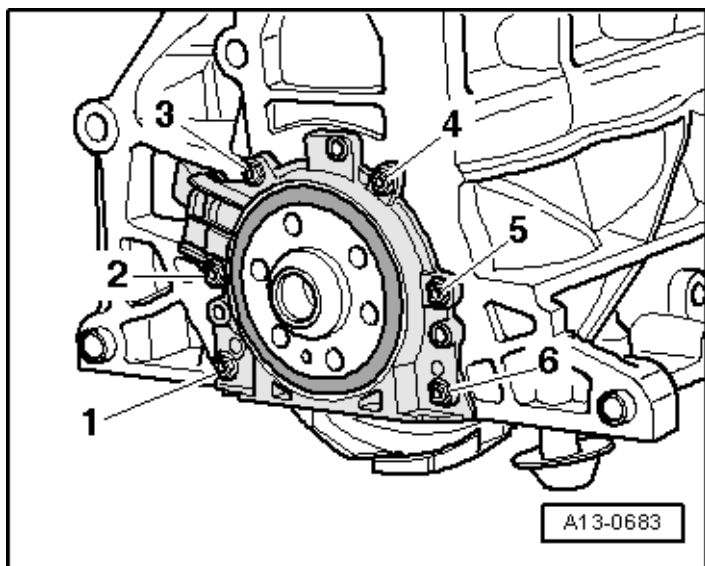
Fastener Tightening Specifications

Sealing Flange Bolt Tightening Sequence and Specification



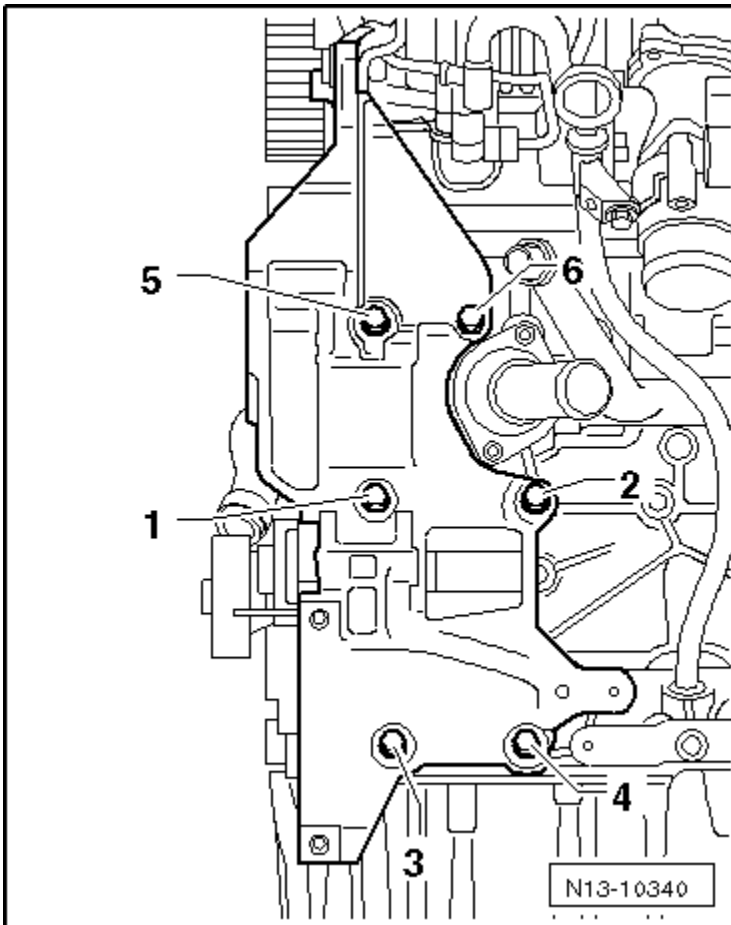
Step	Component	Nm
1	1 through 10	Hand-tighten
2	1 through 6	Tighten diagonally in steps to at least 15 Nm
3	7 through 10	Tighten to 15 Nm

Sealing Flange Bolt Tightening Sequence and Specification



Step	Component	Nm
1	1 through 6	Hand-tighten
2	1 through 6	Tighten diagonally in steps to at least 15 Nm

Accessory Bracket Tightening Specifications



Engine –
2.0L CKRA (TDI)

Step	Component	Nm
1	Tighten bolts 1 through 6 in sequence	Hand-tighten
2	Tighten bolts 1 through 6 in sequence	40
3	Tighten bolts 3 and 4	an additional 45° (1/8 turn)
4	Tighten bolts 1, 2, 5 and 6 in sequence	an additional 90° (1/4 turn)

Crankshaft Dimensions

Honing dimension in mm	Crankshaft bearing pin diameter		Connecting rod bearing pin diameter	
Basic dimension	54.00	-0.022	50.90	-0.022
		-0.042		-0.042

Piston and Cylinder Dimensions

Honing dimension in mm	Piston diameter ¹⁾	Cylinder bore diameter
Basic dimension	80.96	81.01

¹⁾ Measurement with coating (thickness = 0.02 mm). The coating wears off.

Piston Ring End Gaps

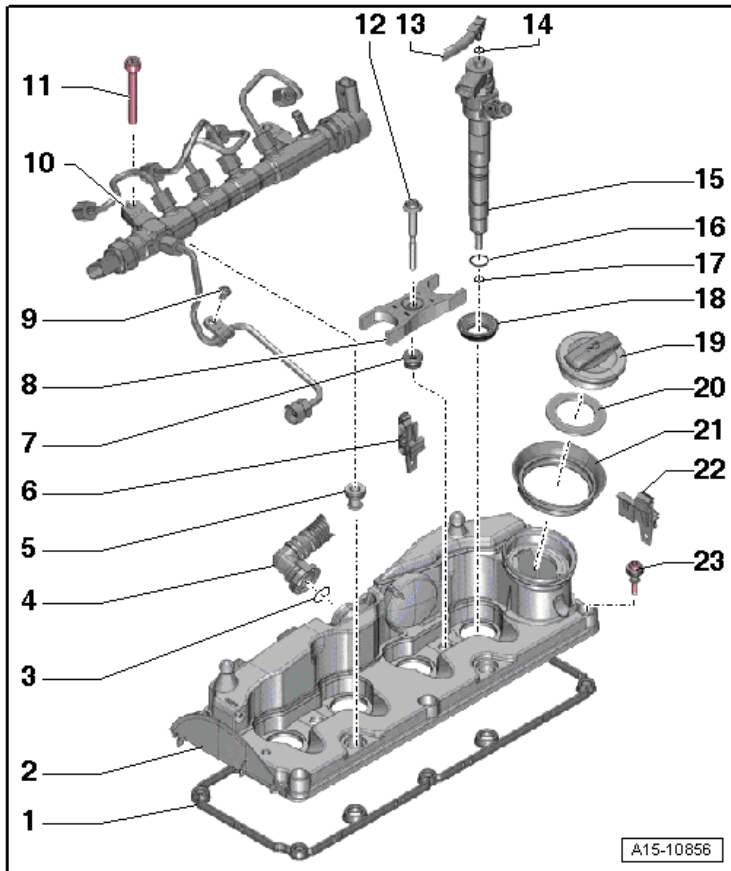
Piston ring gap dimensions in mm	New	Wear limit
1 st compression ring	0.20 to 0.40	1.0
2 nd compression ring	0.20 to 0.40	1.0
Oil scraping ring	0.25 to 0.50	1.0

Piston Ring Clearance

Piston ring to groove clearance dimensions in mm	New	Wear limit
1 st compression ring	0.06 to 0.09	0.25
2 nd compression ring	0.05 to 0.08	0.25
Oil scraping ring	0.03 to 0.06	0.15

Cylinder Head, Valvetrain – 2.0L CKRA (TDI)

Cylinder Head Cover Overview



- 1 - Gasket
- 2 - Cylinder Head Cover
- 3 - O-ring
 - Always replace
- 4 - Hose
- 5 - Sealing Bushing
- 6 - Bracket
- 7 - Grommet
- 8 - Tensioning Bracket
- 9 - Bolt
 - 8 Nm
- 10 - Fuel Rail (high-pressure reservoir)
- 11 - Bolt
 - 22 Nm

12 - Bolt

- 8 Nm +180° turn
- Replace after removing

13 - Fuel Return Line

14 - O-ring

- Always replace

15 - Fuel Injector

16 - O-ring

- Always replace

17 - Heat Protection Seal

18 - Seal

19 - Cap

20 - Gasket

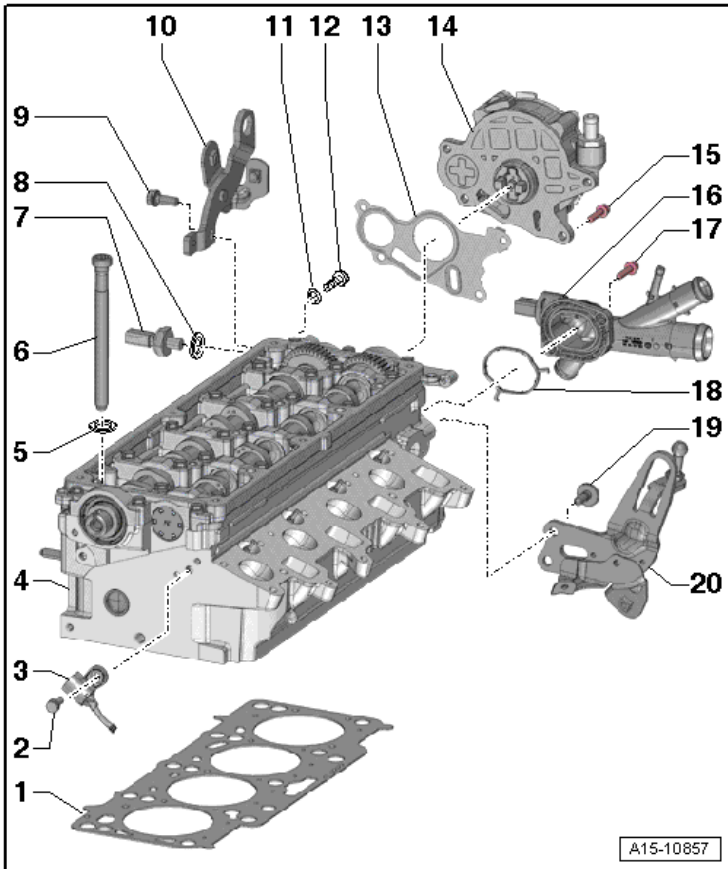
21 - Grommet

22 - Bracket

23 - Bolt

- Tightening specification and sequence, see Cylinder Head Cover Bolt Tightening Sequence and Specification below

Cylinder Head Overview



1 - Cylinder Head Gasket

- Always replace

2 - Bolt

- 10 Nm
- Install using locking compound, refer to the Parts Catalog

3 - Camshaft Position Sensor -G40-

4 - Cylinder Head

5 - Washer

6 - Bolt

- Loosening sequence, see Cylinder Head Bolt Loosening Sequence below
- Tightening sequence and specification, see Cylinder Head Bolt Tightening Sequence and Specification below
- Always replace

7 - Oil Pressure Switch -F1-

- 20 Nm

8 - Seal

- Always replace

9 - Bolt

- 20 Nm

10 - Engine Lifting Eye

11 - Seal

- Always replace

12 - Bolt

- 20 Nm

13 - Gasket

- Always replace

14 - Vacuum Pump

15 - Bolt

- 10 Nm

16 - Connecting Piece

17 - Bolt

- 9 Nm

18 - Gasket

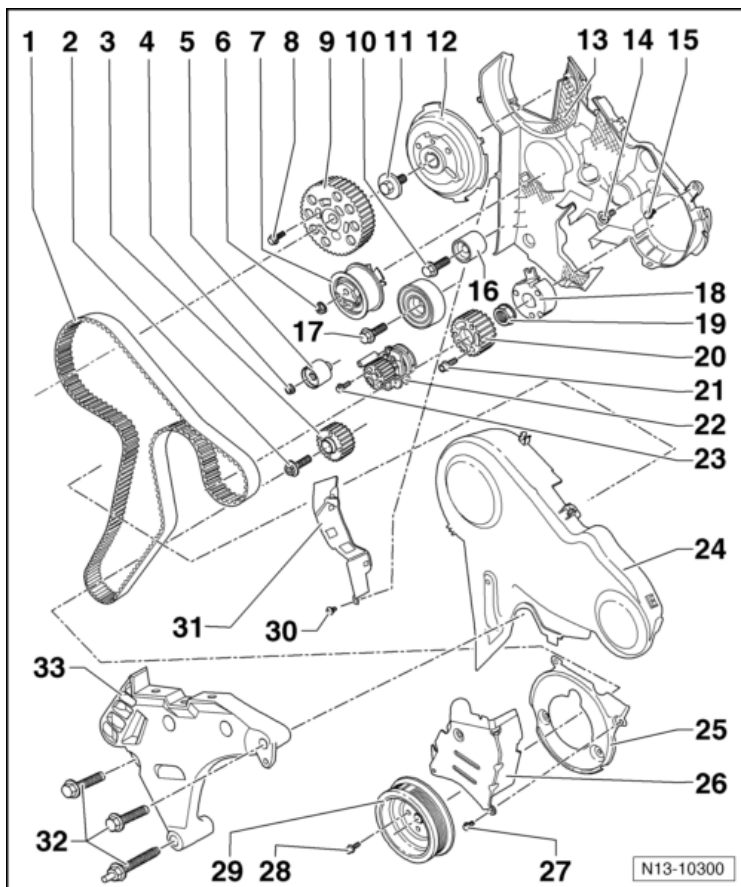
- Always replace

19 - Bolt

- 20 Nm

20 - Engine Lifting Eye

Toothed Belt Drive Overview



1 - Toothed Belt

2 - Bolt

- 120 Nm + 90° turn
- Replace after removing

3 - Crankshaft Toothed Belt Gear

4 - Nut

- 20 Nm

5 - Idler Roller

6 - Nut

- 20 Nm + 45° turn
- Replace after removing

7 - Tensioning Roller

8 - Bolt

- 20 Nm + 45° turn
- Replace after removing

9 - Camshaft Sprocket

10 - Bolt

- 20 Nm

11 - Bolt

- 100 Nm

12 - Hub

13 - Rear Toothed Belt Guard

14 - Bolt

- 20 Nm

15 - Bolt

- 20 Nm
- Replace after removing

16 - Idler roller

17 - Bolt

- 50 Nm + 90° turn
- Replace after removing

18 - Hub

19 - Nut

- 95 Nm

20 - High-Pressure Pump Toothed Belt Gear

21 - Bolt

- 20 Nm

22 - Coolant Pump

23 - Bolt

- 15 Nm

24 - Upper Toothed Belt Guard

25 - Lower Toothed Belt Guard

26 - Center Toothed Belt Guard

27 - Bolt

- 10 Nm
- Replace after removing

28 - Bolt

- 10 Nm + 90° turn
- Replace after removing

29 - Vibration Damper

30 - Bolt

- 5 Nm

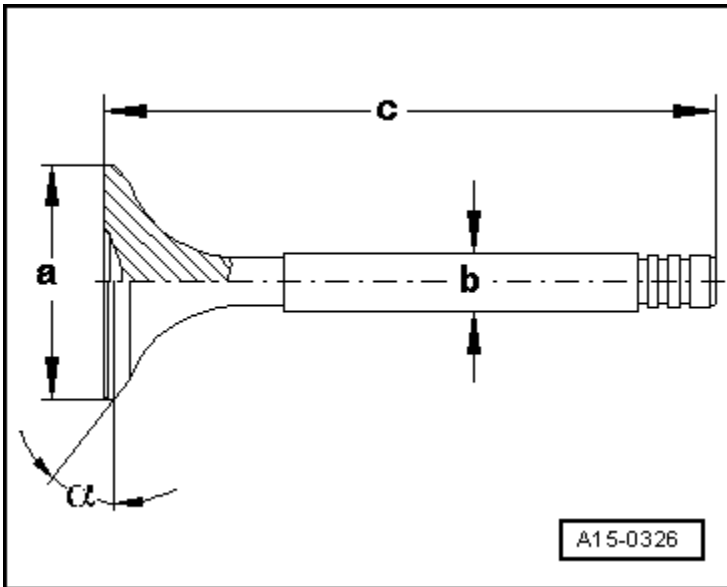
31 - Protective Plate

32- Bolt

- 40 Nm + 180° turn
- Replace after removing

33 - Engine Mount Bracket

Valve Dimensions



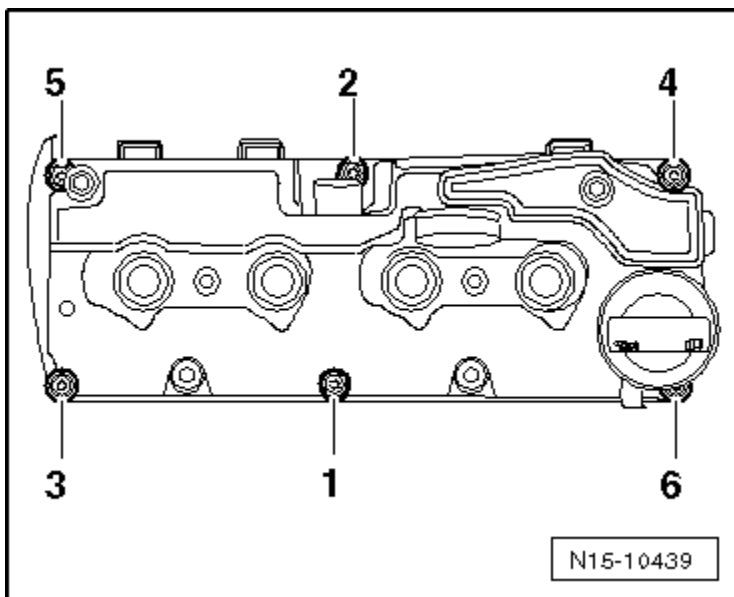
Dimension		Intake valve	Exhaust valve
Diameter a	mm	28.10	26.00
Diameter b	mm	5.975	5.965
c	mm	99.30	99.10
α	$^{\circ}$	45	45

NOTE: Intake and exhaust valves must not be refaced by grinding. Only lapping is permitted.

Compression Pressures

New Bar positive pressure	Wear limit Bar positive pressure	Difference between cylinders Bar positive pressure
25.0 to 31.0	19.0	Maximum 5.0

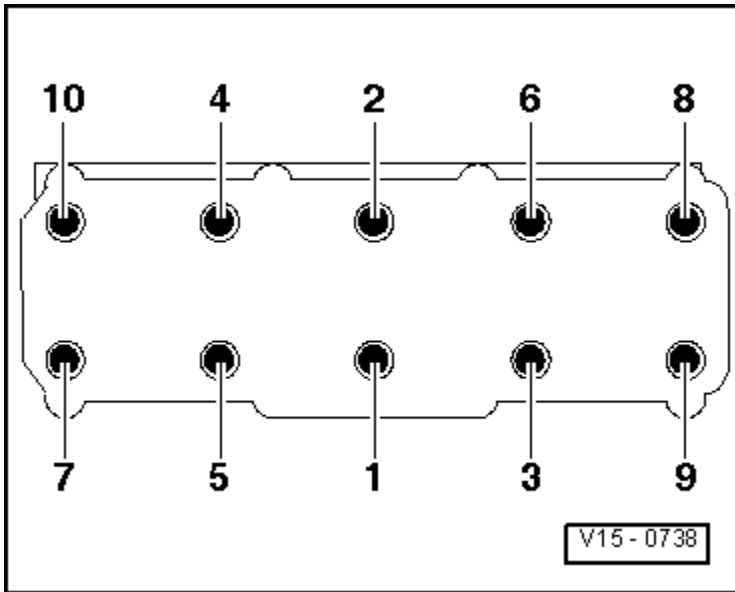
Cylinder Head Cover Bolt Tightening Sequence and Specification



Engine –
2.0L CKRA (TDI)

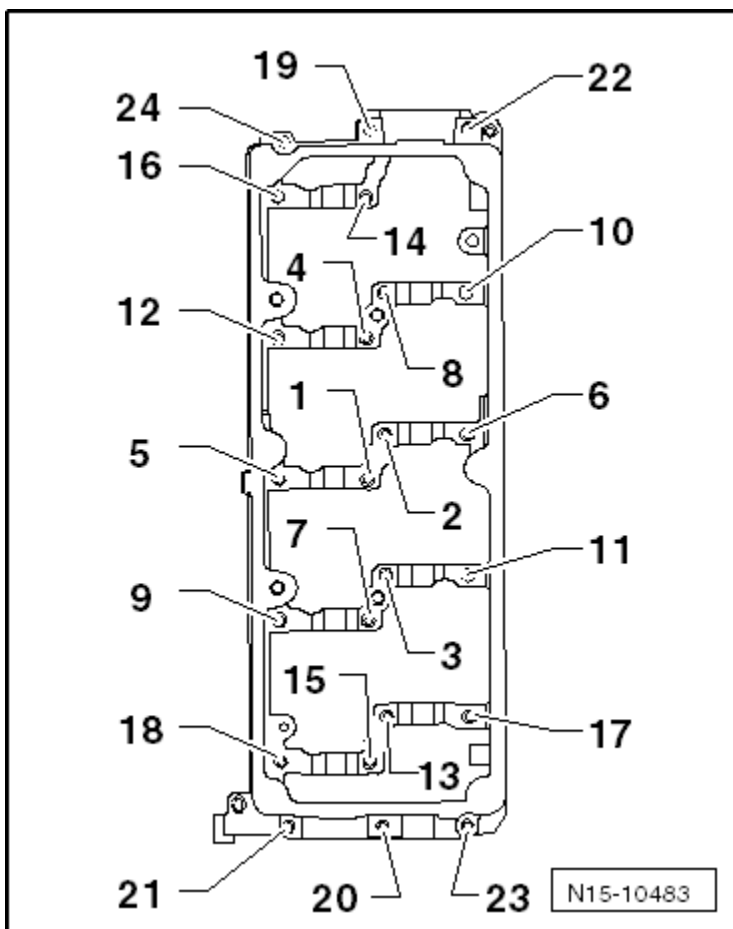
Step	Component	Nm
1	Tighten bolts 1 through 6 in sequence	9

Cylinder Head Tightening Specifications



Step	Component	Nm
1	Tighten bolts 1 through 10 in sequence	30
2	Tighten bolts 1 through 10 in sequence	50
3	Tighten bolts 1 through 10 in sequence	an additional 90° (¼ turn)
4	Tighten bolts 1 through 10 in sequence	an additional 90° (¼ turn)

Bearing Frame Tightening Specifications

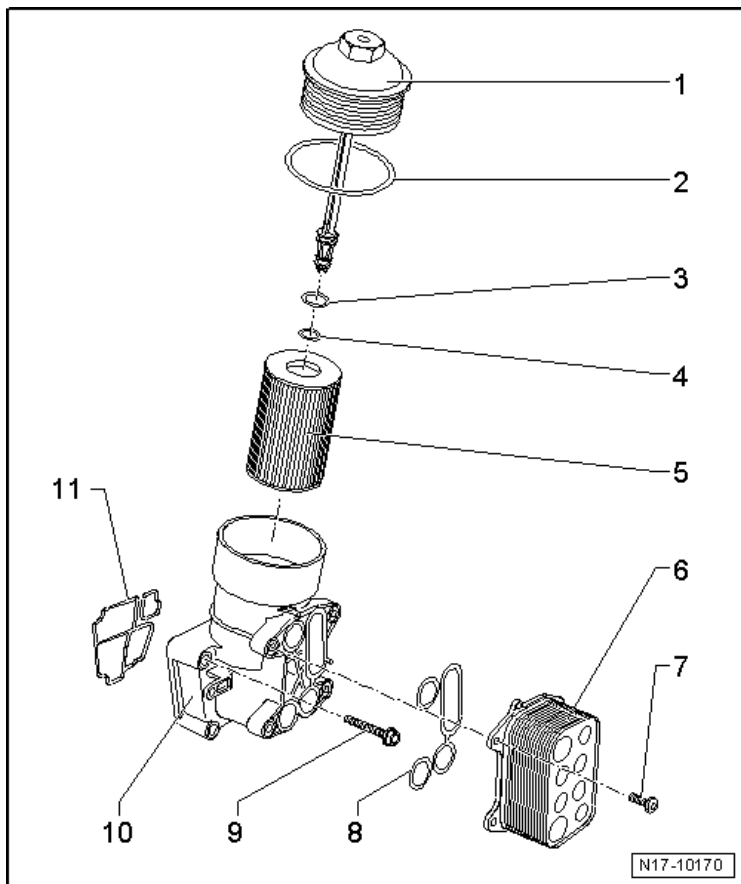


Step	Component	Nm
1	Tighten bolts and nuts 1 through 24 in sequence ¹⁾	Hand-tighten
2	Tighten bolts and nuts 1 through 24 in sequence	10

¹⁾ The guide frame must be in contact with the entire contact surface of the cylinder head.

Lubrication – 2.0L CKRA (TDI)

Oil Filter Bracket and Oil Cooler Overview



1 - Cap

- 25 Nm

2 - O-ring

- Always replace

3 - O-ring

- Always replace

4 - O-ring

- Always replace

5 - Oil Filter Element

6 - Engine Oil Cooler

7 - Bolt

- 11 Nm

8 - Seal

- Always replace

9 - Bolt

- Always replace

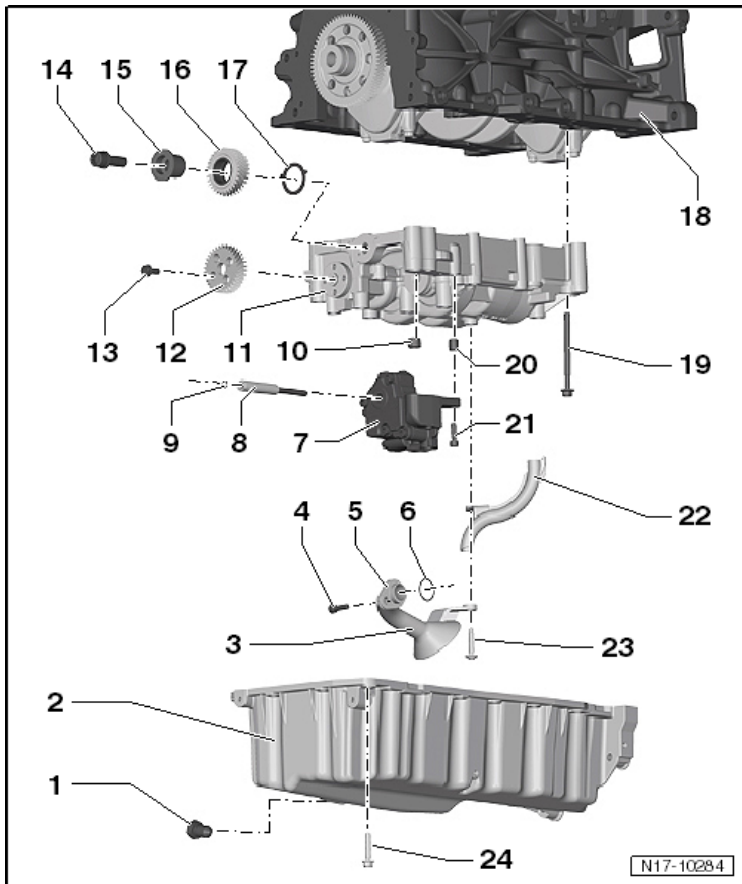
10 - Oil Filter Housing

11 - Seal

- Always replace

Cylinder Head, Valvetrain – 2.0L CKRA (TDI)

Oil Pan, Pump and Balance Shaft Module Overview



1 - Bolt

30 Nm

2 - Rear Coolant Pipe

3 - Nut

25 Nm

4 - Bolt

9 Nm

5 - Connection

6 - O-ring

Always replace

7 - Oil Pump

8 - Drive Axle

9 - Lock Ring

10 - Alignment Bushing

11 - Balance Shaft Module

12 - Spur Gear

13 - Bolt

- 20 Nm + 90° turn
- Always replace

14 - Bolt

- 90 Nm + 90° turn
- Always replace

15 - Axial Bearing Disc

- Always replace

16 - Intermediate Sprocket

- Always replace

17 - Axial Bearing Disc

- Always replace

18 - Crankcase

19 - Bolt

- M7 tighten to 13 Nm + 90° turn
- M8 tighten to 20 Nm + 90° turn
- Always replace

20 - Alignment Bushing

21 - Bolt

- 9 Nm

22 - Oil Pipe

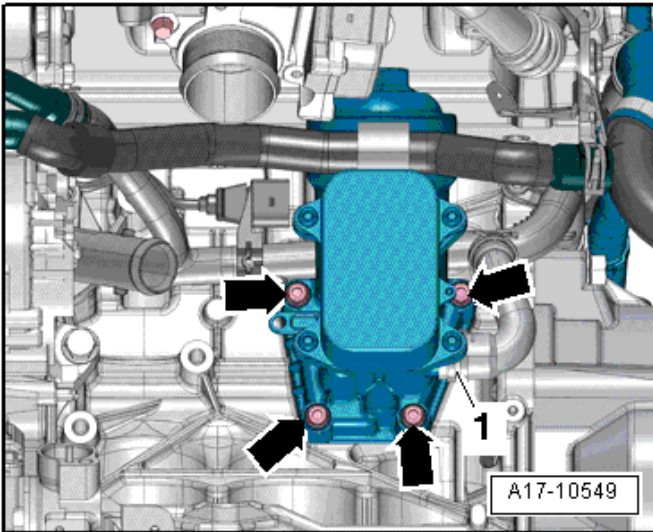
23 - Bolt

- 9 Nm

24 - Bolt

- Tightening sequence and specification, see Oil Pan Bolt Tightening Sequence and Specification below
- Always replace

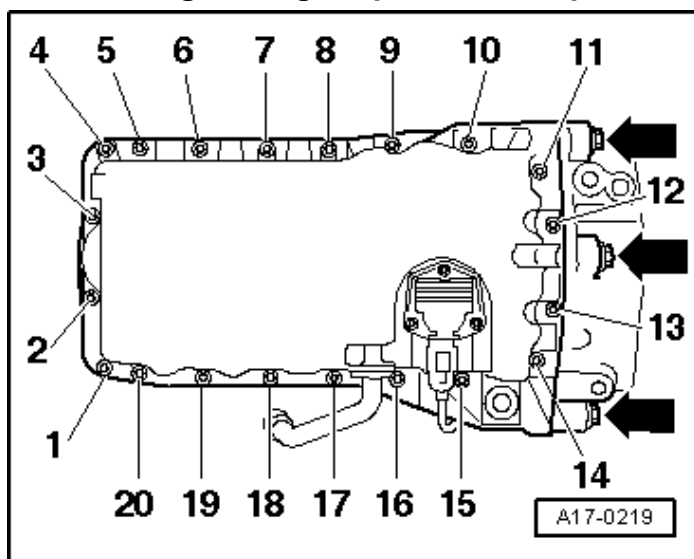
Oil Filter Bracket Bolt Tightening Sequence and Specification



Note: Replace the oil filter bracket bolts. Install the upper left bolt and the lower right bolt. Tighten the bolts in 2 steps:

Step	Bolts	Nm
1	-Arrows-	Tighten to 14 Nm in a diagonal sequence
2	-Arrows-	Tighten an additional 90° (1/4) turn, in a diagonal sequence

Oil Pan Bolt Tightening Sequence and Specification

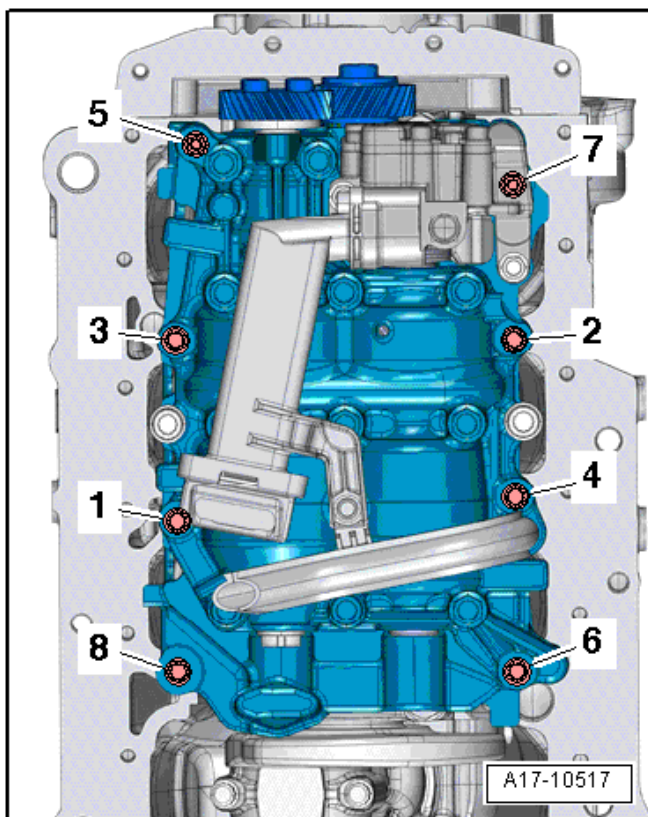


Engine –
2.0L CKRA (TDI)

Note: Replace the oil pan bolts. Tighten the bolt in 3 steps:

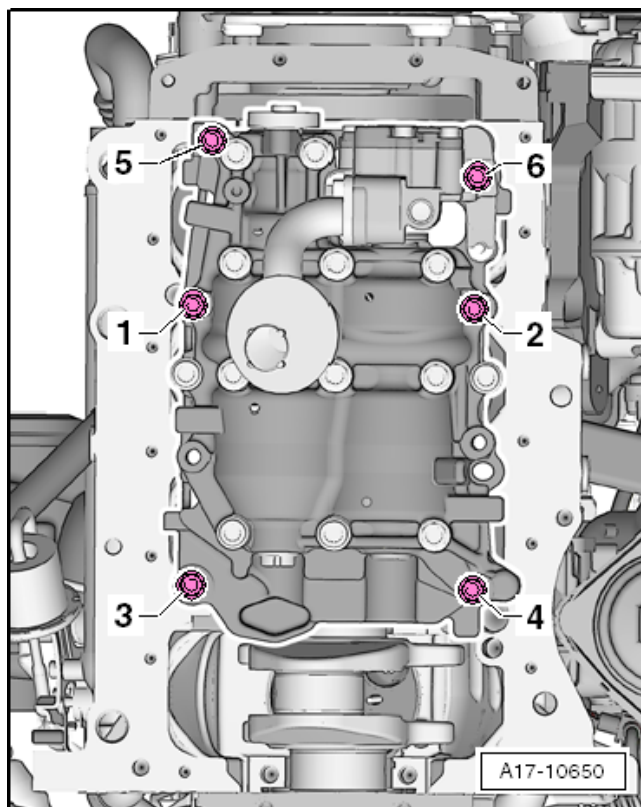
Step	Bolts	Nm
1	-1 through 20-	Tighten to 5 Nm, in a diagonal sequence
2	-Arrows-	Tighten to 40 Nm
3	-1 through 20-	Tighten to 15 Nm, diagonally and in steps

Balance Shaft Module, with 8 Bolts, Tightening Sequence and Specification



Step	Bolts	Nm
1	-1 through 8-	Hand tighten
2	-1 through 8-	Tighten in sequence to 6 Nm
3	-1 through 4-	Tighten to 20 Nm.
4	-5-	Tighten to 13 Nm.
5	-6-	Tighten to 20 Nm.
6	-7-	Tighten to 13 Nm.
7	-8-	Tighten to 20 Nm.
8	-1 through 8-	Tighten an additional 90° (1/4) turn in sequence using a ratchet

Balance Shaft Module, with 6 Bolts, Tightening Sequence and Specification

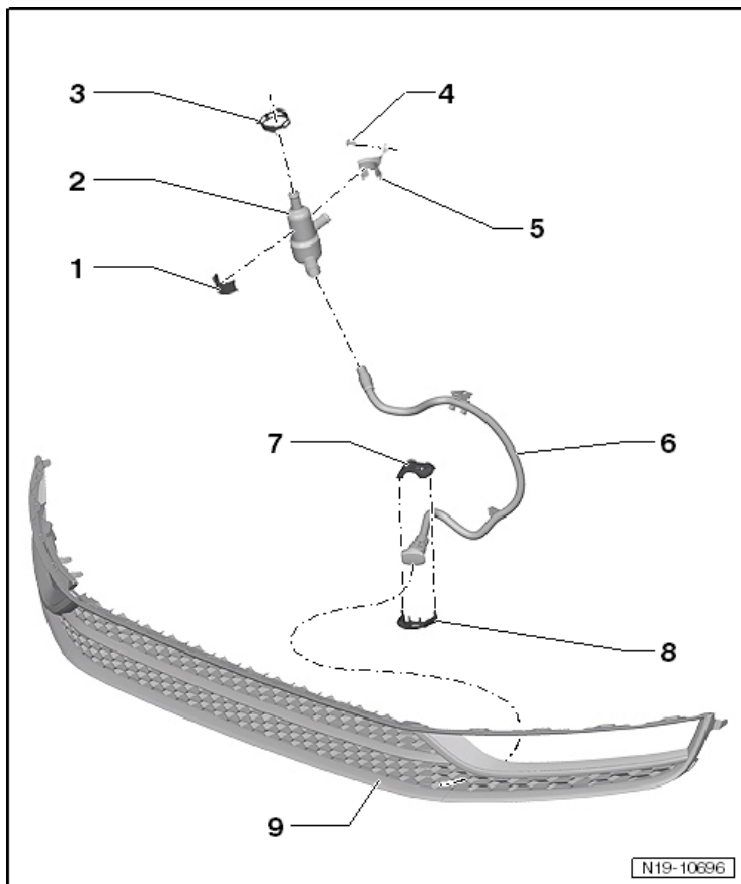


Engine –
2.0L CKRA (TDI)

Step	Bolts	Nm
1	-1 through 6-	Hand tighten
2	-1 through 6-	Tighten in sequence to 6 Nm
3	-1 through 4-	Tighten to 20 Nm.
4	-5 and 6-	Tighten to 13 Nm.
5	-1 through 6-	Tighten an additional 90° (1/4) turn in sequence with a ratchet

Cooling System – 2.0L CKRA (TDI)

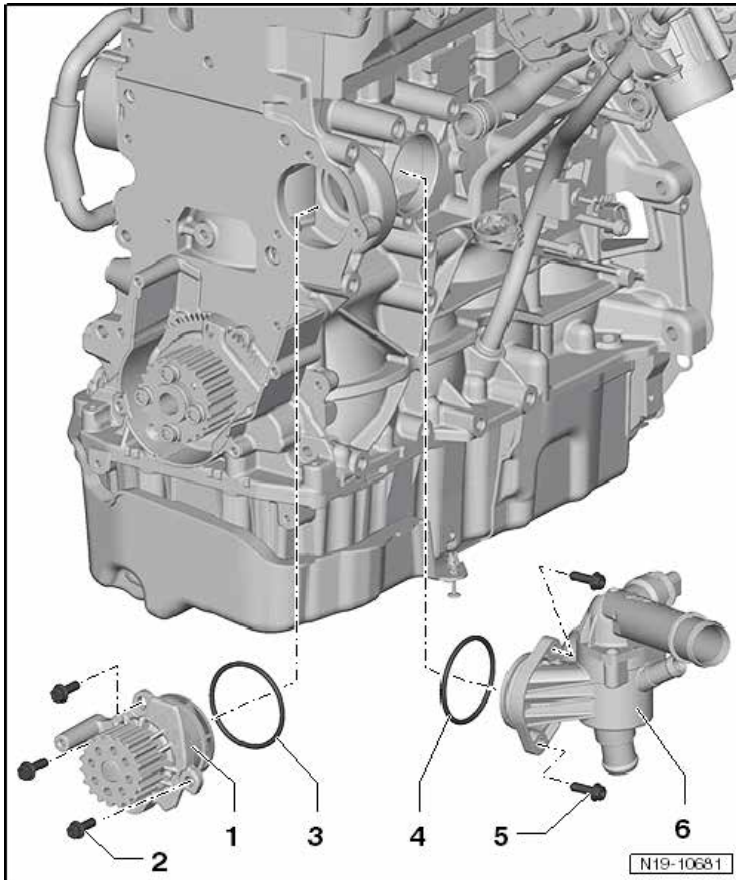
Engine Preheater Overview



- 1 - Rubber Protector
- 2 - Engine Preheating Element -Z97-
- 3 - Clip
- 4 - Bolt
 - 8 Nm
- 5 - Bracket
- 6 - Connecting Cable
- 7 - Bracket
- 8 - Bracket
- 9 - Air Grille

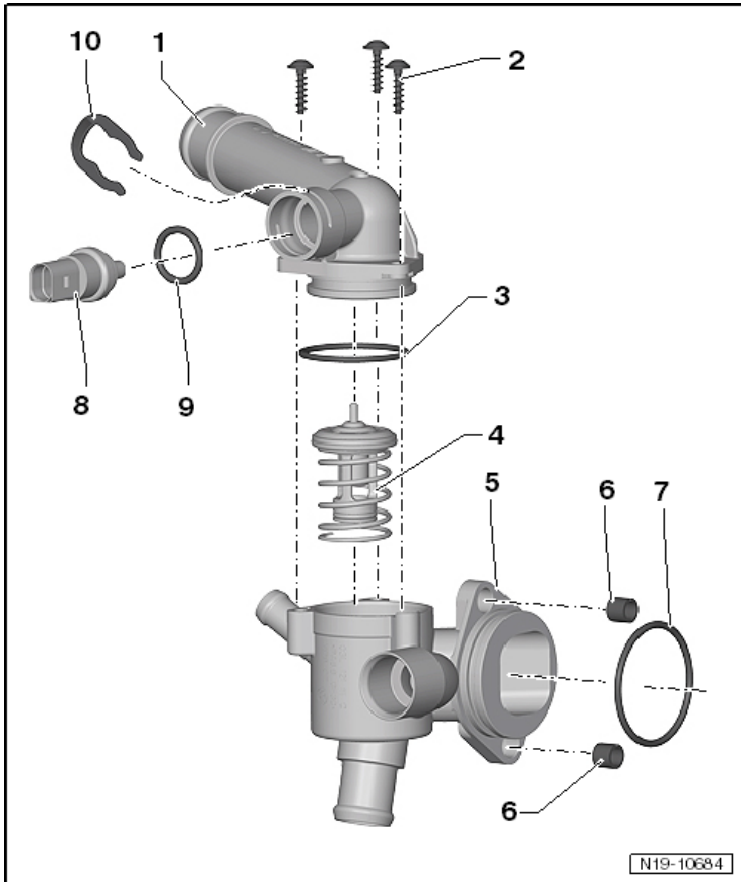
Coolant Pump and Thermostat Overview

Engine –
2.0L CKRA (TDI)



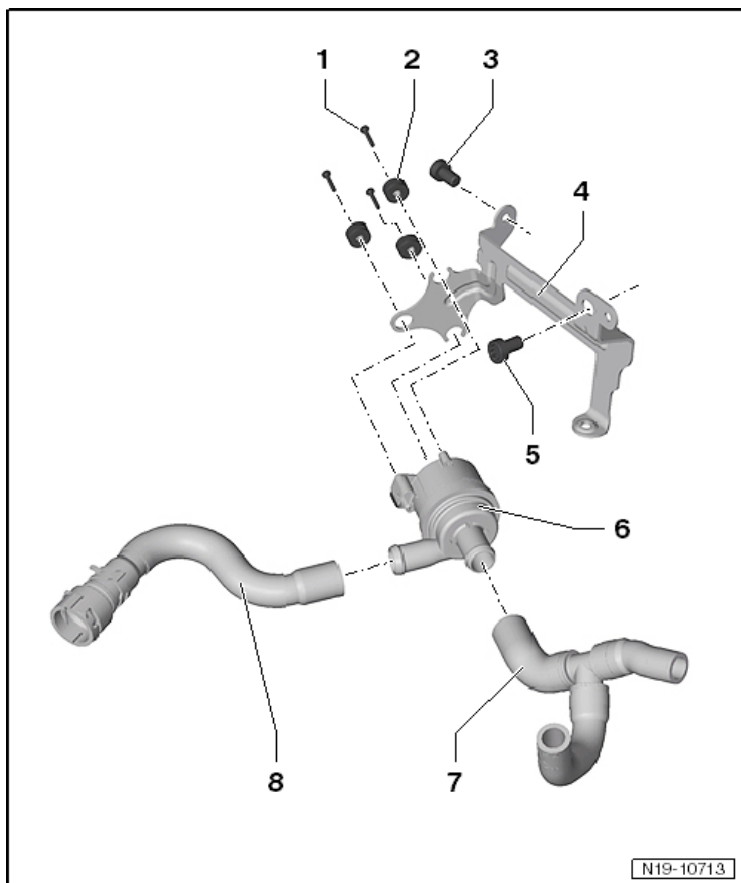
- 1 - Coolant Pump
- 2 - Bolt
 - 15 Nm
- 3 - O-ring
 - Always replace
- 4 - O-ring
 - Always replace
- 5 - Bolt
 - 15 Nm
- 6 - 4/2-Way Valve with Thermostat

4/2-Way Valve and Thermostat Overview



- 1 - Housing Cover**
- 2 - Bolt**
 - 5 Nm
- 3 - O-ring**
 - Always replace
- 4 - Coolant Thermostat**
- 5 - Housing**
- 6 - Bushing**
- 7 - O-ring**
- 8 - Engine Coolant Temperature Sensor on Radiator Outlet -G83-**
- 9 - O-ring**
 - Always replace
- 10 - Alignment Bushing**
- 11 - Spring Clip**
- 12 - Spring**

Charge Air Cooling Pump -V188- Overview



Engine –
2.0L CKRA (TDI)

1 - Bolt

- 1.5 Nm

2 - Rubber Grommet with Sleeve

3 - Bolt

- 8 Nm
- M6 x 12

4 - Bracket

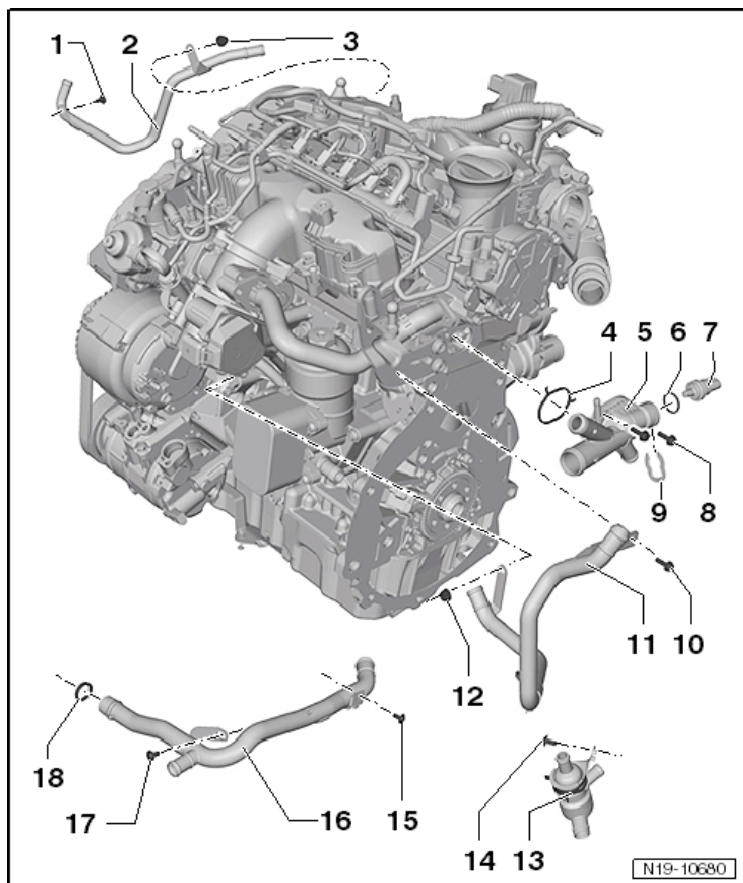
5 - Bolt

- 40 Nm

6 - Charge Air Cooling Pump -V188-

7 - Colant Hose

Coolant Pipes Overview



- 1 - Bolt**
 - 20 Nm
- 2 - Rear Coolant Pipe**
- 3 - Nut**
 - 25 Nm
- 4 - O-ring**
 - Always replace
- 5 - Connecting Piece**
- 6 - O-ring**
 - Always replace
- 7 - Engine Coolant Temperature Sensor -G62-**
- 8 - Bolt**
 - 9 Nm
- 9 - Retaining Clip**
- 10 - Bolt**
 - 9 Nm
- 11 - Front Coolant Pipe**

12 - Nut

- 9 Nm

13 - Engine Preheating Element -Z97-

14 - Bolt

- 8 Nm

15 - Bolt

- 9 Nm

16 - Left Coolant Pipe

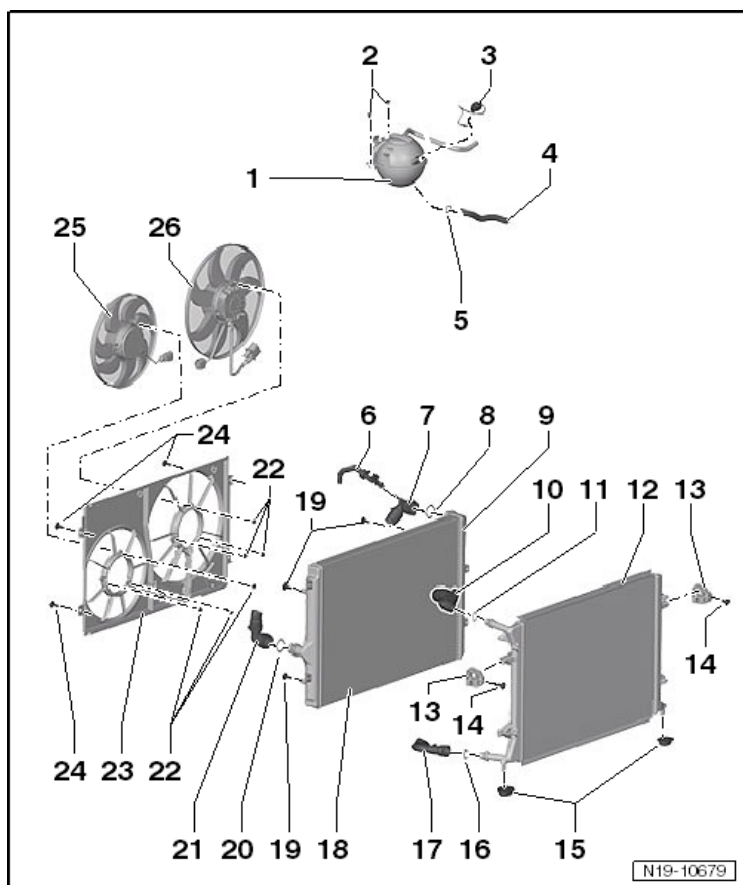
17 - Bolt

- 8 Nm

18 - O-ring

- Always replace

Radiator and Fan Shroud Overview



- 1 - Expansion Tank
- 2 - Bolts
 - 5 Nm
- 3 - Connector
- 4 - Coolant Hose
- 5 - Clip
- 6 - Coolant Hose
- 7 - Engine Coolant Temperature Sensor -G62-
- 8 - O-ring
- 9 - Radiator
- 10 - Coolant Hose
- 11 - O-ring
- 12 - Radiator
- 13 - Bracket
- 14 - Bolt
 - 10 Nm
- 15 - Radiator Mount

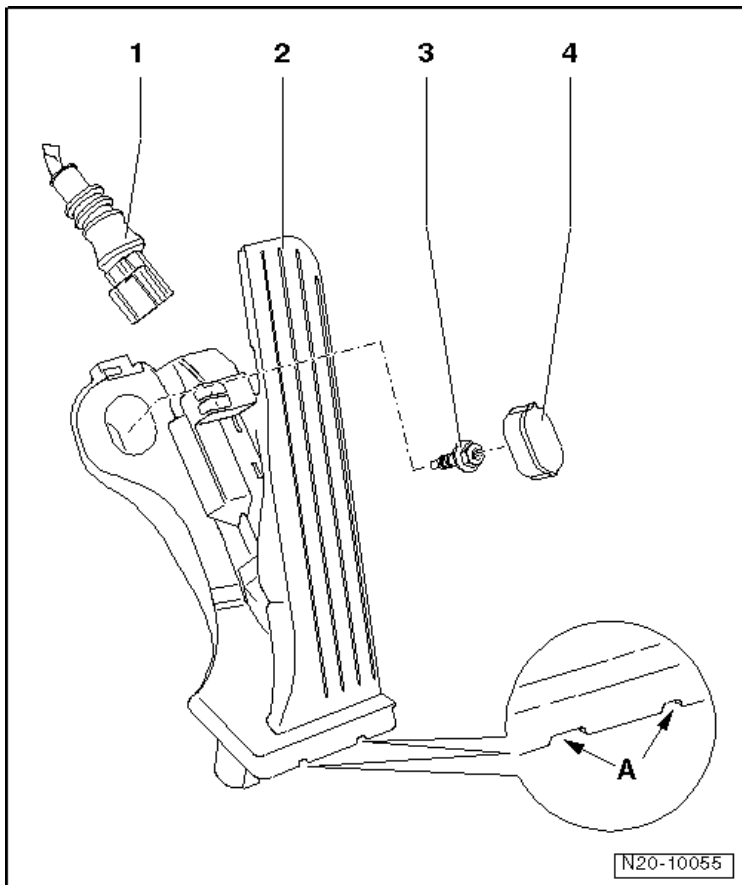
- 16 - O-ring**
- 17 - Coolant Hose**
- 18 - Radiator**
- 19 - Bolt**
 - 5 Nm
- 20 - O-ring**
- 21 - Coolant Hose**
- 22 - Nut**
 - 10 Nm
- 23 - Fan Shroud**
- 24 - Bolt**
 - 5 Nm
- 25 - Coolant Fan -V7-**
- 26 - Right Coolant Fan -V35-**

Fastener Tightening Specifications

Component	Fastener size	Nm
A/C Condenser to the Radiator for the Charged Air Coolant Circuit Bolts	-	5
4/2 way valve housing cover-to-housing bolt	-	5
4/2 way valve with thermostat-to-cylinder block bolt	-	15
Charge air cooling pump-to-bracket bolt	-	1.5
Charge air cooling pump-to-bracket bolt	M6	8
	M10	40
Coolant pipe to engine bolts	-	9
Coolant pump-to-cylinder block bolt	-	15
Engine preheating element bracket bolt	-	8
Intake manifold support-to-engine bolt	-	40
Intake manifold support-to-throttle valve control module bolt	-	8

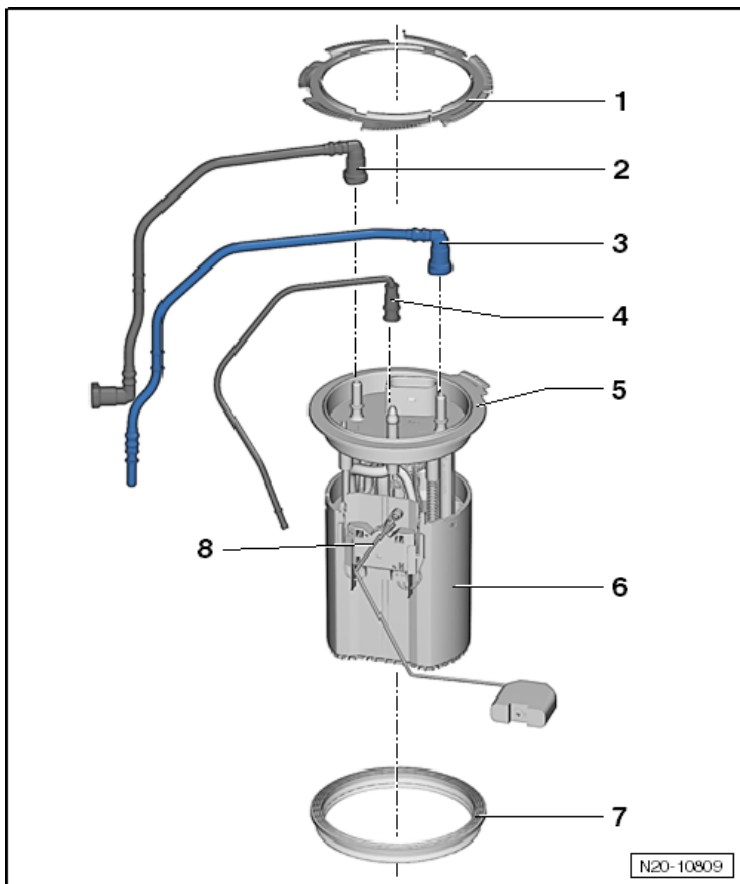
Fuel Supply – 2.0L CKRA (TDI)

Accelerator Pedal Mechanism Overview



- 1 - Connector
- 2 - Accelerator Pedal Module
- 3 - Bolts
 - 5 Nm
- 4 - Cap

Fuel Delivery Unit/Fuel Level Sensor Overview



Engine –
2.0L CKRA (TDI)

1 - Locking Ring

- 110 Nm

2 - Supply Line to Fuel Filter

3 - Return Line

4 - Supply Line for Auxiliary Heater

- Not available in the US or Canada

5 - Flange

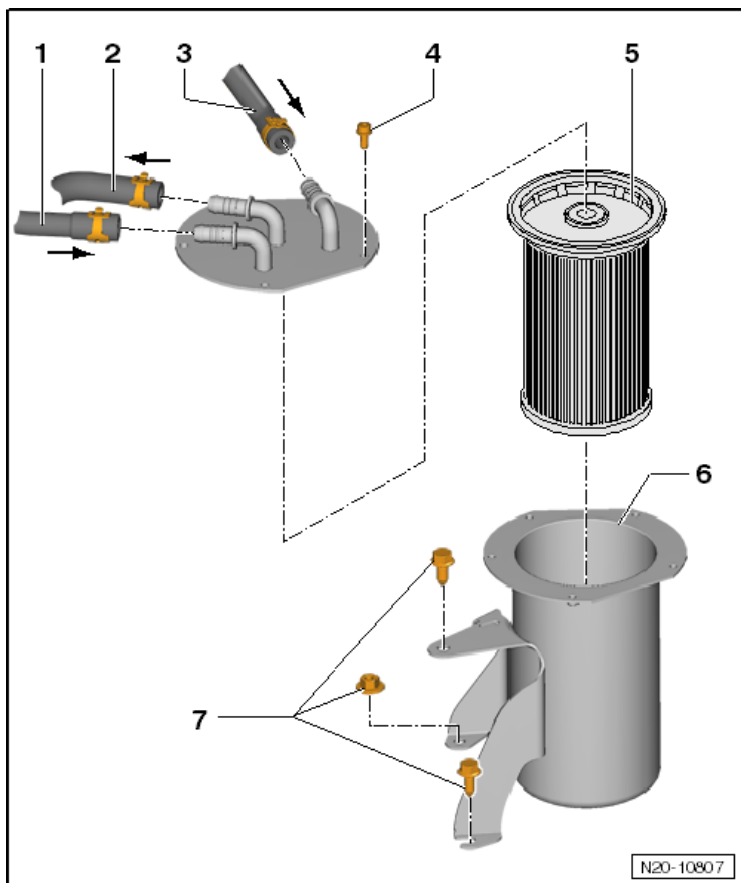
6 - Fuel Level Sensor -G-

7 - Fuel Delivery Unit

8 - Seal

- Replace

Fuel Filter Overview



- 1 - Supply Line**
 - From the fuel tank
- 2 - Supply Line**
 - To the high pressure pump
- 3 - Return Line**
- 4 - Bolt for Fuel Filter Upper Section**
 - 10 Nm
- 5 - Replacement Filter**
- 6 - Fuel Filter Lower Section**
- 7 - Bolt**
 - 10 Nm

12 - Mounting Strap

13 - Fuel Lines

14 - Seal

Replace

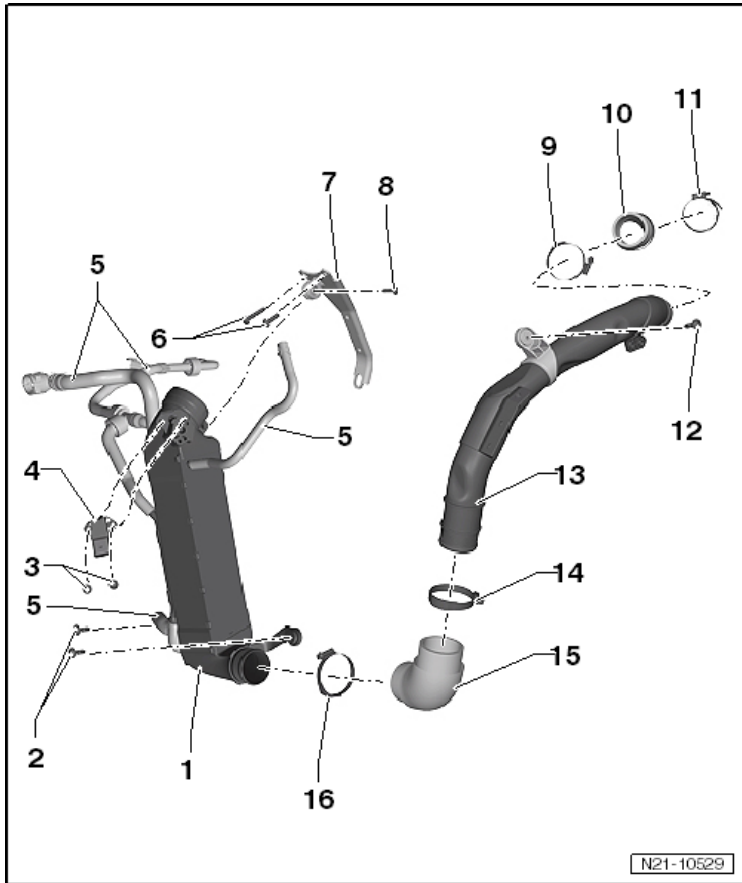
15 - Fuel Delivery Unit

16 - Locking Ring

110 Nm

Turbocharger – 2.0L CKRA (TDI)

Charge Air Cooler Overview



1 - Charge Air Cooler

2 - Bolt

8 Nm

3 - Bolt

5 Nm

4 - Charge Air Pressure Sensor -G31-/Intake Air Temperature Sensor G42-

5 - Windshield Washer Fluid Hose

6 - Bolt

8 Nm

7 - Support

8 - Bolt

8 Nm

9 - Clamp

5.5 Nm

10 - Air Guide Hose

11 - Clamp

5.5 Nm

12 - Bolt

8 Nm

13 - Charge Air Pipe

14 - Bolt

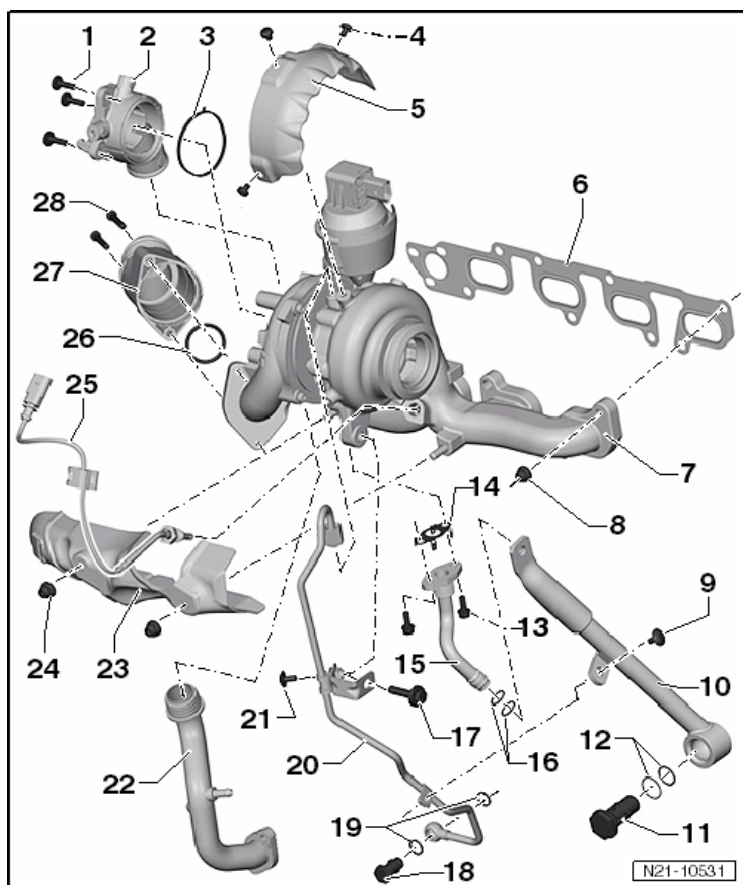
5.5 Nm

15 - Air Guide Hose

16 - Clip

5.5 Nm

Turbocharger and Attachments Overview



- 1 - Bolt
 - 8 Nm
- 2 - Connection
- 3 - O-ring
- 4 - Bolt
 - 15 Nm
- 5 - Ground Connection
- 6 - Gasket
 - Always replace
- 7 - Turbocharger
- 8 - Nut
 - 24 Nm
- 9 - Bolt
 - 10 Nm
- 10 - Support

11 - Banjo Bolt

- 60 Nm
- Replace after removing

12 - O-ring

- Always replace

13 - Bolt

- 15 Nm
- Replace after removing

14 - Gasket

- Always replace

15 - Oil Return Line

16 - O-ring

- Always replace

17 - Bolt

- 20 Nm

18 - Banjo Bolt

- 30 Nm

19 - Seal

- Always replace

20 - Oil Supply Line

- Tighten union nuts to 22 Nm

21 - Bolt

- 10 Nm

22 - Exhaust Gas Recirculation (EGR) Pipe

23 - Heat Shield

24 - Nut

- 24 Nm

25 - Exhaust Gas Temperature Sensor 1 -G235-

26 - O-ring

- Always replace

27 - Pulsation Damper

28 - Bolt

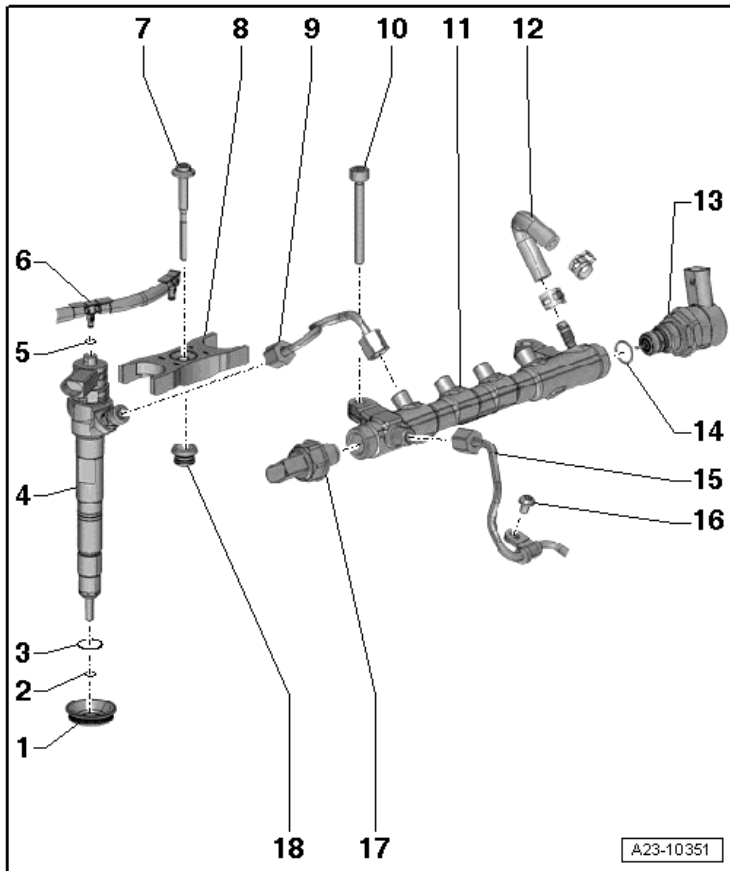
- 9 Nm

Fastener Tightening Specifications

Component	Nm
Charge Air Cooler (CAC)-to-cylinder block bolt	8
Charge air hose clamp (9 mm wide)	3
Charge air hose clamp (13 mm wide)	5.5
Charge air pressure sensor/intake air temperature sensor-to-Charge Air Cooler (CAC) bolt	5
Coolant pipe to engine bolt	9

Diesel Fuel Injection – 2.0L CKRA (TDI)

Fuel Rail and Injector Overview



- 1 - Seal**
- 2 - Copper Washer**
 - Always replace
- 3 - O-ring**
 - Always replace
- 4 - Fuel Injector**
- 5 - O-ring**
 - Always replace
- 6 - Fuel Return Line**
 - To fuel tank
- 7 - Bolt**
 - 8 Nm + 180° turn.
 - Always replace
- 8 - Tensioning Bracket**

9 - High-Pressure Line

- 28 Nm

10 - Bolt

- 22 Nm

11 - Fuel Rail (high-pressure reservoir)

12 - Fuel Return Hose

13 - Fuel Pressure Regulator Valve -N276-

- 80 Nm
- Replace after removing

14 - O-ring

- Always replace

15 - High-Pressure Line

16 - O-ring

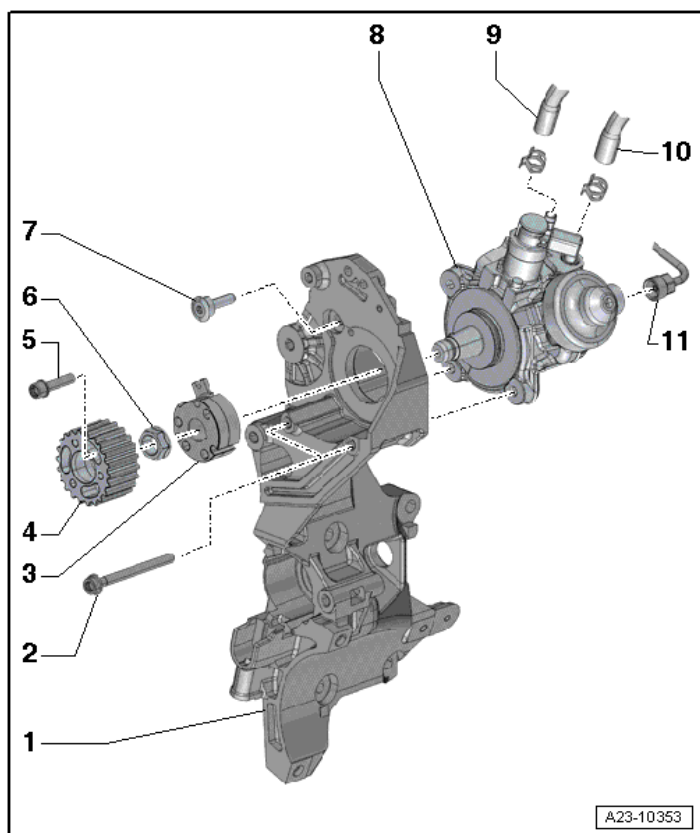
- 8 Nm

17 - Fuel Pressure Sensor -G247-

- 100 Nm
- Replace after removing

18 - Grommet

High-Pressure Pump Overview



1 - Accessory Bracket

2 - Bolt

- 20 Nm + 180° turn
- Replace after removing

3 - Hub

4 - High-Pressure Pump Toothed Belt Gear

5 - Bolt

- 20 Nm
- Replace after removing

6 - Nut

- 95 Nm

7 - Bolt

- 20 Nm + 45° turn
- Replace after removing

8 - High-Pressure Pump

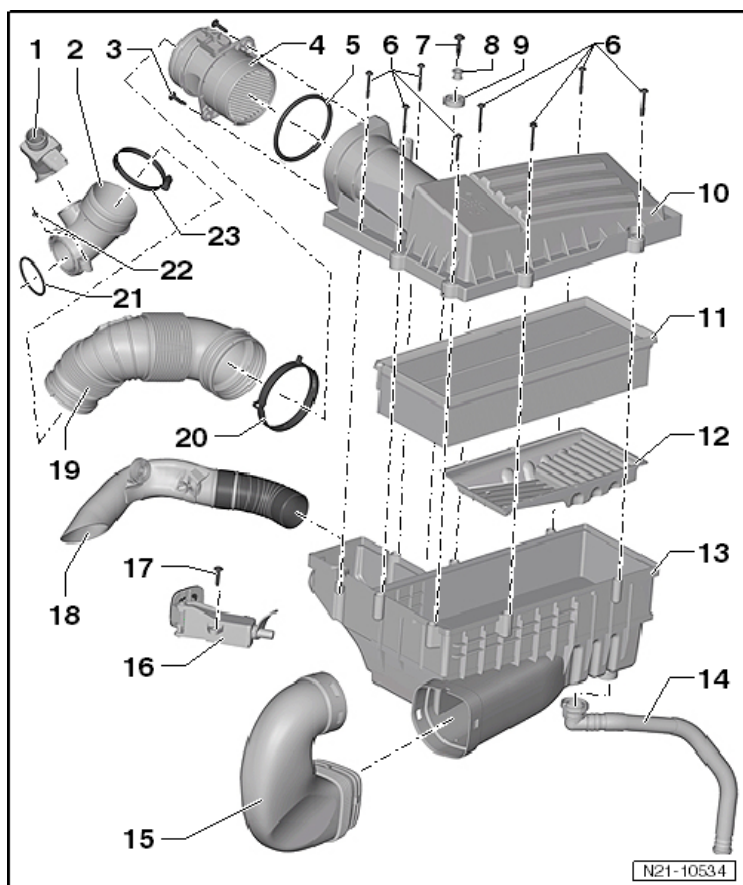
9 - Fuel Supply Hose

10 - Fuel Return Hose

11 - High-Pressure Line

- 28 Nm

Air Filter Housing Overview



- 1 - Hose Connection
- 2 - Air Guide Pipe
- 3 - Bolt
 - 1.5 Nm
- 4 - Mass Airflow Sensor -G70-
- 5 - O-ring
 - Always replace
- 6 - Screw
 - 1.5 Nm
- 7 - Bolt
 - 8 Nm
- 8 - Sleeve
- 9 - Washer
- 10 - Upper Air Filter Housing
- 11 - Air Filter Element
- 12 - Grille
- 13 - Lower Air Filter Housing

14 - Water Drain Hose

15 - Intake Air Guide

16 - Adjusting Element

17 - Bolt

1.5 Nm

18 - Preheating Intake Manifold

8 Nm

19 - Connecting Hose

20 - Spring Clamps

21 - Seal

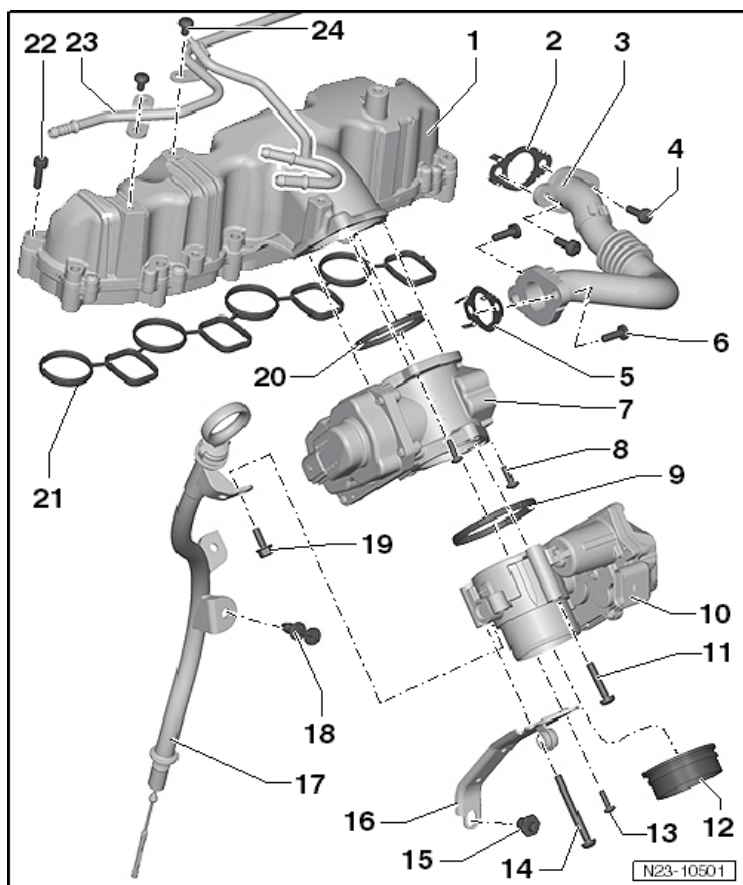
22 - Bolt

8 Nm

23 - Hose Clamp

5.5 Nm

Intake Manifold Overview



1 - Intake Manifold

2 - Gasket

Always replace

3 - Connecting Pipe

4 - Bolt

20 Nm

5 - Gasket

Always replace

6 - Bolt

20 Nm

7 - EGR Vacuum Regulator Solenoid Valve -N18- with EGR Potentiometer -G212-

8 - Bolt

8 Nm

9 - Seal

Always replace

10 - Throttle Valve Control Module -J338-

11 - Bolt

- 10 Nm
- Replace after removing

12 - Gasket

- Always replace

13 - Bolt

- 10 Nm

14 - Bolt

- 10 Nm

15 - Stud Bolt

- 40 Nm

16 - Support

17 - Guide Tube

18 - Clip

19 - Bolt

- 10 Nm

20 - Seal

- Always replace

21 - Gasket

- Always replace

22 - Bolt

- 8 Nm

23 - Fuel Return Line

24 - Bolt

- 8 Nm

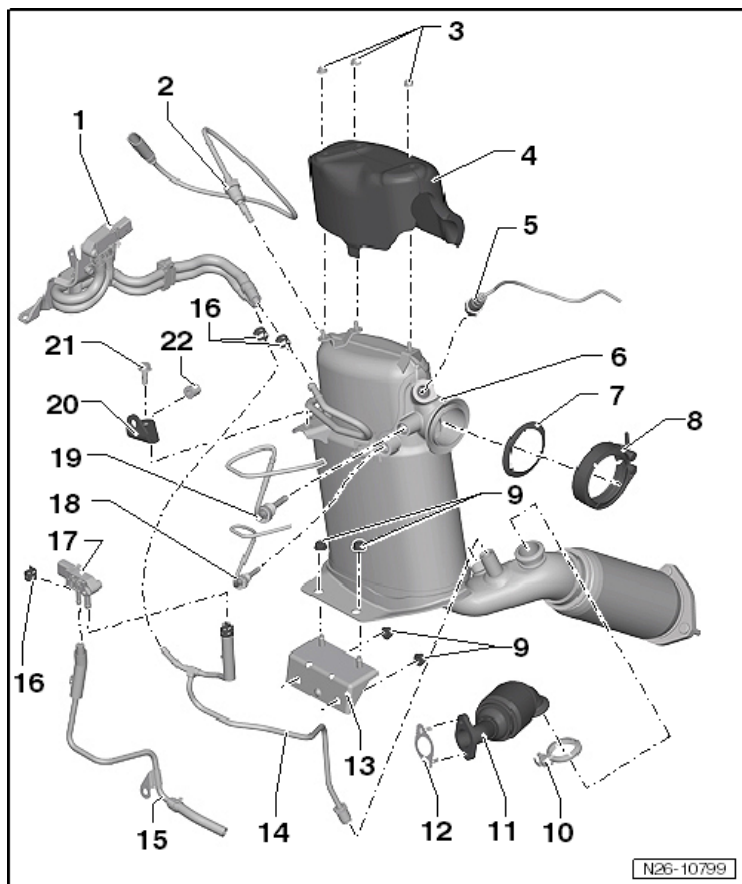
Fastener Tightening Specifications

Component	Fastener size	Nm
Connecting tube bolts	-	20
Differential Pressure Sensor -G505- on the Mount	-	4
Mount on the Engine Mount Bolts	-	20
Exhaust Pressure Sensor 1 -G450- on the Mount	-	4
Fuel Pressure Regulator Valve -N276	-	80
Heated oxygen sensor -G39-	-	50
Intake manifold-to-cylinder head bolt	-	8
Lower air filter housing-to-body bolt	-	8
Lower support bolts on the engine	-	40
Lower support bolts on the engine	-	40
Oil dipstick guide tube bolt	-	10
Throttle valve control module support bolt	-	10
Toothed Belt Sprocket to Hub Bolts	-	20
Upper support bolts on the throttle valve control module -j338-	-	10

¹⁾ Only grease the threads with Hot Bolt Paste -G 052 112 A3-. Do not allow the Hot Bolt Paste -G 052 112 A3- to enter the slits on the sensor body.

Exhaust System, Emission Controls – 2.0L CKRA (TDI)

Front Exhaust Pipe with Particulate Filter Overview



- 1 - Differential Pressure Sensor -G505-
- 2 - Exhaust Gas Temperature Sensor 4 -G648-
 - 45 Nm
- 3 - Nut
 - 9 Nm
- 4 - Shield
- 5 - Heated Oxygen Sensor -G39-
 - 50 Nm
- 6 - Front Exhaust Pipe with Particulate Filter
- 7 - Gasket
 - Always replace
- 8 - Clamp
 - 7 Nm

9 - Nut

- 25 Nm

10 - Clamp

- 3.5 Nm

11 - Exhaust Gas Recirculation (EGR) Pipe

12 - Gasket

13 - Bracket

14 - Control Line

- 45 Nm

15 - Control Line

16 - Clip

17 - Exhaust Pressure Sensor 1 -G450-

18 - Exhaust Gas Temperature Sensor 3 -G495-

- 45 Nm

19 - Connecting Hose

20 - Bracket

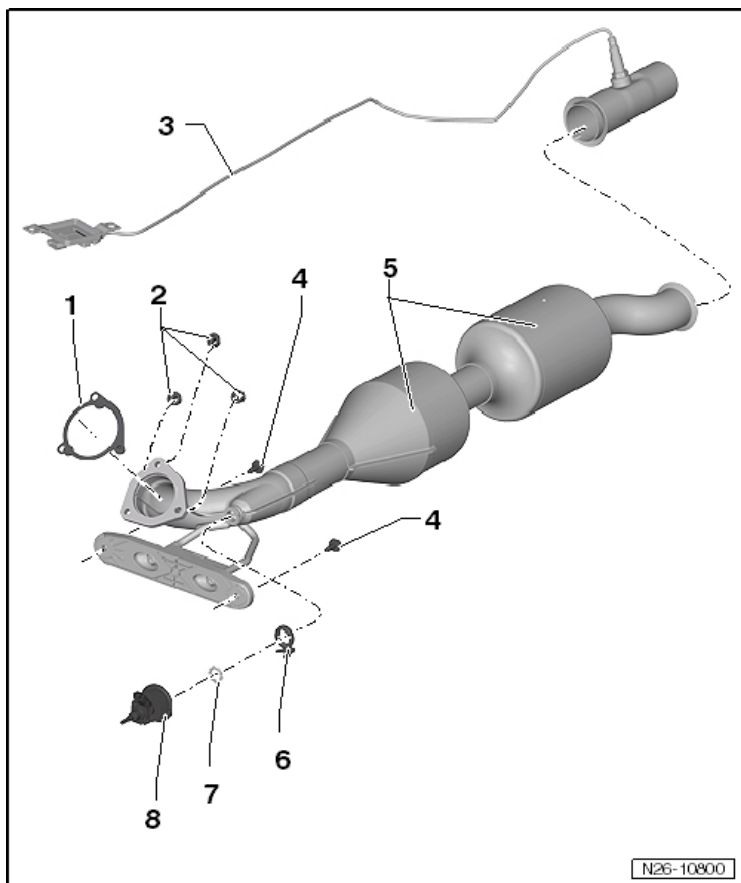
21 - Bolt

- 23 Nm

22 - Nut

- 23 Nm

NOx Reduction Catalytic Converter Overview



1 - Gasket

- Always replace

2 - Nuts

- 23 Nm

3 - NOx Sensor -G295-

4 - Bolt

- 25 Nm

5 - NOx Reduction Catalytic Converter

6 - Clamp

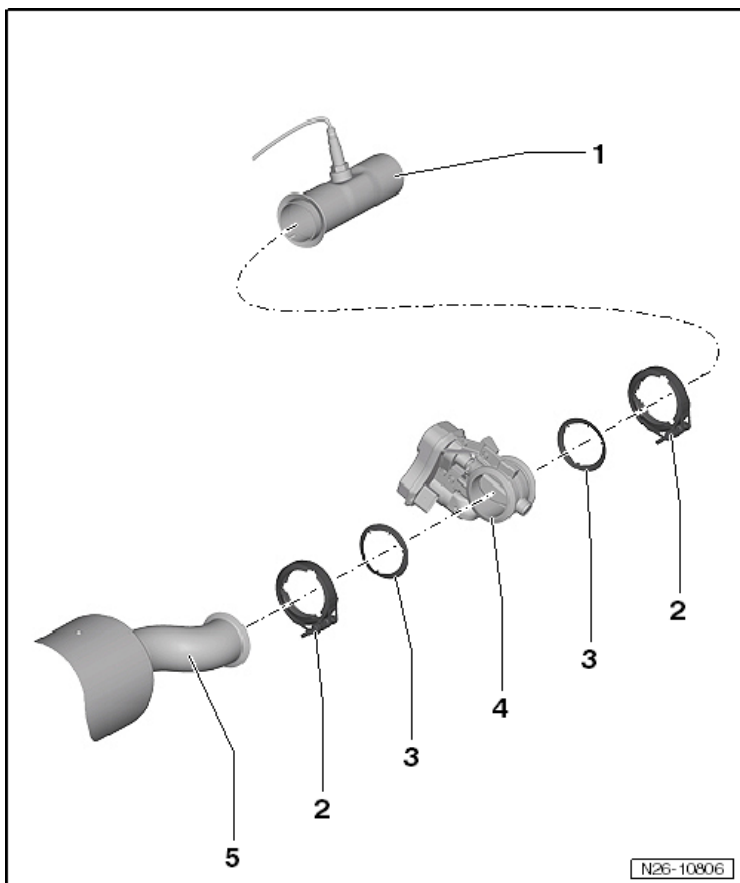
- 5 Nm

7 - Gasket

- Always replace

8 - Reducing Agent Injector -N474-

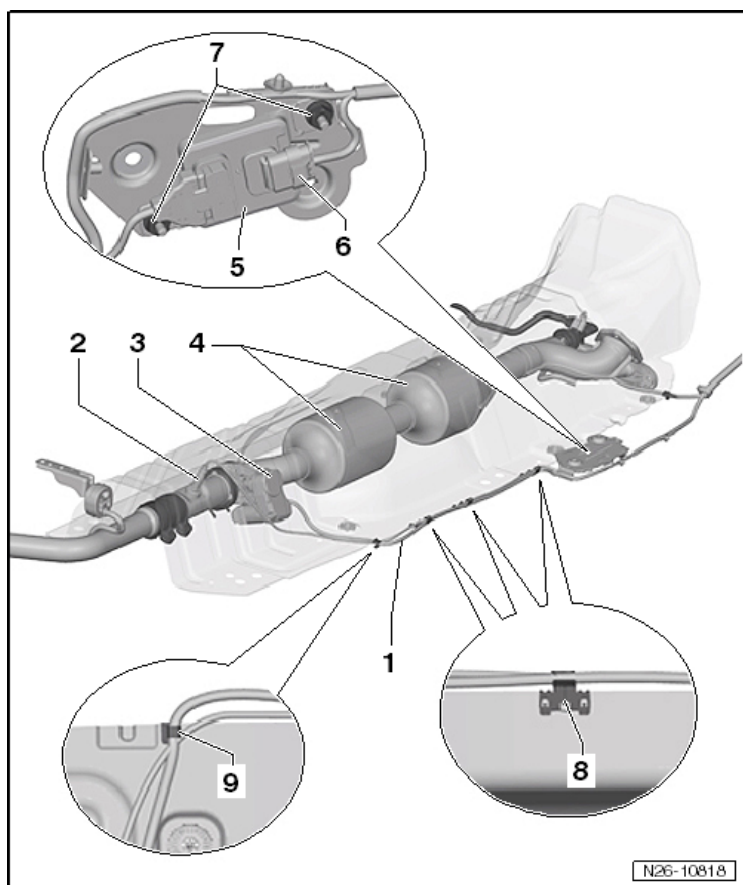
Exhaust Door Control Unit Overview



Engine –
2.0L CKRA (TDI)

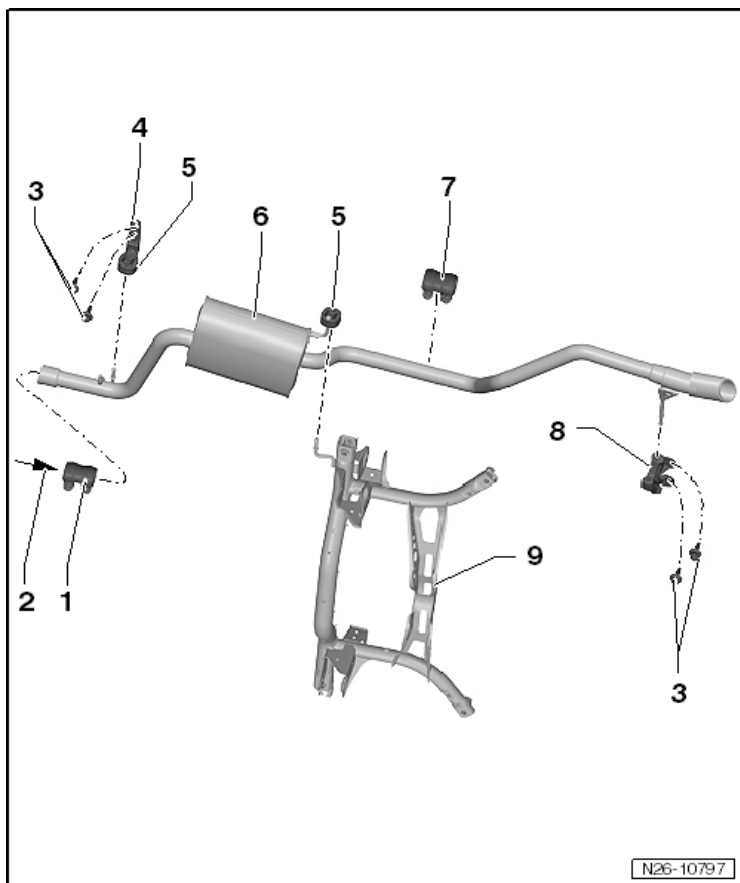
- 1 - Exhaust Pipe with NOx Sensor -G295-**
- 2 - Clamp**
 - 7 Nm
- 3 - Seal**
 - Always replace
- 4 - Exhaust Door Control Unit -J883-**
- 5 - NOx Reduction Catalytic Converter**

NOx sensor -G295- Overview



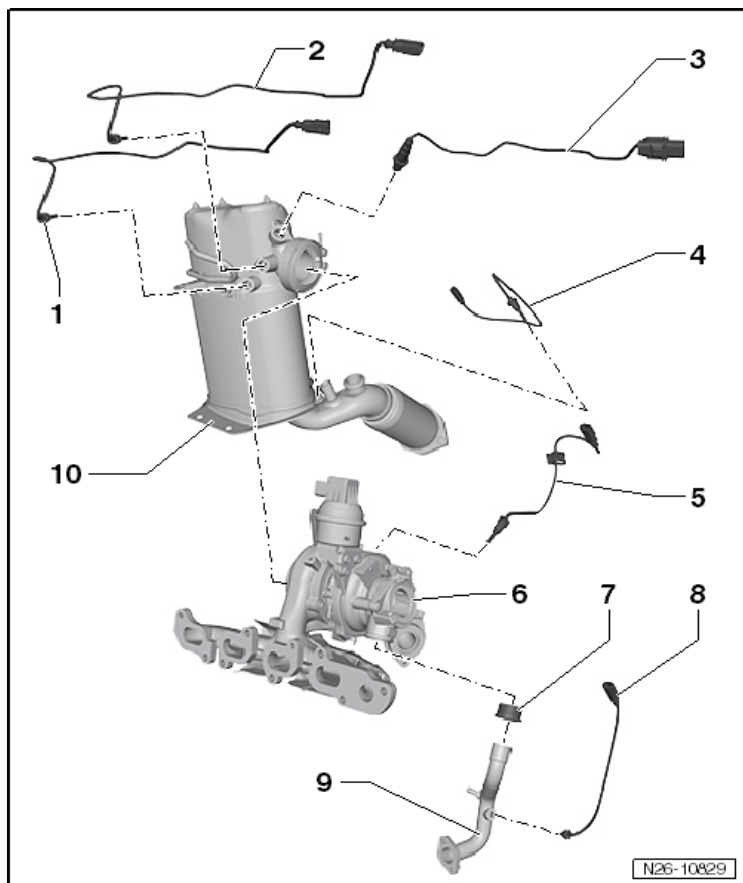
- 1 - Wiring Harness
- 2 - NOx sensor -G295-
 - 52 Nm
- 3 - Exhaust Door Control Unit -J883-
- 4 - NOx Reduction Catalytic Converter
- 5 - NOx Sensor Control Module -J583-
- 6 - Connector
- 7 - Nut
 - 6 Nm
- 8 - Bracket
- 9 - Bracket

Muffler and Mounts Overview



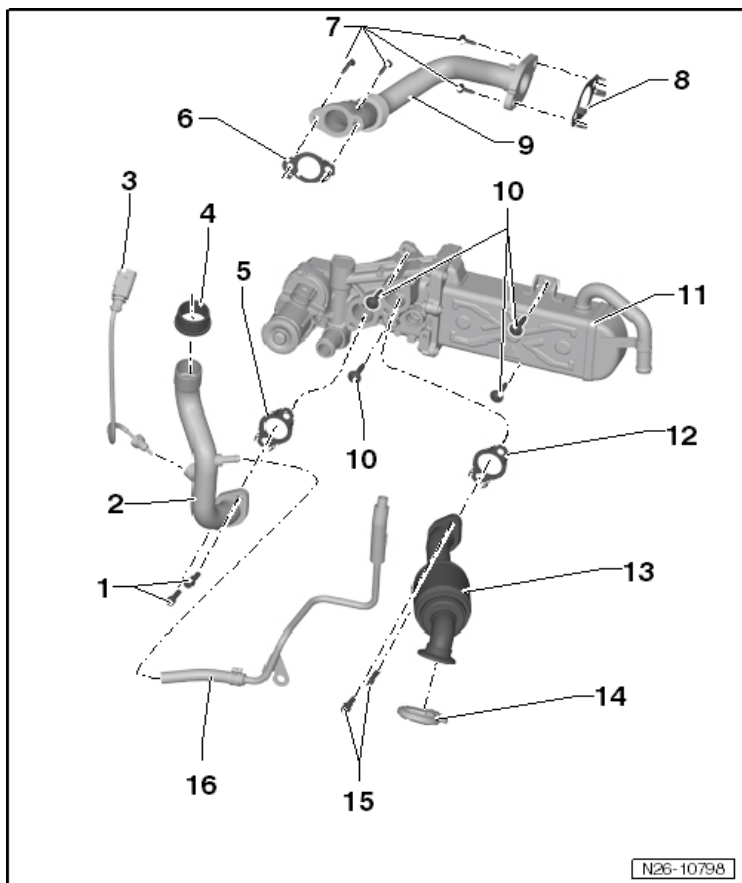
- 1 - Clamping Sleeve
- 2 - From the NOx Reduction Catalytic Converter
- 3 - Bolts
 - 25 Nm
- 4 - Bracket
- 5 - Suspended Mount
- 6 - Rear Muffler
- 7 - Clamping Sleeve
- 8 - Bracket
- 9 - Rear Subframe

Exhaust Temperature Control Overview



- 1 - Exhaust Gas Temperature Sensor 3 -G495-
 - 45 Nm
- 2 - Exhaust Gas Temperature Sensor 2 -G448-
 - 45 Nm
- 3 - Heated Oxygen Sensor -G39- with Oxygen Sensor Heater -Z19-
 - 50 Nm
- 4 - Exhaust Gas Temperature Sensor 4 -G648-
 - 45 Nm
- 5 - Exhaust Gas Temperature Sensor 1 -G235-
 - 45 Nm
- 6 - Turbocharger
- 7 - Gasket
- 8 - EGR Temperature Sensor -G98-
- 9 - Exhaust Gas Recirculation (EGR) Pipe
- 10 - Particulate Filter

Exhaust Gas Recirculation Overview



1 - Bolt

- 1.5 Nm

2 - Exhaust Gas Recirculation (EGR) Pipe

3 - EGR Temperature Sensor -G98-

4 - Gasket

5 - Gasket

- Always replace

6 - Gasket

- Always replace

7 - Bolt

- 9 Nm

8 - Gasket

- Always replace

9 - Exhaust Gas Recirculation (EGR) Pipe

10 - Bolt

- 9 Nm

11 - Exhaust Gas Recirculation (EGR) Cooler

12 - Gasket

- Always replace

13 - Exhaust Gas Recirculation (EGR) Pipe

14 - Clamp

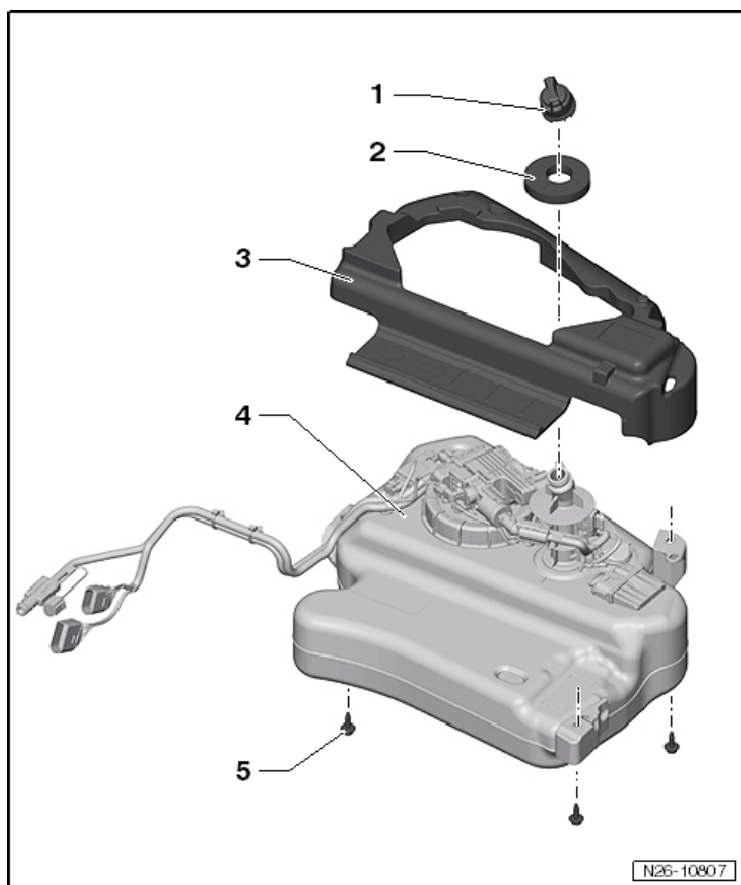
- 5 Nm

15 - Bolt

- 9 Nm

16 - Control Line

Reducing Agent (AdBlue®) Tank Overview

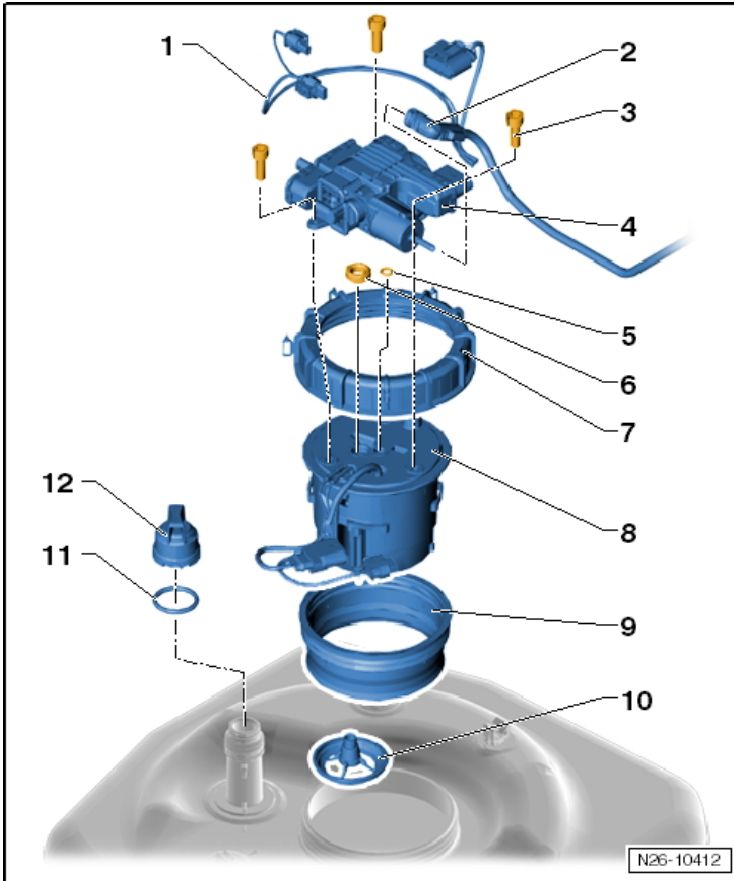


- 1 - Cap
- 2 - Gasket
- 3 - Sound Insulation
- 4 - Reducing Agent Tank
- 5 - Bolt

□ 25 Nm

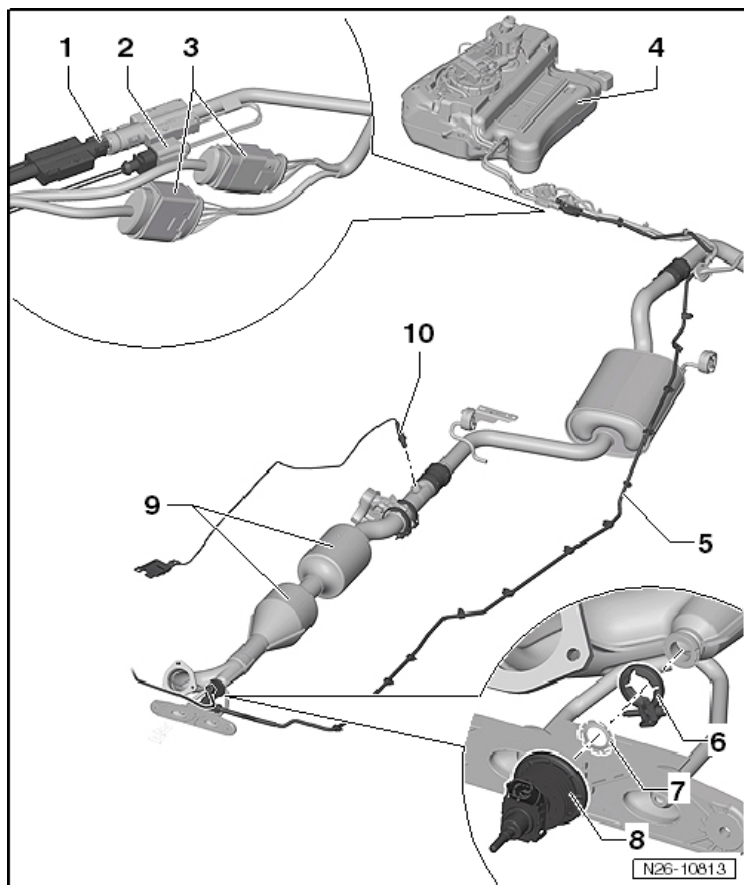
Reducing Agent (AdBlue®) Delivery Module Overview

Engine –
2.0L CKRA (TDI)



- 1 - Wiring Harness
- 2 - Delivery Line
- 3 - Bolt
 - 5 Nm
- 4 - Reducing Agent Pump -V437-
- 5 - Seal
 - Always replace
- 6 - Gasket
 - Always replace
- 7 - Lock Ring
 - 80 Nm
- 8 - Delivery Module
- 9 - Gasket
- 10 - Filter
- 11 - Seal
- 12 - Cap

Reducing Agent (AdBlue®) Delivery Line Overview



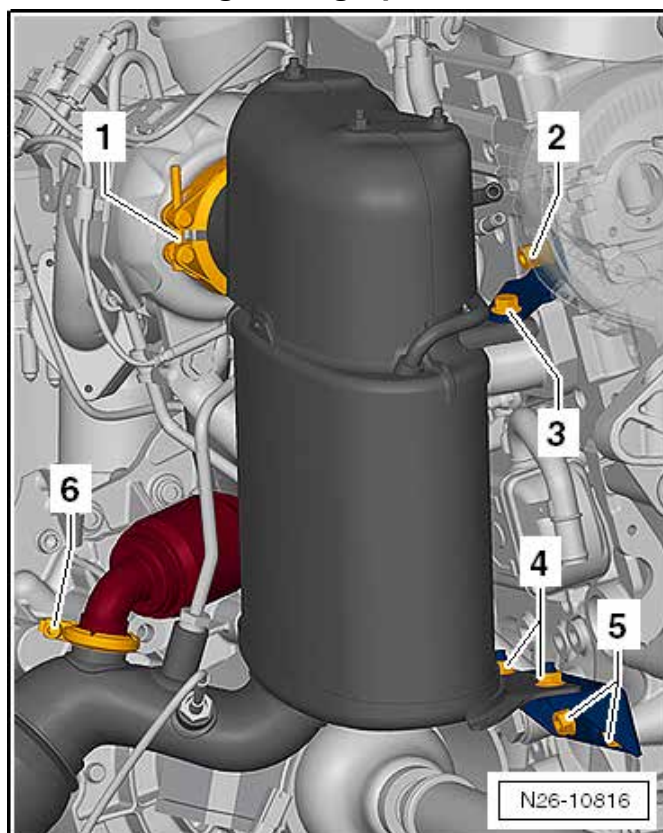
- 1 - Delivery Line Connector
- 2 - Delivery Line Connector
- 3 - Electrical Harness Connectors
- 4 - Reducing Agent Tank
- 5 - Reducing Agent Delivery Line
- 6 - Clamp
 - Always replace
- 7 - Gasket
 - Always replace
- 8 - Reducing Agent Injector -N474-
- 9 - NOx Reduction Catalytic Converter
- 10 - NOx Sensor -G295-

Fastener Tightening Specifications

Component	Nm
Coolant Pipe on the Engine Control	9
Exhaust Gas Recirculation Temperature Sensor to Exhaust Gas Recirculation Pipe	20
Heat Shield Nuts	9
Tunnel Bridge to Underbody Bolt	23

Engine –
2.0L CKRA (TDI)

Front Exhaust Pipe with Particulate Filter Tightening Specifications



Step	Component	Nm
1	Position the particulate filter on the turbocharger. Install clamp (1) so it is still loose.	-
2	Install bolts 2 through 5 hand-tight so they are still loose. The particulate filter and bracket must be allowed to slide back and forth.	-
3	Attach the EGR pipe, loosely secure the clamp (6)	-
4	Tighten clamp (1)	7
5	Tighten the nuts (5)	23
6	Tighten the nuts (4)	23
7	Tighten the nut (2)	23
8	Tighten bolts (3)	23
9	Tighten the clamp (6)	3.5

Ignition/Glow Plug System – 2.0L CKRA (TDI)

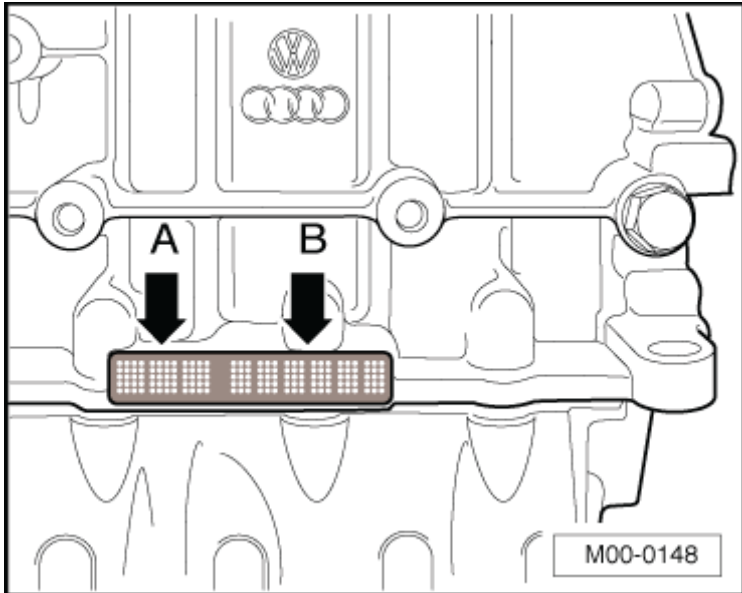
Fastener Tightening Specifications

Component	Nm
Camshaft Position (CMP) sensor	10
Engine Speed (RPM) sensor	5
Glow plug	18

ENGINE MECHANICAL – 2.5L CBTA, CBUA

General, Technical Data

Engine Number



The engine code (A) and engine number (B) (serial number) are located on the rear side of the engine, above the cylinder block/ upper oil pan partition. The engine number consists of up to nine characters (alphanumeric). The first part (maximum of 3 letters) represents the engine code; the second (six digits) is the serial number. If more than 999,999 engines with the same engine code are produced, the first of the six characters is replaced with a letter.

In addition, a sticker with the engine code and engine number is applied to the cylinder head cover. The engine code letters are also located on the vehicle data label. The vehicle data label is located in the customer's service schedule as well as in the spare tire wheel well or on the luggage compartment floor.

When four digit engine codes are used, the first three digits indicate the mechanical structure of the engine and are stamped on the engine. The fourth digit describes the engine output and torque.

Engine Data

Engine codes		CBTA	CBUA
Manufactured		from 07.2007	from 07.2007
Emission values in accordance with		TIER 2/BIN 5 (US coalition)	SULEV ¹⁾
Displacement	cm ³	2480	2480
Output	kW at RPM	125 @ 5700	125 @ 5700
Torque	Nm at RPM	240 @ 4250	240 @ 4250
Engine idle speed ³⁾	RPM	680	680
Engine speed (RPM) limitation	RPM	approximately 6300	approximately 6300
Bore	diameter mm	82.5	82.5
Stroke	mm	92.8	92.8
Compression ratio		9.5	9.5
Valves per cylinder		4	4
Research Octane Number (RON)	minimum	95 unleaded ²⁾	95 unleaded ²⁾
Fuel injection, ignition		Motronic ME 17.5	Motronic ME 17.5
Knock control		2 sensors	2 sensors
Variable valve timing		Yes	Yes
Variable intake manifold		No	No
Oxygen Sensor (O2S) regulation		2 sensors	3 sensors
Catalytic converter		Yes	Yes
Exhaust Gas Recirculation (EGR)		No	No
Turbocharger, Supercharger		No	No
Secondary Air Injection (AIR) system		No	Yes

¹⁾ SULEV = Super Ultra Low Emission Vehicles.

²⁾ Unleaded RON 91 is permitted but performance is reduced.

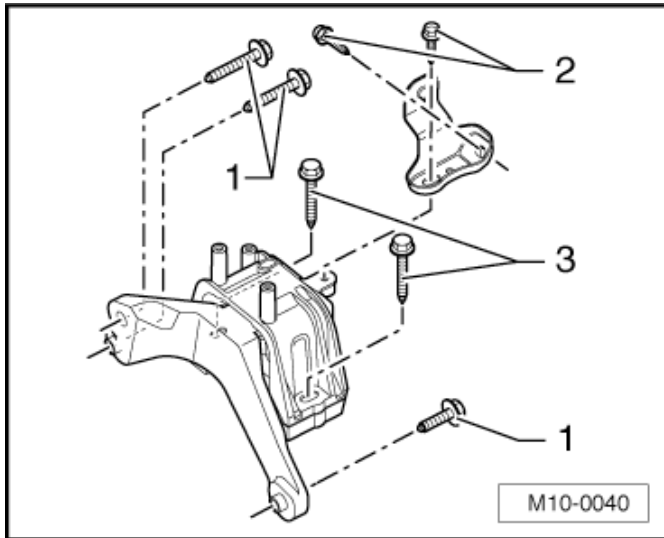
³⁾ Applies to manual and automatic transmission. If voltage supply of Engine Control Module (ECM) drops below 12 volts, idle speed is raised in stages up to 780 RPM. Idle speed is not adjustable.

Engine Assembly – 2.5L CBTA, CBUA

Fastener Tightening Specifications

Component	Fastener size	Nm
Bolts and nuts	M6	10
	M7	15
	M8	25
	M10	40
	M12	60

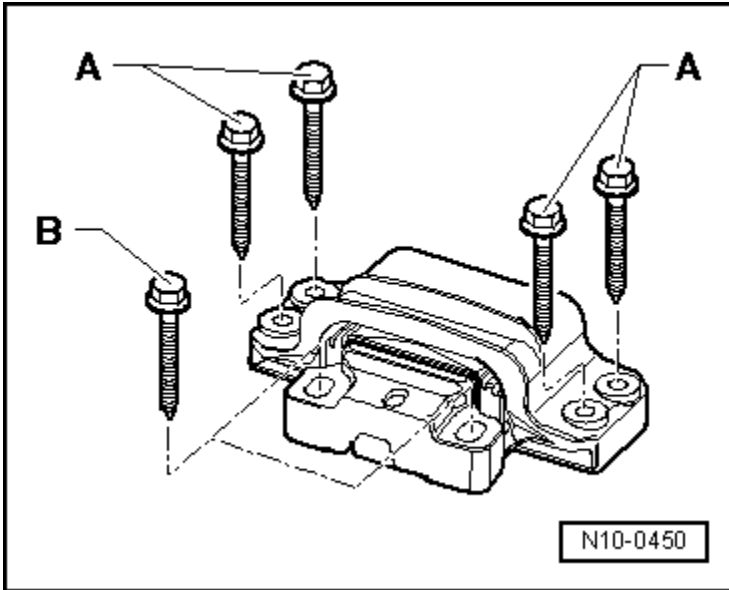
Engine Mount Tightening Specifications



Component	Nm
Bolts 1	40 plus an additional 90° (¼ turn) ¹⁾
Bolts 2	20 plus an additional 90° (¼ turn) ¹⁾
Bolts 3	60 plus an additional 90° (¼ turn) ¹⁾

¹⁾ Replace fastener(s).

Transmission Mount Tightening Specifications

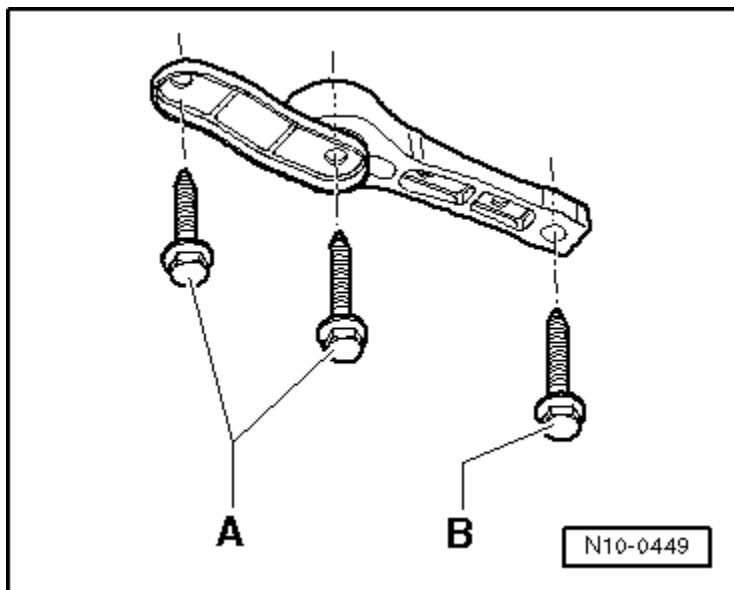


Engine –
2.5L CBTA/CBVA

Component	Nm
Bolts A ¹⁾	40 plus an additional 90° (¼ turn)
Bolt B ¹⁾	60 plus an additional 90° (¼ turn)

¹⁾ Replace fastener(s).

Pendulum Support Tightening Specifications



Secure the pendulum support to the transmission first and then to the subframe. To remove, first remove bolt B, then bolts A.

Component	Fastener size	Nm
Bolts A ¹⁾	10.9	50 plus an additional 90° (¼ turn)
Bolt B ¹⁾	-	100 plus an additional 90° (¼ turn)

¹⁾ Replace fastener(s).

Crankshaft, Cylinder Block – 2.5L CBTA, CBUA

Main Bearing Shell Allocation

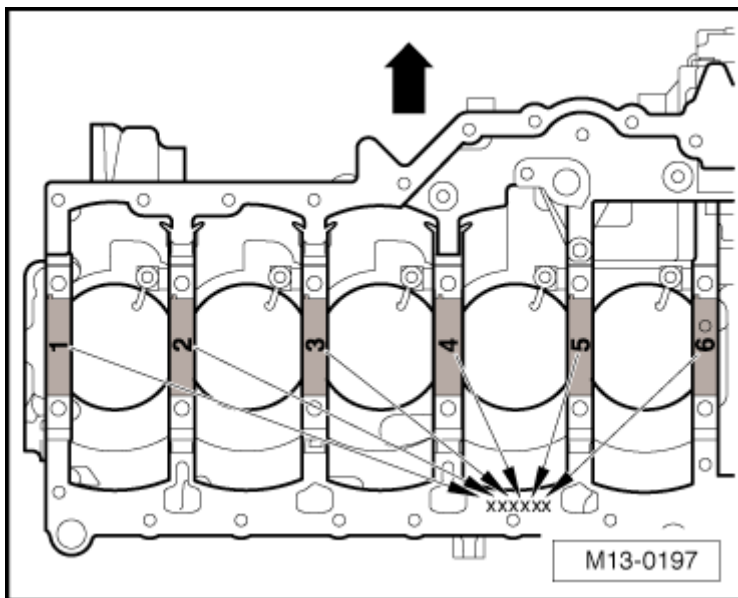
The upper bearing shells are allocated to the cylinder block with the correct thickness from the factory.

Colored dots identify the bearing thicknesses.

The letters marked on the lower sealing surface of the cylinder block identify which bearing thickness must be installed in which location.

Letter on cylinder block	Color of bearing
G	Yellow
B	Blue
W	White

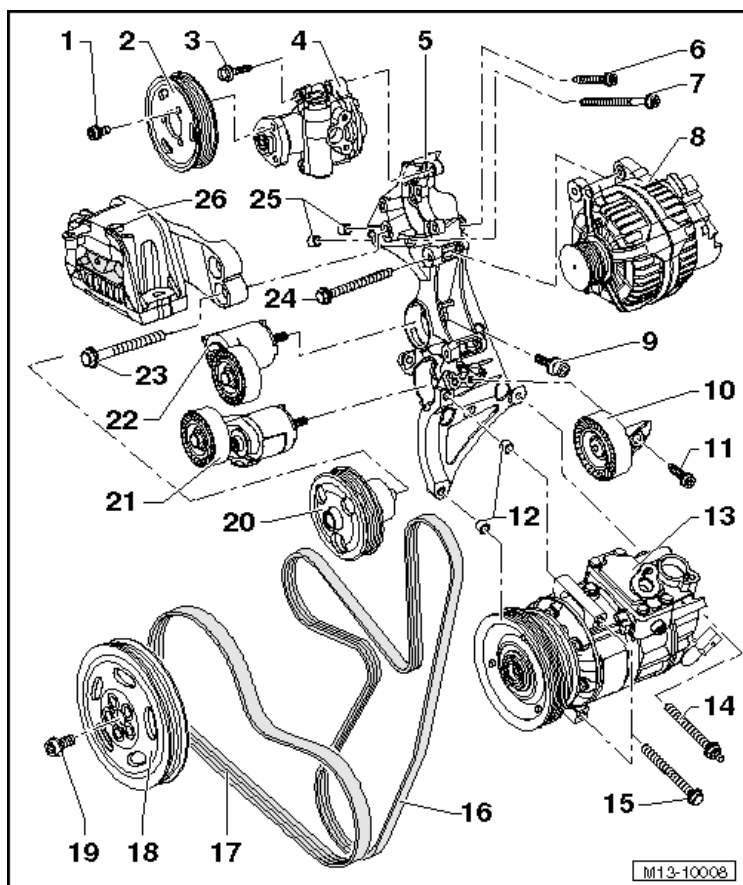
Crankshaft/Upper Bearing Shell Mark



NOTE:

- The ➡ points in the direction of travel.
- If the colored marks can no longer be read, use the bearing shell with the blue mark.
- The lower crankshaft bearing shells are always shipped as a replacement part with the yellow mark.

Ribbed Belt Drive Overview



1 - Bolt

- 23 Nm

2 - Power Steering Pump Pulley

3 - Bolt

- 23 Nm
- 4 - Power Steering Pump

5 - Accessory Bracket

6 - Bolt

- 25 Nm

7 - Bolt

- 25 Nm

8 - Generator

9 - Bolt

- 25 Nm

10 - Idler Pulley with Bracket

11 - Bolt

- 25 Nm

12 - Bushing

13 - A/C Compressor

14 - Stud Bolt

- 25 Nm

15 - Bolt

- 25 Nm

16 - Ribbed Belt, for the Generator, power Steering Pump and Coolant Pump

17 - Ribbed Belt, for the A/C Compressor

18 - Vibration Damper

- There are different versions.

19 - Bolt

- 50 Nm + 90° turn
- Replace after removing

20 - Coolant Pump

21 - Tensioner for A/C Compressor Ribbed Belt

- 35 Nm

22 - Tensioning for Ribbed Belt for Generator, Vane Pump and Coolant Pump

- 35 Nm

23 - Bolt

- 40 Nm + 90° turn

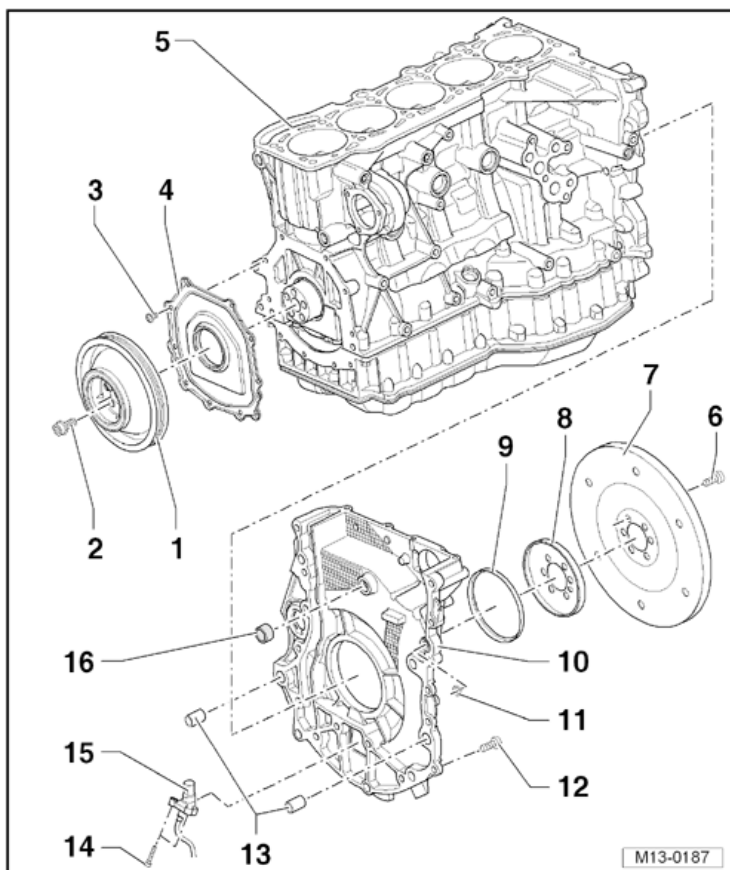
24 - Bolt

- 25 Nm

25 - Bushing

26 - Engine Mount

Cylinder Block Overview, Transmission Side



1 - Vibration Damper

2 - Bolt

50 Nm + 90° turn

Always replace

3 - Bolt

10 Nm

4 - Sealing Flange, Belt Pulley Side

5 - Cylinder Block

6 - Bolt

60 Nm + 90° turn

Always replace

7 - Drive Plate/Flywheel

8 - Sensor Wheel

9 - Crankshaft Seal, Transmission Side

10 - Timing Case

11 - O-ring

- Always replace

12 - Bolt

- 25 Nm

13 - Alignment Sleeves

14 - Bolt

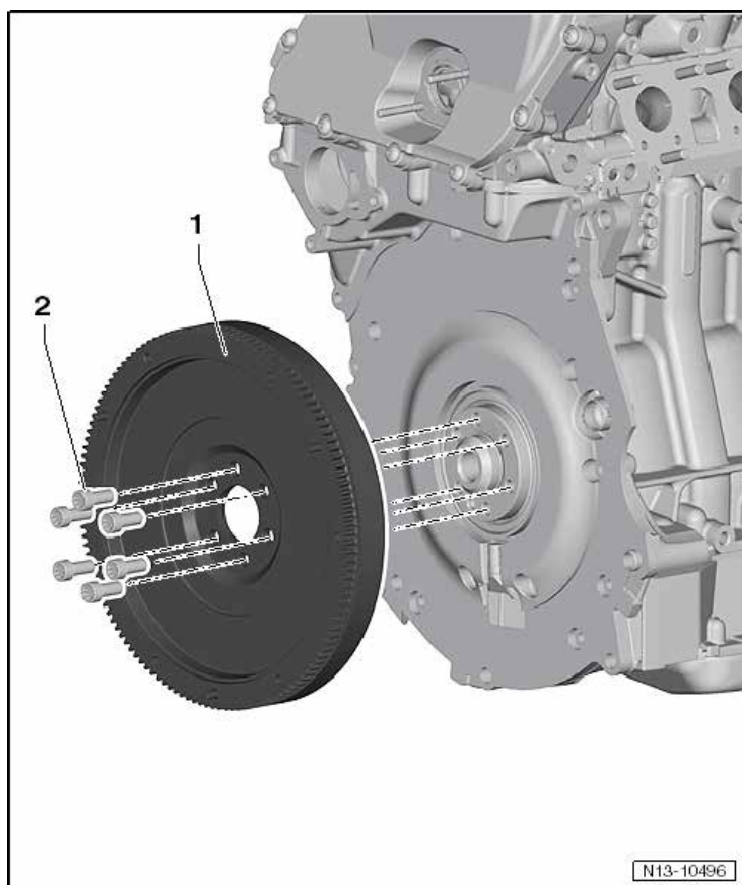
- 5 Nm

15 - Engine Speed Sensor -G28-

16 - Seal

- Always replace

Flywheel Overview

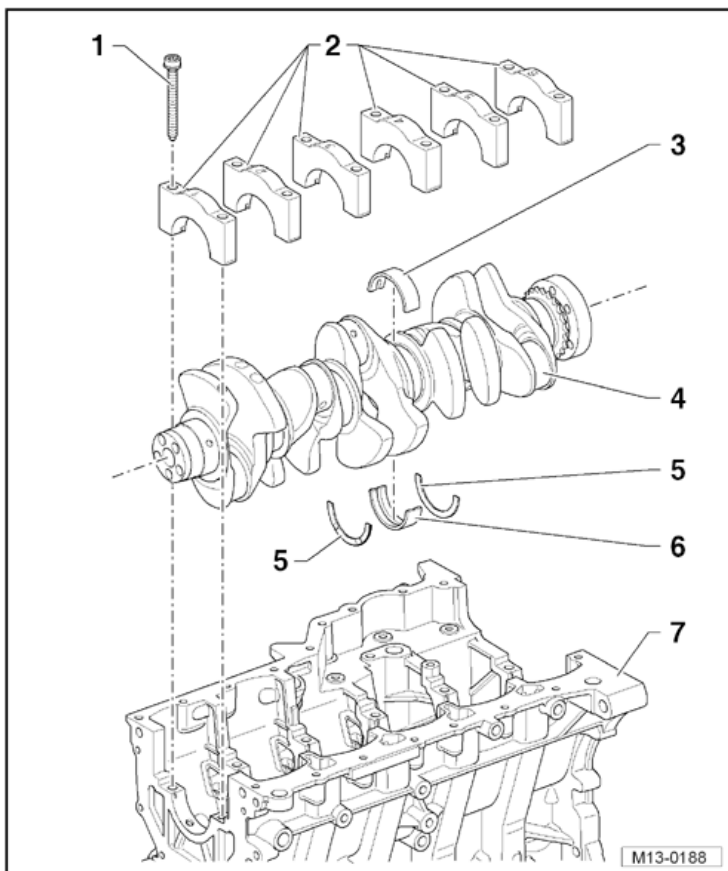


1 - Flywheel

2 - Bolt

- 9 Nm
- Always replace.

Crankshaft Overview



1 - Bolt

- 40 Nm + 90° turn
- Always replace

2 - Bearing Cap

3 - Bearing Shell for the Bearing Cap

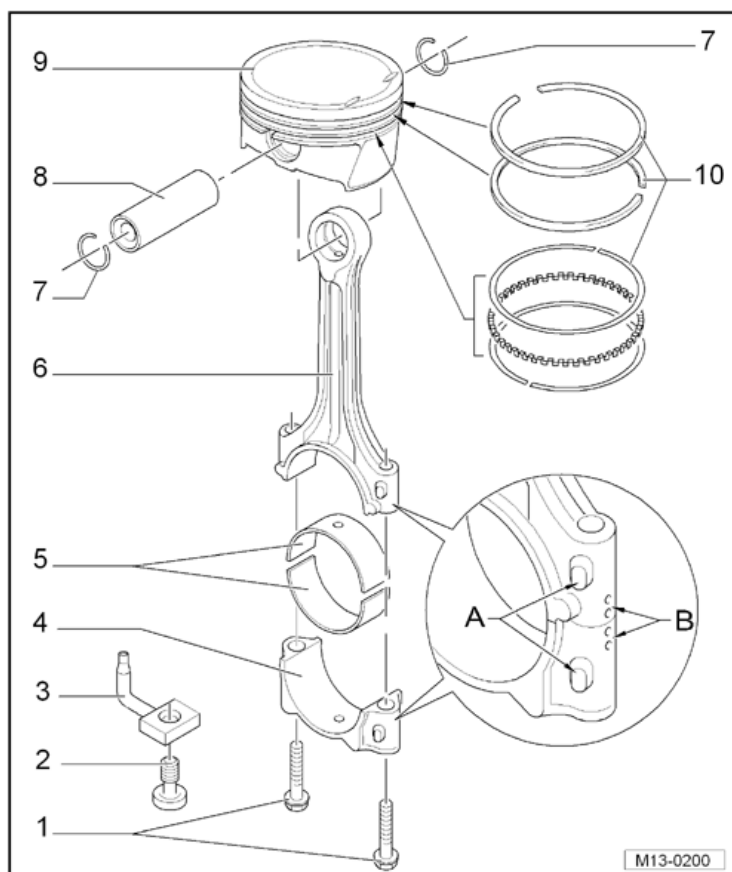
4 - Crankshaft

5 - Thrust Washers

6 - Bearing Shell for the Cylinder Block

7 - Cylinder Block

Piston and Connecting Rod Overview



- 1 - Connecting Rod Bolt**
□ 30 Nm + 90° turn
- 2 - Relief Valve**
□ 27 Nm
- 3 - Oil Spray Jet**
- 4 - Connecting Rod Bearing Cap**
- 5 - Bearing Shell**
- 6 - Connecting Rod**
- 7 - Circlip**
- 8 - Piston Pin**
- 9 - Piston**
- 10 - Piston Rings**

Fastener Tightening Specifications

Component	Nm
Plug to rear of cylinder block	30*

Crankshaft Dimensions

Honing dimensions in mm	Crankshaft bearing pin diameter		Connecting rod bearing pin diameter	
Basic dimension	58.00	-0.022	47.80	-0.022
		-0.042		-0.042
1 st oversize	57.75	-0.022	47.55	-0.022
		-0.042		-0.042
2 nd oversize	57.50	-0.022	47.30	-0.022
		-0.042		-0.042
Stage III	57.25	-0.022	47.05	-0.022
		-0.042		-0.042

Piston Ring Gap

Piston ring		Gap	
		New	Wear limit
Compression rings	mm	0.20 to 0.40	0.8
Oil scraping ring	mm	0.25 to 0.50	0.8

Piston Ring Groove Clearance

Piston ring		Ring to groove clearance	
		New	Wear limit
Compression rings	mm	0.06 to 0.09	0.20
Oil scraping ring	mm	0.03 to 0.06	0.15

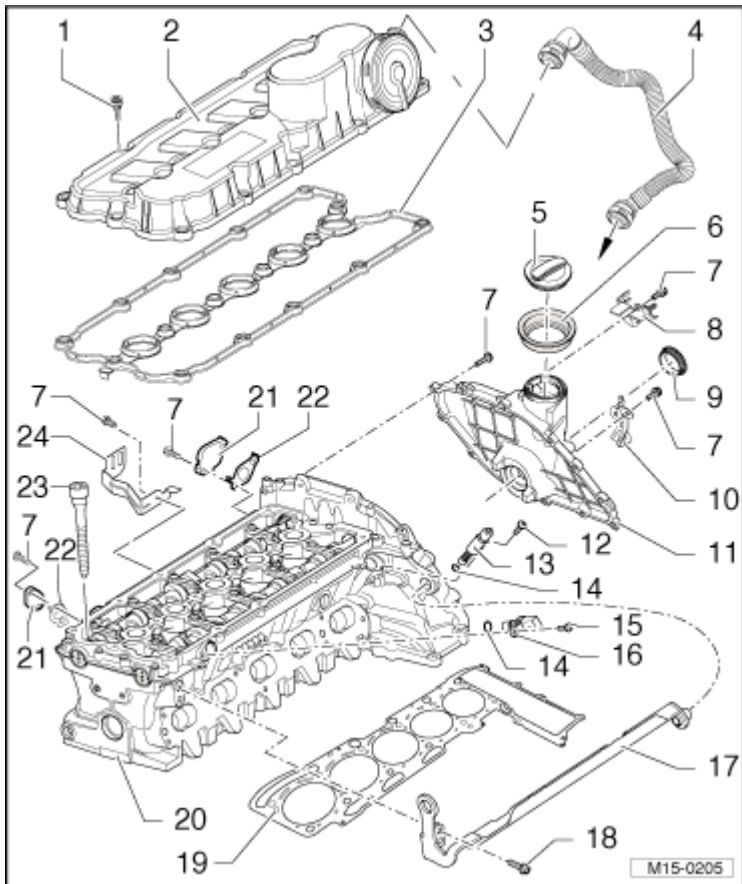
Piston and Cylinder Dimensions

Honing dimension in mm	Piston diameter	Cylinder bore diameter
Basic dimension	82.465 ¹⁾	82.51

¹⁾ Measurement does not include the graphite coating (thickness = 0.02 mm). The graphite coating wears away.

Cylinder Head, Valvetrain – 2.5L CBTA, CBUA

Cylinder Head and Cover Overview



1 - Bolt

- 10 Nm
- Tightening sequence, see Cylinder Head Cover Bolt Tightening Sequence below

2 - Cylinder Head Cover

3 - Cylinder Head Cover Gasket

4 - Crankcase Ventilation Hose

5 - Oil Fill Cap

6 - Seal

7 - Bolt

- 10 Nm

8 - Wire Bracket

9 - Seal

10 - Wire Bracket

11 - Timing Chain Cover

12 - Bolt

- 2 Nm

13 - Camshaft Adjustment Valve 1 -N205-

14 - O-ring

15 - Bolt

- 10 Nm

16 - Camshaft Position Sensor -G40-

17 - Transport Strap

18 - Bolt

- 25 Nm

19 - Cylinder Head Gasket

- Always replace

20 - Cylinder Head

21 - Cap

22 - Gasket

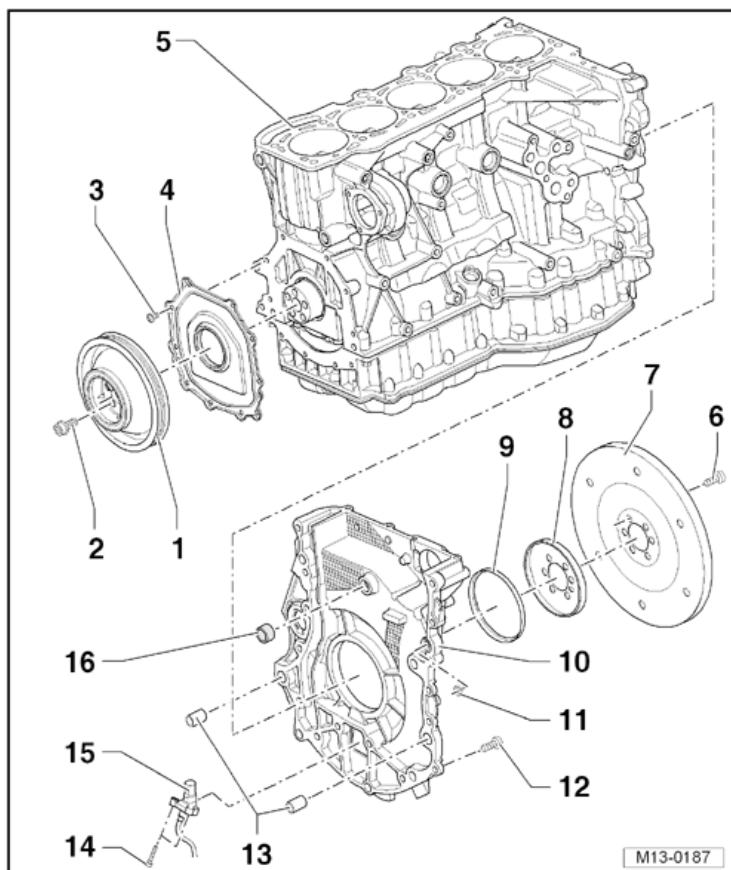
- Always replace

23 - Bolt

- 40 Nm + 180° turn
- Always replace

24 - Wire Bracket

Camshaft Timing Chain Overview



- 1 - Intake Camshaft Adjuster**
- 2 - Exhaust Camshaft Sprocket**
- 3 - Cylinder Head**
- 4 - Tensioning Rail**
- 5 - Double Sprocket**
- 6 - Camshaft Timing Chain**
- 7 - Oil Strainer**
 - Always replace
- 8 - Bolt**
 - 10 Nm
- 9 - Chain Tensioner**
- 10 - Gasket**
 - Always replace
- 11 - Bolt**
 - Always replace

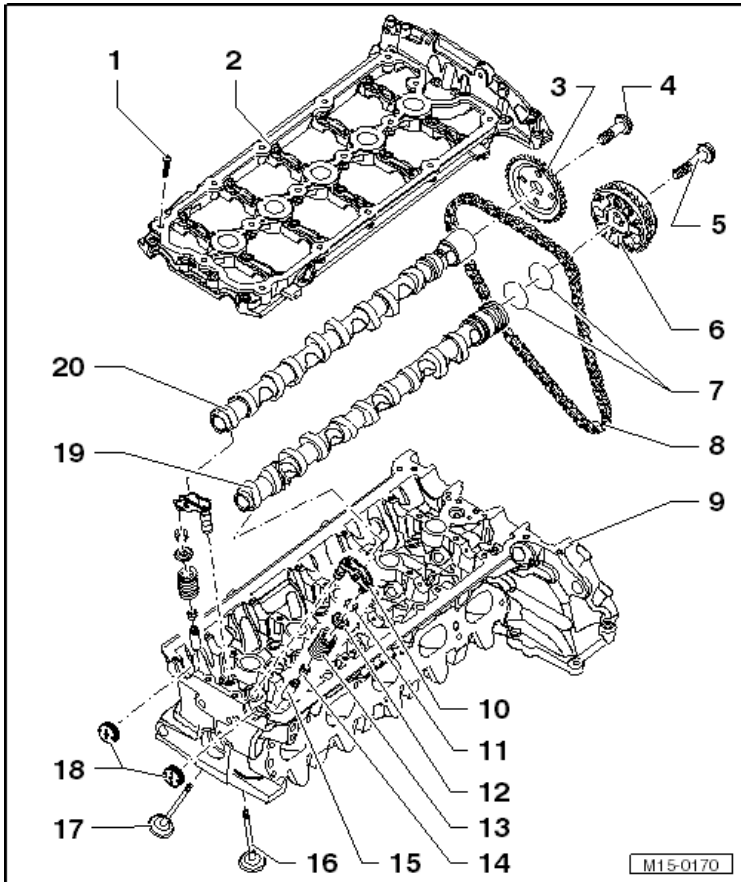
12 - Bolt

- 60 Nm + 90° turn
- Always replace

13 - Bolt

- 60 Nm + 90° turn
- Always replace

Valvetrain Overview



1 - Bolt

- 8 Nm + 90° turn
- Always replace

2 - Guide Frame

3 - Exhaust Camshaft Sprocket

4 - Bolt

- 60 Nm + 90° turn
- Always replace

5 - Bolt

- 60 Nm + 90° turn
- Always replace

6 - Intake Camshaft Adjuster

7 - Seals

8 - Timing Chain

9 - Cylinder Head

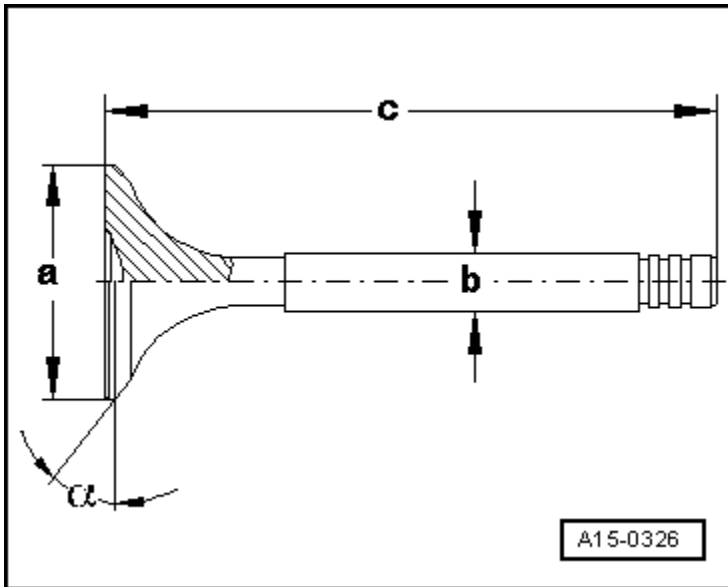
- 10 - Hydraulic Lash Adjuster
- 11 - Valve Retainers
- 12 - Spring Seat
- 13 - Valve Spring
- 14 - Valve Stem Seal
- 15 - Valve Guide
- 16 - Intake Valve
- 17 - Exhaust Valve
- 18 - Sealing Plug
 - Always replace
- 19 - Intake Camshaft
- 20 - Exhaust Camshaft

Fastener Tightening Specifications

Component	Nm
AIR pipe at cylinder head bolt	10
Coolant pipe to bracket bolt	10
Flange to timing chain cover bolt	10
Timing chain cover to cylinder head bolt	10
Vacuum pump to timing case bolt	10

Engine –
2.5L CBTA/CBUA

Valve Dimensions

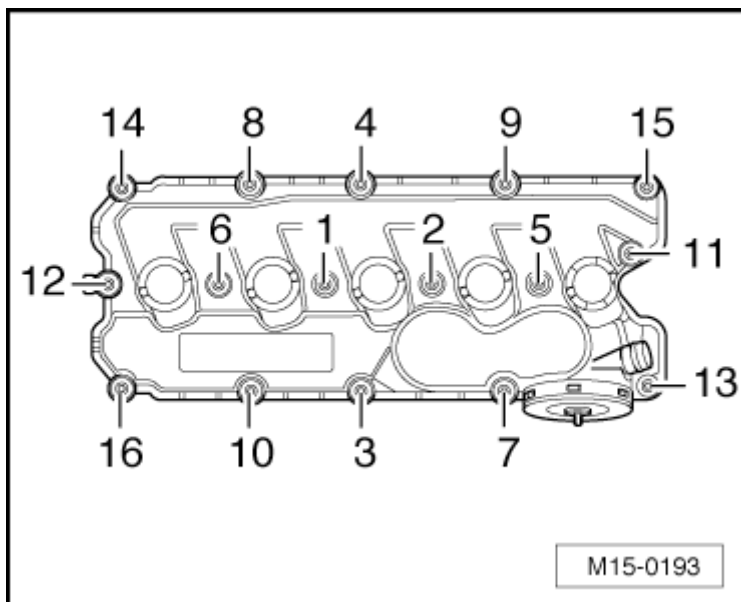


Dimension		Intake valve	Exhaust valve
Diameter a	mm	26.80 to 27.00	29.80 to 30.00
Diameter b	mm	5.95 to 5.97	5.94 to 5.95
c	mm	104.84 to 105.34	103.64 to 104.14
α	$^{\circ}$	45	45

Compression Pressures

New Bar positive pressure	Wear limit Bar positive pressure	Difference between cylinders Bar positive pressure
9.0 to 13.0	8.0	Maximum 3.0

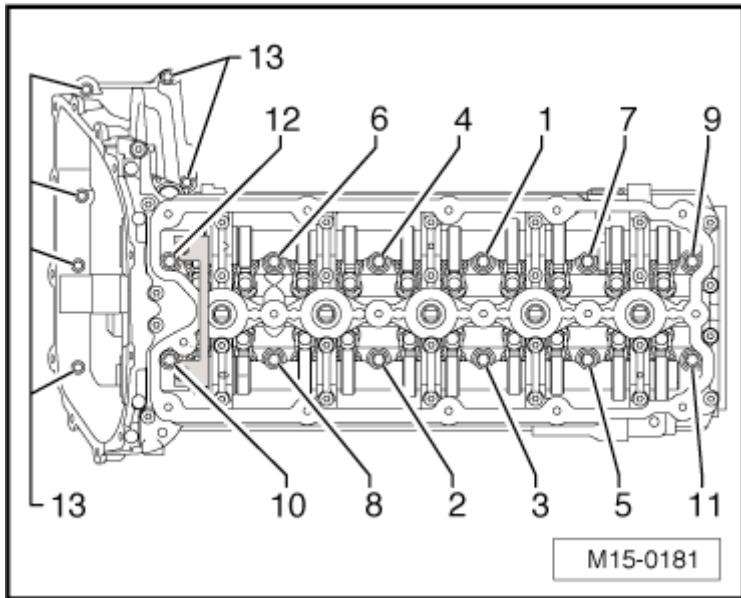
Cylinder Head Cover Bolt Tightening Sequence and Specification



**Engine –
2.5L CBTA/CBUA**

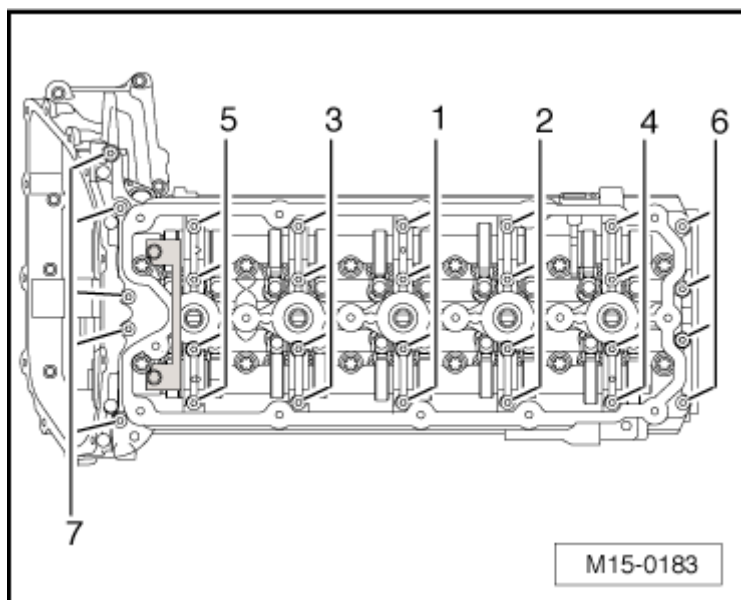
Step	Component	Nm
1	Tighten bolts 1 through 16 in sequence	10

Cylinder Head Bolt Tightening Sequence and Specification



Step	Component	Nm
1	Tighten bolts 1 through 12 in sequence	40
2	Tighten bolts 1 through 12 in sequence	an additional 90° (¼ turn)
3	Tighten bolts 1 through 12 in sequence	an additional 90° (¼ turn)
4	Tighten bolts 13	10

Guide Frame Bolt Tightening Sequence and Specification



Engine –
2.5L CBTA/CBUA

Step	Component	Nm
1	Tighten bolts 1 through 7 in sequence ¹⁾	8
2	Tighten bolts 1 through 7 in sequence	an additional 90° (¼ turn)

¹⁾ Replace fastener(s).

10 - Bolt

- 25 Nm

11 - Oil Filter Adapter

12 - Oil Dipstick

13 - Circlip

14 - Guide Tube

15 - Engine Pre-Heater

16 - Bolt

- 25 Nm

17 - O-ring

- Always replace

18 - Seal

- Always replace

19 - Bracket

20 - Bolt

- 10 Nm

21 - Lower Oil Pan

22 - Bolt

- 10 Nm

23 - Oil Drain Plug

- 30 Nm

24 - Decoupling Element

- 10 Nm

25 - Oil Intake Pipe

26 - Bolt

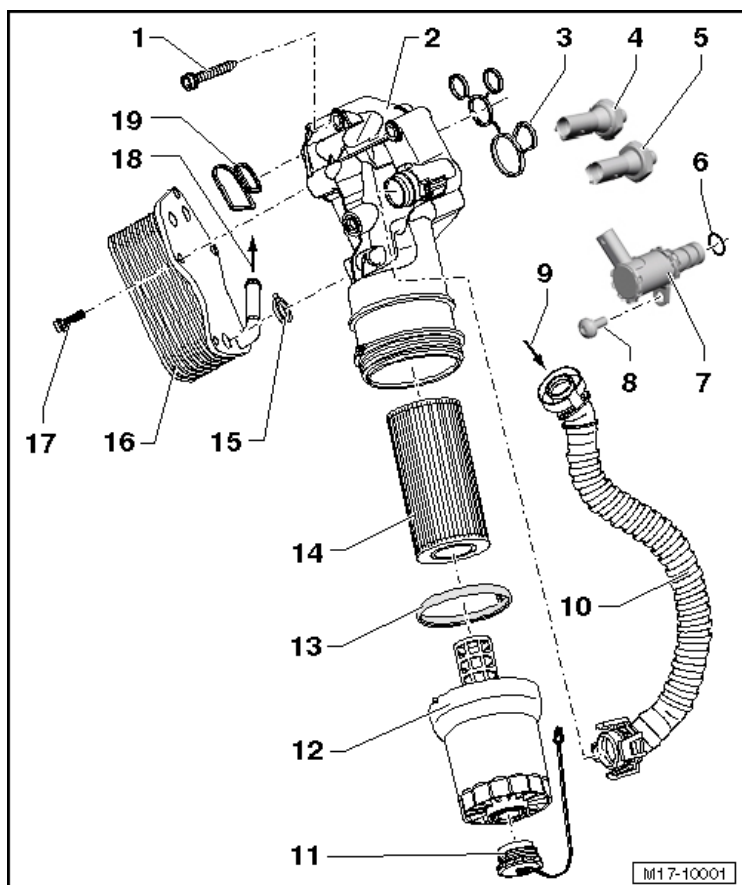
- 25 Nm

27 - Upper Oil Pan

28 - O-ring

- Always replace

Oil Filter Adapter Overview



- 1 - Bolt**
 - 25 Nm
- 2 - Oil Filter Adapter**
- 3 - Gasket**
 - Always replace
- 4 - Oil Pressure Switch -F1-**
 - 20 Nm
- 5 - Reduced Oil Pressure Switch -F378-**
 - 20 Nm
- 6 - O-ring**
- 7 - Oil Pressure Regulation Valve -N428-**
- 8 - Bolt**
 - 9 Nm
- 9 - from Connecting Pipe**
- 10 - Vent Tube**
- 11 - Cap**

12 - Oil Filter Housing

- 25 Nm

13 - Seal

14 - Oil Filter Element

15 - Gasket

- Always replace

16 - Engine Oil Cooler

17 - Bolt

- 25 Nm

18 - to the Thermostat Housing

19 - Gasket

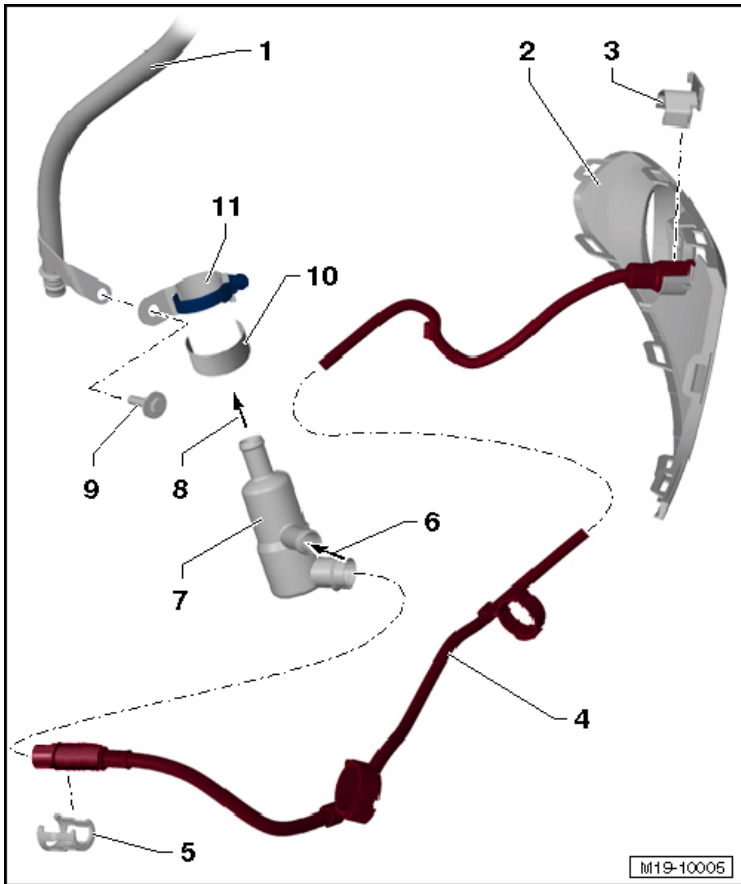
- Always replace

Fastener Tightening Specifications

Component	Nm
Oil intake pipe-to-oil pump bolt	10
Oil intake pipe-to-upper oil pan bolt	10
Upper oil pan-to-cylinder block bolt	25

Cooling System – 2.5L CBTA, CBUA

Engine Pre-Heater Overview

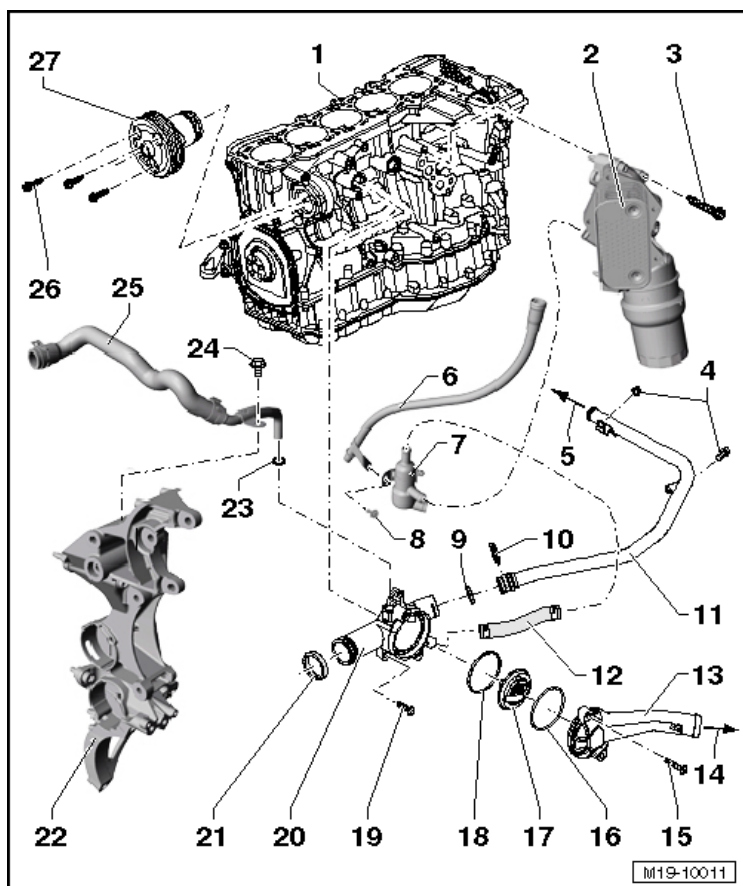


Not installed on all vehicles.

- 1 - Guide Tube
- 2 - Left Cover
- 3 - Bracket
- 4 - Connecting Cable
- 5 - Retainer
- 6 - from the Oil Cooler
- 7 - Engine Pre-Heater
- 8 - to the Coolant Thermostat Housing
- 9 - Bolt
 - 25 Nm
- 10 - Adhesive Foil
- 11 - Bracket with Clamp

**Engine –
2.5L CBTA/CBUA**

Coolant Pump and Thermostat Overview Part 1, Belt Pulley Side



- 1 - Cylinder Block
- 2 - Engine Oil Cooler
- 3 - Bolt
 - 25 Nm
- 4 - Bolt/Nut
 - 10 Nm
- 5 - to the Heater Core, Bottom Connection
- 6 - Guide Tube
- 7 - Engine Pre-Heater
- 8 - Bolt
 - 25 Nm
- 9 - O-ring
 - Always replace
- 10 - Circlip
- 11 - Front Coolant Pipe
- 12 - Connecting Hose

13 - Cover

14 - to the Radiator, Lower Connection

15 - Bolt

- 5 Nm

16 - O-ring

- Always replace

17 - Coolant Thermostat

18 - Seal

- Always replace

19 - Bolt

- 25 Nm

20 - Coolant Thermostat Housing

21 - Seal

- Always replace

22 - Accessory Bracket

23 - O-ring

- Always replace

24 - Bolt

- 9 Nm

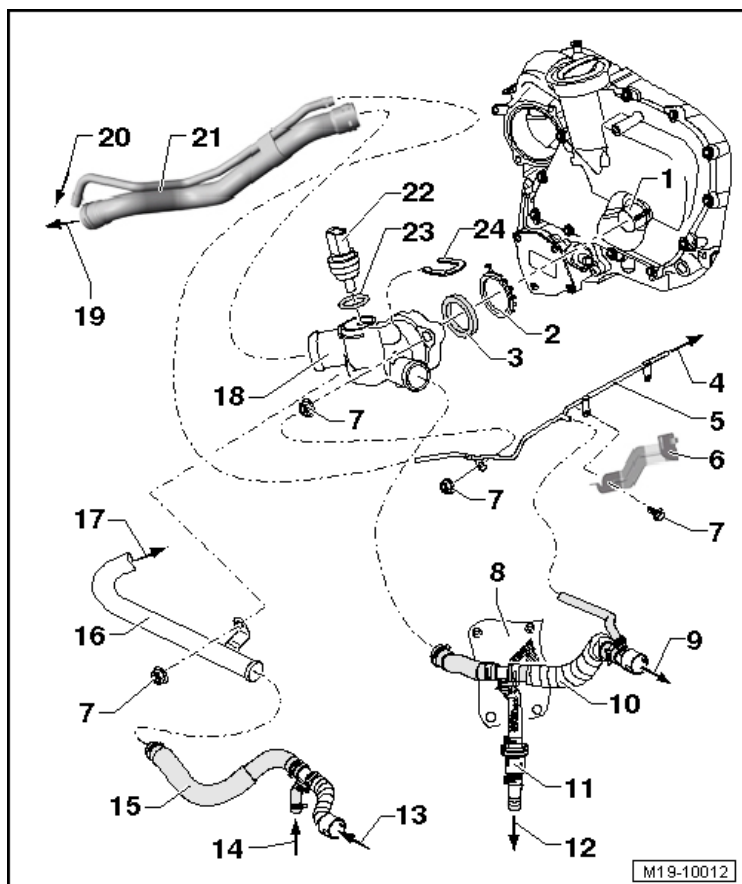
25 - Coolant Hose

26 - Bolt

- 25 Nm

27 - Coolant Pump

Coolant Pump and Thermostat Overview Part 2, Transmission Side



- 1 - Coolant Pipe Connection
- 2 - Lock Ring
- 3 - Seal
- 4 - to the Expansion Tank, Top Connection
- 5 - Rear Coolant Pipe
- 6 - Bracket
- 7 - Bolt/Nut
 - 10 Nm
- 8 - Heat Shield
- 9 - to the Heater Core, Top Connection
- 10 - Supply Hose
- 11 - Bypass Thermostat
 - Only for vehicles with a automatic transmission.
- 12 - to the Transmission Oil Cooler
 - Only for vehicles with a automatic transmission.

13 - from the Heater Core, Bottom Connection

14 - from the Transmission Oil Cooler

- Only for vehicles with a automatic transmission.

15 - Return Hose

16 - Coolant Pipe

17 - to the Flange

18 - Flange

19 - to the Radiator, Upper Connection

20 - to the Radiator, Upper Connection

21 - Supply Hose

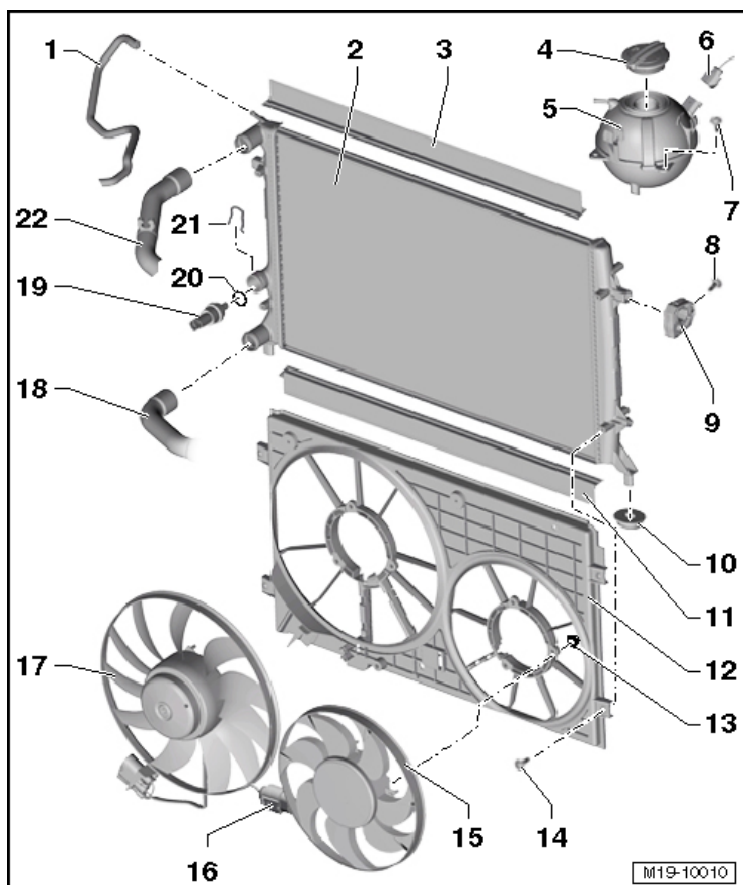
22 - Engine Coolant Temperature Sensor -G62-

23 - O-ring

- Always replace

24 - Retaining Clip

Fan Shroud and Radiator Overview



- 1 - Coolant Hose
- 2 - Radiator
- 3 - Upper Seal
- 4 - Cap
- 5 - Expansion Tank
- 6 - Connector
- 7 - Bolt
 - 2 Nm
- 8 - Bolt
 - 5 Nm
- 9 - Mount
- 10 - Mount
- 11 - Lower Seal
- 12 - Fan Shroud
- 13 - Nut
 - 5 Nm

14 - Bolt

- 5 Nm

15 - Coolant Fan 2 -V177-

16 - Connector

17 - Coolant Fan -V7-

18 - Lower Coolant Hose

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

20 - O-ring

- Always replace

21 - Retaining Clip

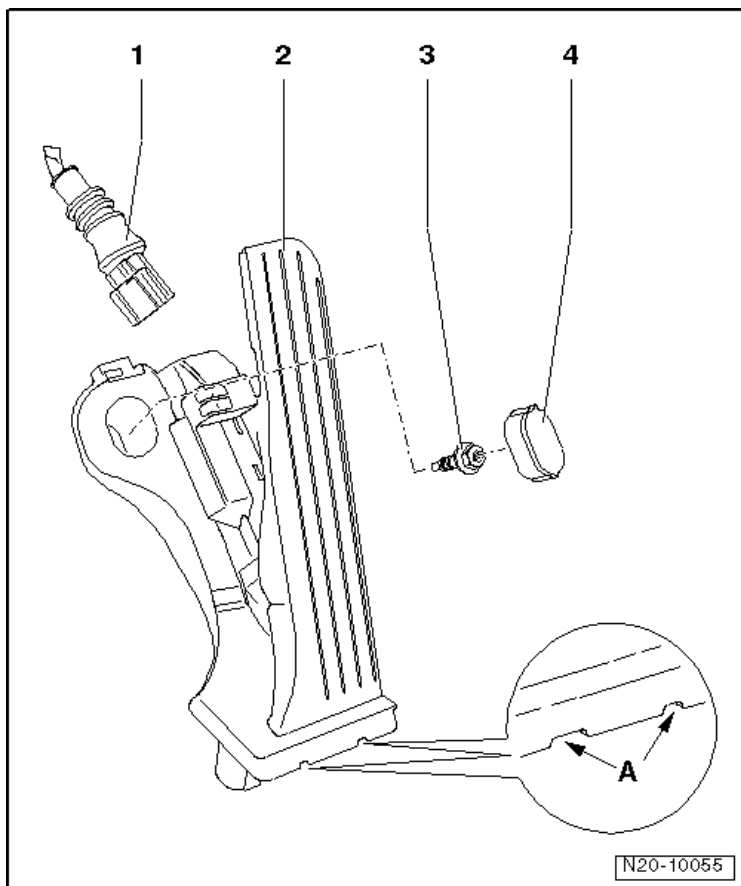
22 - Upper Coolant Hose

Fastener Tightening Specifications

Component	Nm
A/C condenser to radiator	5
Coolant fan to fan shroud	5
Coolant pump to cylinder block	10
Cover to coolant thermostat housing	5
Radiator mount to lock carrier	7

Fuel Supply – 2.5L CBTA, CBUA

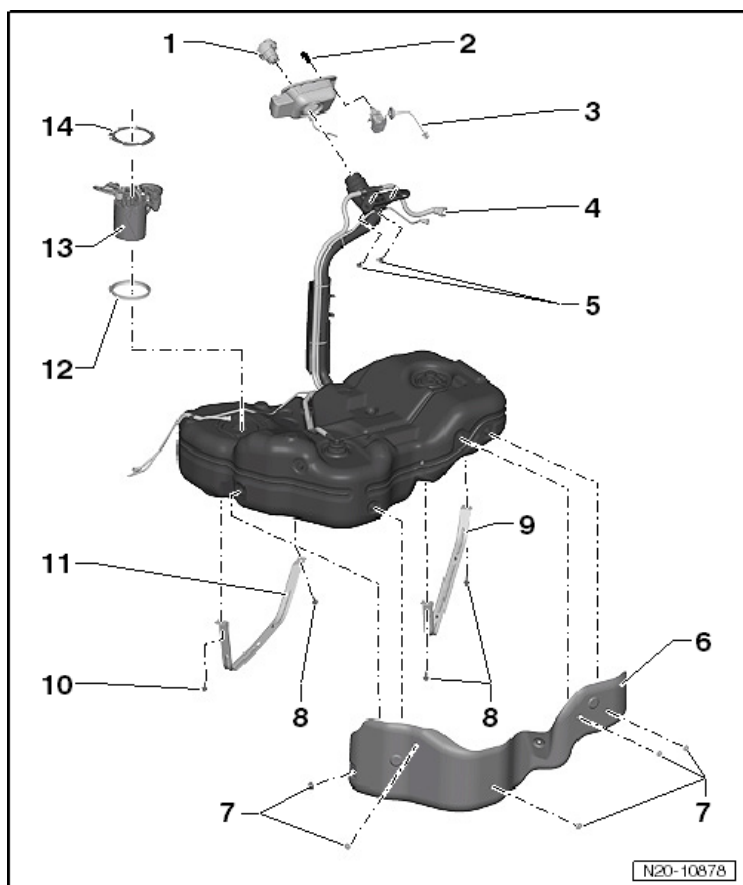
Accelerator Pedal Mechanism Overview



- 1 - Connector
- 2 - Accelerator Pedal Position Sensor -G79- with Accelerator Pedal Position Sensor 2 -G185-
- 3 - Bolt
 - 10Nm
- 4 - Cap

**Engine –
2.5L CBTA/CBUA**

Fuel Tank and Attachments Overview



1 - Cap

2 - Bolt

- Tightening specification, refer to Body Exterior

3 - Fuel Filler Door Unit with Fuel Filler Door Lock

4 - Ventilation Line

5 - Bolt

- 11 Nm

6 - Heat Shield

7 - Nut

- 2.5 Nm

8 - Bolt

- 25 Nm

9 - Left Tensioning Strap

10 - Bolt

- 25 Nm
- Always replace

11 - Right Tensioning Strap

12 - Seal

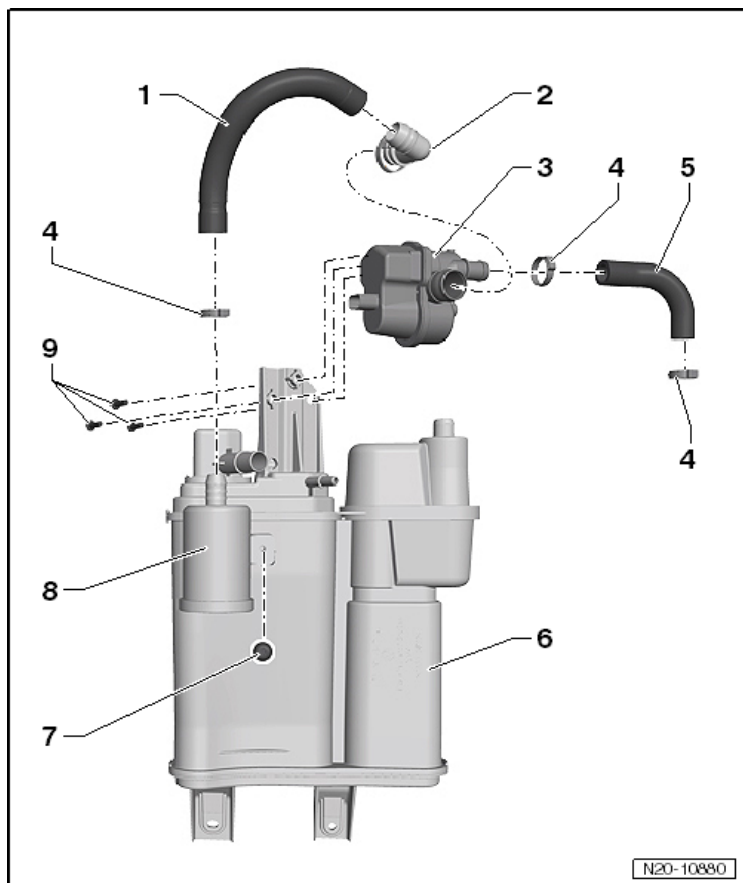
- Always replace

13 - Fuel Delivery Unit

14 - Lock Ring

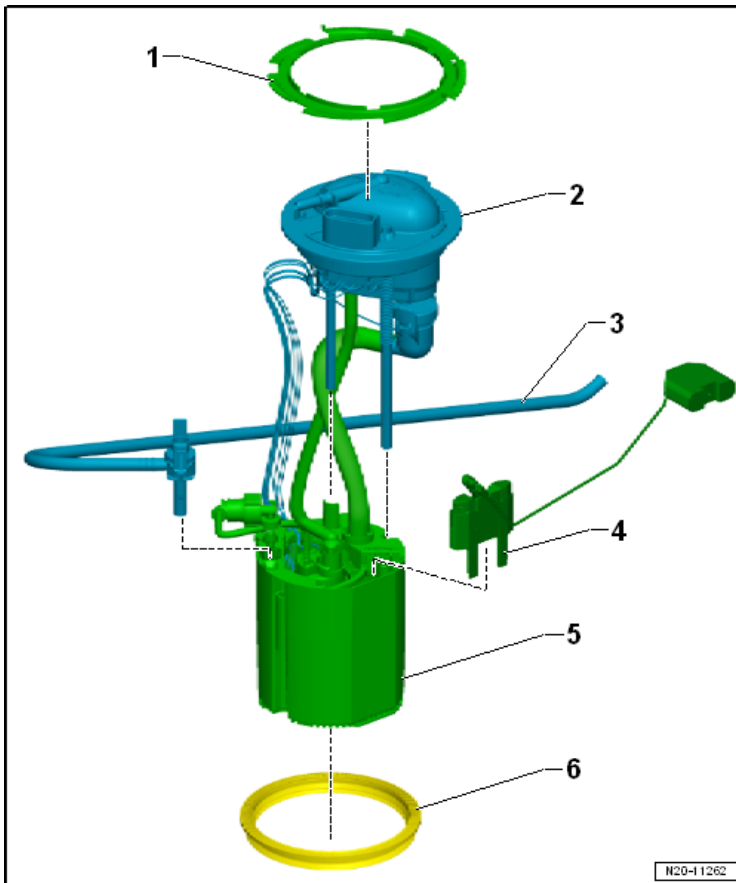
- 110 Nm

EVAP System Component Overview



- 1 - Connecting Hose
- 2 - Connecting Hose Connection
- 3 - Leak Detection Pump -V144-
- 4 - Hose Clamp
- 5 - Connecting Hose
- 6 - EVAP Canister
- 7 - Nut
 - 1.8 Nm
- 8 - Air Filter with Connecting Hose
- 9 - Bolt
 - 1.8 Nm

Fuel Delivery Unit/Fuel Level Sensor Assembly Overview



1 - Locking Ring

110 Nm

2 - Flange

3 - Intake Line

4 - Fuel Level Sensor -G-

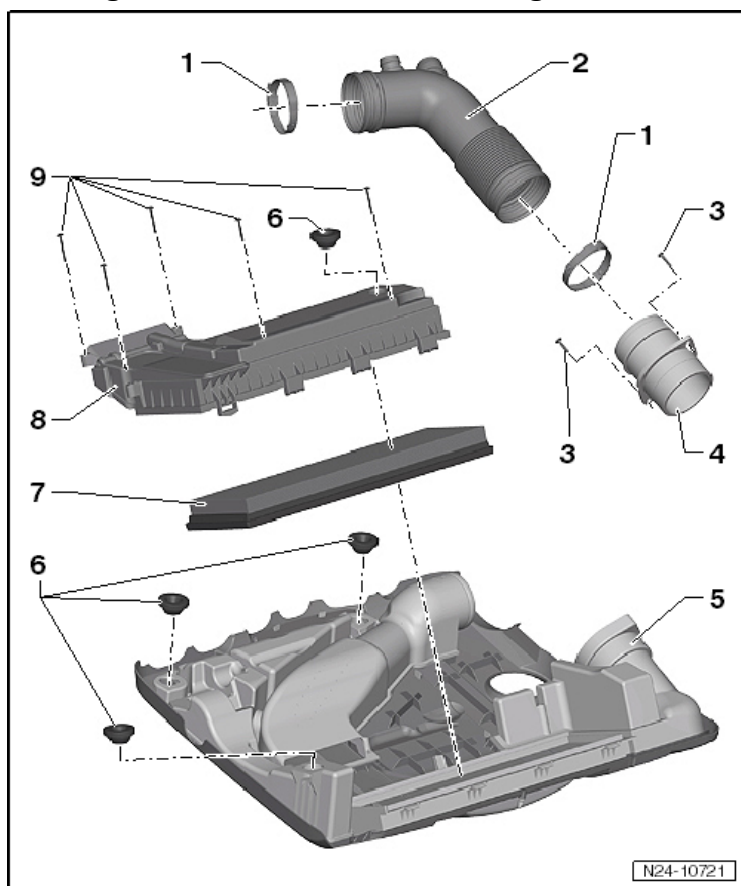
5 - Fuel Delivery Unit

6 - Seal

Replace

Multiport Fuel Injection – 2.5L CBTA, CBUA

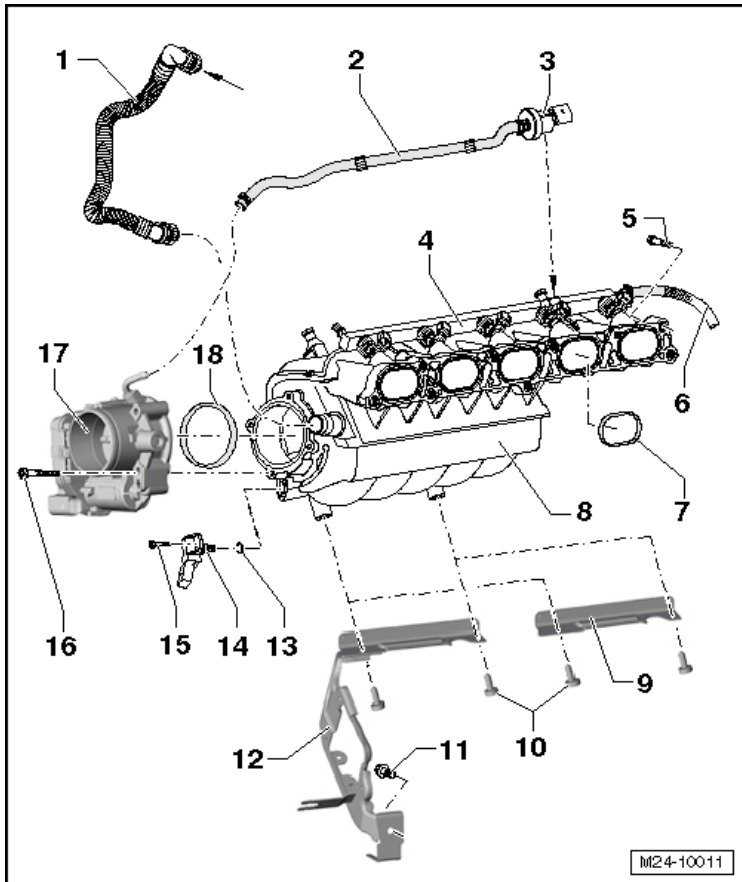
Engine Cover/Air Filter Housing Overview



- 1 - Spring Clamp
- 2 - Connecting Pipe
- 3 - Bolt
 - 3 Nm
- 4 - Connecting Piece
- 5 - Engine Cover/Upper Air Filter Housing
- 6 - Rubber Bushing
- 7 - Filter Element
- 8 - Lower Air Filter Housing
- 9 - Bolt
 - 2 Nm

**Engine –
2.5L CBTA/CBUA**

Intake Manifold Overview



- 1 - Crankcase Ventilation Vent Hose
- 2 - Connecting Hose
- 3 - EVAP Canister Purge Regulator Valve 1 -N80-
- 4 - Fuel Rail
- 5 - Bolt
 - 9 Nm
- 6 - Fuel Supply Line
- 7 - Seal
 - Always replace
- 8 - Intake Manifold
- 9 - Bracket
- 10 - Bolt
 - 16 Nm
- 11 - Bolt
 - 25 Nm
- 12 - Bracket

13 - O-ring

14 - Manifold absolute pressure sensor -G71- with intake air temperature sensor -G42-

15 - Bolt

3.5 Nm

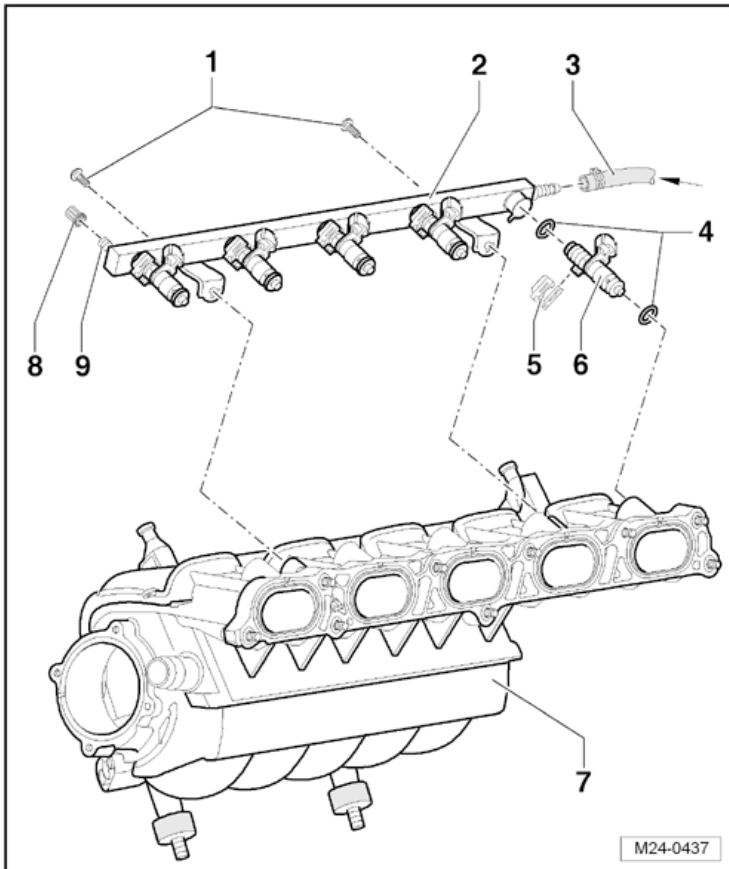
16 - Bolt

6.5 Nm

17 - Throttle Valve Control Module -J338-

18 - Seal

Fuel Rail and Injectors Overview



1 - Bolt

- 3.5 Nm

2 - Fuel Rail

3 - Fuel Supply Line

4 - O-ring

- Always replace

5 - Retaining Clip

6 - Fuel Injector -N30, N31, N32, N33, N83-

7 - Intake Manifold

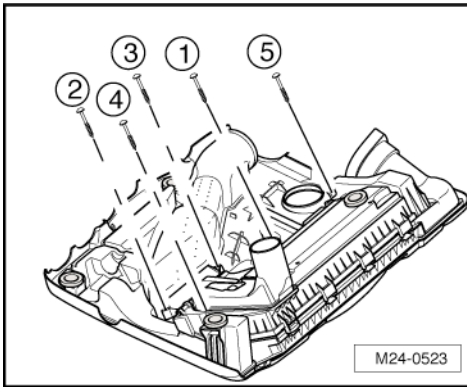
8 - Cap

9 - Valve

Fastener Tightening Specifications

Component	Nm
Fuel rail-to-intake manifold bolt	3.5*
Intake manifold support-to-cylinder block bolt	25*
Oil dipstick guide tube-to-cylinder block bolt	25*
Transport strap to cylinder head	25*

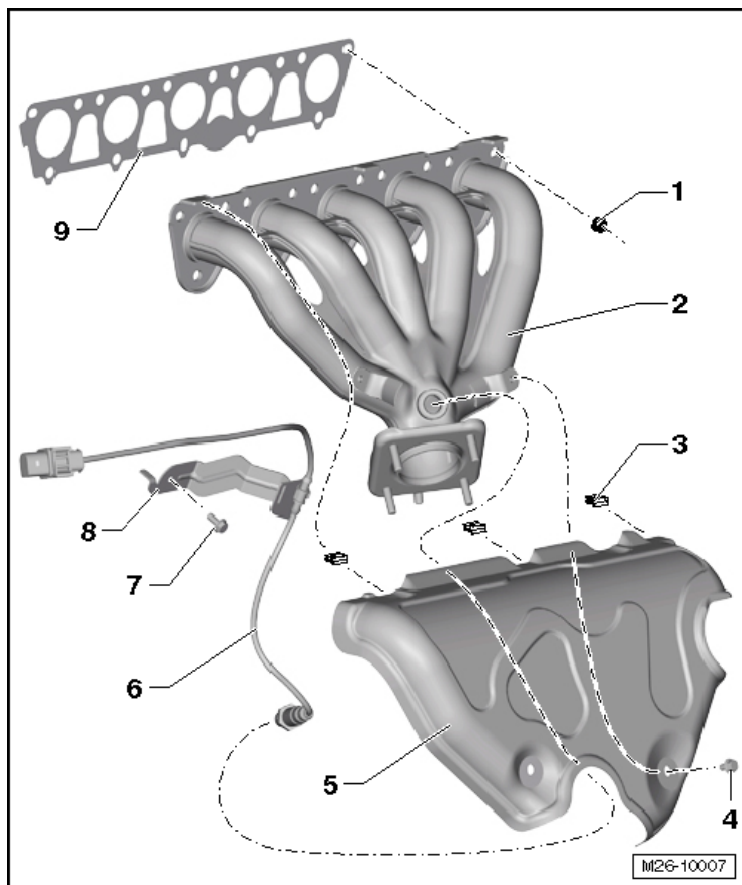
Lower Air Filter Housing Bolt Tightening Sequence



Step	Component	Nm
1	Tighten bolts 1 through 5 in sequence	2

Exhaust System, Emission Controls – 2.5L CBTA, CBUA

Exhaust Manifold Overview



1 - Nut

- 23 Nm
- Always replace

2 - Exhaust Manifold

3 - Clip

4 - Bolt

- 10 Nm

5 - Heat Shield

6 - Heated Oxygen Sensor -G39-

- 55 Nm
- When reusing an old oxygen sensor, only use hot bolt paste -G 052 112 A3- to grease the threads, do not let the paste get onto the slits of the oxygen sensor body.

7 - Bolt

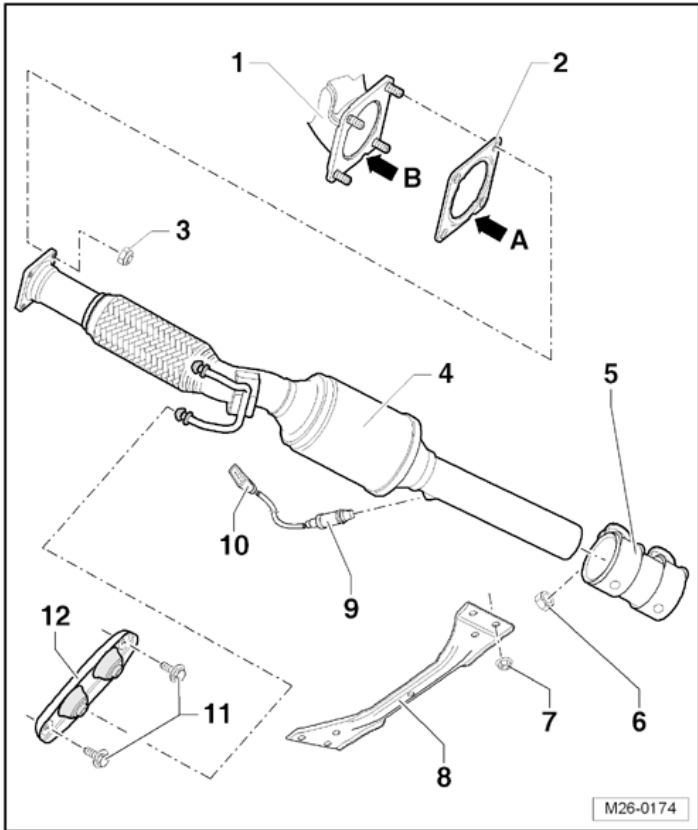
- 10 Nm

8 - Bracket

9 - Gasket

- Always replace

Exhaust Pipe with Catalytic Converter Overview



1 - Exhaust Manifold

2 - Gasket

- Always replace

3 - Nut

- 23 Nm
- Always replace

4 - Exhaust Pipe with Catalytic Converter

5 - Clamp

6 - Nut

- 23 Nm

7 - Nut

- 20 Nm

8 - Tunnel Brace

9 - Oxygen Sensor after Three Way Catalytic Converter -G130-

- 55 Nm

10 - Connector

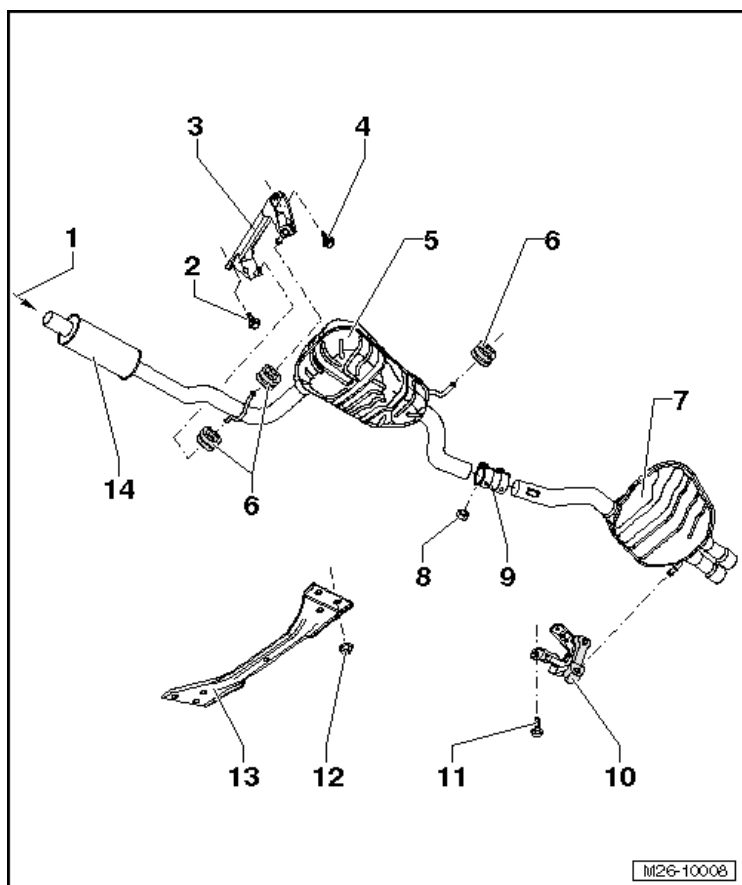
11 - Bolt

- 23 Nm

12 - Suspended Mount

**Engine –
2.5L CBTA/CBUA**

Muffler Overview



1 - from the Exhaust Pipe with Catalytic Converter

2 - Bolt

- 26 Nm
- Always replace

3 - Suspended Mount

4 - Bolt

- 23 Nm

5 - Center Muffler

6 - Retaining Ring

7 - Rear Muffler

8 - Nut

- 23 Nm

9 - Repair Clamp

10 - Suspended Mount

11 - Bolt

- 23 Nm

12 - Nut

□ 23 Nm

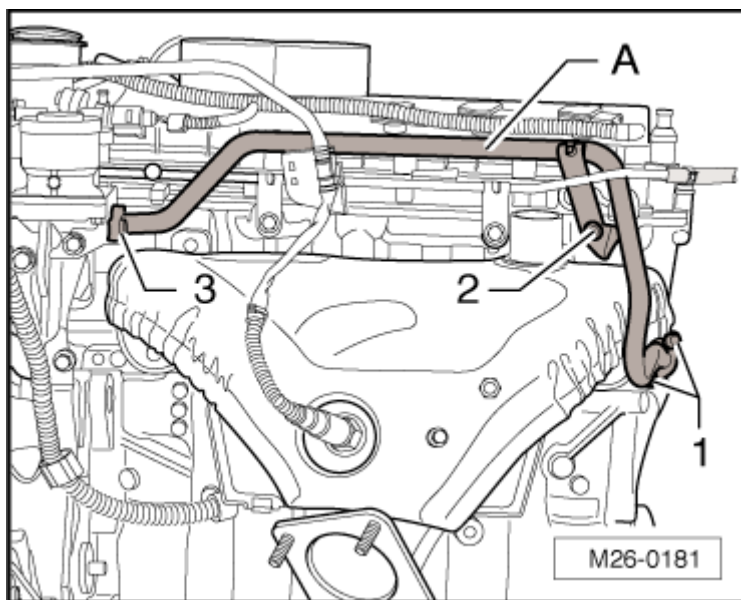
13 - Tunnel Brace

14 - Front Muffler

Fastener Tightening Specifications

Component	Nm
Clamp	25
Suspended mount to subframe	25*

Secondary Air Injection Pipe Tightening Specifications

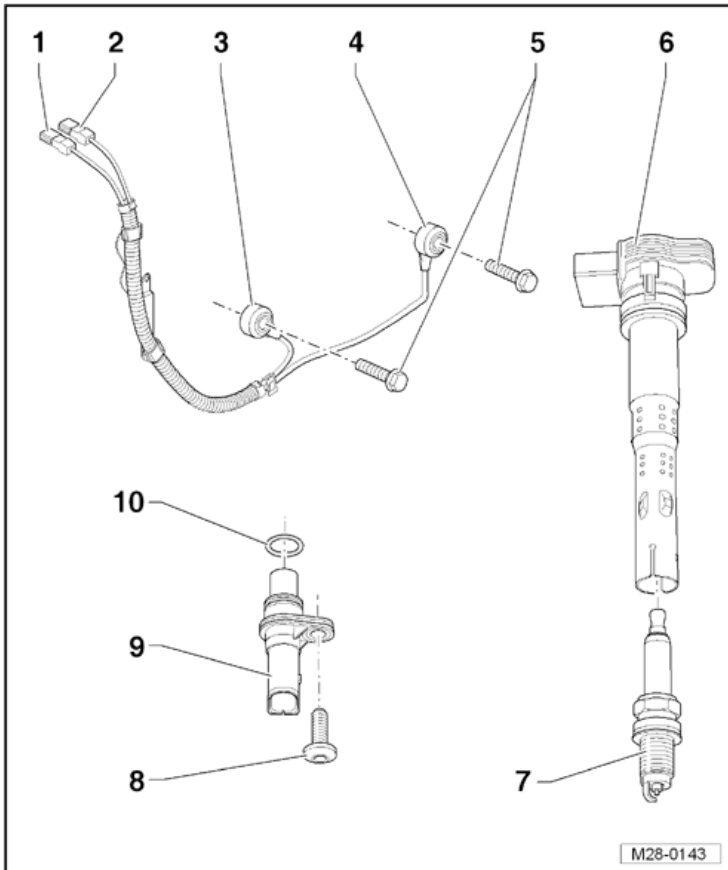


Step	Component	Nm
1	Tighten bolts 1 through 3 in sequence	Hand-tighten
2	Tighten bolts 1 through 3 in sequence	10

Engine –
2.5L CBTA/CBUA

Ignition – 2.5L CBTA, CBUA

Ignition System Component Overview



1 - Knock Sensor 2 Connector

2 - Knock Sensor 1 Connector

3 - Knock Sensor 2 -G66-

4 - Knock Sensor 1 -G61-

5 - Bolt

□ 20 Nm

6 - Ignition Coil with Power Output Stage -N70, N127, N291, N292, N323-

7 - Spark Plug

□ 25 Nm

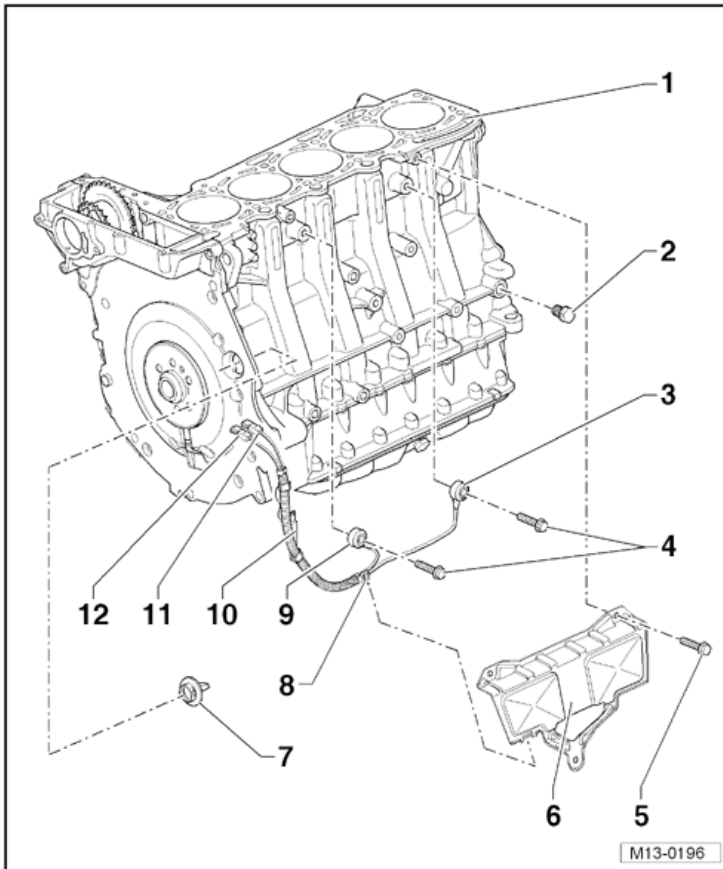
8 - Bolt

□ 10 Nm

9 - Camshaft Position Sensor -G40-

10 - O-ring

Muffler Overview



Engine –
2.5L CBTA/CBUA

- 1 - Cylinder Block
- 2 - Plug
 - 30 Nm
- 3 - Knock Sensor 1 -G61-
- 4 - Bolt
 - 20 Nm
- 5 - Bolt
 - 10 Nm
- 6 - Cover
- 7 - Bayonet Connection
- 8 - Wire Clip
- 9 - Knock Sensor 2 -G66-
- 10 - Wire Bracket
- 11 - Knock Sensor 1 Connector
- 12 - Knock Sensor 2 Connector

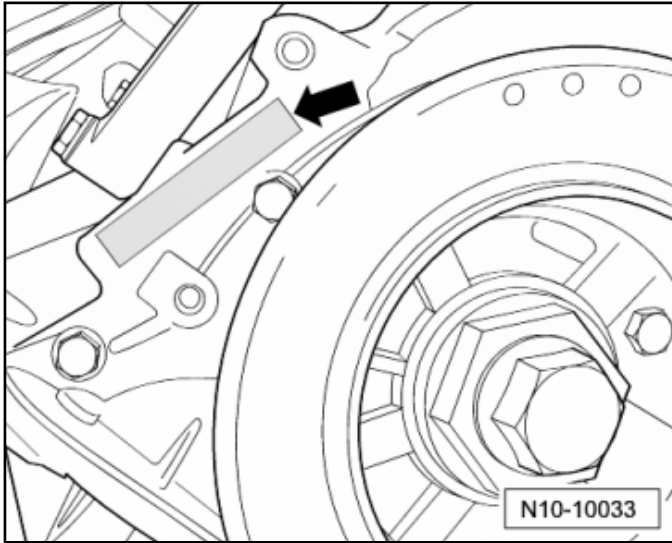
Technical Data

Engine codes	CBTA and CBUA
Ignition sequence	1-2-4-5-3
Spark plugs	Refer to the Parts Catalog
Electrode gap	1.0 to 1.1 mm
Tightening specification	25 Nm
Change intervals	Refer to Maintenance Intervals Rep. Gr. 03

ENGINE MECHANICAL – 3.6L CDVB

General, Technical Data

Engine Number Location



The engine number (engine code and serial number) (➡) is located on the cylinder block next to the vibration damper.

Engine –
3.6L CDVB

Engine Data

Engine code		CDVB
Manufactured		From 01.2011
Emission values in accordance with		BIN 5/ULEV 2 ²⁾
Displacement	cm ³	3597
Output	kW at RPM	206 @ 6200
Torque	Nm at RPM	350 @ 2500-5000
Engine idle speed ³⁾	RPM	640 to 760
Engine speed (RPM) limitation	RPM	approximately 6700
Bore	diameter mm	89.0
Stroke	mm	96.4
Cylinder angle		10.6°
Compression ratio		11.4
Valves per cylinder		4
Research Octane Number (RON)	minimum	95 unleaded ¹⁾
Fuel injection, ignition		Motronic MED 17.1.6
Knock control		2 knock sensors
Oxygen Sensor (O2S) regulation		4 sensors
Catalytic converter		Yes
Leak detection system		No
Exhaust Gas Recirculation (EGR)		Internal

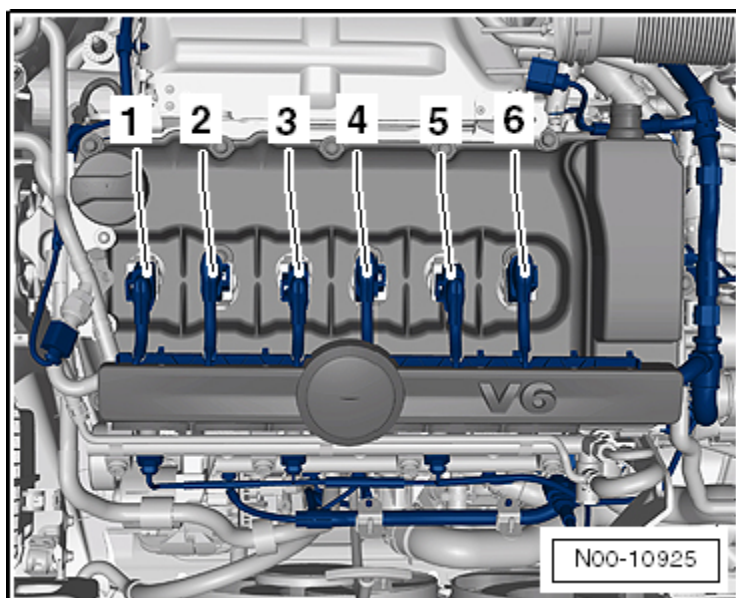
¹⁾ In exceptional circumstances a minimum 91 RON, however with reduced performance.

²⁾ ULEV 2: Ultra Low Emission Vehicles 2.

³⁾ Idle speed is not adjustable.

Cylinder Numbering

NOTE: Cylinder 1 is located opposite the fuel supply side.



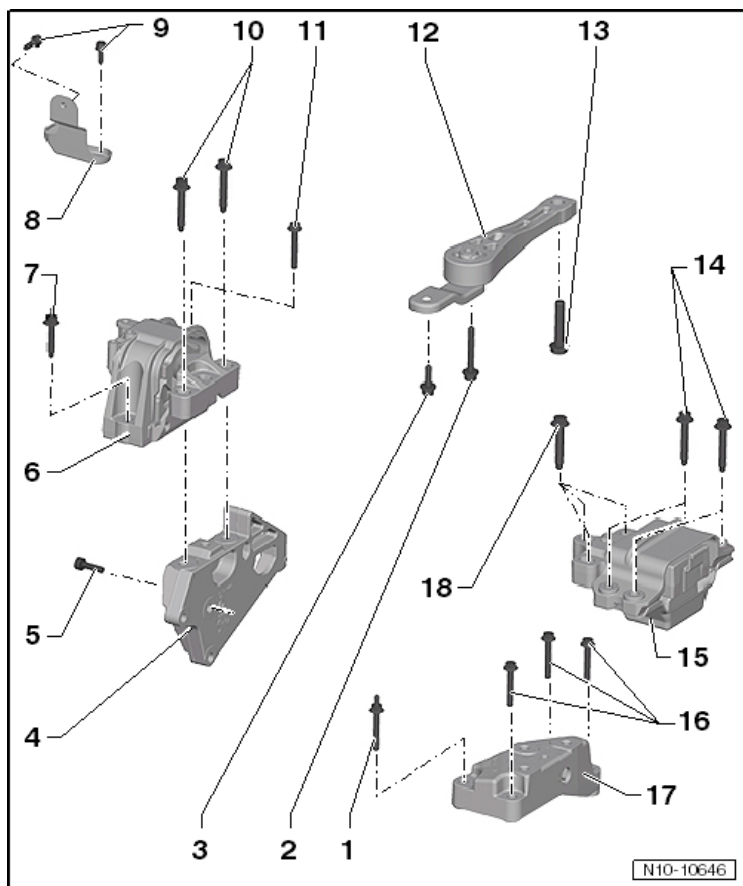
Ignition sequence

1-5-3-6-2-4

Engine -
3.6L CDVB

Engine Assembly – 3.6L CDVB

Engine/Transmission Mounts Overview



1 - Bolt

- Tightening specification, refer to DSG® Transmission

2 - Bolt

- 50 Nm + 90° turn
- Always replace

3 - Bolt

- 50 Nm + 90° turn
- Always replace

4 - Engine Mount Bracket

5 - Bolt

- 40 Nm + 180° turn
- Always replace

6 - Bolt

- 40 Nm + 90° turn
- Always replace

7 - Bolt

- 40 Nm + 90° turn
- Always replace

8 - Support

9 - Bolt

- 20 Nm + 90° turn
- Always replace

10 - Bolt

- 40 Nm + 90° turn
- Always replace

11 - Bolt

- 40 Nm + 90° turn
- Always replace

12 - Pendulum Support

13 - Bolt

- 100 Nm + 90° turn
- Always replace

14 - Bolt

- 40 Nm + 90° turn
- Always replace

15 - Transmission Mount

16 - Bolt

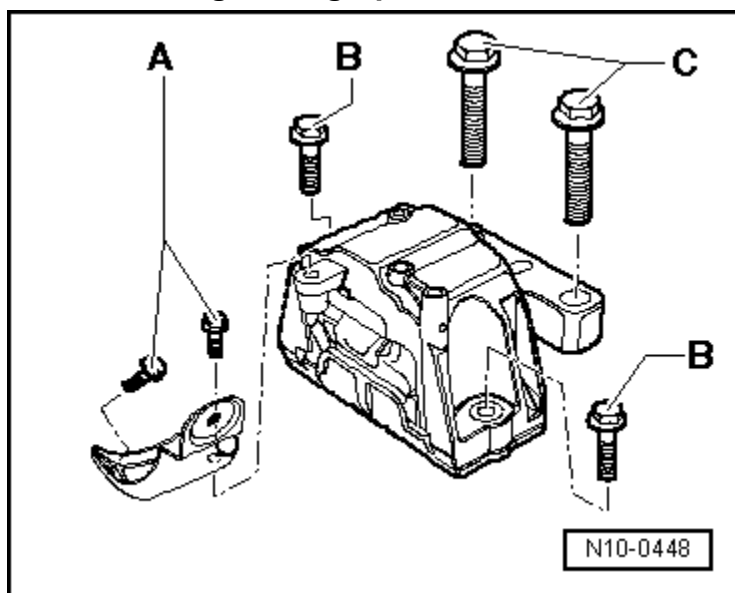
- Tightening specification, refer to DSG® Transmission

17 - Transmission Mount Bracket

18 - Bolt

- 60 Nm + 90° turn
- Always replace

Tightening Specifications



Bolt	Tightening Specifications
-A- ¹⁾	20 Nm + an additional 90° (1/4) turn
-B- ¹⁾	40 Nm + an additional 90° (1/4) turn
-C- ¹⁾	60 Nm + an additional 90° (1/4) turn

¹⁾ Always replace

Fastener Tightening Specifications

Component	Fastener size	Nm
Bolts and nuts	M6	10
	M7	15
	M8	25
	M10	40
	M12	60

Crankshaft, Cylinder Block – 3.6L CDVB

Allocation of Crankshaft Bearing Shells for Cylinder Block

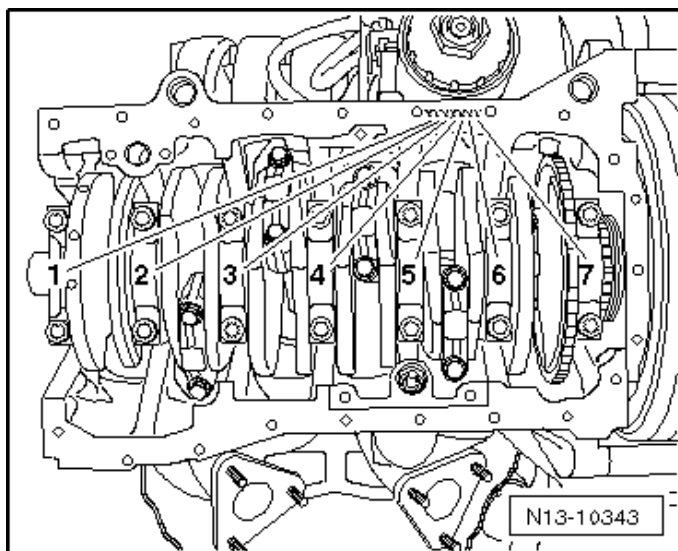
The main bearing shells with the correct thickness are allocated to the cylinder block and crankshaft in the factory. Colored dots identify the bearing thickness.

Allocate the bearing shells if the cylinder block or crankshaft are being replaced.

The bearing shell for the cylinder block (upper bearing shell) is always marked with a yellow dot.

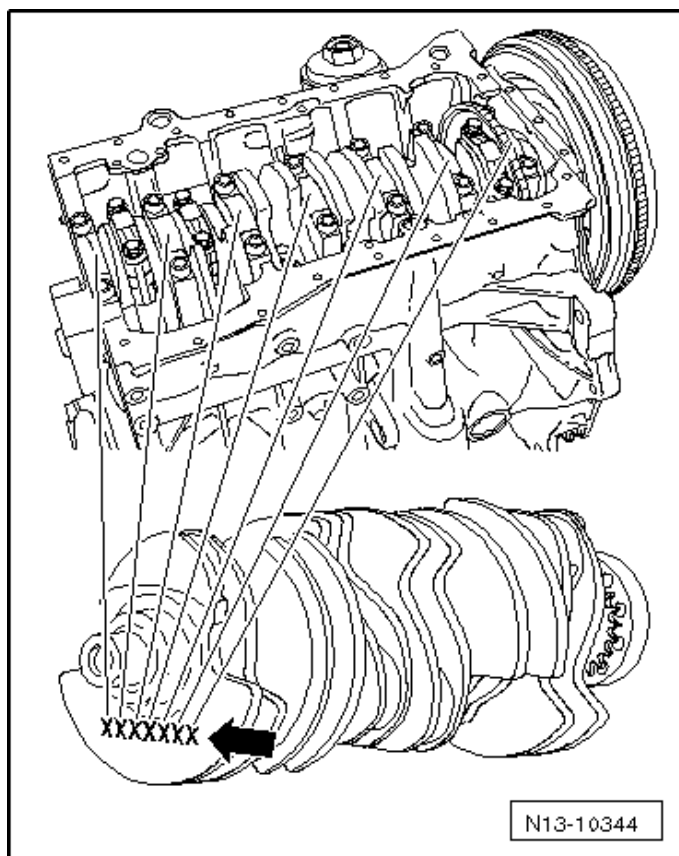
Using the letters on the cylinder block and crankshaft, determine the correct color identification for the bearing shell in the bearing cap (lower bearing shell). The first letter is for bearing cap 1, the second for bearing cap 2, etc.

Cylinder Block Identification



The letters are located on the oil pan sealing surface.

Crankshaft Identification



The letters are located on the outer crankshaft counterweight for cylinder 1.

Note the letters and then match it to the color identification in the table.

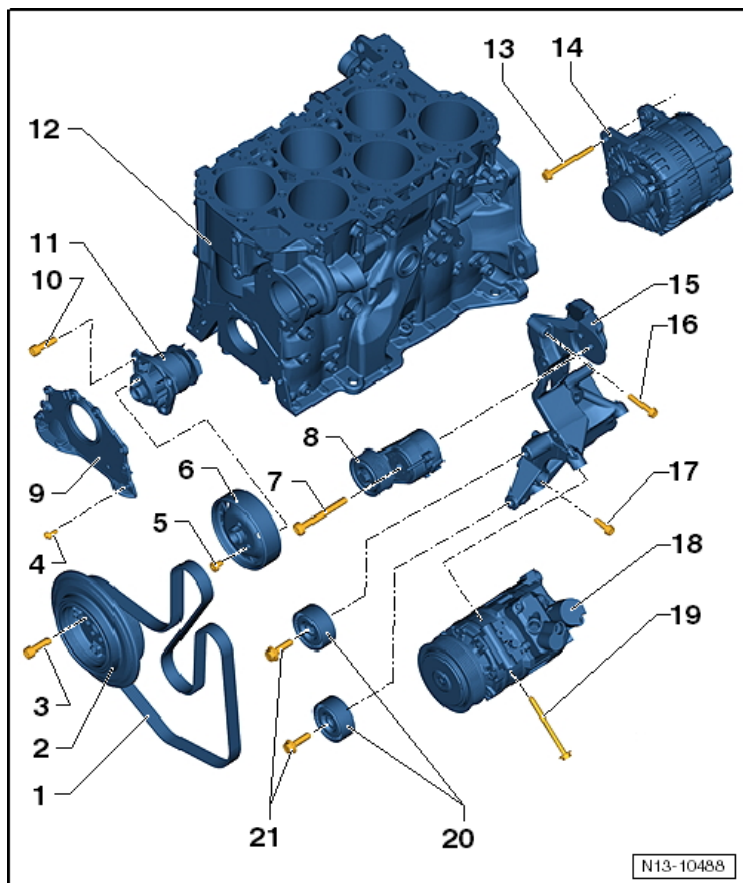
Letter on the cylinder block	Letter on the crankshaft counterweight	Bearing shell color identification for the bearing cap	Bearing shell color identification for the cylinder block
A, B, C, D, E	R	Red	Yellow
A, B, C, D, E	G	Red	Yellow
A, B, C, D, E	B	Yellow	Yellow
A, B, C, D, E	V	Blue	Yellow
G, H, I	R	Red	Yellow
G, H, I	G	Red	Yellow

Letter on the cylinder block	Letter on the crankshaft counterweight	Bearing shell color identification for the bearing cap	Bearing shell color identification for the cylinder block
G, H, I	B	Yellow	Yellow
G, H, I	V	Blue	Yellow
K, L, M	R	Red	Yellow
K, L, M	G	Yellow	Yellow
K, L, M	B	Blue	Yellow
K, L, M	V	Purple	Yellow

Example:

Bearing Cap	1	2	3	4	5	6	7
Letter on the cylinder block	G	H	H	H	G	E	G
Letter on the crankshaft counterweight	G	B	B	V	B	B	G
Bearing shell color identification for the bearing cap	Red	Yellow	Yellow	Blue	Yellow	Yellow	Red

Cylinder Block Overview, Belt Pulley Side



- 1 - Ribbed Belt
- 2 - Vibration Damper
- 3 - Bolt
- 4 - Bolt
 - 10 Nm
- 5 - Bolt
 - 20 Nm
- 6 - Coolant Pump Pulley
- 7 - Bolt
 - 50 Nm
- 8 - Ribbed Belt Tensioner
- 9 - Sealing Flange
- 10 - Bolt
 - 8 Nm
- 11 - Coolant Pump
- 12 - Cylinder Block

13 - Bolt

25 Nm

14 - Generator

15 - Accessory Bracket

16 - Bolt

25 Nm

17 - Bolt

25 Nm

18 - A/C Compressor

19 - Bolt

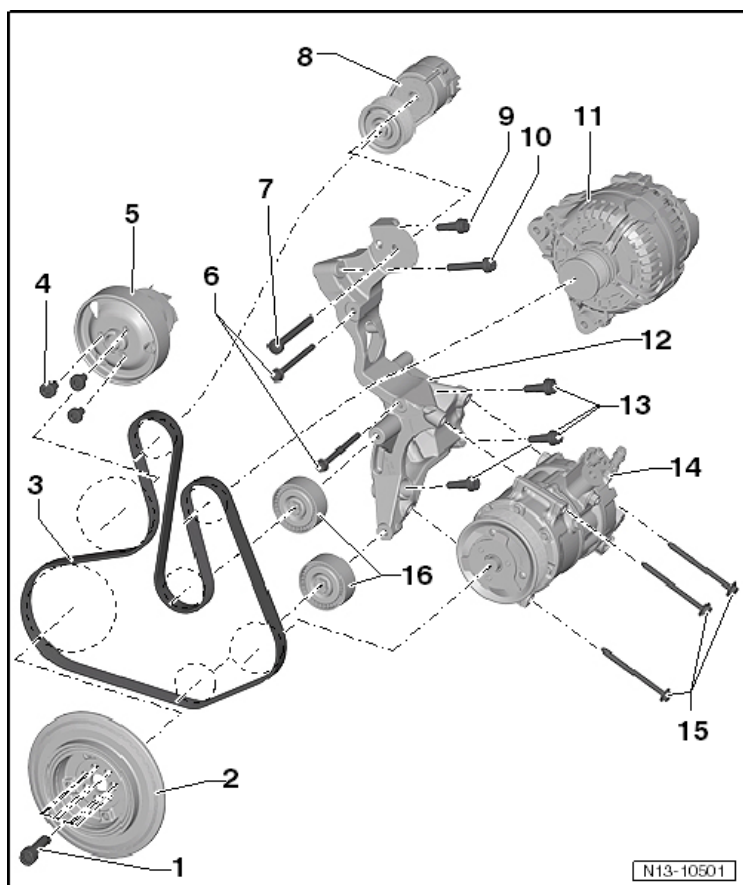
23 Nm

20 - Idler Roller

21 - Bolt

40 Nm

Ribbed Belt Drive Overview



1 - Bolt

- 60 Nm + 180° turn

2 - Vibration Damper

3 - Ribbed Belt

4 - Bolt

- 20 Nm

5 - Coolant Pump

6 - Bolt

- 25 Nm

7 - Bolt

- 50 Nm

8 - Ribbed Belt Tensioner

9 - Bolt

- 25 Nm

10 - Bolt

- 25 Nm

11 - Generator

12 - Accessory Bracket

13 - Bolt

- 25 Nm

14 - A/C Compressor

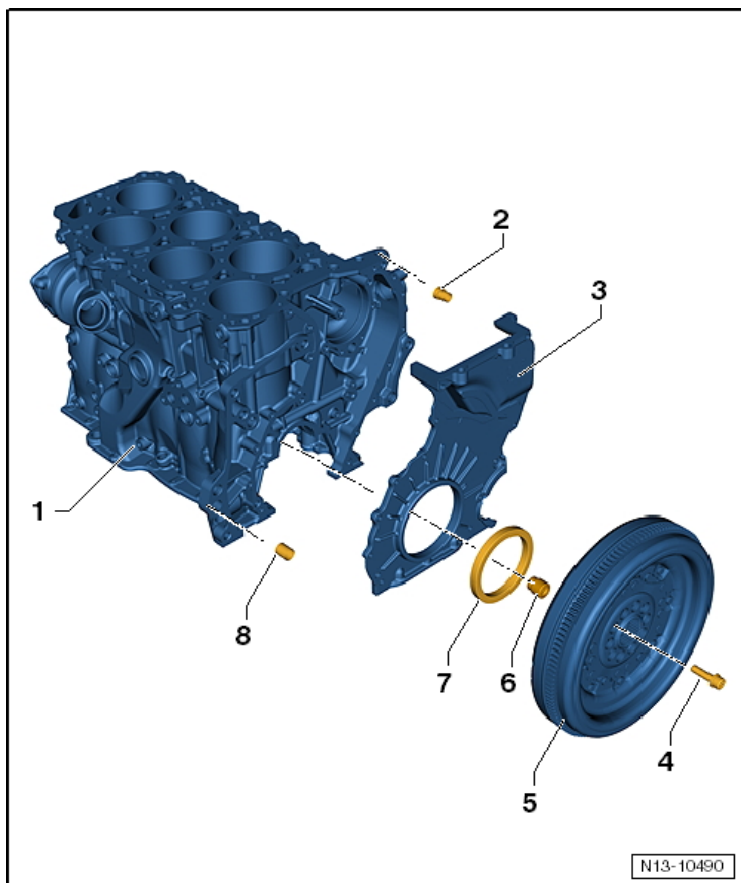
15 - Bolt

- 23 Nm
- M8 x 100

16 - Idler Roller

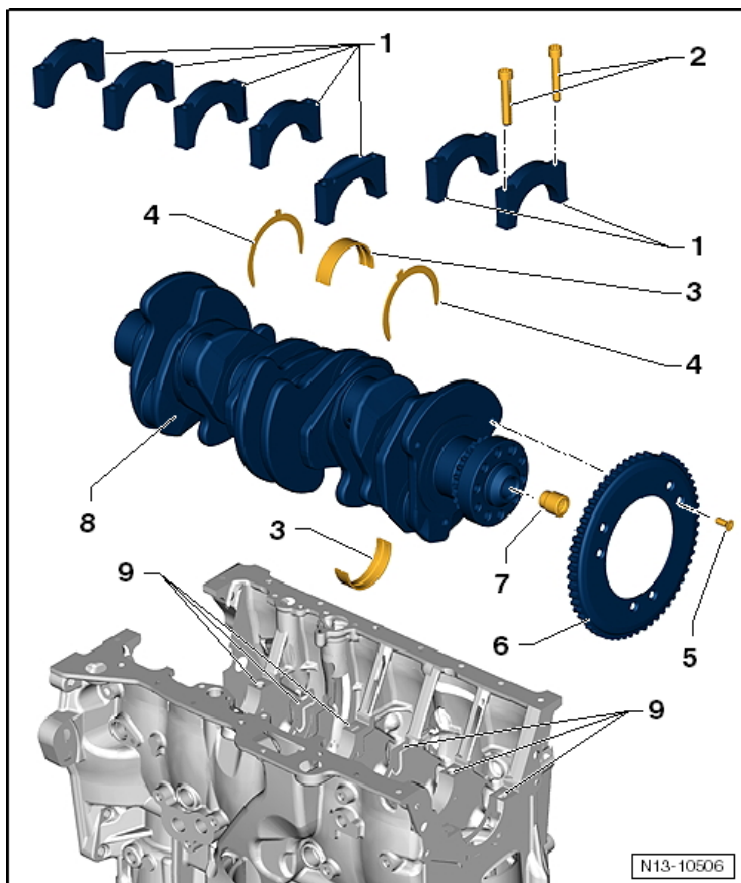
- 40 Nm

Cylinder Block Overview, Transmission Side



- 1 - Cylinder Block
- 2 - Alignment Pin
- 3 - Sealing Flange
- 4 - Bolt
 - 60 Nm + 90° turn
 - Always replace
- 5 - Flywheel
- 6 - Needle Bearing
- 7 - Seal
- 8 - Alignment Sleeve

Crankshaft Overview



1 - Bearing Cap

2 - Bolt

- 30 Nm + 180° turn
- Always replace

3 - Bearing Shells, 1 through 7

4 - Thrust Washer

5 - Bolt

- 10 Nm + 90° turn
- Always replace

6 - Sensor Wheel

- Always replace

7 - Needle Bearing

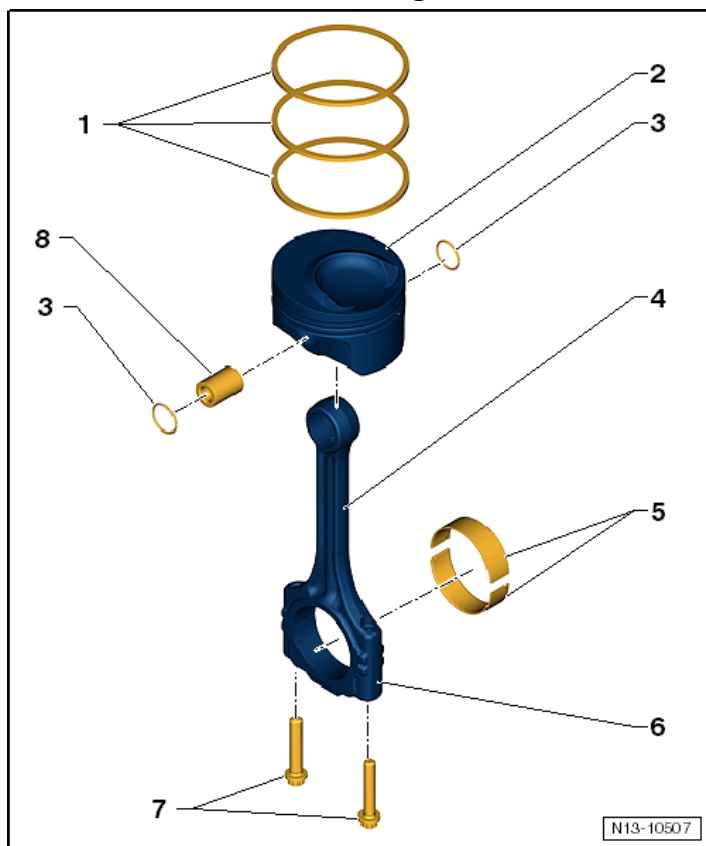
8 - Crankshaft

9 - Oil Spray Jet

- 40 Nm + 90° turn
- Always replace

Engine –
3.6L CDVB

Pistons and Connecting Rod Overview



1 - Piston Rings

2 - Piston

3 - Lock Ring

4 - Connecting Rod

5 - Bearing Shell

6 - Connecting Rod Bearing Cap

7 - Bolt

40 Nm + 90° turn

Always replace

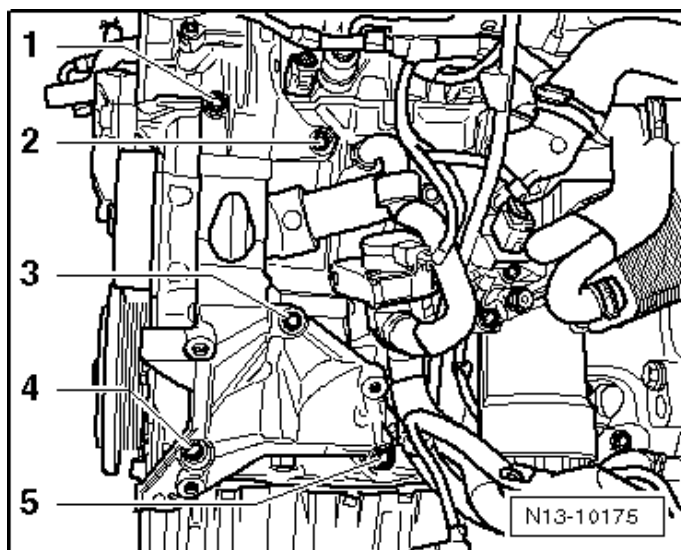
7 - Piston Pin

Fastener Tightening Specifications

Component	Fastener size	Nm
Sensor wheel-to-crankshaft screw ¹⁾	-	10 plus an additional 90° (¼ turn)

¹⁾ Replace fastener(s).

Accessory Bracket Bolt Tightening Specifications



Step	Component	Nm
1	Tighten bolts 2 and 4	Hand-tighten
2	Tighten bolts 1, 3 and 5	Hand-tighten
3	Tighten bolts 1 through 5 in a diagonal sequence	25

Engine –
3.6L CDVB

Piston Ring End Gaps

Piston ring dimensions in mm	Gap	
	New	Wear limit
Compression ring	0.30 to 0.45	1.0
Stepped compression ring	0.30 to 0.50	1.0
Oil scraping ring	0.20 to 0.90	1.2

Piston Ring Clearance

Piston ring dimensions in mm	Ring to groove clearance	
	New	Wear limit
Compression ring	0.04 to 0.06	0.12
Stepped compression ring	0.03 to 0.06	0.15
Oil scraping ring	0.02 to 0.06	0.15

Piston and Cylinder Dimensions

Honing dimension in mm	Piston diameter	Cylinder bore diameter
Basic dimension	88.945	89.010

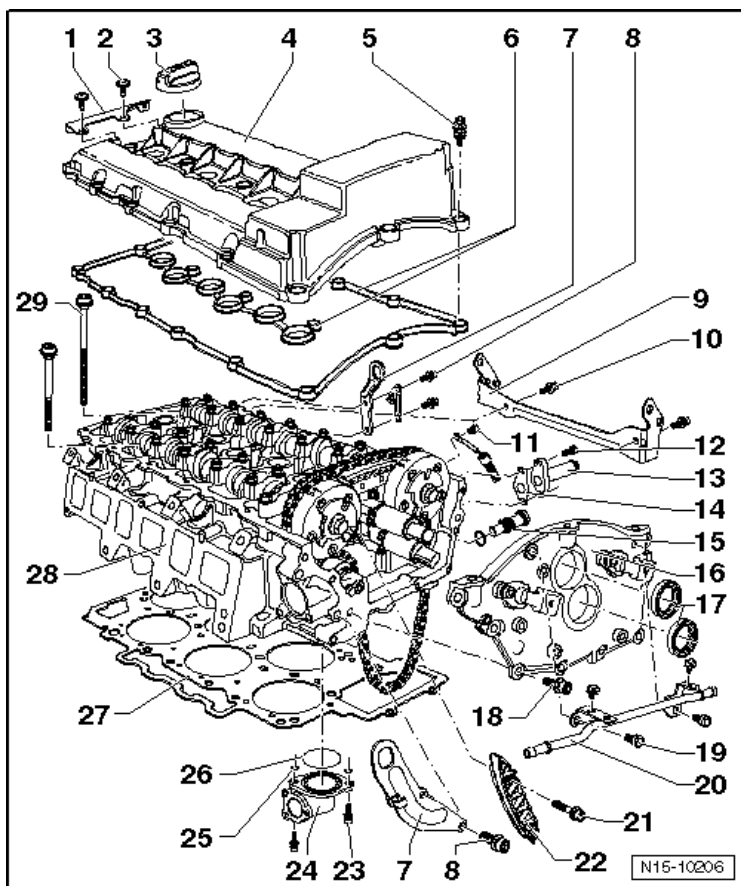
Crankshaft Dimensions

Reconditioning dimension in mm	Crankshaft bearing pin diameter	Connecting rod bearing pin diameter
Basic dimension	59.958 to 59.978	53.958 to 53.978

**Engine –
3.6L CDVB**

Cylinder Head, Valvetrain – 3.6L CDVB

Ribbed Belt Drive Overview



- 1 - Bracket
- 2 - Bolt
 - 10 Nm
- 3 - Cap
- 4 - Cylinder Head Cover
- 5 - Bolt
 - 10 Nm
- 6 - Cylinder Head Cover Gasket
- 7 - Lifting Eye
- 8 - Bolt
 - 23 Nm
- 9 - Intake Manifold Support
- 10 - Bolt
 - 23 Nm

11 - Bolt

- 10 Nm

12 - Bolt

- 10 Nm

13 - Water Connection

14 - Seal Ring

- Always replace

15 - Chain Tensioner

- 50 Nm

16 - Cover

17 - Seal

18 - Bolt

- 8 Nm

19 - Bolt

- 8 Nm

20 - Coolant Pipe

21 - Bolt

- 23 Nm

22 - Guide Rail

23 - Bolt

- 23 Nm
- Install using liquid locking fluid -D 000 600 A2-.

24 - Water Connection

25 - O-ring

- Always replace

26 - Seal

- Always replace

27 - Cylinder Head Gasket

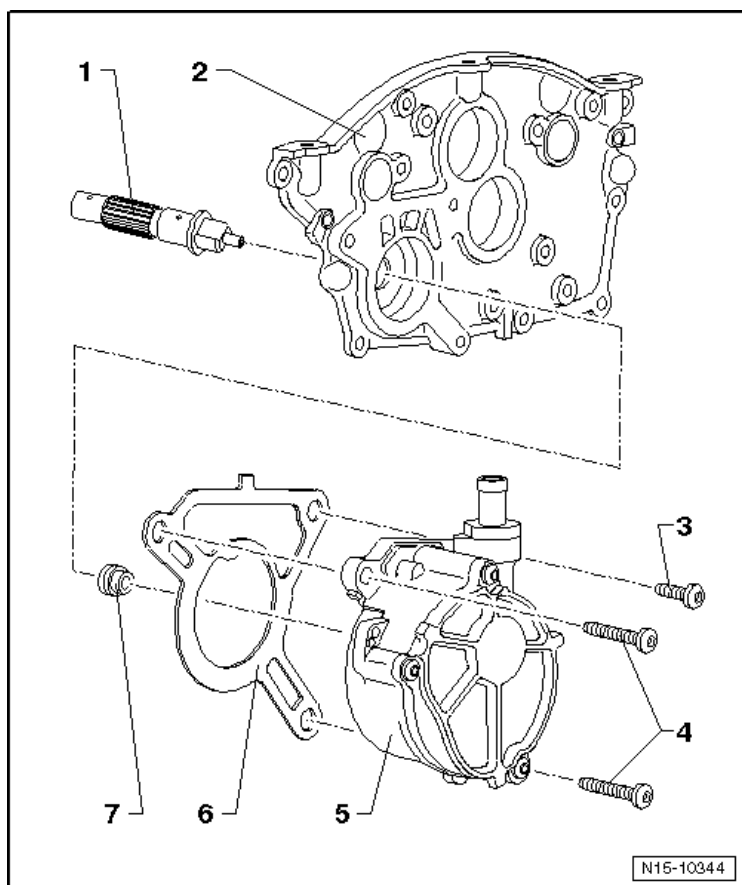
- Always replace

28 - Cylinder Head

29 - Bolt

- Always replace
- Before installing, coat the bolts with liquid locking fluid -D 197 300 A2-.
- Follow the instructions and sequence when loosening see below
- Follow the instructions and sequence when tightening see below

Vacuum Pump Overview



1 - Drive Shaft

2 - Cover

3 - Bolt

8 Nm

Short

4 - Bolt

8 Nm

Long

5 - Vacuum Pump

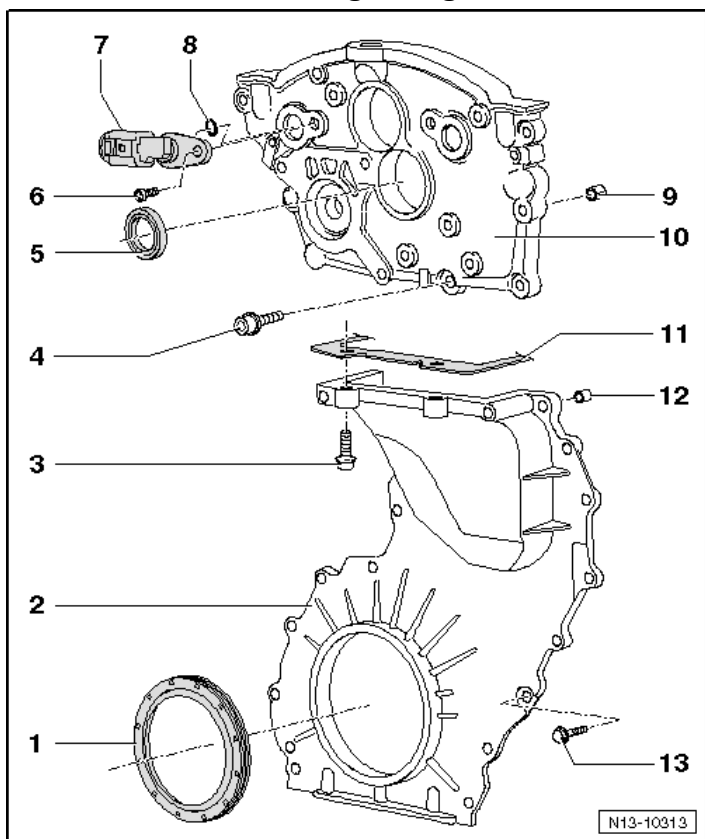
6 - Gasket

Always replace

7 - Seal

**Engine –
3.6L CDVB**

Cover and Sealing Flange Overview



1 - Seal

2 - Sealing Flange

3 - Bolt

23 Nm

4 - Bolt

8 Nm

Tighten in a diagonal sequence and in steps.

5 - Seal

6 - Bolt

8 Nm

7 - Camshaft Position (CMP) Sensor

8 - O-ring

Always replace

9 - Alignment Pin

10 - Cover

11 - Cylinder Head Gasket

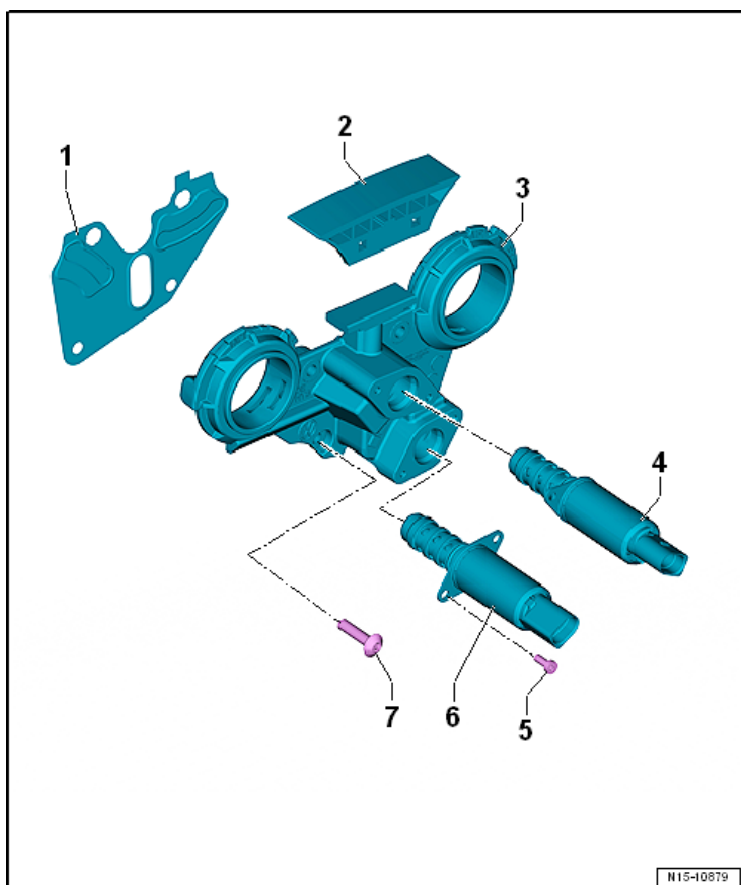
12 - Alignment Pin

13 - Bolt

10 Nm

**Engine –
3.6L CDVB**

Control Housing Overview



1 - Gasket

- Replace

2 - Vibration Damper

3 - Guide Track: Clipped to the Control Housing

4 - Camshaft Adjustment Valve 1 -N205-

5 - Bolt

- 3.8 Nm

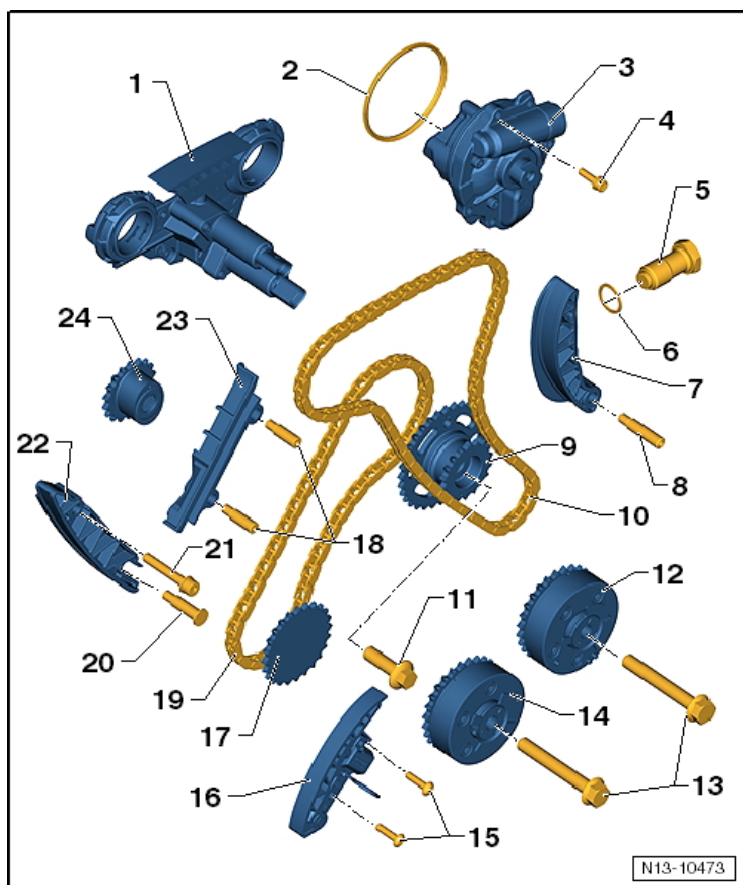
6 - Exhaust Camshaft Adjustment Valve 1 -N318-

7 - Bolt

- 8 Nm + 180° turn
- Replace

**Engine –
3.6L CDVB**

Timing Chains Overview



1 - Control Housing

2 - Seal

- Always replace

3 - Oil Pump

4 - Bolt

- 8 Nm

- Install using liquid locking fluid -D 000 600 A2-.

5 - Chain Tensioner

- 50 Nm

6 - Seal

7 - Tensioning Rail

8 - Pin

- 10 Nm

9 - Chain Sprocket

10 - Camshaft Timing Chain

11 - Bolt

- 60 Nm + 90° turn
- Always replace

12 - Exhaust Camshaft Adjuster

13 - Bolt

- 60 Nm + 90° turn
- Always replace

14 - Intake Camshaft Adjuster

15 - Bolt

- 10 Nm

16 - Chain Tensioner with Tensioning Rail

17 - Drive Sprocket

18 - Pin

- 10 Nm

19 - Oil Pump Timing Chain

20 - Pin

- 10 Nm

21 - Bolt

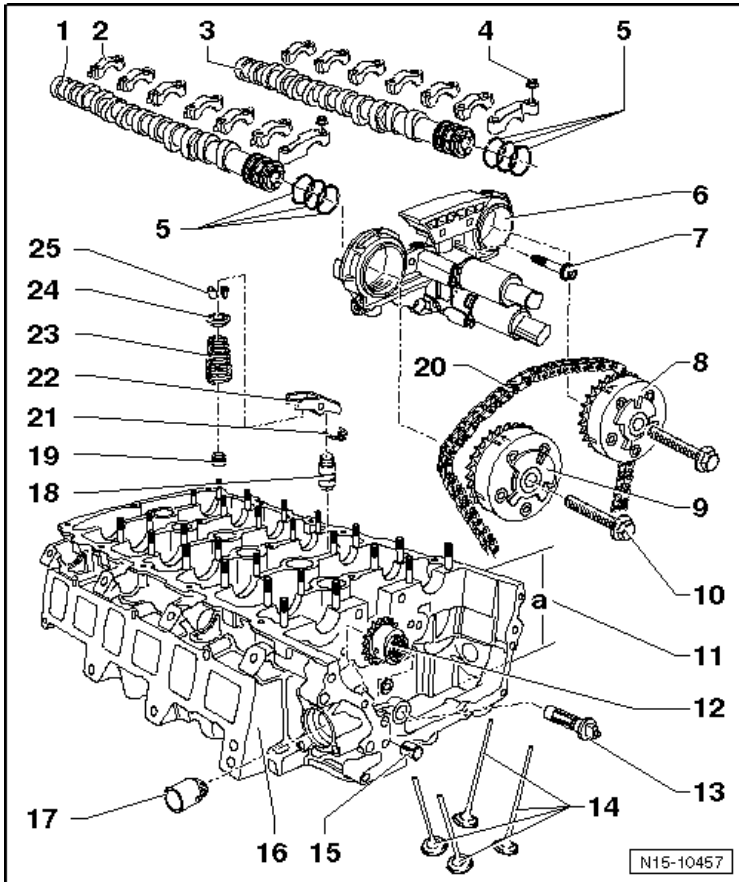
- 23 Nm

22 - Guide Rail

23 - Guide Rail

24 - High Pressure Pump Sprocket

Valvetrain Overview



1 - Intake Camshaft

2 - Camshaft Bearing Cap

3 - Exhaust Camshaft

4 - Nut

- 5 Nm + 45° turn

5 - Seal

6 - Control Housing

7 - Bolt

- 8 Nm + an 90° (1/4) turn
- Replace

8 - Exhaust Camshaft Adjuster

9 - Intake Camshaft Adjuster

10 - Bolt

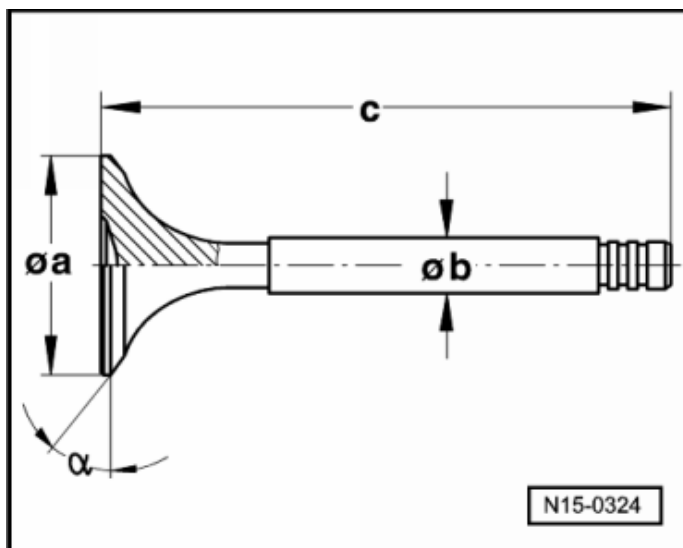
- 60 Nm + 90° turn
- Always replace

- 11 - Cylinder Head Height
- 12 - High Pressure Pump Sprocket
- 13 - Drive Shaft
- 14 - Valves
- 15 - Alignment Bushing
- 16 - Cylinder Head
- 17 - Cam Follower
- 18 - Hydraulic Lash Adjuster
- 19 - Valve Stem Seal
- 20 - Camshaft Timing Chain
- 21 - Clip
- 22 - Roller Rocker Arm
- 23 - Valve Spring
- 24 - Valve Spring Retainer
- 25 - Valve Retainer

Compression Pressures

New Bar positive pressure	Wear limit Bar positive pressure	Difference between cylinders Bar positive pressure
11.0 to 13.0	8.0	Max. 3.0

Valve Dimensions



Dimensions for Intake Valve

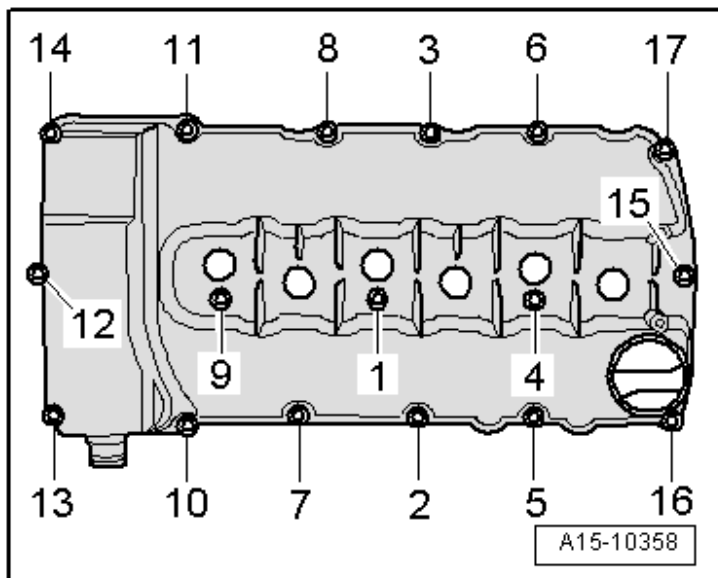
Dimension		Short valve	Long valve
Diameter a	mm	33.20	33.20
Diameter b	mm	5.98	5.98
c	mm	102.46	136.36
α	$^{\circ}$	$44^{\circ} 40'$	$44^{\circ} 40'$

Dimensions for Exhaust Valve

Dimension		Short valve	Long valve
Diameter a	mm	30.20	30.20
Diameter b	mm	5.97	5.97
c	mm	102.20	136.20
α	$^{\circ}$	$44^{\circ} 40'$	$44^{\circ} 40'$

NOTE: Intake and exhaust valves must not be refaced by grinding. Only lapping is permitted.

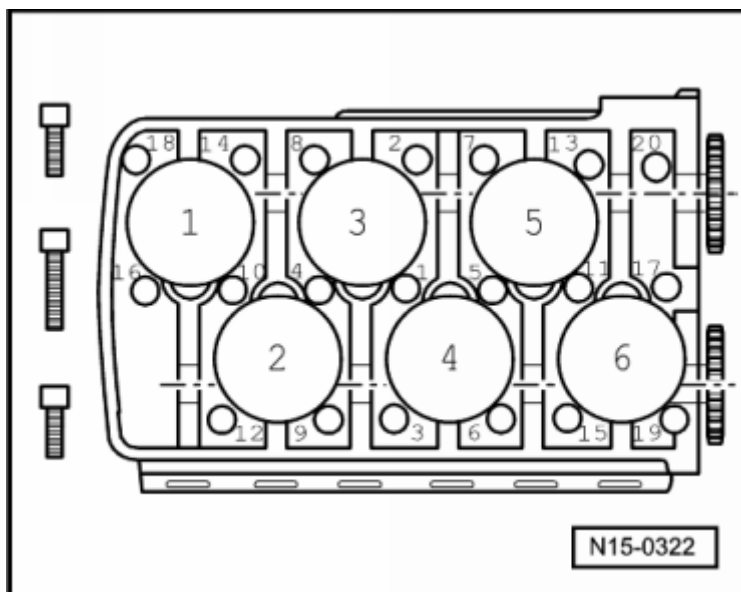
Cylinder Head Cover Bolt Tightening Sequence and Specification



Step	Component	Nm
1	Tighten bolts 1 through 17 in sequence	10

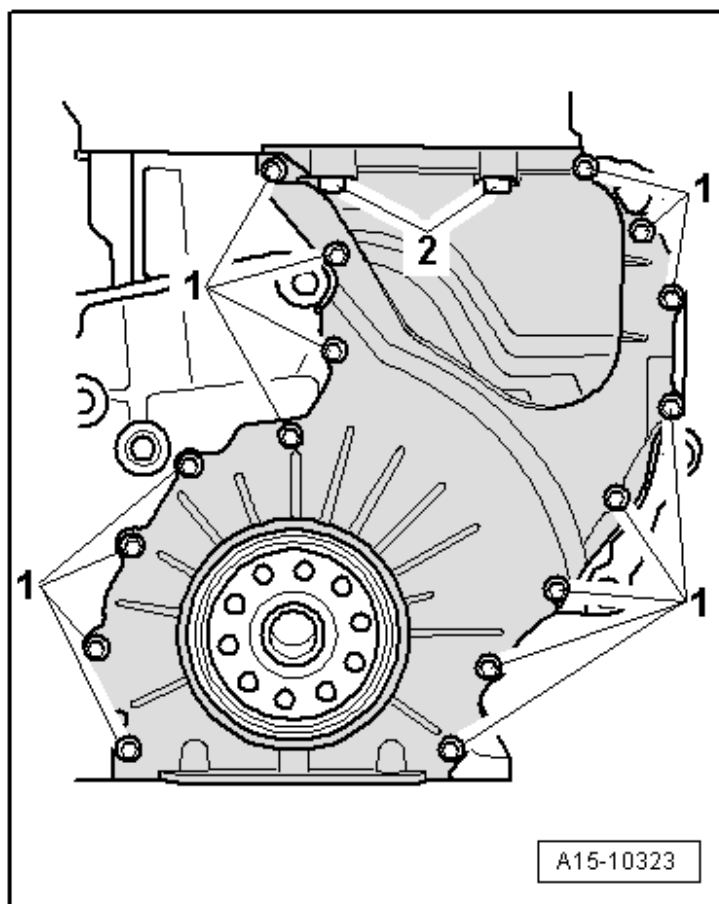
**Engine –
3.6L CDVB**

Cylinder Head Tightening Specifications



Step	Component	Nm
1	Tighten bolts 1 through 20 in sequence	15
2	Tighten bolts 1 through 20 in sequence	30
3	Tighten bolts 1 through 20 in sequence	an additional 90° (¼ turn)
4	Tighten bolts 1 through 20 in sequence	an additional 90° (¼ turn)

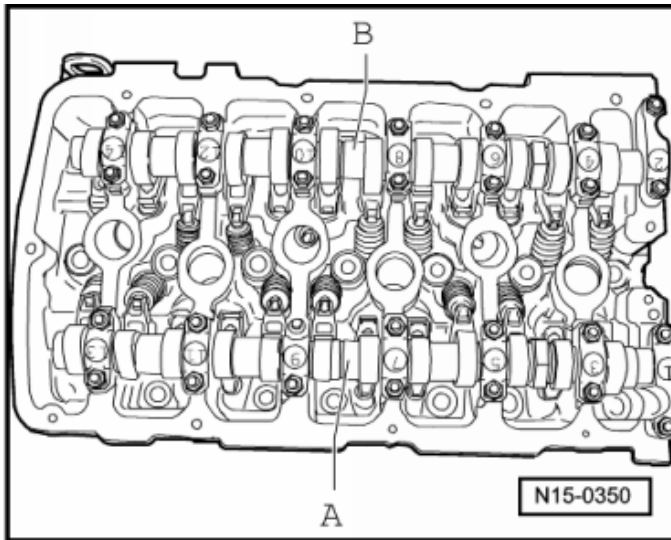
Sealing Flange to Cylinder Block Bolt Tightening Sequence and Specification



Engine –
3.6L CDVB

Step	Component	Nm
1	Tighten bolts 1	5
2	Tighten bolts 2	23
3	Tighten bolts 1	10

Camshaft Bearing Cap Tightening Specifications

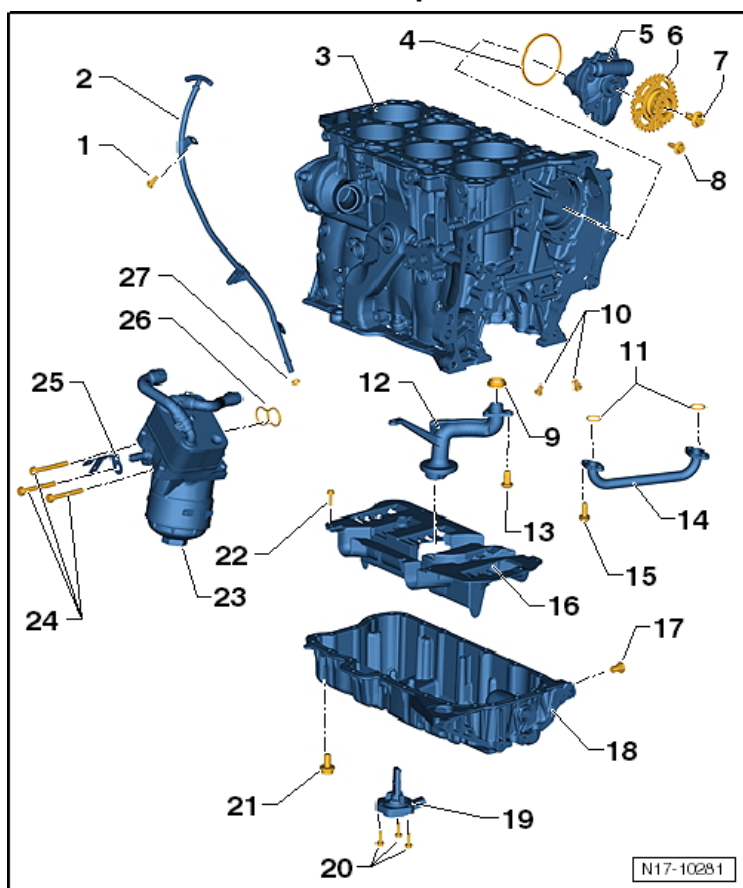


Step	Component	Nm
A - Intake Camshaft		
1	Alternately tighten bearing caps 5 and 9 and in a diagonal sequence	5 plus an additional 45° (1/8 turn)
2	Alternately tighten bearing caps 1 and 13 in a diagonal sequence	5 plus an additional 45° (1/8 turn)
3	Tighten bearing cap 7	5 plus an additional 45° (1/8 turn)
4	Alternately tighten bearing caps 3 and 11 and in a diagonal sequence	5 plus an additional 45° (1/8 turn)
B - Exhaust Camshaft		
1	Alternately tighten bearing caps 6 and 10 and in a diagonal sequence	5 plus an additional 45° (1/8 turn)
2	Alternately tighten bearing caps 2 and 14 and in a diagonal sequence	5 plus an additional 45° (1/8 turn)
3	Tighten bearing cap 8	5 plus an additional 45° (1/8 turn)
4	Alternately tighten bearing caps 4 and 12 and in a diagonal sequence	5 plus an additional 45° (1/8 turn)

**Engine –
3.6L CDVB**

Lubrication – 3.6L CDVB

Oil Pan/Oil Pump Overview



1 - Bolt

- 6 Nm

2 - Guide Tube

3 - Cylinder Block

4 - O-ring

- Always replace

5 - Oil Pump

6 - Chain Sprocket

7 - Bolt

- 60 Nm + an 90° turn
- Replace

8 - Bolt

- 8 Nm

9 - Seal

- Always replace

10 - Oil Spray Jet

11 - Seal

12 - Oil Suction Pipe

13 - Bolt

- 8 Nm
- Install using liquid locking fluid.

14 - Oil Pipe

15 - Bolt

- 8 Nm
- Install using liquid locking fluid.

16 - Baffle Plate

17 - Oil Drain Plug

- 30 Nm
- Always replace

18 - Oil Pan

19 - Oil Level Thermal Sensor -G266-

20 - Bolt

- 10 Nm

21 - Bolt

- 12 Nm

22 - Bolt

- 10 Nm

23 - Oil Filter Housing

24 - Bolt

- 23 Nm

25 - Oil Pressure Switch

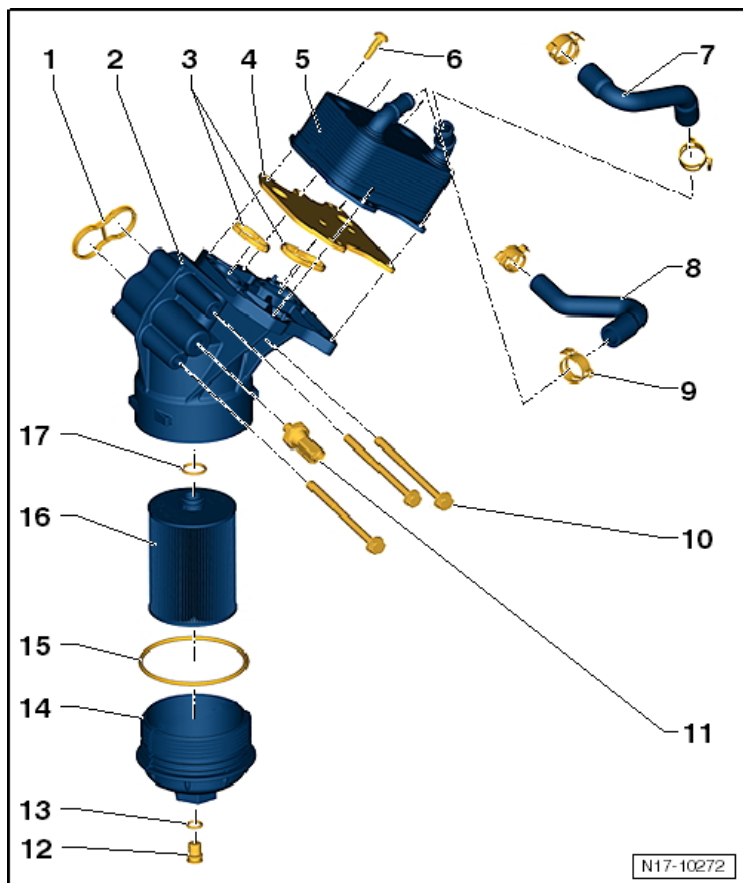
26 - Seal

- Always replace
- Coat with oil before installing

27 - Seal

- Always replace
- Coat with oil before installing

Oil Filter Housing/Oil Pressure Switch Overview



1 - Seal

- Always replace
- Coat with oil before installing

2 - Oil Filter Housing

3 - Seal

- Always replace
- Coat with oil before installing

4 - Plate

5 - Engine Oil Cooler

6 - Bolt

- 8 Nm

7 - Coolant Hose

8 - Coolant Hose

9 - Hose Clamp

10 - Bolt

- 23 Nm

11 - Oil Pressure Switch -F1-

- 20 Nm

12 - Oil Drain Plug

- 10 Nm

13 - O-ring

- Always replace
- Coat with oil before installing

14 - Cap

- 25 Nm

15 - O-ring

- Always replace
- Coat with oil before installing

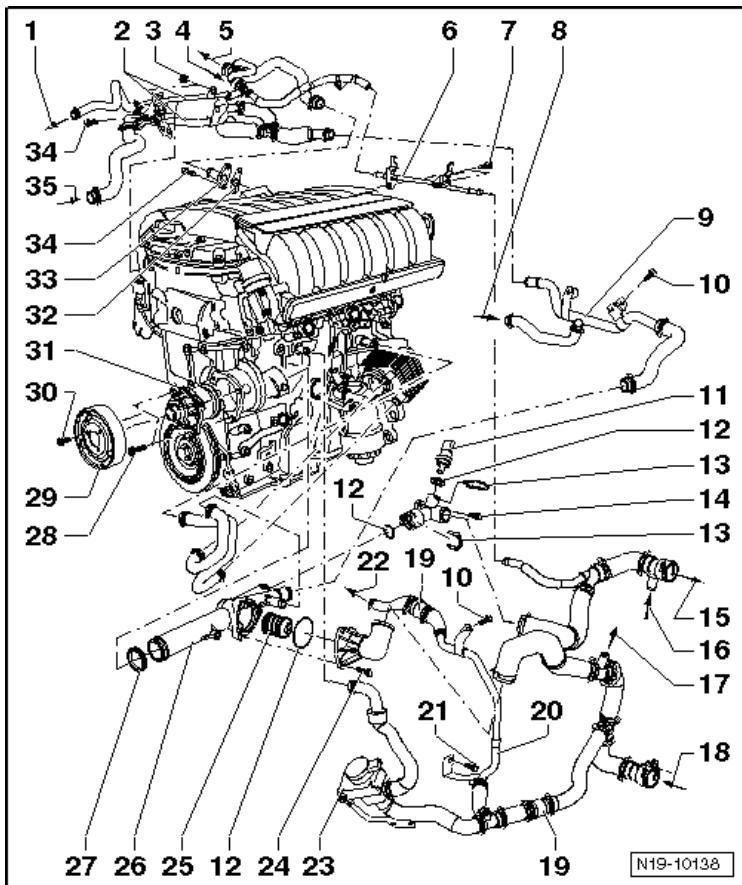
16 - Oil Filter Element

17 - O-ring

- Always replace
- Coat with oil before installing

Cooling System – 3.6L CDVB

Coolant Pump/Thermostat Overview



- 1 - to the Expansion Tank Upper Connection
- 2 - Rear Coolant Pipe
- 3 - Nut
 - 20 Nm
- 4 - from the Heater Core
- 5 - to the Heater Core
- 6 - Coolant Pipe
- 7 - Bolt
 - 10 Nm
- 8 - from the Transmission Oil Cooler
- 9 - Coolant Pipe, Side, Top
- 10 - Bolt
 - 10 Nm
- 11 - Engine Coolant Temperature Sensor -G62-

12 - O-ring

- Always replace

13 - Clip

14 - Bolt

- 10 Nm

15 - to the Radiator Upper Connection

16 - from the Auxiliary Cooler

- If installed

17 - to the Auxiliary Cooler

- If installed

18 - from the Radiator Lower Connection

19 - Check Valve

20 - Coolant Pipe, Side, Bottom

21 - Bolt

- 25 Nm

22 - to the Transmission Oil Cooler

23 - Recirculation Pump -V55-

24 - Bolt

- 8 Nm

25 - Coolant Thermostat

26 - Coolant Pipe

27 - Seal

- Always replace

28 - Bolt

- 8 Nm

29 - Pulley

30 - Bolt

- 20 Nm

31 - Coolant Pump

32 - Gasket

- Always replace

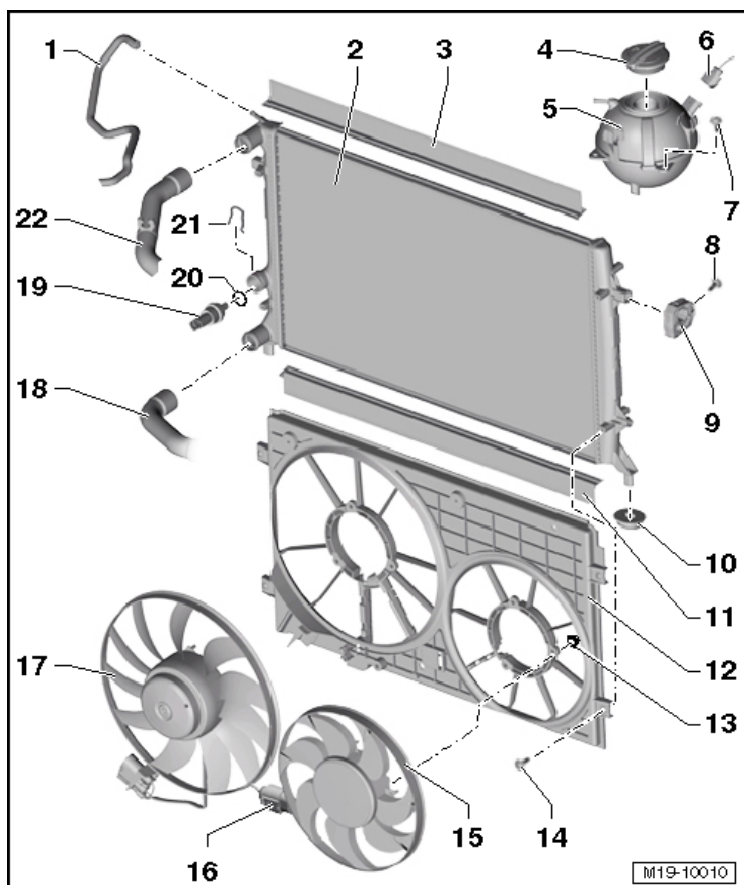
33 - Water Connection

34 - Bolt

- 10 Nm

35 - from the Expansion Tank Lower Connection

Radiator/Coolant Fan Overview



- 1 - Coolant Hose
- 2 - Radiator
- 3 - Upper Seal
- 4 - Cap
- 5 - Coolant Expansion Tank
- 6 - Connector
- 7 - Bolt
 - 2 Nm
- 8 - Bolt
 - 5 Nm
- 9 - Mount
- 10 - Mount
- 11 - Lower Seal
- 12 - Fan Shroud
- 13 - Nut
 - 5 Nm
- 14 - Fan Shroud
- 15 - Fan
- 16 - Fan Connector
- 17 - Fan
- 18 - Coolant Hose
- 19 - Coolant Hose
- 20 - Coolant Hose
- 21 - Coolant Hose
- 22 - Coolant Hose

14 - Bolt

- 5 Nm

15 - Coolant Fan 2 -V177-

16 - Connector

17 - Coolant Fan -V7-

18 - Lower Coolant Hose

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

20 - O-ring

- Always replace

21 - Clamp

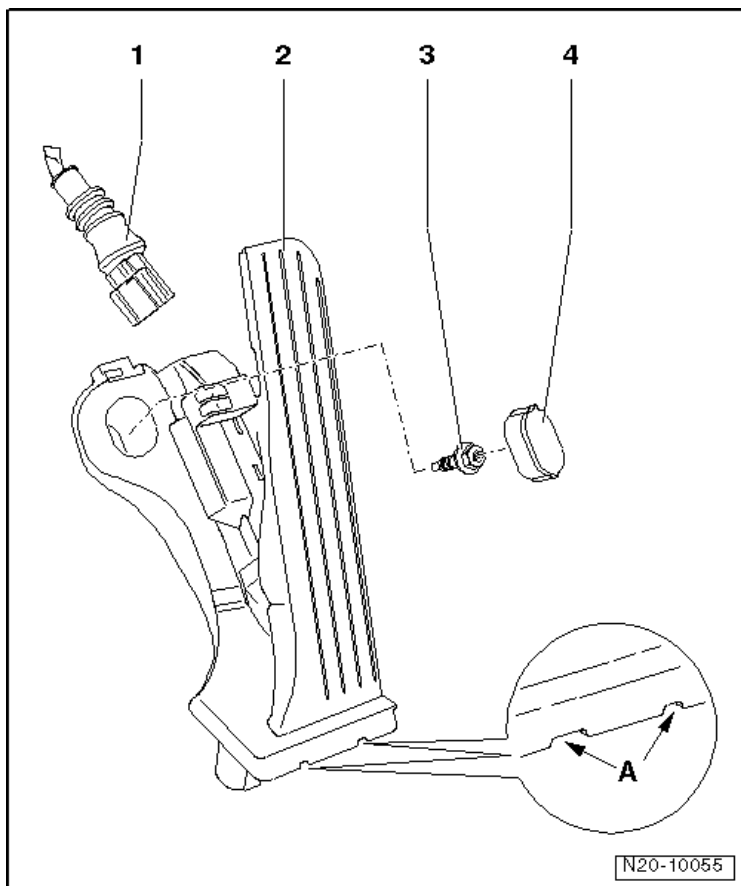
22 - Upper Coolant Hose

Fastener Tightening Specifications

Component	Nm
A/C condenser to radiator	5
Radiator mount to lock carrier	7

Fuel Supply System – 3.6L CDVB

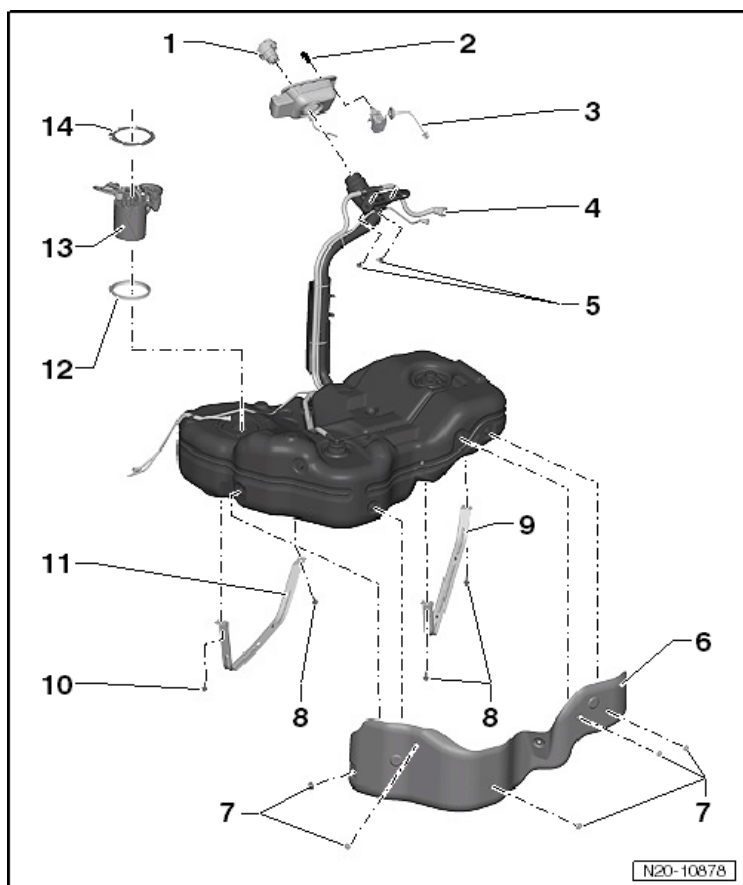
Accelerator Pedal Mechanism Overview



- 1 - Connector
- 2 - Accelerator Pedal Position Sensor -G79- with Accelerator Pedal Position Sensor 2 -G185-
- 3 - Bolt
 - 10Nm
- 4 - Cap

**Engine –
3.6L CDVB**

Fuel Tank and Attachments Overview



1 - Cap

2 - Bolt

- Tightening specification, refer to Body Exterior

3 - Fuel Filler Door Unit with Fuel Filler Door Lock

4 - Ventilation Line

5 - Bolt

- 11 Nm

6 - Heat Shield

7 - Nut

- 2.5 Nm

8 - Bolt

- 25 Nm
- Always replace

9 - Left Tensioning Strap

10 - Bolt

- 25 Nm
- Always replace

11 - Right Tensioning Strap

12 - Seal

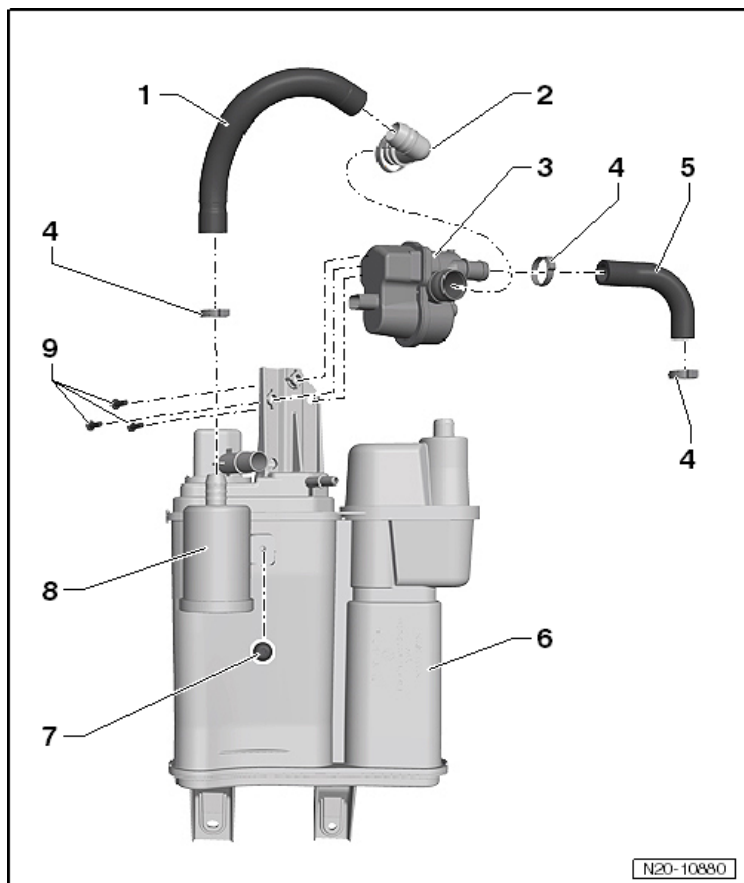
- Always replace

13 - Fuel Delivery Unit

14 - Lock Ring

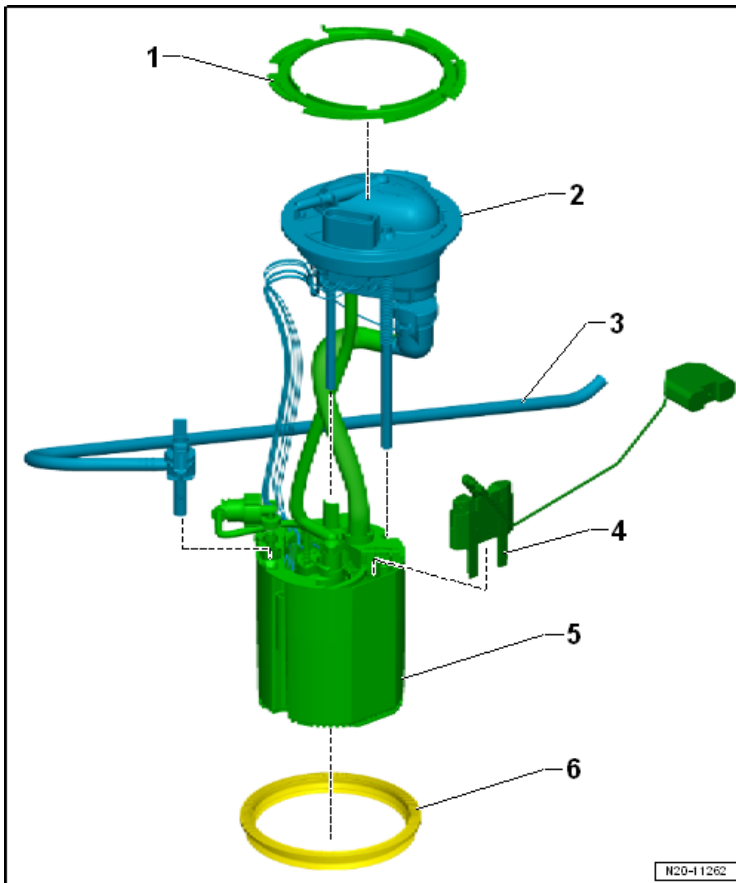
- 110 Nm

EVAP System Component Overview



- 1 - Connecting Hose
- 2 - Connecting Hose Connection
- 3 - Leak Detection Pump -V144-
- 4 - Hose Clamp
- 5 - Connecting Hose
- 6 - EVAP Canister
- 7 - Nut
 - 1.8 Nm
- 8 - Air Filter with Connecting Hose
- 9 - Bolt
 - 1.8 Nm

Fuel Delivery Unit/Fuel Level Sensor Assembly Overview



1 - Locking Ring

110 Nm

2 - Flange

3 - Intake Line

4 - Fuel Level Sensor -G-

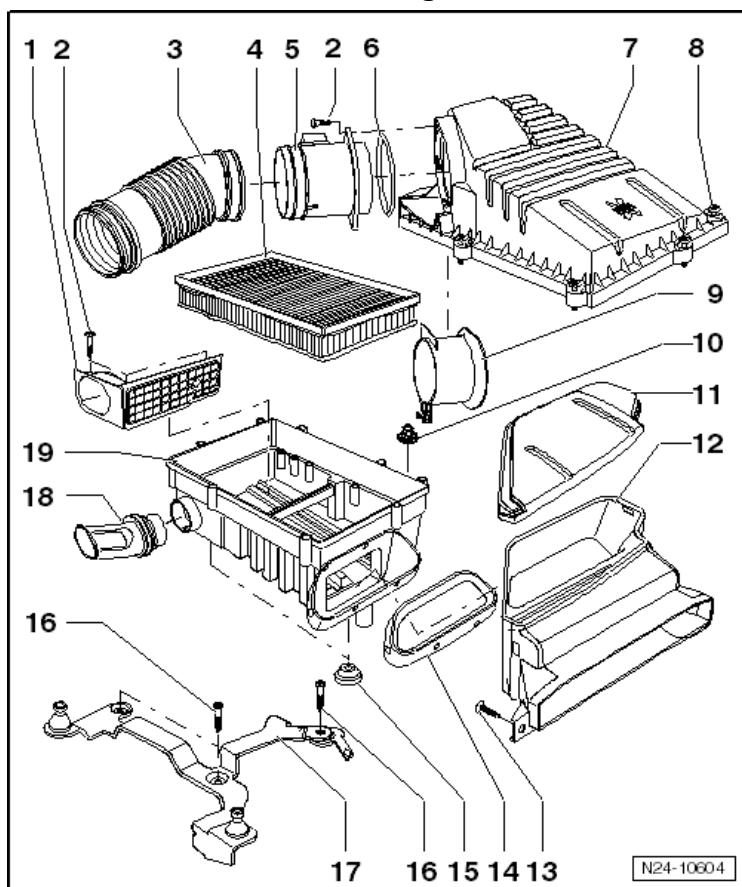
5 - Fuel Delivery Unit

6 - Seal

Replace

Multiport Fuel Injection – 3.6L CDVB

Air Filter Housing Overview



- 1 - Regulator Flap
- 2 - Bolt
 - 2 Nm
- 3 - Connecting Pipe
- 4 - Air Filter Element
- 5 - Mass Airflow Sensor -G70-
- 6 - Seal
- 7 - Upper Air Filter Housing
- 8 - Bolt
 - 2 Nm
- 9 - Connection
- 10 - Nut
 - 8 Nm
- 11 - Intake Air Duct Cover

12 - Intake Air Duct

13 - Bolt

5 Nm

14 - Gasket

15 - Rubber Bushing

16 - Bolt

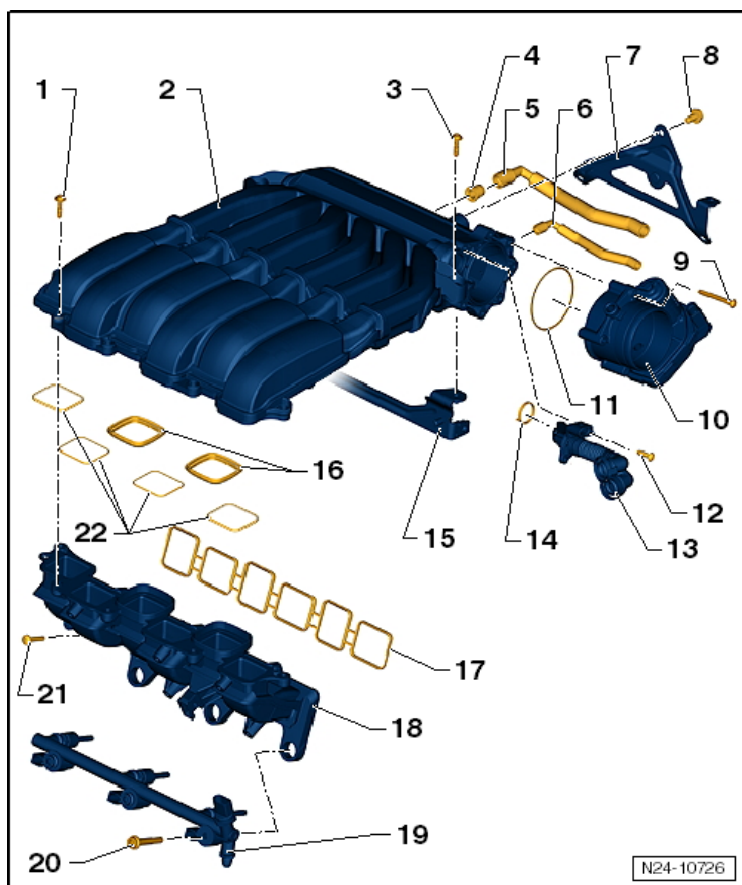
10 Nm

17 - Bracket

18 - Connection

19 - Lower Air Filter Housing

Intake Manifold Overview



1 - Bolt

- 10 Nm

2 - Upper Intake Manifold

3 - Bolt

- 10 Nm

4 - Grommet

5 - to the Brake Booster

6 - from EVAP Canister Purge Regulator Valve 1 -N80-

7 - Intake Manifold Rear Support

8 - Bolt

- 20 Nm

9 - Bolt

- 7 Nm

10 - Throttle Valve Control Module -J338-

11 - Seal

- Always replace

12 - Bolt

- 3.5 Nm

13 - Vent Hose

14 - Seal

15 - Intake Manifold Front Support

16 - Gasket

17 - Gasket

- Always replace

18 - Lower Intake Manifold

19 - Fuel Rail

20 - Bolt

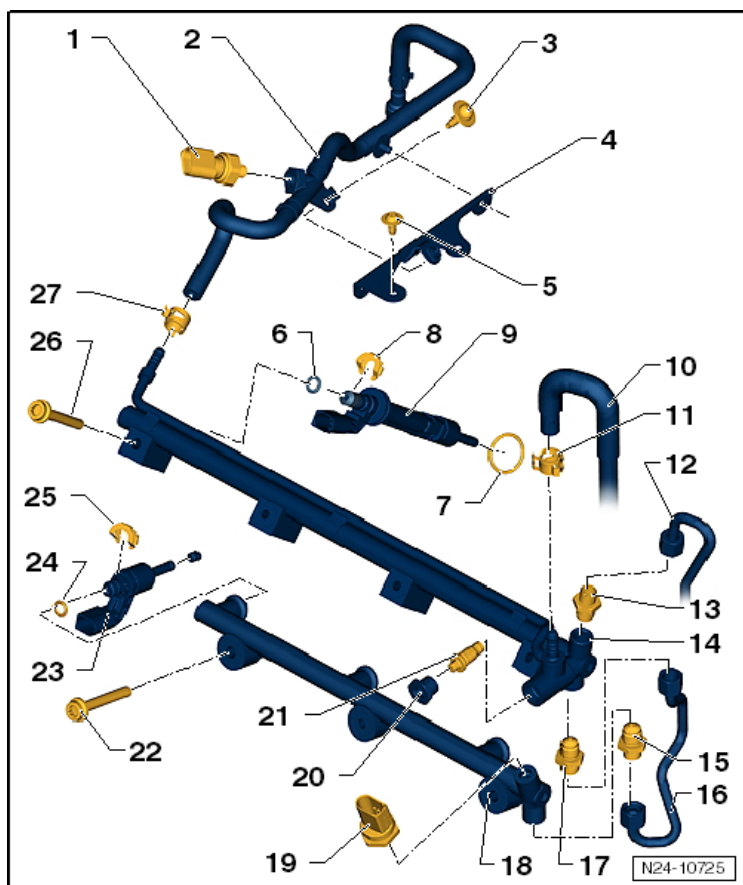
- 30 Nm + 90° turn
- Always replace

21 - Bolt

- 8 Nm

22 - Gasket

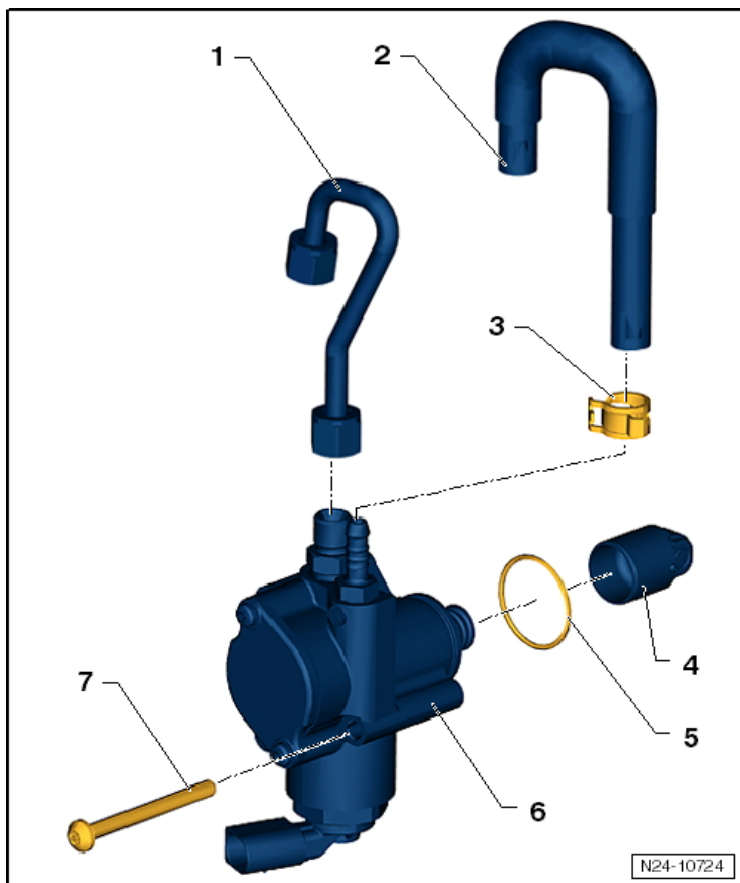
Fuel Rail with Injector Overview



- 1 - Low Fuel Pressure Sensor -G410-**
 15 Nm
- 2 - Fuel Supply Hose**
- 3 - Bolt**
 8 Nm
- 4 - Bracket**
- 5 - Bolt**
 8 Nm
- 6 - O-ring**
 Always replace
- 7 - Seal**
 Always replace
- 8 - Spring**
- 9 - Cylinder 1 Fuel Injector -N30-**
- 10 - Low Pressure Fuel Hose**
- 11 - Spring Clamp**

- 12 - High Pressure Fuel Pipe**
 - 28 Nm
- 13 - Pressure Relief Valve**
- 14 - Fuel Rail**
- 15 - Pressure Relief Valve**
- 16 - Connecting Pipe**
- 17 - Pressure Relief Valve**
- 18 - Fuel Rail**
- 19 - Fuel Pressure Sensor -G247-**
 - 22 Nm
- 20 - Plug**
 - 22 Nm
- 21 - Pressure Relief Valve**
- 22 - Bolt**
 - 30 Nm + 90° turn
 - Always replace
- 23 - Cylinder 2 Fuel Injector -N31-**
- 24 - Support Washer**
- 25 - Spring**
- 26 - Bolt**
 - 30 Nm + 90° turn
 - Always replace
- 27 - Spring Clamp**

High Pressure Pump Overview



1 - High Pressure Pipe

- 28 Nm

2 - Low Pressure Hose

3 - Spring Clamp

4 - Cam Follower

5 - O-ring

- Always replace

6 - High Pressure Pump

7 - Bolt

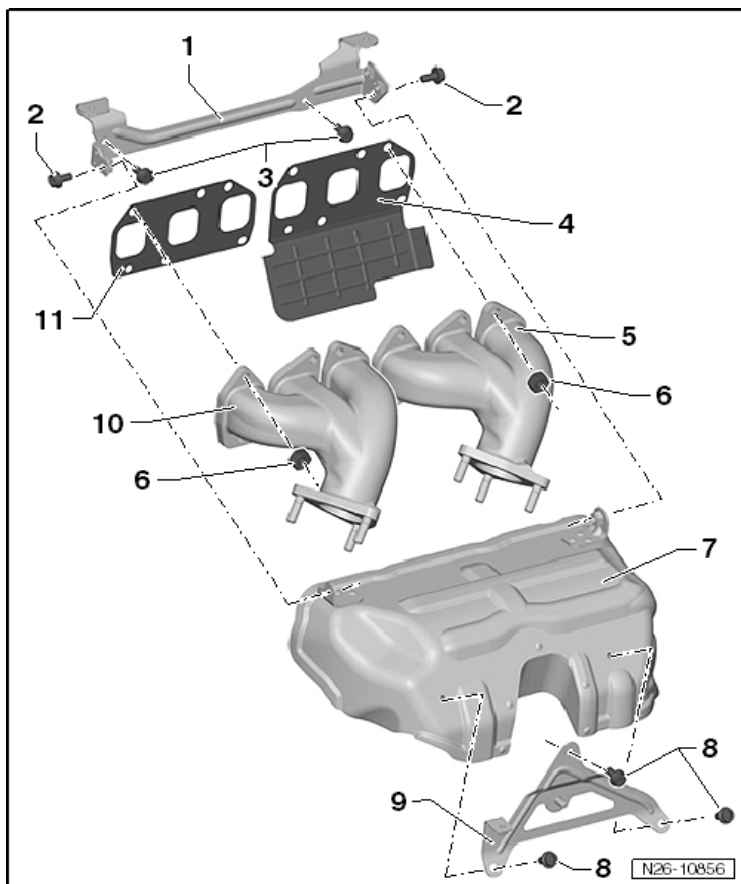
- 10 Nm

N24-10724

**Engine –
3.6L CDVB**

Exhaust System, Emission Controls – 3.6L CDVB

Exhaust Manifold Overview



1 - Intake Manifold Front Support

2 - Bolt

20 Nm

3 - Bolt

20 Nm

4 - Gasket

Always replace

5 - Exhaust Manifold

6 - Nut

25 Nm

Always replace

7 - Heat Shield

8 - Bolt

- 20 Nm

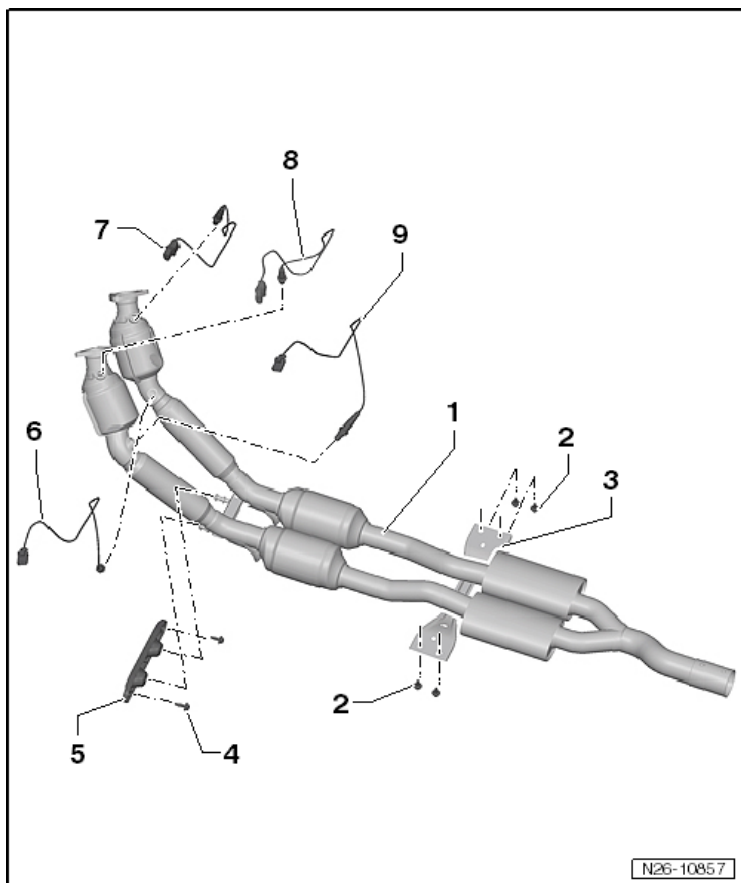
9 - Intake Manifold Rear Support

10 - Exhaust Manifold

11 - Gasket

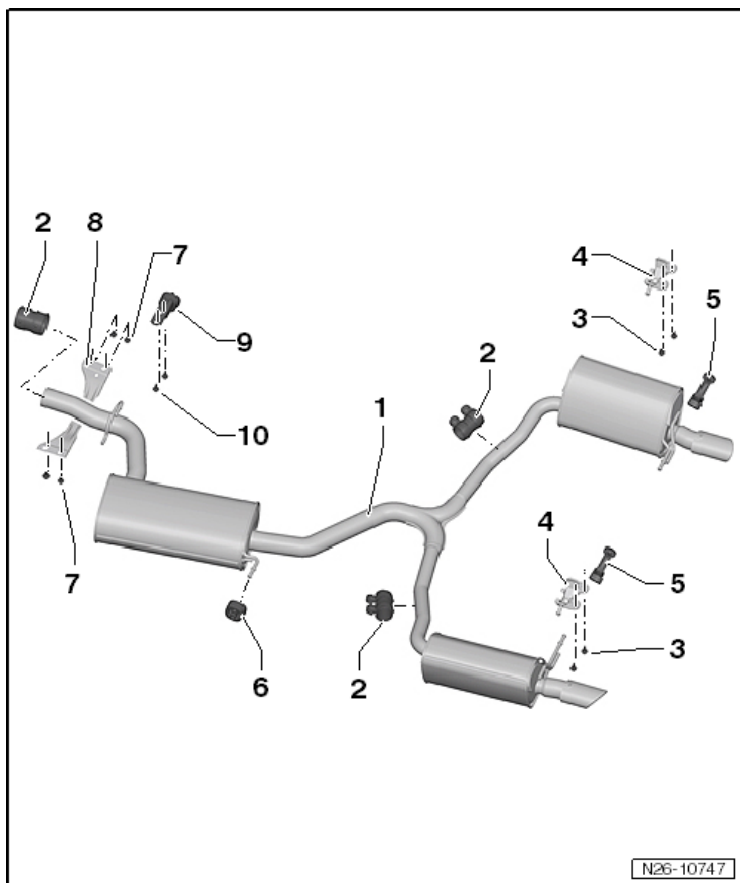
- Always replace

Exhaust Pipe with Catalytic Converter Overview



- 1 - Exhaust Pipe with Catalytic Converters
- 2 - Bolt
 - 25 Nm
- 3 - Tunnel Brace
- 4 - Bolt
 - 25 Nm
- 5 - Suspended Mount
- 6 - Oxygen Sensor after Three Way Catalytic Converter -G130-
 - 50 Nm
- 7 - Heated Oxygen Sensor -G39-
 - 50 Nm
- 8 - Heated Oxygen Sensor 2 -G108-
 - 50 Nm
- 9 - Oxygen Sensor 2 after Catalytic Converter -G131-
 - 50 Nm

Muffler Overview



Engine –
3.6L CDVB

- 1 - Center Muffler**
- 2 - Clamping Sleeve**
 - M8 nut - 25 Nm
 - M10 nut - 40 Nm
- 3 - Bolt**
 - 23 Nm
- 4 - Suspended Mount**
- 5 - Retaining Loop**
- 6 - Left Rear Muffler**
- 7 - Bolt**
 - 25 Nm
- 8 - Tunnel Brace**
- 9 - Suspended Mount**
- 10 - Bolt**
 - 23 Nm

Fastener Tightening Specifications

Component	Fastener size	Nm
Center muffler bracket-to-underbody bolt	-	23
Clamping Sleeve	-	25
Front exhaust pipe-to-exhaust manifold nut ¹⁾	-	40
Heat shield bracket-to-cylinder head bolt	-	20
Heat shield bracket-to-heat shield bolt	-	20
Suspended mount to subframe	-	25
Tunnel brace to body	-	25

¹⁾ Replace fastener(s).

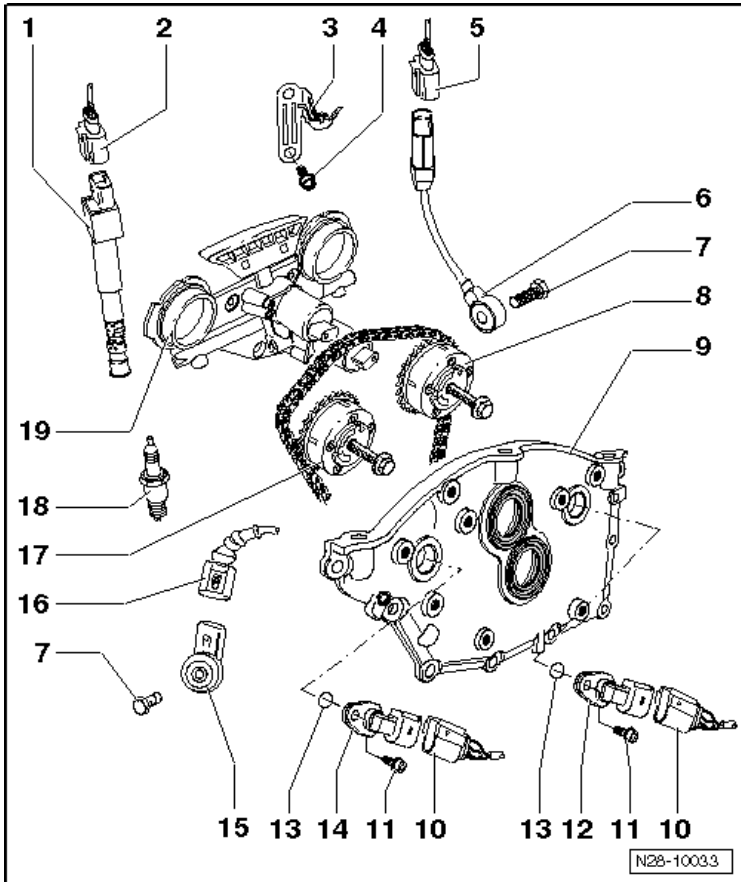
Ignition/Glow Plug System – 3.6L CDVB

Ignition Technical Data

Engine code	CDVB
Ignition sequence	1-5-3-6-2-4
Spark plugs ¹⁾	
VW/Audi	101 905 622 A
Electrode gap	0.8 to 0.9 mm
Tightening specification	18 Nm
Change intervals	Refer to Maintenance Procedures Rep. Gr. 03 Maintenance Procedures

¹⁾ Use the spark plug removal tool (3122B) to remove or install spark plugs.

Ignition System Assembly Overview



- 1 - Ignition Coil with Power Output Stage -N70, N127, N291, N292, N323, N324-
- 2 - Connector
- 3 - Bracket
- 4 - Bolt
 - 20 Nm
- 5 - Retaining Loop
- 6 - Knock Sensor 1 -G61-
- 7 - Bolt
 - 20 Nm
- 8 - Exhaust Camshaft Adjuster
- 9 - Cover
- 10 - Connector
- 11 - Bolt
 - 10 Nm
- 12 - Camshaft Position Sensor 2 -G163-

13 - Seal

- Always replace

14 - Camshaft Position Sensor -G40-

15 - Knock Sensor 2 -G66-

16 - Connector

17 - Intake Camshaft Adjuster

18 - Spark Plug

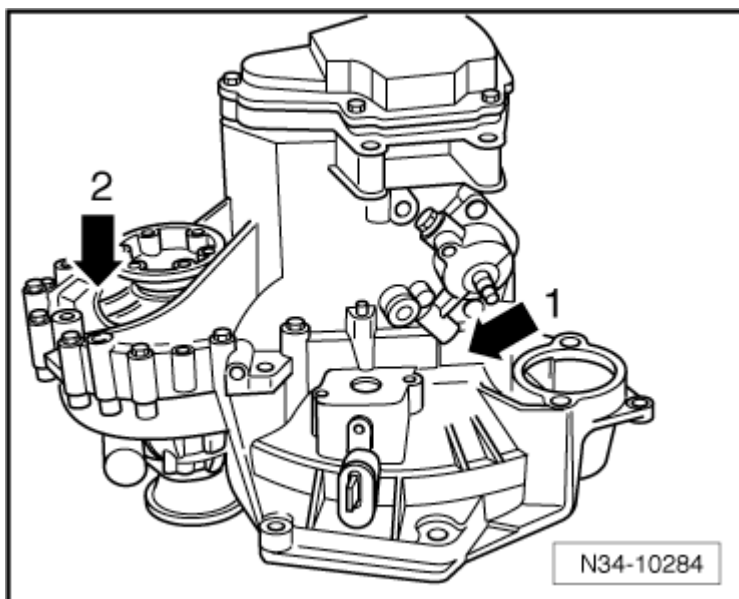
- 10 Nm

19 - Control Housing

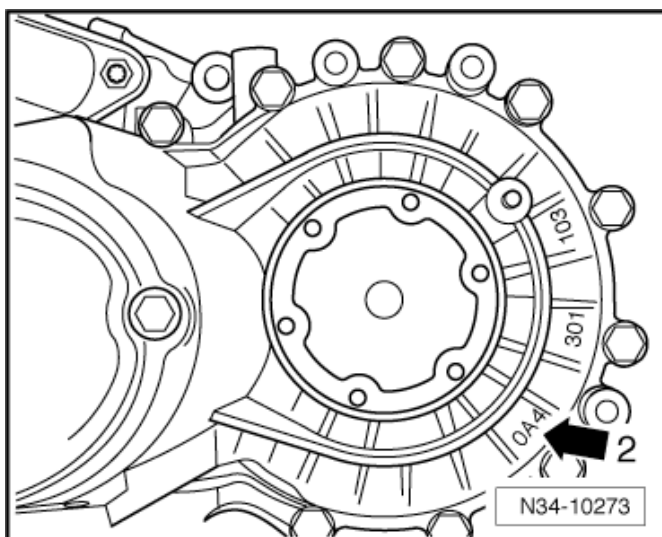
MANUAL TRANSMISSION – 0A4

General, Technical Data

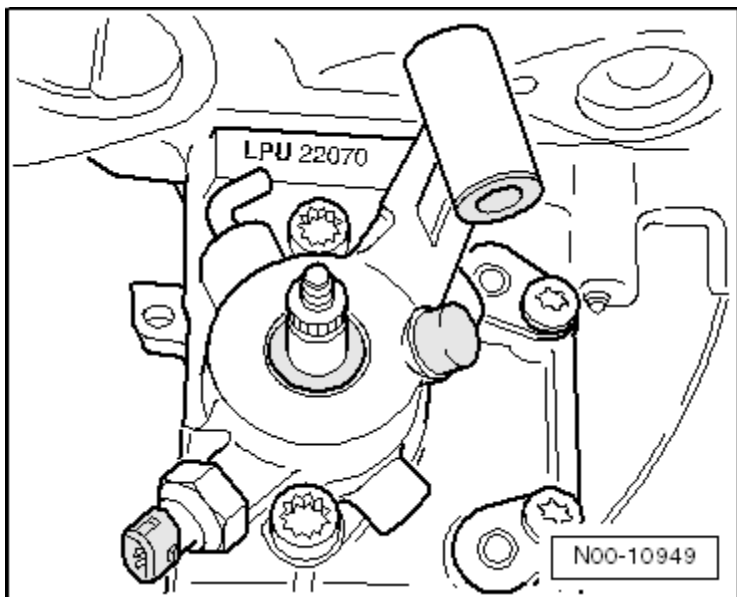
Transmission Identification



Code letters and build date (1) manual transmission 0A4 (2).



Manual transmission 0A4 (2).



Transmission code letters and build date.

Example:

LPU	22	07	0
Identification code	Day	Month	Year (2010) of manufacture

NOTE: The transmission code letters are also included on the vehicle data label.

Codes Letters, Transmission Allocation and Capacities

Manual transmission		5 Speed Manual Transmission 0A4
Identification code		LPU
Manufactured	from through	from 06.2011
Allocation	Type	Passat from MY 2012
	Engine	2.5 L - 125 kW
Ratio: $Z_2: Z_1$	Final drive	62:17 = 3.647
Manual transmission capacity (transmission completely disassembled)		Refer to the Fluid Capacity Tables Rep. Gr. 03

Refer to the Electronic Parts Catalog (ETKA) for the following information:

- Individual gear ratios
- Transmission fluid specifications
- Clutch disc and pressure plate allocation

15 - Bolt

20 Nm

16 - Vent Valve

4.5 Nm

17 - Cap

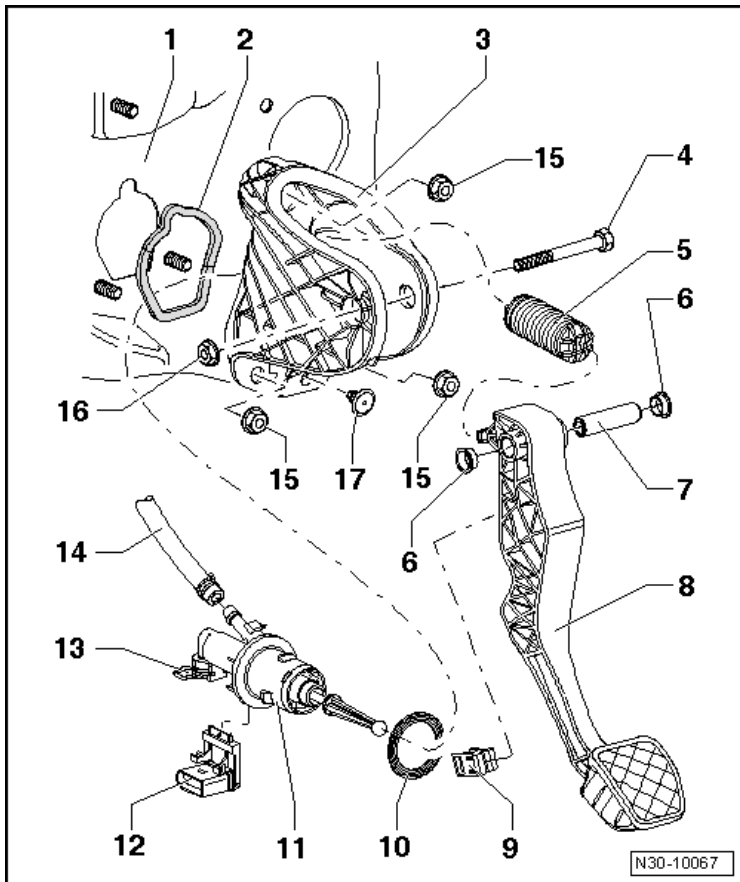
18 - Transmission

19 - Bracket

20 - Bolt

20 Nm

Pedal Cluster Overview



- 1 - Bulkhead
- 2 - Gasket
- 3 - Mounting Bracket
- 4 - Bolt
- 5 - Over-Center Spring
- 6 - Bushing
- 7 - Pin
- 8 - Clutch Pedal
- 9 - Base Plate
- 10 - Gasket
- 11 - Clutch Master Cylinder
- 12 - Clutch Position Sensor -G476-
- 13 - Clip
- 14 - Supply Hose

15 - Nut

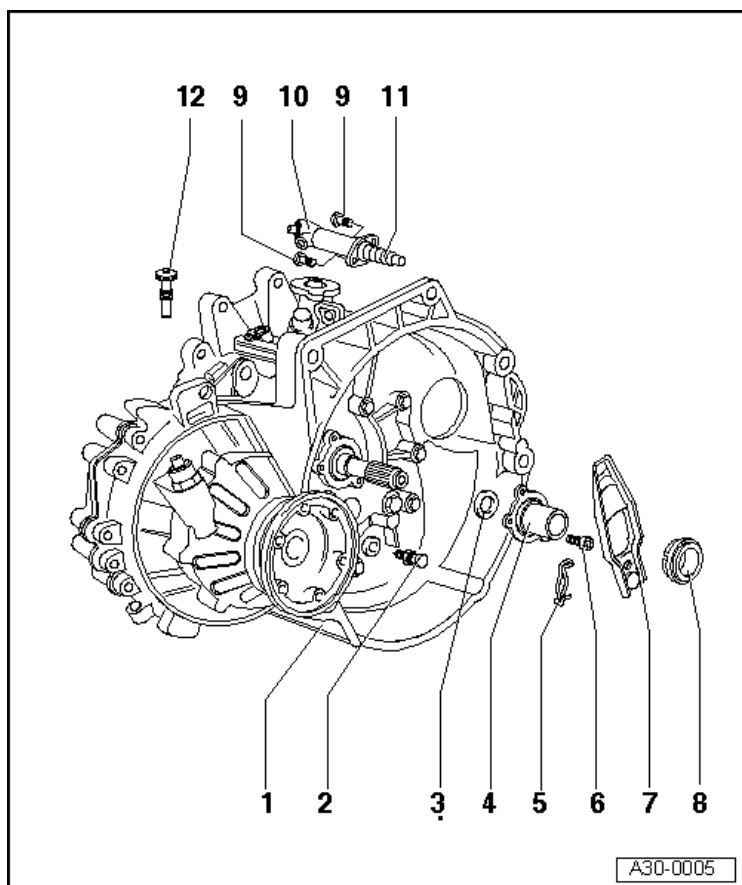
- 25 Nm
- Replace after removing

16 - Nut

- 25 Nm
- Replace after removing

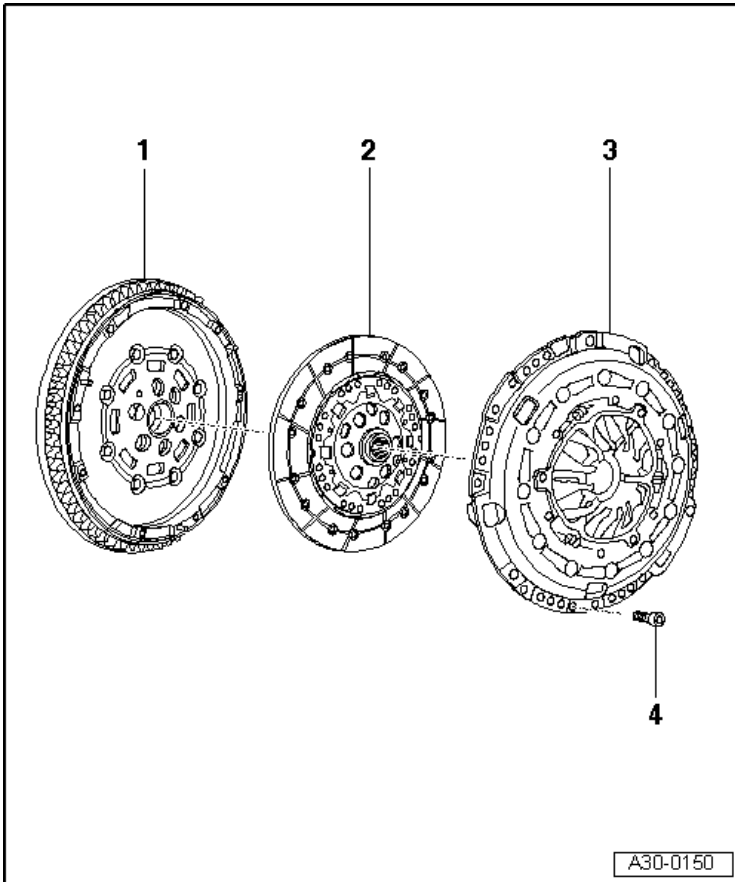
17 - Jounce Bumper

Clutch Release Mechanism Overview



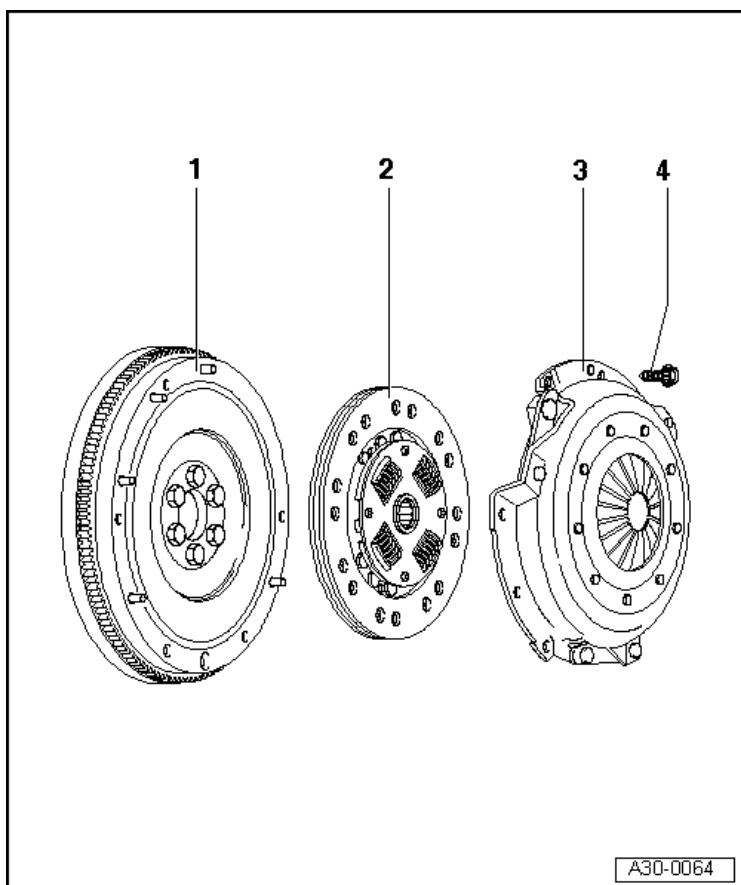
- 1 - Transmission
- 2 - Ball Stud
 - 25 Nm
- 3 - Input Shaft Seal
- 4 - Guide Sleeve
- 5 - Spring
- 6 - Bolt
 - 20 Nm
- 7 - Clutch Release Lever
- 8 - Release Bearing
- 9 - Bolt
 - 20 Nm
- 10 - Clutch Slave Cylinder
- 11 - Plunger
- 12 - Assembly Bolt

Clutch Overview, with Dual Mass Flywheel, LuK



- 1 - Flywheel
- 2 - Clutch Plate
- 3 - SAC Pressure Plate
- 4 - Bolt
 - M6: 13 Nm
 - M7: 20 Nm

Clutch Overview, with Single Flywheel



1 - Flywheel

2 - Clutch Plate

3 - Pressure Plate

4 - Bolt

M6: 13 Nm

M7: 20 Nm

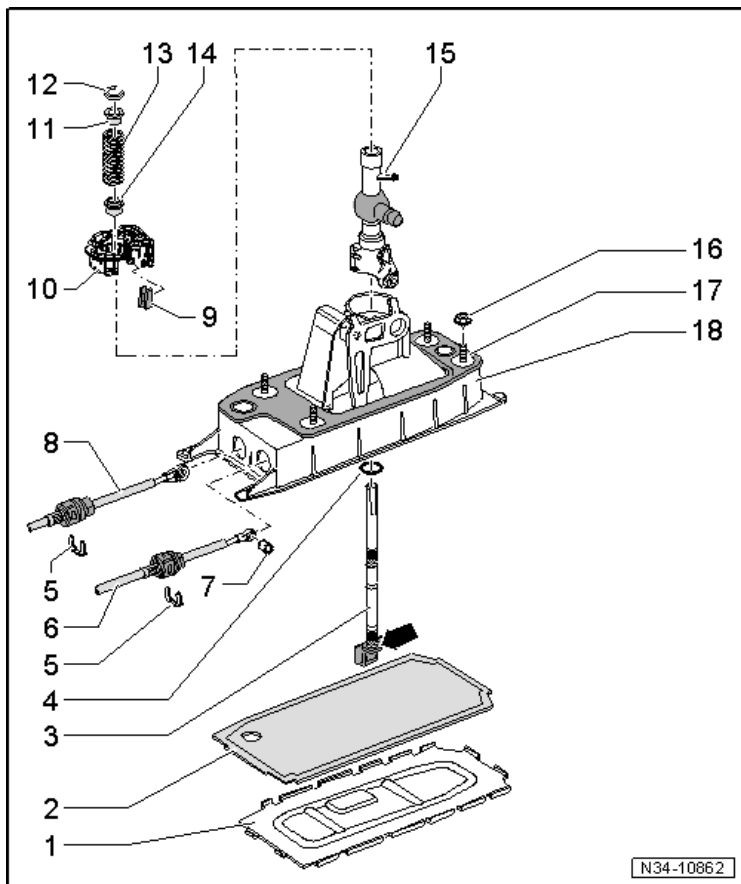
Fastener Tightening Specifications

Component	Fastener size	Nm
Crash bolster to mounting bracket/steering column ¹⁾	-	20

¹⁾ Replace the impact bolster bolt.

Controls, Housing – 0A4

Shift Lever and Housing Overview



- 1 - Base Plate
- 2 - Gasket
- 3 - Shift Lever
- 4 - Washer
- 5 - Lock Washer
- 6 - Selector Cable
- 7 - Bushing
- 8 - Shift Cable
- 9 - Sound Insulation
- 10 - Bearing Shell
- 11 - Bushing
- 12 - Lock Washer
- 13 - Pressure Spring
- 14 - Bushing

15 - Shift Lever Guide

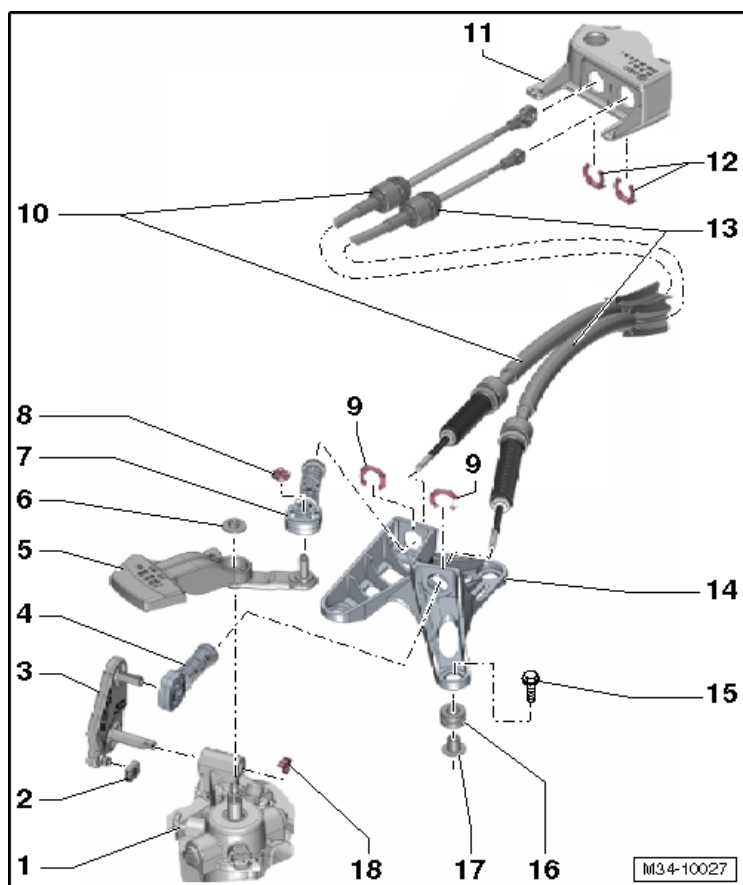
16 - Nut

8 Nm

17 - Gasket

18 - Shift Housing

Shift and Selector Cables Overview



- 1 - Gear Shift Unit
- 2 - Sliding Shoe
- 3 - Relay Lever
- 4 - Cable Retainer
- 5 - Shift Lever, Transmission
- 6 - Nut
 - 25 Nm
 - Replace after removing
- 7 - Cable Retainer
- 8 - Lock Washer
- 9 - Lock Washer
- 10 - Selector Cable
- 11 - Shift Housing
- 12 - Lock Washer
- 13 - Shift Cable

14 - Cable Bracket

15 - Bolt

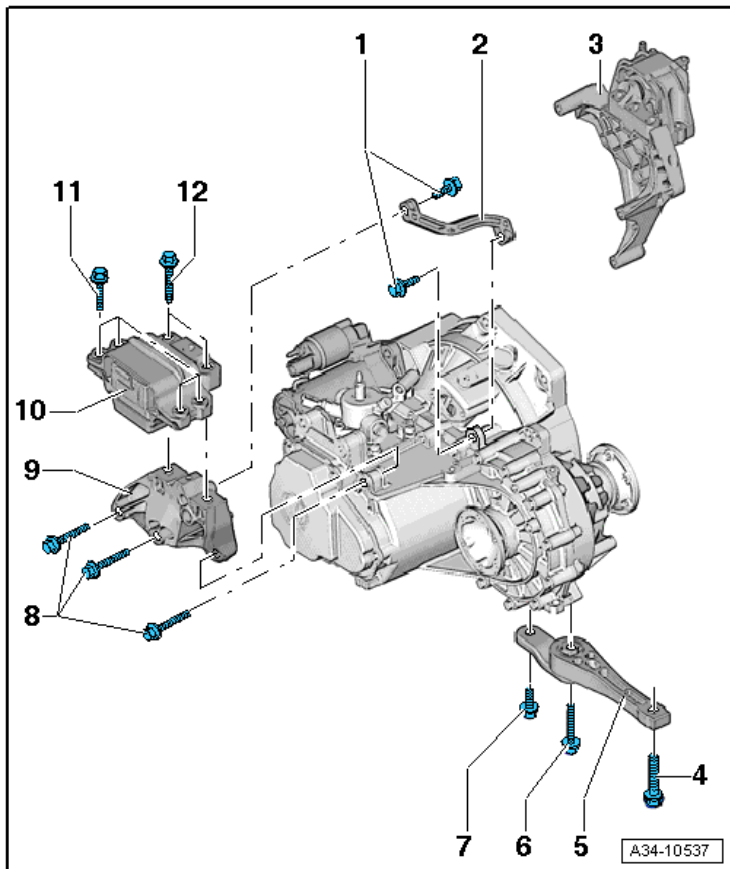
20 Nm

16 - Grommet

17 - Spacer

18 - Clip

Engine and Transmission Mounts Overview



1 - Bolt

- 20 Nm + 90° turn
- Replace after removing

2 - Transmission Support

3 - Engine Mount with Engine Mount Bracket

4 - Bolt

- Tightening specification, refer to Suspension, Wheels, Steering, Front Suspension

5 - Pendulum Support

6 - Bolt

- Tightening specification, refer to Suspension, Wheels, Steering, Front Suspension

7 - Bolt

- Tightening specification, refer to Suspension, Wheels, Steering, Front Suspension

8 - Bolt

- 40 Nm + 90° turn
- Replace after removing

9 - Transmission Mount Bracket

10 - Transmission Mount

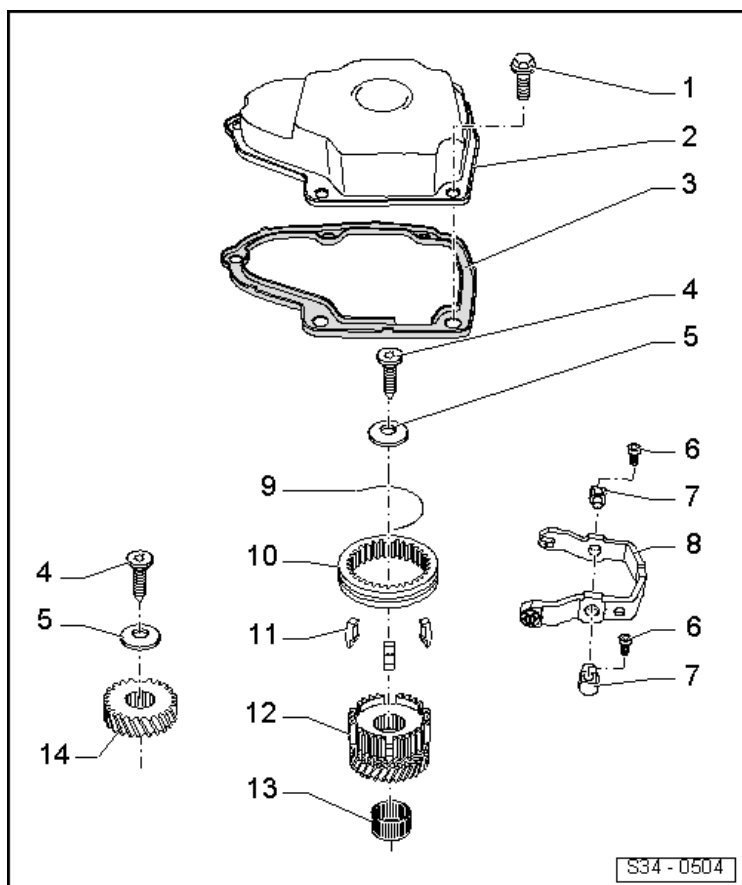
11 - Bolt

- Tightening specification, refer to Engine Mechanical, Fuel Injection and Ignition, Engine Assembly

12 - Bolt

- 60 Nm + 90° turn
- Replace after removing

Transmission Cover and 5th Gear Overview



1 - Bolt

- 18 Nm

2 - Transmission Cover

3 - Gasket

4 - Bolt

- 80 Nm + 90° turn
- Replace after removing

5 - Concave Washer

6 - Bolt

- 25 Nm

7 - Base for Selector Fork

8 - 5th Gear Selector Fork

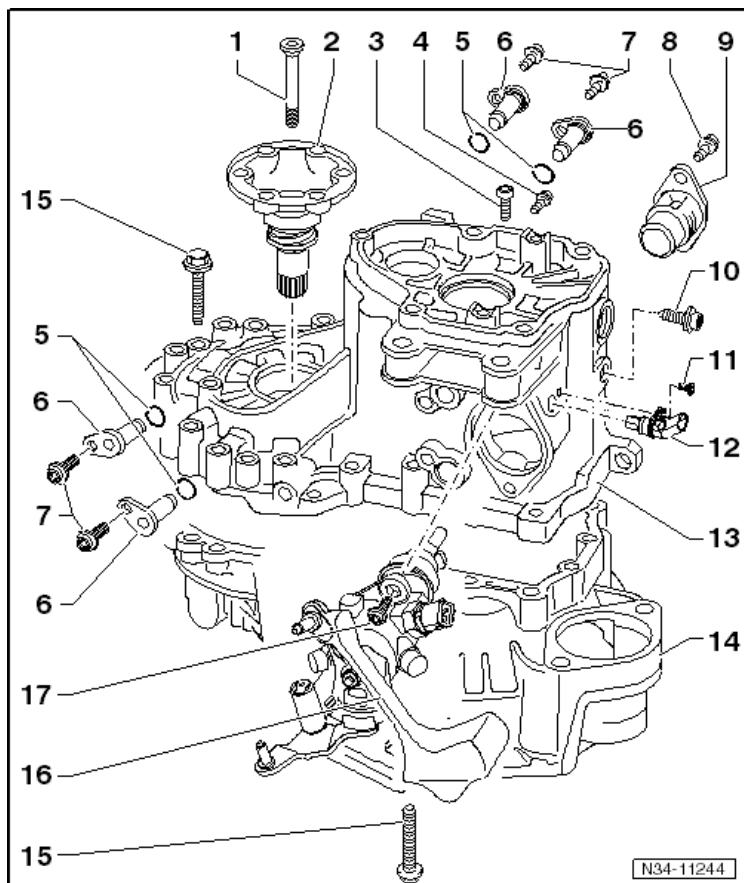
9 - Spring

10 - 5th Gear Locking Collar

11 - Locking Pieces

- 12 - Synchronizer Hub with Gear and 5th Gear Synchronizer Ring**
- 13 - Needle Bearing**
- 14 - 5th Gear**

Transmission Housing and Gear Shift Unit Overview



1 - Countersunk Bolt

- 25 Nm

2 - Flange Shaft with Pressure Spring

3 - Inner TORX® Bolt

- 25 Nm
- Replace after removing

4 - Bolt

5 - O-ring

6 - Support Pin

7 - Pin

8 - Bolt

- 25 Nm

9 - Sealing Cap

10 - Bolt

- 25 Nm
- Replace after removing

11 - Bolt

- 5 Nm
- Not available in the US/Canadian market.

12 - Transmission Neutral Position Sensor -G701-

- Not available in the US/Canadian market

13 - Transmission Housing

14 - Clutch Housing

15 - Bolt

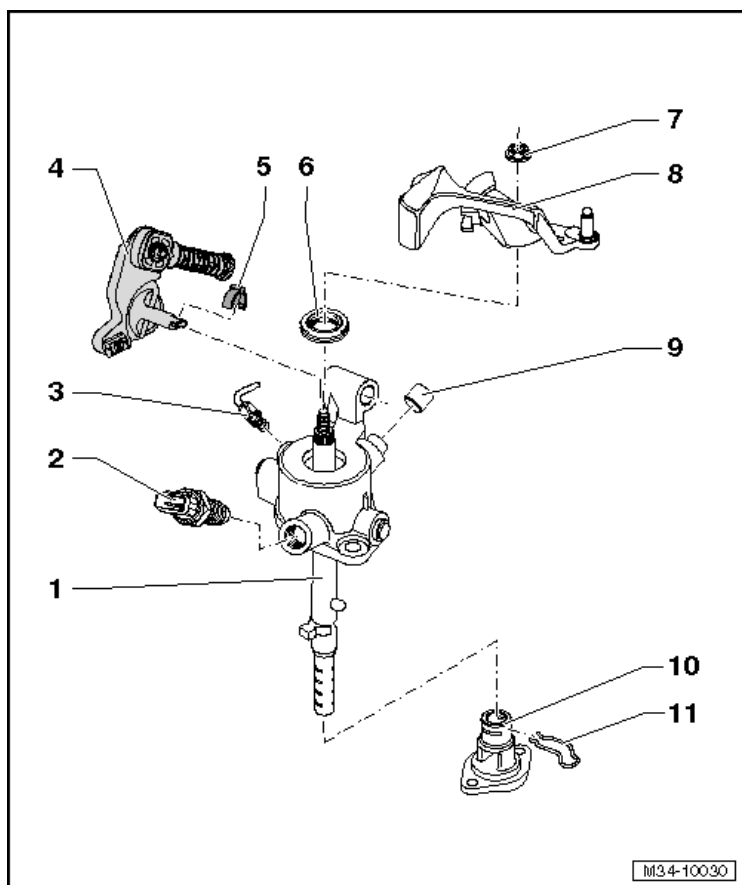
- 25 Nm + 90° turn
- Replace after removing

16 - Gear Shift Unitg

17 - Bolt

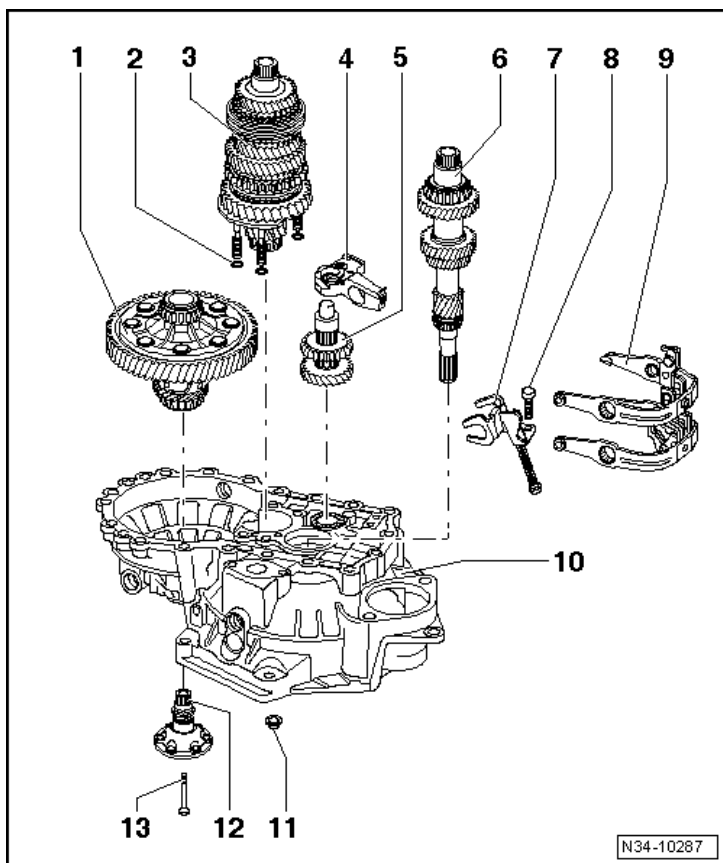
- 25 Nm

Gear Shift Unit Overview



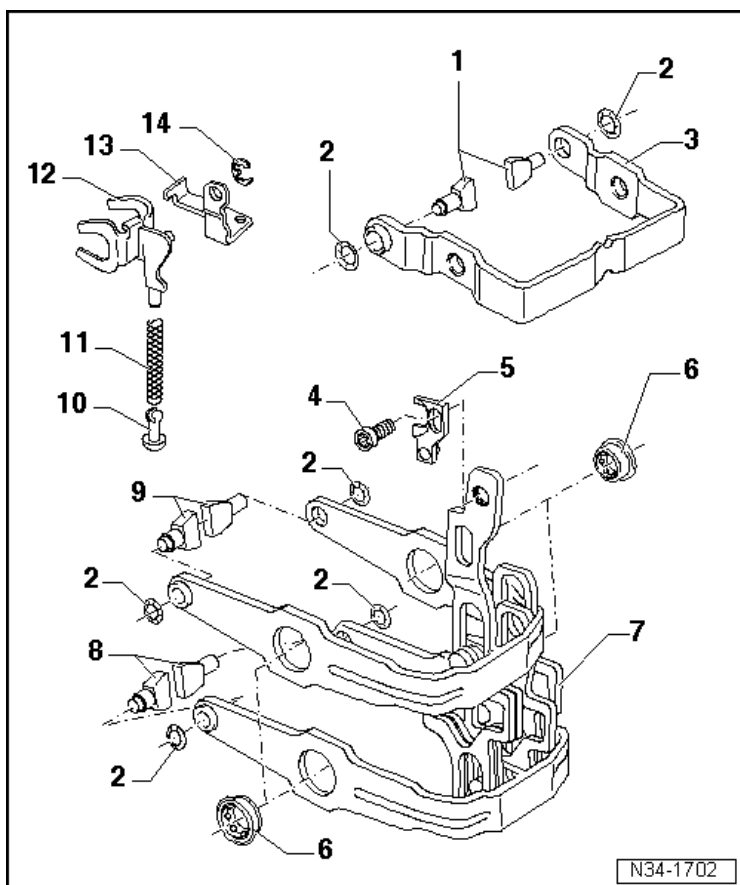
- 1 - Gear Shift Unit
- 2 - Backup Lamp Switch -F4-
 - 25 Nm
- 3 - Locking Pin
- 4 - Relay Lever
- 5 - Clip
- 6 - Seal
- 7 - Nut
 - 23 Nm
 - Replace after removing
- 8 - Shift Lever
- 9 - Cap
- 10 - Sealing Cap
- 11 - Spring

Input Shaft, Output Shaft, Differential and Shift Rods Overview



- 1 - Differential**
- 2 - Seal**
- 3 - Output Shaft**
- 4 - Reverse Gear Shaft Support**
- 5 - Reverse Gear Shaft**
- 6 - Input Shaft**
- 7 - Reverse Gear Selector Fork**
- 8 - Inner TORX® Bolt**
 - 25 Nm
- 9 - Selector Fork with Rail**
- 10 - Clutch Housing**
- 11 - Nut**
 - 25 Nm + 90° turn
 - Replace after removing
- 12 - Flange Shaft with Pressure Spring**
- 13 - Countersunk Bolt**
 - 25 Nm

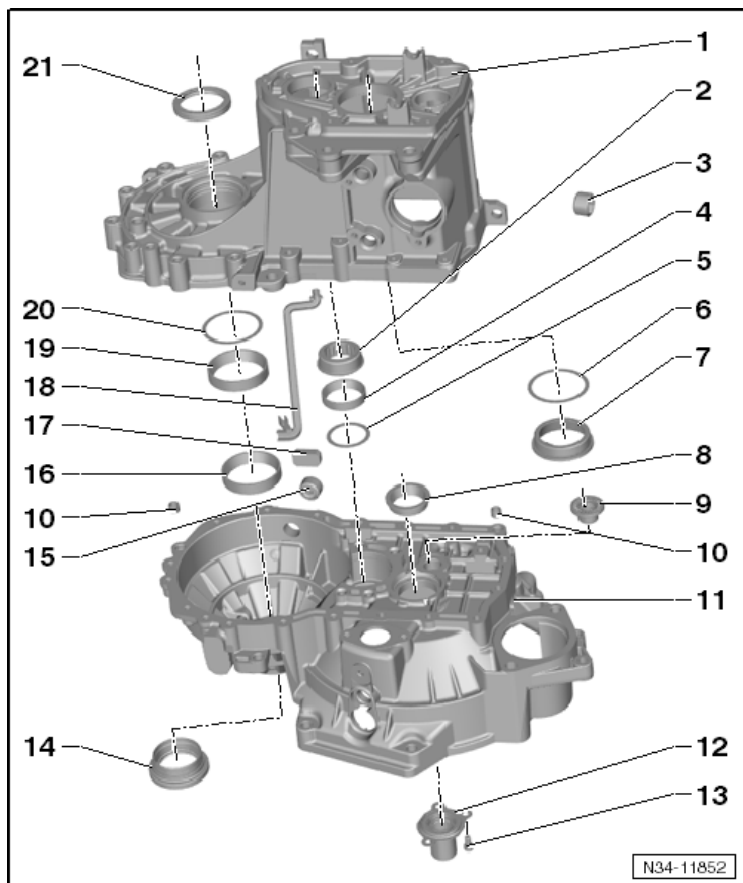
Selector Fork Overview



N34-1702

- 1 - 5th Gear Shift Segment
- 2 - Lock Washer
- 3 - 5th Gear Selector Fork
- 4 - Bolt
 - 25 Nm
- 5 - 5th Gear Shift Jaw
- 6 - Ball Bearing
- 7 - Selector Fork with Rail
- 8 - 1st/2nd Gear Shift Segment
- 9 - 3rd/4th Gear Shift Segment
- 10 - Gliding Piece
- 11 - Spring
- 12 - Reverse Gear Selector Fork
- 13 - Support for the Reverse Gear Selector Fork
- 14 - Lock Ring

Transmission Housing and Clutch Housing Overview



- 1 - Transmission Housing
- 2 - Needle Bearing
- 3 - Fill Plug
 - 35 Nm
- 4 - Outer Race/Tapered Roller Bearing
- 5 - Adjusting Shim
- 6 - Adjusting Shim
- 7 - Outer Race/Tapered Roller Bearing
- 8 - Outer Race/Tapered Roller Bearing
- 9 - Needle Sleeve
- 10 - Alignment Sleeve
- 11 - Clutch Housing
- 12 - Guide Sleeve
- 13 - Bolt
 - 20 Nm
- 14 - Seal and Sleeve, One Piece

15 - Drain Plug

□ 35 Nm

16 - Outer Race/Tapered Roller Bearing

17 - Magnet

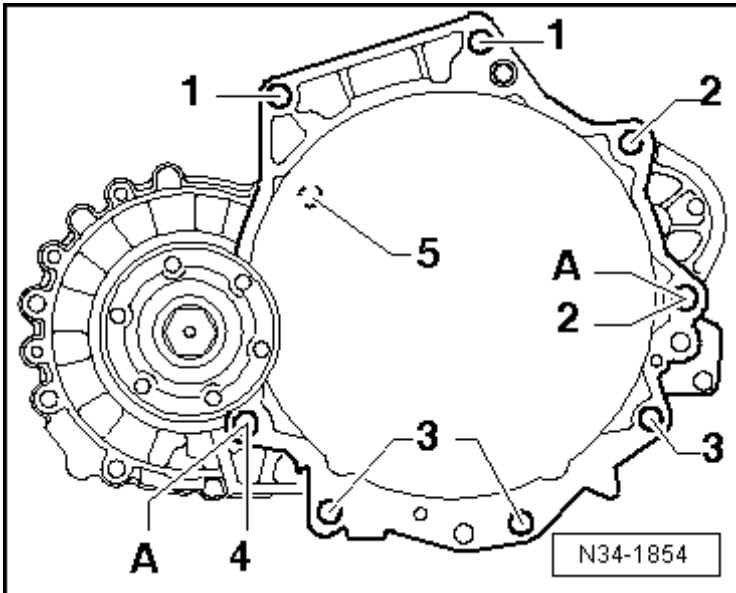
18 - Oil Guide

19 - Jounce Bumper

20 - Jounce Bumper

21 - Jounce Bumper

Transmission to Engine Tightening Specifications



Item	Fastener	Quantity	Nm
1	M 12 x 50	2	80
2	M 12 x 150 Also starter to transmission	2	80
3	M 10 x 55	3	80
4	M 12 x 60	1	80
5	M 6 x 8 (Not present on all)	1	40

¹⁾ Also starter to transmission

Gears, Shafts – 0A4

Fastener Tightening Specification

Component	Nm
Output shaft bearing support-to-clutch housing nut ¹⁾	25 plus an additional 90° (¼ turn)

¹⁾ Replace fastener(s).

Determining Shim Thickness

Example	Bearing clearance measured value	Adjustment shim thickness according to the table
	0.850 mm	1.000 mm

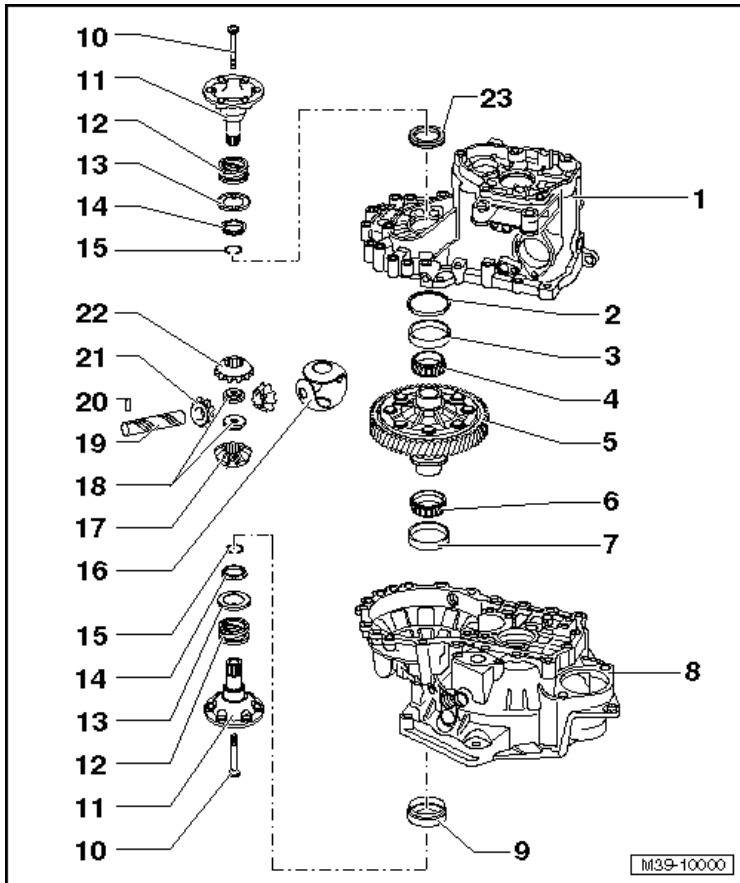
Adjustment Shim Table

Bearing play	Adjusting shim
Measured value (mm)	Thickness (mm)
0.671 to 0.699	0.650
0.700 to 0.724	0.675
0.725 to 0.749	0.700
0.750 to 0.774	0.725
0.775 to 0.799	0.750
0.800 to 0.824	0.775
0.825 to 0.849	0.800
0.850 to 0.874	0.825
0.875 to 0.899	0.850
0.900 to 0.924	0.875
0.925 to 0.949	0.900
0.950 to 0.974	0.925
0.975 to 0.999	0.950
1.000 to 1.024	0.975
1.025 to 1.049	1.000
1.050 to 1.074	1.025
1.075 to 1.099	1.050
1.100 to 1.124	1.075
1.125 to 1.149	1.100
1.150 to 1.174	1.125
1.175 to 1.199	1.150
1.200 to 1.224	1.175
1.225 to 1.249	1.200
1.250 to 1.274	1.225
1.275 to 1.299	1.250
1.300 to 1.324	1.275
1.325 to 1.349	1.300
1.350 to 1.374	1.325
1.375 to 1.399	1.350
1.400 to 1.424	1.375
1.425 to 1.449	1.400
1.450 to 1.474	1.425
1.475 to 1.499	1.450
1.500 to 1.524	1.475
1.525 to 1.549	1.500
1.550 to 1.574	1.525
1.575 to 1.599	1.550
1.600 to 1.624	1.575
1.625 to 1.649	1.600
1.650 to 1.674	1.625
1.675 to 1.699	1.650
1.700 to 1.724	1.675

NOTE: Refer to the Electronic Parts Catalog
(ETKA) for the correct shims.

Rear Final Drive, Differential – 0A4

Differential Overview



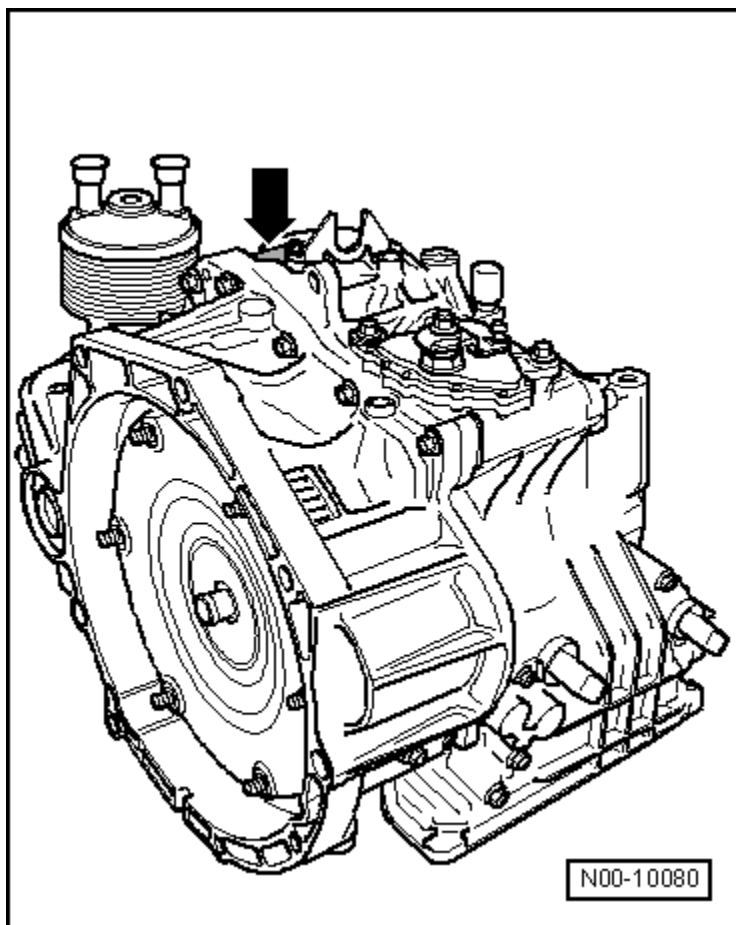
- 1 - Transmission Housing
- 2 - Adjusting Shim
- 3 - Outer Race/Tapered Roller Bearing
- 4 - Bearing Inner Race/Taper Roller Bearing
- 5 - Differential Housing
- 6 - Bearing Inner Race/Taper Roller Bearing
- 7 - Outer Race/Tapered Roller Bearing
- 8 - Clutch Housing
- 9 - Seal
- 10 - Countersunk Bolt
 - 25 Nm
- 11 - Flange Shaft
- 12 - Flange Shaft Pressure Spring
- 13 - Thrust Washer

- 14 - Tapered Ring
- 15 - Lock Ring
- 16 - Thrust Washer Union
- 17 - Large Differential Bevel Gear
- 18 - Threaded Piece
- 19 - Differential Taper Axle
- 20 - Adapter Sleeve
- 21 - Small Differential Bevel Gear
- 22 - Large Differential Bevel Gear
- 23 - Seal

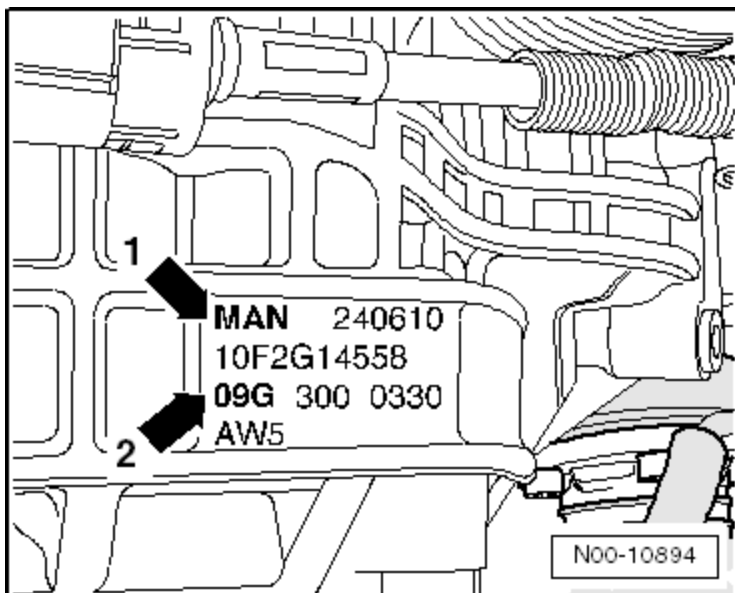
AUTOMATIC TRANSMISSION – 09G

General, Technical Data

Identification on Transmission



Code letters (➡).



Code letter (1) indicates 6-speed automatic transmission 09G (2).

Example:

MAN	24	06	10
Identification codes	Day	Month	Year (2010) of manufacture

The transmission code letters are also included on the vehicle data labels.

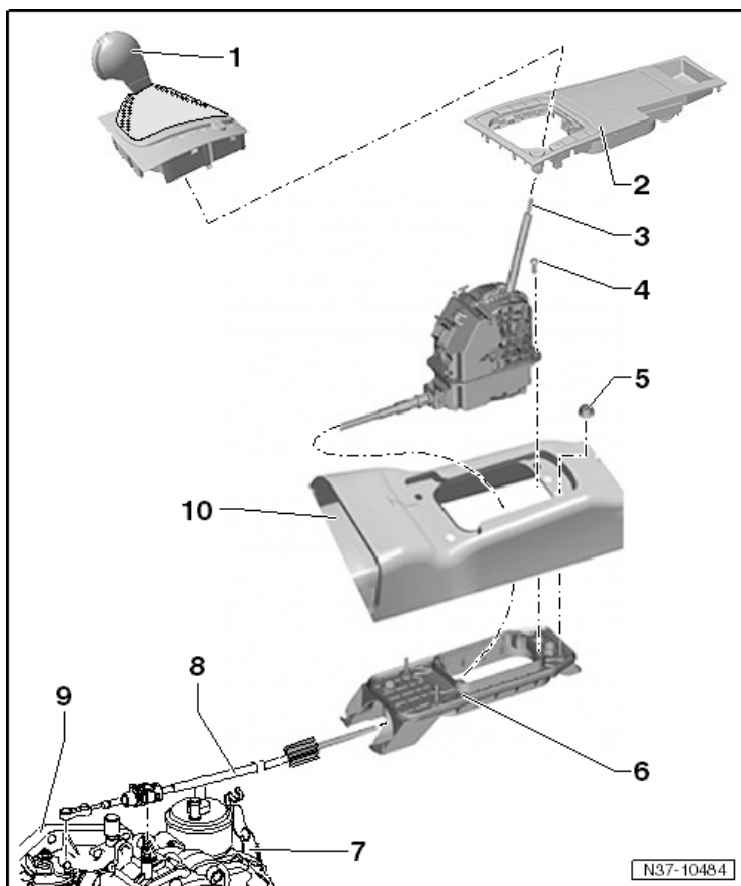
Engine and Transmission Allocation

If original replacement parts are needed for a repair, always pay attention to the transmission codes.

6-Speed automatic transmission 09G		
Transmission code	MAN	NTJ
Engine	2.5L -125 kW	1.8L -125 kW

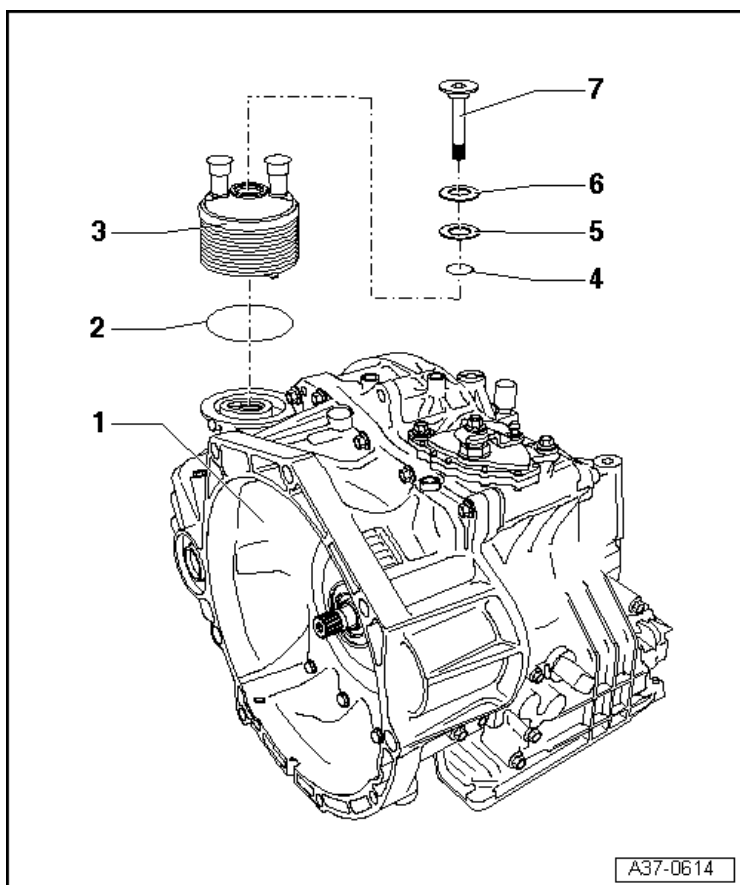
Controls, Housing – 09G

Selector Mechanism Overview



- 1 - Selector Handle With Cover**
- 2 - Center Console Cover**
- 3 - Selector Mechanism**
- 4 - Bolt**
 - 8 Nm
- 5 - Nut**
 - 8 Nm
- 6 - Gearshift Housing**
- 7 - Bracket**
- 8 - Selector Lever Cable**
- 9 - Transmission**
- 10 - Tunnel/Body**

ATF Cooler, Round Version



1 - Transmission Housing

2 - O-ring

Always replace

3 - Automatic Transmission Fluid (ATF) Cooler

4 - O-ring

Always replace

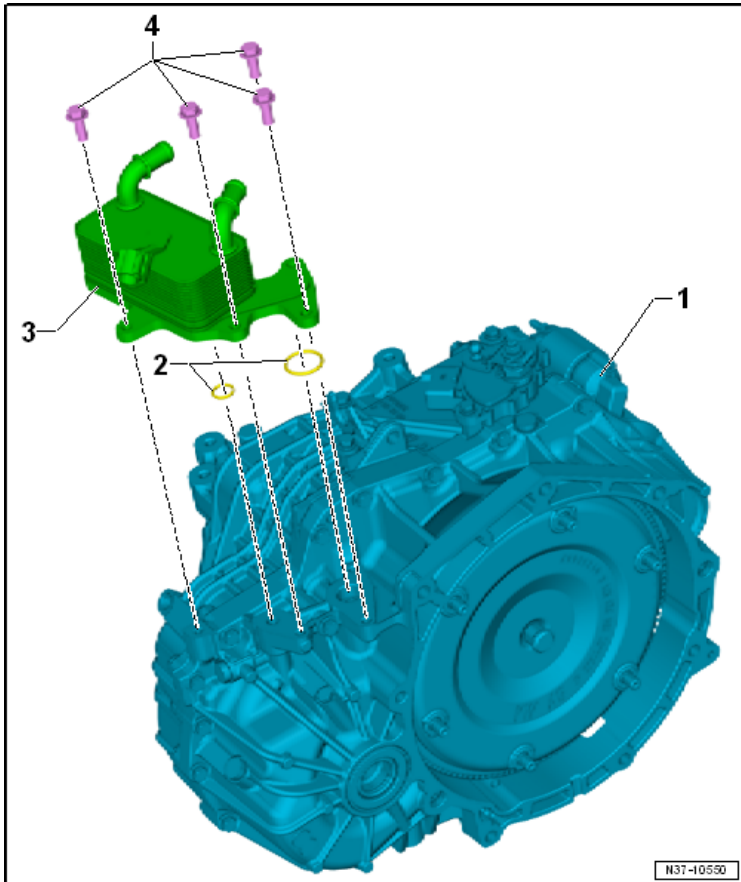
5 - Washer

6 - Plate Spring

7 - Bolt

36 Nm

ATF Cooler, Rectangular Version



1 - Transmission Housing

2 - O-ring

- Always replace

3 - ATF Cooler

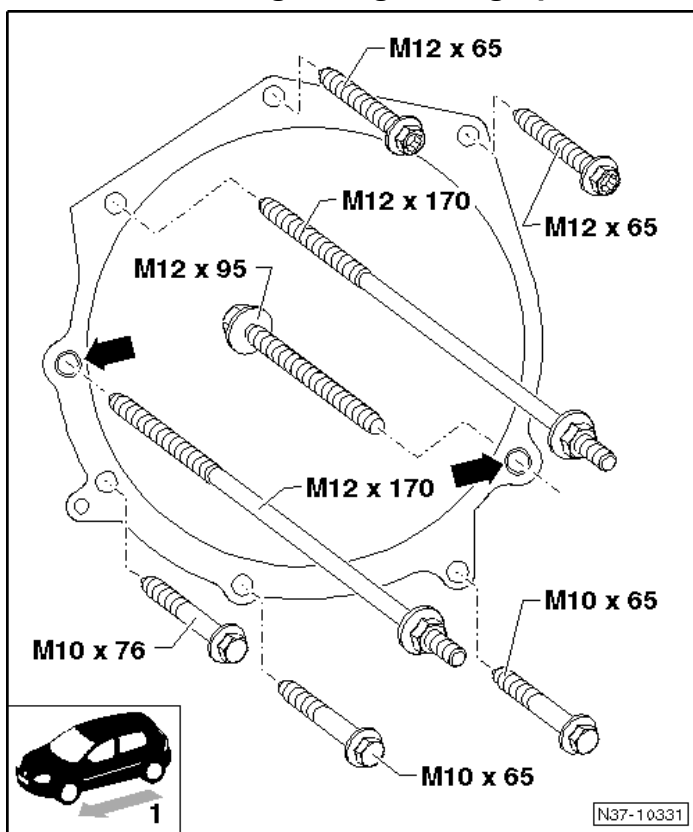
4 - Bolt

- 20 Nm
- M8 x 25

Fastener Tightening Specifications

Component	Nm
Multifunction transmission range switch-to-transmission bolt	6
Multifunction transmission range switch-to-transmission nut	7
Selector lever cable adjustment bolt	13
Selector lever-to-selector shaft nut	13
Transmission oil pan inspection plug	27

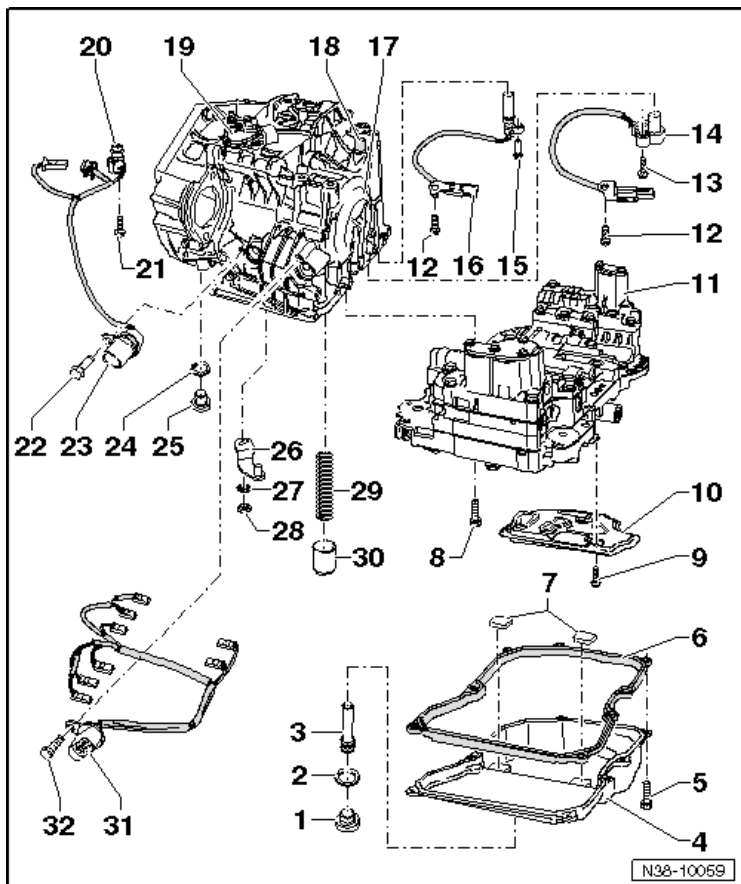
Transmission to Engine Tightening Specifications



Component	Fastener size	Nm
Drive plate-to-converter	-	60
Bolts	M12	80 or 65, if using T10179
Bolts located in the lower flange	M10	40
Alignment (arrow) pins for centering		

Gears, Hydraulic Controls – 09G

Differential Overview



1 - Inspection Plug

- Tightening specification, see Fastener Tightening Specifications below

2 - Seal

- Always replace

3 - Overflow Tube

- Tightening specification, see Fastener Tightening Specifications below

4 - Transmission Fluid Pan

5 - Bolt

- Tighten the pan bolts diagonally and in several steps.
- Tightening specification, see Fastener Tightening Specifications below

6 - Gasket

7 - Magnet

8 - Bolt

- Always replace
- Tightening specification, see Fastener Tightening Specifications below

9 - Bolt

- Tightening specification, see Fastener Tightening Specifications below

10 - Transmission Fluid Filter

11 - Valve Body

12 - Bolt

- Tightening specification, see Fastener Tightening Specifications below

13 - Bolt

- Tightening specification, see Fastener Tightening Specifications below

14 - Transmission Input Speed Sensor -G182-

15 - Bolt

- Tightening specification, see Fastener Tightening Specifications below

16 - Transmission Output Speed Sensor -G195-

17 - Transmission Housing

18 - Vent

19 - Multifunction Transmission Range Switch -F125-

20 - Transmission Fluid Temperature Sensor -G93-

21 - Bolt

- Tightening specification, see Fastener Tightening Specifications below

22 - Bolt

- Tightening specification, see Fastener Tightening Specifications below

23 - Sensor Wiring Harness

24 - Seal

- Always replace

25 - Drain Plug

- Tightening specification, see Fastener Tightening Specifications below

26 - Selector Shaft Lever

27 - Washer

28 - Nut

- Tightening specification, see Fastener Tightening Specifications below

29 - Spring

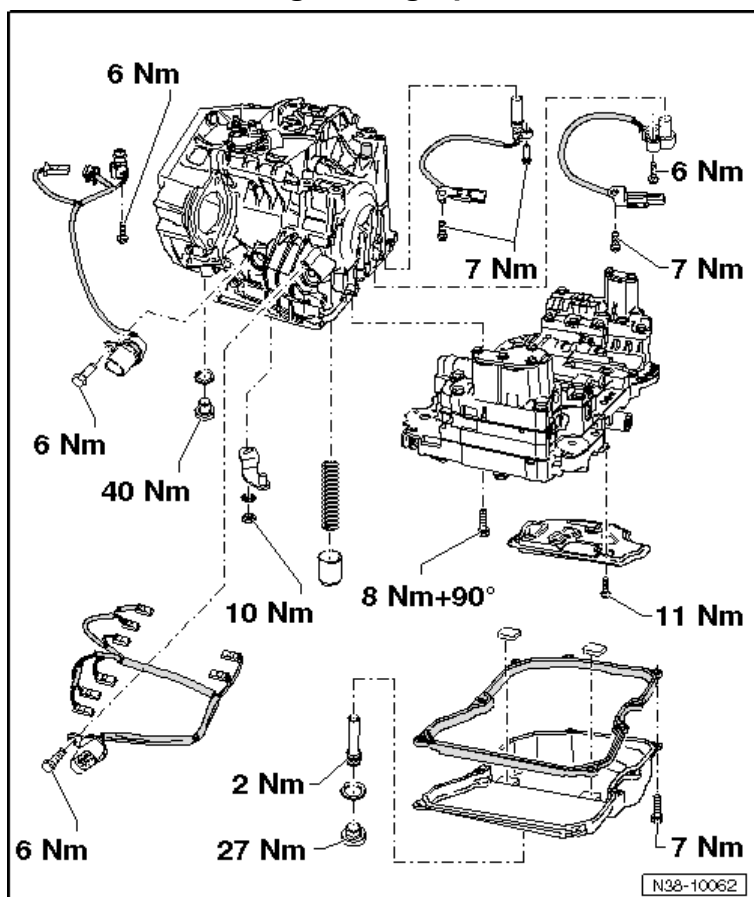
30 - Piston

31 - Solenoid Valve Wiring Harness

32 - Bolt

- Tightening specification, see Fastener Tightening Specifications below

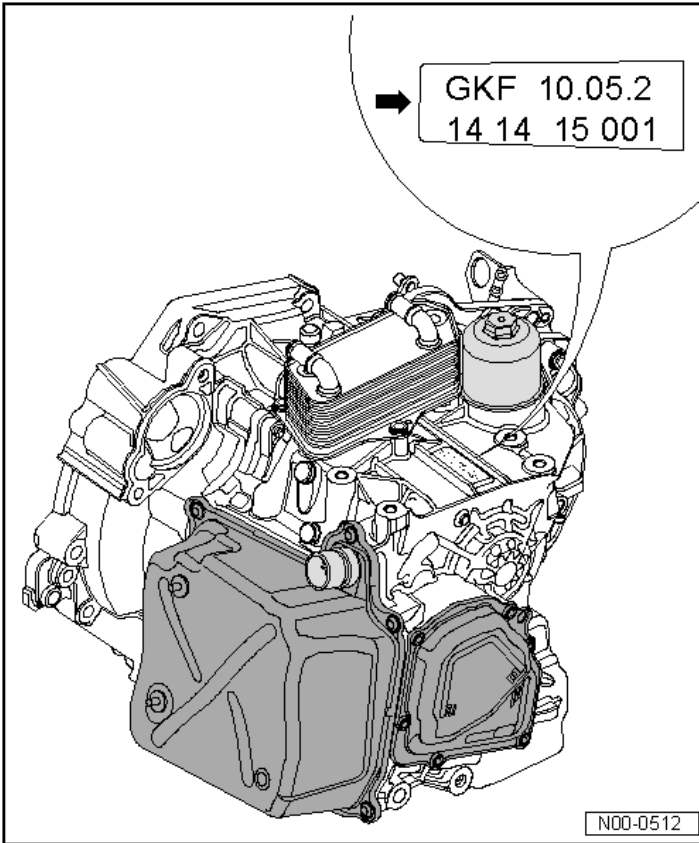
Fastener Tightening Specifications



DIRECT SHIFT GEARBOX (DSG) TRANSMISSION – 02E

General, Technical Data

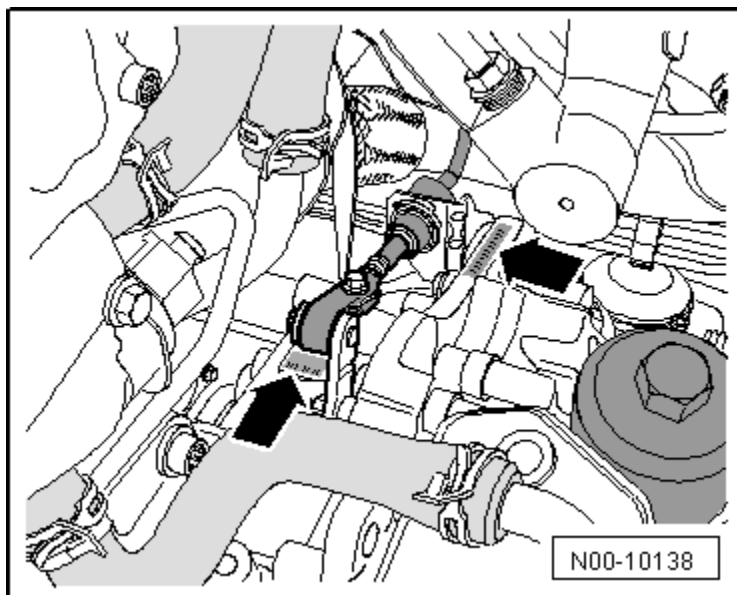
Identification on Transmission



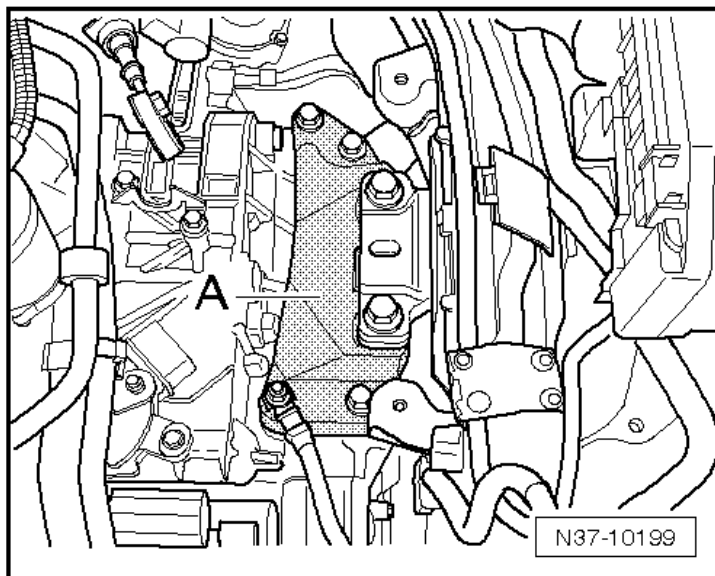
Example:

GKF	10	05	10
Identification codes	Day	Month	Year (2002) of manufacture

Identification on Transmission



The transmission code letters can be found on the transmission near the selector lever cable (➡) or under the transmission mount bracket.



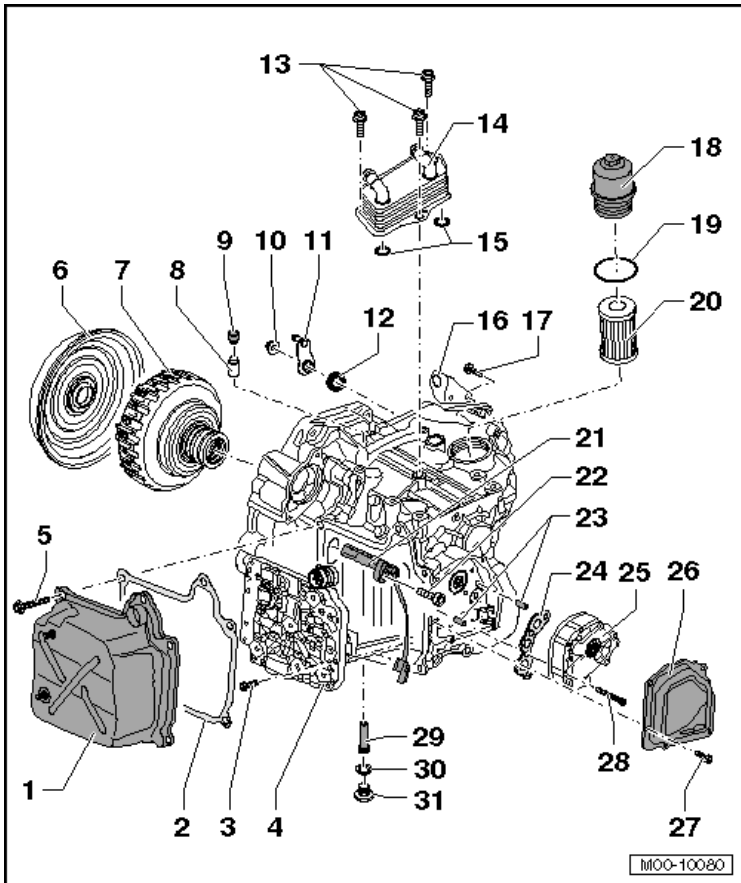
To read the transmission code letters under the transmission mount bracket, support the engine and transmission and remove the transmission mount bracket (A). Refer to ElsaWeb for the transmission mount bracket removal procedure.

Transmission Allocation Codes

Direct Shift Gearbox (DSG®) 02E		
Identification codes	MTA, NJH, NLW	MSV, NJK, NLP
Engine	3.6L - 206 kW FSI	2.0L - 103 kW TDI Common Rail

Controls, Housing (DSG) – 02E

Transmission Component Overview



1 - Transmission Cover

2 - Gasket

- Always replace

3 - Bolt

- 5 Nm + 90° turn
- Always replace

4 - DSG Transmission Mechatronic -J743-

5 - Bolt

- 16 Nm
- Always replace

6 - Clutch End Cover for the Direct Shift Gearbox (DSG®)

7 - Dual Clutch

8 - Vent Tube

- Always replace after removing.

9 - Cover

10 - Nut

- 20 Nm
- Always replace

11 - Gear Shift Lever

12 - Seal

13 - Bolt

- 20 Nm + 90° turn
- Always replace

14 - Transmission Oil Cooler

15 - O-rings

- Always replace

16 - Cable Bracket

17 - Bolt

- 20 Nm + 90° turn
- Always replace

18 - Oil Filter Housing

- 20 Nm

19 - O-ring

- Always replace

20 - Oil Filter Element

21 - Transmission Input Speed Sensor -G182- and Clutch Oil Temperature Sensor -G509-

22 - Bolt

- 10 Nm
- Always replace

23 - Alignment Pin

24 - Gasket

- Always replace

25 - Transmission Oil Pump

26 - Transmission Oil Pump Cover

- Always replace

27 - Bolt

- 8 Nm
- Always replace

28 - Bolt

- Always replace
- There are different bolts for the transmission oil pump.

29 - Overflow Tube

- 3 Nm

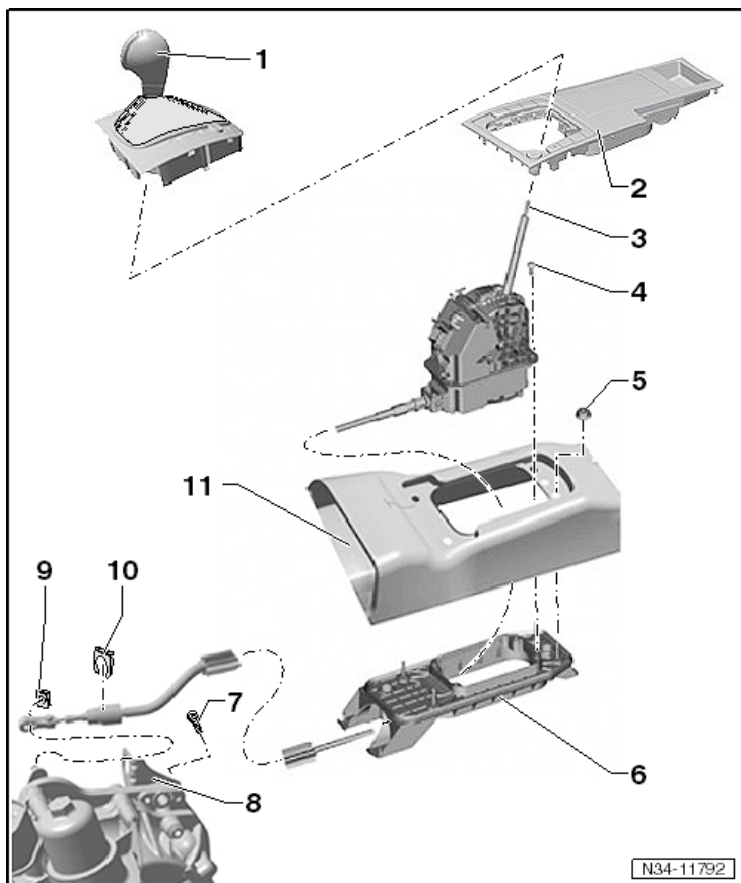
30 - Seal

- Always replace

31 - Oil Drain and Check Plug

- 45 Nm

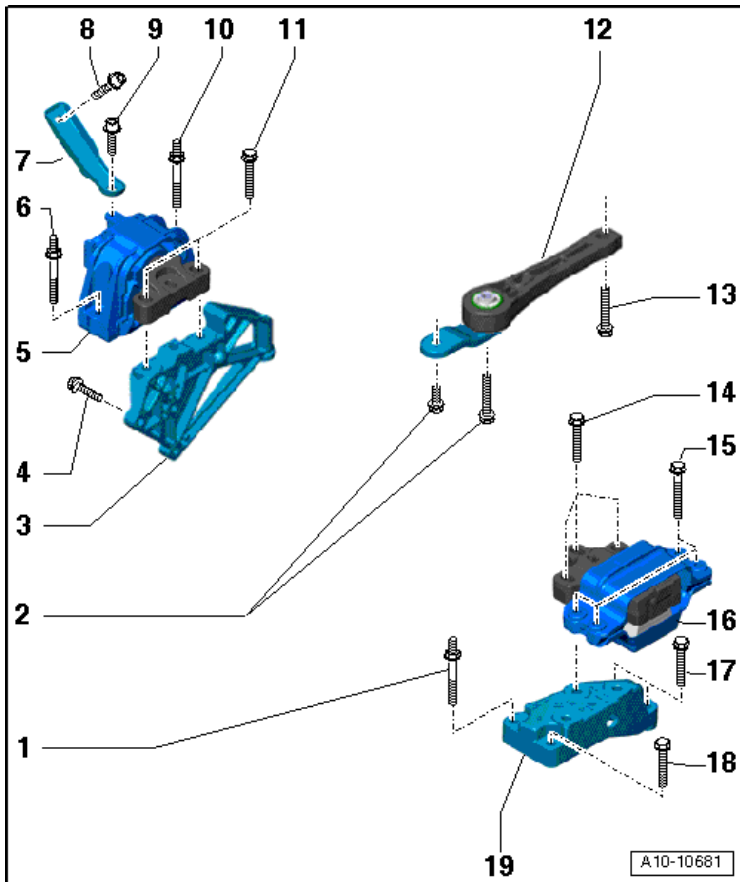
Selector Mechanism Overview



N34-11792

- 1 - Selector Handle with Cover**
- 2 - Center Console Cover**
- 3 - Selector Mechanism with Selector Lever Cable**
- 4 - Bolt**
 - 8 Nm
- 5 - Nut**
 - 8 Nm
- 6 - Selector Housing**
- 7 - Bolt**
 - 20 Nm + 90° turn
 - Always replace
- 8 - Cable Bracket**
- 9 - Lock Washer**
 - Always replace after removing
- 10 - Lock Washer**
 - Always replace after removing
- 11 - Tunnel/Body**

Engine and Transmission Mounts Overview



1 - Bolt

- 40 Nm + 90° turn
- Always replace

2 - Bolt

- Tightening specification, refer to Suspension, Wheels, Steering, Front Suspension

3 - Engine Mount Bracket

4 - Bolt

- Tightening specification, refer to Engine Mechanical, Fuel Injection and Ignition, Engine Assembly

5 - Engine Mount

6 - Bolt

- Tightening specification, refer to Engine Mechanical, Fuel Injection and Ignition, Engine Assembly

7 - Support

8 - Bolt

- Tightening specification, refer to Engine Mechanical, Fuel Injection and Ignition, Engine Assembly

9 - Bolt

- Tightening specification, refer to Engine Mechanical, Fuel Injection and Ignition, Engine Assembly

10 - Bolt

- Tightening specification, refer to Engine Mechanical, Fuel Injection and Ignition, Engine Assembly

11 - Bolt

- Tightening specification, refer to Engine Mechanical, Fuel Injection and Ignition, Engine Assembly

12 - Pendulum Support

13 - Bolt

- Tightening specification, refer to Suspension, Wheels, Steering, Front Suspension

14 - Bolt

- 60 Nm + 90° turn
- Always replace

15 - Bolt

- Tightening specification, refer to Engine Mechanical, Fuel Injection and Ignition, Engine Assembly

16 - Transmission Mount

17 - Bolt

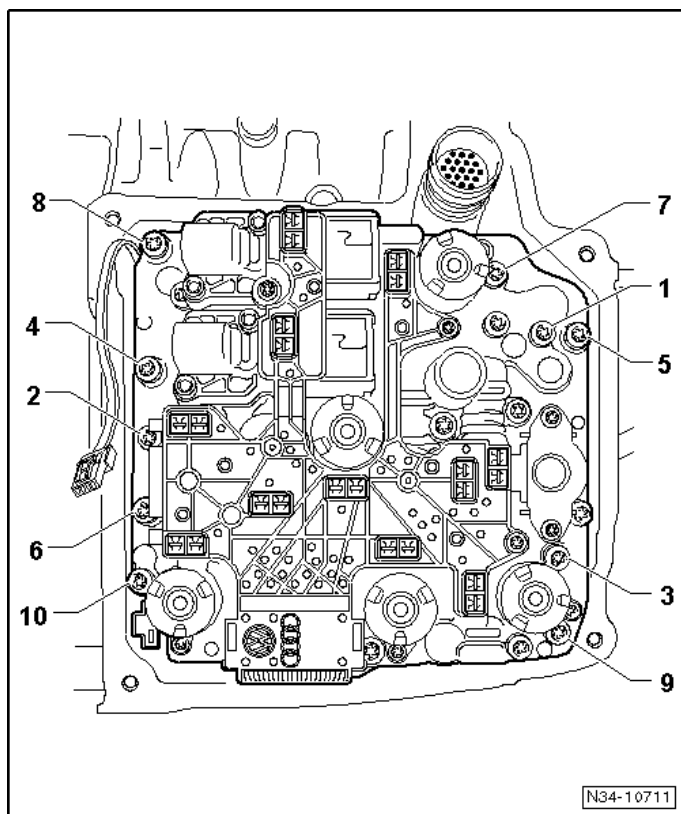
- 40 Nm + 90° turn
- Always replace

18 - Bolt

- 40 Nm + 90° turn
- Always replace

19 - Transmission Mount Bracket

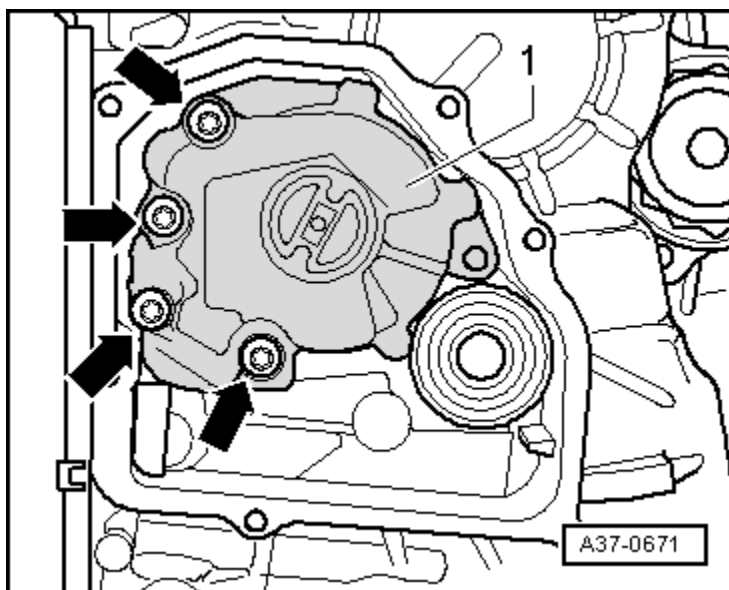
Mechatronic Tightening Specifications



Step	Component	Nm
1	Tighten bolts 1 through 10 in sequence ¹⁾	Hand-tighten
2	Tighten bolts 1 through 10 in sequence	5
3	Tighten bolts 1 through 10 in sequence	an additional 90° (¼ turn)

¹⁾ Replace fastener(s).

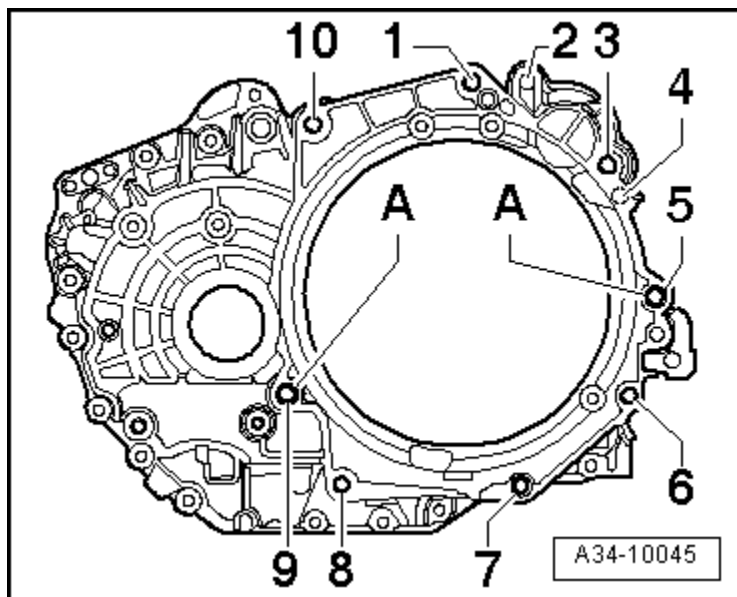
Oil Pump Tightening Specifications Without Countersunk Bolt



DSG Trans. –
02E

Component	Nm
Oil pump bolts (➡) with flat heads	5 plus an additional 90° (¼ turn)

Transmission to Engine Tightening Specifications Diesel Engine

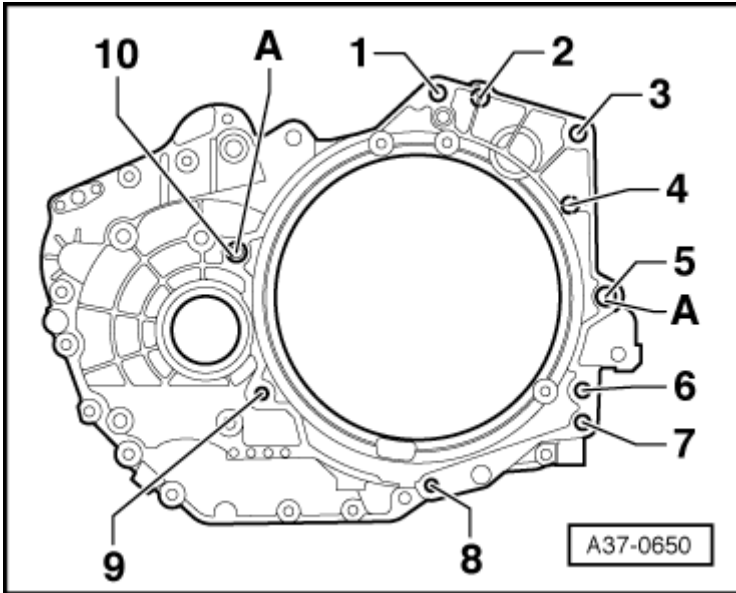


Item	Fastener	Nm
1	M12 x 55	80
2	M10 x 45 ¹⁾	40
3	M12 x 55 ²⁾	80
4	M10 x 45 or M10 x 40 ¹⁾	40
5	M12 x 65 or M12 x 70	80
6	M10 x 50	40
7	M10 x 50	40
8	M10 x 50	40
9	M12 x 65 or M12 x 70	80
10	M12 x 55	80
A	Alignment sleeves for centering	

¹⁾ Also starter to transmission.

²⁾ Is accessible only through the opening for the starter.

Gas Engine



DSG Trans. -
02E

Item	Fastener	Nm
1	M12 x 55	80
2	M10 x 45 ¹⁾	40
3	M12 x 55	80
4	M10 x 45 ¹⁾	40
5	M12 x 55 ²⁾	80
6	M12 x 55	80
7	M10 x 50	40
8	M10 x 50	40
9	M10 x 45 ²⁾	40
10	M12 x 65 ²⁾	80
A	Alignment sleeves for centering	

¹⁾ Also starter to transmission.

²⁾ Installed from the engine side.