



Das Auto.

2014

Jetta & GLI

**Quick Reference
Specification Book**

2014 VW Jetta & GLI

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

N·m-to-lb·ft (ft·lb)

To calculate: N·m x 0.738 = lb·ft

N·m	lb·ft (ft·lb)	N·m	lb·ft (ft·lb)	N·m	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

N·m-to-lb·in (in·lb), kg·cm

To calculate: $N \cdot m \times 8.85 = lb \cdot in$ • $N \cdot m \times 10.20 = kg \cdot cm$

N·m	lb·in (in·lb)	kg·cm	N·m	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: $N \cdot cm \times 0.089 = lb \cdot in$ • $N \cdot cm \times 0.102 = kg \cdot cm$

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: kg·cm x 0.868 = lb·in • kg·cm x 9.81 = N·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.

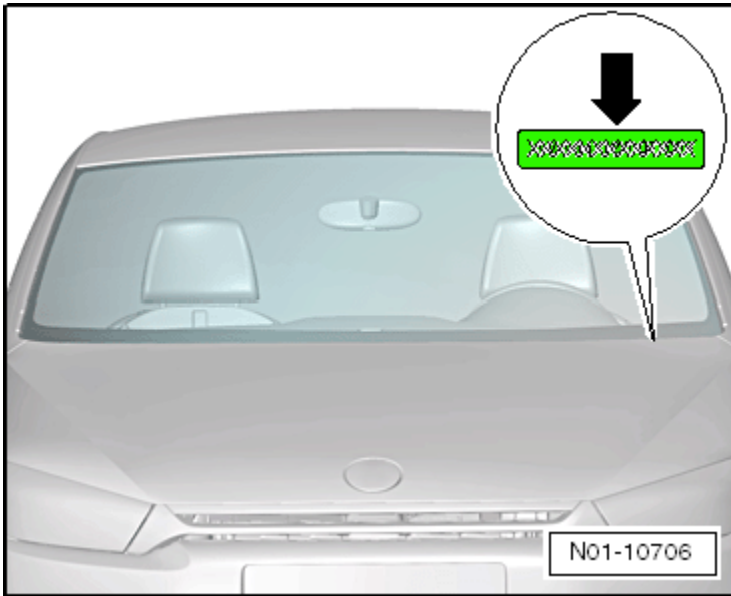
(CAUTIONS cont'd on next page)

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

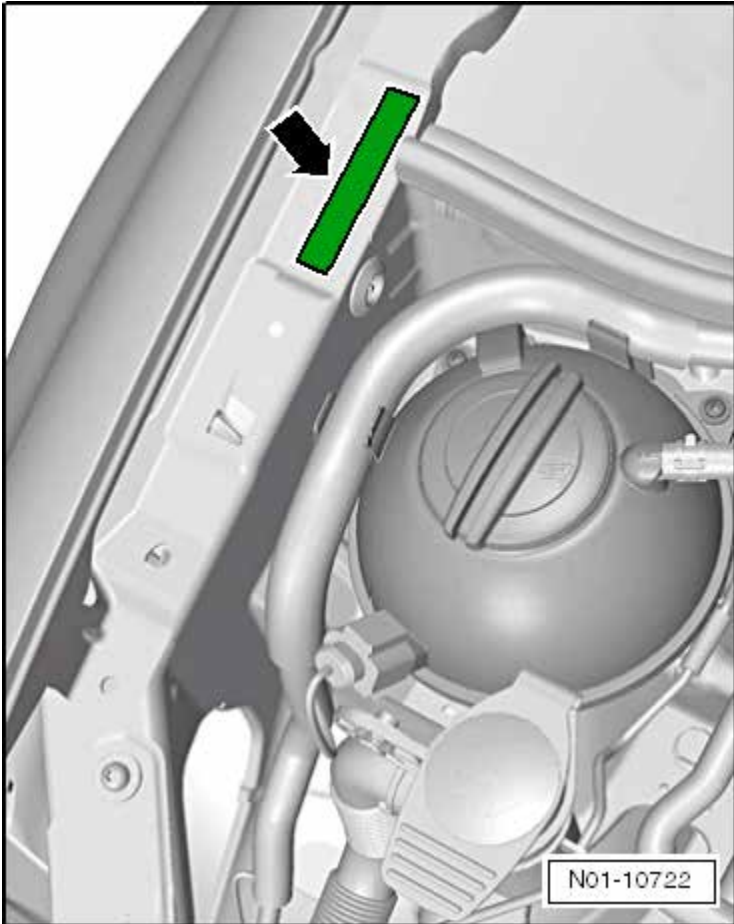
VIN on Lower Edge of Windshield



Vehicle
Identification

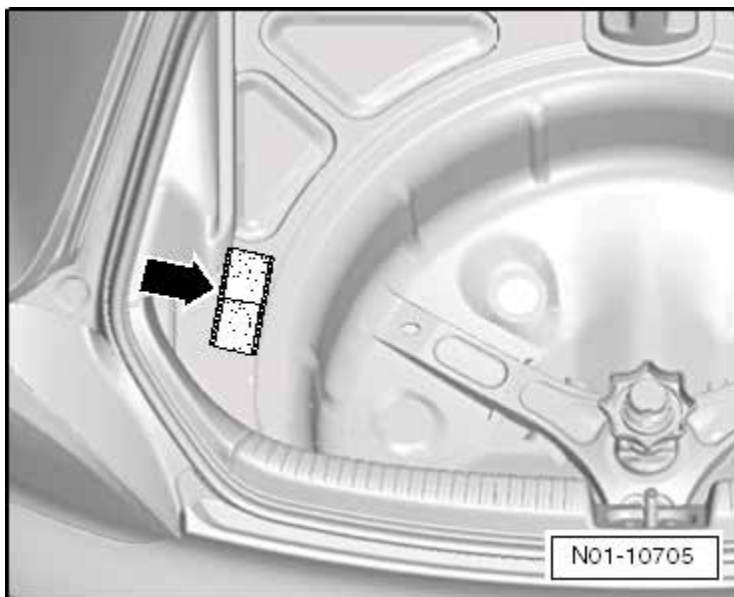
The VIN ➡ is on the left side of the vehicle in the area of the windshield wiper mount. It is visible from outside.

VIN on Longitudinal Member Extension



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

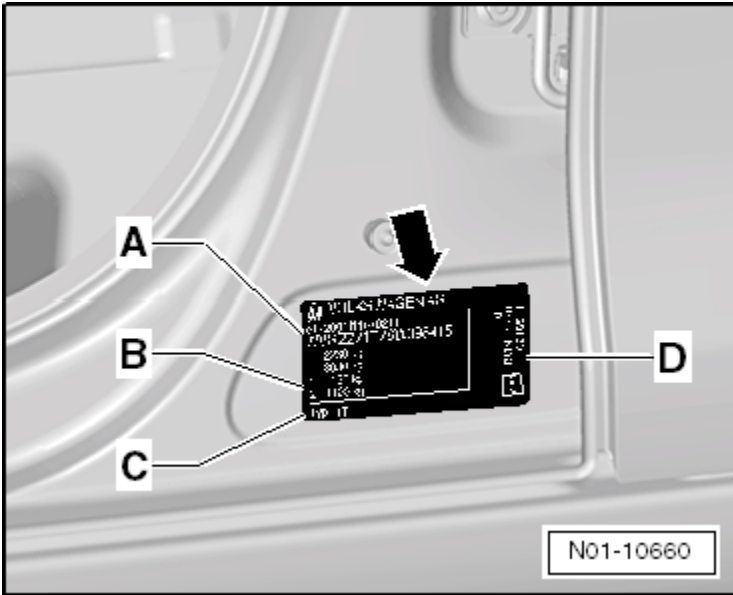
Vehicle Data Label



The vehicle data label ➔ is located in the left rear of vehicle in the spare wheel well. The vehicle data sticker can also be found in the customer's service schedule.

Vehicle
Identification

Type Plate



The type plate ➔ is visible at the bottom of the B-pillar when the left front door is open.

The type plate contains the following vehicle information:

- A – Vehicle Identification Number (VIN)
- B – Variable specifications (axle loads, total permissible weights, permissible towing weights)
- C – Type number
- D – Engine code

VIN Decoder

2014 Volkswagen VIN Decoder (except Routan)

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 FS/TDI R-Line

E* Touareg V6 FS/TDI Hybrid

F* Beetle w/S Spd Auto Trans, Eos Lux/Exec w/Auto Trans

G* CC V6 Exec w/Auto Trans and 4-Motion, 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* Beetle TDI w/Spd Man, CC Exec w/Auto Trans

R* 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 Manual, Jetta GLI w/Auto Trans

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

Country of origin	Manufacturer	Vehicle Type	Series	Engine	Restraint system	Model (7 & 8)	Check digit	Model year	Assembly plant	Sequential production number (position 12 - 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

WW = Europe - Pass. Car

VW = USA - Pass. Car

3W = Mexico - Pass. Car

WVC = Europe - S.U.V.

See back

Calculate per NHTSA Code

2014

A3*** = Passat

AH (HF) = Eos

AJ (H6TK)*** = Golf, GTI, Jetta, Jetta SportWagen

CC = Beetle, Beetle Conv.

AN (3C) = Tiguan

AT = Touareg

AX (8N) = Tiguan

BP (FP) = Touareg

C = Chattanooga **P** = Mosel

D = Bratislava **V** = Portugal

E = Emden **W** = Wolfsburg

M = Mexico

E = 2014

Sequential production number (position 12 - 17)

A* 5 cyl 2.5L 170hp (CBTA-M) Golf

B* 5 cyl 2.5L 170hp (CBUA-M-PZE1V*) Golf

D* 4 cyl 2.0L 200hp (CBFA-PZE1V*) GTI

F* VR6 3.6L 280hp (CGRA) Touareg

G* 6 cyl 3.0L 333hp + 34 Kw (CGFA) Touareg Hybrid

H* 5 cyl 2.5L 170hp (CBTA-M) Passat

K* 4 cyl 2.0L 116hp (CBPA) Jetta

L* 4 cyl 2.0L TDI 140hp (CJAA) Beetle, Beetle Convertible, Jetta, Jetta SportWagen

M* 4 cyl 2.0L TDI 140hp (CJAA) Golf

N* VR6 3.6L 280hp (CDBB) Passat

P* 4 cyl 2.0L 200hp (CCTA) CC

R* 4 cyl 2.0L TDI 140hp (CKRA) Beetle

1* 4 cyl 2.0L 200hp (CBFA-PZE1V*) CC

2* 5 cyl 2.5L 170hp (CBUA-M-PZE1V*) Beetle, Beetle Convertible, Jetta, Jetta SportWagen, Passat

3* VR6 3.0L TDI 240hp (CNRB) Touareg

4* 4 cyl 1.8L 170hp (CPKA) Passat

5* 4 cyl 2.0L 210hp (CPLA) Beetle, Beetle Convertible, Jetta GLI

6* 4 cyl 1.8L 170hp (CPRA-PZE1V*) Passat

7* 4 cyl 2.0L 210hp (CPRA-PZE1V*) Beetle, Beetle Convertible, Jetta GLI

8* VR6 3.6L 280hp (CNNA) CC

9* 4 cyl 2.0L 200hp (CCTA) Tiguan

W* 4 cyl 2.0L 200hp (CBFA-SULEV 1P*) Eos

1* 5 cyl 2.5L 170hp (CBTA-M) Beetle, Beetle Convertible, Jetta, Jetta SportWagen

0* 4 cyl 1.8L 170hp (CPKA) Beetle, Beetle Convertible, Jetta

1* 4 cyl 1.8L 170hp (CPRA-PZE1V*) Beetle, Beetle Convertible, Jetta

3* 4 cyl 1.4L 150hp + 28 Kw (CNLA-PZE1V*) Jetta Hybrid

*** 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 **3W**. GTI and Golf models are identified by WMI code of **WVW**.

Vehicle Identification

2014 Restraint System:

All = Active-Dri/Pass - Front Air Bag - Dri/Pass

1 (Tiguan) = Advanced Front Air Bags + Side Impact Air Bags - Front + Side Curtain Air Bags + 4 Star Crash Rated

2 (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

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

Calculate per NHTSA Code

Sequential Product Number

SALES CODES

Engine Codes

CPKA/CPRA	1.8L 4-cylinder 4V
CPLA/PPA	2.0L 4-cylinder 4V
CBFA/CCTA	2.0L 4-cylinder 4V
CJAA	2.0L TDI 4-cylinder 4V turbo
CBTA/CBUA	2.5L 5-cylinder 4V

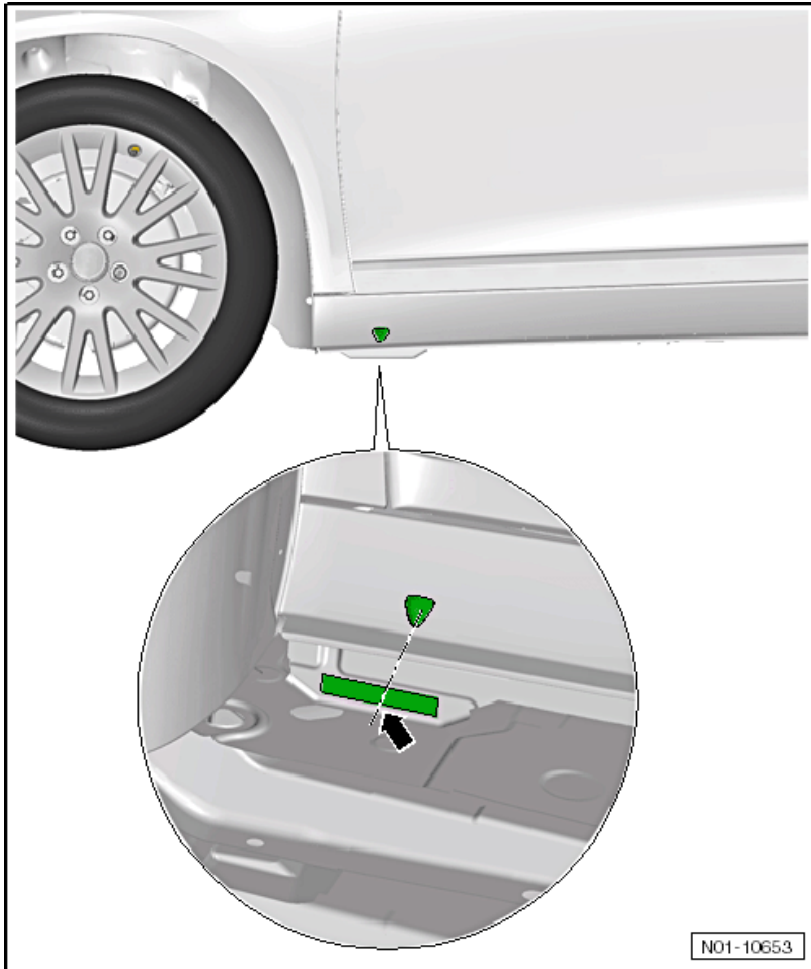
Transmission Codes

0A4	5-speed manual
02Q	6-speed manual
02E	6-speed direct shift
09G	6-speed automatic

VEHICLE LIFTING

Hoist and Jack Mounting Points

Front

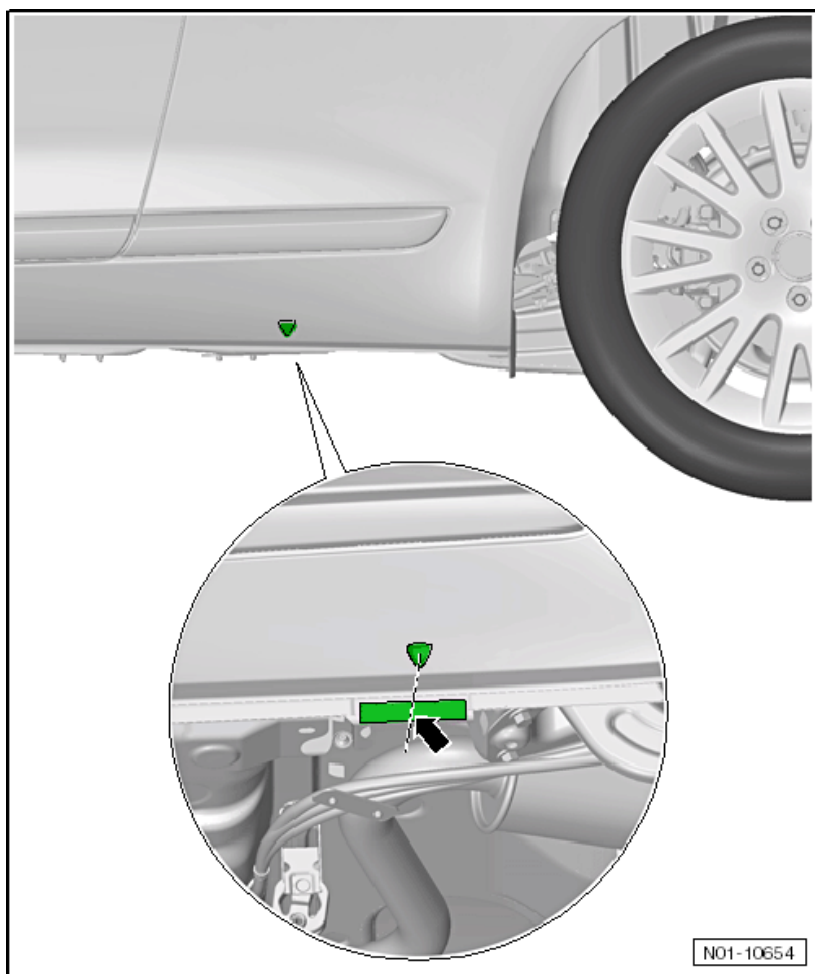


Position the support plate in the side member vertical reinforcement area ➡.

Sales
Codes

Vehicle
Lifting

Rear

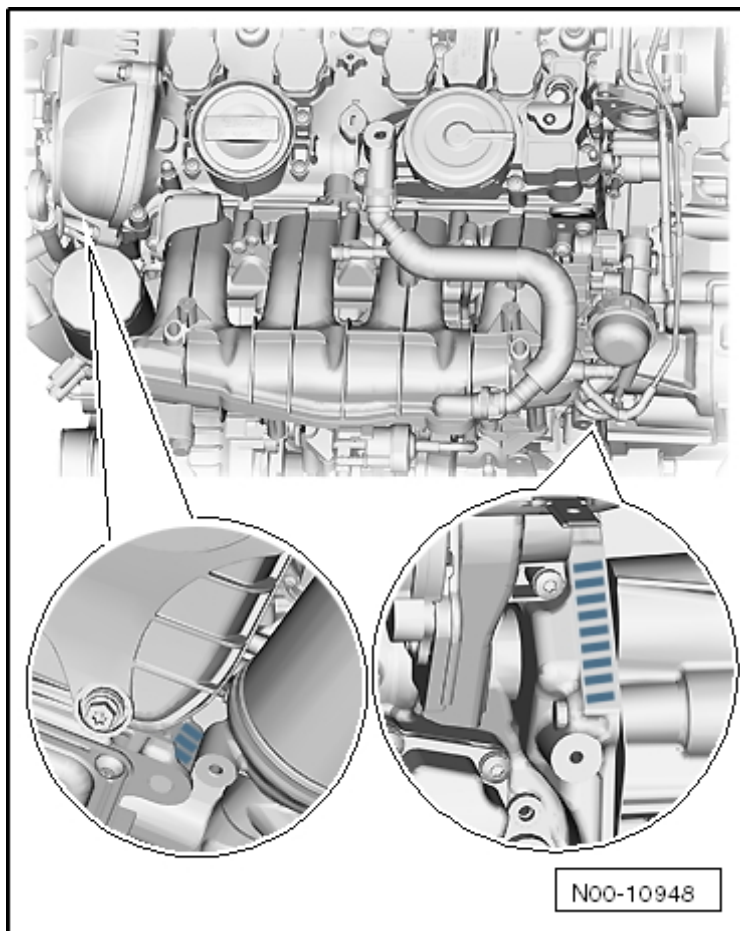


Position the support plate in the side member vertical reinforcement area ➡.

ENGINE – 1.8L CPKA,CPRA

General Information – 1.8L CPKA, CPRA

Engine Number



The engine number (“engine codes” and “serial number”) are located at the engine/transmission joint.

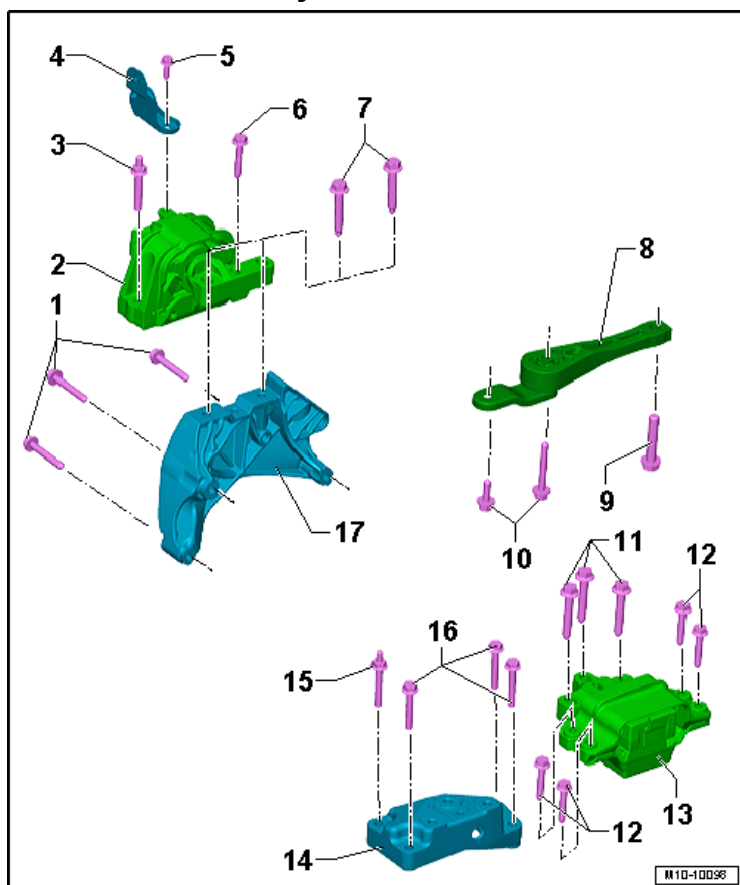
The engine code is also printed behind the oil filter on the cylinder block. There is also a label glued to the timing chain cover with the “engine code” and “serial number”. The first three digits describe the mechanical structure of the engine and are still stamped on the engine. The fourth digit describes 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

Code Letters		CPKA	CPRA
Manufactured		07/2013	07/2013
Emission values in accordance with		BIN 5 TIER 2	PZEV SULEV
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
Compression ratio		9.6:1	9.6:1
Valves per cylinder		4	4
Research Octane Number (RON)	Minimum	95 RON (or 91 RON unleaded)	
Injection system/ignition system		TFSI/SIMOS 12	TFSI/SIMOS 12
Ignition sequence		1-3-4-2	1-3-4-2
Oil pressure control		Yes	Yes
Turbocharger, Supercharger		Yes	Yes
Secondary Air Injection (AIR) system		Yes	Yes
Valves per cylinder		4	4
Variable Valve Timing (VVT)		Yes (Intake)	Yes (Intake)

Engine Assembly – 1.8L CPKA, CPRA

Assembly Mounts Overview



1 - Bolt

- Tightening specification see Engine Support - Tightening Specification and Sequence below
- 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

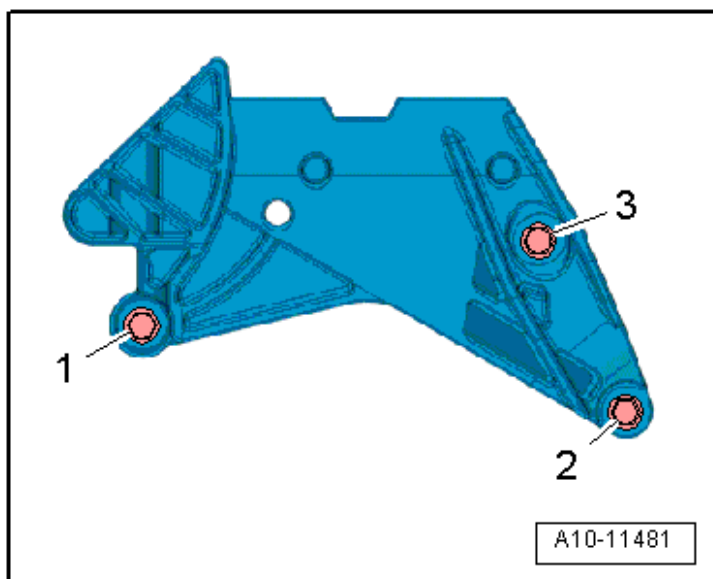
16 - Engine Mount

- 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	60

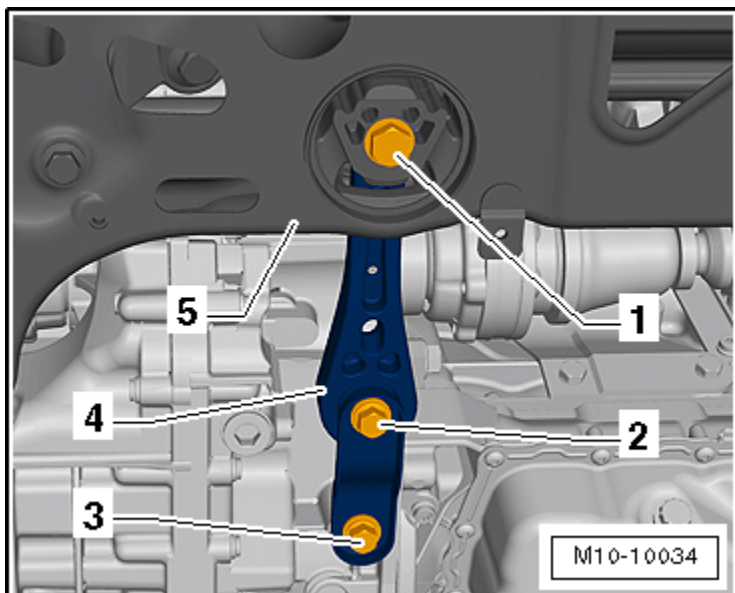
Engine Support - Tightening Specification and Sequence



Tighten the bolts in steps in the sequence shown:

Steps	Bolts	Tightening Specification/Additional Turn
1	-1- through -3-	7 Nm
2	-1- through -3-	40 Nm
3	-1- through -3-	Tighten 90° additional turn

Install the Pendulum Support

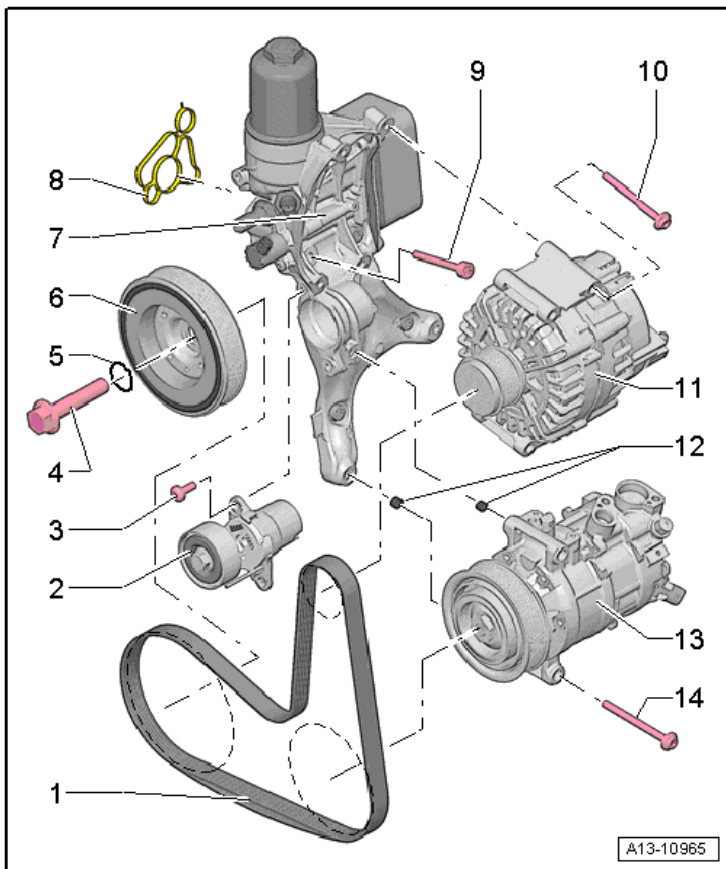


First install pendulum support -4- to the transmission and then to the subframe. Tighten the bolts in steps in the sequence shown:

Steps	Bolts	Tightening Specification/Additional Turn
1	-2- and -3-	50 Nm
2	-1-	100 Nm
3	-1- through -3-	Tighten 90° additional 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
- 5 - O-ring
- 6 - Vibration Damper
- 7 - Auxiliary Components Bracket

8 - Seal

- Replace after removing

9 - Bolt

- Tightening specification and sequence see Accessory assembly bracket - tightening specifications and tightening sequence below

10 - Bolt

- Tightening specification, refer to Electrical Equipment

11 - Generator

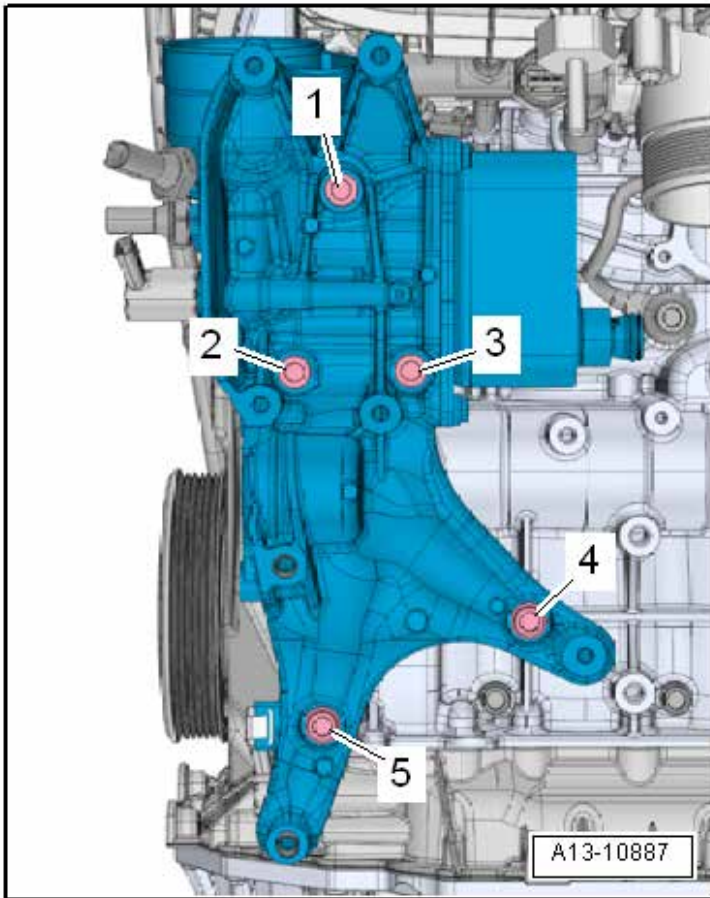
12 - Alignment Sleeves

13 - A/C Compressor

14 - Bolt

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

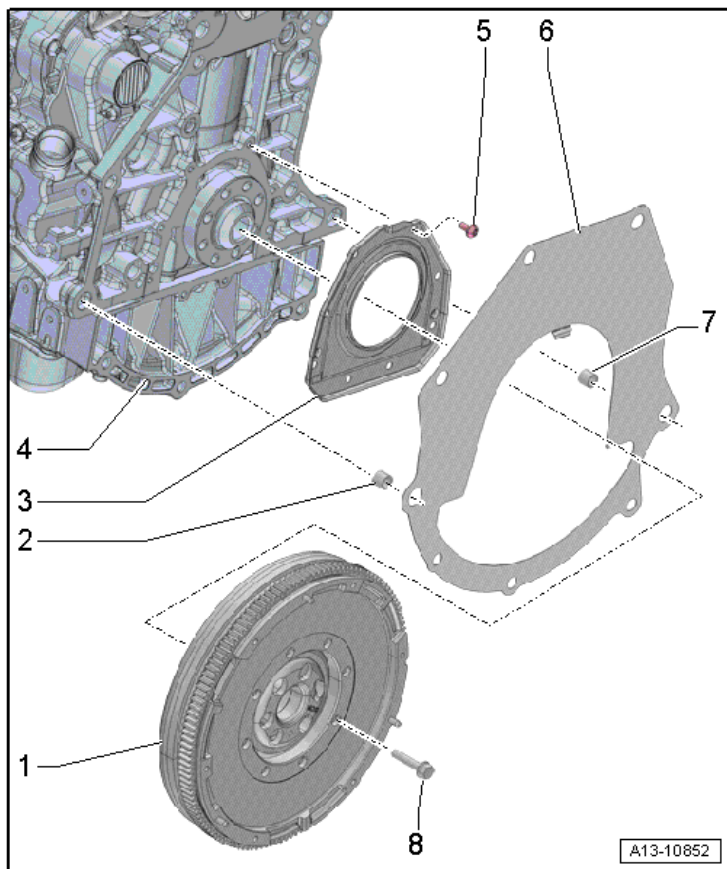
Accessory Assembly Bracket - Tightening Specifications and Tightening Sequence



Mount the accessory assembly bracket and then install the bolt -4- by hand. Then install the remaining bolts by hand. Tighten bolts in three stages in sequence -1- to -5- as follows:

Steps	Bolts	Tightening Specification/Additional Turn
1	-1- through -5-	Tighten by hand
2	-1- through -5-	Tighten to 20 Nm
3	-1- through -5-	Tighten 90° additional turn

Cylinder Block Overview, Transmission Side



1 - Flywheel

2 - Alignment Sleeve

3 - ing Flange, Transmission Side

4 - Cylinder Block

5 - Bolt

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

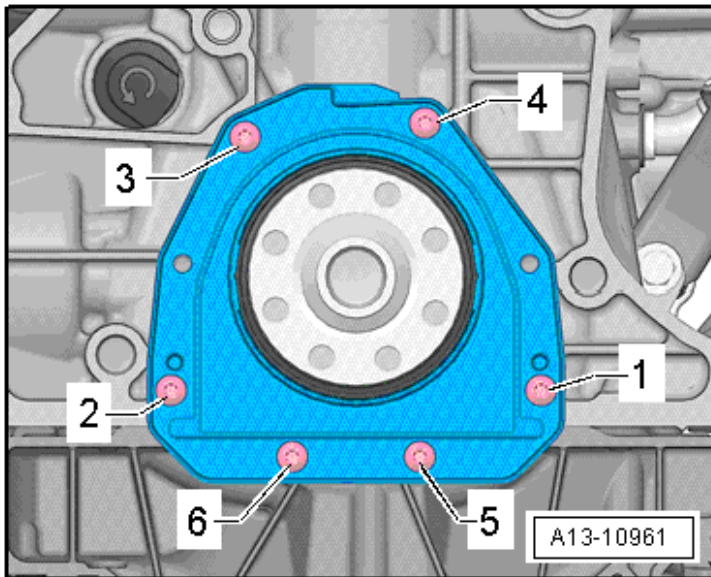
6 - Intermediate Plate

7 - Alignment Sleeve

8 - Bolt

- 60 Nm + 90° turn
- Replace after removing

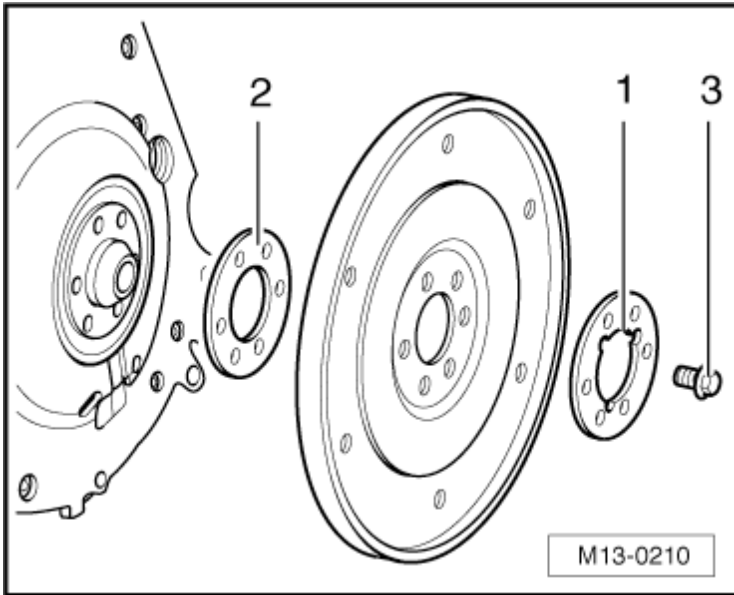
Ribbed Belt Transmission Side Sealing Flange - Tightening Specifications and Sequence



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

Steps	Bolts	Tightening Specification/Additional Turn
1	-1- through -6-	Tighten by hand
2	-1- through -6-	9 Nm

Drive Plate Overview



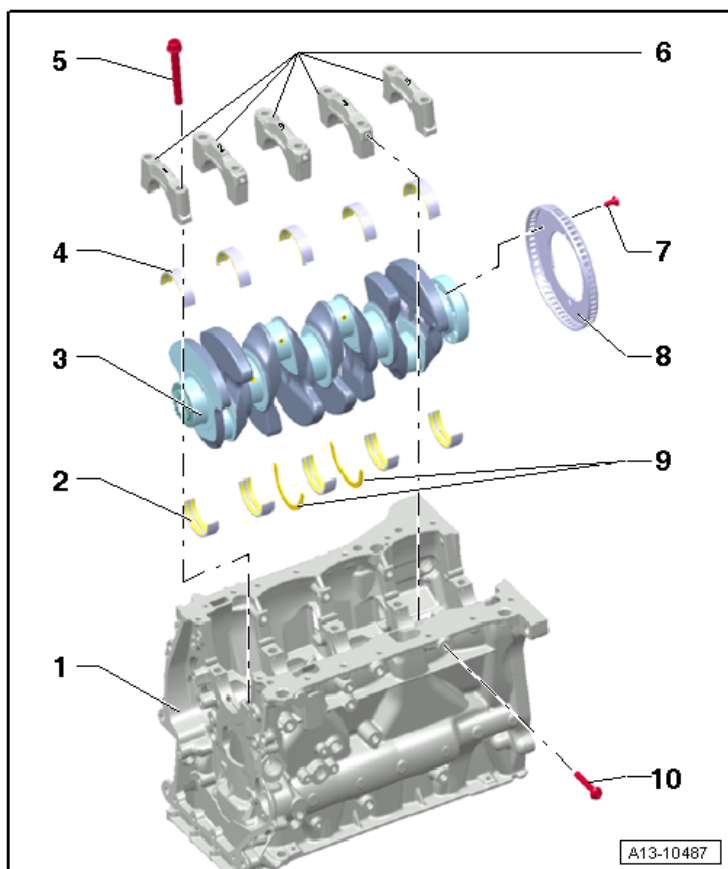
1 - Washer with Recesses

2 - Shim

3 - Bolt

- 40 Nm + 90° turn
- Replace after removing

Crankshaft Overview



1 - Cylinder Block

2 - Bearing Shell for Cylinder Block

3 - Crankshaft

4 - Bearing Shell for Bearing Cap

5 - Bolt

Tightening sequence, see Crankshaft, tightening sequence below

Replace after removing

6 - Bearing Cap

7 - Bolt

10 Nm + 90° turn

Replace after removing

8 - Sensor Wheel

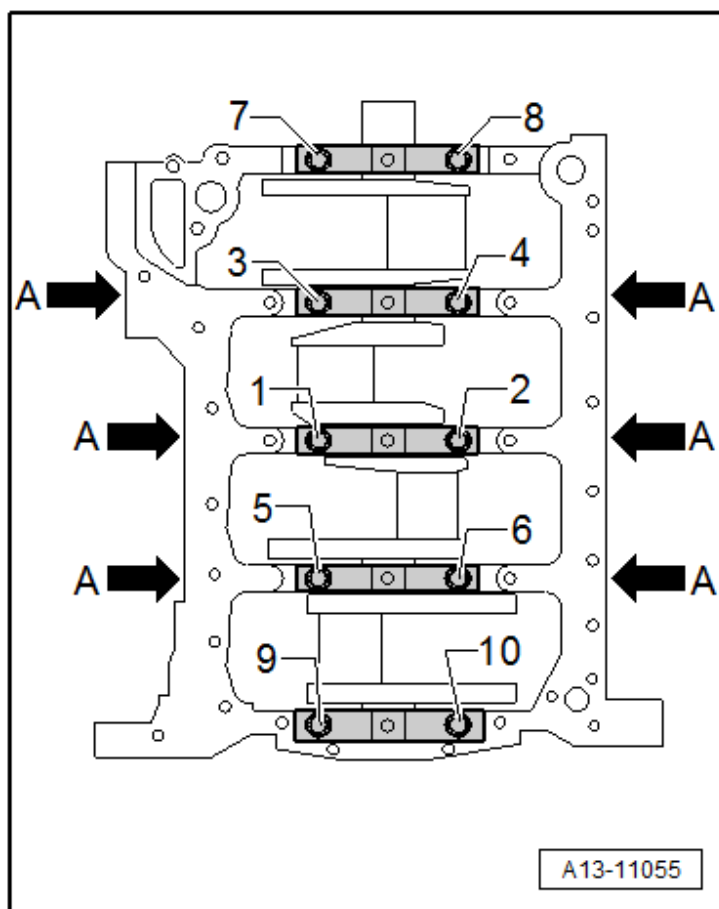
9 - Thrust Washers

10 - Bolt

Tightening sequence, see Crankshaft, tightening sequence below

Replace after removing

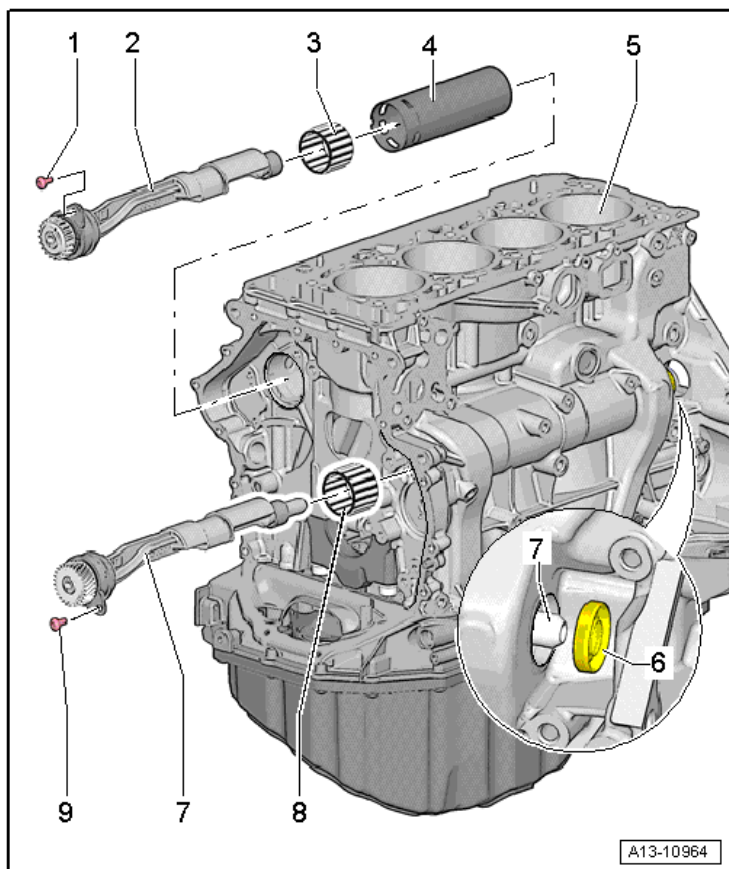
Crankshaft Tightening Specifications and Sequence



Tighten the crankshaft bolts in the sequence -1- through -10- and -arrows A- as follows.

Steps	Bolts	Tightening Specification/Additional Turn
1	-1- through -10- and -arrows A-	Tighten by hand
2	-1- through -10-	Tighten to 65 Nm
3	-1- through -10-	Turn another 90° using a rigid wrench.
4	-arrows A-	Tighten to 20 Nm
5	-arrows A-	Turn another 90° using a rigid wrench.

Balance Shaft Overview



1 - Bolt

- 4 Nm + 45° turn
- Replace after removing

2 - Balance Shaft

3 - Needle Bearing Rim

4 - Pipe for the Balance Shaft

5 - Cylinder block

6 - Balance Shaft Seal Intake Side

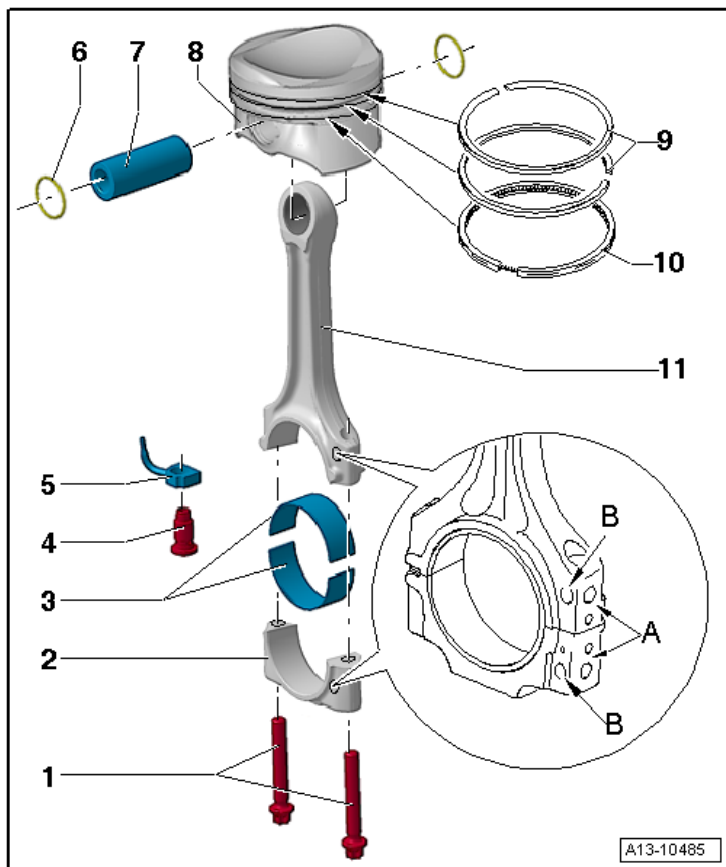
7 - Balance Shaft

8 - Needle Bearing Rim

9 - Bolt

- 4 Nm + 45° turn
- Replace after removing

Pistons and Connecting Rods Overview



- 1 - Connecting Rod Bolts**
 - 45 Nm + 90° turn
 - Replace after removing
- 2 - Connecting Rod Bearing Cap**
- 3 - Bearing Shells**
- 4 - Pipe for the Balance Shaft**
 - 27 Nm
- 5 - Oil Spray Jet**
- 6 - Locking Ring**
- 7 - Piston Pin**
- 8 - Piston**
- 9 - Compression Rings**
- 10 - Oil Scraping Ring**
- 11 - Connecting Rod**

Crankshaft Dimensions

Honing dimension in mm	Crankshaft bearing pin - diameter	Connecting rod bearing pin - diameter
Basic dimension	58.00	47.80

Piston and Cylinder Dimensions

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

¹⁾ Measurements are without the graphite coating (thickness = 0.02 mm). The graphite coating wears off.

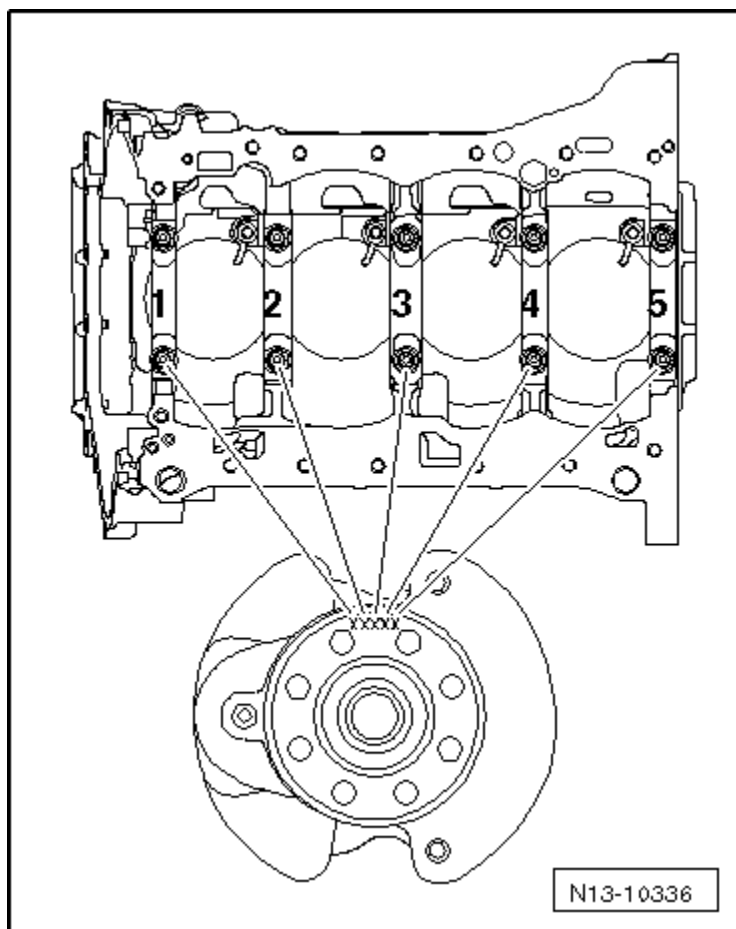
Piston Ring Gap

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

Piston Ring Groove Clearance

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

Bearing Cap Bearing Shell Identification



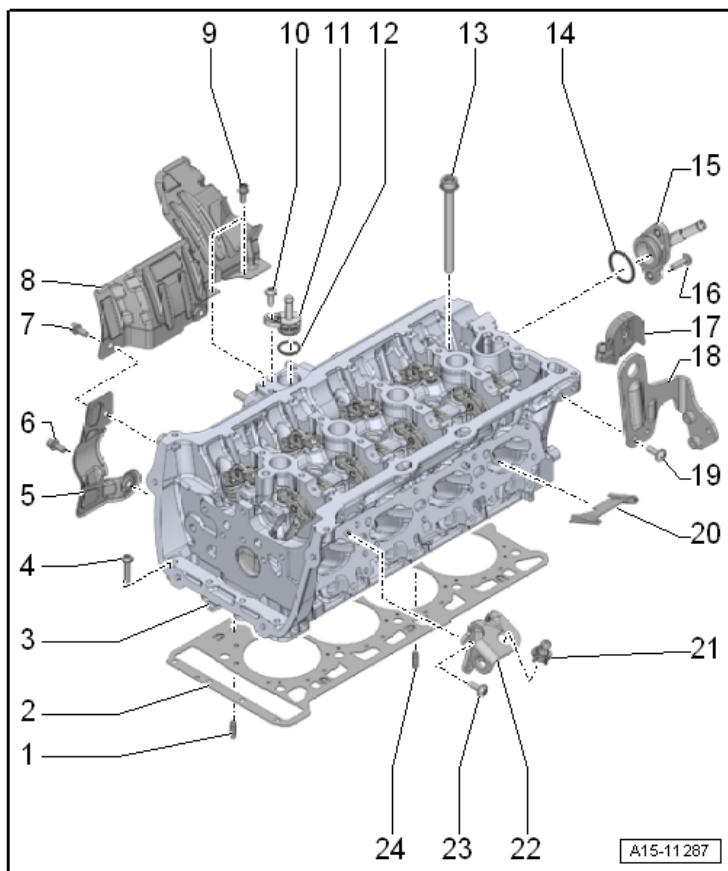
The identification on the crankshaft is for the lower bearing shell. Write down the letters and then use the table to find the color identification.

Letter on cylinder block	Color of bearing
S	Black
R	Red
G	Yellow
B	Blue
W	White

If the colored marks are not yet stamped or are no longer readable, use the center (red) bearing shell. The lower crankshaft bearing shells are shipped as a replacement part with a yellow dot.

Cylinder Head, Valvetrain – 1.8L CPKA, CPRA

Pistons and Connecting Rods Overview



- 1 - Alignment Pin**
- 2 - Cylinder Head Gasket**
- 3 - Cylinder Head**
- 4 - Bolt**

- Procedure when loosening, see Loosening the cylinder head below
- Procedure when tightening, see Cylinder head tightening sequence below
- Replace after removing

- 5 - Heat Shield**

- 6 - Bolt**

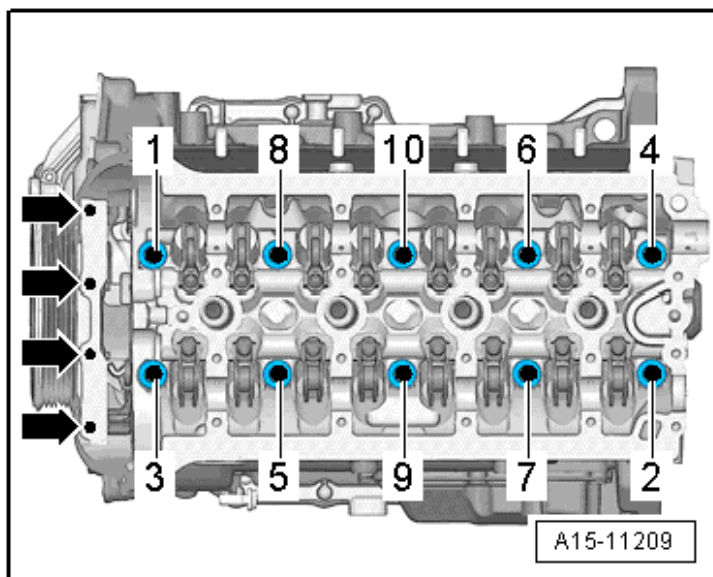
- 9 Nm

- 7 - Bolt**

- 9 Nm

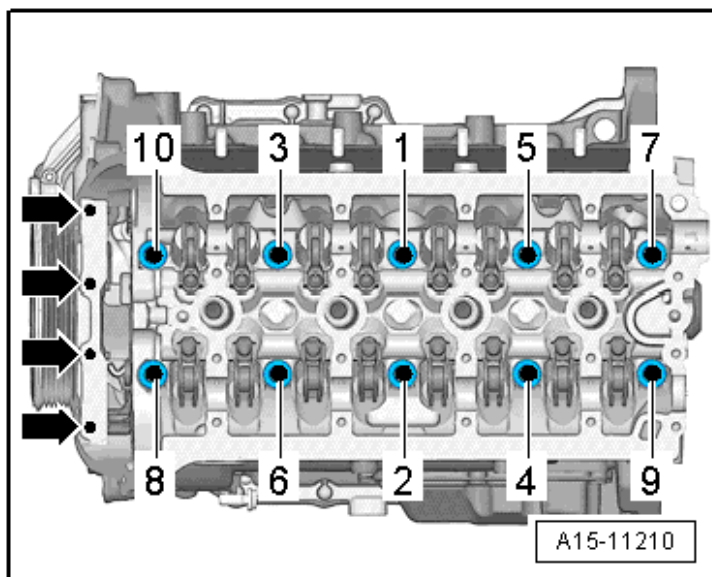
- 8 - Heat Shield**
- 9 - Bolt**
 - 9 Nm
- 10 - Bolt**
 - 9 Nm
- 11 - Connecting Piece**
- 12 - O-ring**
 - Replace after removing
 - Coat with coolant
- 13 - Cylinder Head Bolt**
- 14 - O-ring**
 - Replace after removing
 - Coat with coolant
- 15 - Connecting Piece**
- 16 - Bolt**
 - 9 Nm
- 17 - Mount**
- 18 - Engine Lifting Eye**
- 19 - Bolts**
 - 8 Nm + 90° turn
 - Replace after removing
- 20 - Partition Plate**
- 21 - Ball Pin**
- 22 - Engine Lifting Eye**
- 23 - Bolts**
 - 8 Nm + 90° turn
 - Replace after removing
- 24 - Alignment Pin**

Loosening Cylinder Head



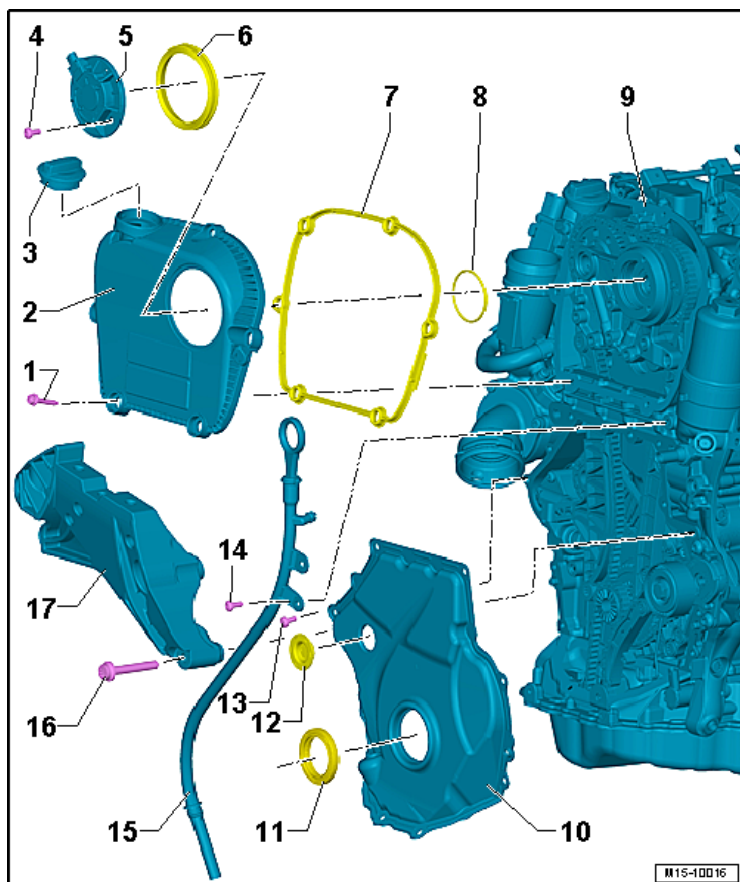
Remove the bolts -arrows-. Loosen the cylinder head bolts in order from -1- to -10-.

Cylinder Head Tightening Sequence



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 Cover Overview



1 - Bolt

- Tightening sequence, 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

- Replace after removing
- Coat with oil before installing

9 - Engine

10 - Lower Cover for Timing Chain

11 - Shaft Seal

12 - Plug

- Replace after removing

13 - Bolt

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

14 - Bolt

- 9 Nm

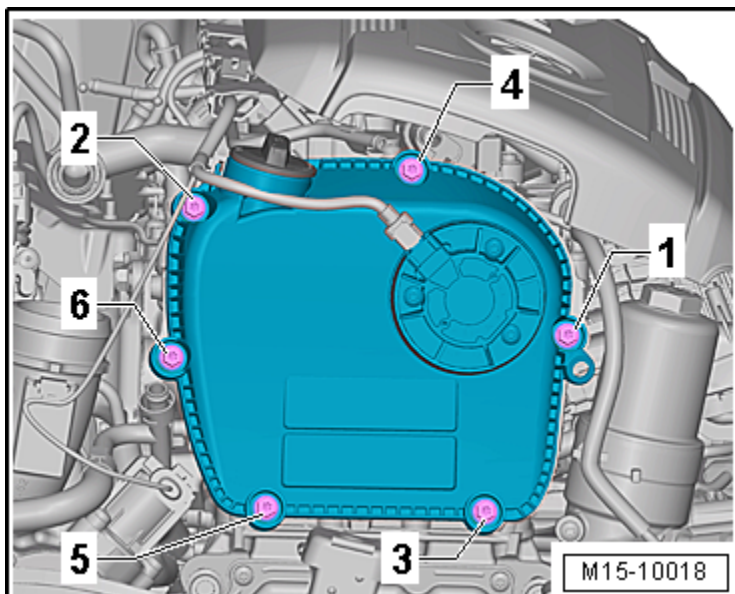
15 - Oil Dipstick Tube

16 - Bolt

- See Assembly Mounts Overview

17 - Engine Support

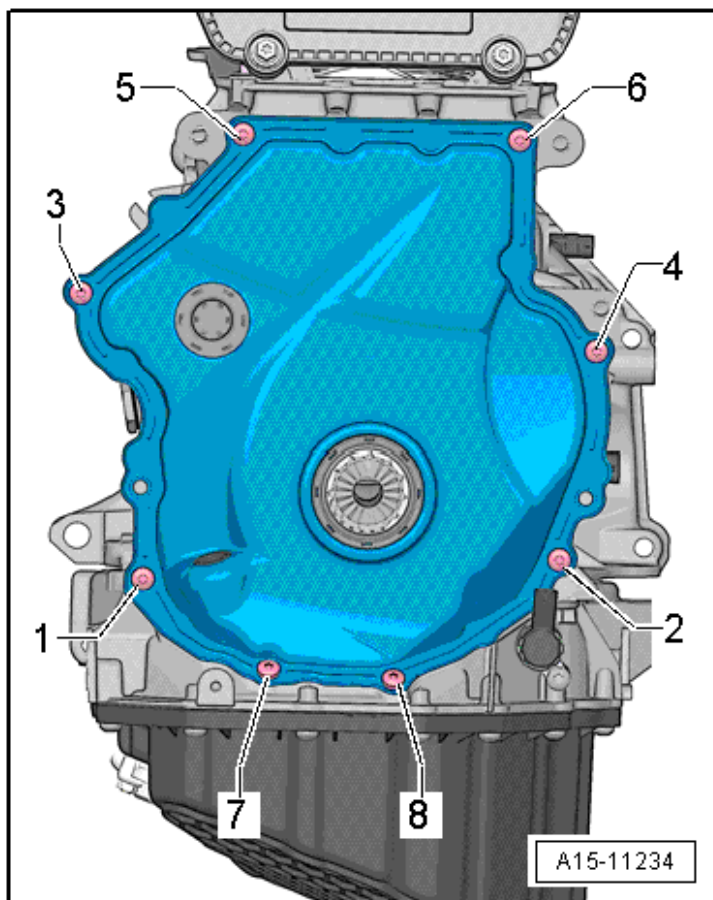
Timing Chain Guard Upper Cover - Tightening Sequence



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 9 Nm

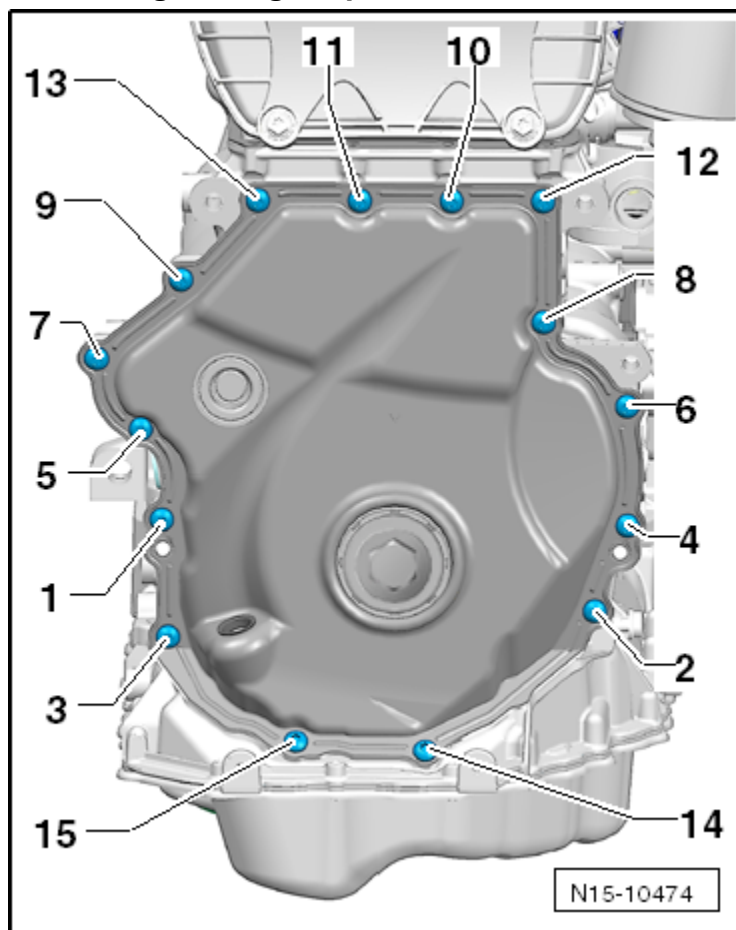
Lower Cover for Timing Chain Tightening Sequence



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

Stage	Bolts	Tightening specification/additional turn
1	-1- through -8-	Tighten to 4 Nm
2	-1- through -8-	Tighten 45° additional turn

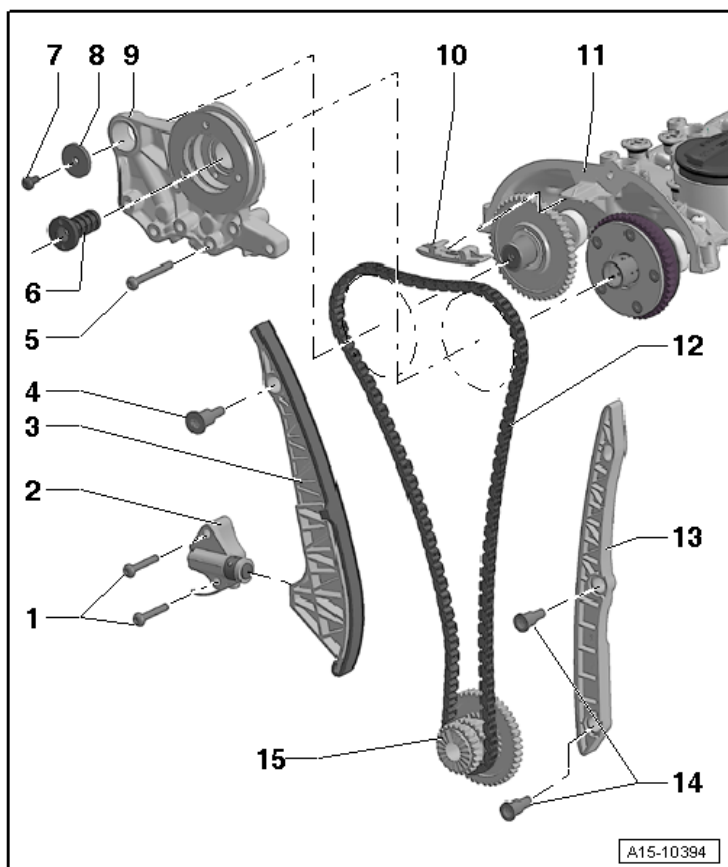
Lower Cover for Timing Chain - Tightening Sequence for 15 Bolts



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

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

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

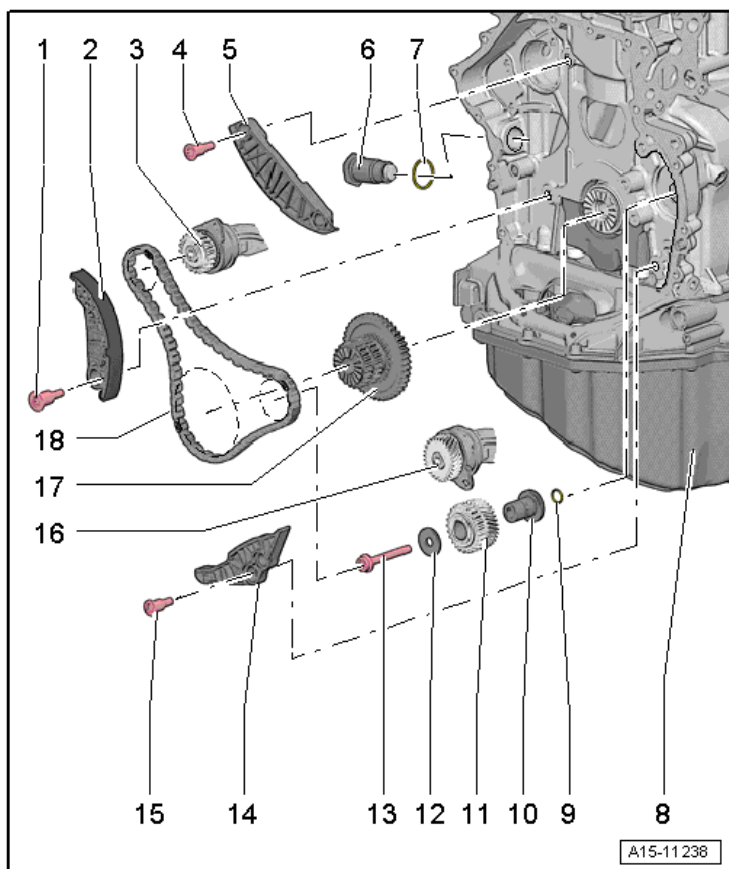
- 35 Nm

7 - Bolt

- M6: 8 Nm + 90° turn
- M8: 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

4 - Guide Pins

- 20 Nm

5 - Guide Rail

6 - Chain Tensioner

- 20 Nm
- Mount with locking compound

7 - Seal

8 - Piston

9 - O-ring

- Lubricate with engine oil

10 - Mounting Pin

- Lubricate with engine oil

11 - Intermediate Sprocket

12 - Washer

13 - Bolt

- Tightening sequence, see Intermediate Sprocket Tightening Sequence below
- Replace after removing

14 - Guide Rail

15 - Guide Pins

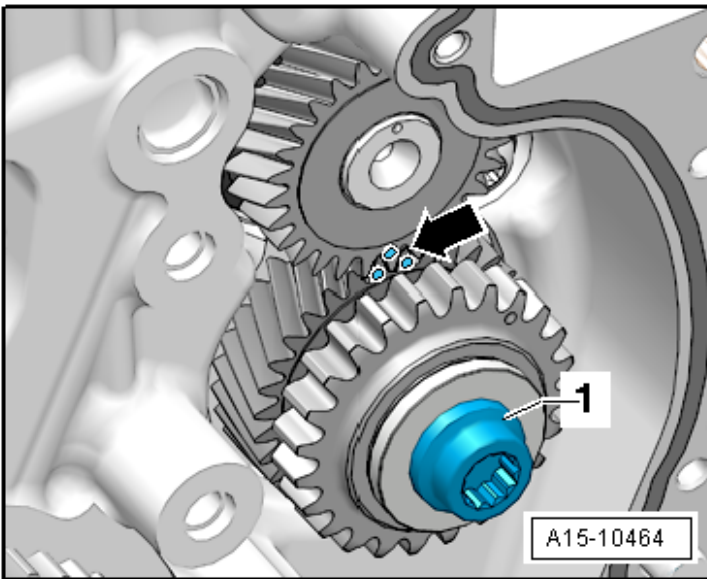
- 20 Nm

16 - Balance Shaft

17 - Three Stage Chain Sprocket

18 - Balance Shaft Drive Chain

Intermediate Sprocket Tightening Sequence



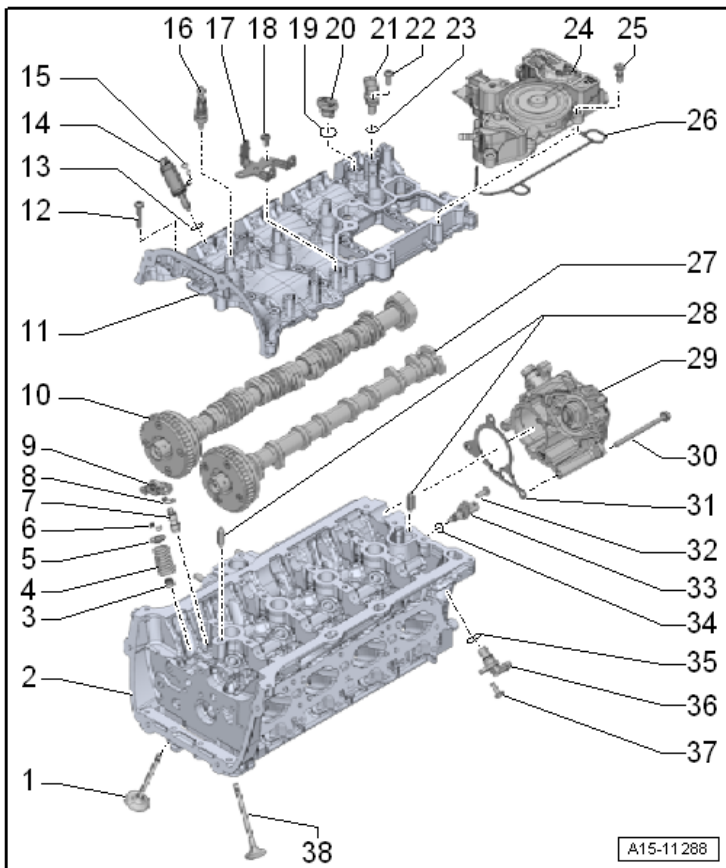
Caution

Always replace the intermediate sprocket. Otherwise the backlash will not adjust itself and it could result in engine damage. The new intermediate sprocket has an anti-friction coating that wears off after a short period of use, which automatically adjusts the backlash

Tighten with a new bolt as follows:

Stage	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.

Valvetrain Overview



- 1 - Intake Valve
- 2 - Cylinder Head
- 3 - Valve Stem Seal
- 4 - Valve Spring
- 5 - Valve Spring Retainer
- 6 - Valve Retainers
- 7 - Hydraulic Adjusting Element
- 8 - Clip
- 9 - Roller Rocker Lever
- 10 - Exhaust Camshaft
- 11 - Cylinder Head Cover
- 12 - Bolt

- Loosening, see Loosening the Cylinder Head Cover below
- Tightening specification and sequence, see Cylinder Head Cover, Tightening Specifications and Sequence below

13 - O-ring

- Not installed

14 - Cam Adjustment Actuator

- Not installed

15 - Bolt

- Not installed

16 - Ball Pin

- 9 Nm

17 - Bracket

18 - Bolt

- 9 Nm

19 - O-ring

- Replace after removing
- Coat with engine oil

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 specification and sequence, see Oil Separator - Tightening Sequence below

26 - Seal

- Replace after removing

27 - Intake Camshaft

28 - Alignment Pins

29 - Vacuum Pump

30 - Bolt

31 - Seal

32 - Bolt

- 4 Nm + 45° turn
- Replace after removing

33 - Engine Coolant Temperature Sensor -G62-

34 - O-ring

- Replace after removing
- Coat with coolant

35 - O-ring

- Replace after removing
- Coat with engine oil

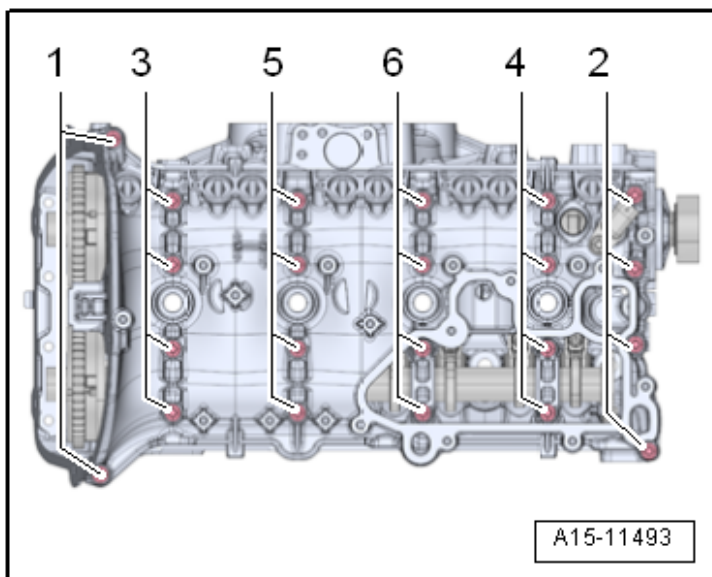
36 - Camshaft Position Sensor -G40-

37 - Bolt

- Tightening specification, see Ignition System Overview

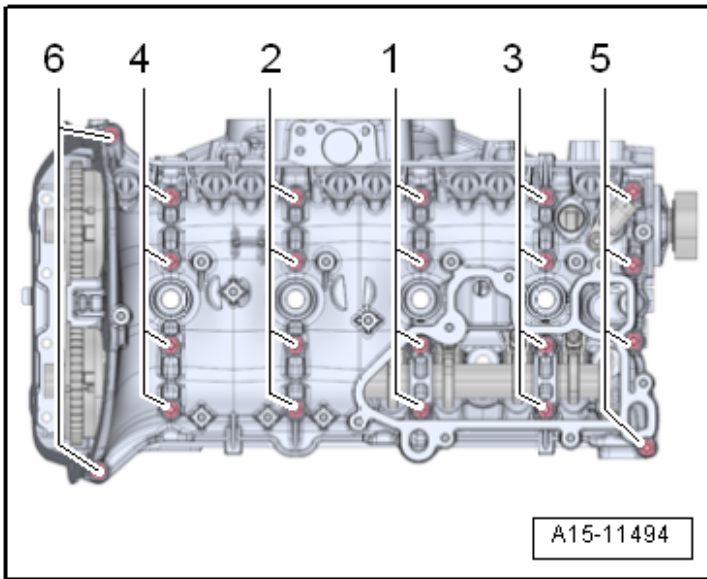
38 - Exhaust Valve

Loosening the Cylinder Head Cover



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

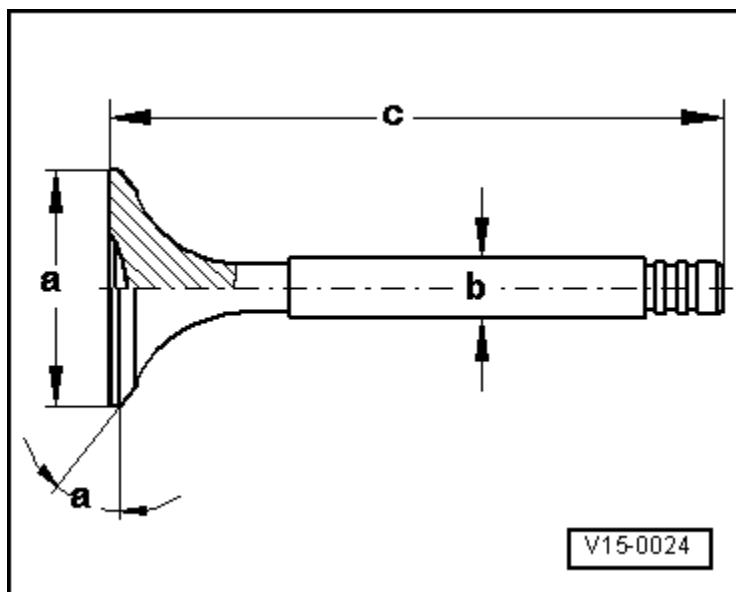
Cylinder Head Cover, Tightening Specifications and Sequence



Replace the bolts.

Stage	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-	ighten 90° further using a rigid wrench

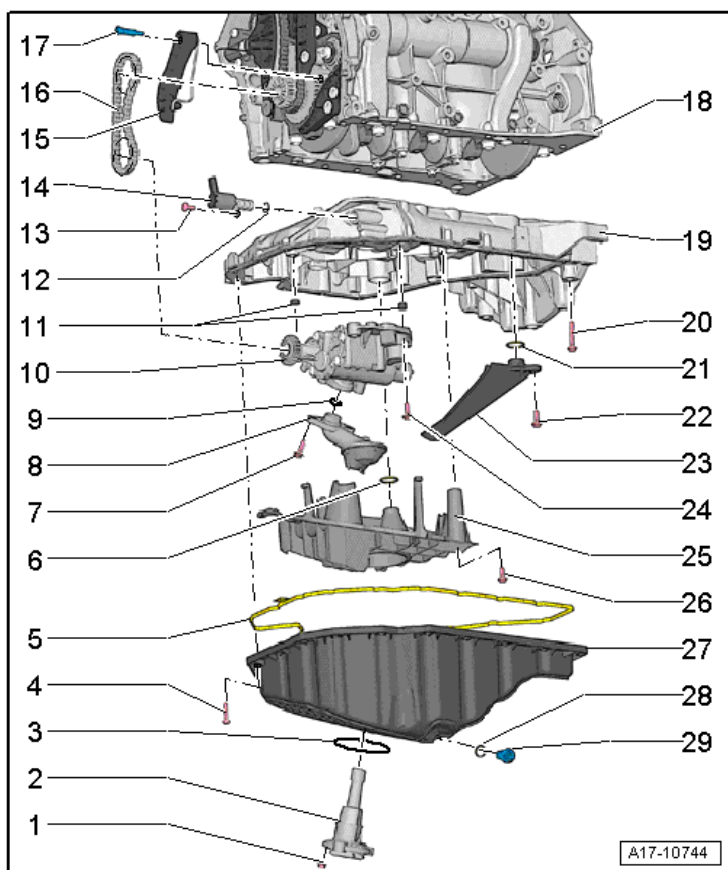
Valve Dimensions



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	$^{\circ}$	45	45

Lubrication – 1.8L CPKA, CPRA

Oil Pan/Oil Pump Overview



1 - Nut

- 9 Nm

2 - Oil Level Thermal Sensor -G266-

3 - Seal

- Replace after removing

4 - Bolt

- Tightening sequence, see Sheet Metal Oil Pan Lower Section - Tightening Sequence below
- Replace after removing

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

- 4 Nm + 90° turn
- Replace after removing

14 - Oil Pressure Regulation Valve -N428-

15 - Chain Tensioner

16 - Pump Drive Chain

17 - Bolt

- 9 Nm

18 - Cylinder Block

19 - Oil Pan Upper Section

20 - Bolt

- Tightening sequence, 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 + 90° turn
- Replace after removing

25 - Oil Baffle

- Replace after removing

26 - Bolt

- 4 Nm + 45° turn
- Replace after removing

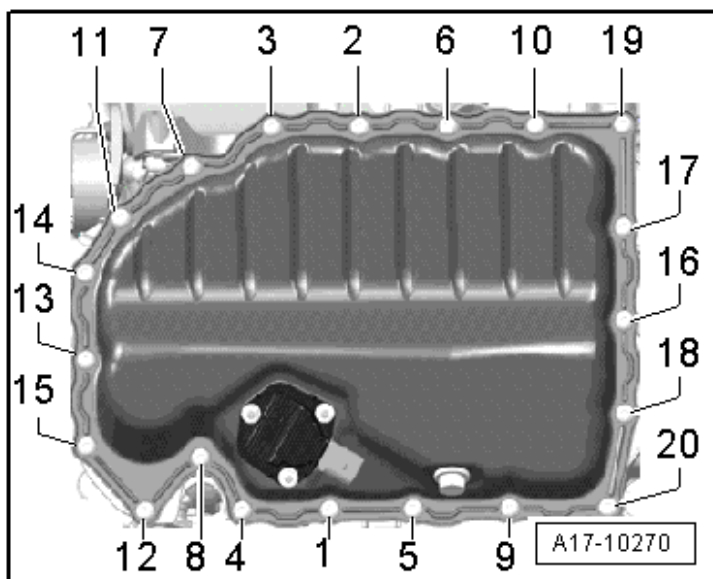
27 - Oil Pan Lower Section

28 - Seal

29 - Oil Drain Plug

- 30 Nm

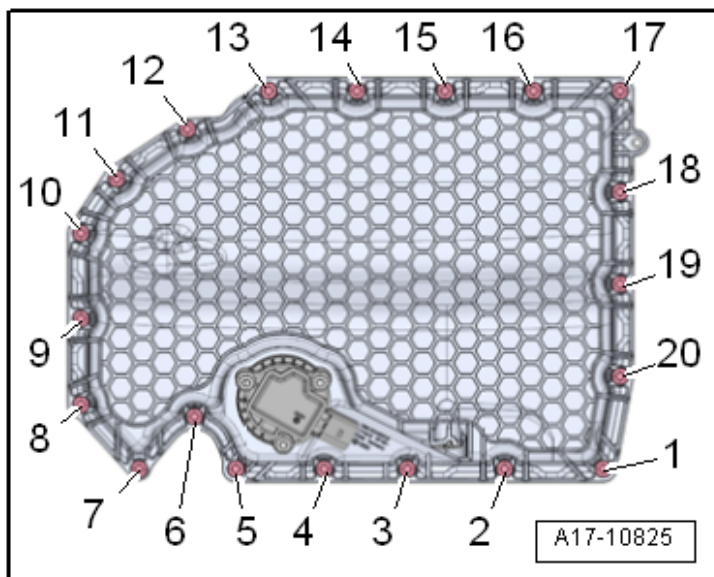
Sheet Metal Oil Pan Lower Section - Tightening Sequence



Replace the bolts were tightened with an additional turn. Tighten the bolts -1- through -20- in two stages in the sequence shown:

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

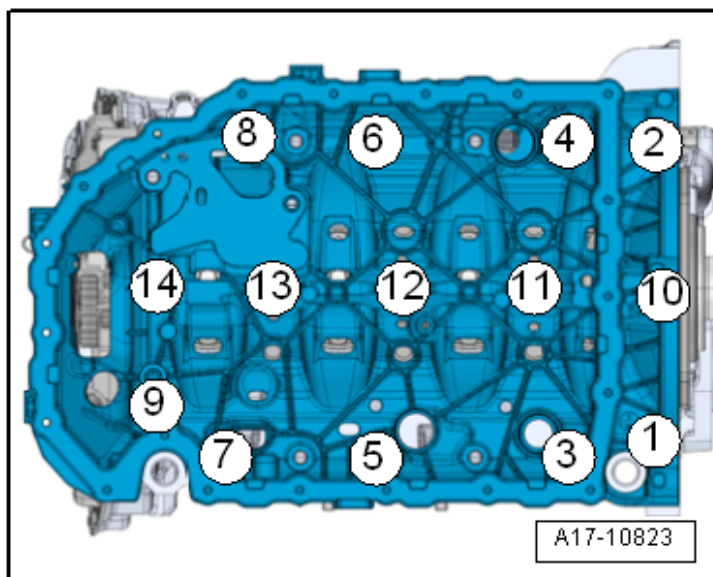
Tightening Sequence for Lower Plastic Oil Pan



Replace the bolts were tightened with an additional turn. Tighten the bolts -1- through -20- in two stages in the sequence shown:

Stage	Bolts	Tightening specification/additional turn
1	-1- through -20-	Tighten to 8 Nm
2	-1- through -20-	Tighten 90° additional turn

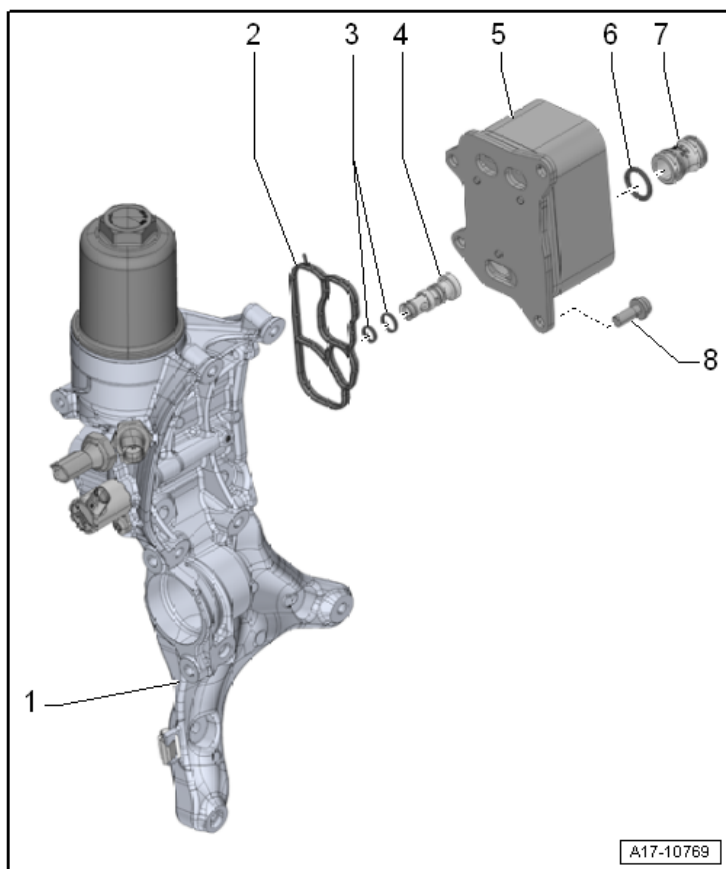
Oil Pan Upper Section - Tightening Sequence



Replace the bolts were tightened with an additional turn. ten the bolts -1- through -14- in the sequence shown:

Stage	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	11- through -14-	Tighten 90° additional turn

Engine Oil Cooler Overview



1 - Auxiliary Components Bracket

2 - Seal

- Replace after removing

3 - O-ring

- Replace after removing
- Coat with engine oil

4 - Mechanical Switch Valve

5 - Engine Oil Cooler

6 - Seal

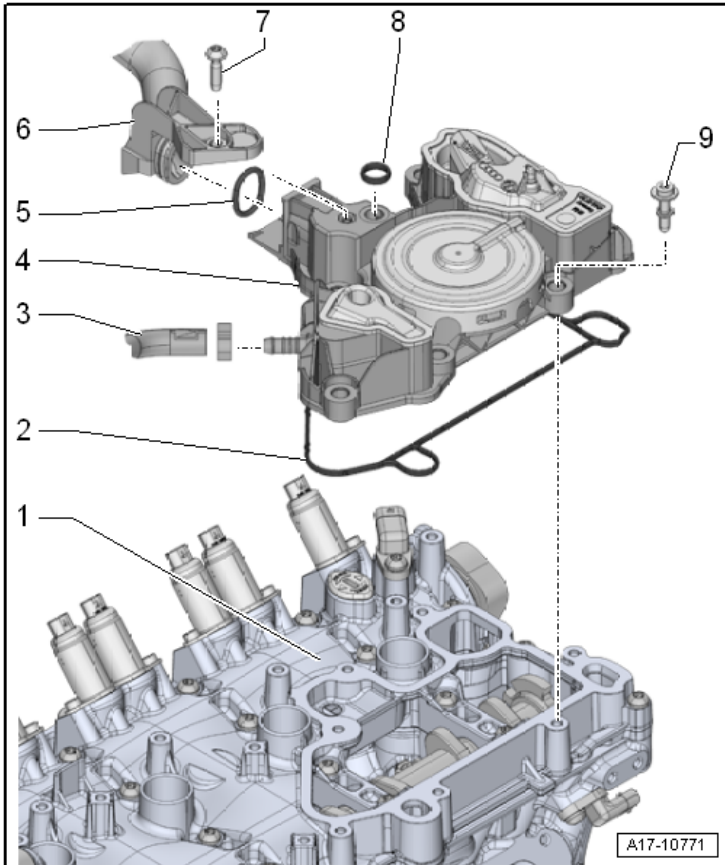
- Replace after removing
- Coat with coolant

7 - Connection

8 - Bolt

- 8 Nm + 45° turn
- Replace after removing

Crankcase Ventilation Overview



1 - Cylinder Head Cover

2 - Seal

- Replace after removing

3 - Hose

4 - Oil Separator

5 - Seal

6 - Hose

7 - Bolt

- 4 Nm

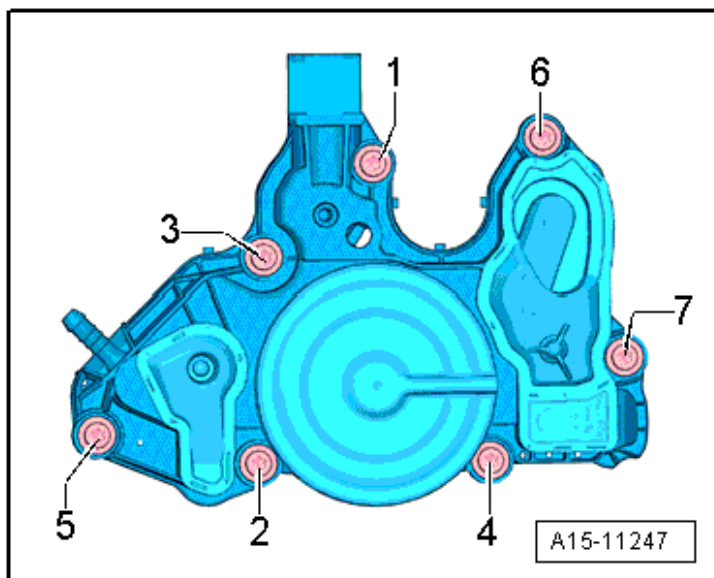
8 - Seal

- Replace after removing

9 - Bolt

- Position the bolt by hand and tighten it until it finds the old threads. Then tighten the bolt to the specification.
- Tightening specification and sequence, see Oil Separator - Tightening Sequence below

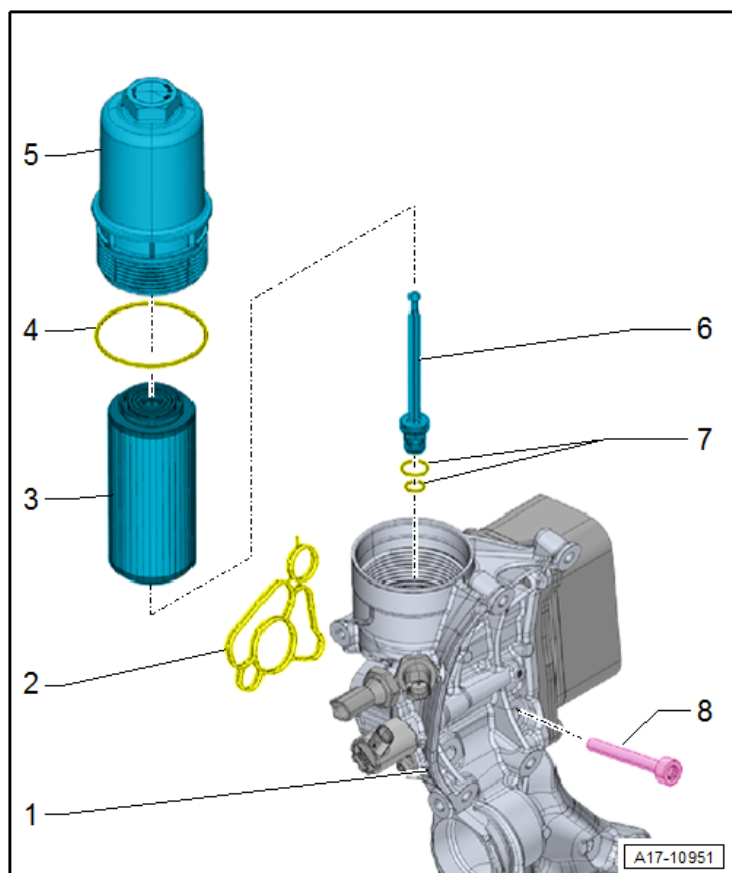
Oil Separator - Tightening Sequence



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

Bolts	Tightening specification/additional turn
-1- through -20-	Tighten to 9 Nm

Oil Filter Overview



1 - Auxiliary Components Bracket

2 - Seal

3 - Oil Filter

4 - O-ring

5 - Oil Filter Housing

25 Nm

6 - Oil Drain Supports

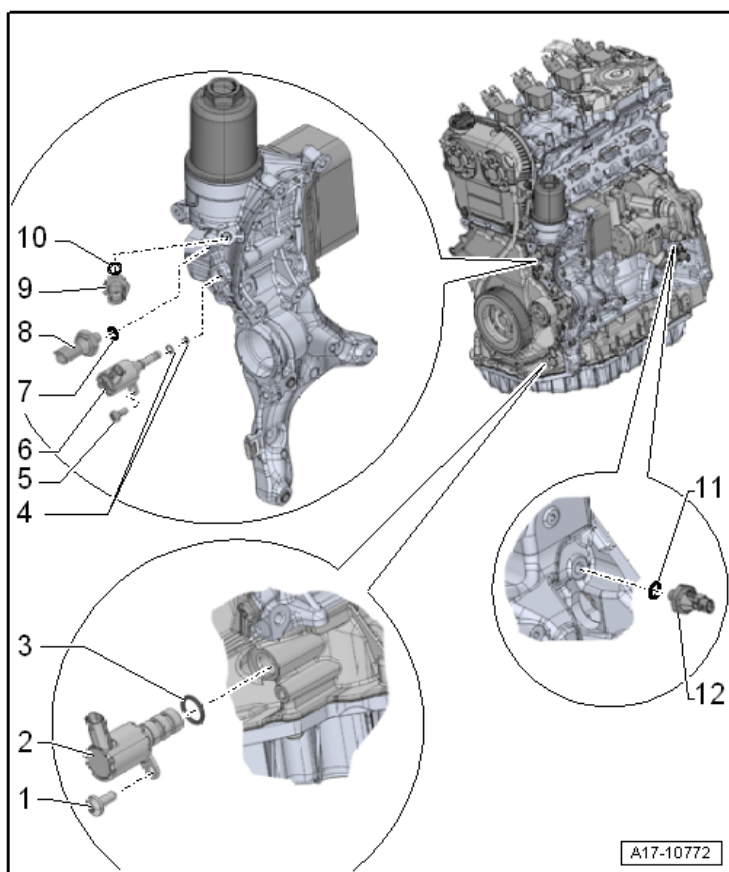
7 - O-rings

Replace after removing

8 - Bolt

Tightening specification and sequence, see Accessory Assembly Bracket - Tightening Specifications and Tightening Sequence in Cylinder Block Overview, Belt Pulley Side

Oil Pressure Switch/Oil Pressure Regulator Valve Overview



1 - Bolt

- 4 Nm + 90° turn
- Replace after removing

2 - Oil Pressure Regulation Valve -N428-

3 - O-ring

- Replace after removing
- Coat with engine oil

4 - O-ring

- Not installed

5 - Bolt

- Not installed

6 - Valve Retainers

7 - Seal

8 - Oil Pressure Switch -F22-

20 Nm

9 - Reduced Oil Pressure Switch -F378-

20 Nm

10 - Seal

11 - Seal

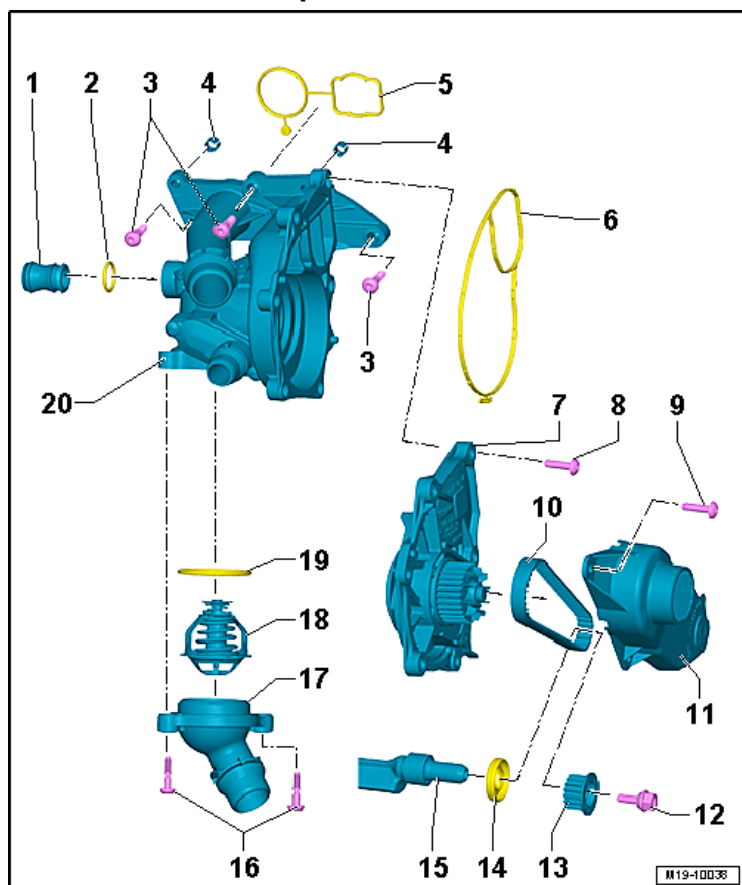
Not installed

12 - Oil Pressure Switch, Level 3 -F447-

Not installed

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 sequence, see Coolant Pump - Tightening Specification and Sequence below

9 - Bolt

- 9 Nm

10 - Toothed Belt

11 - Toothed Belt Cover

12 - Bolt

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

13 - Drive Gear for Toothed Belt

14 - Balance Shaft Seal Intake Side

15 - Balance Shaft

16 - Bolt

- 9 Nm

17 - Connecting Piece

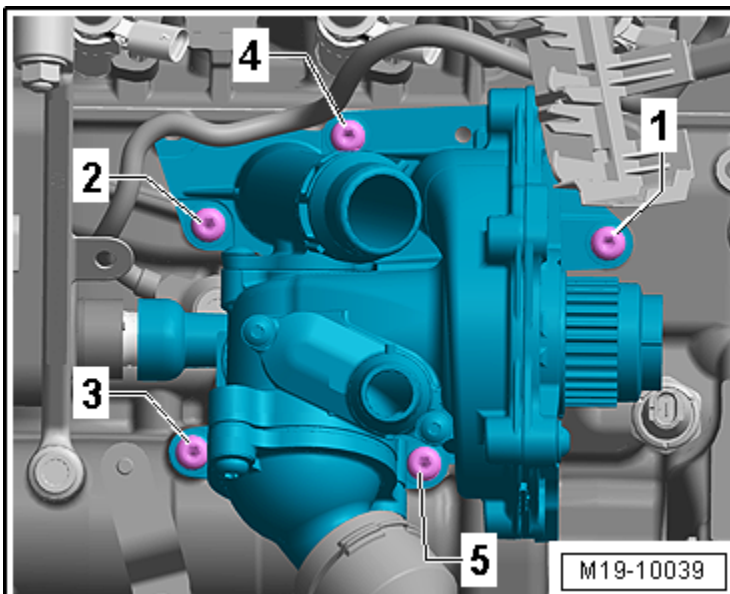
18 - Thermostat

19 - O-ring

- Replace after removing

20 - Coolant Thermostat

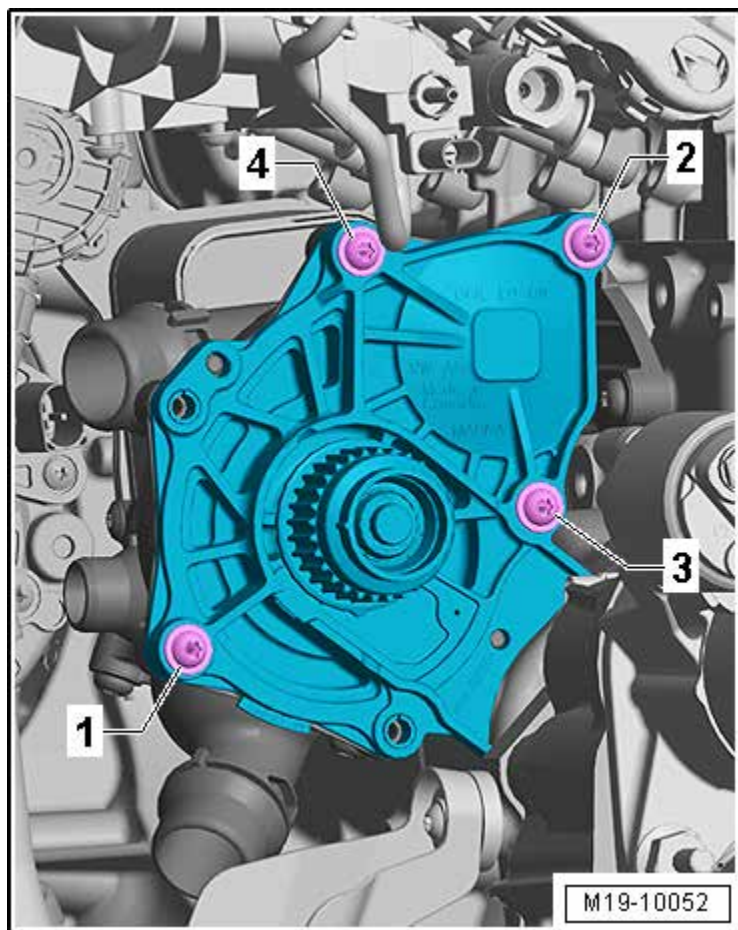
Thermostat - Tightening Specification and Tightening Sequence



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

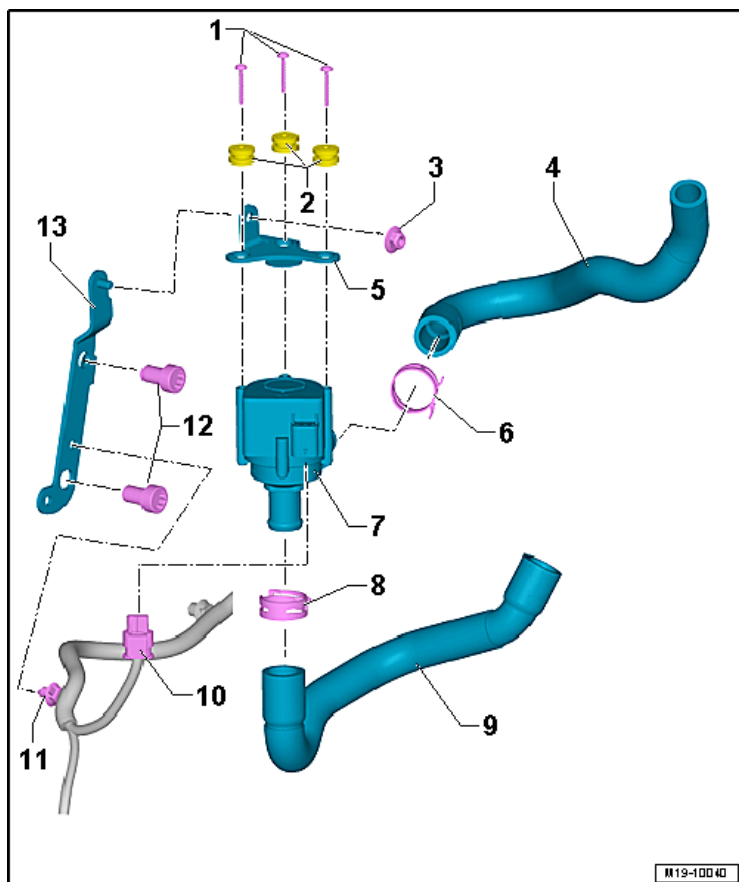
Engine -
1.8L CPKA, CPRA

Coolant Pump - Tightening Specification and Sequence



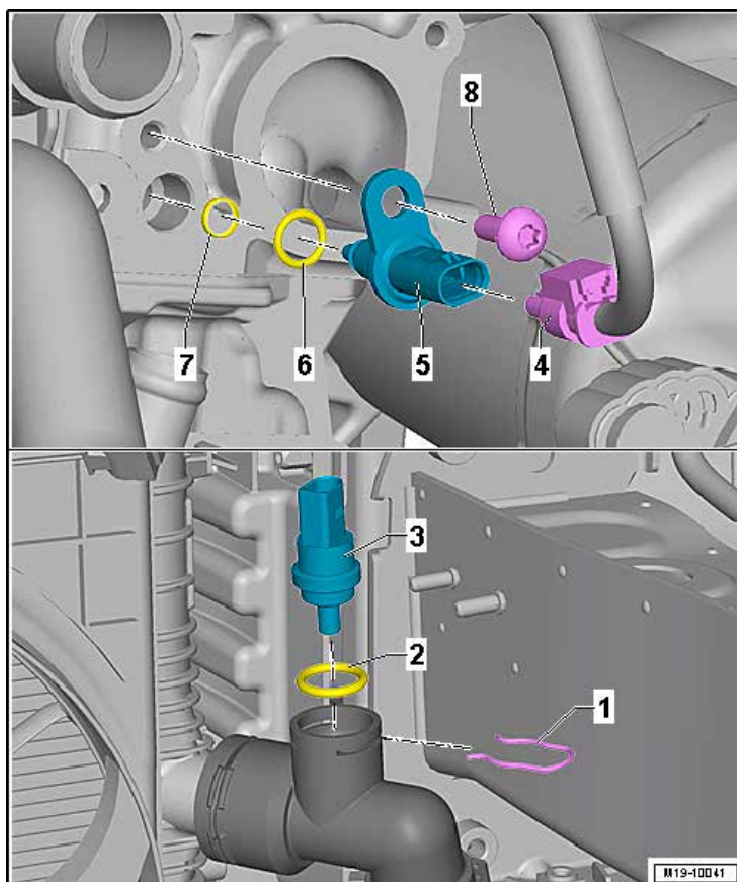
Tightening sequence	Tightening specification
-1- through -4-	Tighten to 9 Nm

Electric Coolant Pump Overview



- 1 - Bolt
 - 5 Nm
- 2 - Plastic Sockets
- 3 - Nut
 - 9 Nm
- 4 - Coolant Hose
- 5 - Bracket
- 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-

6 - O-ring

- Replace after removing
- Coat with coolant

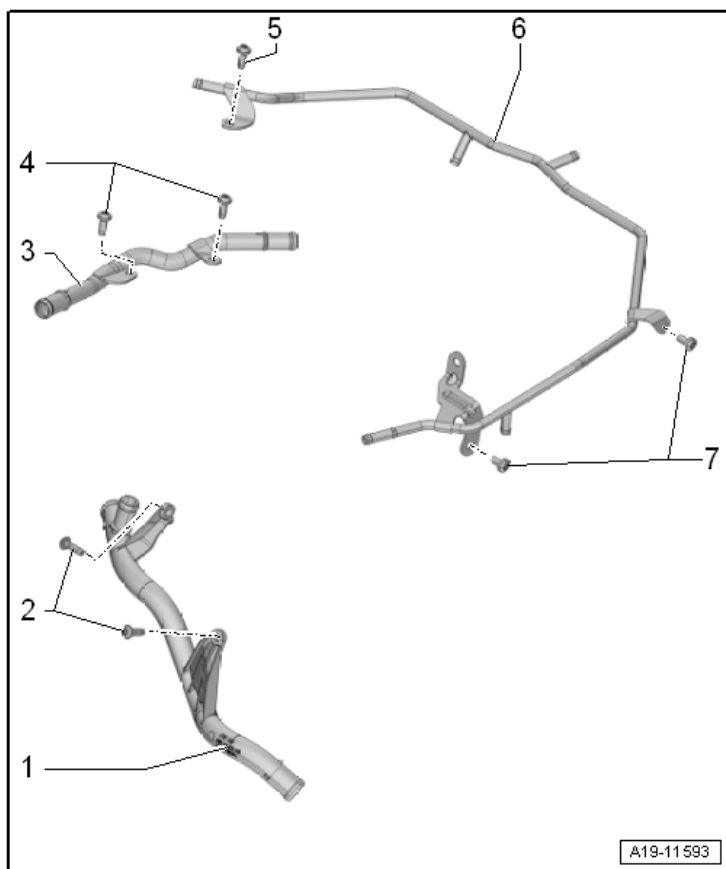
7 - O-ring

- Replace after removing
- Coat with coolant

8 - Bolt

- 4 Nm + 45° turn
- Replace after removing

Coolant Pipes Overview



1 - Front Coolant Pipe

2 - Bolts

□ 6 Nm

3 - Upper Coolant Pipe

4 - Bolts

□ 9 Nm

5 - Bolt

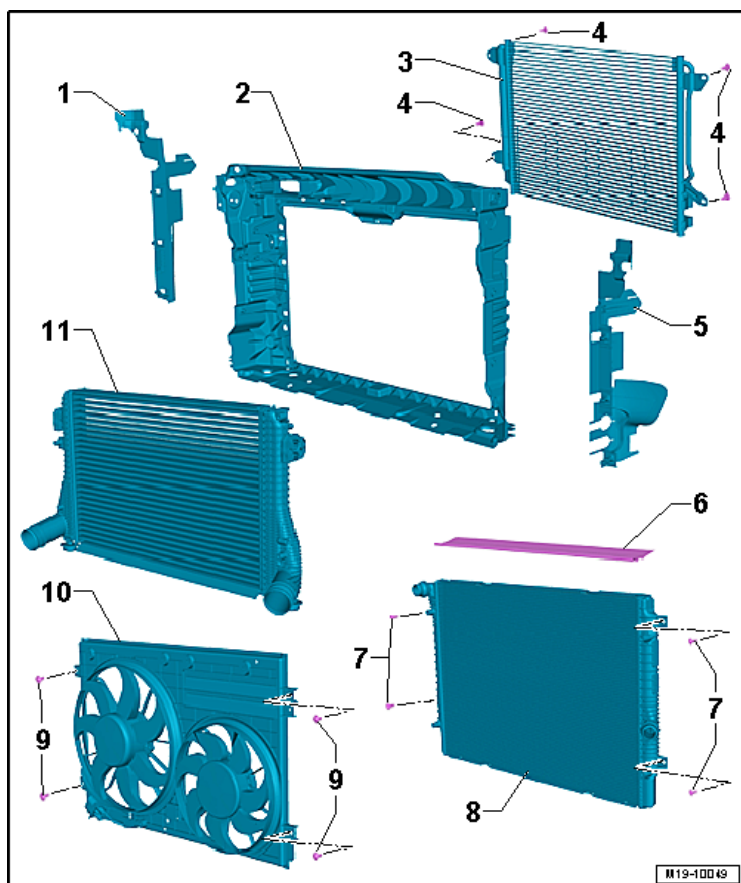
□ 9 Nm

6 - Coolant Pipe

7 - Bolt

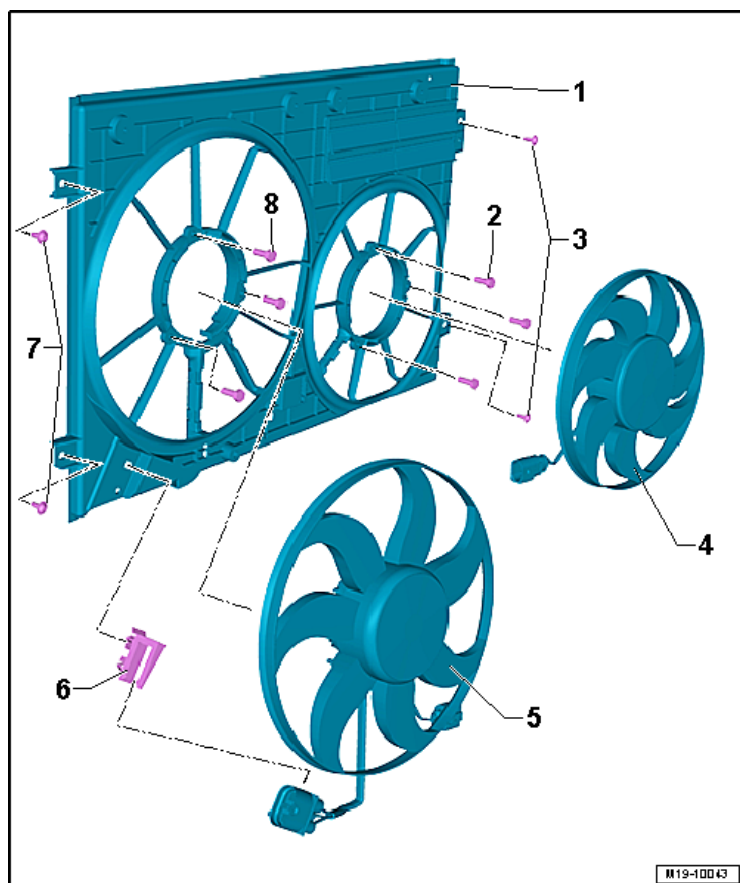
□ 9 Nm

Radiator/Coolant Fan Overview



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

Fan Shroud and Radiator Fan Overview



1 - Fan Shroud

2 - Bolt

□ 5 Nm

3 - Bolt

□ Tightening specification, see Radiator/Coolant Fan Overview

4 - Coolant Fan 2 -V177-

5 - Coolant Fan -V7-

6 - Bracket

7 - Bolt

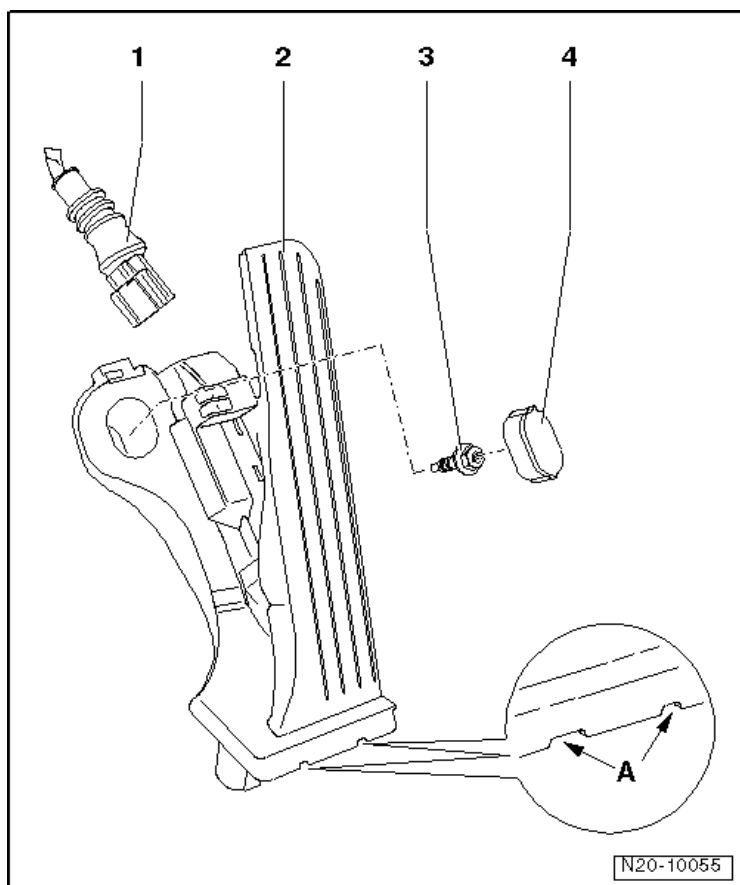
□ Tightening specification, see Radiator/Coolant Fan Overview

8 - Bolt

□ 8 Nm

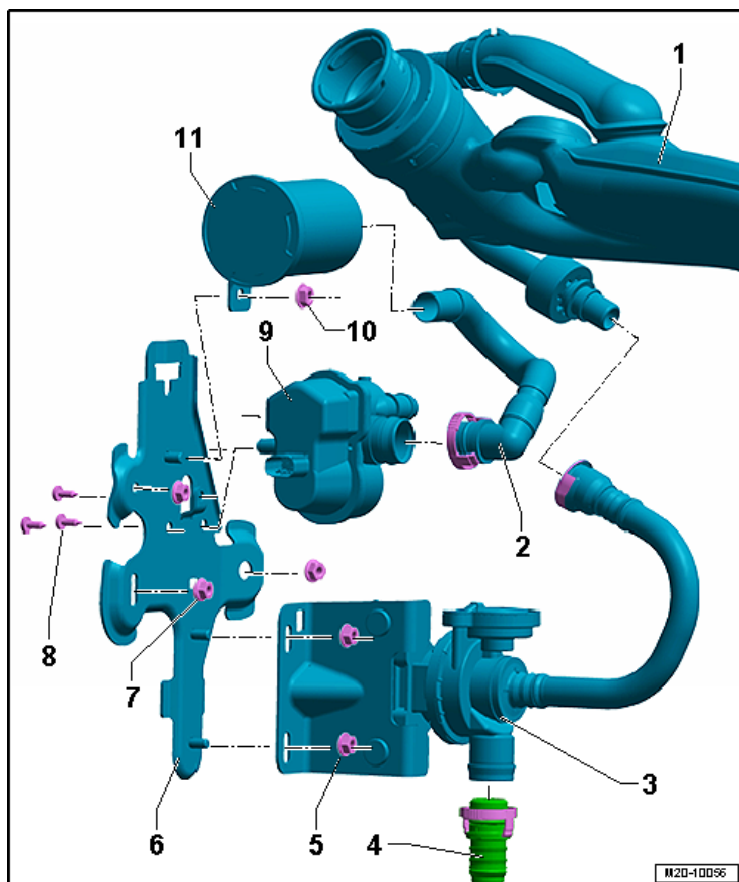
Fuel Supply – 1.8L CPKA, CPRA

Accelerator Pedal Module Overview



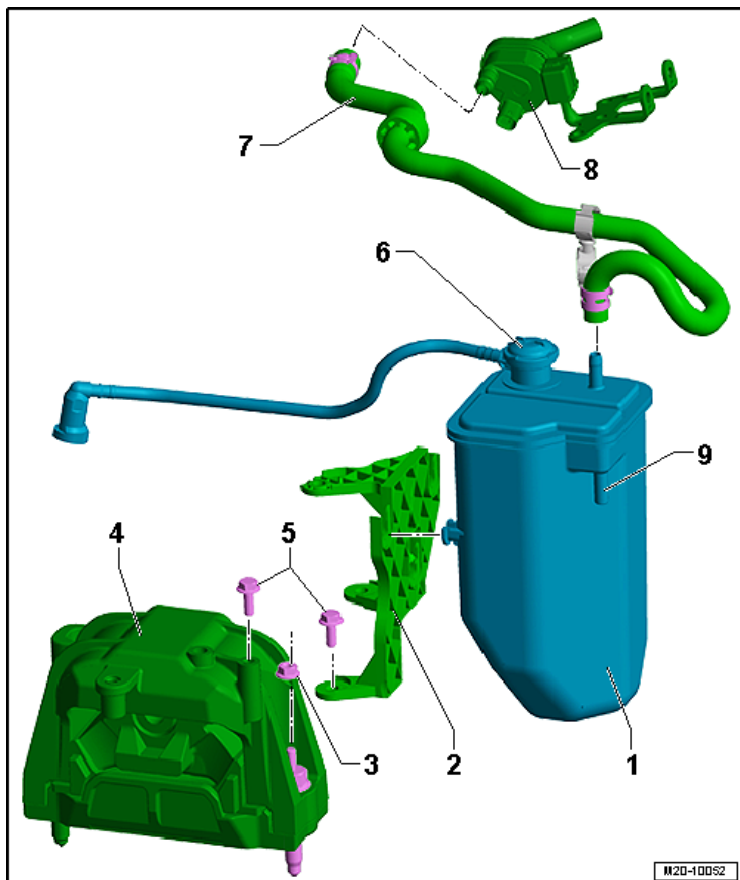
- 1 - Connector
- 2 - Accelerator Pedal Module with the Accelerator Pedal Position Sensor -G79- and Accelerator Pedal Position Sensor 2 -G185-
- 3 - Bolt
 - 10 Nm
- 4 - Cap

Leak Detection Pump -V144- Assembly Overview



- 1 - Fuel Tank Filler Tube
- 2 - Connecting Pipe
- 3 - Connecting Pipe
- 4 - Connecting Pipe
- 5 - Nut
 - 6 Nm
- 6 - Bracket
- 7 - Nut
 - 6 Nm
- 8 - Bolts
 - 3 Nm
- 9 - Leak Detection Pump -V144-
- 10 - Nut
 - 2 Nm
- 11 - Air Filter

EVAP Canister Installed in Engine Compartment



1 - EVAP Canister

2 - Bracket

3 - Nut

□ 10 Nm

4 - Engine Mount

5 - Bolts

□ 10 Nm

6 - Connecting Line

7 - Connecting Line

8 - EVAP Canister Purge Regulator Valve 1 -N80-

9 - Vent Hole

13 - Bolt

3 Nm

14 - Bracket

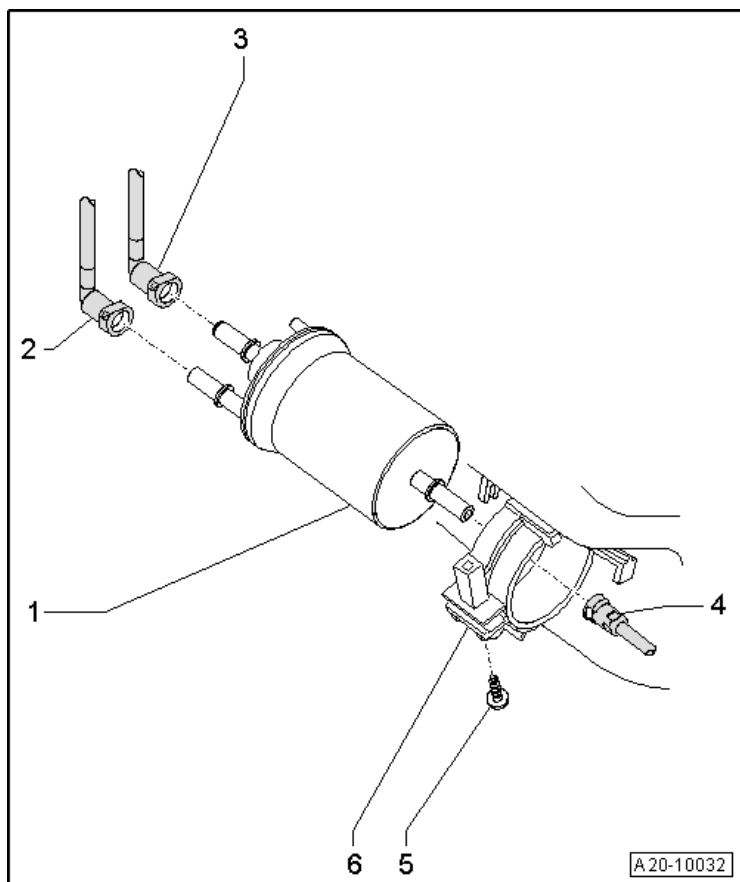
15 - Leak Detection Pump -V144-

16 - Air Filter

17 - Connecting Line

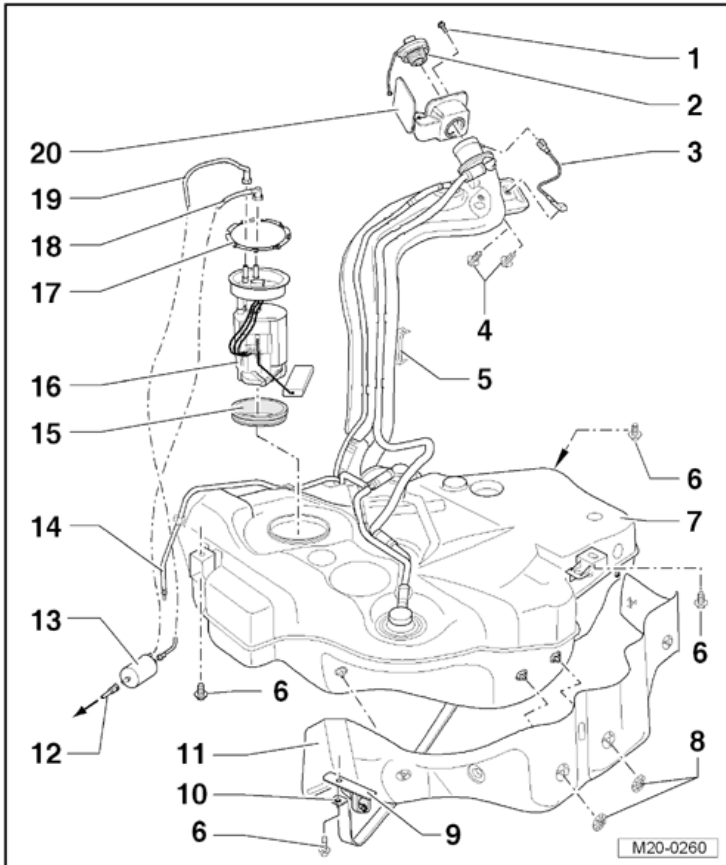
18 - Valve

Fuel Filter Overview



- 1 - Fuel Filter
- 2 - Fuel Supply Line
- 3 - Fuel Return Line
- 4 - Fuel Supply Line
- 5 - Bolt
 - 3 Nm
- 6 - Bracket for Fuel Filter

Fuel Tank and Attachments Overview

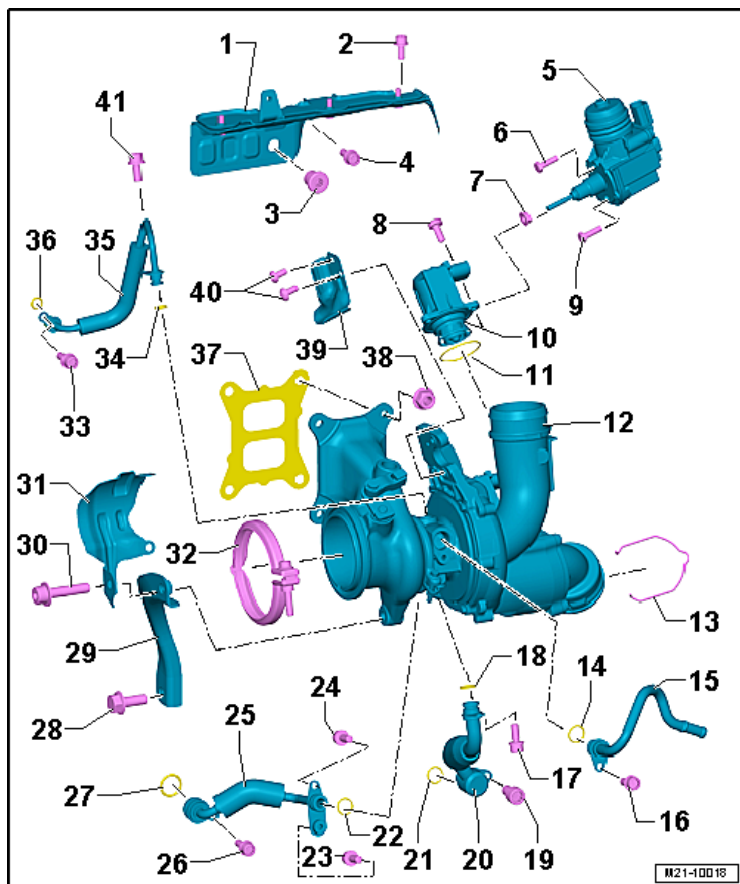


- 1 - Bolt
- 2 - Cover
- 3 - Ground Connection
- 4 - Bolt
 - 10 Nm
- 5 - Wiring Guide
- 6 - Bolt
 - 25 Nm
 - Replace after removing
- 7 - Fuel Tank
- 8 - Lock Washer
- 9 - Exhaust System Bracket
- 10 - Mounting Strap
- 11 - Heat Shield
- 12 - Supply Line
- 13 - Fuel Filter
- 14 - Vent Line

- 15 - Seal**
- 16 - Fuel Delivery Unit**
- 17 - Locking Ring**
 - 110 Nm
- 18 - Supply Line**
- 19 - Return Line**
- 20 - Fuel Filler Door Unit**

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

Replace turbocharger after loosening bolt.

Do not remove the Charge Pressure Actuator -V465-.

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
 - Coat with coolant
- 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

33 - Bolt

- 9 Nm

34 - O-ring

- Replace after removing
- Coat with engine oil

35 - Oil Supply Line

36 - O-ring

- Replace after removing
- Coat with engine oil

37 - Seal

- Replace after removing

38 - Nut

- 25 Nm
- Replace after removing

39 - Heat Shield

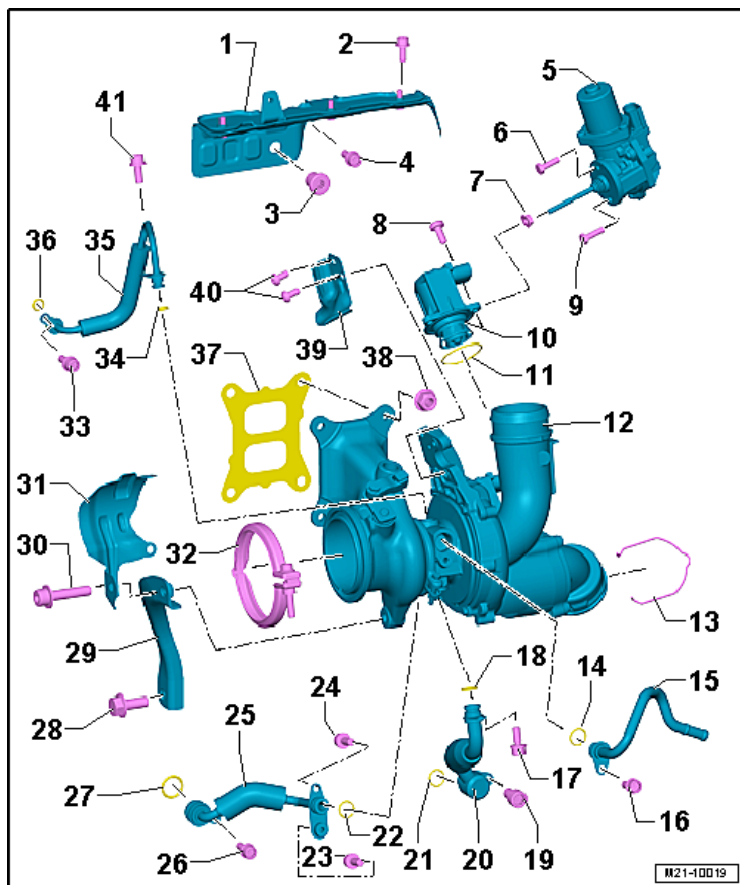
40 - Bolt

- 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
- Coat with coolant

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

33 - Bolt

- 9 Nm

34 - O-ring

- Replace after removing
- Coat with engine oil

35 - Oil Supply Line

36 - O-ring

- Replace after removing
- Coat with engine oil

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-

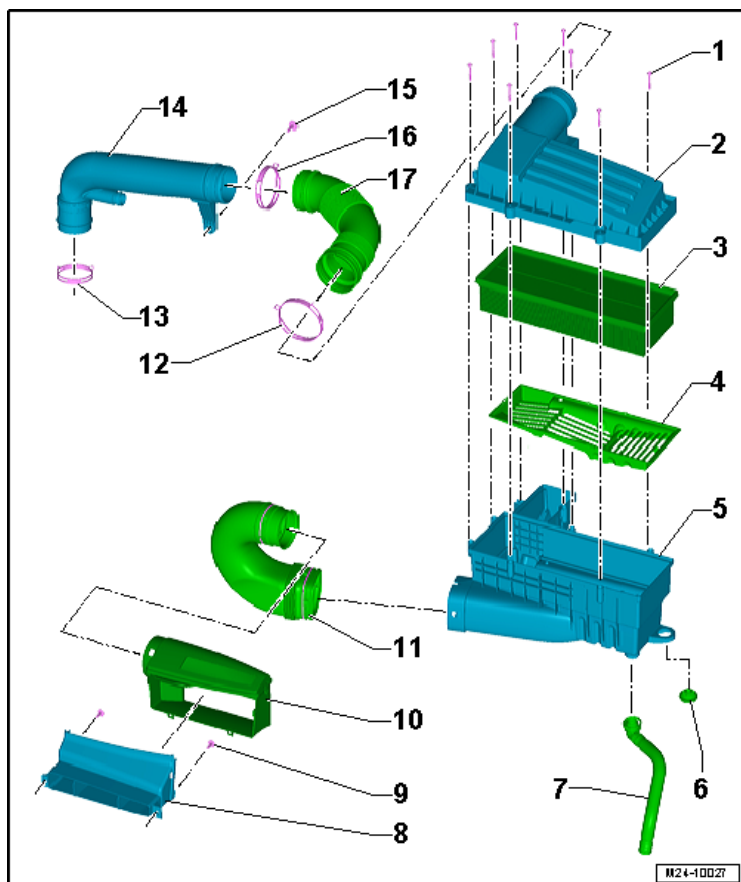
20 - Air Guide Hose

Fastener Tightening Specifications

Component	Nm
Hose clamp width 9 mm wide	3
Hose clamp width 13 mm wide	5.5

- 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 - Bolts**
 - 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**
 - 9 Nm
- 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**
 Not installed on all vehicles
- 5 - Air Filter Housing Lower Section**
 Bolt 8
- 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

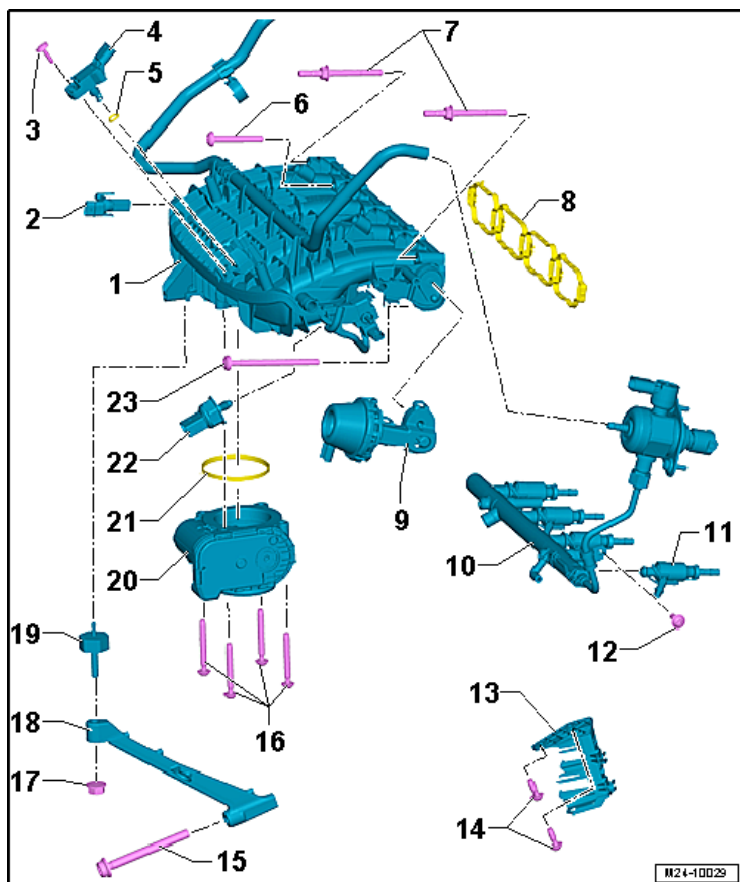
15 - Bolt

5 Nm

16 - Spring Clamp

17 - Air Guide Hose

Intake Manifold Overview



- 1 - Intake Manifold
- 2 - Intake Manifold Runner Position Sensor -G336-
- 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

13 - Bracket

14 - Bolt

- 5 Nm

15 - Bolt

- 20 Nm

16 - Bolts 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

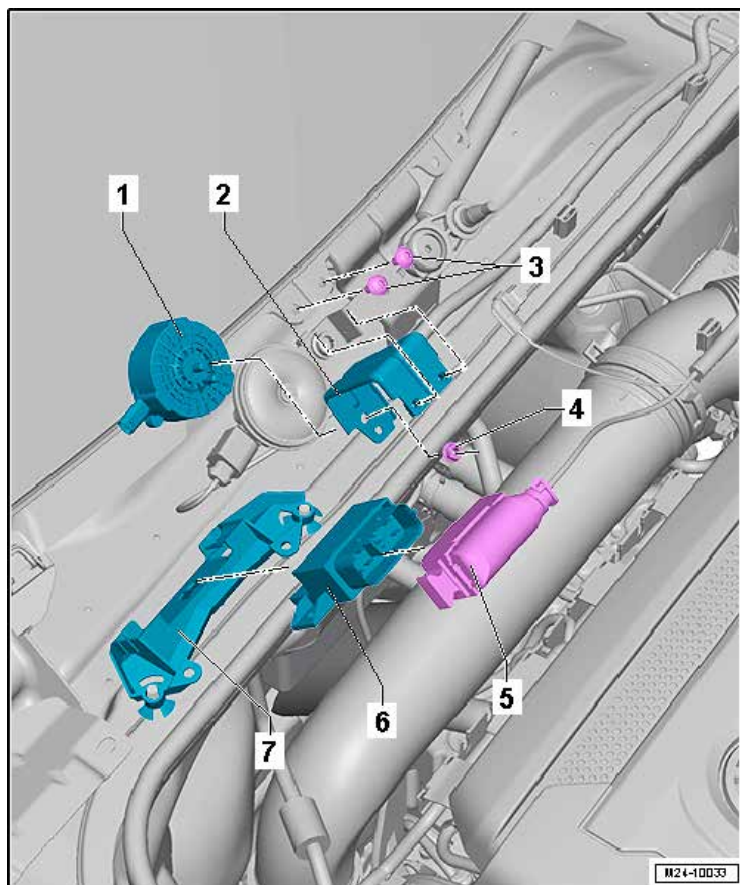
- Replace after removing

22 - Fuel Pressure Sensor -G247-

23 - Bolt

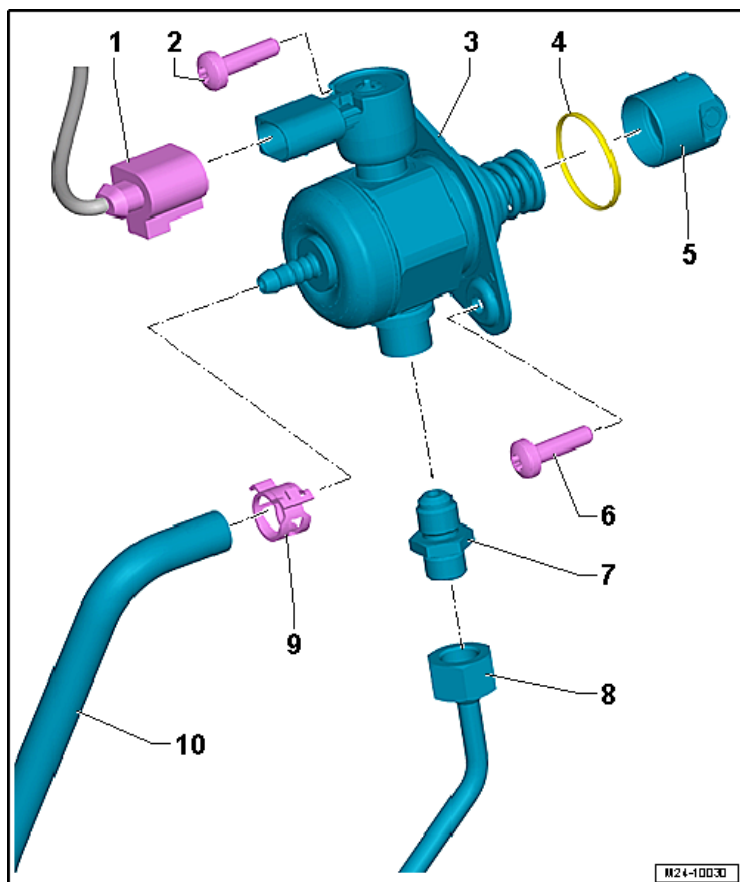
- 9 Nm

Structure Borne Sound Actuator and Control Module Overview



- 1 - Structure-Borne Sound Actuator -R214-**
- 2 - Bracket**
- 3 - Bolt**
 - 8 Nm
- 4 - Nut**
 - 15 Nm
- 5 - Connector**
- 6 - Structure Borne Sound Control Module -J869-**
- 7 - Bracket**

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

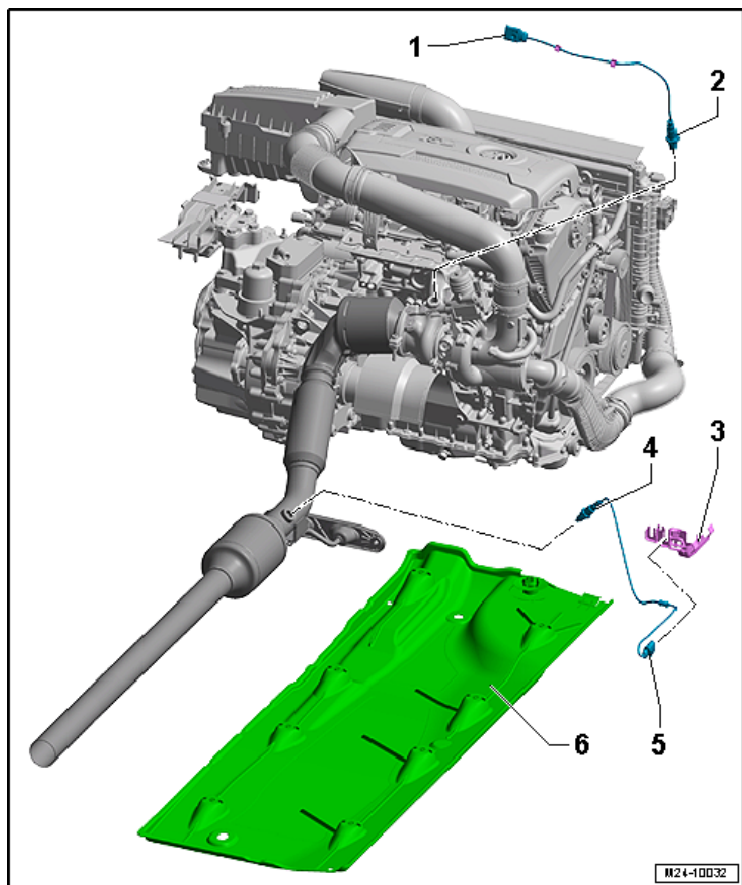
- 30 Nm
- Replace after removing

8 - Fuel Supply Line

9 - Spring Clamp

10 - Fuel Supply Line

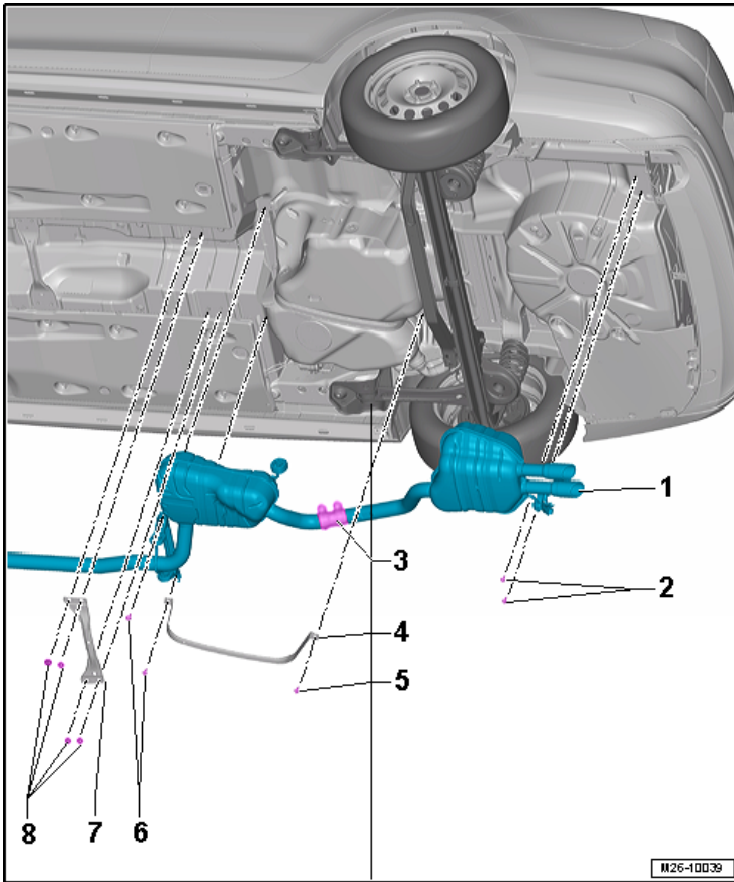
Heated Oxygen Sensor and Two Heated Oxygen Sensors Overview



- 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 for 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

3 - Separating Point

4 - Mounting Strap

5 - Bolt

□ Tightening specification refer to Turbocharger

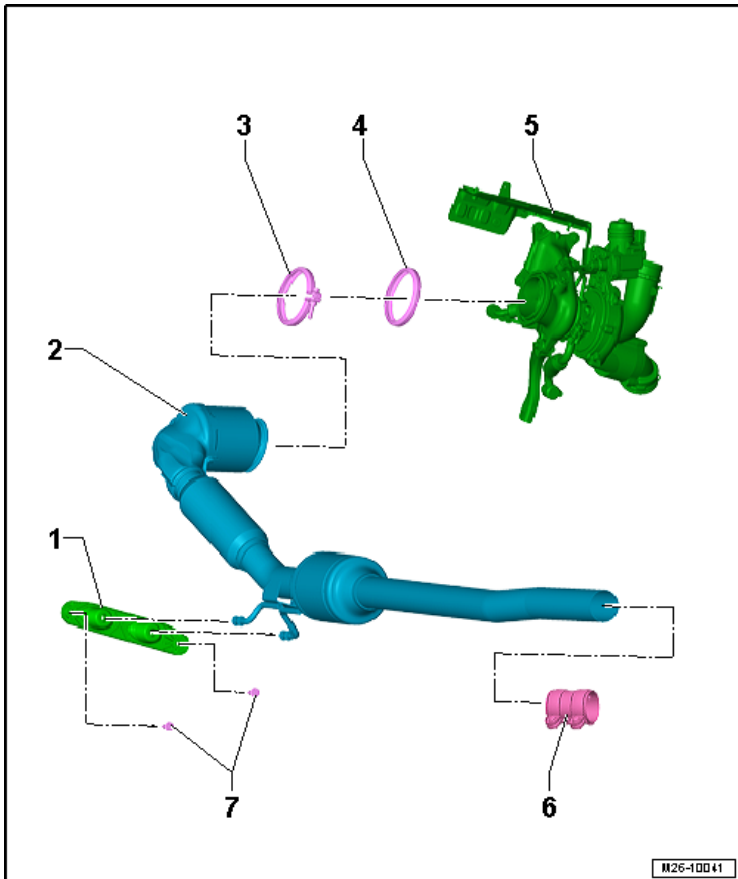
6 - Underbody Trim

7 - Rear Tunnel Bridge

8 - Nut

□ 20 Nm

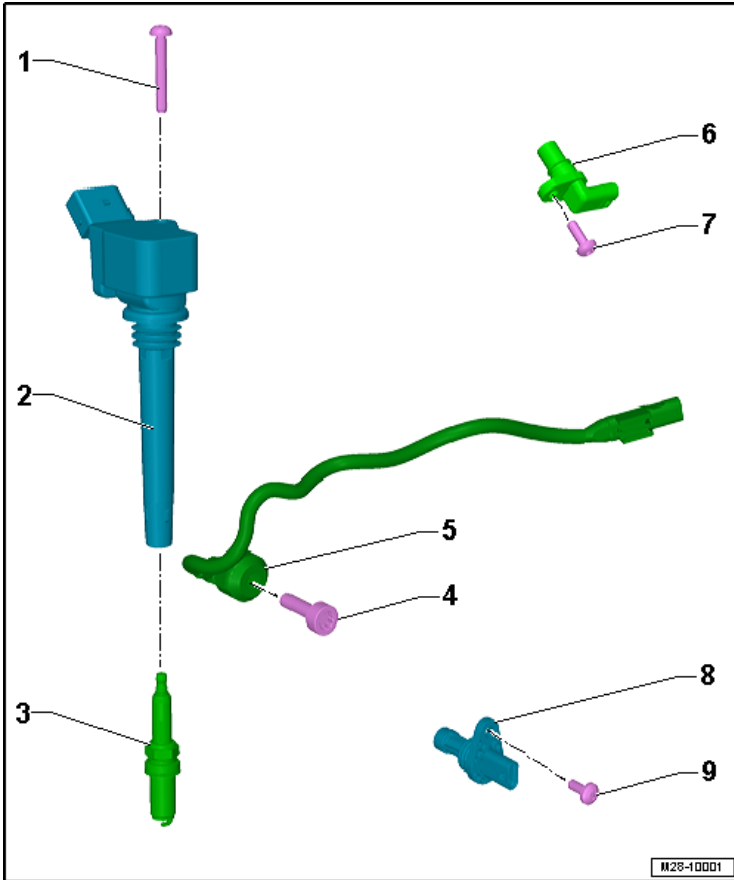
Emissions Control Overview



- 1 - Bracket
- 2 - Catalytic Converter
- 3 - V-Clamp
 - Replace after removing
- 4 - Seal
 - Replace after removing
- 5 - Turbocharger
- 6 - Front Clamping Sleeve
- 7 - Bolt
 - 23 Nm

Ignition – 1.8L CPKA, CPRA

Ignition System Overview

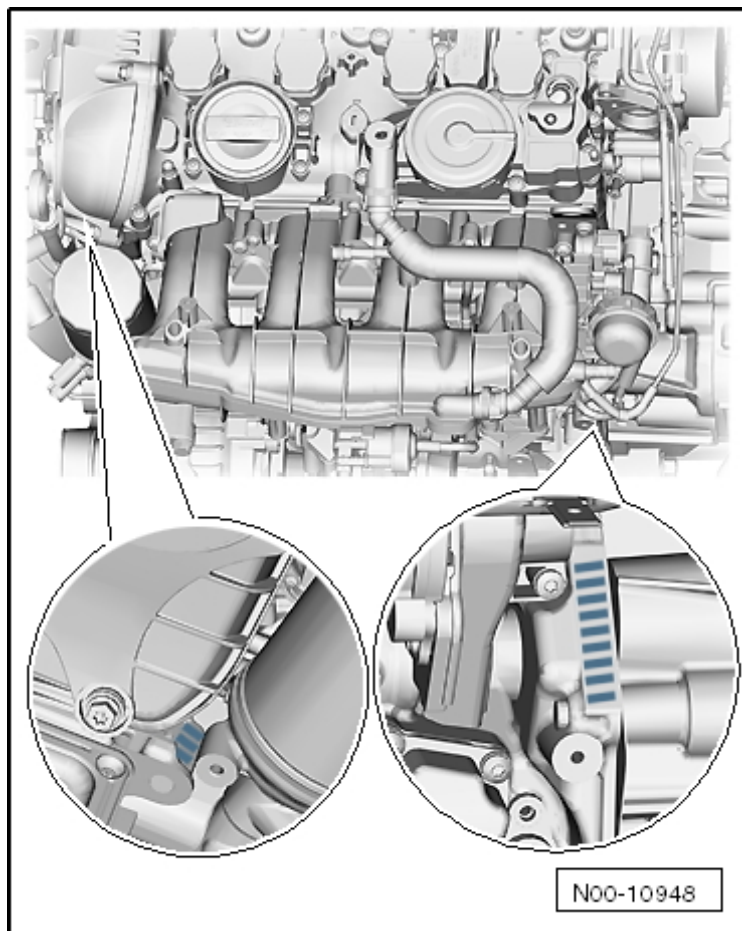


- 1 - Bolt
 - 10 Nm
- 2 - Ignition Coil with Power Output Stage
- 3 - Spark Plug
- 4 - Bolt
 - 20 Nm
 - Replace after removing
- 5 - Knock Sensor I -G61-
- 6 - Camshaft Position Sensor -G40-
- 7 - Bolt
 - 9 Nm
- 8 - Engine Speed Sensor -G28-
- 9 - Bolt
 - 10 Nm

ENGINE – 2.0L CPLA, CPPA

General Information – 2.0L CPLA, CPPA

Engine Number



The engine number (“engine codes” 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”.

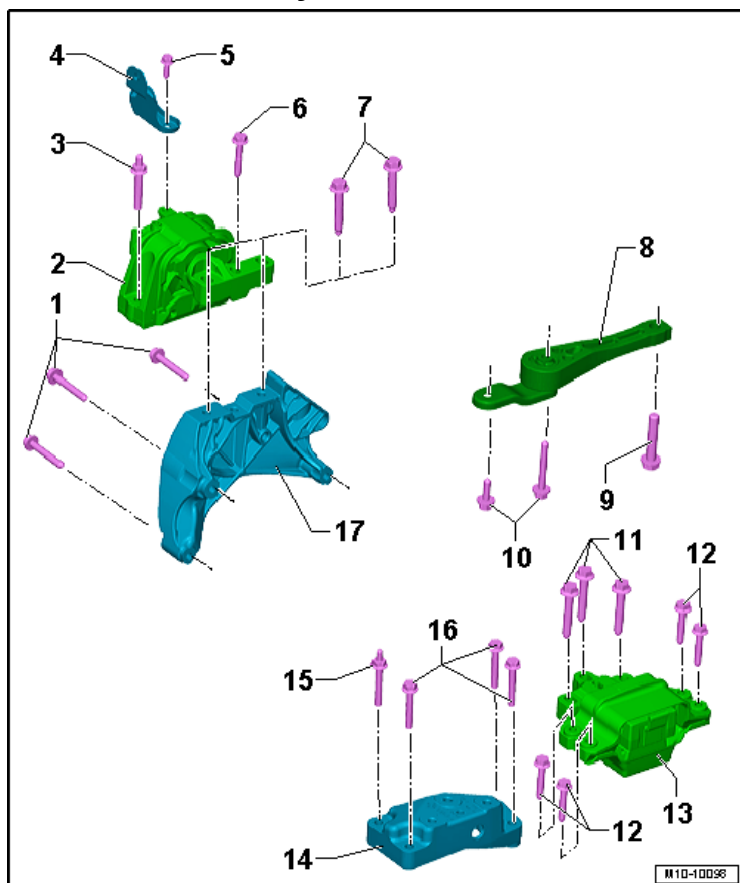
The first three digits describe the mechanical structure of the engine and are still stamped on the engine. The fourth digit describes the engine output and torque and depends on the engine control module. Four-digit engine codes are found on the type plate and vehicle data label. It can also be read via the engine control module.

Engine Data

Code Letters		CPLA	CPPA
Manufactured		from 02.13	from 02.13
Emission values in accordance with		Tier 2 BR	SULEV
Displacement	liter	2.0	2.0
Output	kW at RPM	155 at 5300 to 6200	155 at 5300 to 6200
Torque	Nm at RPM	280 at 1700 to 5200	280 at 1700 to 5200
Bore	Diameter mm	82.5	82.5
Stroke	mm	92.8	92.8
Compression ratio		9.6:1	9.6:1
Valves per cylinder		4	4
Research Octane Number (RON)	Minimum	95 RON (or 91 RON unleaded)	95 RON (or 91 RON unleaded)
Fuel injection		TFSI/SIMOS 12	TFSI/SIMOS 12
Ignition		TFSI/SIMOS 12	TFSI/SIMOS 12
Ignition sequence		1-3-4-2	1-3-4-2
Turbocharger,		Yes	Yes
Variable valve timing		Yes (Intake)	Yes (Intake)
Secondary air injection (AIR)		No	No
Oil pressure control		Yes	Yes

Engine Assembly – 2.0L CPLA, CPPA

Assembly Mounts Overview



1 - Bolt

- Tightening specification, see Engine Support - Tightening Specification and Sequence below

2 - Engine Mount

3 - Bolt

- 40 Nm + 90° turn
- Replace after removing

4 - Bracket

5 - Bolt

- 20 Nm + 90° turn
- Replace after removing

6 - Bolt

- 40 Nm + 90° turn
- Replace after removing

7 - Bolt

- 60 Nm + 90° turn
- Replace after removing

8 - Pendulum Support

9 - Bolt

- Tightening specification, see Installing the Pendulum Support below

10 - Bolt

- Tightening specification, see Installing the Pendulum Support below

11 - Bolt

- 60 Nm + 90° turn
- Replace after removing

12 - Bolt

- 40 Nm + 90° turn
- Replace after removing

13 - Transmission Mount

- Illustration shows the DSG transmission version

14 - Gearbox Support

15 - Bolt

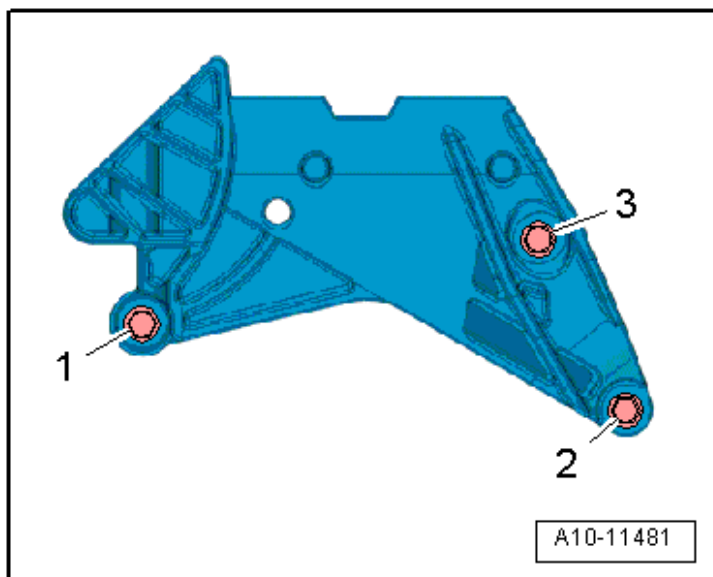
- Tightening specification, refer to Transmission Section

16 - Bolt

- Tightening specification, refer to Transmission Section

17 - Engine Support

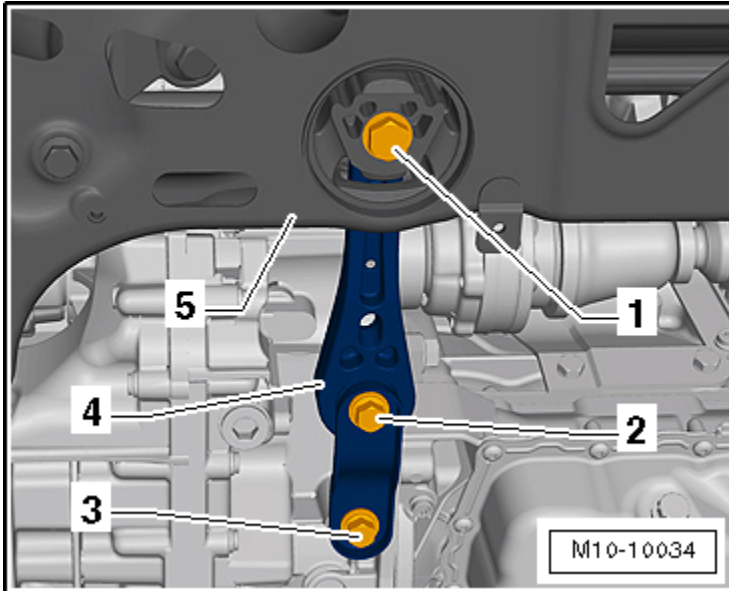
Engine Support Tightening Specifications



Tighten the bolts in steps in the sequence shown:

Stage	Component	Tightening Specification/Additional Turn
1	-1- through -3-	7 Nm
2	-1- through -3-	40 Nm
3	-1- through -3-	Tighten an additional 90° turn

Pendulum Support Tightening Specifications



Tighten the bolts in steps in the sequence shown

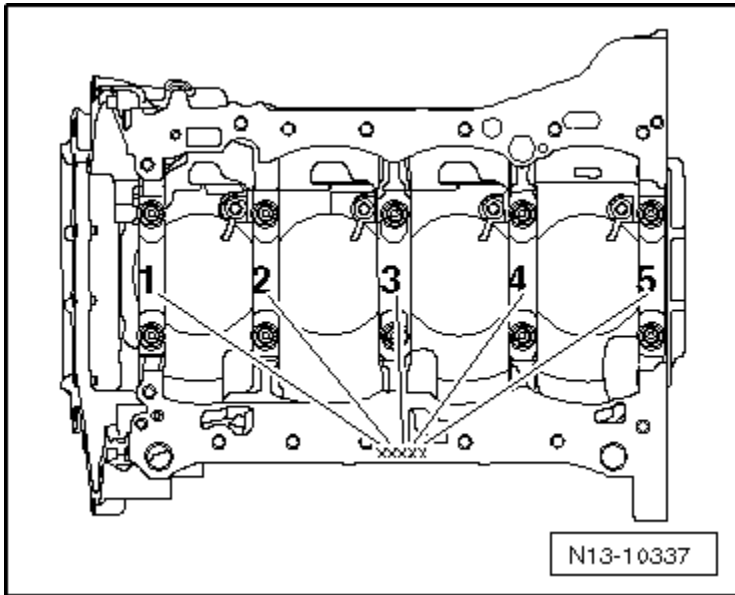
Stage	Component	Tightening Specification/Additional Turn
1	-2- and -3-	50 Nm
2	-1-	100 Nm
3	-1- through -3-	Tighten an additional 90° turn

Fastener Tightening Specifications

Component	Fastener Size	Nm
Bolts and nuts	M6	9
	M7	15
	M8	23
	M10	40
	M12	60

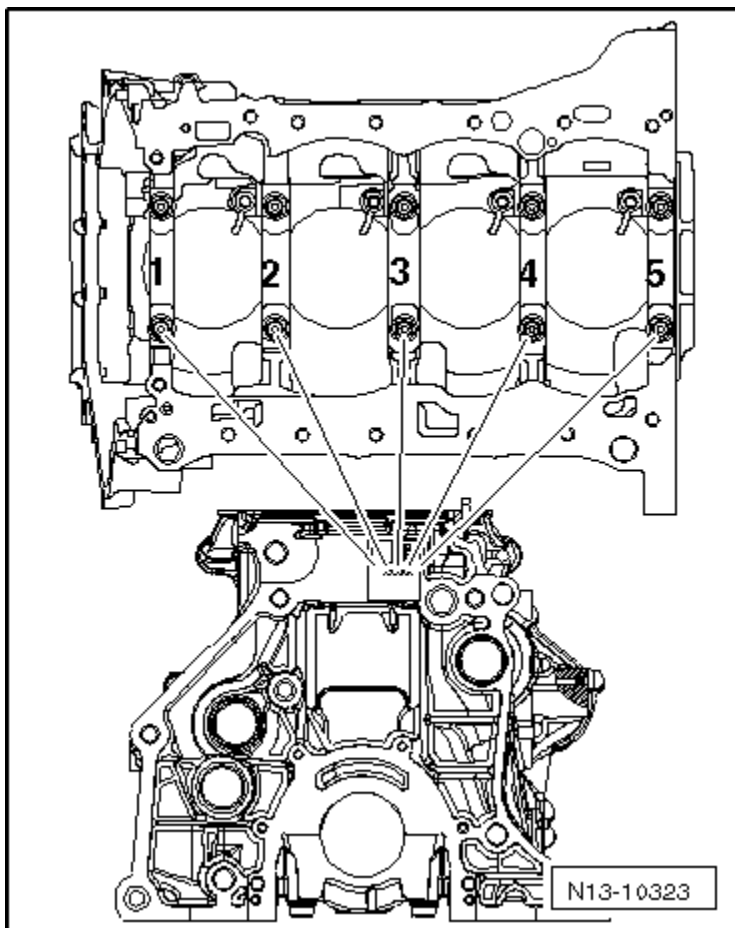
Crankshaft, Cylinder Block – 2.0L CPLA, CPPA

Cylinder Block Bearing Shell Identification



The cylinder block identification may be located either on the oil pan sealing surface or on the top (transmission side) of the cylinder block.

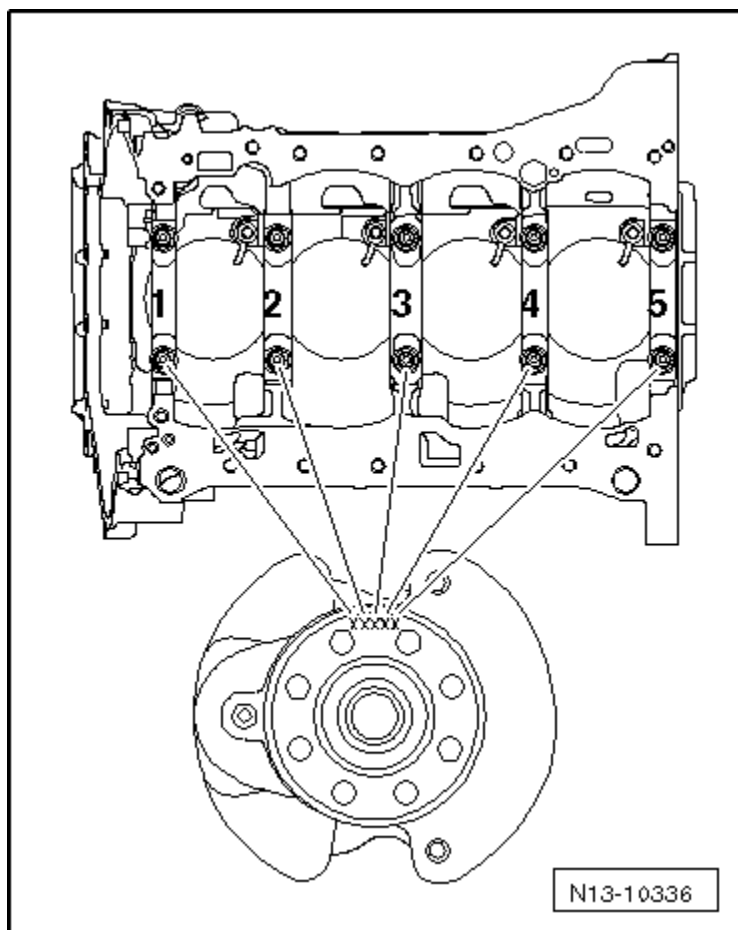
Upper Crankshaft Bearing Identification



Engine –
2.0L CPLA, CPPA

Write down the letters and then use the table to find the color identification.

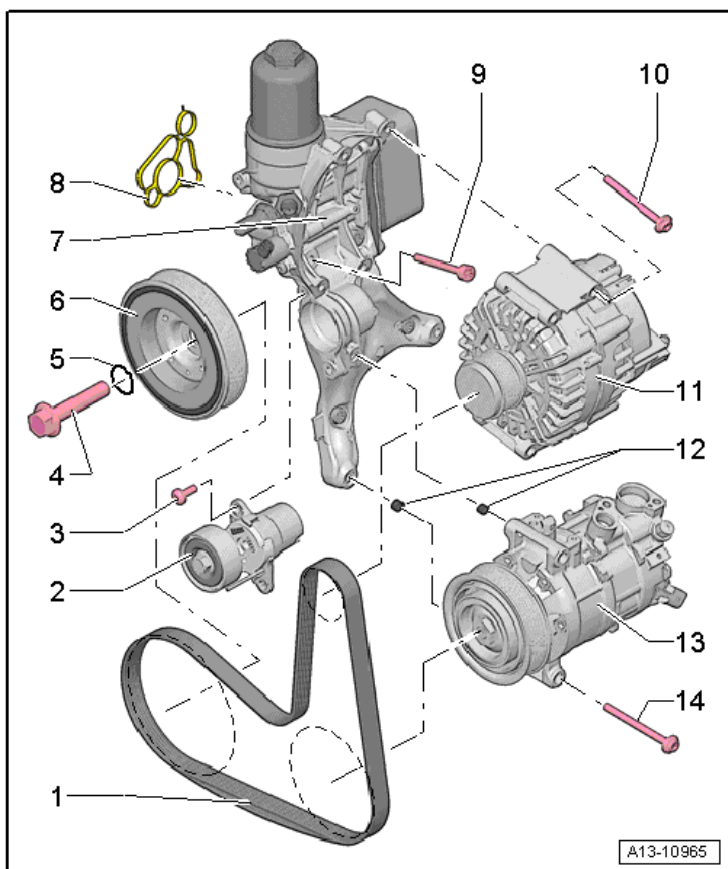
Bearing Cap Bearing Shell Identification



The identification on the crankshaft is for the lower bearing shell.
Write down the letters and then use the table to find the color identification.

Letter on cylinder block	Color of bearing
S	Black
R	Red
G	Yellow
B	Blue
W	White

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

5 - O-ring

6 - Vibration Damper

7 - Auxiliary Components Bracket

8 - Seal

9 - Bolt

- Tightening specification and sequence, see Accessory Assembly Bracket - Tightening Specifications and Tightening Sequence below

10 - Bolt

- Tightening specification, see Electrical Equipment

11 - Generator

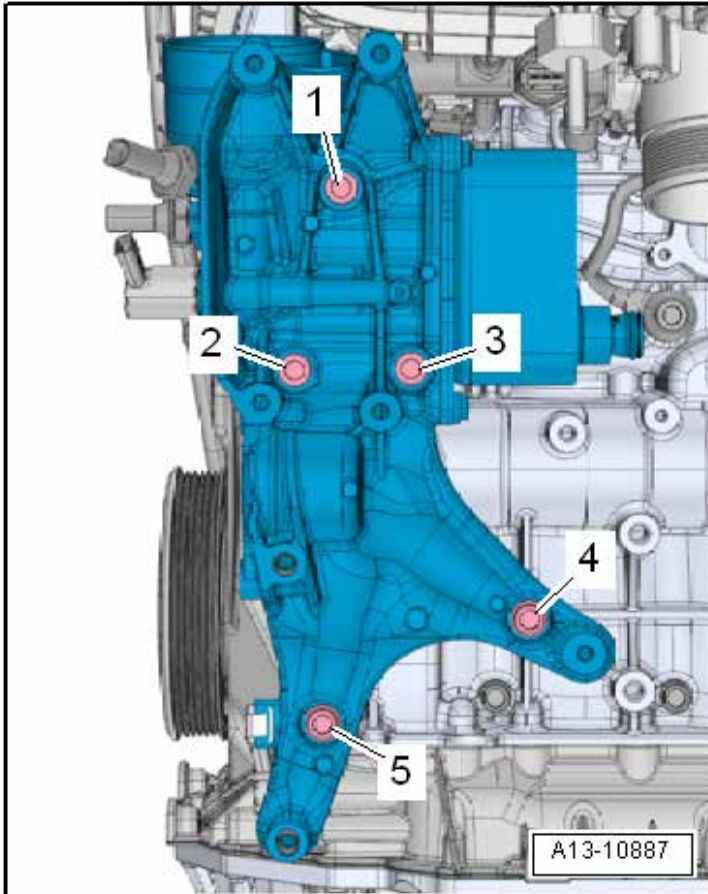
12 - Alignment Sleeves

13 - A/C Compressor

14 - Bolt

- Tightening specification, see Heating, Ventilation and Air Conditioning

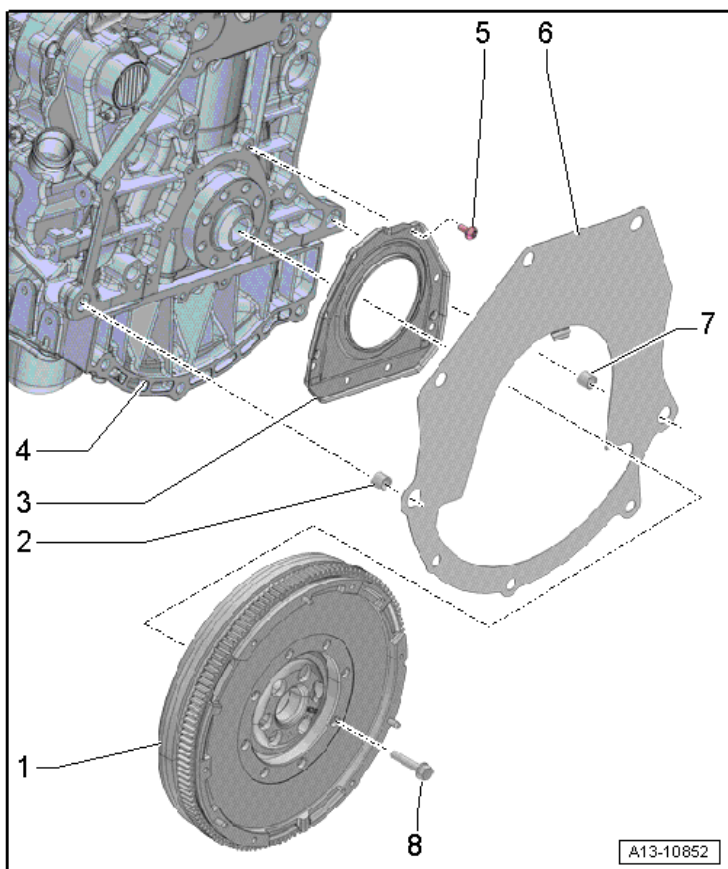
Accessory Assembly Bracket - Tightening Specifications and Tightening Sequence



Tighten bolts in three stages in sequence -1- to -5- as follows:

Stage	Component	Tightening Specification/Additional Turn
1	-1- through -5-	Tighten by hand
2	-1- through -5-	Tighten to 20 Nm
3	-1- through -5-	Tighten an additional 90° turn

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

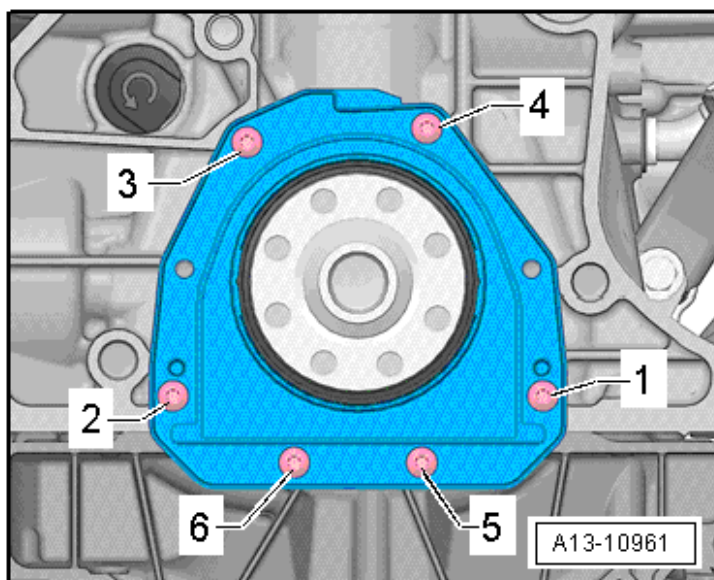
6 - Intermediate Plate

7 - Alignment Sleeve

8 - Bolt

- 60 Nm + 90° turn
- Replace after removing

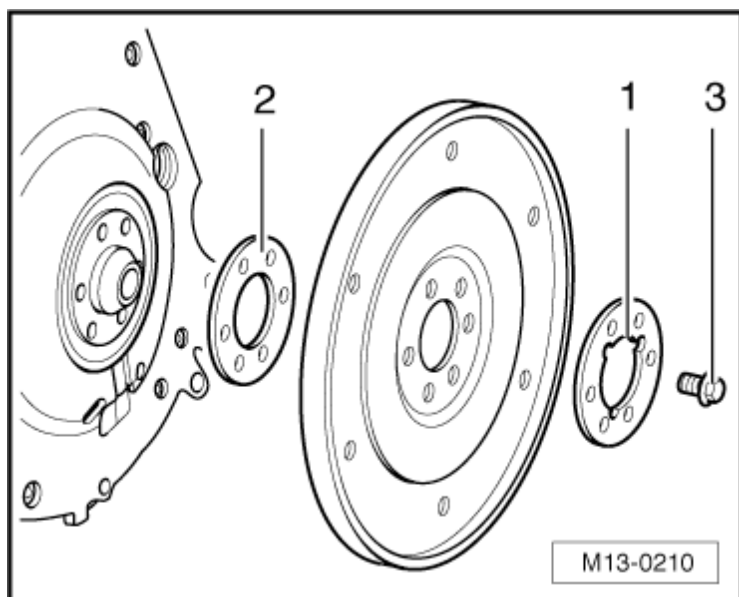
Ribbed Belt Transmission Side Sealing Flange - Tightening Specifications and Sequence



Tighten the bolts in steps in the sequence shown:

Stage	Component	Tightening Specification/Additional Turn
1	-1- through -6-	Install all the way in by hand.
2	-1- through -6-	9 Nm

Drive Plate Overview



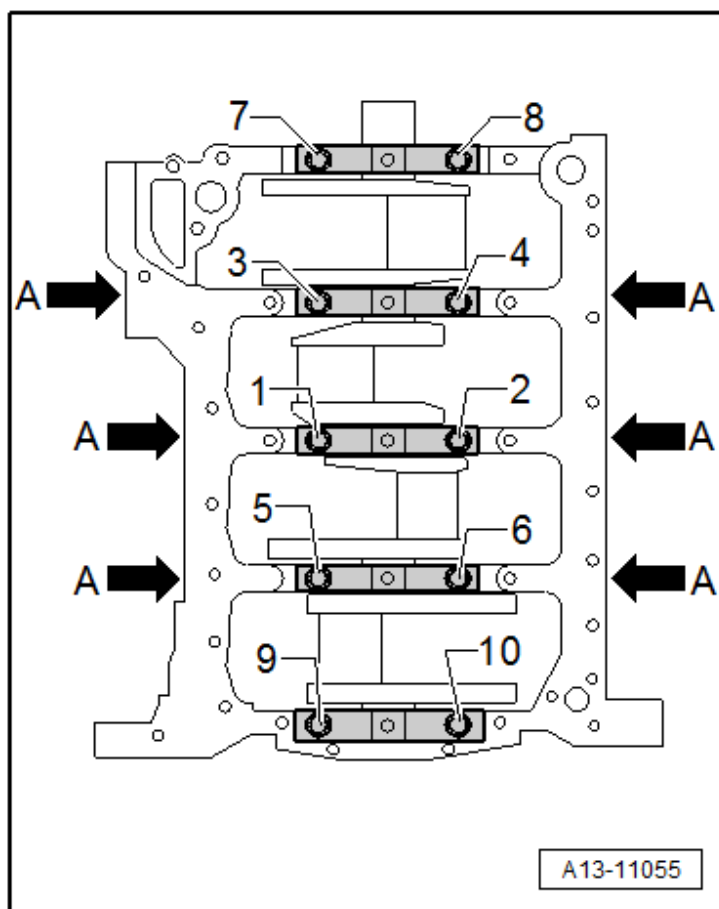
1 - Washer with Recesses

2 - Shim

3 - Bolt

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

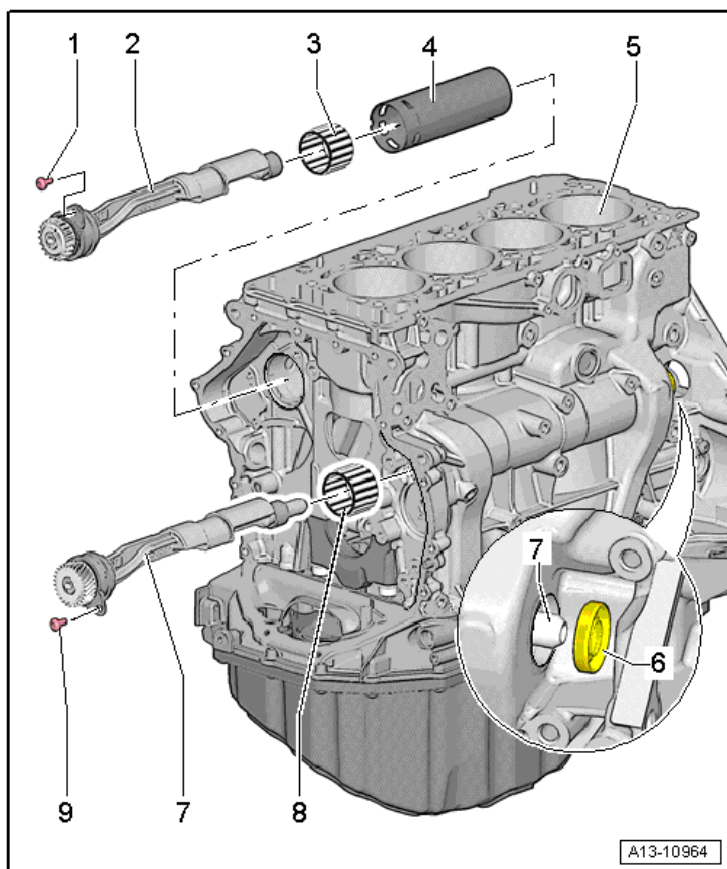
Crankshaft, Tightening Sequence



Tighten the crankshaft bolts in the sequence -1- through -10- and -arrows A- as follows.

Stage	Component	Tightening Specification/Additional Turn
1	-1- through -10- and -arrows A-	Install hand-tight
2	-1- through -10-	Tighten to 65 Nm
3	-1- through -10-	Turn another 90° using a rigid wrench.
4	-arrows A-	Tighten to 20 Nm
5	-arrows A-	Turn another 90° using a rigid wrench.

Balance Shaft Overview



1 - Bolt

- 4 Nm + 45° turn
- Replace after removing

2 - Balance Shaft

3 - Needle Bearing Rim

4 - Pipe for the Balance Shaft

5 - Cylinder Block

6 - Balance Shaft Seal Intake Side

7 - Bolt

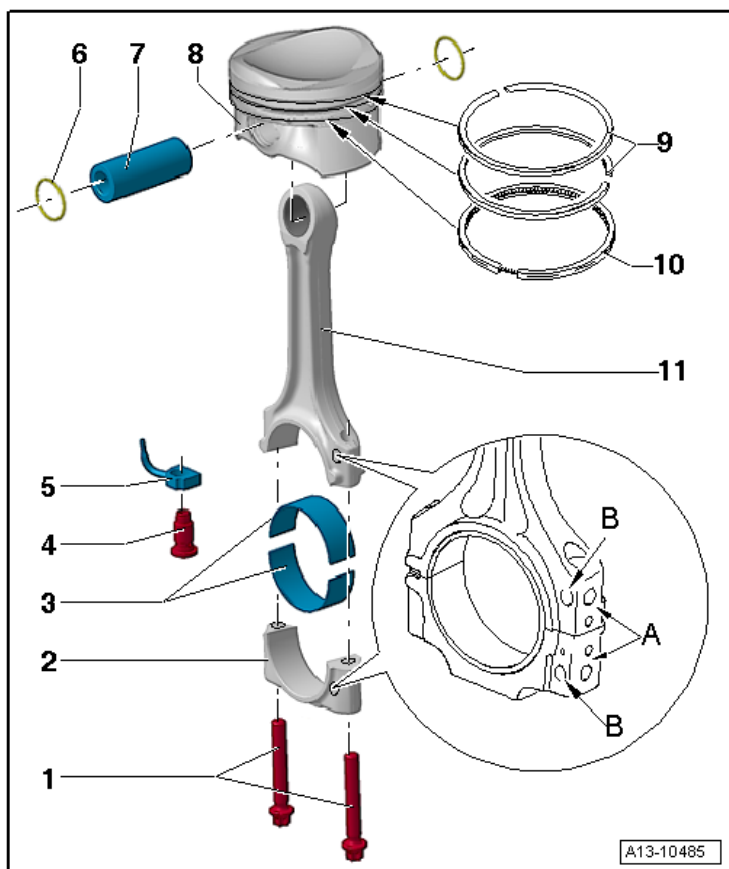
- 60 Nm + 90° turn
- Replace after removing

8 - Needle Bearing Rim

9 - Bolt

- 4 Nm + 45° turn
- Replace after removing

Pistons and Connecting Rods Overview



1 - Connecting Rod Bolts

- 45 Nm + 90° turn
- Replace after removing

2 - Connecting Rod Bearing Cap

3 - Bearing Shells

4 - Relief Valve

- 27 Nm

5 - Oil Spray Jet

6 - Locking Ring

- Replace after removing

7 - Piston Pin

8 - Piston

9 - Compression Rings

10 - Oil Scrapping Ring

11 - Connecting Rod

Crankshaft Dimensions

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

¹⁾ Measurements are without the graphite coating (thickness = 0.02 mm). The graphite coating wears off.

Piston Ring Gap

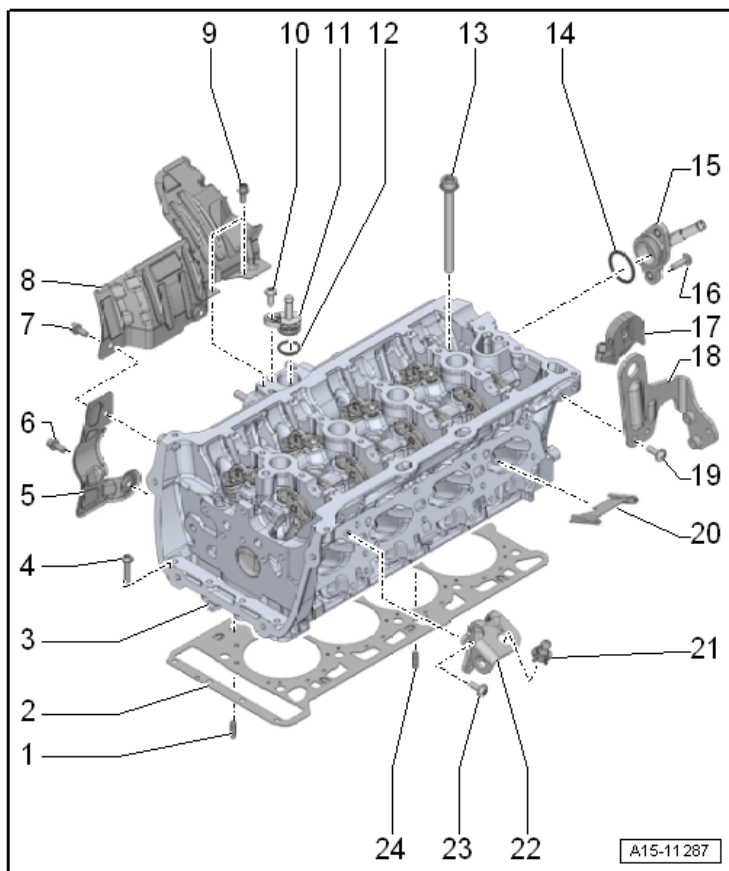
Piston ring gap Dimensions in mm	New	Wear limit
Compression rings	0.20 to 0.40	0.80
Oil scraping ring	0.25 to 0.50	0.80

Piston Ring Groove Clearance

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

Cylinder Head, Valvetrain – 2.0L CPLA, CPPA

Cylinder Head Overview



1 - Alignment Pin

2 - Cylinder Head Gasket

3 - Cylinder Head

4 - Bolt

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

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

14 - O-ring

15 - Connecting Piece

16 - Bolt

- 9 Nm

17 - Mount

18 - Engine Lifting Eye

19 - Bolt

- 8 Nm + 90° turn
- Replace after removing

20 - Partition Plate

21 - Ball Pin

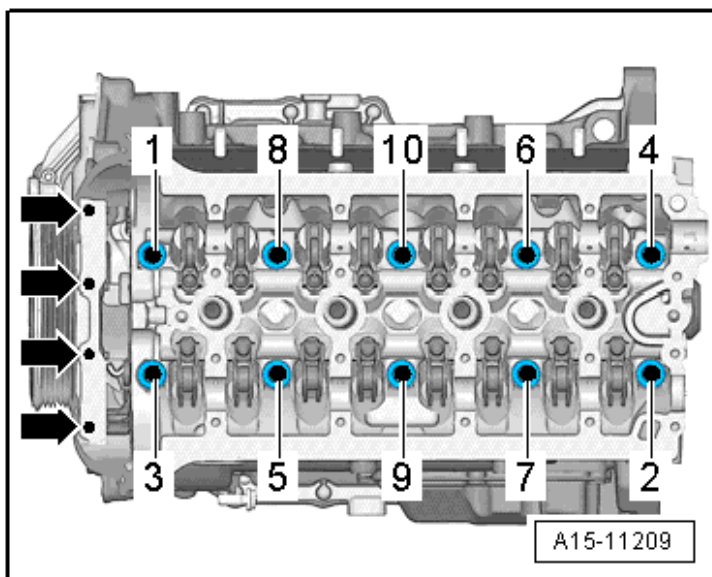
22 - Engine Lifting Eye

23 - Bolt

- 8 Nm + 90° turn
- Replace after removing

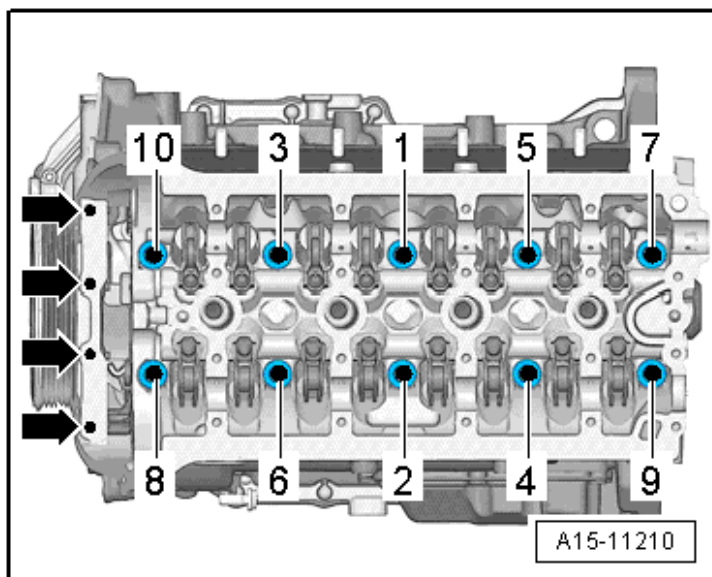
24 - Alignment Pin

Cylinder Head Removal



Remove the bolts -arrows-. Loosen the cylinder head bolts in order from -1- to -10-.

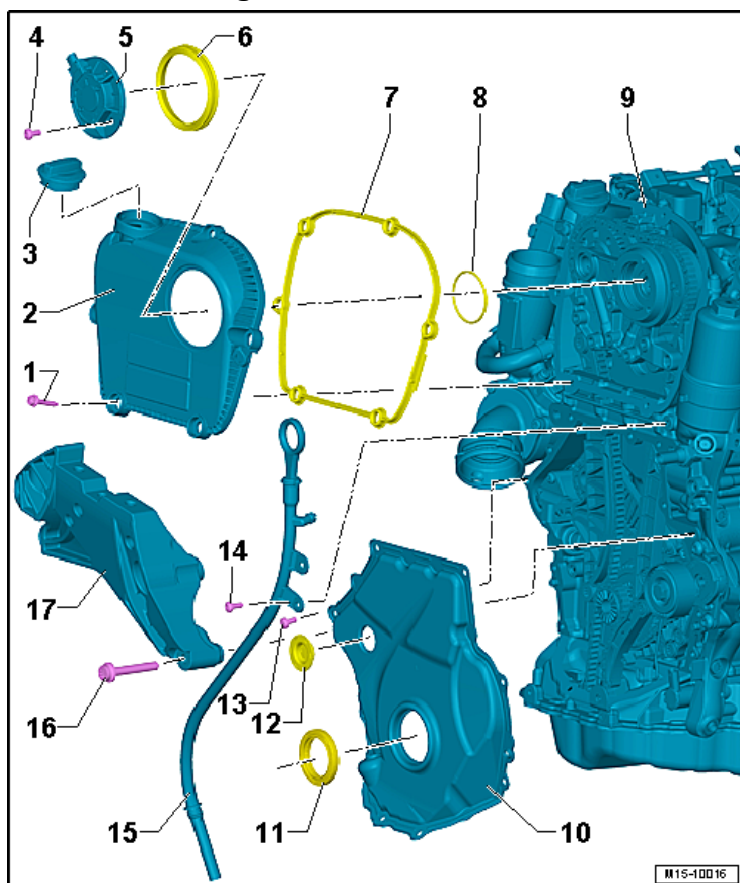
Cylinder Head Tightening Sequence



Engine –
2.0L CPLA, CPPA

Stage	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-	Turn another 90° using a rigid wrench.

Timing Chain Cover Overview



1 - Bolt

- Tightening sequence, 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

- Replace after removing

7 - Seal

8 - O-ring

- Replace after removing

9 - Engine

10 - Lower Cover for Timing Chain

11 - Shaft Seal

12 - Plug

- Replace after removing

13 - Bolt

- Tightening sequence for eight bolts → Fig. „Lower cover for timing chain tightening sequence“
- Tightening sequence for 15 bolts → Fig. „Lower cover for timing chain - tightening sequence for 15 bolts“

14 - Bolt

- 9 Nm

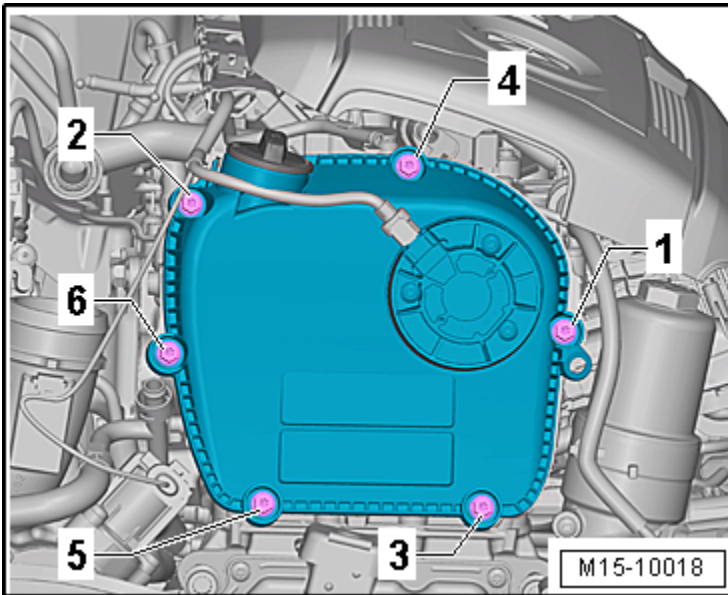
15 - Oil Dipstick Tube

16 - Bolt

- See Assembly Mounts Overview

17 - Engine Support

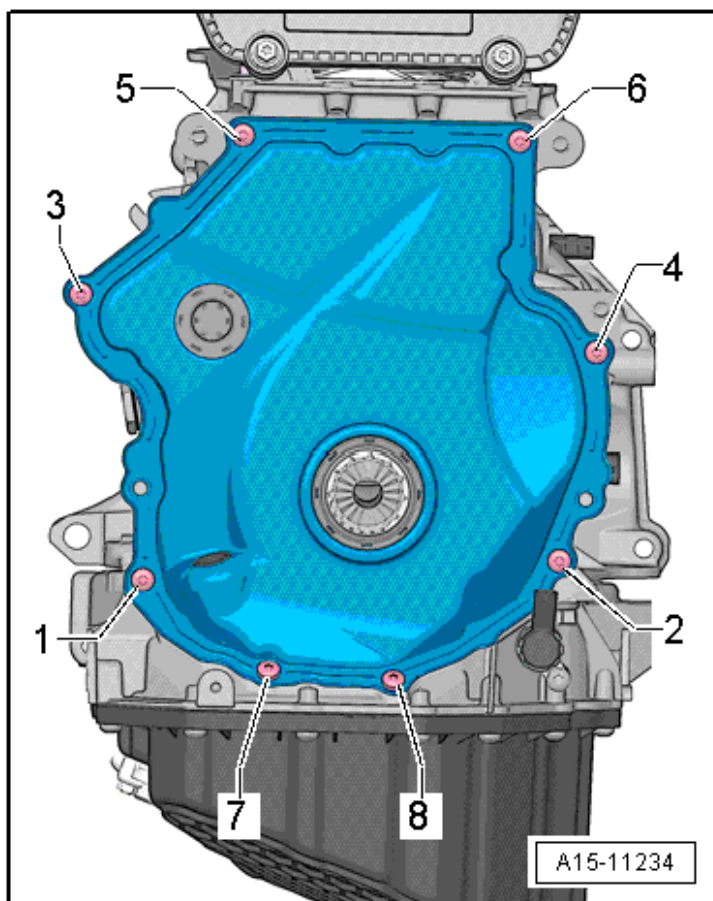
**Timing Chain Guard Upper Cover
- Tightening Sequence**



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

Stage	Bolts	Tightening specification/additional turn
1	-1- through -6-	Install by hand all the way
2	-1- through -6-	Tighten to 9 Nm

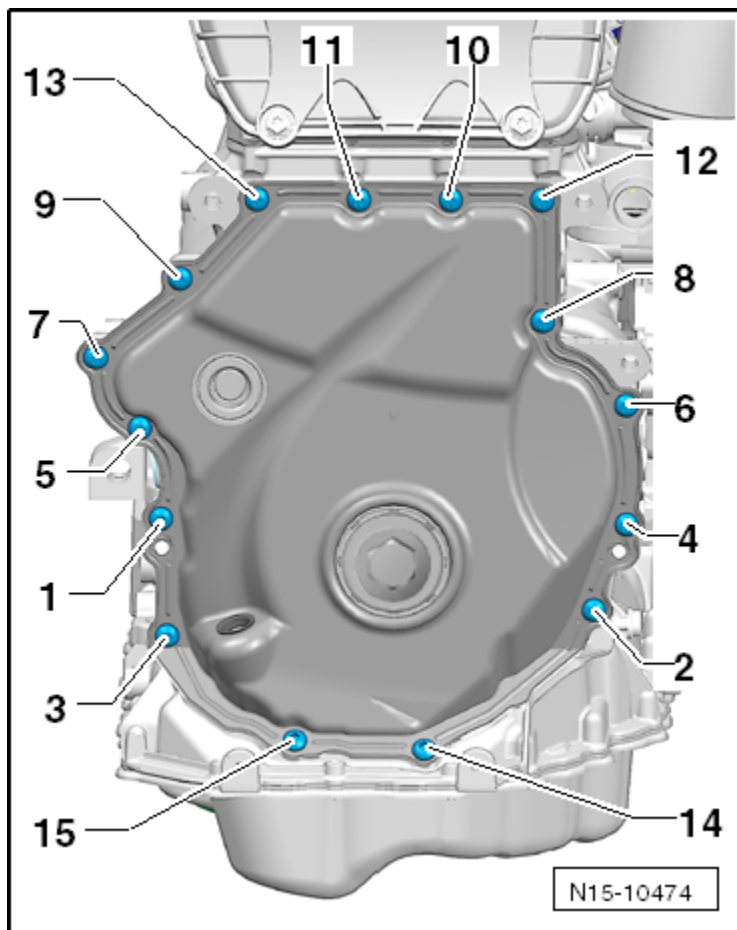
Lower Cover for Timing Chain Tightening Sequence for 8 Bolts



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

Stage	Bolts	Tightening specification/additional turn
1	-1- through -8-	Tighten to 4 Nm
2	-1- through -8-	Tighten 45° additional turn

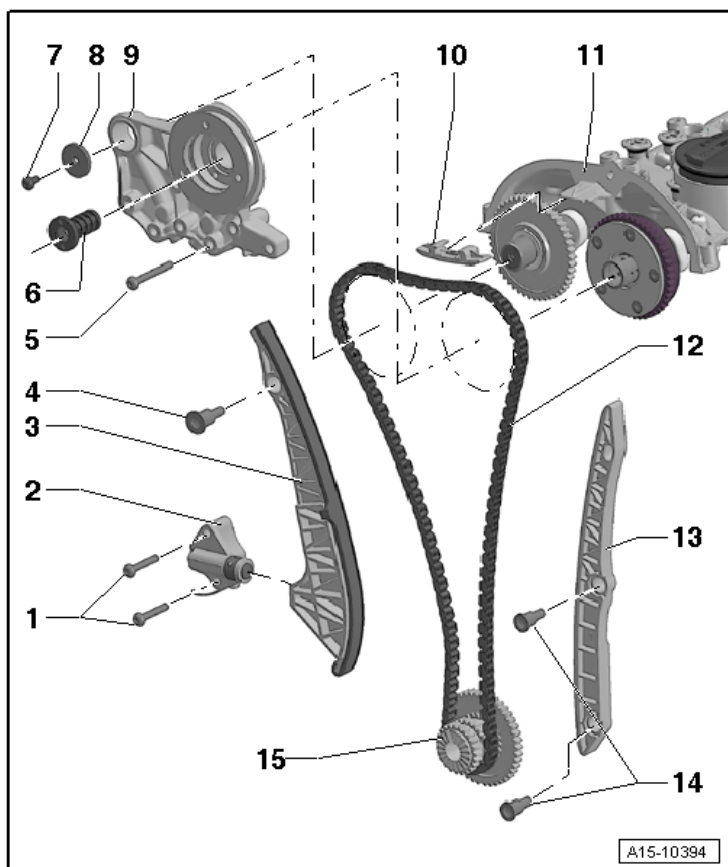
Lower Cover for Timing Chain - Tightening Sequence for 15 Bolts



Engine –
2.0L CPLA, CPPA

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

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

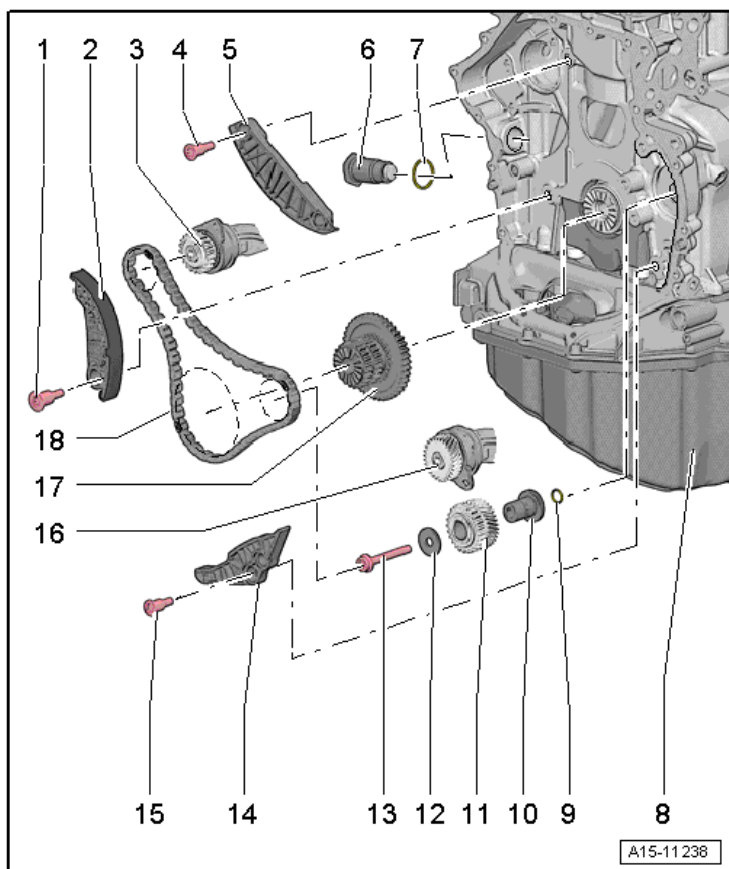
- 35 Nm
- Left thread

7 - Bolt

- M6: 8 Nm + 90° turn
- M8: 20 Nm + 90° turn

- 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

4 - Guide Pins

- 20 Nm

5 - Guide Rail

6 - Chain Tensioner

- 85 Nm
- Mount with locking compound

7 - 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
- Replace after removing

14 - Guide Rail

15 - Guide Pins

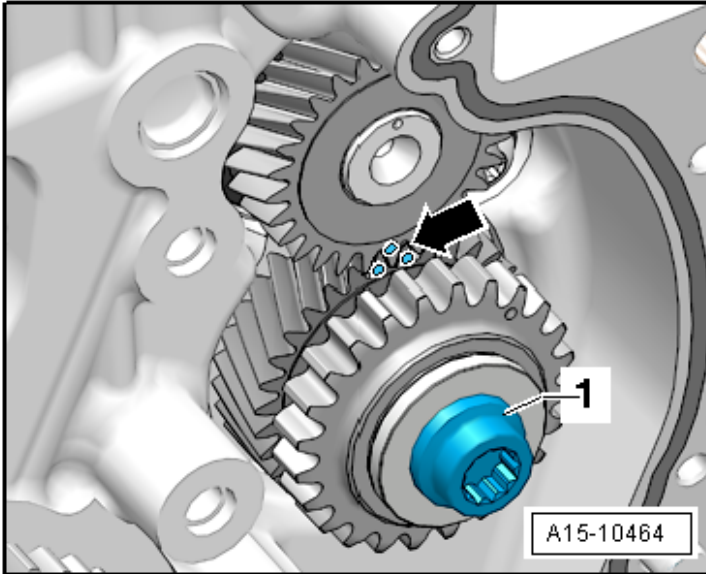
- 20 Nm

16 - Balance Shaft

17 - Three Stage Chain Sprocket

18 - Balance Shaft Drive Chain

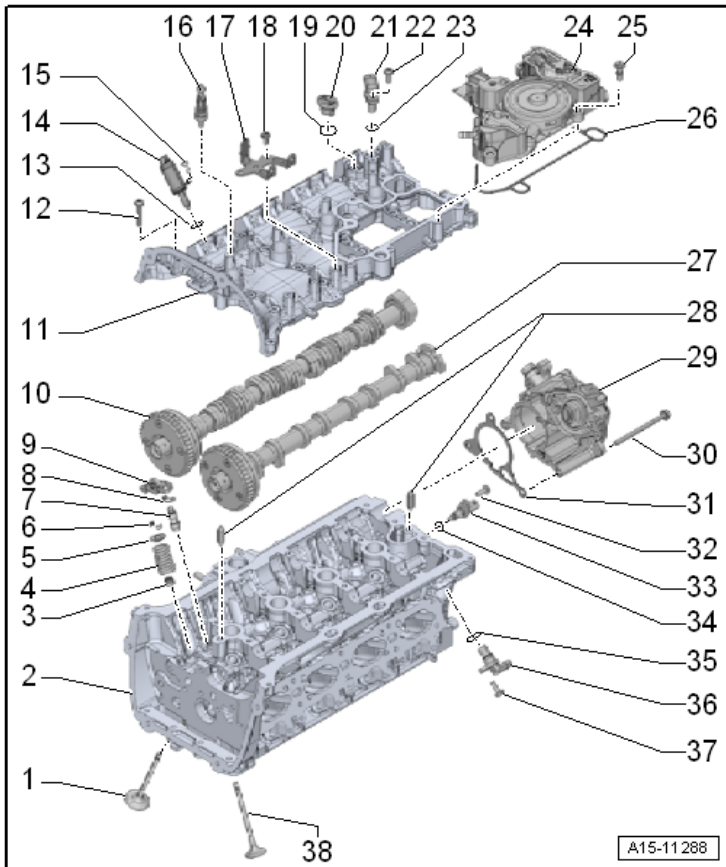
Intermediate Sprocket Tightening Sequence



Tighten with a new bolt as follows:

Stage	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.

Valvetrain Overview



- 1 - Intake Valve
- 2 - Cylinder Head
- 3 - Valve Stem Seal
- 4 - Valve Spring
- 5 - Valve Spring Retainer
- 6 - Valve Retainers
- 7 - Hydraulic Adjusting Element
- 8 - Clip
- 9 - Roller Rocker Lever
- 10 - Exhaust Camshaft
- 11 - Cylinder Head Cover
- 12 - Bolt
 - Loosening, see Loosening the Cylinder Head Cover below
 - Tightening specification and sequence, see Cylinder Head Cover, Tightening Specifications and Sequence below
- 13 - O-ring
 - Not installed

14 - Cam Adjustment Actuator

- Not installed

15 - Bolt

- Not installed

16 - Ball Pin

- 9 Nm

17 - Bracket

18 - Bolt

- 9 Nm

19 - O-ring

- Replace after removing
- Coat with engine oil

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 specification and sequence, see Oil Separator - Tightening Sequence below

26 - Seal

- Replace after removing

27 - Intake Camshaft

28 - Alignment Pins

29 - Vacuum Pump

30 - Bolt

31 - Seal

32 - Bolt

- 4 Nm + 45° turn
- Replace after removing

33 - Engine Coolant Temperature Sensor -G62-

34 - O-ring

- Replace after removing
- Coat with coolant

35 - O-ring

- Replace after removing
- Coat with engine oil

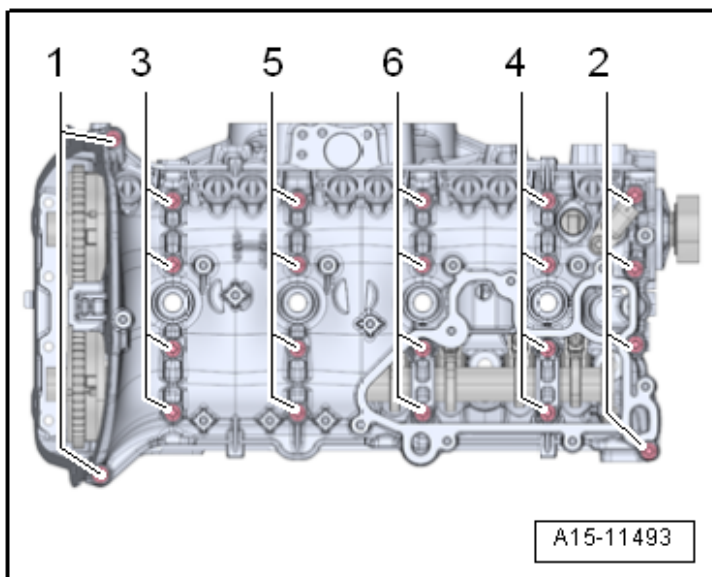
36 - Camshaft Position Sensor -G40-

37 - Bolt

- Tightening specification, see Ignition System Overview

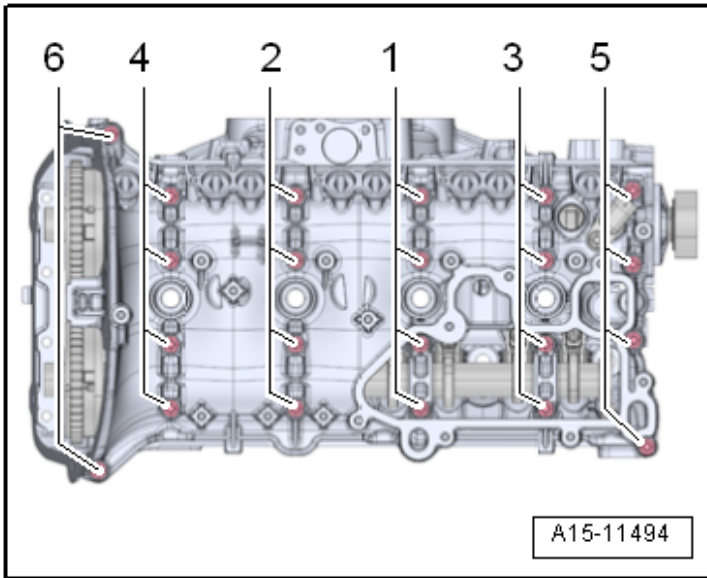
38 - Exhaust Valve

Loosening the Cylinder Head Cover



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

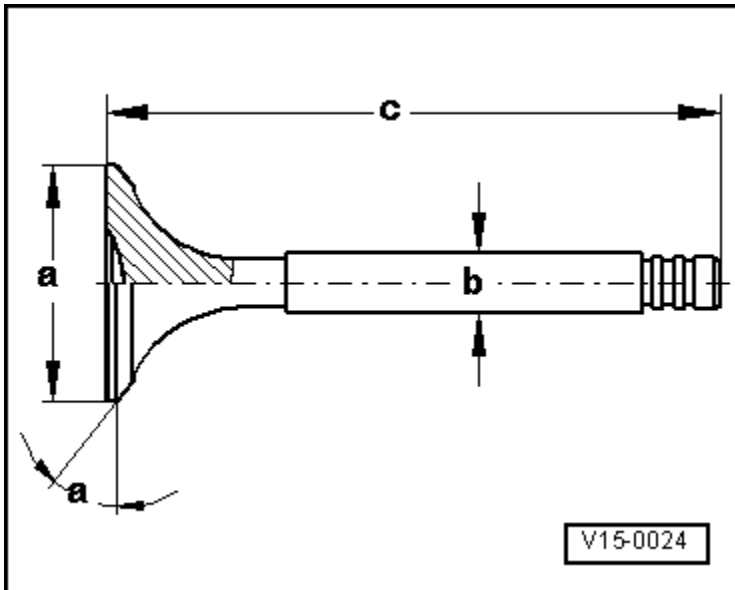
Cylinder Head Cover, Tightening Specifications and Sequence



Replace the bolts.

Stage	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-	ighten 90° further using a rigid wrench

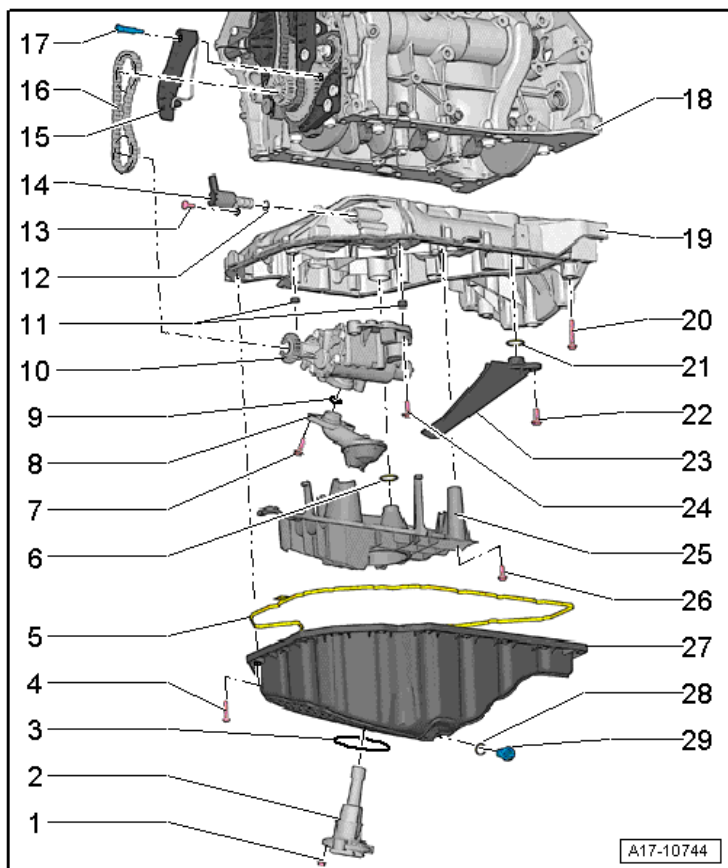
Valve Dimensions



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	$^{\circ}$	45	45

Lubrication – 2.0L CPLA, CPPA

Oil Pan/Oil Pump Overview



1 - Nut

- 9 Nm

2 - Oil Level Thermal Sensor -G266-

3 - Seal

- Replace after removing

4 - Bolt

- Tightening sequence, see Sheet Metal Oil Pan Lower Section - Tightening Sequence below
- Replace after removing

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

- 4 Nm + 90° turn
- Replace after removing

14 - Oil Pressure Regulation Valve -N428-

15 - Chain Tensioner

16 - Pump Drive Chain

17 - Bolt

- 9 Nm

18 - Cylinder Block

19 - Oil Pan Upper Section

20 - Bolt

- Tightening sequence, 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 + 90° turn
- Replace after removing

25 - Oil Baffle

- Replace after removing

26 - Bolt

- 4 Nm + 45° turn
- Replace after removing

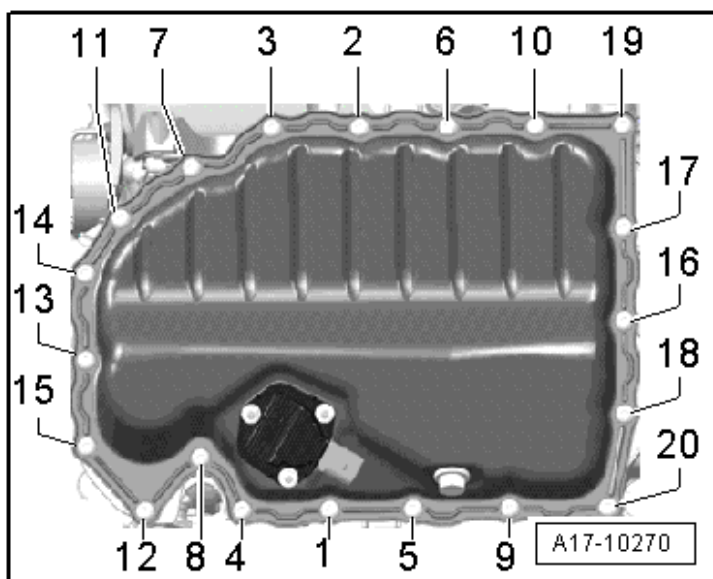
27 - Oil Pan Lower Section

28 - Seal

29 - Oil Drain Plug

- 30 Nm

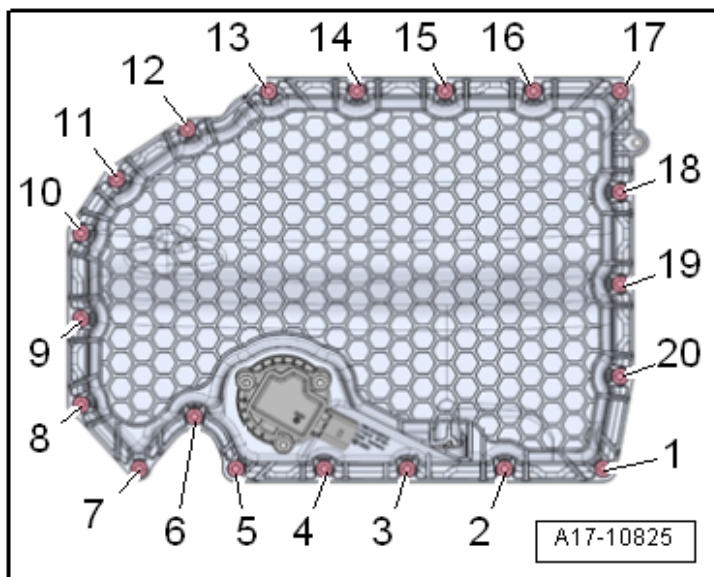
Sheet Metal Oil Pan Lower Section - Tightening Sequence



Replace the bolts were tightened with an additional turn. Tighten the bolts -1- through -20- in two stages in the sequence shown:

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

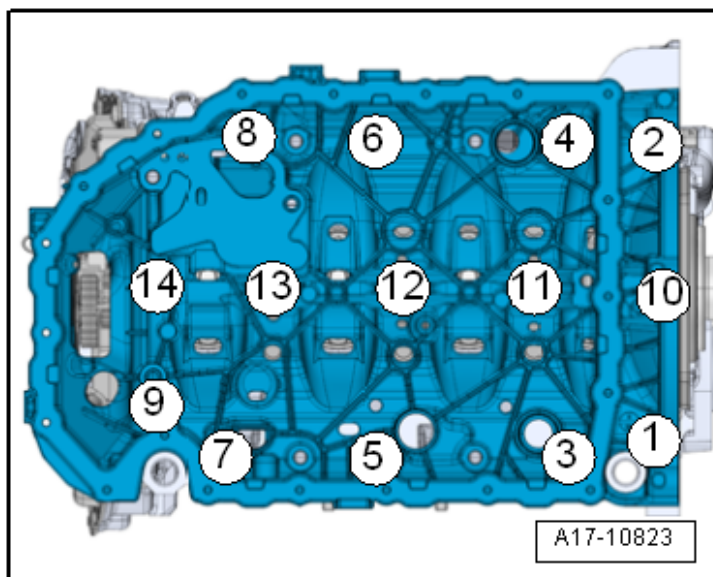
Tightening Sequence for Lower Plastic Oil Pan



Replace the bolts were tightened with an additional turn. Tighten the bolts -1- through -20- in two stages in the sequence shown:

Stage	Bolts	Tightening specification/additional turn
1	-1- through -20-	Tighten to 8 Nm
2	-1- through -20-	Tighten 90° additional turn

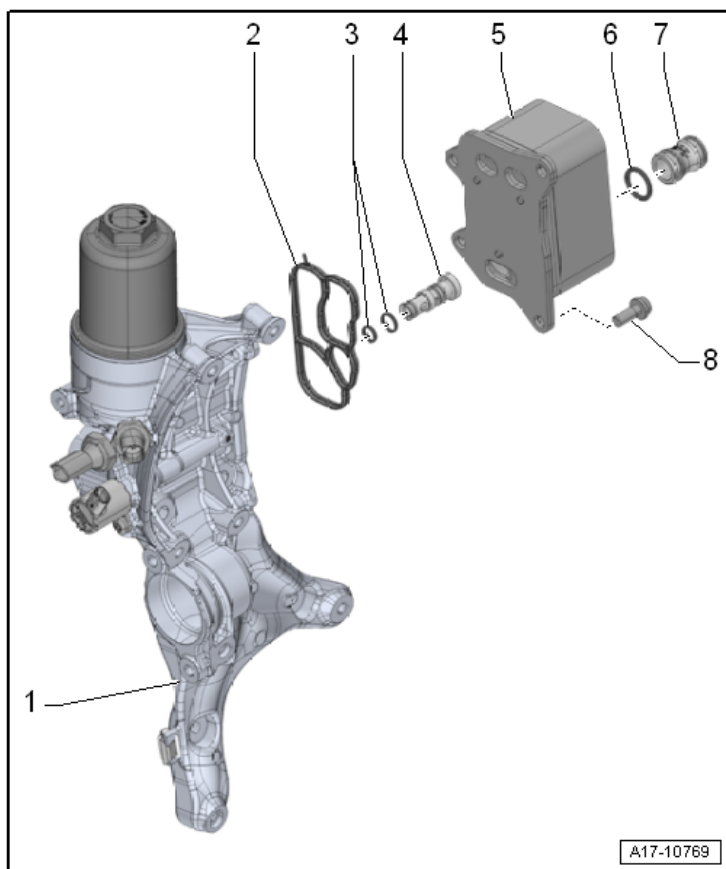
Oil Pan Upper Section - Tightening Sequence



Replace the bolts were tightened with an additional turn. ten the bolts -1- through -14- in the sequence shown:

Stage	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	11- through -14-	Tighten 90° additional turn

Engine Oil Cooler Overview



1 - Auxiliary Components Bracket

2 - Seal

- Replace after removing

3 - O-ring

- Replace after removing
- Coat with engine oil

4 - Mechanical Switch Valve

5 - Engine Oil Cooler

6 - Seal

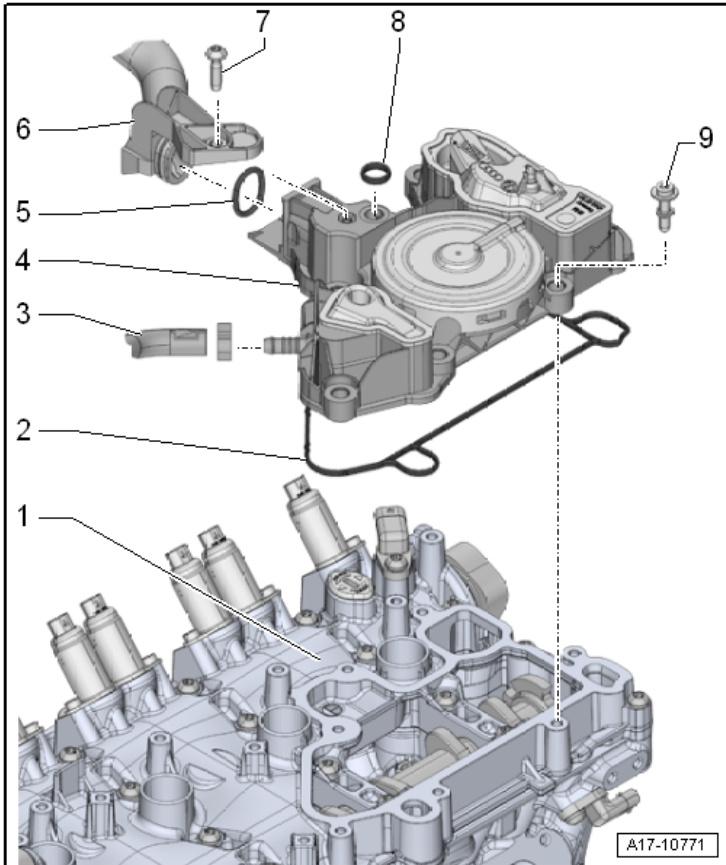
- Replace after removing
- Coat with coolant

7 - Connection

8 - Bolt

- 8 Nm + 45° turn
- Replace after removing

Crankcase Ventilation Overview



1 - Cylinder Head Cover

2 - Seal

- Replace after removing

3 - Hose

4 - Oil Separator

5 - Seal

6 - Hose

7 - Bolt

- 4 Nm

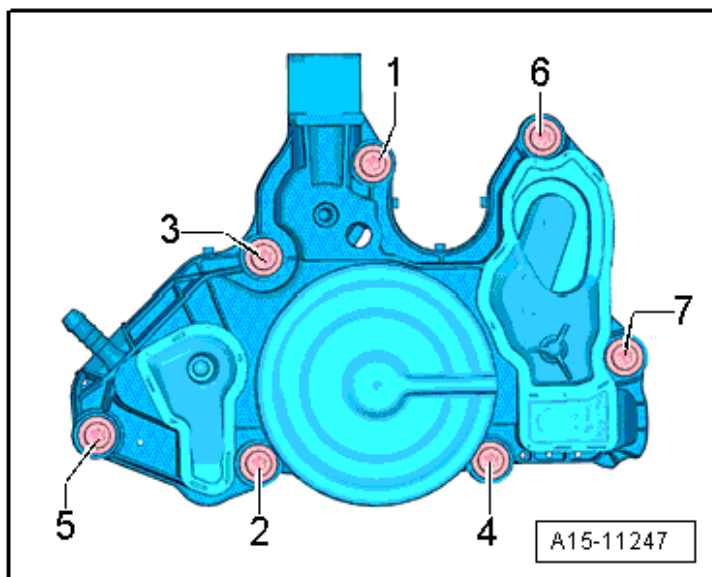
8 - Seal

- Replace after removing

9 - Bolt

- Position the bolt by hand and tighten it until it finds the old threads. Then tighten the bolt to the specification.
- Tightening specification and sequence, see Oil Separator - Tightening Sequence below

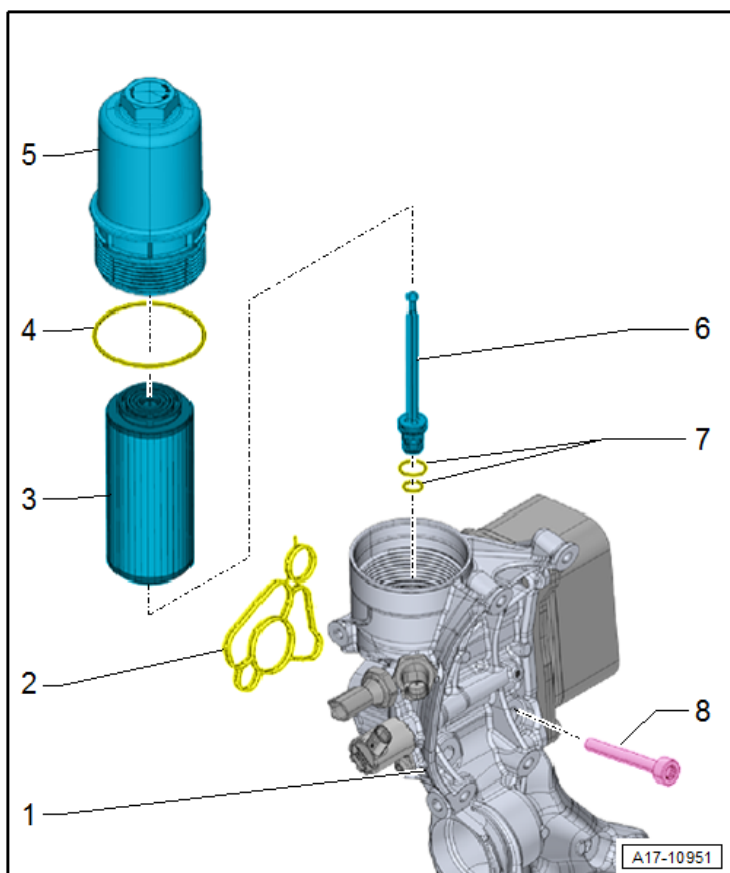
Oil Separator - Tightening Sequence



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

Bolts	Tightening specification/additional turn
-1- through -20-	Tighten to 9 Nm

Oil Filter Overview



1 - Auxiliary Components Bracket

2 - Seal

3 - Oil Filter

4 - O-ring

5 - Oil Filter Housing

25 Nm

6 - Oil Drain Supports

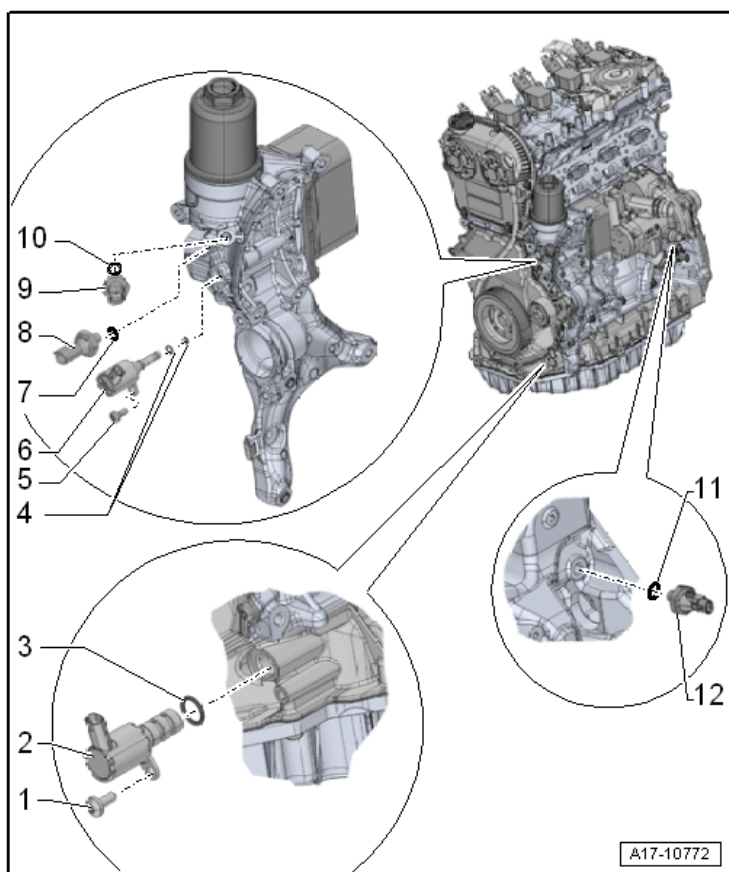
7 - O-rings

Replace after removing

8 - Bolt

Tightening specification and sequence, see Accessory Assembly Bracket - Tightening Specifications and Tightening Sequence in Cylinder Block Overview, Belt Pulley Side

Oil Pressure Switch/Oil Pressure Regulator Valve Overview



1 - Bolt

- 4 Nm + 90° turn
- Replace after removing

2 - Oil Pressure Regulation Valve -N428-

3 - O-ring

- Replace after removing
- Coat with engine oil

4 - O-ring

- Not installed

5 - Bolt

- Not installed

6 - Valve Retainers

7 - Seal

8 - Oil Pressure Switch -F22-

- 20 Nm

9 - Reduced Oil Pressure Switch -F378-

- 20 Nm

10 - Seal

11 - Seal

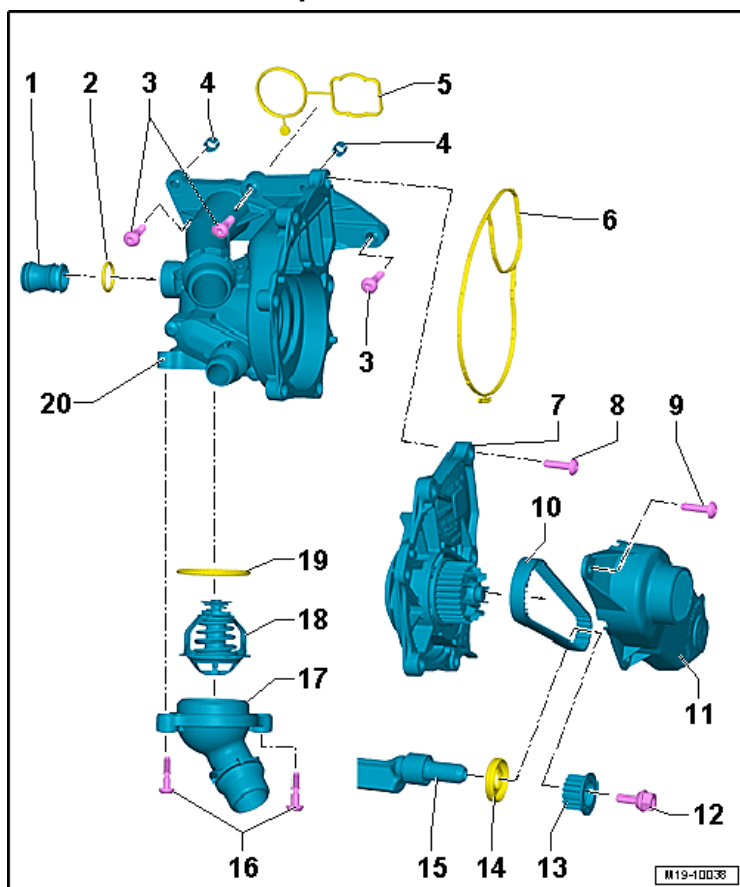
- Not installed

12 - Oil Pressure Switch, Level 3 -F447-

- Not installed

Cooling System – 2.0L CPLA, CPPA

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 sequence, see Coolant Pump - Tightening Specification and Sequence below

9 - Bolt

- 9 Nm

10 - Toothed Belt

11 - Toothed Belt Cover

12 - Bolt

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

13 - Drive Gear for Toothed Belt

14 - Balance Shaft Seal Intake Side

15 - Balance Shaft

16 - Bolt

- 9 Nm

17 - Connecting Piece

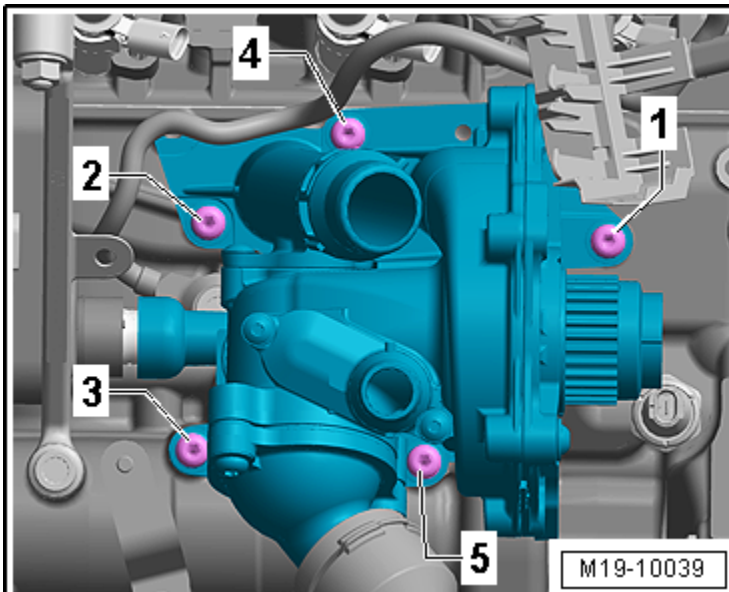
18 - Thermostat

19 - O-ring

- Replace after removing

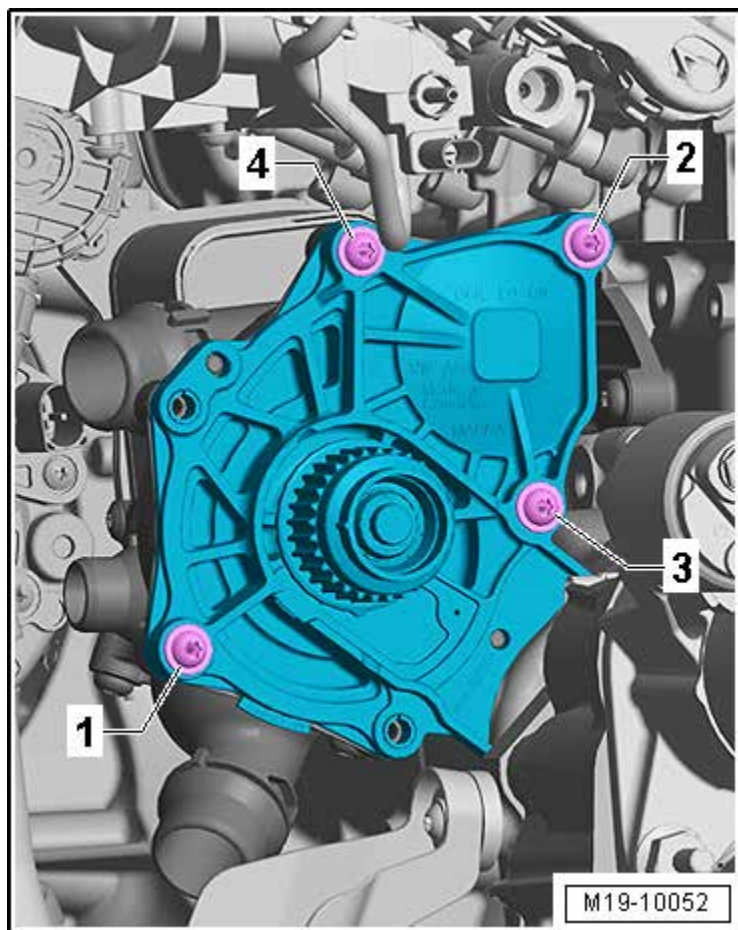
20 - Coolant Thermostat

**Thermostat - Tightening Specification
and Tightening Sequence**



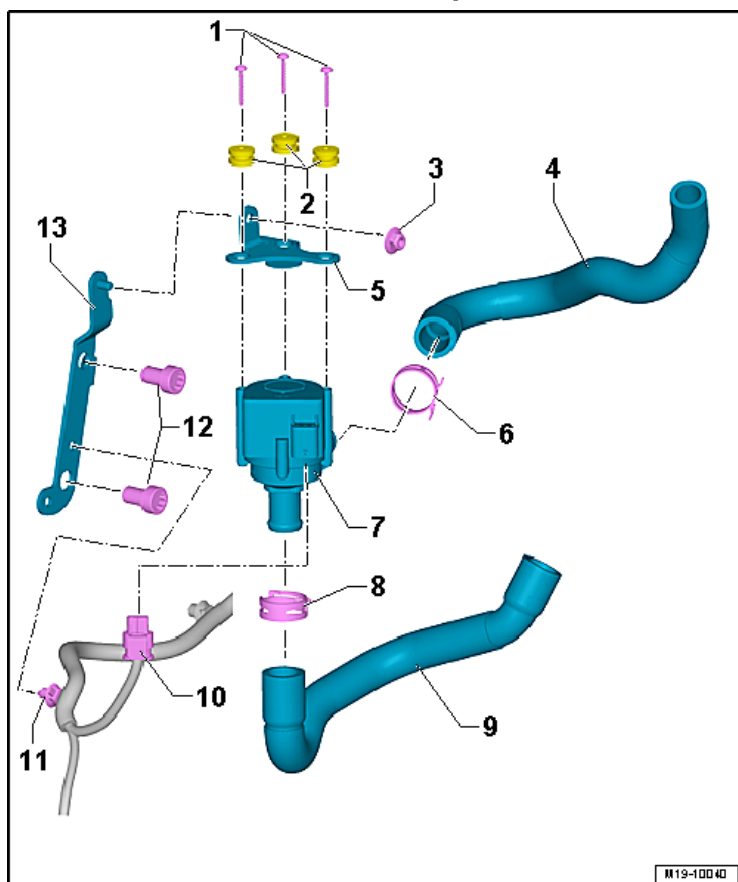
Tightening sequence	Tightening specification
-1- through -5-	Tighten to 9 Nm

Coolant Pump - Tightening Specification and Sequence



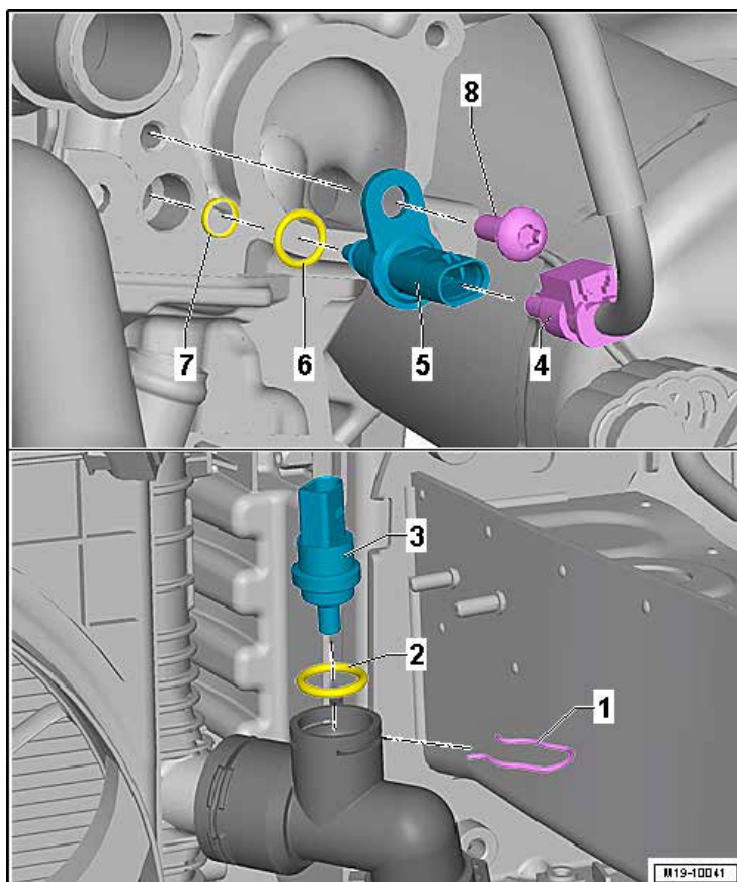
Tightening sequence	Tightening specification
-1- through -4-	Tighten to 9 Nm

Electric Coolant Pump Overview



- 1 - Bolt
 - 5 Nm
- 2 - Plastic Sockets
- 3 - Nut
 - 9 Nm
- 4 - Coolant Hose
- 5 - Bracket
- 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-

6 - O-ring

- Replace after removing
- Coat with coolant

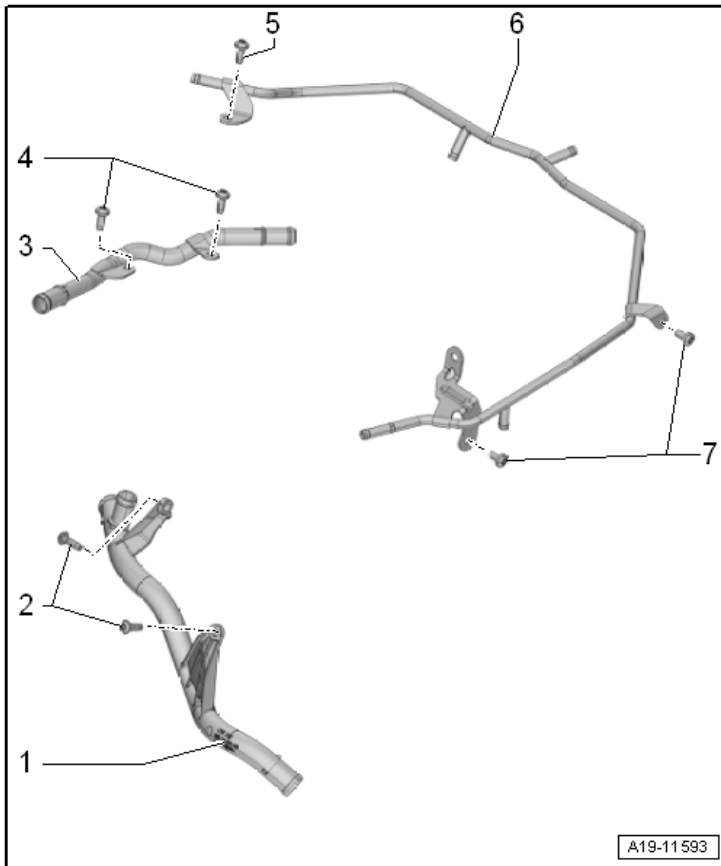
7 - O-ring

- Replace after removing
- Coat with coolant

8 - Bolt

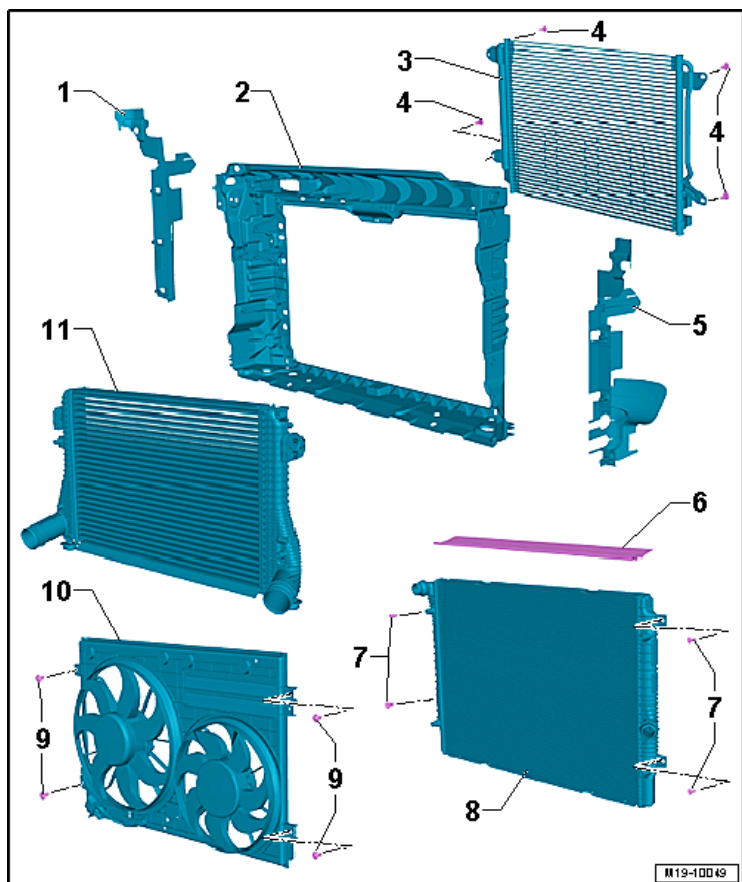
- 4 Nm + 45° turn
- Replace after removing

Coolant Pipes Overview



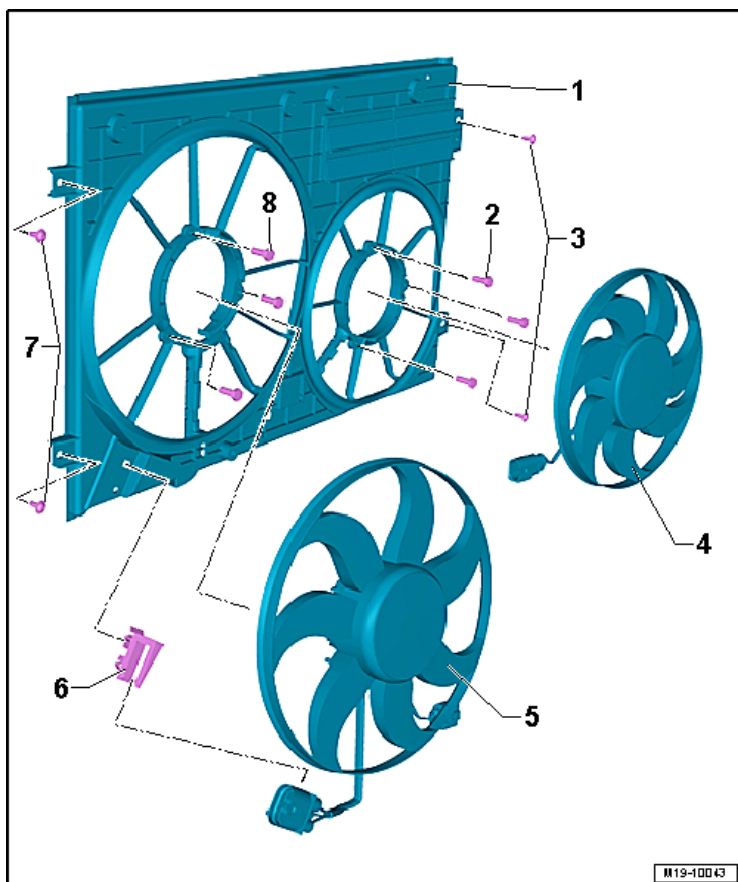
- 1 - Front Coolant Pipe**
- 2 - Bolts**
 - 6 Nm
- 3 - Upper Coolant Pipe**
- 4 - Bolts**
 - 9 Nm
- 5 - Bolt**
 - 9 Nm
- 6 - Coolant Pipe**
- 7 - Bolt**
 - 9 Nm

Radiator/Coolant Fan Overview



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

Fan Shroud and Radiator Fan Overview



Engine –
2.0L CPLA, CPPA

1 - Fan Shroud

2 - Bolt

□ 5 Nm

3 - Bolt

□ Tightening specification, see Radiator/Coolant Fan Overview

4 - Coolant Fan 2 -V177-

5 - Coolant Fan -V7-

6 - Bracket

7 - Bolt

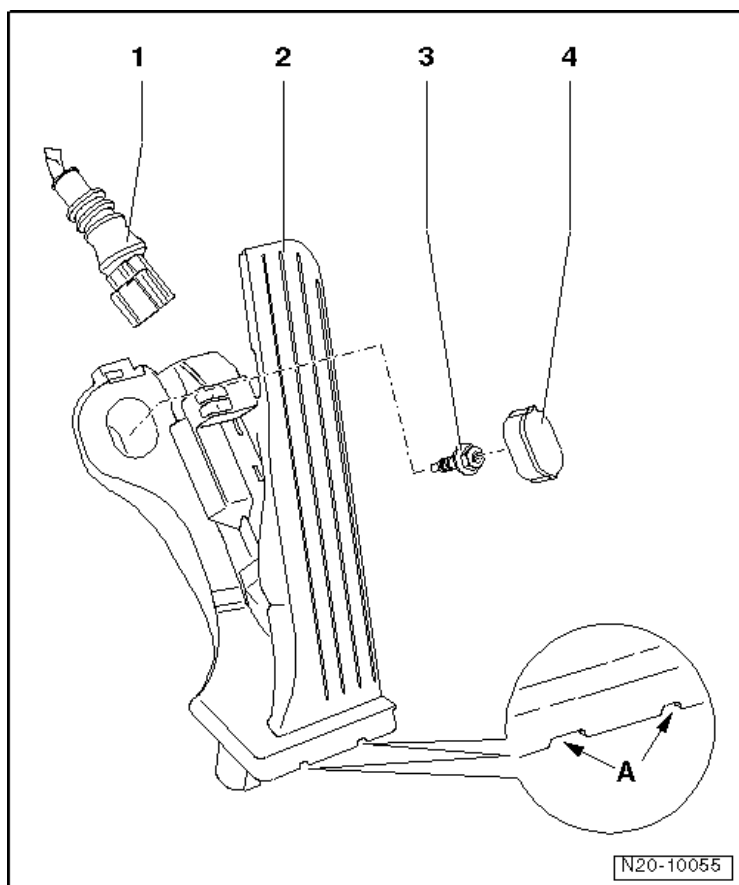
□ Tightening specification, see Radiator/Coolant Fan Overview

8 - Bolt

□ 8 Nm

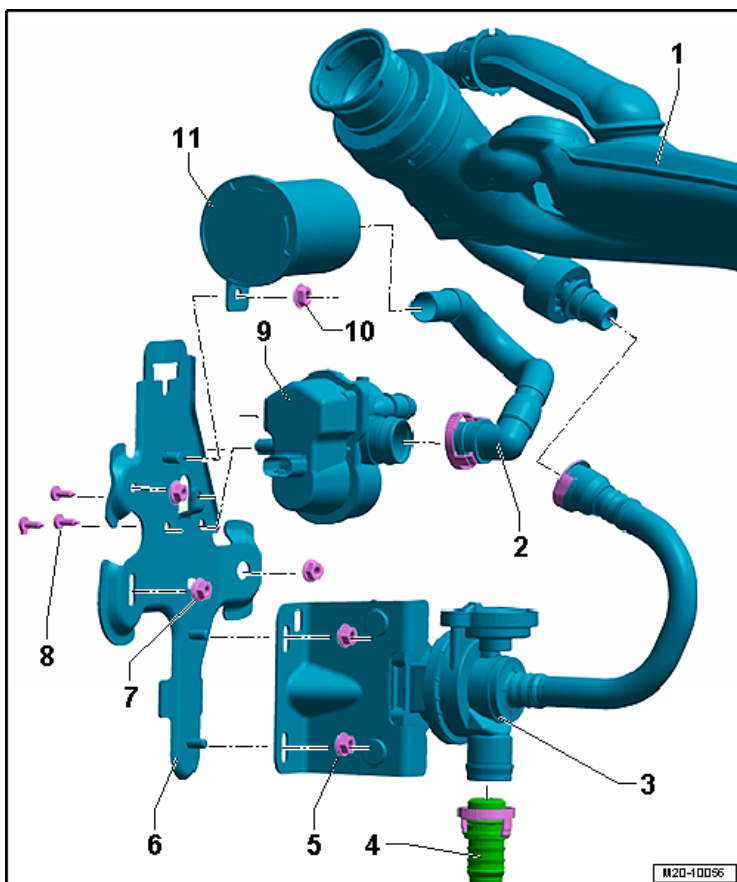
Fuel Supply – 2.0L CPLA, CPPA

Radiator/Coolant Fan Overview



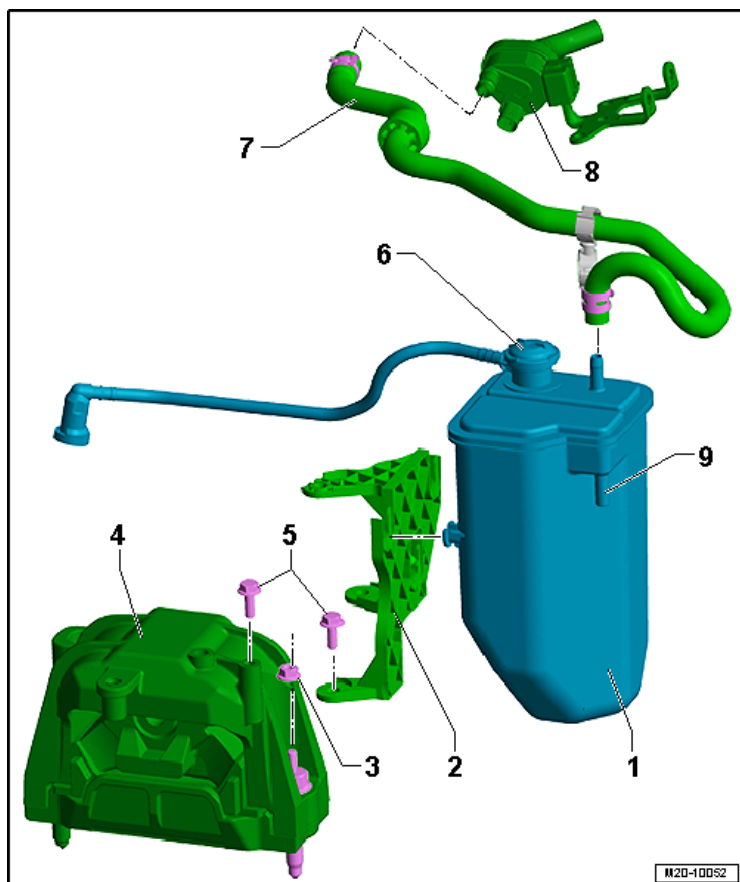
- 1 - Connector
- 2 - Accelerator Pedal Module with the Accelerator Pedal Position Sensor -G79- and Accelerator Pedal Position Sensor 2 -G185-
- 3 - Bolt
 - 10 Nm
- 4 - Cap

Leak Detection Pump -V144- Overview



- 1 - Fuel Tank Filler Tube
- 2 - Connecting Pipe
- 3 - Connecting Pipe
- 4 - Connecting Pipe
- 5 - Nut
 - 6 Nm
- 6 - Bracket
- 7 - Nut
 - 6 Nm
- 8 - Bolts
 - 3 Nm
- 9 - Leak Detection Pump -V144-
- 10 - Nut
 - 2 Nm
- 11 - Air Filter

EVAP Canister Installed in Engine Compartment



1 - EVAP Canister

2 - Bracket

3 - Nut

□ 10 Nm

4 - Engine Mount

5 - Bolts

□ 10 Nm

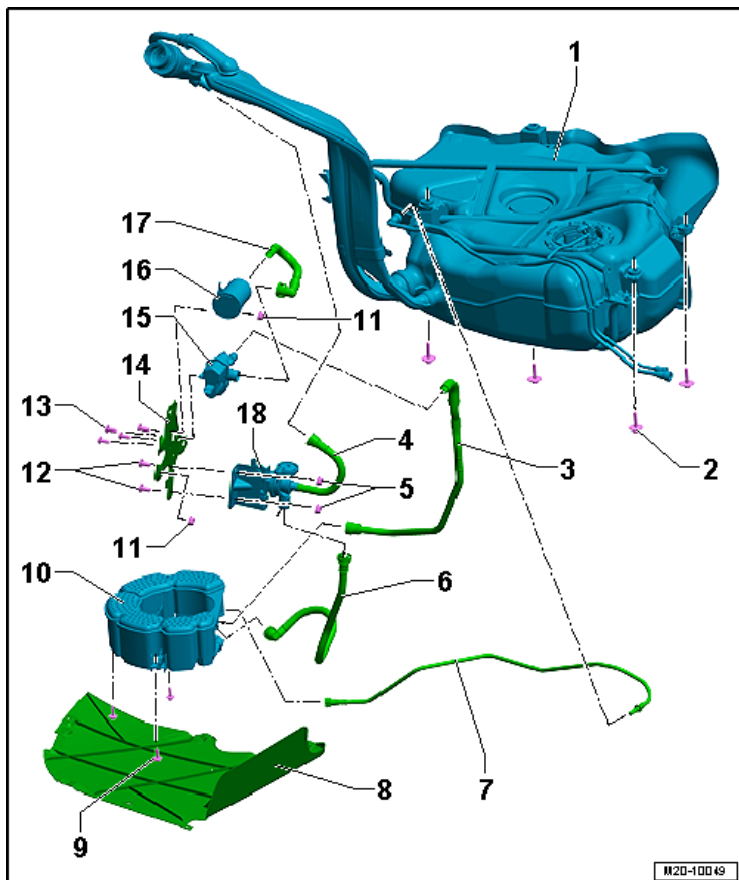
6 - Connecting Line

7 - Connecting Line

8 - EVAP Canister Purge Regulator Valve 1 -N80-

9 - Vent Hole

EVAP Canister Installed on Right Rear Side



1 - Fuel Tank

2 - Bolts

- Tightening specification, refer to Fuel Tank Overview

3 - Vent Line

4 - Connecting Line

5 - Nuts

- 6 Nm

6 - Connecting Line

7 - Vent Line

8 - Underbody Cover

9 - Bolts

- 8 Nm

10 - EVAP Canister

11 - Nut

- 6 Nm

12 - Threaded Stud

13 - Bolt

3 Nm

14 - Bracket

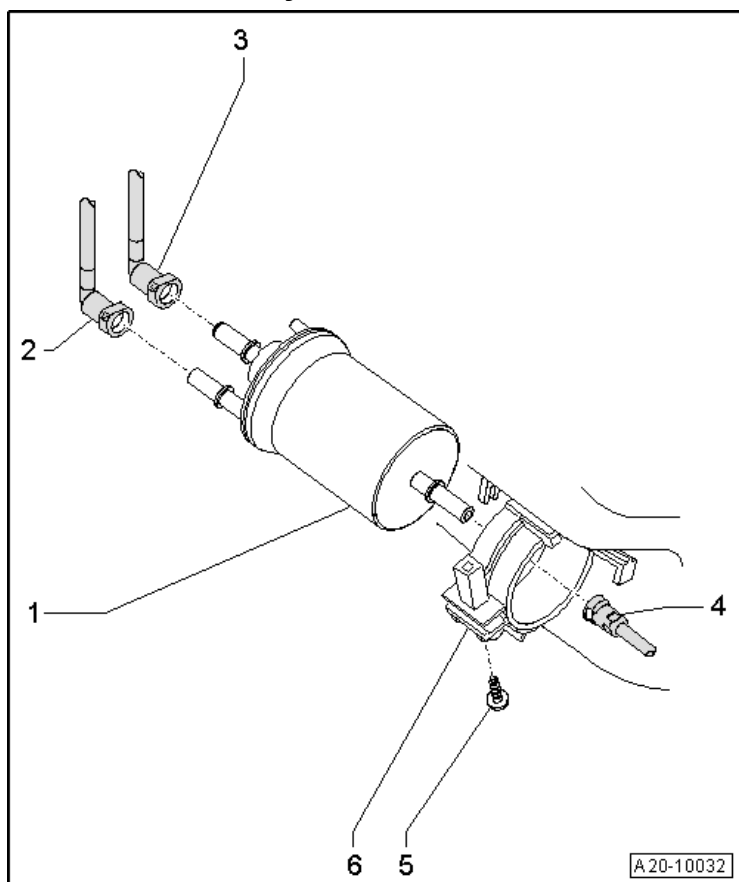
15 - Leak Detection Pump -V144-

16 - Air Filter

17 - Connecting Line

18 - Valve

Externally Installed Fuel Filter



- 1 - Fuel Filter
- 2 - Fuel Supply Line
- 3 - Fuel Return Line
- 4 - Fuel Line
- 5 - Bolt
 - 3 Nm
- 6 - Bracket for Fuel Filter

15 - Seal

16 - Fuel Delivery Unit

17 - Locking Ring

□ 110 Nm

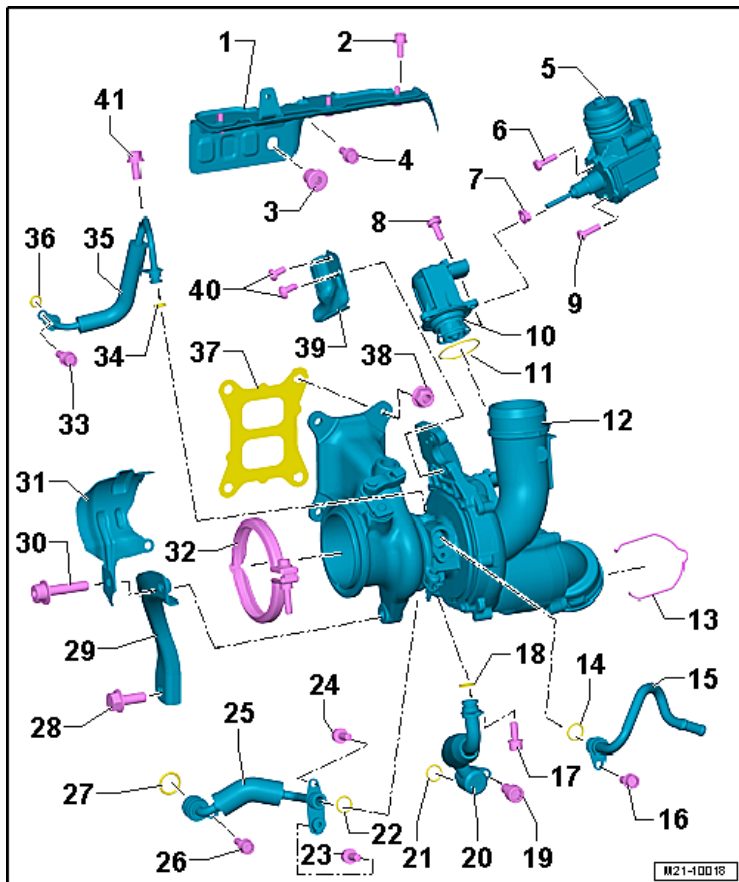
18 - Supply Line

19 - Return Line

20 - Fuel Filler Door Unit

Turbocharger – 2.0L CPLA, CPPA

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

Replace turbocharger after loosening bolt.

Do not remove the Charge Pressure Actuator -V465-.

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
- Coat with coolant

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

33 - Bolt

- 9 Nm

34 - O-ring

- Replace after removing
- Coat with engine oil

35 - Oil Supply Line

36 - O-ring

- Replace after removing
- Coat with engine oil

37 - Seal

- Replace after removing

38 - Nut

- 25 Nm
- Replace after removing

39 - Heat Shield

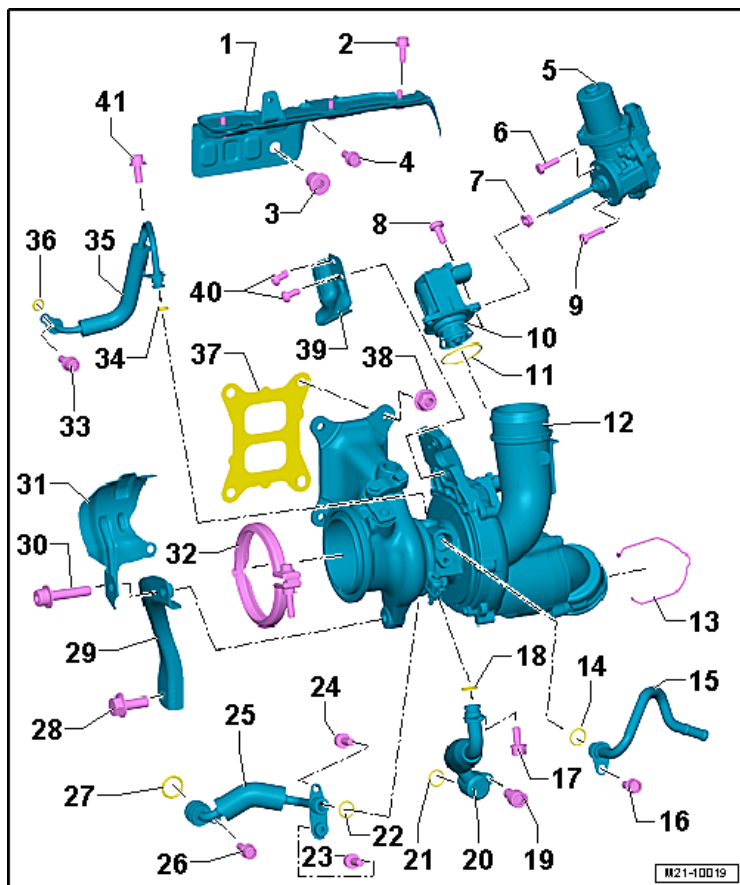
40 - Bolt

- 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
- Coat with coolant

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

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

33 - Bolt

- 9 Nm

34 - O-ring

- Replace after removing
- Coat with engine oil

35 - Oil Supply Line

36 - O-ring

- Replace after removing
- Coat with engine oil

37 - Seal

- Replace after removing

38 - Nut

- 25 Nm
- Replace after removing

39 - Heat Shield

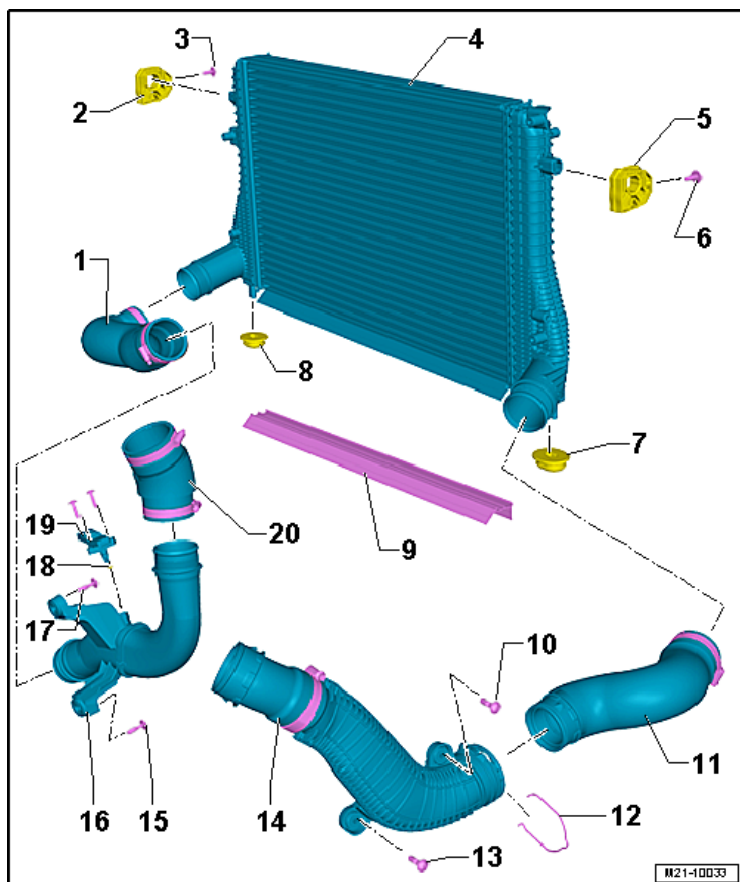
40 - Bolt

- 4.5 Nm

41 - Bolt

- 9 Nm

Charge Air System Overview



- 1 - Air Guide Hose
- 2 - Rubber Bushing
- 3 - Bolt
 - 8 Nm
- 4 - Charge Air Cooler
- 5 - Rubber Bushing
- 6 - Bolt
 - 8 Nm
- 7 - Rubber Bushing
- 8 - Rubber Bushing
- 9 - Gasket
- 10 - Bolt
 - 7 Nm
- 11 - Air Guide Hose
- 12 - Spring Clip
- 13 - Bolt
 - 7 Nm

14 - Air Guide Pipe

15 - Bolt

7 Nm

16 - Air Guide Pipe

17 - Bolt

7 Nm

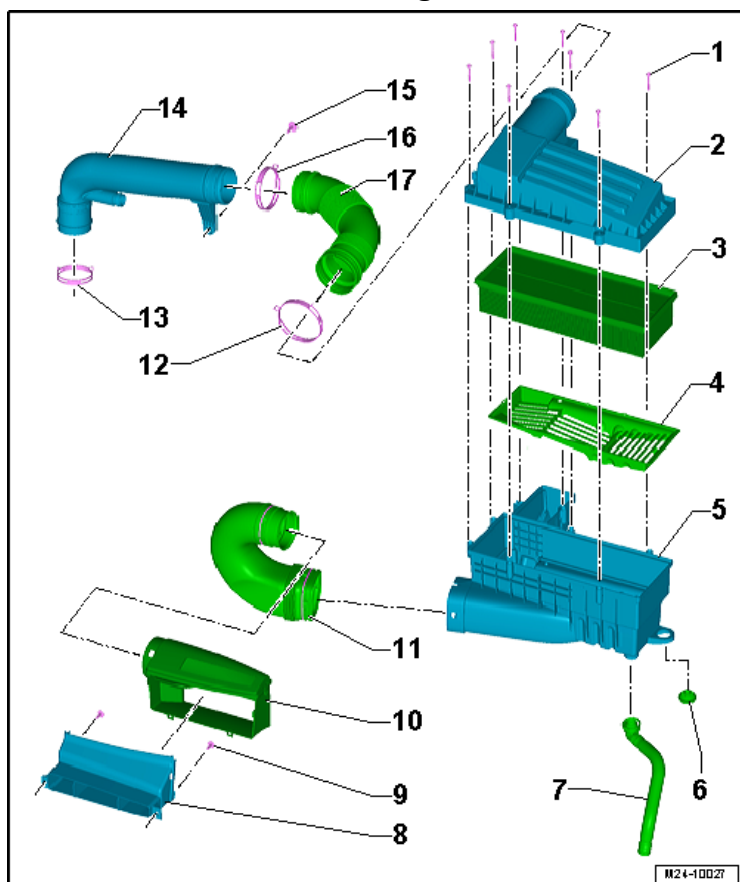
18 - O-ring

19 - Charge Air Pressure Sensor -G31-

20 - Air Guide Hose

- 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 - Bolts**
 - 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**
 - 9 Nm
- 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

- Not installed on all vehicles

5 - Air Filter Housing Lower Section

- Bolt 8

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

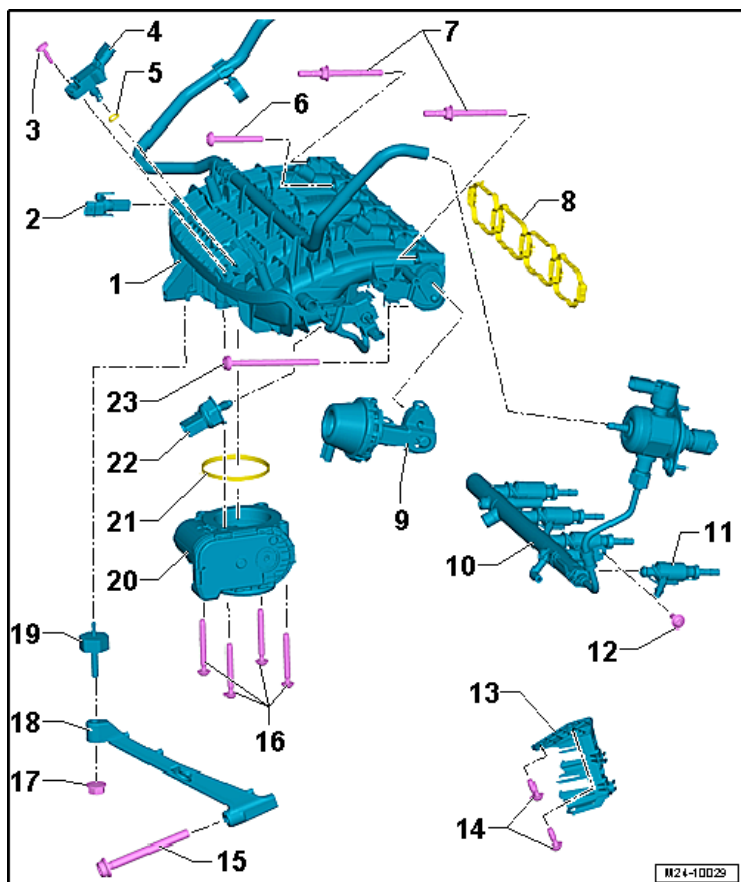
15 - Bolt

5 Nm

16 - Spring Clamp

17 - Air Guide Hose

Intake Manifold Overview



- 1 - Intake Manifold
- 2 - Intake Manifold Runner Position Sensor -G336-
- 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

13 - Bracket

14 - Bolt

5 Nm

15 - Bolt

20 Nm

16 - Bolts 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

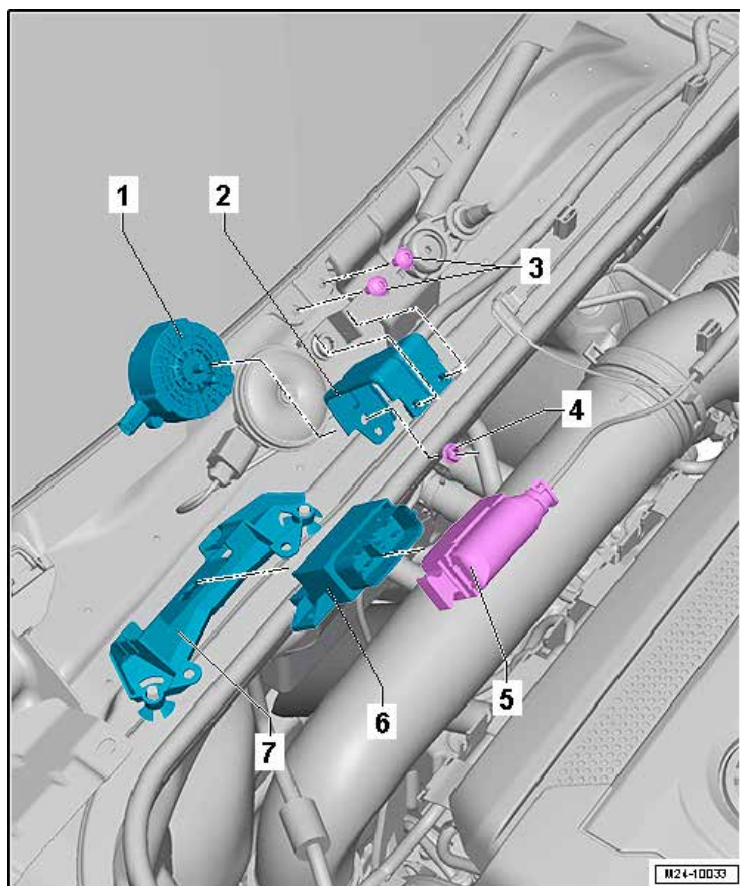
Replace after removing

22 - Fuel Pressure Sensor -G247-

23 - Bolt

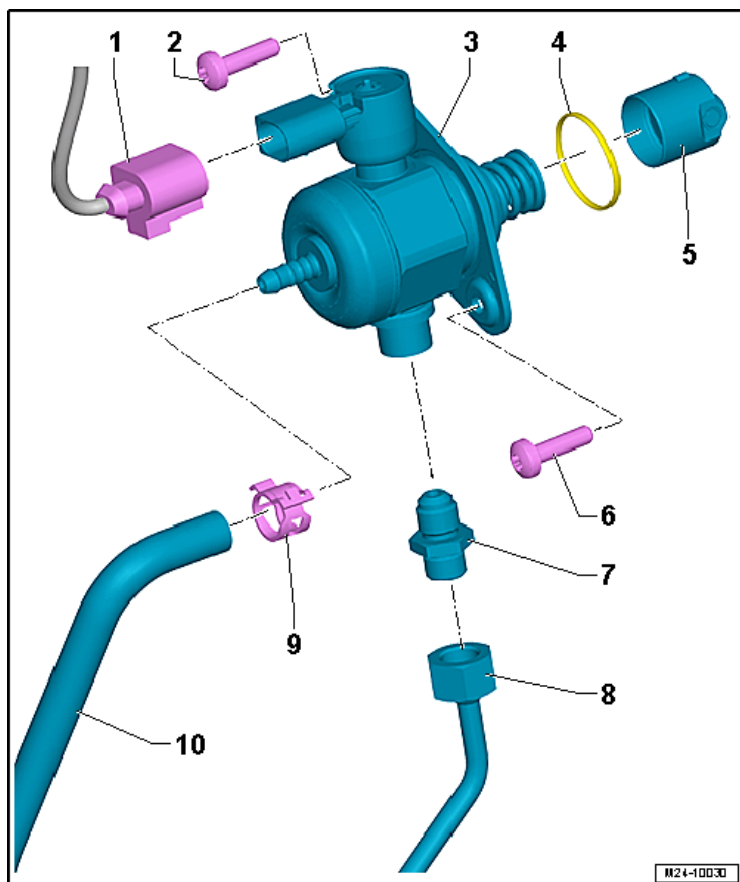
9 Nm

Structure Borne Sound Actuator and Control Module Overview



- 1 - Structure-Borne Sound Actuator -R214-**
- 2 - Bracket**
- 3 - Bolt**
 - 8 Nm
- 4 - Nut**
 - 15 Nm
- 5 - Connector**
- 6 - Structure Borne Sound Control Module -J869-**
- 7 - Bracket**

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

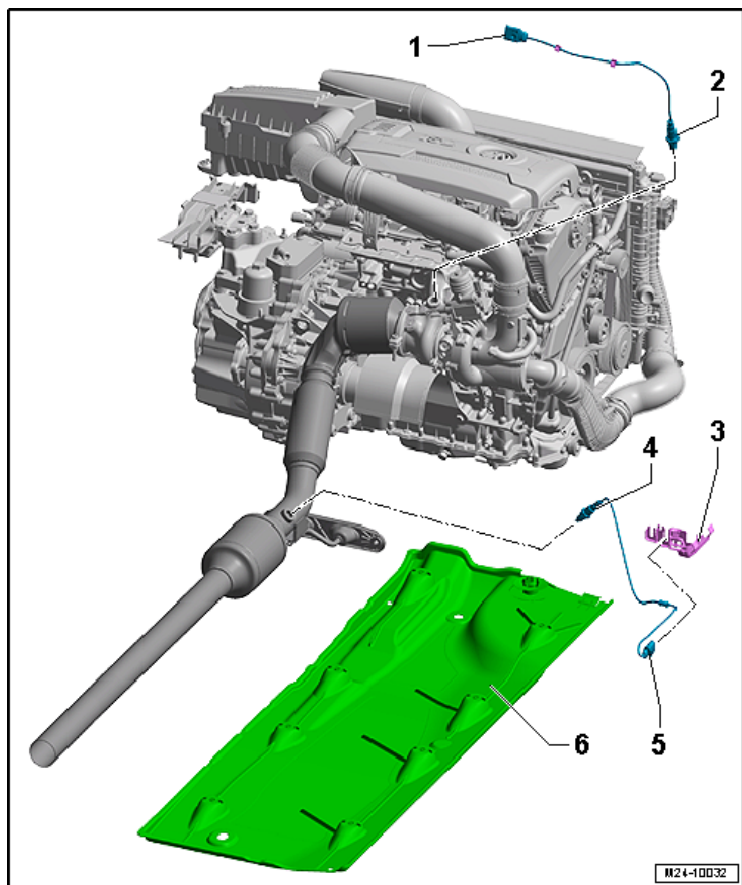
8 - Fuel Supply Line

9 - Spring Clamp

10 - Fuel Supply Line

Engine –
2.0L CPLA, CPPA

Heated Oxygen Sensor and Two Heated Oxygen Sensors Overview

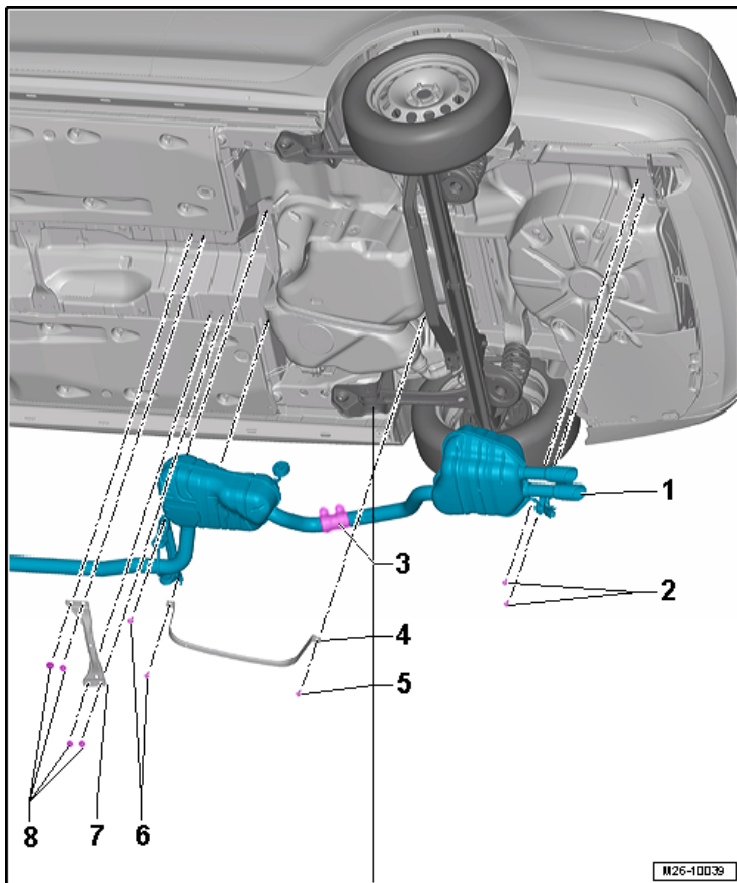


- 1 - Connector
- 2 - Heated Oxygen Sensor -G39- with Oxygen Sensor Heater -Z19-
□ 55 Nm
- 3 - Bracket
- 4 - Oxygen Sensor after Three Way Catalytic Converter -G130- with
Heater for Oxygen Sensor 1 After Catalytic Converter -Z29-
- 5 - Connector
- 6 - Underbody Trim

Exhaust System, Emission Controls – 2.0L CPLA, CPPA

Engine –
2.0L CPLA, CPPA

Muffler Overview



1 - Exhaust Pipe With Rear Muffler

2 - Bolt

□ 25 Nm

3 - Separating Point

4 - Mounting Strap

5 - Bolt

□ Tightening specification refer to Turbocharger

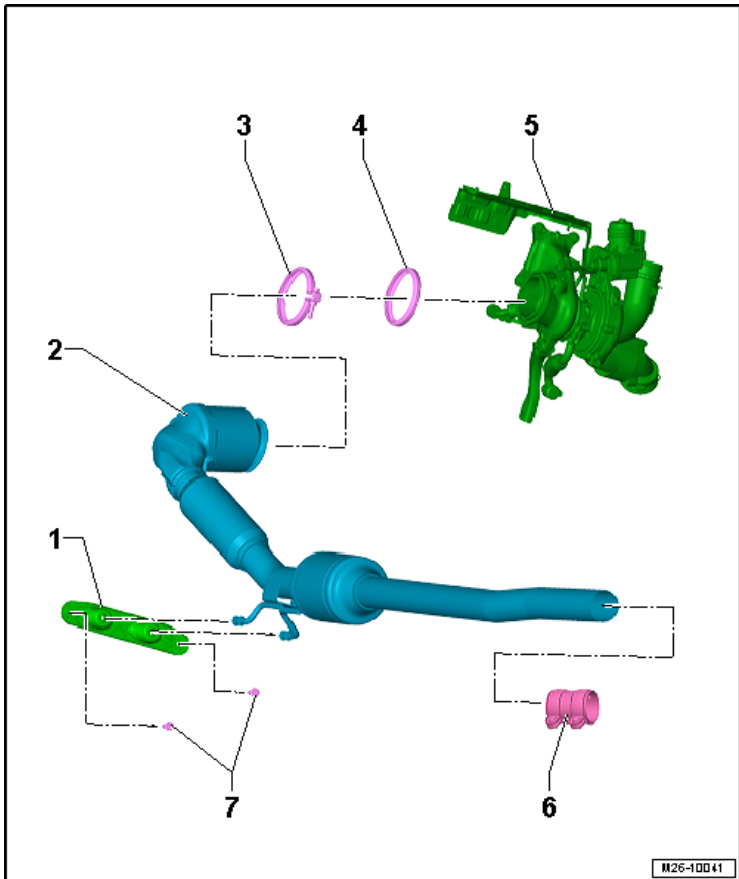
6 - Underbody Trim

7 - Rear Tunnel Bridge

8 - Nut

□ 20 Nm

Emissions Control Overview

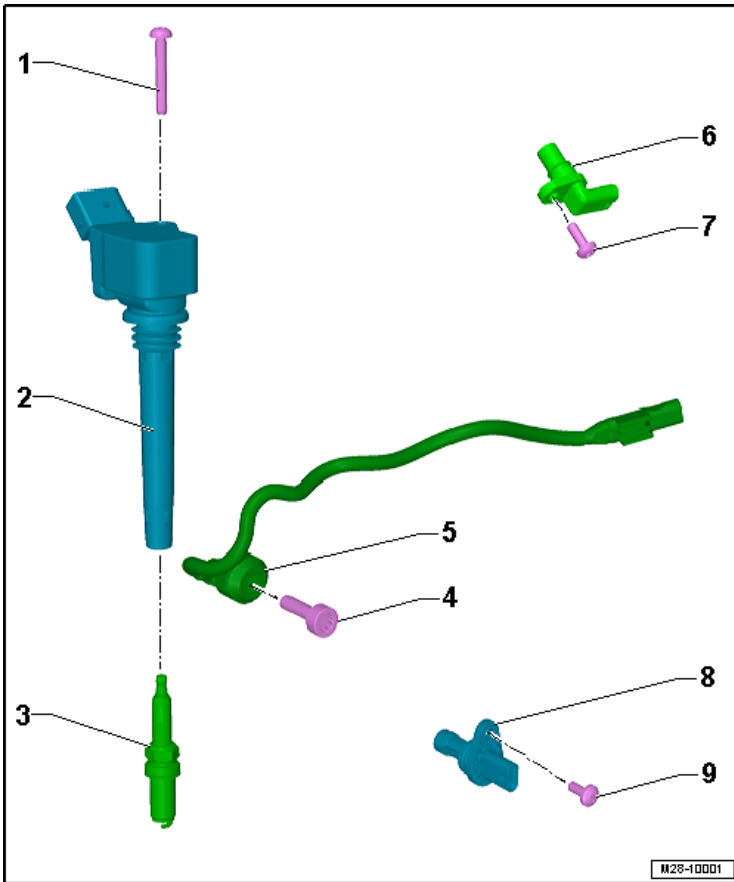


- 1 - Bracket
- 2 - Catalytic Converter
- 3 - V-Clamp
 - Replace after removing
- 4 - Seal
 - Replace after removing
- 5 - Turbocharger
- 6 - Front Clamping Sleeve
- 7 - Bolt
 - 23 Nm

Ignition – 2.0L CPLA, CPPA

Engine –
2.0L CPLA, CPPA

Ignition System Overview



1 - Bolt

- 10 Nm

2 - Ignition Coil with Power Output Stage

3 - Spark Plug

4 - Bolt

- 20 Nm
- Replace after removing

5 - Knock Sensor 1 -G61-

6 - Camshaft Position Sensor -G40-

7 - Bolt

- 9 Nm

7 - Engine Speed Sensor -G28-

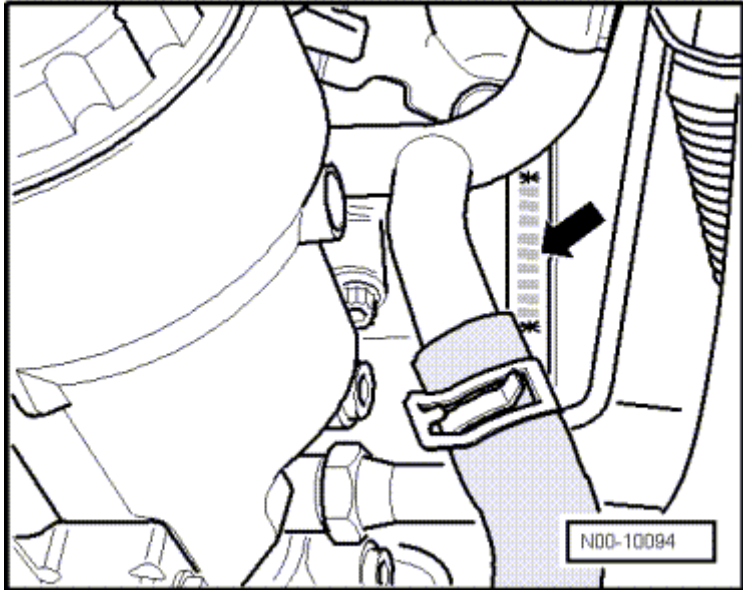
8 - Bolt

- 10 Nm

ENGINE – 2.0L CJAA (TDI)

General Information

Engine Number



The engine number (engine code and serial number) ➔ 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 digit. 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

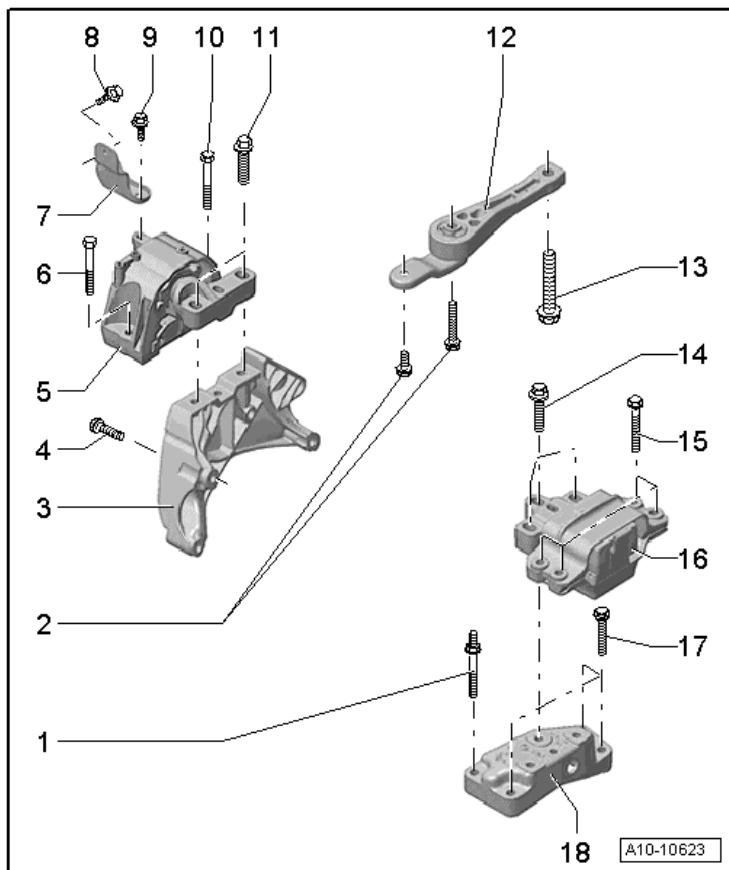
Code Letters		CJAA
Manufactured		From 05.09
Emissions values	in accordance with	ULEV2 Standard
Displacement	liter	2.0
Output	kW at RPM	103 at 4000
Torque	Nm at RPM	320 at 1750 - 2500
Bore	Diameter mm	81.0
Stroke	mm	95.5
Valves per cylinder		4
Compression ratio		16.5
Diesel fuel	in accordance with	ASTM D 975 Standard ¹⁾
Ignition sequence		1-3-4-2
Balance shaft module		No
Nitrogen Oxide (NOx) reduction catalytic converter		Yes
Reduction catalytic converter		Yes
Exhaust Gas Recirculation (EGR)		Yes
Turbocharger, Supercharger		Turbocharger
Charge Air Cooler (CAC)		Yes
Particulate filter		Yes

¹⁾ With a sulfur content less than 15 mg/kg of diesel fuel.

**Engine –
2.0L CJAA (TDI)**

Engine Assembly – 2.0L CJAA (TDI)

Engine and Transmission Mount Overview



1 - Bolt

- Tightening specifications, refer to Transmission

2 - Bolt

- 50 Nm + 90° turn
- Replace after removing

3 - Engine Mount Bracket

4 - Bolt

- 40 Nm + 180° turn
- Replace after removing

5 - Engine Mount

6 - Bolt

- 40 Nm + 90° turn
- Replace after removing

7 - Bracket

8 - Bolt

- 20 Nm + 90° turn
- Replace after removing

9 - Bolt

- 20 Nm + 90° turn
- Replace after removing

10 - Bolt

- 40 Nm + 90° turn
- Replace after removing

11 - Bolt

- 60 Nm + 90° turn
- Replace after removing

12 - Pendulum Support

13 - Bolt

- 100 Nm + 90° turn
- Replace after removing

14 - Bolt

- 60 Nm + 90° turn
- Replace after removing

15 - Bolt

- 40 Nm + 90° turn
- Replace after removing

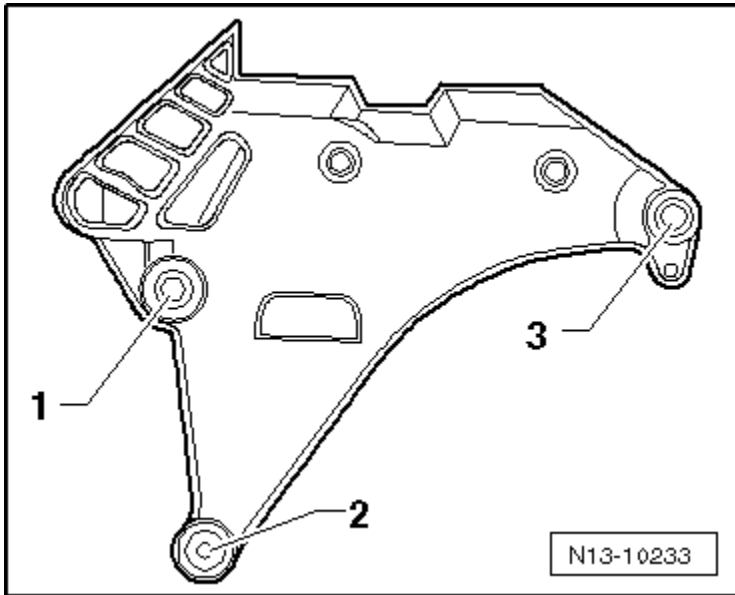
16 - Transmission Mount

17 - Bolt

- Tightening specifications, refer to Transmission

18 - Transmission Mount Bracket

Engine Mount Bracket-to-Cylinder Block Tightening Specifications



WARNING

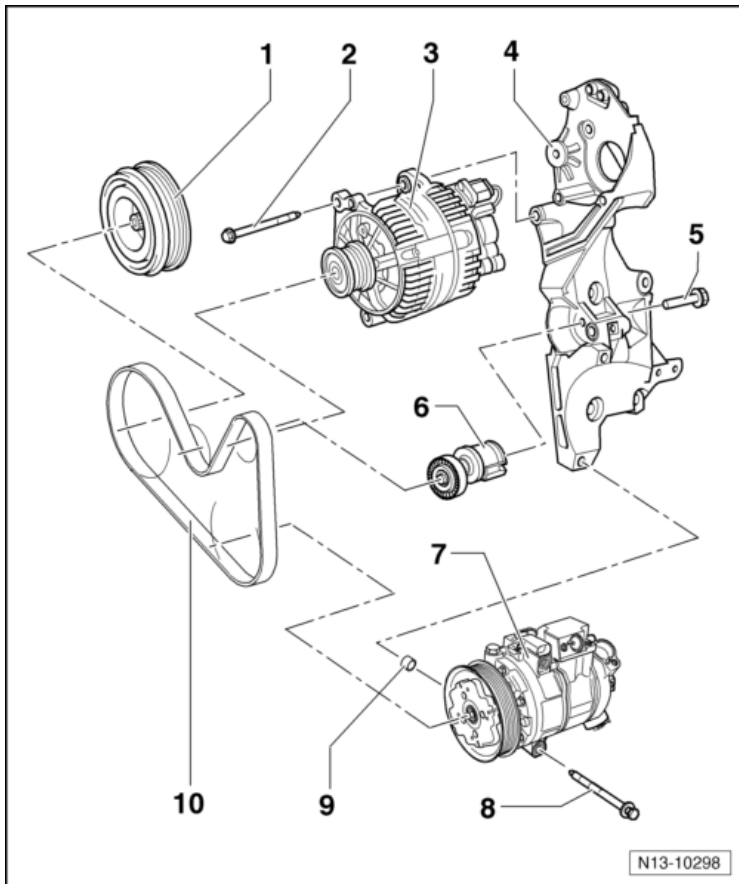
Always use the correct tightening sequence and specifications for the engine mount bracket bolts. Otherwise tension could develop in the engine mount bracket and break it.

Step	Component	Nm
1	Tighten bolts 1 through 3 in sequence by hand	Hand-tighten
2	Tighten the bolts 1 through 3 in sequence	40 plus an additional 180° (½ turn)

**Engine –
2.0L C-JAA (TDI)**

Crankshaft, Cylinder Block – 2.0L CJAA (TDI)

Ribbed Belt Overview



1 - Vibration Damper

2 - Bolt

25 Nm

3 - Generator

4 - Accessory Bracket

5 - Bolt

20 Nm + 90° turn

Replace after removing

6 - Belt Tensioner

7 - Air Conditioning (A/C) Compressor

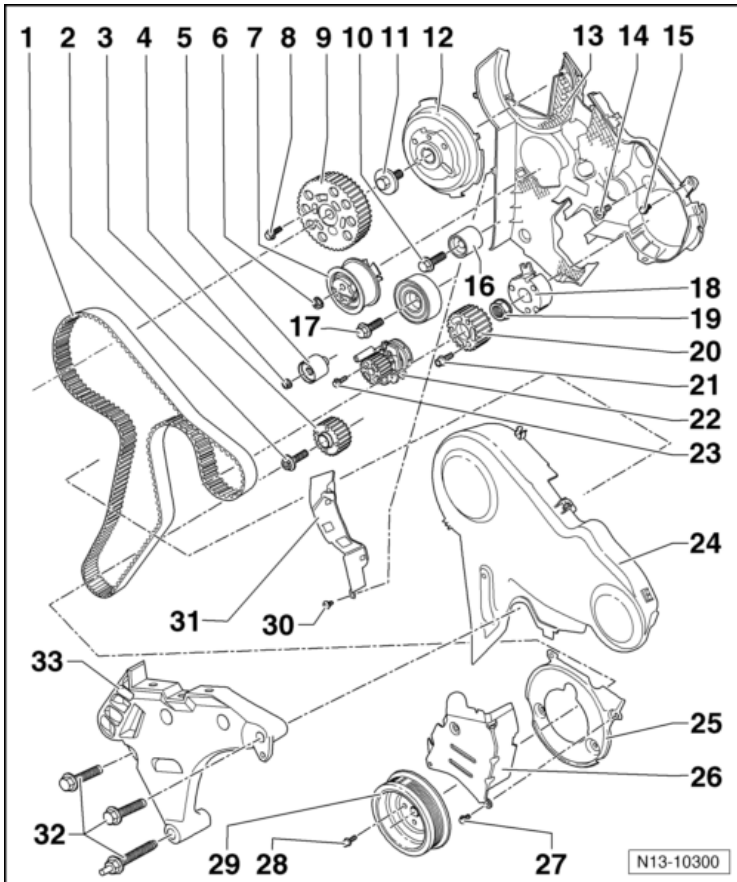
8 - Bolt

45 Nm

- 9 - Alignment Sleeve
- 10 - Ribbed Belt

Engine –
2.0L C-JAA (TDI)

Toothed Belt Overview



1 - Toothed Belt

2 - Bolt

- 120 Nm + 90° turn
- Replace after removing

3 - Crankshaft Toothed Belt Gear

4 - Bolt

- 20 Nm

5 - Idler Roller

6 - Nut

- 20 Nm + 45° turn
- Replace after removing

7 - Belt Tensioner

8 - Bolt

- 20 Nm + 45° turn
- Replace after removing

9 - Camshaft Toothed Belt Gear

10 - Bolt

- 25 Nm

11 - Bolt

- 100 Nm

12 - Hub

13 - Rear Toothed Belt Guard

14 - Bolt

- 20 Nm

15 - Bolt

- 10 Nm
- Replace after removing

16 - Idler Roller

17 - Bolt

- 50 Nm + 90° turn
- Replace after removing

18 - Hub

19 - Nut

- 95 Nm

20 - Pressure Fuel Pump Toothed Belt Gear

21 - Bolt

- 20 Nm + 90° turn
- Replace after removing

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

28 - Bolt

- 10 Nm + 90° turn
- Replace after removing

29 - Vibration Damper

30 - Bolt

- 5 Nm

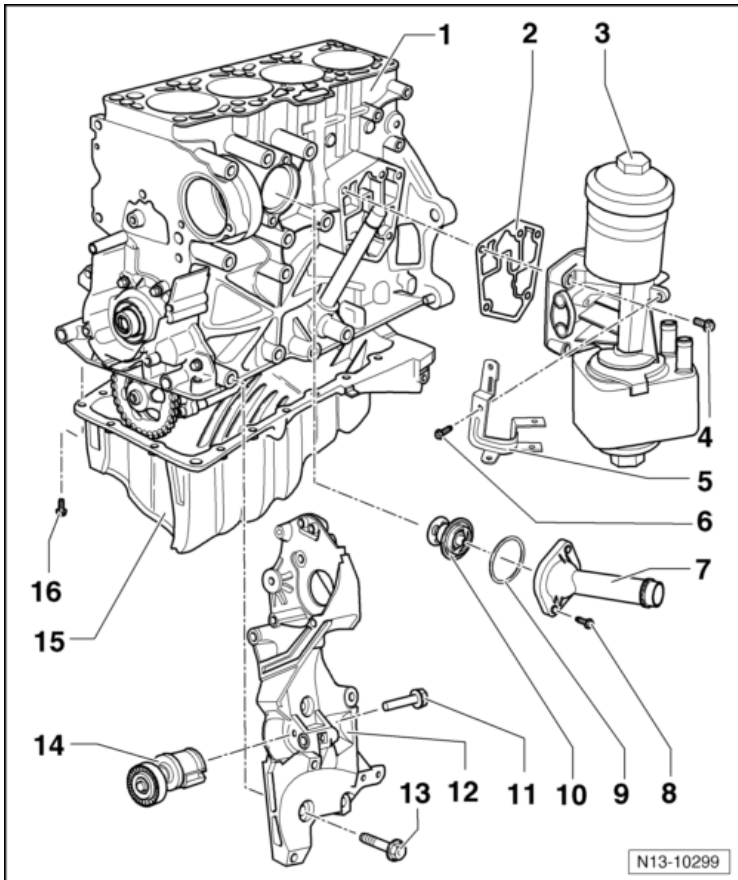
31 - Protective Plate

32 - Bolt

- 40 Nm + 180° turn
- Replace after removing

33 - Engine Mount Bracket

Cylinder Block Overview



1 - Cylinder Block

2 - Gasket

- Always replace

3 - Oil Filter Bracket

4 - Bolt

- 15 Nm + 180° turn
- Replace after removing

5 - Bracket

6 - Bolt

- 10 Nm

7 - Connecting Piece

8 - Bolt

- 15 Nm

9 - O-ring

10 - Coolant Thermostat

11 - Bolt

- 20 Nm + 180° turn
- Replace after removing

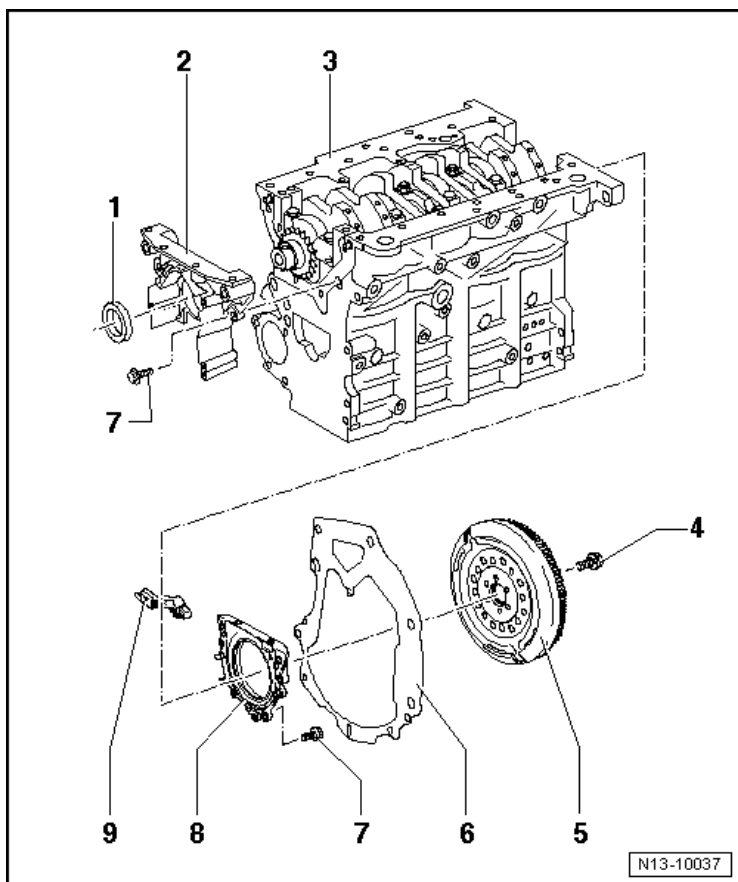
12 - Accessory Bracket**13 - Bolt**

- 40 Nm + 90° turn
- Replace after removing

14 - Ribbed Belt Tensioner**15 - Oil Pan****16 - Bolt**

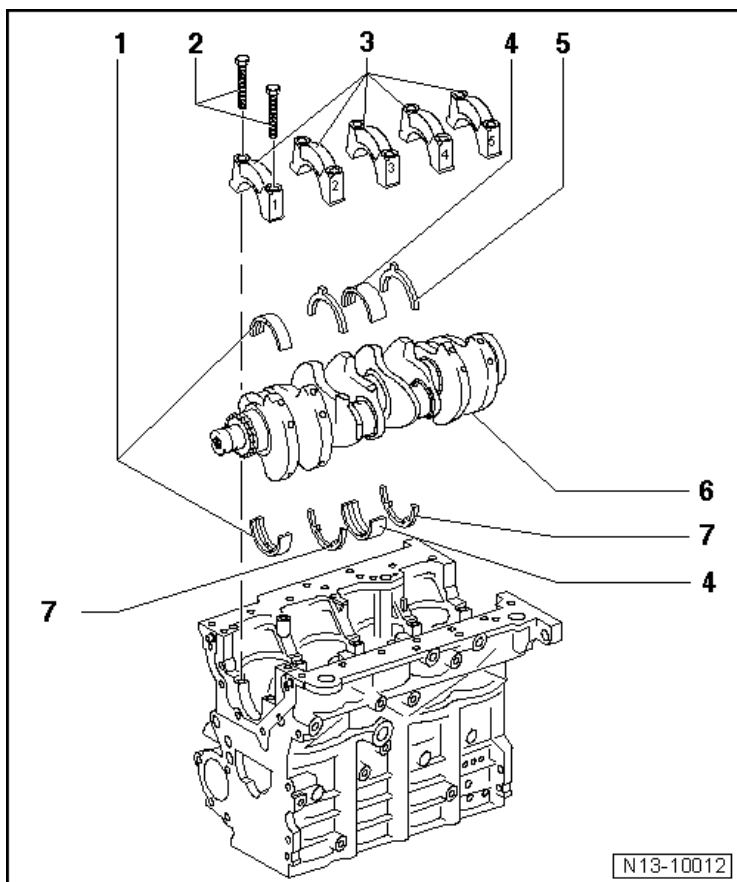
- 40 Nm + 90° turn
- Tighten in a diagonal sequence and in steps.

Sealing Flange and Flywheel Overview



- 1 - Seal**
- 2 - Sealing Flange**
- 3 - Cylinder Block**
- 4 - Bolt**
 - 60 Nm + 90° turn
 - Replace after removing
- 5 - Flywheel**
- 6 - Intermediate Plate**
- 7 - Bolt**
 - 15 Nm
- 8 - Sealing Flange with Seal**
- 9 - Engine Speed Sensor -G28-**
 - 5 Nm

Crankshaft Overview



1 - Bearing Shells 1, 2, 4 and 5

2 - Bolt

- 65 Nm + 90° turn
- Replace after removing

3 - Bearing Cap

4 - Bearing Shell 3

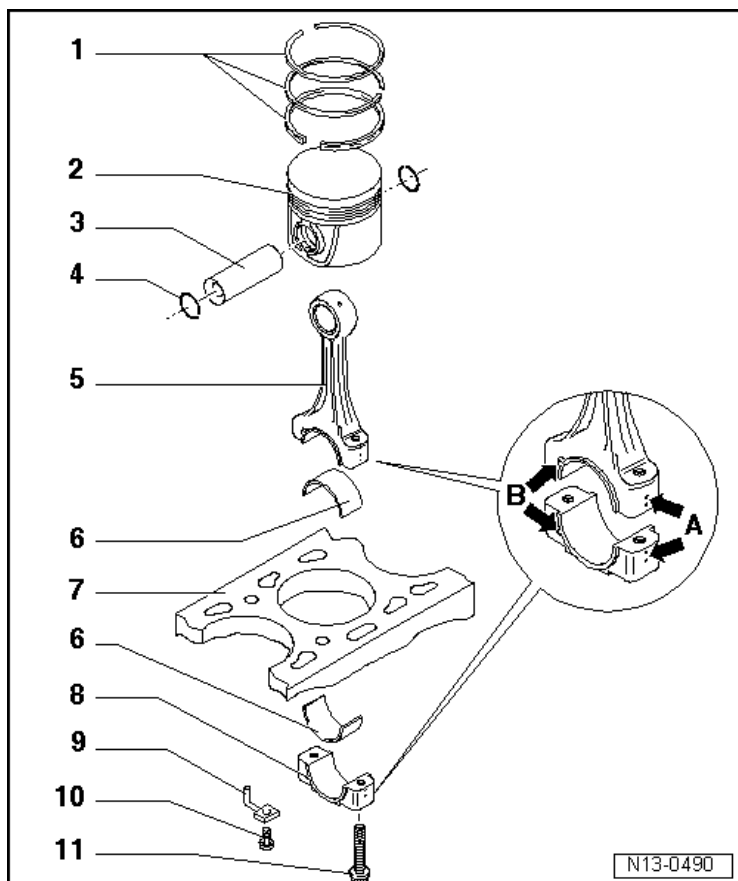
5 - Thrust Washer

6 - Crankshaft

7 - Thrust Washer

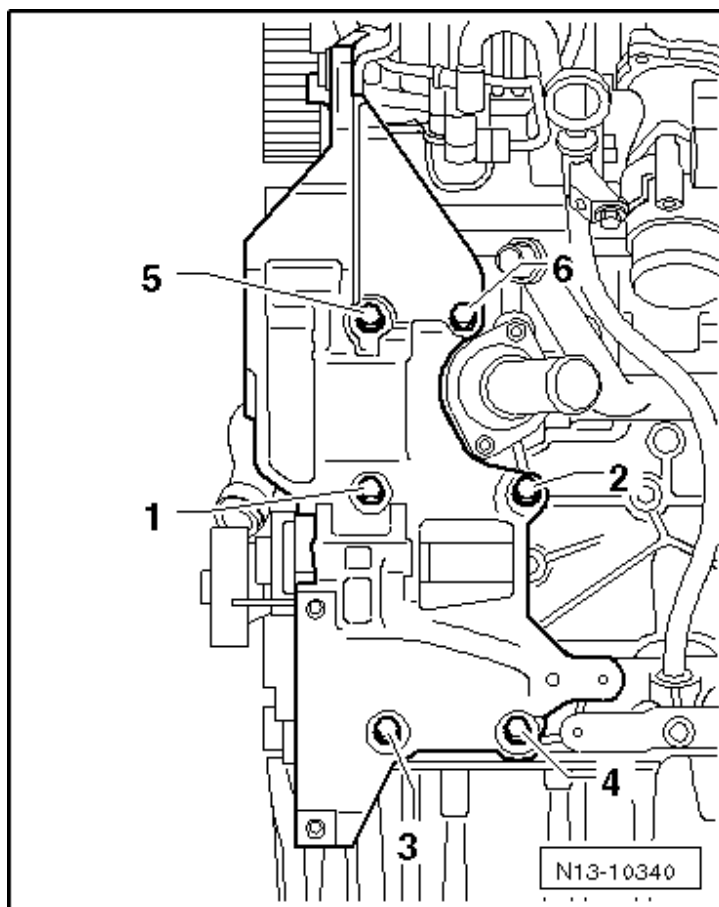
Engine –
2.0L C-JAA (TDI)

Pistons and Connecting Rod Overview



- 1 - Piston Rings
- 2 - Piston
- 3 - Piston Pin
- 4 - Circlip
- 5 - Connecting Rod
- 6 - Bearing Shell
- 7 - Cylinder Block
- 8 - Connecting Rod Bearing Cap
- 9 - Oil Spray Jet
- 10 - Bolt with Pressure Relief Valve
 - 27 Nm
- 11 - Bolt
 - 30 Nm + 90° turn
 - Replace after removing

Accessory Bracket Tightening Specifications



Engine –
2.0L C-JAA (TDI)

Component	Nm
Tighten new accessory bracket bolts 1 through 6 in sequence	40 plus an additional 90° (¼ turn)

Piston and Cylinder Dimensions

Honing dimension in mm	Piston diameter ¹⁾	Cylinder bore diameter
Basic dimension	80.960	81.010

¹⁾ Take the measurement approximately 12 mm in from the lower edge of the piston and offset 90° to the piston axis.

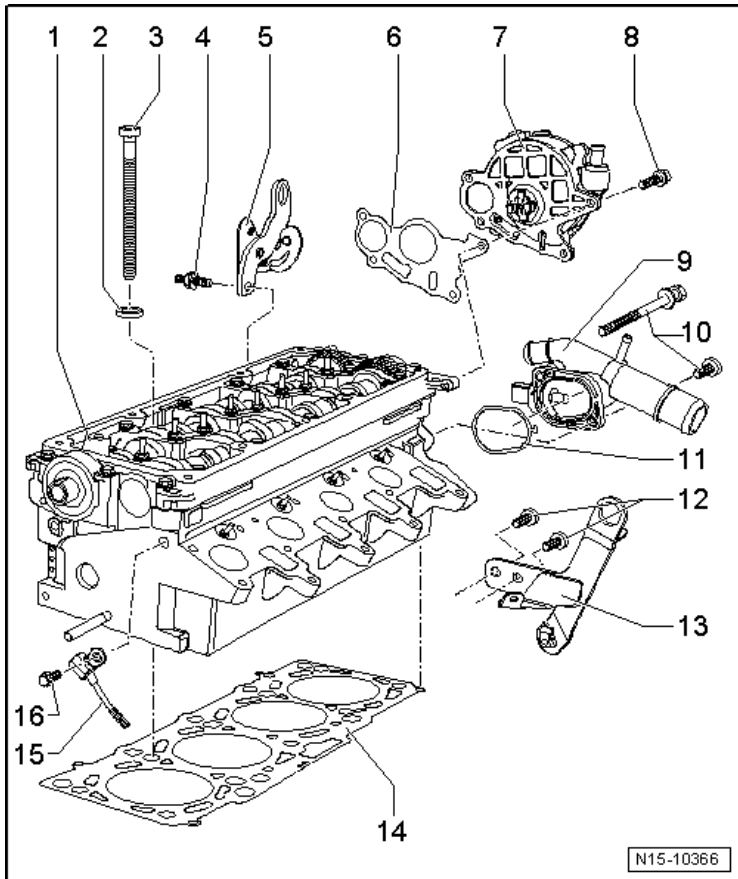
Crankshaft Dimensions

Honing dimension in mm	Crankshaft bearing pins-diameter		Connecting rod bearing pin-diameter	
Basic dimension	54.000	- 0.022	50.900	- 0.022
		-0.042		- 0.042

**Engine –
2.0L C-JAA (TDI)**

- 9 - Fuel Injector**
- 10 - Bracket**
- 11 - Vacuum Hose**
- 12 - Cylinder Head Cover**
- 13 - Gasket**
- 14 - Bolt**
 - 10 Nm
- 15 - Cap**
- 16 - Heat Shield**
- 17 - Bushing**

Cylinder Head Overview



1 - Cylinder Head

2 - Washer

3 - Cylinder Head Bolt

- Sequence for loosening and tightening, see Cylinder Head Tightening Specifications below

4 - Stud Bolt

- 25 Nm

5 - Lifting Eye

6 - Gasket

- Always replace

7 - Vacuum Pump

8 - Bolt

- 10 Nm

9 - Coolant Connection

10 - Bolt

- 10 Nm

11 - Seal

- Always replace

12 - Bolt

- 25 Nm

13 - Lifting Eye

14 - Cylinder Head Gasket

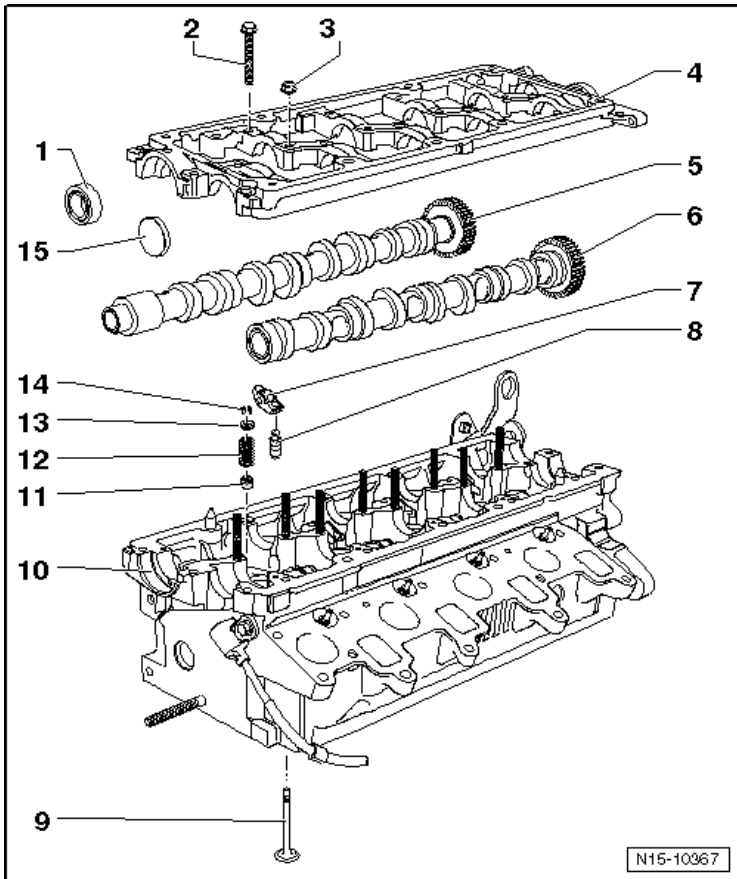
- Always replace

15 - Camshaft Position Sensor -G40-

16 - Bolt

- 10 Nm

Valvetrain Overview



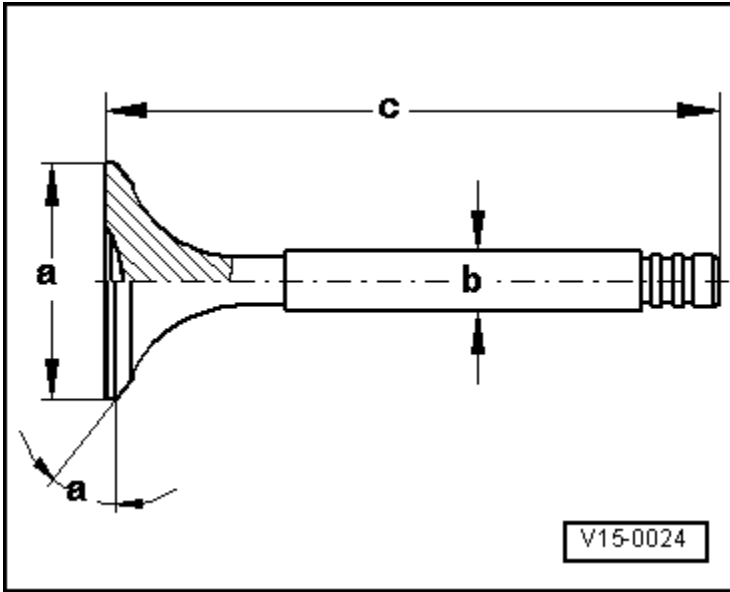
- 1 - Seal
- 2 - Bolt
 - 10 Nm
- 3 - Nut
 - 10 Nm
- 4 - Bearing Frame
- 5 - Exhaust Camshaft
- 6 - Intake Camshaft
- 7 - Roller Rocker Lever
- 8 - Hydraulic Lash Adjusters
- 9 - Valve
- 10 - Cylinder Head
- 11 - Valve Stem Seal
- 12 - Valve Spring
- 13 - Valve Spring Plate
- 14 - Valve Retainers
- 15 - Seal

15 - Cap

16 - Bolt

- 40 Nm + 90° turn
- Tighten in a diagonal sequence and in steps.

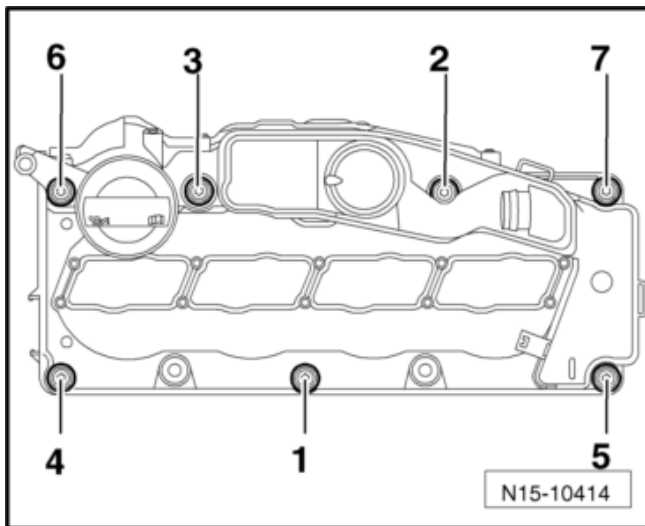
Valve Dimensions



Dimension		Intake Valve	Exhaust Valve
Diameter a	mm	26.60	26.00
Diameter b	mm	5.940	5.940
c	mm	99.30	99.10
α	\angle°	45	45

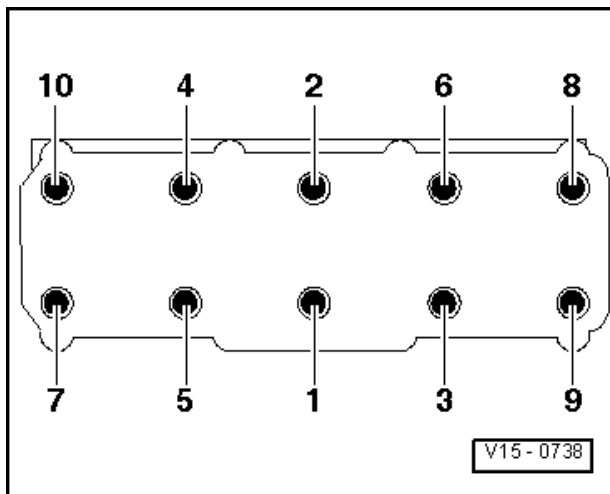
Engine –
2.0L C-JAA (TDI)

Cylinder Head Cover Tightening Specifications



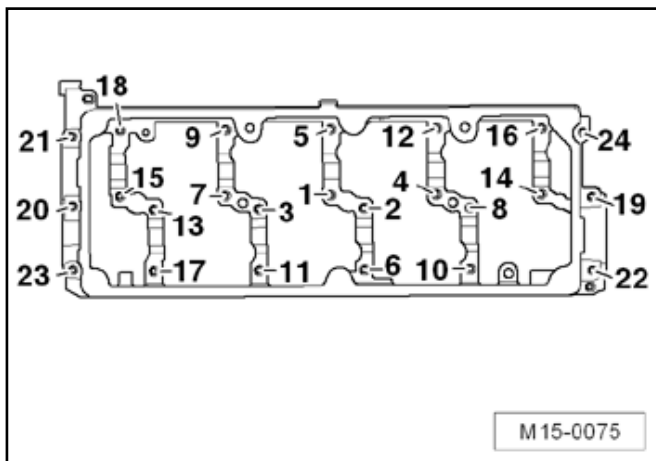
Component	Nm
Tighten the cylinder head cover bolts 1 through 7 in sequence	10

Cylinder Head Tightening Specifications



Step	Component	Nm
1	Tighten bolts using a torque wrench	35
2	Tighten bolts using a torque wrench	60
3	Tighten bolts using a ratchet	an additional 90° (¼ turn)
4	Tighten bolts using a ratchet	an additional 90° (¼ turn)

Bearing Frame Tightening Specifications

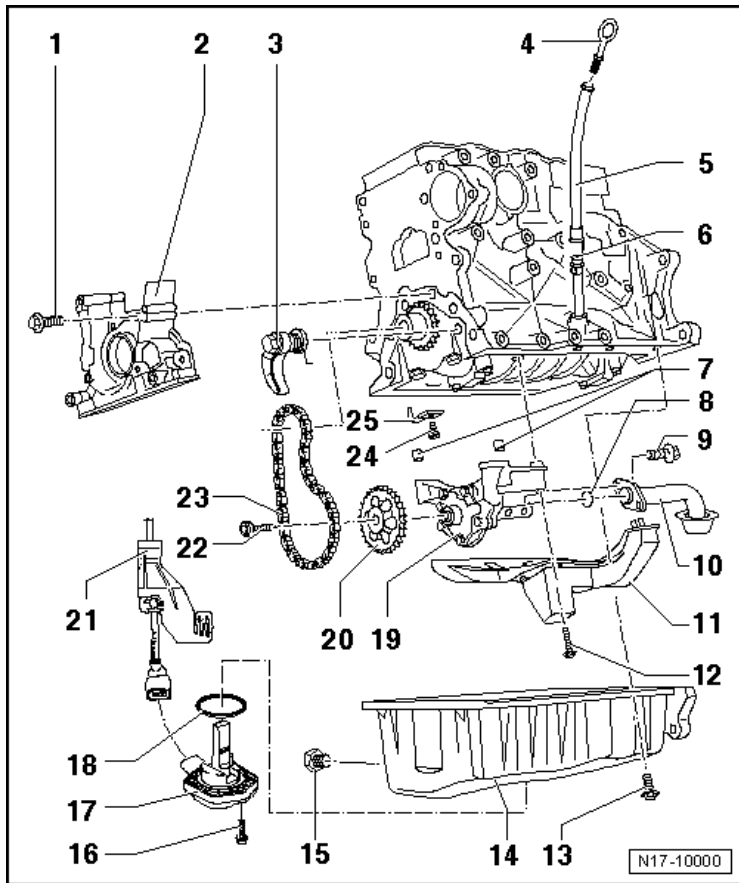


Component	Nm
Tighten the bearing frame bolts and nuts 1 through 24 in sequence	10

Engine –
2.0L C-JAA (TDI)

Lubrication – 2.0L CJAA (TDI)

Oil Pump and Oil Pan Overview



1 - Bolt

□ 15 Nm

2 - Sealing Flange

3 - Chain Tensioner with Tensioning Rail

□ 15 Nm

4 - Oil Dipstick

5 - Guide Tube

6 - Guide Tube

7 - Alignment Sleeves

8 - O-ring

9 - Bolt

□ 15Nm

10 - Suction Line

11 - Splash Wall

12 - Bolt

□ 15 Nm

13 - Bolt

- 15 Nm

14 - Oil Pan

15 - Oil Drain Plug

- 30 Nm

16 - Bolt

- 10 Nm

17 - Oil Level Thermal Sensor -G266-

18 - Seal

- Always replace

19 - Oil Pump

20 - Oil Pump Sprocket

21 - Bracket

22 - Bolt

- 20 Nm + 90° turn

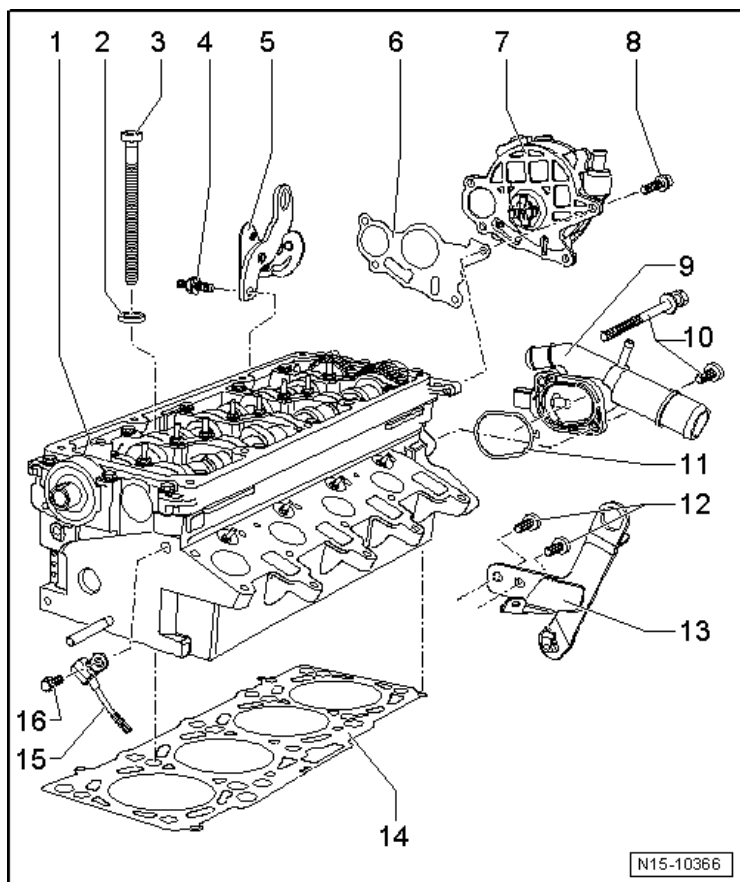
23 - Chain

24 - Bolt

- 27 Nm

25 - Oil Spray Jet

Oil Filter Bracket and Oil Cooler Overview



1 - Gasket

- Always replace

2 - Bolt

- 15 Nm + 90° turn

3 - Oil Filter Bracket

4 - Seal

- Always replace

5 - Connection

- 30 Nm

6 - Oil Supply Line

- 22 Nm

7 - Oil Pressure Switch -F1-

- 22 Nm

8 - Cover

- 25 Nm

9 - O-ring

- Always replace

10 - Oil Filter Element

11 - Seal

- Always replace

12 - Oil Cooler

13 - Seal

- Always replace

14 - Locking Bolt

- 25 Nm

15 - Bolt

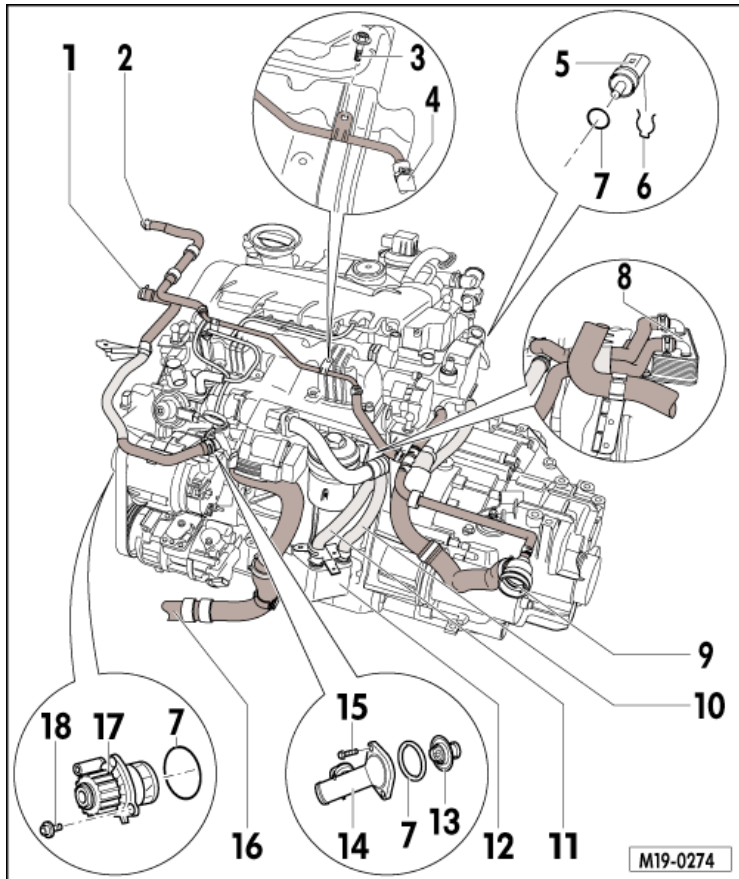
- 10 Nm

16 - Bracket

- 12 - Coolant Fan -V7-
- 13 - Connector
- 14 - Fan Shroud

Engine –
2.0L C-JAA (TDI)

Without a Engine Pre-Heater



- 1 - Coolant Expansion Tank, Lower Hose**
- 2 - Coolant Expansion Tank, Upper Hose**
- 3 - Bolt**
 - 10 Nm
- 4 - Ventilation Pipe**
- 5 - Engine Coolant Temperature Sensor -G62-**
- 6 - Retaining Clip**
- 7 - O-ring**
 - Always replace
- 8 - Transmission Oil Cooler**
- 9 - To the Radiator Upper Connection**
- 10 - Engine Oil Cooler Coolant Supply Hose**
 - On vehicles without a transmission fluid cooler.
- Transmission Oil Cooler Coolant Return Line**
 - On vehicles with a transmission oil cooler.
- 11 - Engine Oil Cooler Coolant Return Hose**
- 12 - Engine Oil Cooler**

13 - Thermostat / 4/2 Way Valve with Thermostat

14 - Connecting Piece

15 - Bolt

15 Nm

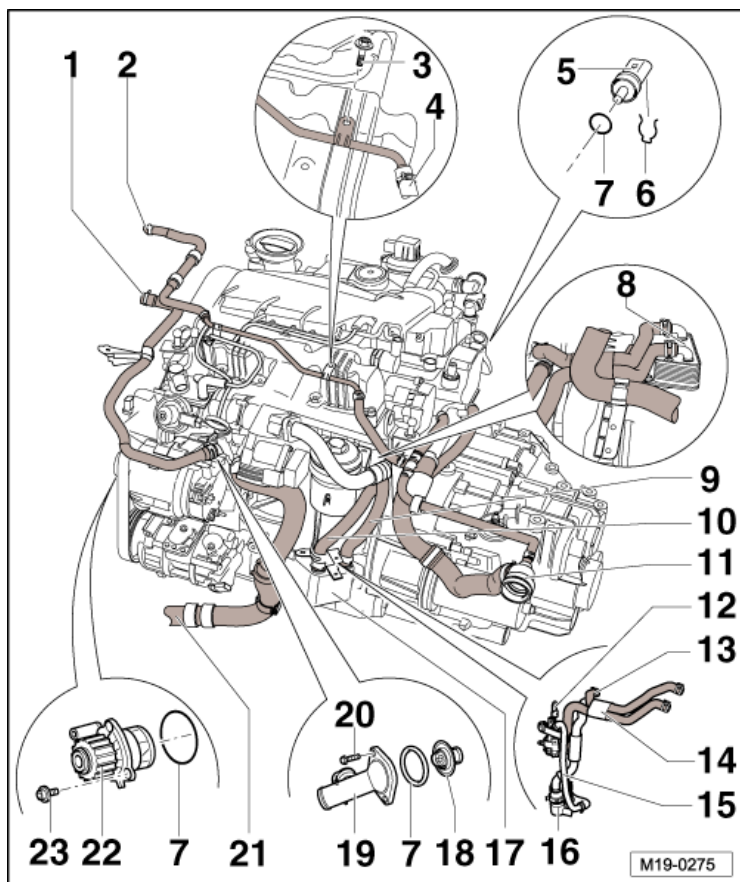
16 - To Radiator Lower Connection

17 - Coolant Pump

18 - Bolt

15 Nm

With a Engine Pre-Heater



- 1 - Coolant Expansion Tank, Lower Hose
- 2 - Coolant Expansion Tank, Upper Hose
- 3 - Bolt
 - 10 Nm
- 4 - Ventilation Pipe
- 5 - Engine Coolant Temperature Sensor -G62-
- 6 - Retaining Clip
- 7 - O-ring
 - Always replace
- 8 - Transmission Oil Cooler
- 9 - Engine Oil Cooler Coolant Supply Hose
- 10 - Engine Oil Cooler Coolant Return Hose
- 11 - To the Radiator Upper Connection
- 12 - Bracket for Wiring Harness and Coolant Pipe
- 13 - Coolant Hose
- 14 - Coolant Hoses
- 15 - Coolant Line

16 - Engine Pre-Heater

17 - Engine Oil Cooler

18 - Coolant Thermostat

19 - Connecting Piece

20 - Bolt

15 Nm

21 - To Radiator Lower Connection

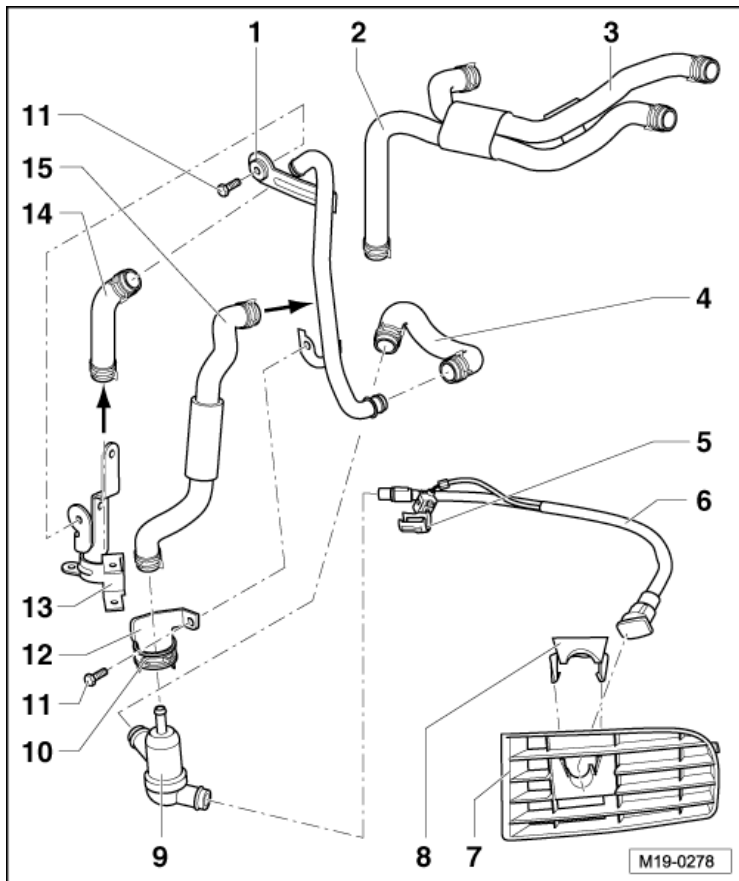
22 - Coolant Pump

23 - Bolt

15 Nm

**Engine –
2.0L C-JAA (TDI)**

Engine Pre-Heater Overview



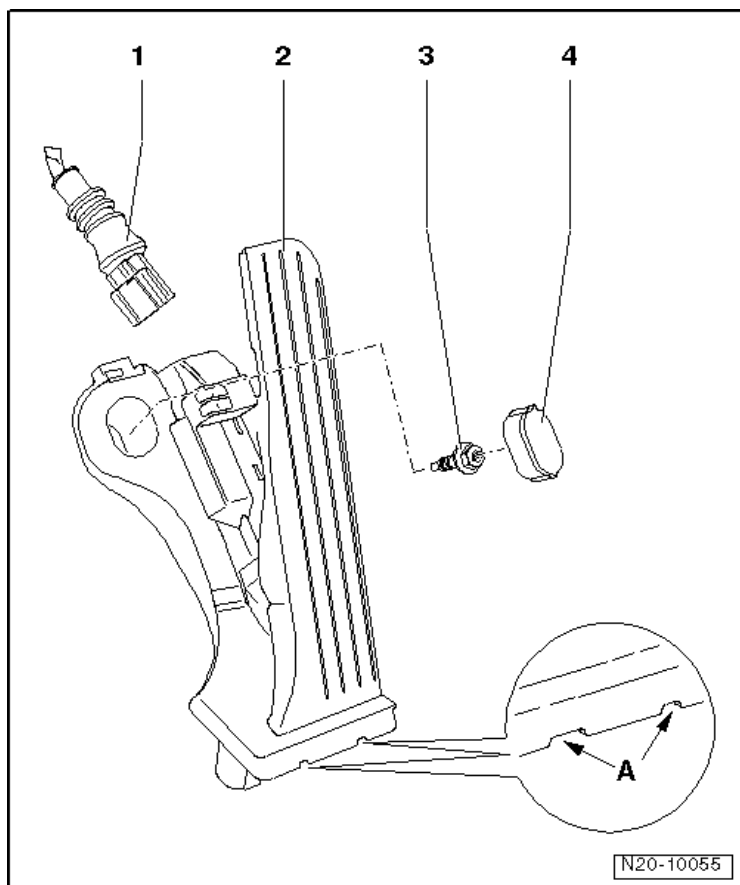
- 1 - Engine Pre-Heater Coolant Pipe
- 2 - Coolant Hose from the Cylinder Block Connection to Transmission Oil Cooler
- 3 - Oil Filter Bracket
- 4 - Coolant Hose from the Engine Pre-Heater Coolant Pipe to the Engine Pre-Heater
- 5 - Retainer
- 6 - External Power Supply Connecting Wire
- 7 - Left Vent Grille
- 8 - Bracket
- 9 - Engine Pre-Heater
- 10 - Engine Pre-Heater Clamp
- 11 - Bolt
 - 10 Nm
- 12 - Engine Pre-Heater Bracket
- 13 - Bracket for the Wiring Harness and Coolant Pipe

- 14 - Coolant Hose from Engine Oil Cooler to Engine Pre-Heater Coolant Pipe
- 15 - Coolant Hose from Engine Pre-Heater to the Coolant Hose on Cylinder Block

Engine –
2.0L C-JAA (TDI)

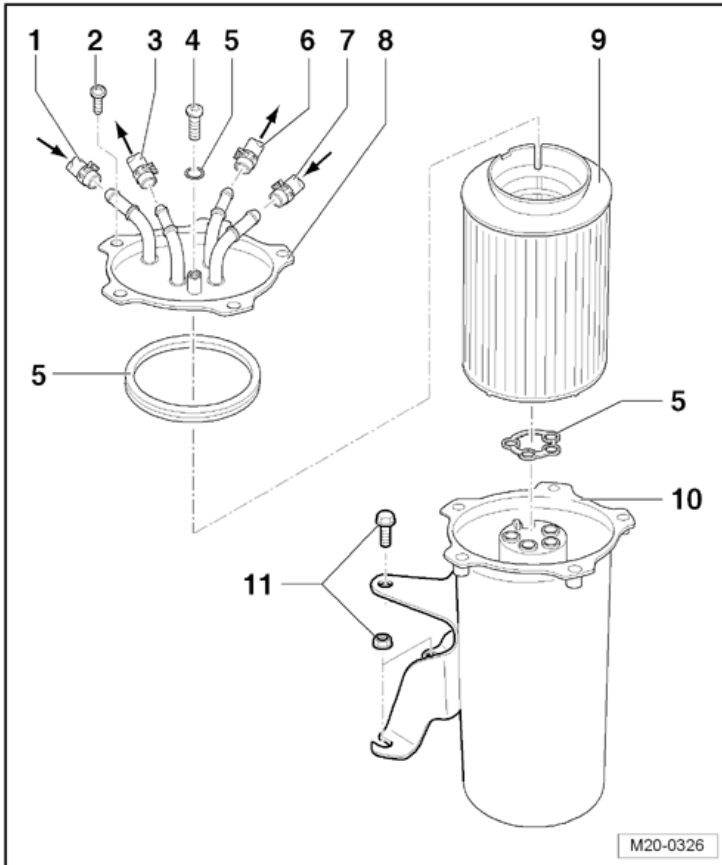
Fuel Supply – 2.0L CJAA (TDI)

Accelerator Pedal Module Overview



- 1 - Connector
- 2 - Accelerator Pedal Module
- 3 - Bolt
 - 9 Nm
- 4 - Cap

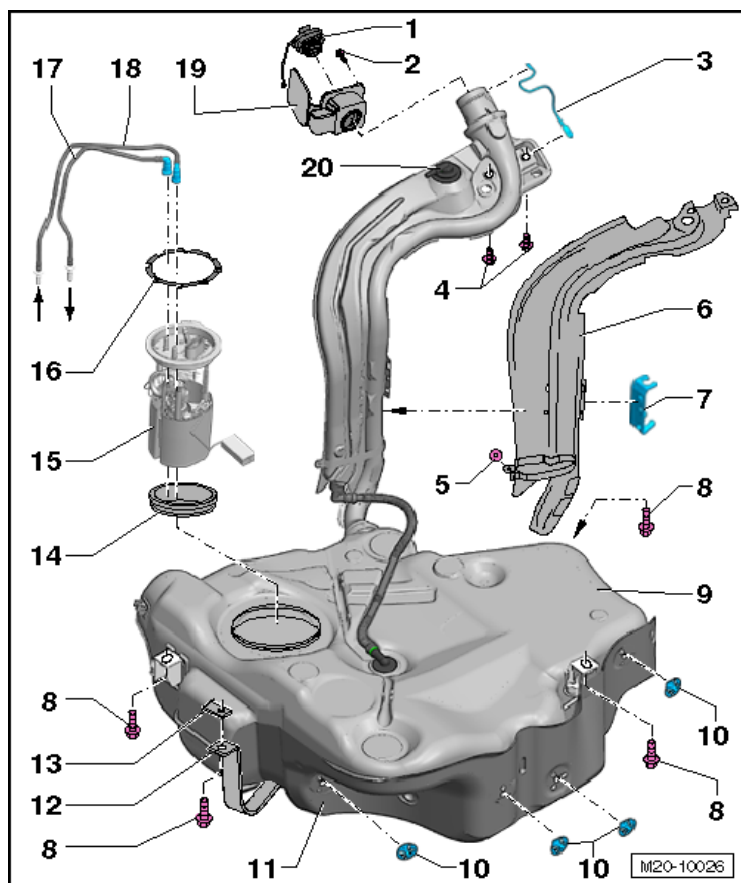
Filter Overview



Engine –
2.0L C-JAA (TDI)

- 1 - Fuel Supply Line
- 2 - Bolt
 - 9 Nm
- 3 - Fuel Return Line
- 4 - Locking Bolt
 - 5 Nm
- 5 - Seal
- 6 - Fuel Supply Line
- 7 - Fuel Return Line
- 8 - Fuel Filter Housing Cover
- 9 - Fuel Filter Element
- 10 - Fuel Filter Housing
- 11 - Bolt/Nut
 - 8 Nm
- 12 - Seal
 - Always replace

Fuel Tank Overview



- 1 - Cap
- 2 - Bolt
 - 1.5 Nm
- 3 - Ground Connection
- 4 - Bolt
 - 11 Nm
- 5 - Rivet
- 6 - Protective Plate
- 7 - Wiring Router
- 8 - Bolt
 - 25 Nm
 - Always replace
- 9 - Fuel Tank
- 10 - Lock Washer
- 11 - Heat Shield
- 12 - Securing Strap
- 13 - Suspended Mount

14 - Seal

15 - Fuel Delivery Unit

16 - Lock Ring

110 Nm

17 - Fuel Supply Line

18 - Fuel Return Line

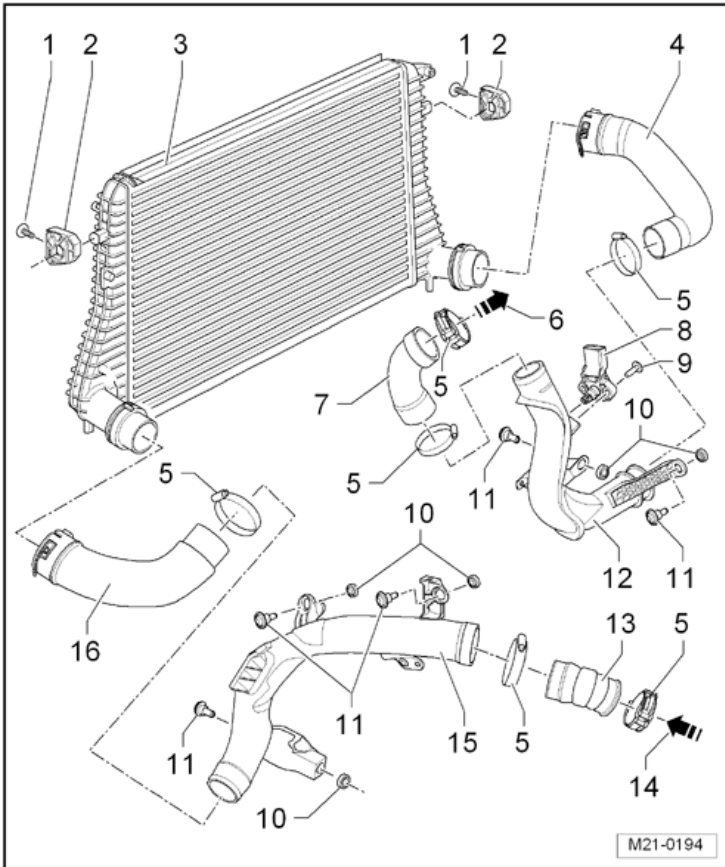
19 - Fuel Filler Door Unit

20 - Ventilation

**Engine –
2.0L C-JAA (TDI)**

Turbocharger – 2.0L CJAA (TDI)

Charge Air Cooler Component Overview



1 - Bolt

5 Nm

2 - Mount

3 - Charge Air Cooler

4 - Charge Air Hose

5 - Clamp

5 Nm

6 - To the Throttle Valve Control Module -J338-

7 - Charge Air Hose

8 - Charge Air Pressure Sensor -G31-

9 - Bolt

3 Nm

10 - Rubber Grommet

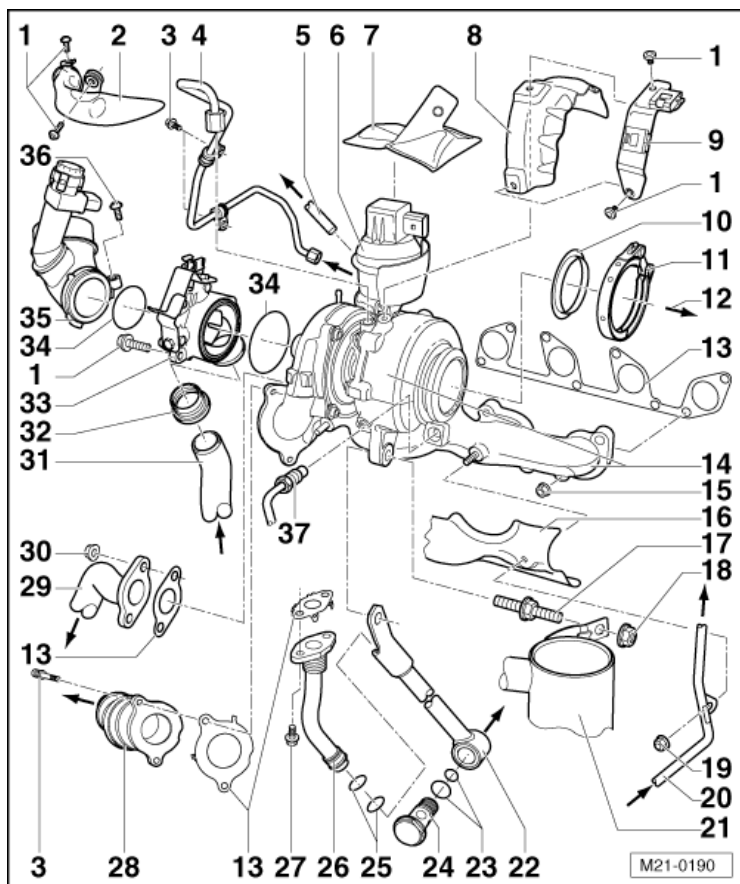
11 - Bolt

8 Nm

- 12 - Charge Air Pipe
- 13 - Charge Air Hose
- 14 - From Turbocharger
- 15 - Charge Air Pipe
- 16 - Charge Air Hose

Engine –
2.0L C-JAA (TDI)

Turbocharger and Exhaust Manifold with Attachments Overview



- 1 - Bolt
 - 8 Nm
- 2 - Warm Air Collector Plate
- 3 - Bolt
 - 10 Nm
- 4 - Oil Supply Line
 - 22 Nm
- 5 - Vacuum Hose
- 6 - Vacuum Diaphragm
- 7 - Heat Shield
- 8 - Heat Shield
- 9 - Bracket
- 10 - Seal
 - Always replace

11 - Clamp

- 7 Nm

12 - To Particulate Filter

13 - Gasket

- Always replace

14 - Turbocharger

15 - Nut

- 25 Nm
- Always replace
- Coat the studs for the exhaust manifold with Hot Bolt Paste
-G 052 112 A3-

16 - Heat Shield

17 - Stud Bolt

- 20 Nm

18 - Nut

- 23 Nm

19 - Nut

- 23 Nm

20 - Control Line

- 23 Nm

21 - Filter

22 - Brace

23 - Seal

- Always replace

24 - Banjo Bolt

- 60 Nm
- Always replace

25 - O-ring

- Always replace

26 - Oil Return Line

27 - Bolt

- 15 Nm

28 - Damper

29 - Connecting Pipe

30 - Nut

- 20 Nm

31 - Connecting Pipe

32 - Seal

33 - Connecting Piece

34 - O-ring

35 - Intake Scoop

36 - Bolt

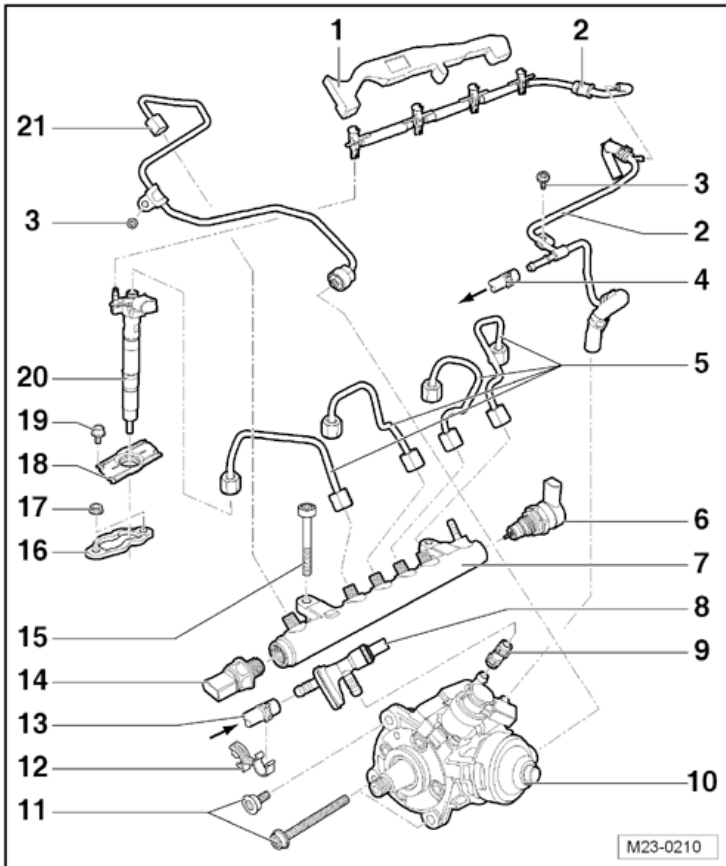
- 8 Nm

37 - Exhaust Gas Temperature Sensor 1 -G235-

- 45 Nm

Diesel Fuel Injection – 2.0L CJAA (TDI)

Fuel Rail and Injectors Overview



- 1 - Protective Strip
- 2 - Fuel Return Line
- 3 - Bolt/Nut
 - 8 Nm
- 4 - Fuel Return Line
- 5 - High Pressure Lines
 - 28 Nm
- 6 - Fuel Pressure Regulator Valve -N276-
 - 80 Nm
- 7 - Fuel Rail
- 8 - Fuel Temperature Sensor -G81-
- 9 - Fuel Supply Line
- 10 - High Pressure Fuel Pump

11 - Bolt

- 20 Nm

12 - Bracket

13 - Fuel Supply Line

14 - Fuel Pressure Sensor -G247-

- 100 Nm

15 - Bolt

- 22 Nm

16 - Tensioning Plate

- Always replace

17 - Nut

- 10 Nm

18 - Sealing Cap

19 - Bolt

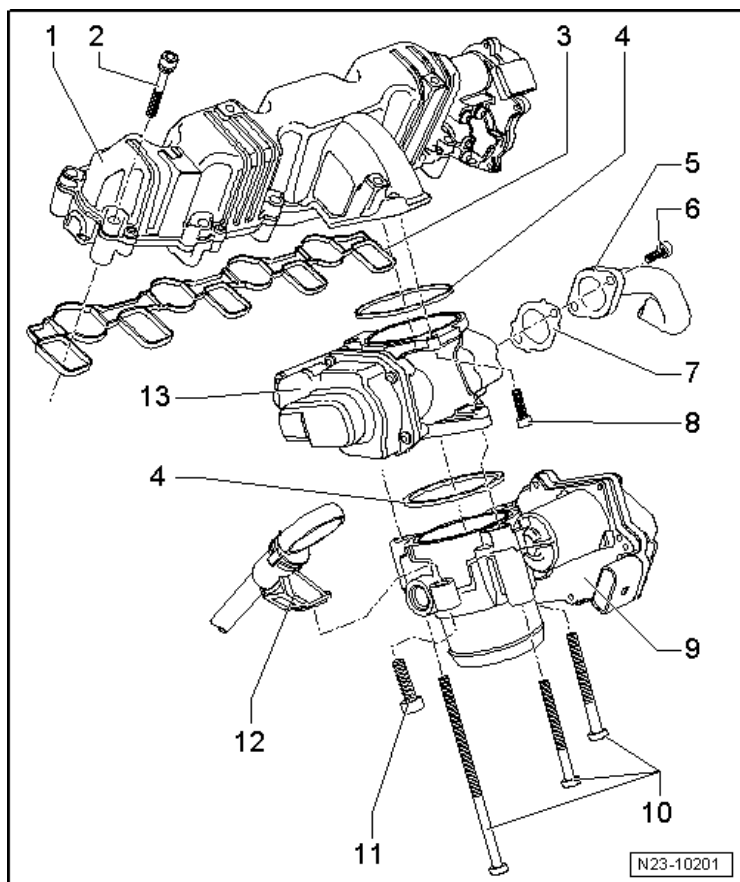
- 5 Nm

20 - Fuel Injector

21 - High Pressure Line

- 28 Nm

Intake Manifold and Attachments Overview



1 - Intake Manifold

2 - Bolt

- 8 Nm

3 - Gasket

- Always replace

4 - Seal

- Always replace

5 - Connecting Pipe

- Always replace

6 - Bolt

- 20 Nm

7 - Gasket

- Always replace

8 - Bolt

- 8 Nm

9 - Throttle Valve Control Module -J338-

10 - Bolt

8 Nm

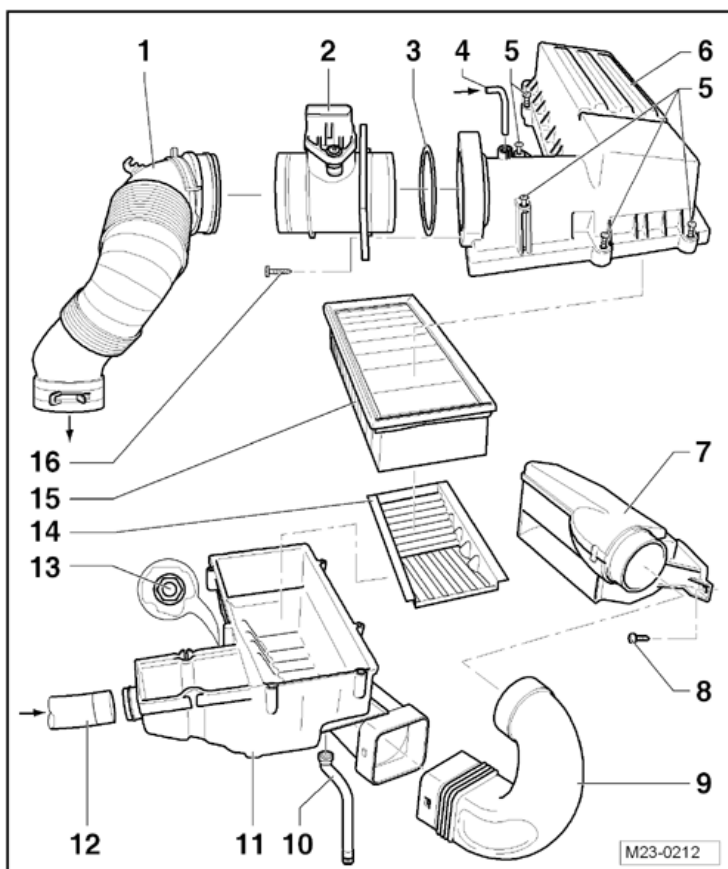
11 - Bolt

8 Nm

12 - Oil Dipstick

13 - Exhaust Gas Recirculation Vacuum Regulator Solenoid Valve -N18-

Air Filter Housing Overview



- 1 - Intake Tube
- 2 - Mass Airflow Sensor -G70-
- 3 - O-ring
 - 10 Nm
- 4 - Vacuum Hose
- 5 - Screw
 - 2 Nm
- 6 - Upper Air Filter Housing
- 7 - Intake Air Guide
- 8 - Screw
 - 5 Nm
- 9 - Air Guide Hose
- 10 - Water Drain Hose
- 11 - Lower Air Filter Housing
- 12 - Connecting Hose

13 - Bolt

8 Nm

14 - Snow Screen

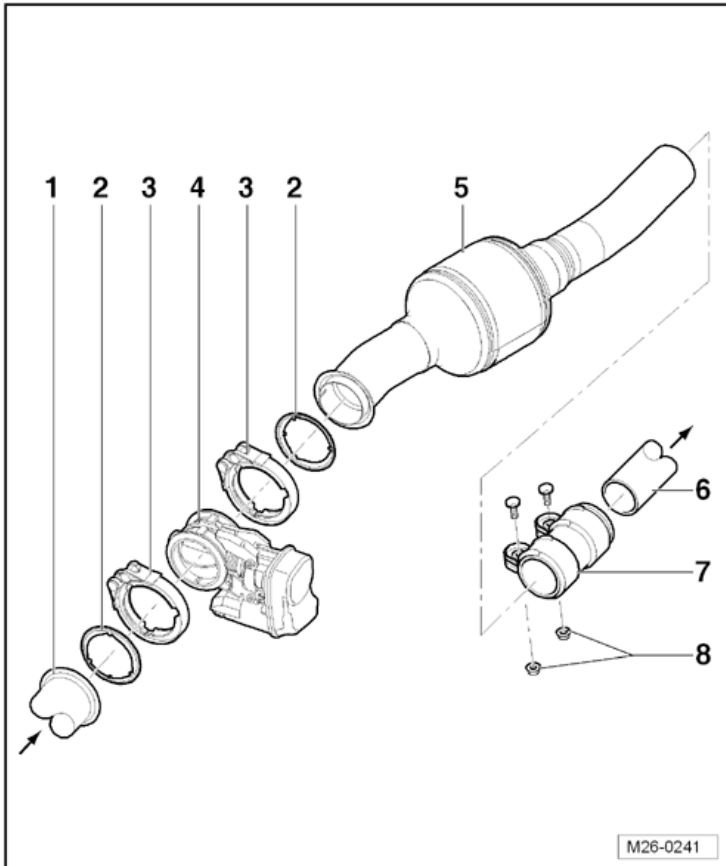
15 - Filter Element

16 - Bolt

3.5 Nm

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

Exhaust Door Control Unit -J883- and Reduction Catalytic Converter Overview



1 - From the NOx Reduction Catalytic Converter

2 - Seal

Always replace

3 - Clamp

7 Nm

Always replace

4 - Exhaust Door Control Unit -J883-

5 - Reduction Catalytic Converter

6 - To Front Muffler

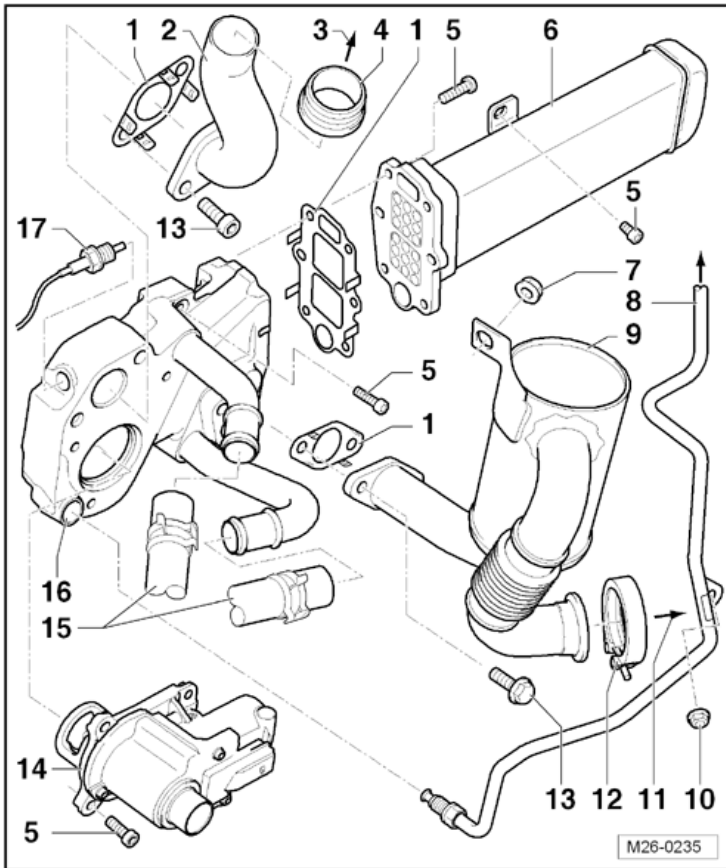
7 - Clamping Sleeve

8 - Nut

23 Nm

**Engine –
2.0L C-JAA (TDI)**

Exhaust Gas Recirculation System Component Overview



- 1 - Gasket**
 Always replace
- 2 - Connecting Pipe**
- 3 - To Connection on the Turbocharger**
- 4 - Seal**
- 5 - Bolt**
 8 Nm
- 6 - Cooler**
- 7 - Nut**
 23 Nm
- 8 - Control Line**
 23 Nm
- 9 - Filter**
- 10 - Nut**
 23 Nm
- 11 - To Particulate Filter**

12 - Clamp

- 3.5 Nm
- Always replace

13 - Bolt

- 23 Nm

14 - Valve 2 for EGR -N213-

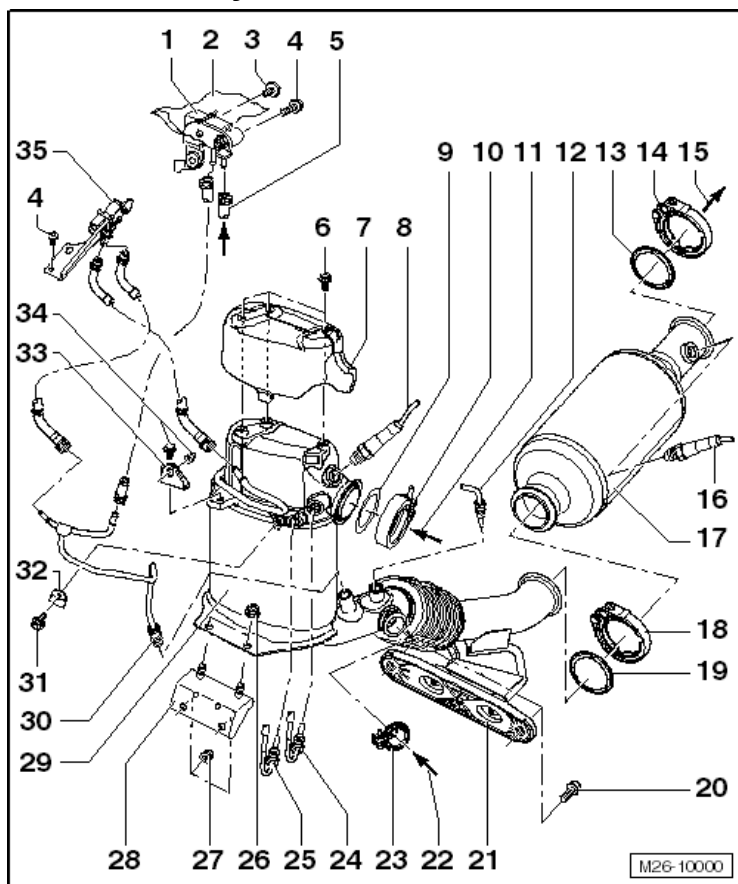
15 - Coolant Hose

16 - Housing for EGR System

17 - EGR Temperature Sensor -G98-

- 20 Nm

Particulate Filter with NOx Reduction Catalytic Converter Overview



1 - Exhaust Pressure Sensor 1 -G450-

2 - Heat Shield

3 - Bolt

8 Nm

4 - Bolt

4 Nm

5 - Control Line

6 - Bolt

10 Nm

7 - Shield

8 - Heated Oxygen Sensor -G39-

52 Nm

Lubricate the threads with Hot Bolt Paste -G 052 112 A3- only

9 - Seal

Always replace

10 - Clamp

- 7 Nm
- Always replace

11 - From Turbocharger

12 - Exhaust Gas Temperature Sensor 4 -G648-

- 45 Nm

13 - Seal

- Always replace

14 - Clamp

- 7 Nm
- Always replace

15 - to Exhaust Door Control Unit -J883-

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

- 52 Nm

17 - NOx Reduction Catalytic Converter

18 - Clamp

- 7 Nm
- Always replace

19 - Seal

- Always replace

20 - Bolt

- 25 Nm

21 - Suspended Mount

22 - From EGR Filter

23 - Clamp

- 3.5 Nm
- Always replace

24 - Exhaust Gas Temperature Sensor 2 -G448-

- 45 Nm
- Coat only the threads with Hot Bolt Paste -G 052 112 A3-

25 - Exhaust Gas Temperature Sensor 3 -G495-

- 45 Nm
- Coat only the threads with Hot Bolt Paste -G 052 112 A3-

26 - Nut

- 23 Nm

27 - Nut

- 23 Nm

28 - Bracket

29 - Particulate Filter

30 - Control Line

- 45 Nm

31 - Bolt

- 9 Nm

32 - Bracket

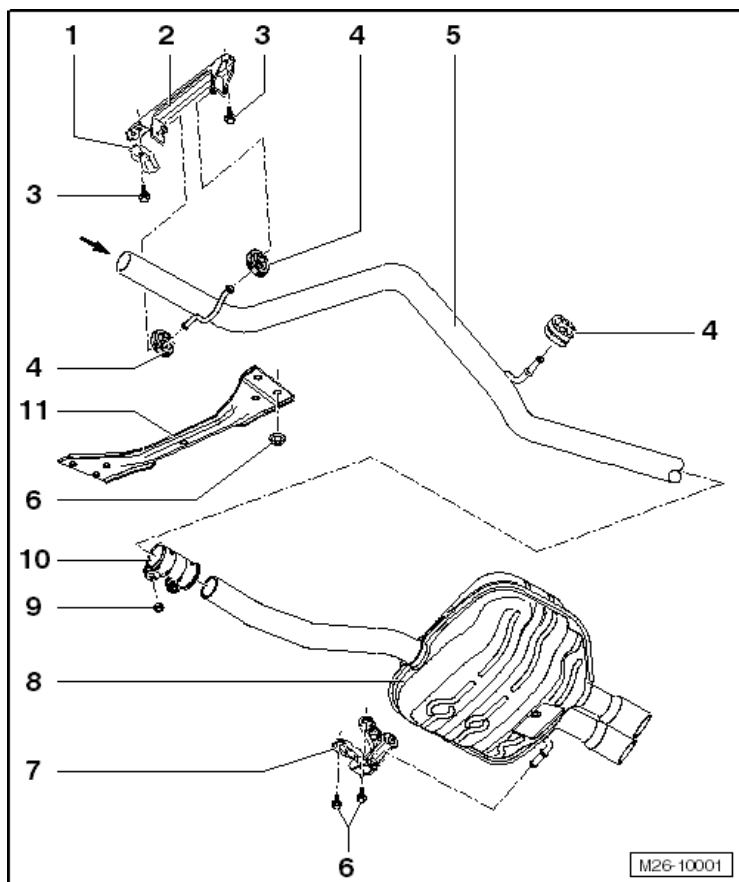
33 - Bracket

34 - Bolt

- 23 Nm

35 - Differential Pressure Sensor -G505-

Muffler Overview



1 - Securing Strap

2 - Suspended Mount

3 - Bolt

23 Nm

Always replace

4 - Retaining Loop

5 - Exhaust Pipe

6 - Bolt

23 Nm

7 - Suspended Mount

8 - Rear Muffler

9 - Nut

23 Nm

10 - Repair Clamping Sleeve

11 - Tunnel Bridge

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

Fastener Tightening Specification

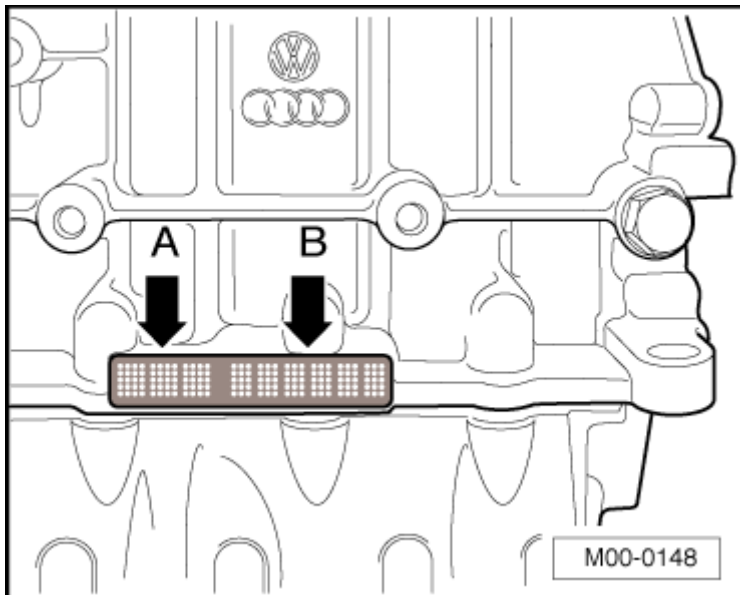
Component	Nm
Glow plug	12

**Engine –
2.0L CJAA (TDI)**

ENGINE – 2.5L CBTA, CBUA

General Information

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 digit) 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 Code		CBTA	CBUA
Manufactured		from 07.07	from 07.07
Emission values in accordance with		through MY 2009: ULEV 2 ¹⁾ from MY 2010: TIER 2/BIN% (US coalition)	SULEV ²⁾
Displacement	cm ³	2480	2480
Output	kW at RPM	125 at 5700	125 at 5700
Torque	Nm at RPM	240 at 4250	240 at 4250
Bore	Diameter mm	82.5	82.5
Stroke	mm	92.8	92.8
Compression ratio		9.5	9.5
Valves per cylinder		4	4
RON	Minimum	95 unleaded ³⁾	95 unleaded ³⁾
Fuel injection, ignition		through 05.08: Motronic ME 7.1.1 from 06.08: ME 17.5	through 05.08: Motronic ME 7.1.1 from 06.08: 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		Through MY 2009: Yes From MY 2010: No	Yes

¹⁾ ULEV 2: Ultra Low Emission Vehicle 2

²⁾ SULEV: Super Ultra Low Emission Vehicle

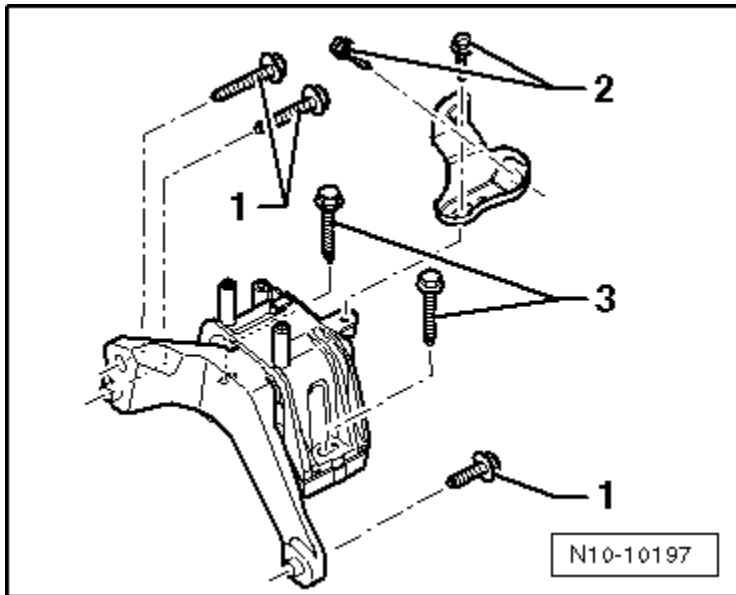
³⁾ Unleaded RON 91 is permitted, but performance is reduced.

Engine Assembly – 2.5L CBTA, CBUA

Fastener Tightening Specifications

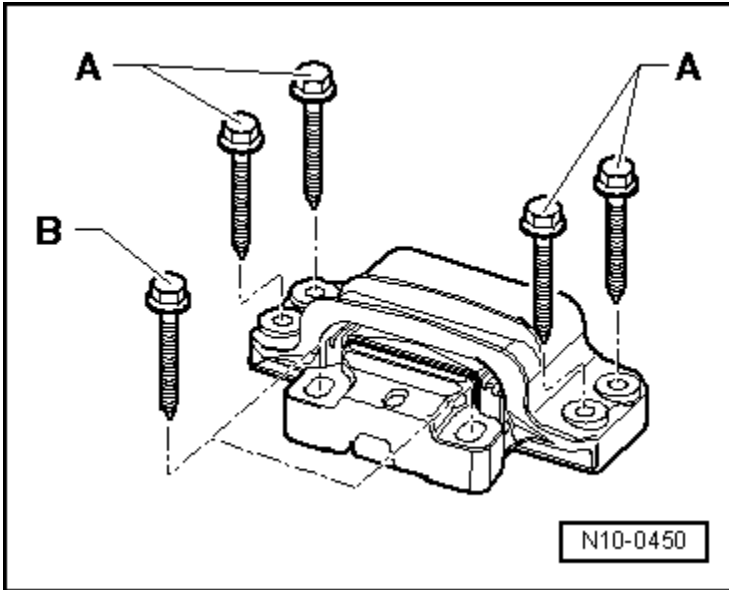
Component	Fastener size	Nm
Bolts, nuts	M6	10
	M7	15
	M8	25
	M10	40
	M12	60

Engine Mount Tightening Specifications



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

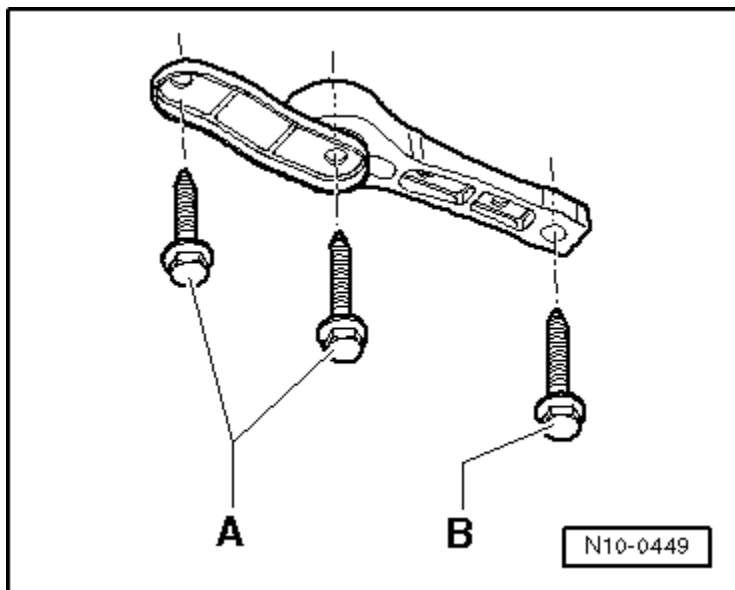
Transmission Mount Tightening Specifications



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

**Engine –
2.5L CBTA, CBUA**

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.

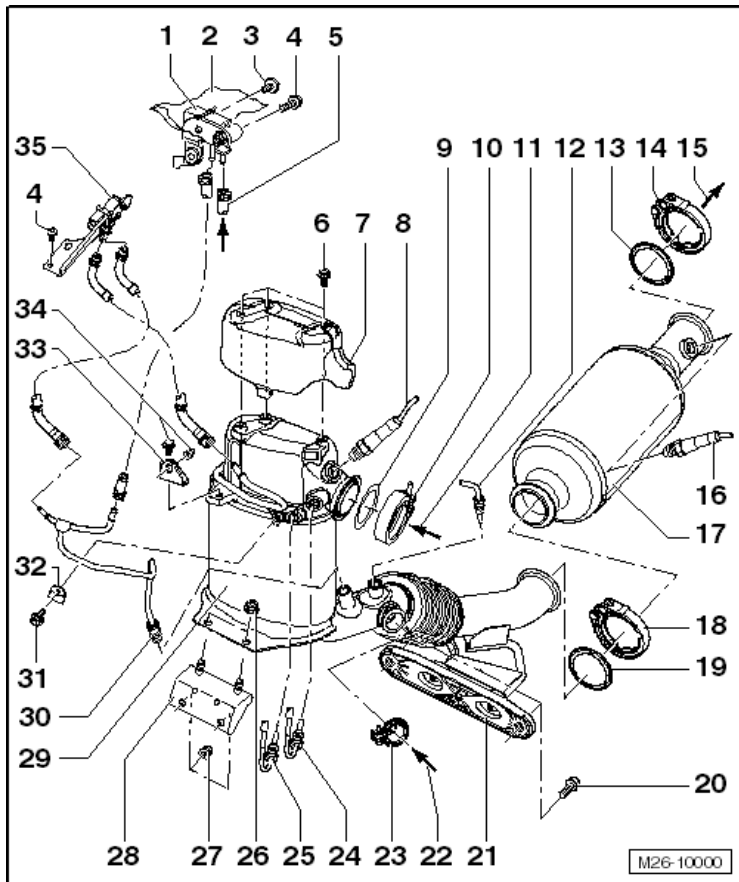
To install, first install bolts A, then bolt B.

Component	Fastener size	Nm
Bolts A (always replace)	8.8	40 plus an additional 90° (¼ turn)
	10.9	50 plus an additional 90° (¼ turn)
Bolt B (always replace)		100 plus an additional 90° (¼ turn)

**Engine –
2.5L CBTA, CBUA**

Crankshaft, Cylinder Block – 2.5L CBTA, CBUA

Accessory Drive Overview



- 1 - Bolt
 - 23 Nm
- 2 - Pulley, for the Power Steering Pump
- 3 - Bolt
 - 23 Nm
- 4 - Power Steering Pump
- 5 - Accessory Bracket
- 6 - Bolt
 - 25 Nm
- 7 - Shield
- 8 - Generator
- 9 - Bolt
 - 25 Nm

10 - Lower 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

19 - Bolt

- 50 Nm + 90° turn
- Always replace
- Only use strength category 10.9.

20 - Coolant Pump

21 - Belt Tensioner, for the A/C Compressor Ribbed Belt

- 35 Nm

22 - Belt Tensioner for the Generator, Power Steering Pump and Coolant Pump

- 35 Nm

23 - Bolt

- 40 Nm + 90° turn
- Always replace

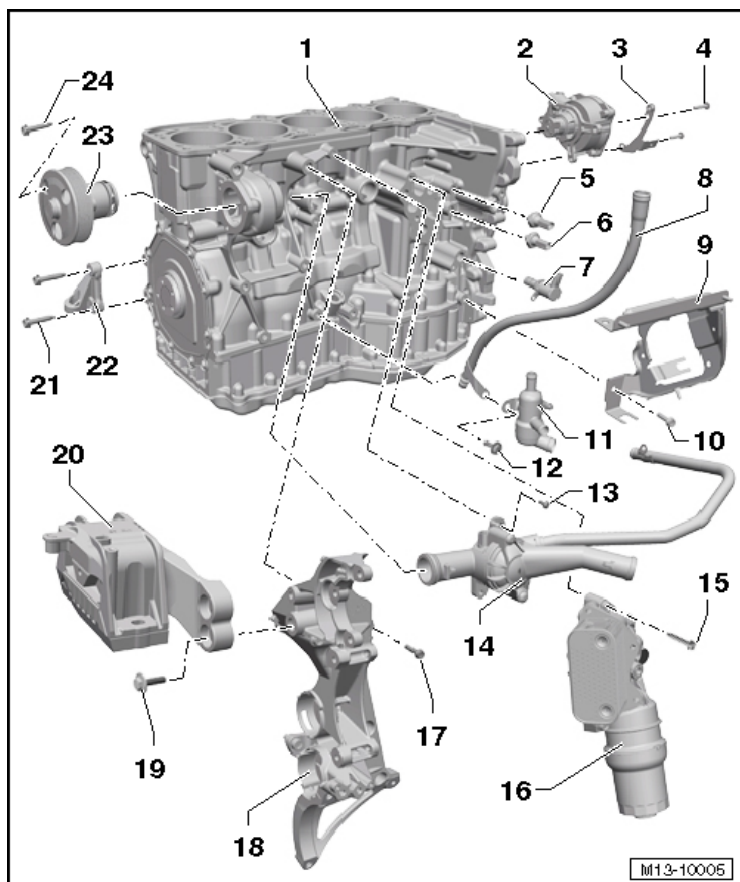
24 - Bolt

- 25 Nm

25 - Bushing

26 - Engine Mount

Engine, Front and Side



1 - Cylinder Block

2 - Vacuum Pump, for the Brake Booster

3 - bracket

4 - Bolt

10 Nm

5 - Oil Pressure Switch -F1-

20 Nm

6 - Reduced Oil Pressure Switch -F378-

20 Nm

7 - Oil Pressure Regulation Valve -N428-

8 - Guide Tube

9 - Intake Manifold Support

10 - Bolt

25 Nm

11 - Pre-warmer

12 - Bolt

25 Nm

13 - Bolt

- 10 Nm

14 - Thermostat Housing

15 - Bolt

- 25 Nm

16 - Oil Filter Bracket

17 - Bolt

- 25 Nm

18 - Accessory Bracket

19 - Bolt

- 40 Nm + 90° turn
- Always replace

20 - Engine Mount

21 - Bolt

- 25 Nm

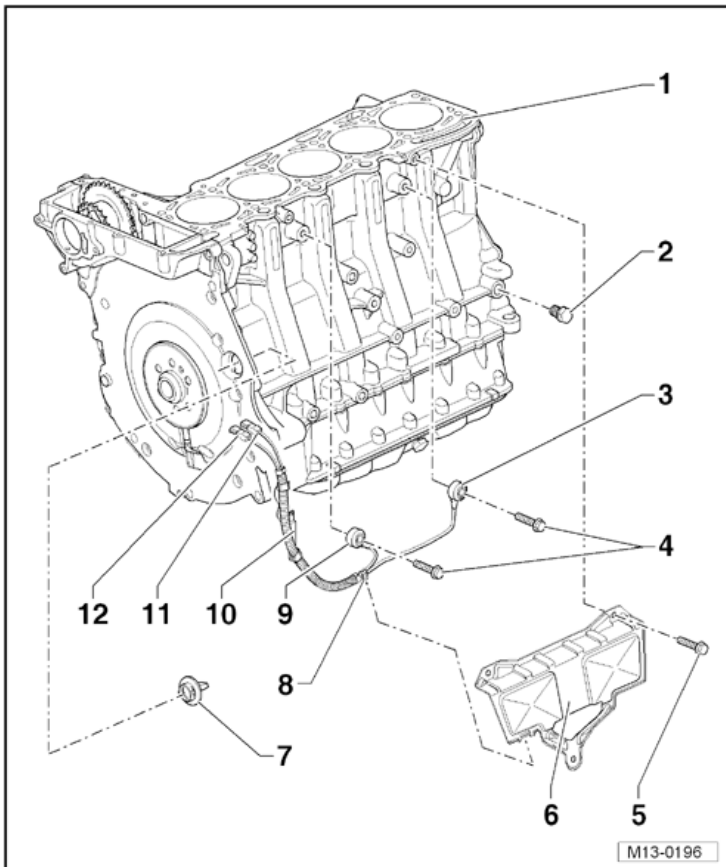
22 - Transport Strap

23 - Coolant Pump

24 - Bolt

- 10 Nm

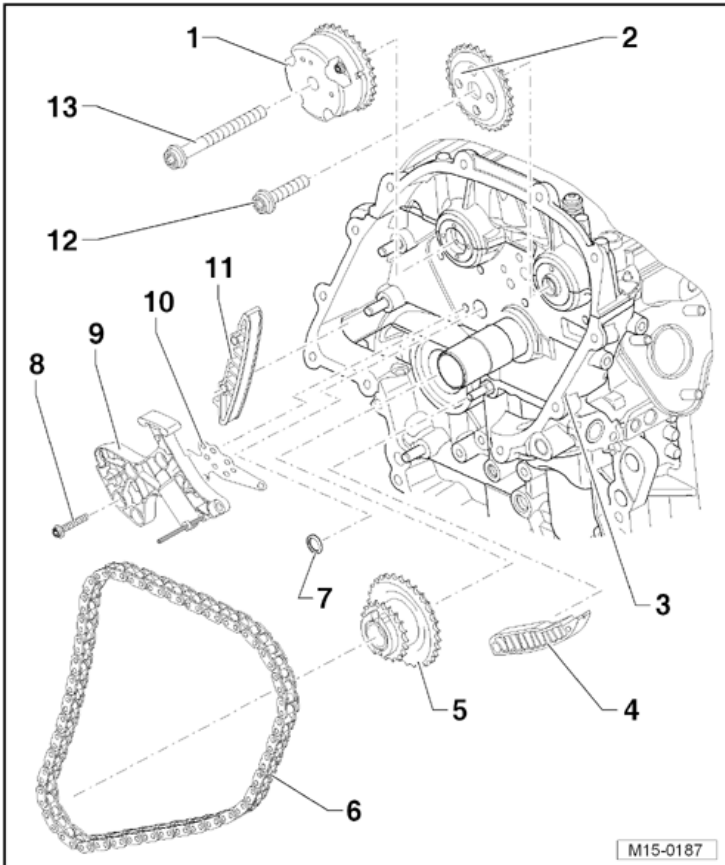
Engine, Rear Overview



- 1 - Cylinder Block**
- 2 - Locking Bolt**
 - 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 - Connector**
- 12 - Connector**

**Engine –
2.5L CBTA, CBUA**

Timing Chain, Camshafts Overview



1 - Camshaft Adjuster, for the Intake Camshaft

2 - Sprocket, for the Exhaust Camshaft

3 - Cylinder Head

4 - Tensioning Rail

5 - Double Sprocket

6 - Timing Chain

7 - Strainer

Always replace

8 - Bolt

10 Nm

9 - Chain Tensioner

10 - Gasket

Always replace

11 - Guide Rail

12 - Bolt

60 Nm + 90° turn

Always replace

13 - Bolt

- 60 Nm + 90° turn
- Always replace

12 - Double Sprocket

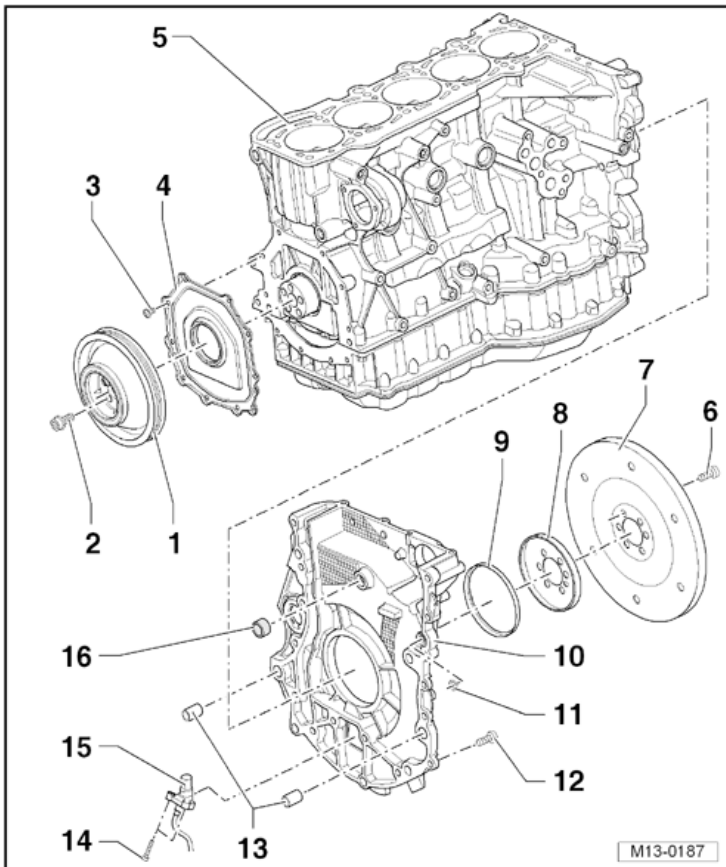
13 - Gear Shaft

14 - Threaded Pin

40 Nm

**Engine –
2.5L CBTA, CBUA**

Sealing Flange and Drive Plate/Flywheel Overview



1 - Vibration Damper

2 - Bolt

- 50 Nm + 90° turn
- Always replace
- Only use a strength category 10.9.

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 - Control Housing Cover

11 - O-ring

- Always replace

12 - Bolt

- 25 Nm

13 - Alignment Sleeves

14 - Bolt

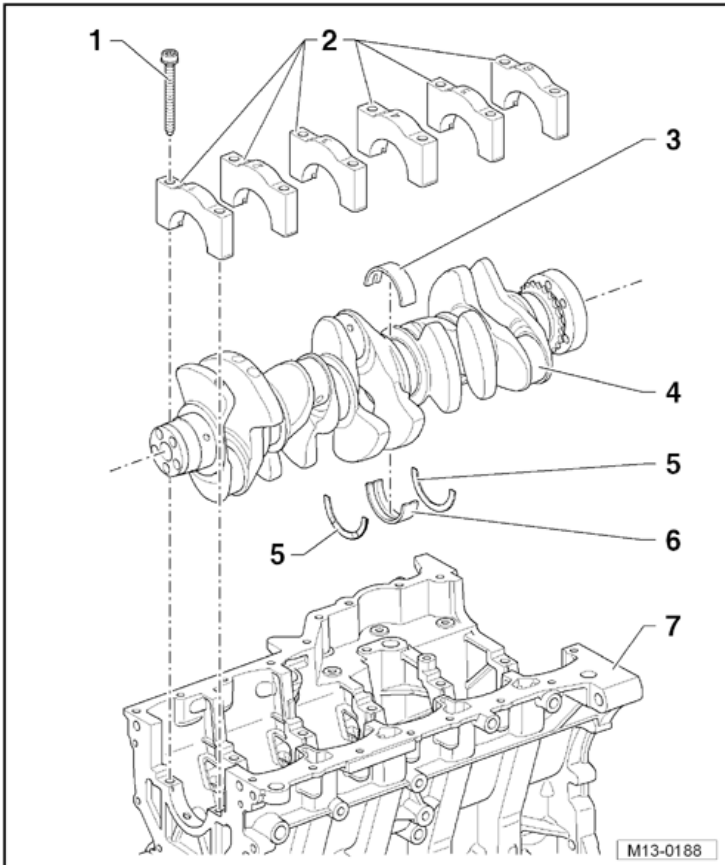
- 5 Nm

15 - Engine Speed Sensor -G28-

16 - Seal

- Always replace

Crankshaft Overview



1 - Bolt

- 40 Nm + 90° turn
- Always replace

2 - Bearing Cap

3 - Bearing Shell, for the Bearing Cap

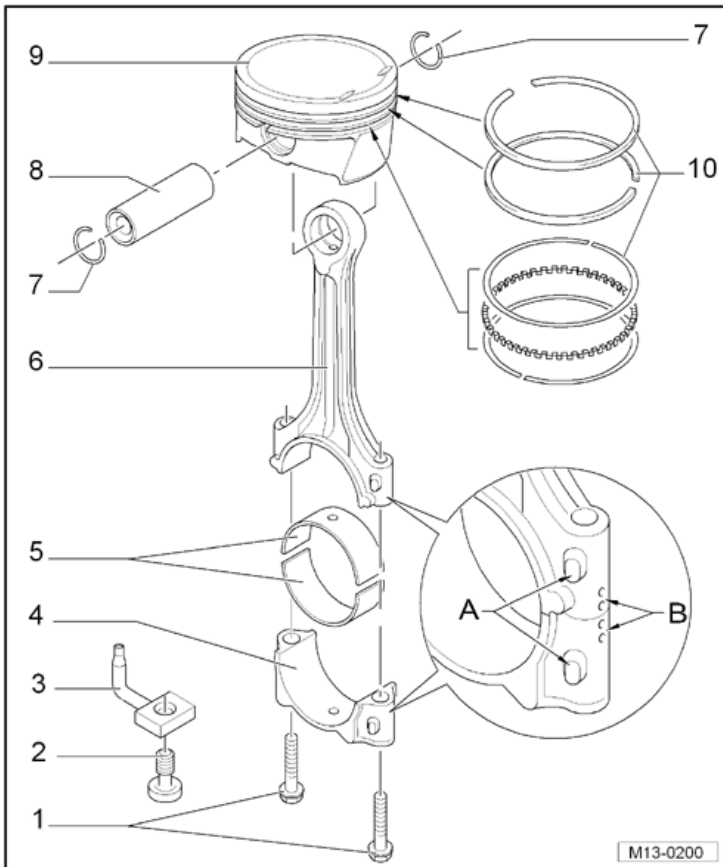
4 - Crankshaft

5 - Thrust Washers

6 - Bearing Shell, for the Cylinder Block

7 - Cylinder Block

Piston and Connecting Rod Overview



Engine –
2.5L CBTA, CBUA

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

Crankshaft Dimensions

Honing dimension in mm	Crankshaft bearing pins-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 and Cylinder Dimensions

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

¹⁾ Dimension without graphite coating (thickness 0.02 mm). The graphite coating wears away.

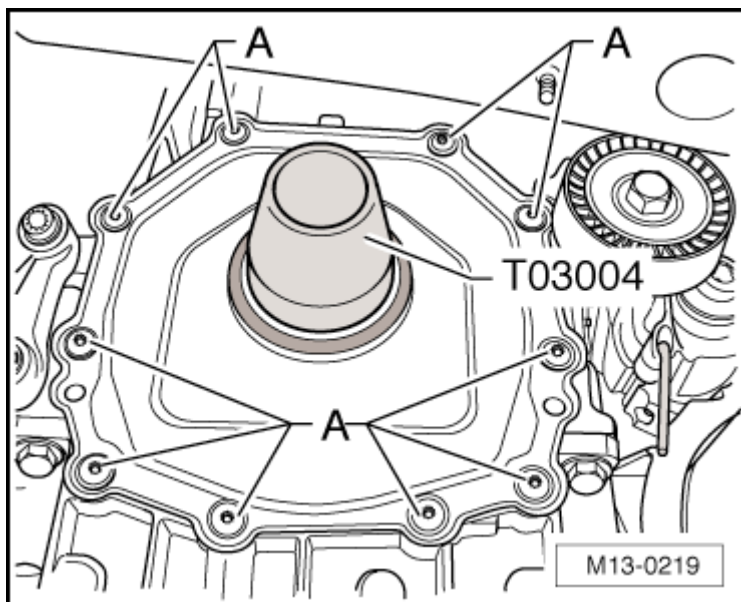
Piston Ring End Gaps

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

Piston Ring Clearance

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

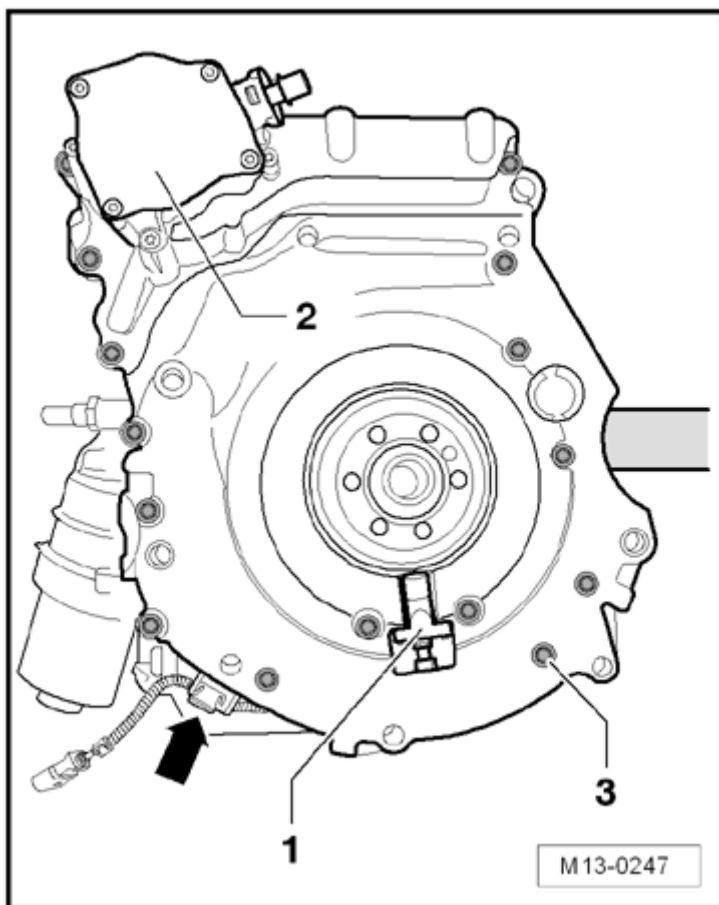
Sealing Flange (Belt Pulley Side) Tightening Specifications



Tighten the sealing flange bolts (A) uniformly in a diagonal sequence to 10 Nm.

Component	Nm
Vibration damper-to-crankshaft (always replace)	50 plus an additional 90° (¼ turn)
Belt tensioner-to-accessory bracket	35
Sealing flange-to-cylinder block	10
Locking bolt-to-cylinder block	30

Control Housing Cover Tightening Specifications



Tighten all the control housing cover bolts (3) to the cylinder block and the upper oil pan to 10 Nm.

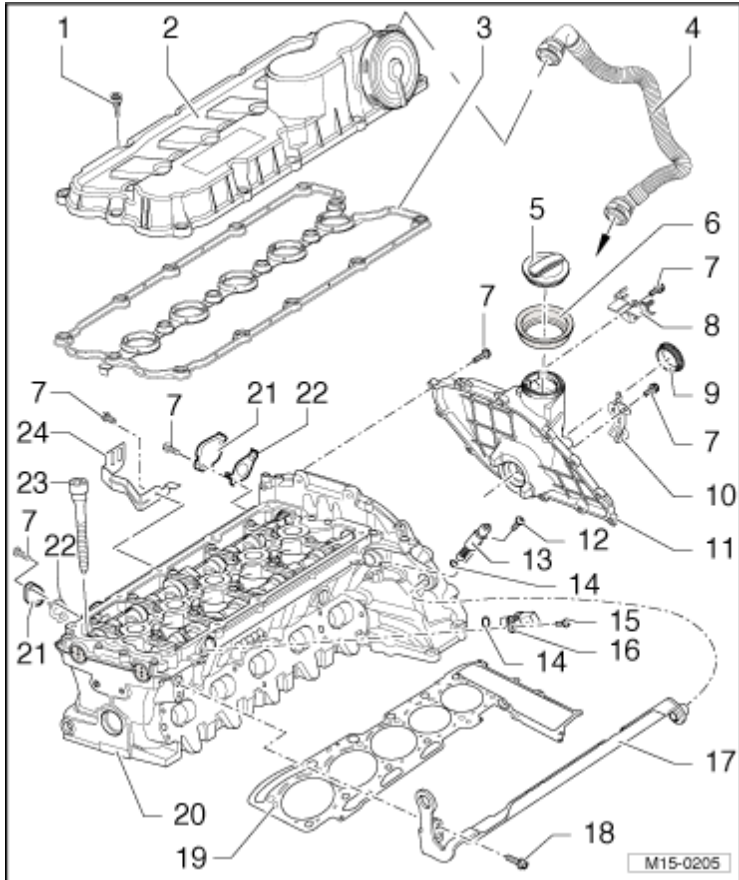
Tighten the bolts to the cylinder block and the upper oil pan to 25 Nm.

Component	Nm
Flywheel/drive plate-to-crankshaft (always replace bolts)	60 plus an additional 90° (¼ turn)
Locking bolt-to-cylinder block	30

**Engine –
2.5L CBTA, CBUA**

Cylinder Head – 2.5L CBTA, CBUA

Cylinder Head and Cover Overview



1 - Bolt

- 10 Nm

2 - Cylinder Head Cover

3 - Cylinder Head Cover Gasket

4 - Crankcase Ventilation Hose

5 - Oil Filler Cap

6 - Gasket

7 - Bolt

- 10 Nm

8 - Wire Bracket

9 - Piston

10 - Piston Rings

11 - Chain Compartment 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

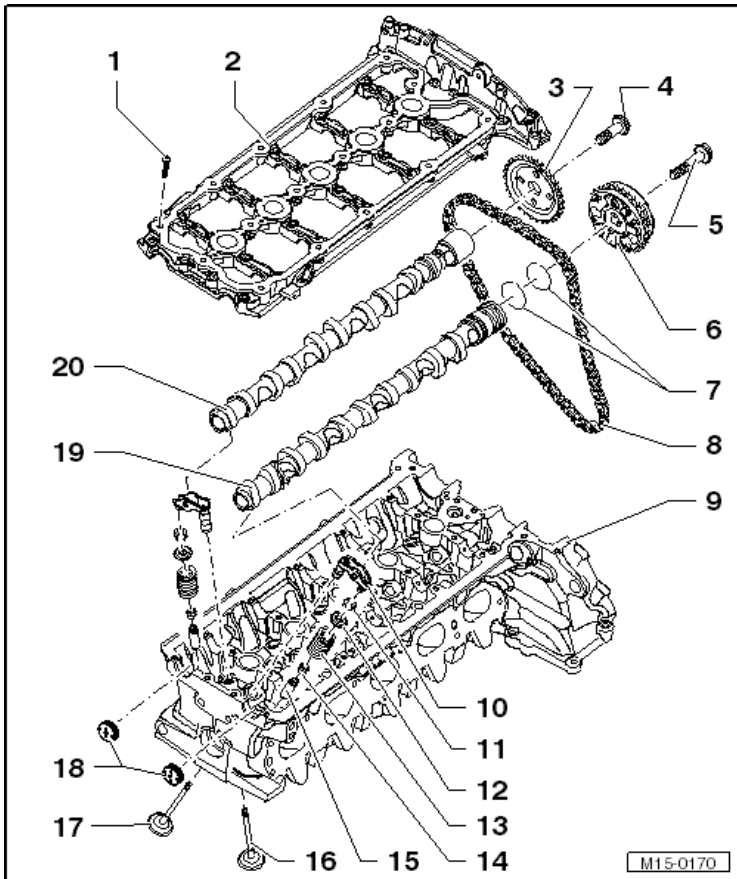
- Always replace

23 - Bolt

- 40 Nm + 180° turn
- Always replace

24 - Wire Bracket

Valvetrain Overview



1 - Bolt

- 8 Nm + 90° turn
- Always replace

2 - Guide Frame

3 - Sprocket

4 - Bolt

- 60 Nm + 90° turn
- Always replace

5 - Bolt

- 60 Nm + 90° turn
- Always replace

6 - Camshaft Adjuster

7 - Seal

8 - Timing Chain

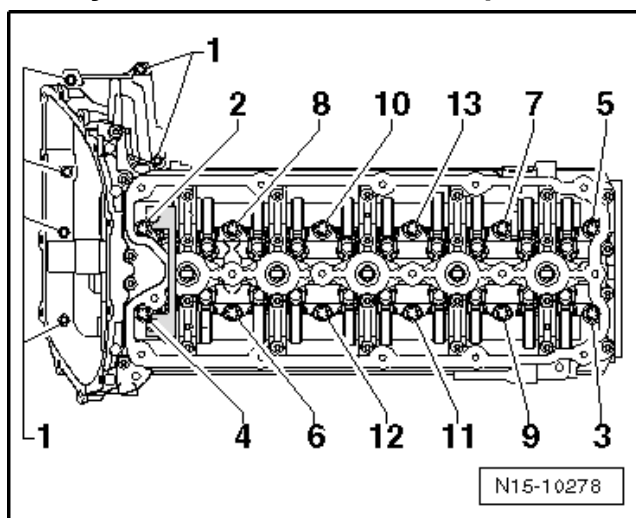
9 - Cylinder Head

10 - Roller Rocker Arm with Hydraulic Lash Adjuster

11 - Valve Retainers

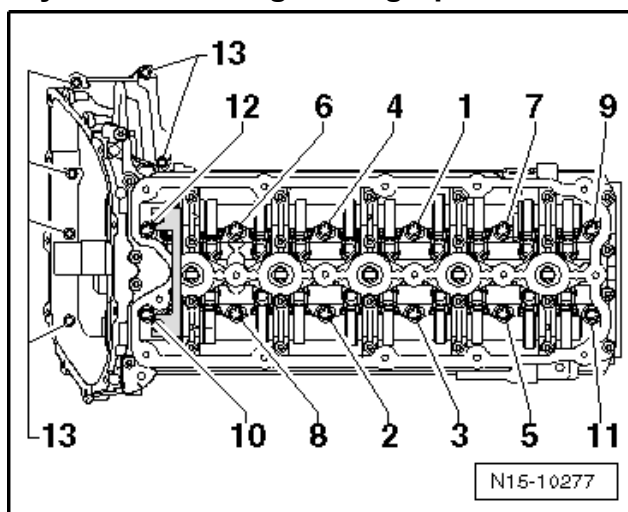
- 12 - Upper Spring Seat**
- 13 - Valve Spring**
- 14 - Valve Stem Seal**
- 15 - Valve Guide**
- 16 - Intake Valve**
- 17 - Exhaust Valve**
- 18 - Sealing Plugs**
 - Always replace
- 19 - Intake Camshaft**
- 20 - Exhaust Camshaft**

Cylinder Head Removal Sequence



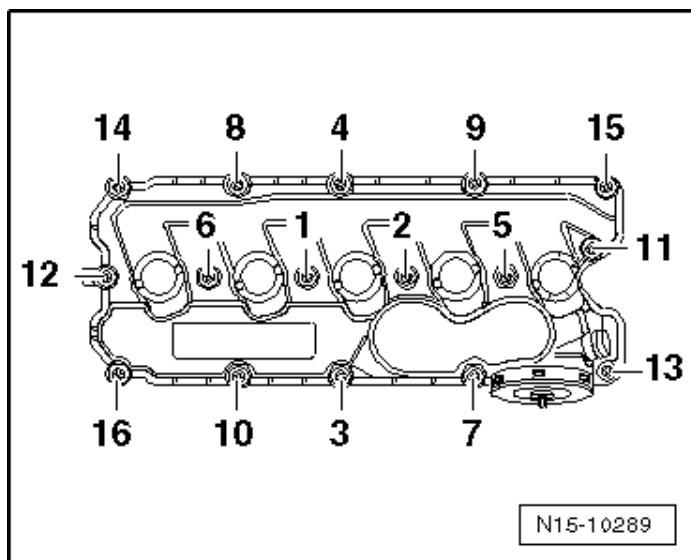
Remove the cylinder head bolts 1 through 13 in sequence.

Cylinder Head Tightening Specifications



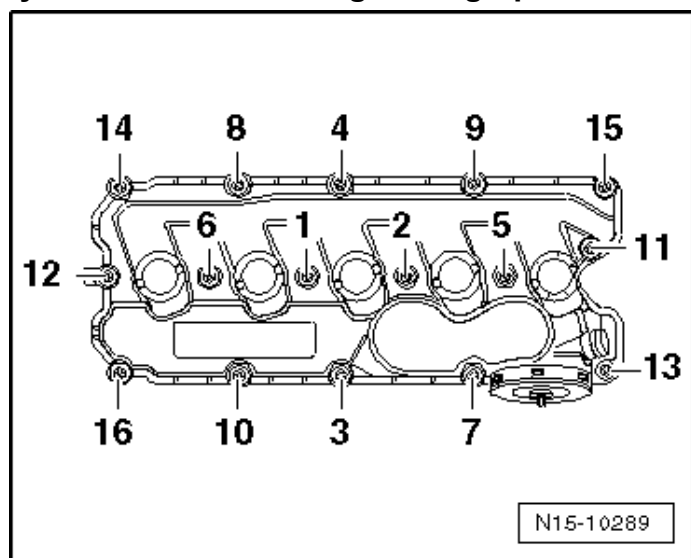
Step	Tighten	Nm
1	Tighten bolts 1 through 12 in sequence	40
2	Tighten bolts 1 through 12 in sequence	an additional 90° (¼ turn)
3	Tighten bolts 1 through 12 in sequence	an additional 90° (¼ turn)
4	Tighten bolt 13	10

Cylinder Head Cover Removal Sequence



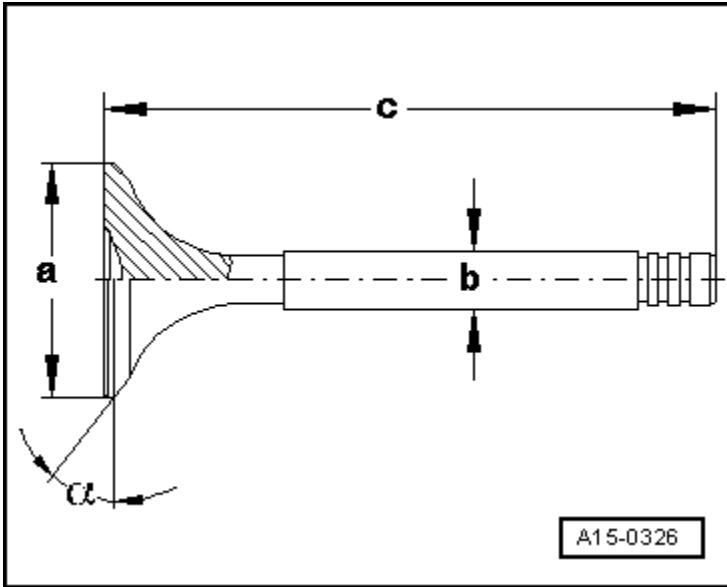
Remove the cylinder head cover bolts 16 through 1 in sequence.

Cylinder Head Cover Tightening Specifications



Component	Nm
Cylinder head cover-to-cylinder head	10
Secondary Air Injection (AIR) connecting pipe at cylinder head	10

Valve Dimensions



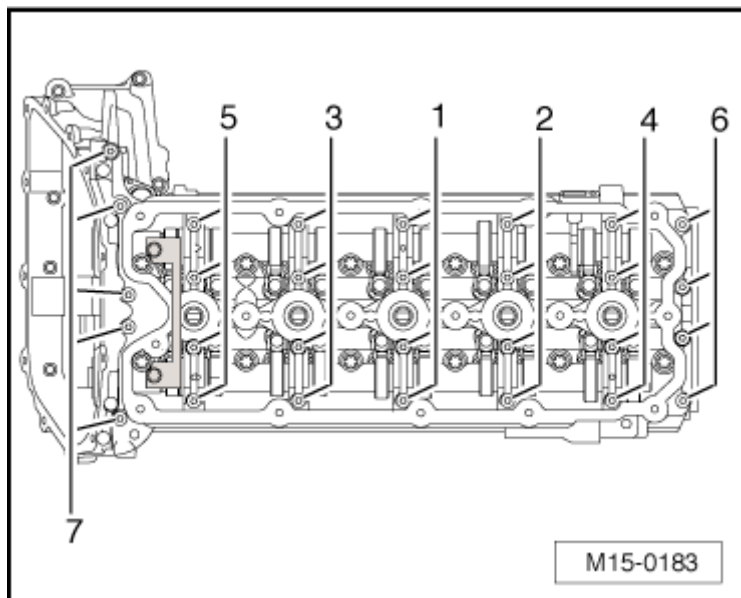
Dimension		Intake valve	Exhaust valve
Diameter a	mm	26.80 to 27.00	29.80 to 30.00
Diameter b	mm	5.95 to 5.97	5.94 to 5.95
c	mm	104.84 to 105.34	103.64 to 104.14
α	$^{\circ}$	45	45

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
9.0 to 13.0	8.0	Max. 3.0

Guide Frame Bolt Tightening Sequence and Specification

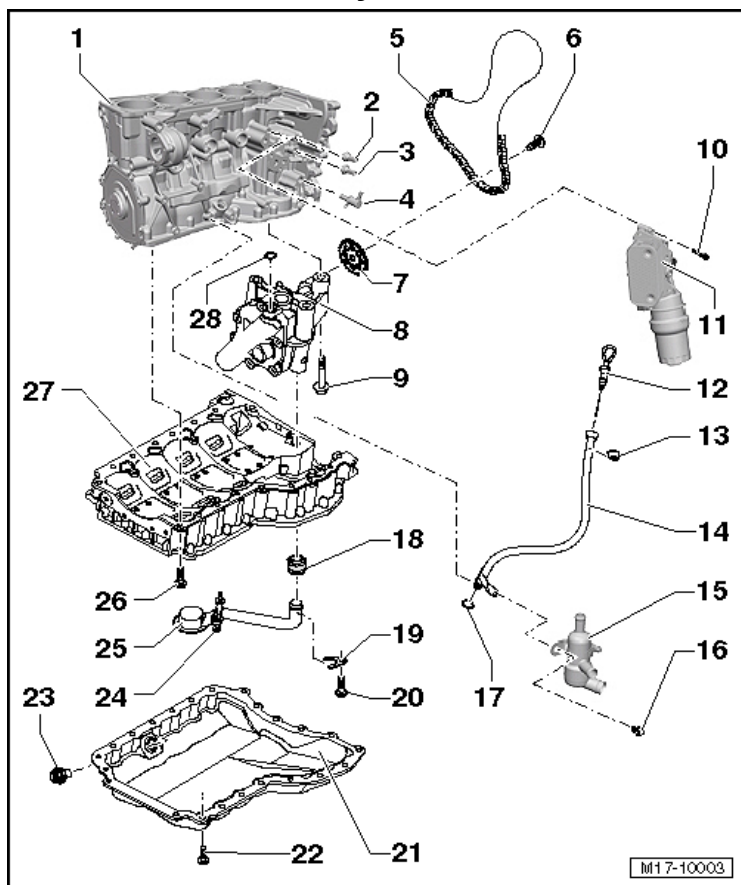


Component	Nm
Tighten bolts 1 through 7 in sequence	8
Tighten bolts 1 through 7 in sequence	an additional 90° (¼ turn)

Engine –
2.5L CBTA, CBUA

Lubrication – 2.5L CBTA, CBUA

Lubrication System Overview



- 1 - Cylinder Block
- 2 - Oil Pressure Switch -F1-
 - 20 Nm
- 3 - Reduced Oil Pressure Switch -F378-
 - 20 Nm
- 4 - Oil Pressure Regulation Valve -N428-
- 5 - Oil Pump Timing Chain
- 6 - Bolt
 - 20 Nm + 90° turn
 - Always replace
- 7 - Oil Pump Sprocket
- 8 - Oil Pump
- 9 - Bolt
 - 25 Nm

10 - Bolt

- 25 Nm

11 - Oil Filter Bracket with Attachments

12 - Oil Dipstick

13 - Retaining Ring

14 - Guide Tube

15 - Pre-warmer

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
- Always replace

24 - Decoupling Element

- Bolt 10 Nm

25 - Oil Intake Pipe

26 - Bolt

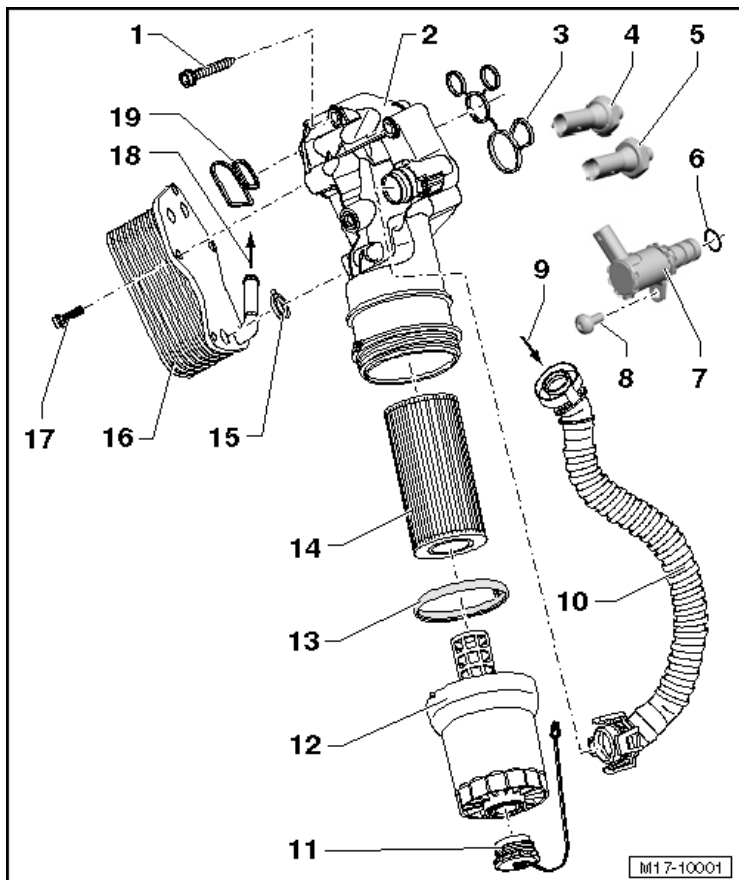
- 25 Nm

27 - Upper Oil Pan

28 - O-ring

- Always replace

Oil Filter Bracket with Attachments Overview



1 - Bolt

- 25 Nm

2 - Oil Filter Bracket

3 - Gasket

- Always replace

4 - Oil Pressure Switch -F1-

- 20 Nm

5 - Reduced Oil Pressure Switch -F378-

- 20 Nm

6 - O-ring

- Always replace

7 - Oil Pressure Regulation Valve -N428-

8 - Bolt

- 9 Nm

9 - From the Connecting Pipe

10 - Vent Tube

11 - Cap

12 - Oil Filter Housing

- 25 Nm

13 - Seal

14 - Oil Filter Element

15 - Gasket

- Always replace

16 - Oil Cooler

17 - Bolt

- 25 Nm

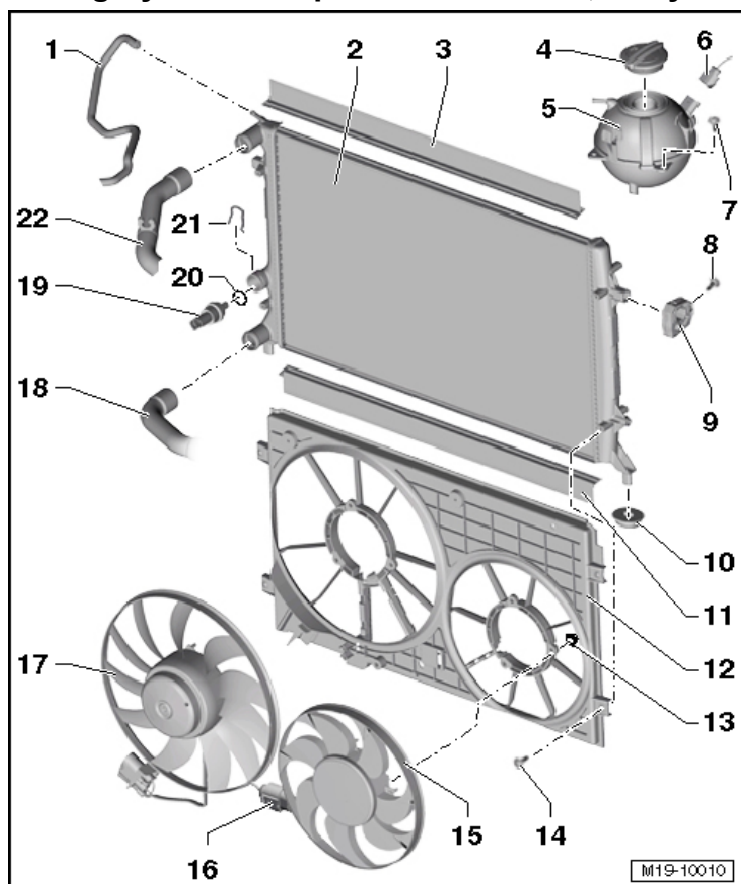
18 - To Thermostat Housing

19 - Gasket

- Always replace

Cooling System – 2.5L CBTA, CBUA

Cooling System Components Overview, Body Side



- 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 - Support
- 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 -G83-

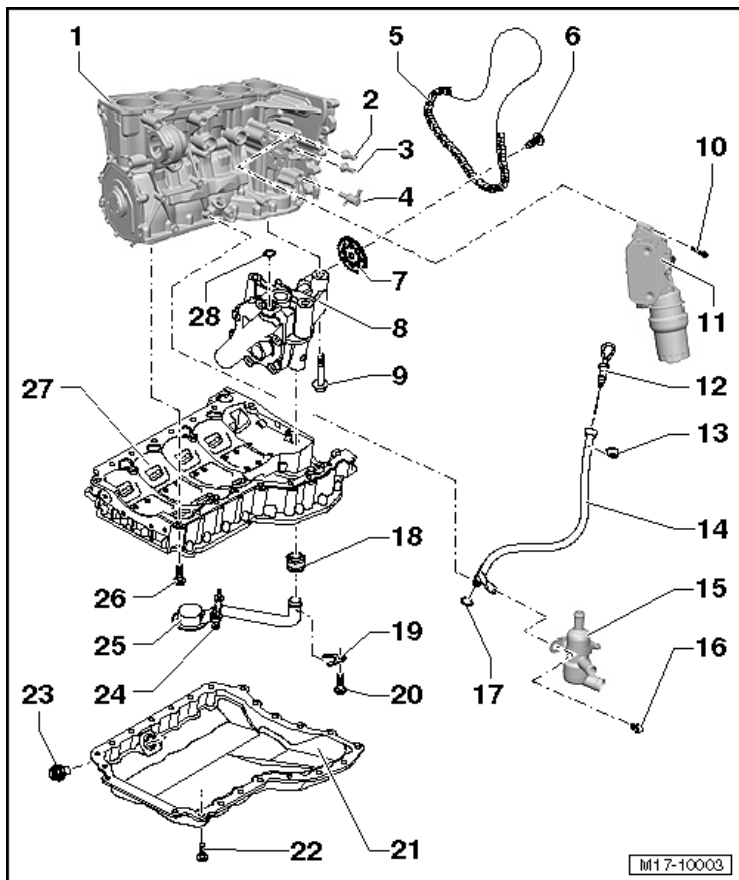
20 - O-ring

- Always replace

21 - Retaining Clip

22 - Upper Coolant Hose

Cooling System Components Overview, Engine Side

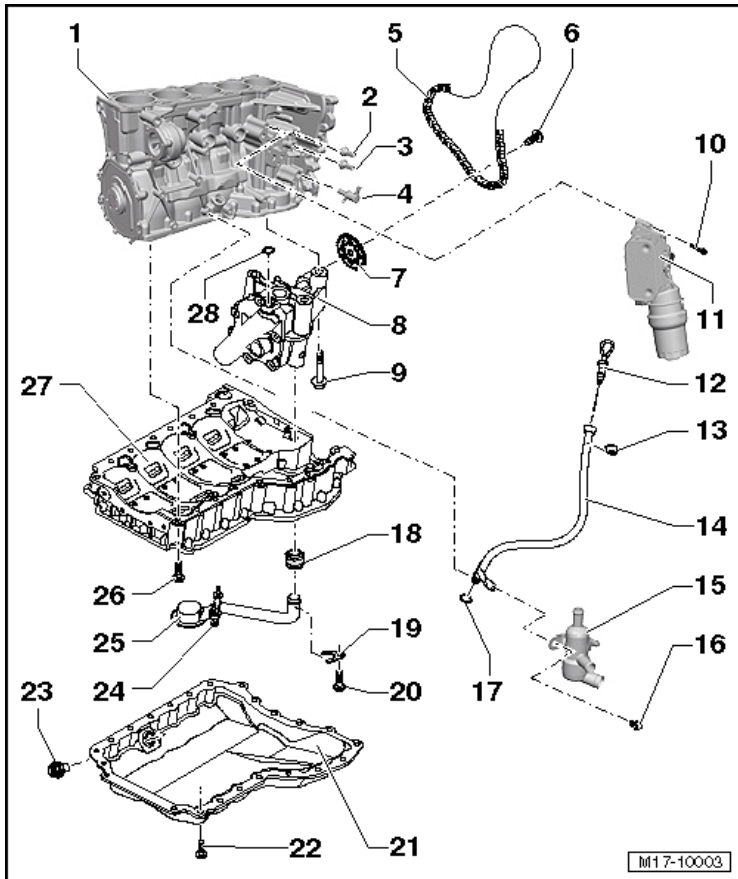


Part 1

- 1 - Cylinder Block
- 2 - Engine Oil Cooler
- 3 - Bolt
 - 25 Nm
- 4 - Bolt/Nut
 - 10 Nm
- 5 - to Bottom Heater Core Connection
- 6 - Guide Tube
- 7 - Pre-Warmer
 - Not available in the US/Canadian market.
- 8 - Bolt
 - 25 Nm
- 9 - O-ring
 - Always replace
- 10 - Retaining Clip

- 11 - Front Coolant Line**
- 12 - Connecting Hose**
- 13 - Thermostat Housing Cover**
- 14 - to Lower Radiator 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**
 - 10 Nm
- 27 - Coolant Pump**

Part 2



- 1 - Coolant Adapter
- 2 - Circlip
- 3 - Seal
- 4 - to Top Expansion Tank Connection
- 5 - Rear Coolant Line
- 6 - Bracket
- 7 - Bolt/Nut
 - 10 Nm
- 8 - Heat Shield
- 9 - to Top Heater Core Connection
- 10 - Supply Hose
- 11 - By-Pass Thermostat
- 12 - to Transmission Fluid Cooler
- 13 - from Bottom Heater Core Connection
- 14 - from Transmission Fluid Cooler
- 15 - Return Hose
- 16 - Coolant Line

- 17 - to Coolant Thermostat Housing
- 18 - Flange
- 19 - to Top Radiator Connection
- 20 - to Top Radiator Connection
- 21 - Supply Hose
- 22 - Engine Coolant Temperature Sensor -G62-
- 23 -O-ring
 - Always replace
- 24 - Retaining Clip

Recommended Mixture Ratios

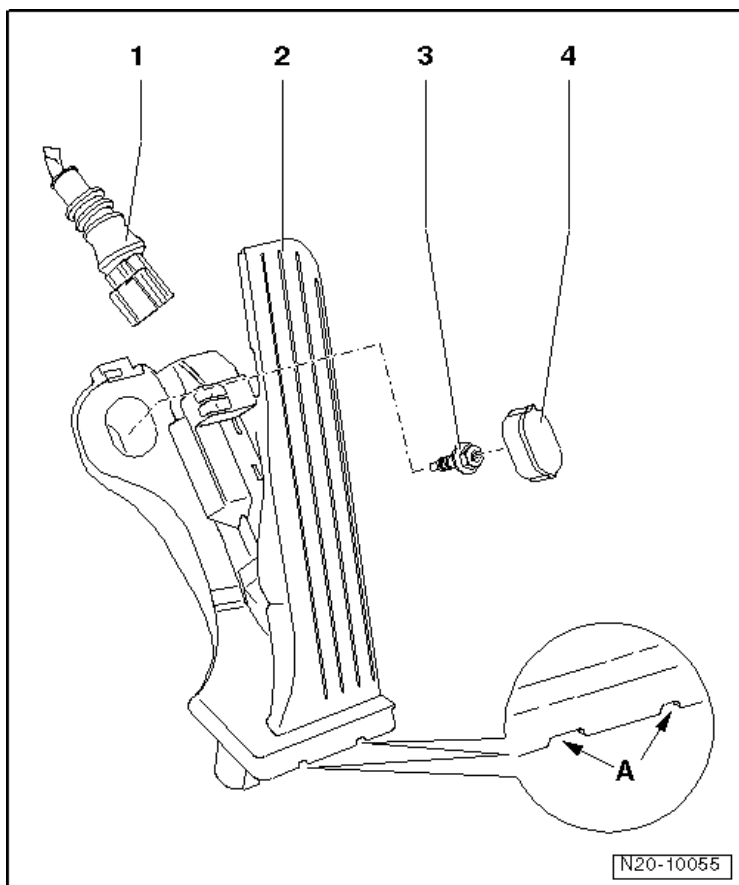
Frost protection to	Coolant	G 12 Plus-Plus ¹⁾	Distilled water ¹⁾
-25°C (-13°F)	40%	3.6L	5.4L
-35°C (-31°F)	50%	4.5L	4.5L

¹⁾ The quantity of coolant can vary depending upon the vehicle equipment.

**Engine –
2.5L CBTA, CBUA**

Fuel Supply – 2.5L CBTA, CBUA

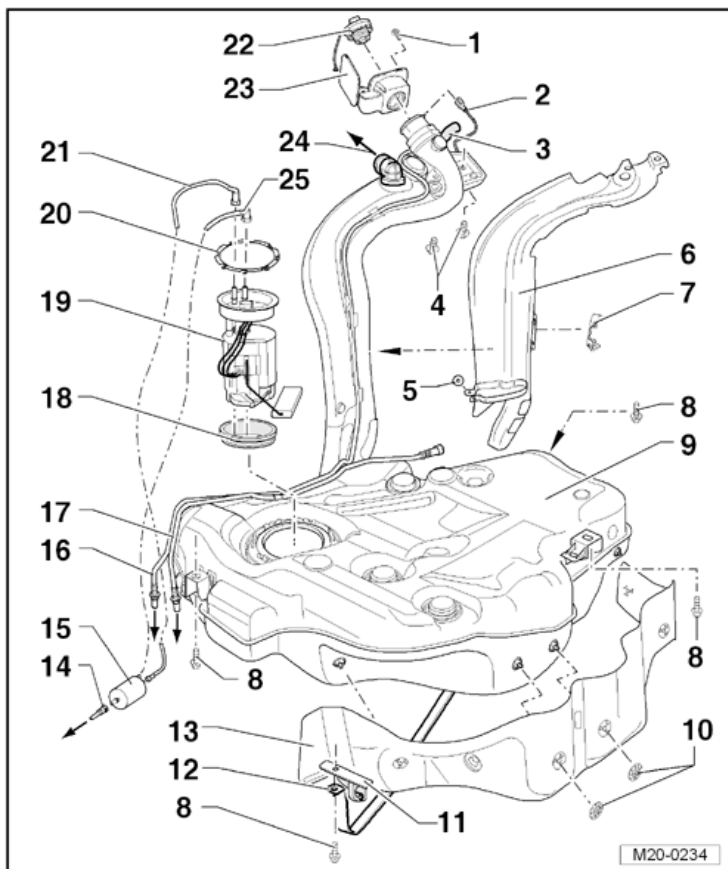
Accelerator Pedal Module Overview



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

**Engine –
2.5L CBTA, CBUA**

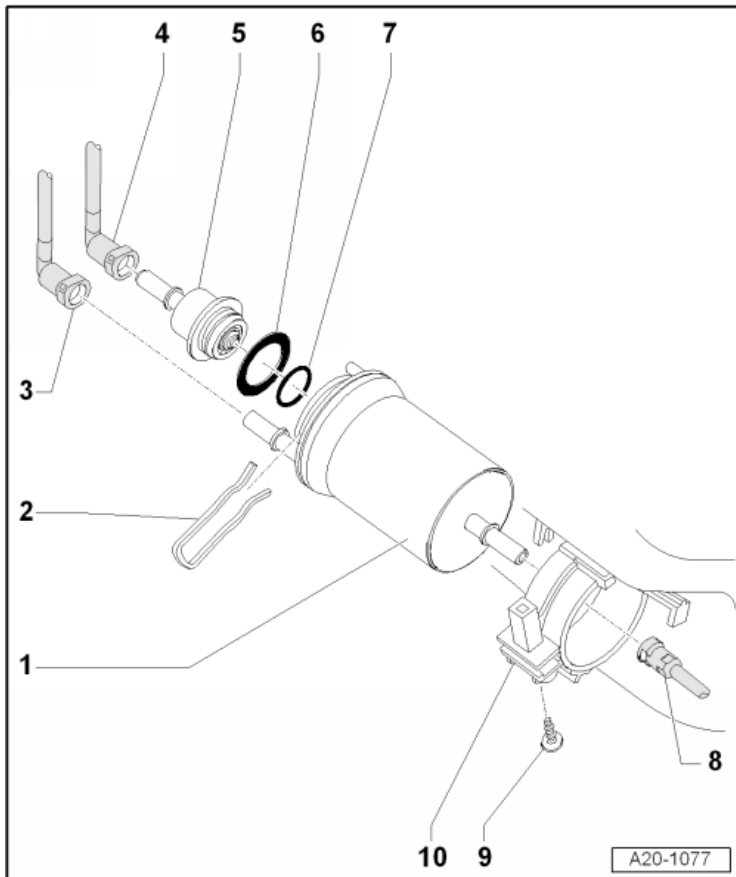
Fuel Tank and Attachments Overview



- 1 - Bolt
- 2 - Ground Connection
- 3 - Vacuum Line
- 4 - Bolt
 - 11 Nm
- 5 - Rivet
- 6 - Protective Plate
- 7 - Wiring Router
- 8 - Bolt
 - 26 Nm
 - Always replace
- 9 - Fuel Tank
- 10 - Retainer
- 11 - Bracket for the Exhaust System
- 12 - Tensioning Strap
- 13 - Heat Shield
- 14 - Supply Line

- 15 - Fuel Filter**
- 16 - Vacuum Line**
- 17 - Vent Line**
- 18 - Seal**
 - Always replace
- 19 - Fuel Delivery Unit**
- 20 - Locking Ring**
 - 110 Nm
- 21 - Return Line**
- 22 - Cap**
- 23 - Fuel Filler Door Unit**
- 24 - to EVAP Canister**
- 25 - Supply Line**

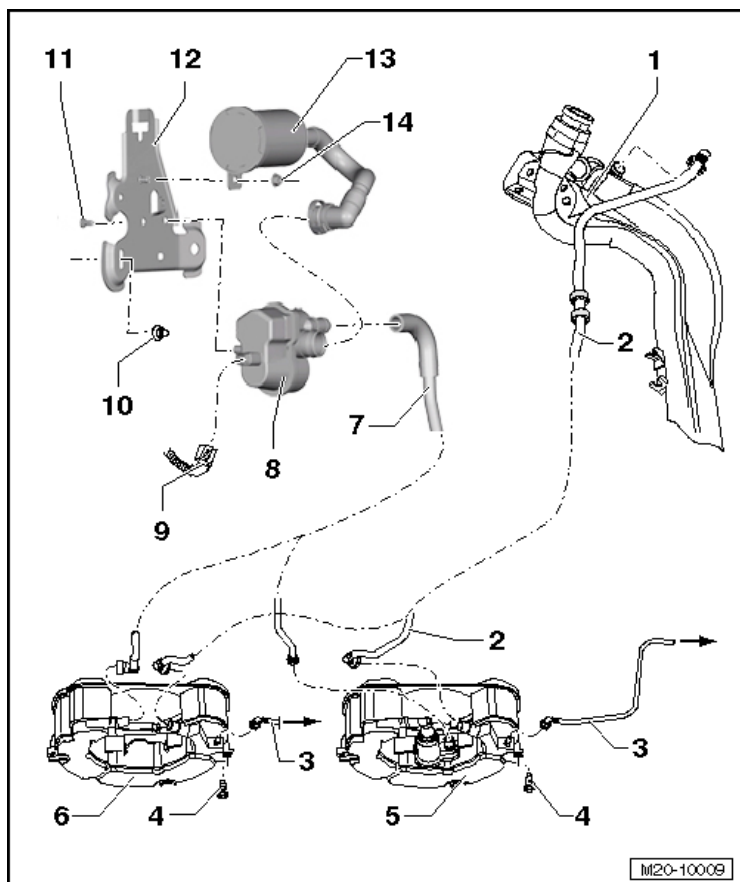
Fuel Filter Overview



- 1 - Fuel Filter
- 2 - Retaining Clip
- 3 - Fuel Supply Line
- 4 - Fuel Return Line
- 5 - Fuel Pressure Regulator
- 6 - Gasket
 - Always replace
- 7 - O-ring
 - Always replace
- 8 - Fuel Supply Line
- 9 - Bolt
 - 3 Nm
- 10 - Bracket

**Engine –
2.5L CBTA, CBUA**

EVAP System Component Overview



- 1 - Fuel Tank
- 2 - Vent Line
- 3 - Vent Line
- 4 - Bolt
 - 8 Nm
- 5 - Evaporative Emission (EVAP) Canister
 - For engine code CBUA
- 6 - EVAP Canister
- 7 - Connecting Line
- 8 - Leak Detection Pump -V144-
- 9 - Connector
- 10 - Nut
 - 6 Nm
- 11 - Bolt
 - 3 Nm
- 12 - Bracket

13 - Air Filter Housing

14 - Nut

2 Nm

**Engine –
2.5L CBTA, CBUA**

Multiport Fuel Injection – 2.5L CBTA, CBUA

Technical Data

Engine codes		CBTA and CBUA
Idle check		
Engine idle speed ¹⁾	RPM	680
Engine Control Module (ECM) ²⁾		
System designation		Motronic ME 7.1.1 from MY 2009 Motronic ME 17.5
Replacement part number		Refer to parts catalog
Engine speed limitation	RPM	Approximately 6300

¹⁾ 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.

²⁾ Replace the ECM. Refer to ElsaWeb.

**Engine –
2.5L CBTA, CBUA**

12 - Bracket

- For engine code CBUA only.

13 - O-ring

**14 - Manifold Absolute Pressure Sensor -G71- with Intake Air
Temperature Sensor -G42-**

15 - Bolt

- 3.5 Nm

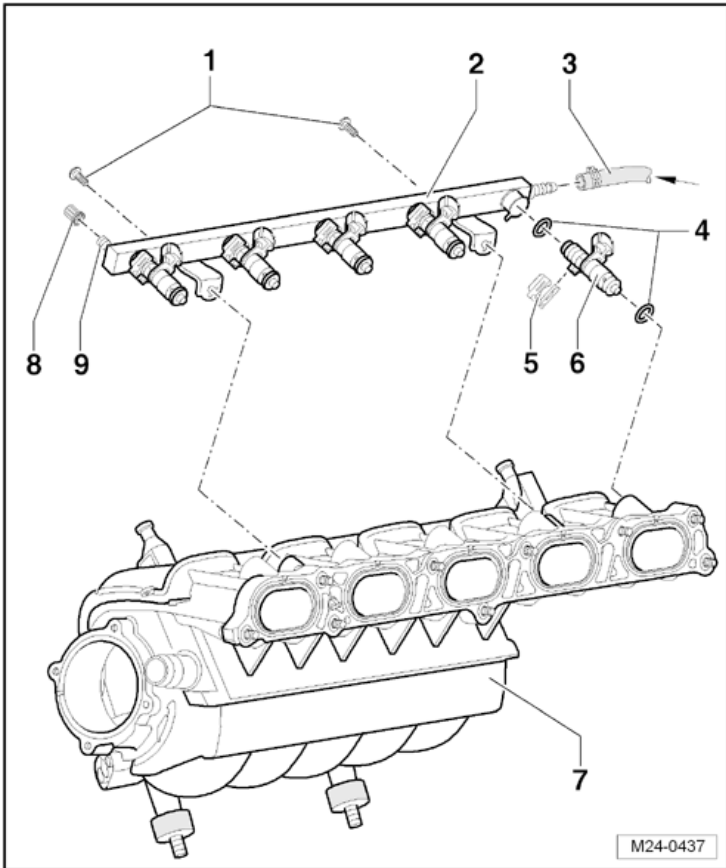
16 - Bolt

- 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-

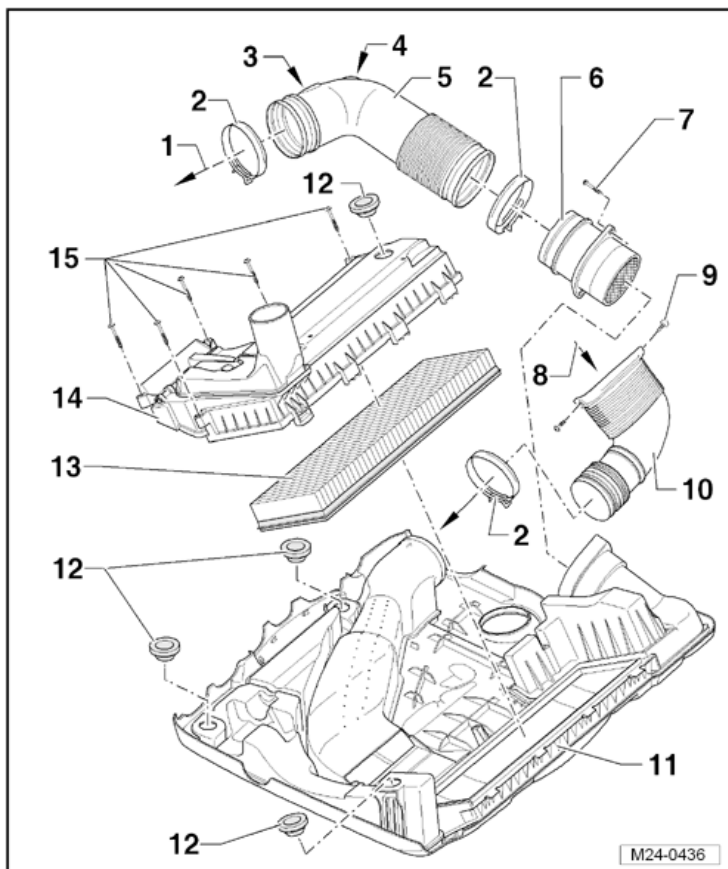
7 - Intake Manifold

8 - Cap

9 - Bleed Valve

**Engine –
2.5L CBTA, CBUA**

Air Filter Housing Overview

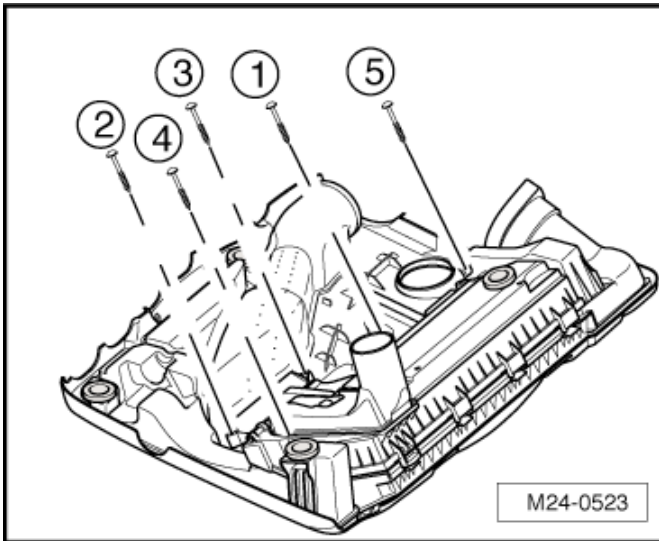


- 1 - to Throttle Valve Control Module -J338-
- 2 - Spring Type Clip
- 3 - Connection
- 4 - Connection
- 5 - Connecting Pipe
- 6 - Mass Airflow Sensor -G70- with Intake Air Temperature Sensor -G42-
- 7 - Bolt
 - 3 Nm
- 8 - from Air Guide on the Lock Carrier
- 9 - Screw
 - 1.5 Nm
- 10 - Intake Air Duct
- 11 - Upper Air Filter Housing
- 12 - Rubber Bushing
- 13 - Filter Element
- 14 - Lower Air Filter Housing

15 - Bolt

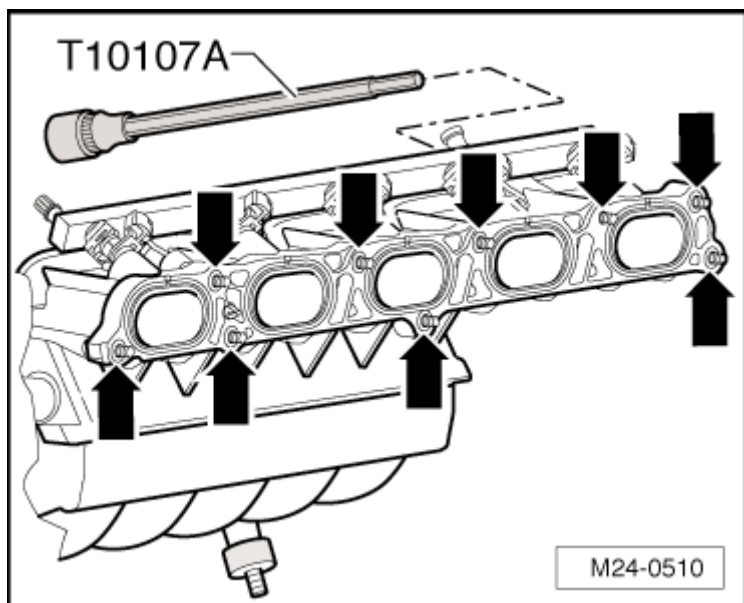
□ 2 Nm

**Lower Air Filter Housing to Upper Air Filter Housing/
Engine Cover Tightening Sequence and Specification**



Tighten the bolts as shown in sequence -1 through 5- to 2 Nm.

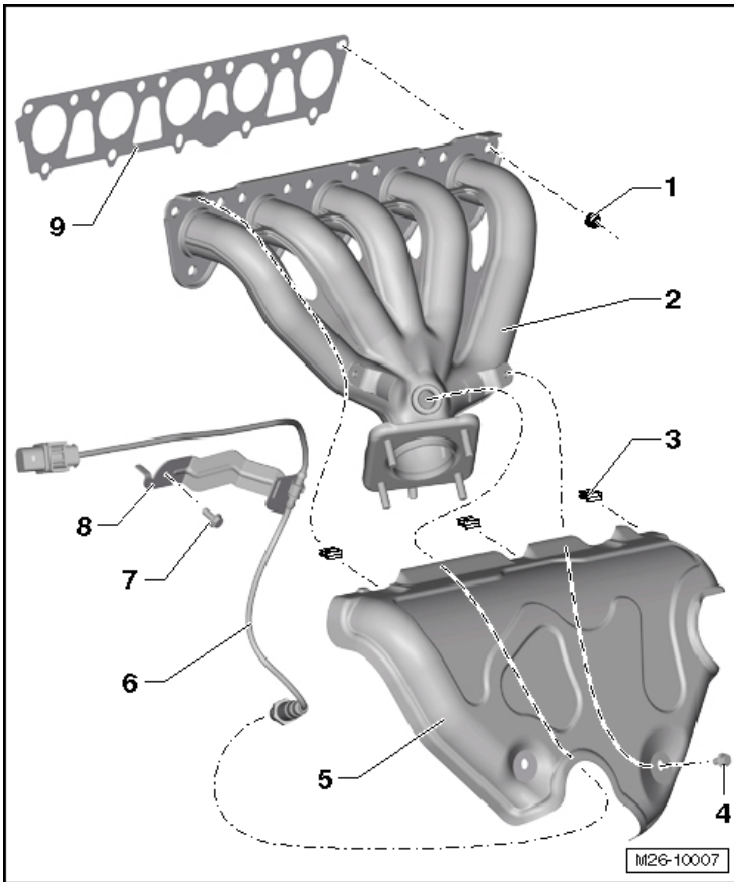
Intake Manifold Tightening Specifications



Starting from the inside and working toward the outside, tighten the intake manifold bolts in a diagonal sequence to 9 Nm.

Exhaust System – 2.5L CBTA, CBUA

Exhaust Manifold and Attachments Overview



Engine –
2.5L CBTA, CBUA

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

7 - Bolt

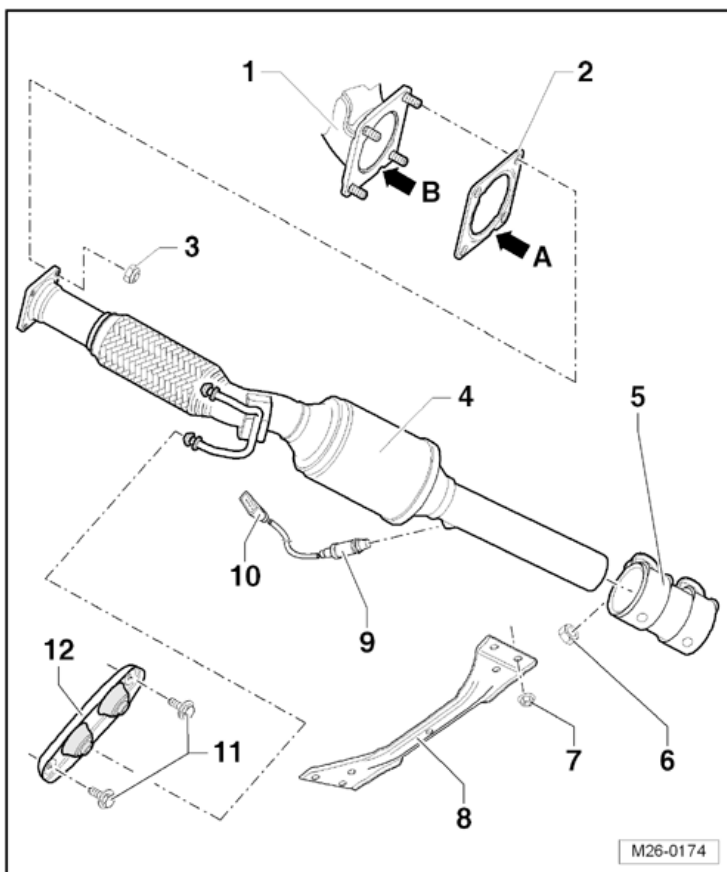
- 10 Nm

8 - Bracket

9 - Gasket

- Always replace

Front Exhaust Pipe with Catalytic Converter and Attachments Overview



1 - Exhaust Manifold

2 - Gasket

Always replace

3 - Nut

23 Nm

Always replace

4 - Front Exhaust Pipe with Catalytic Converter

5 - Clamp

6 - Nut

23 Nm

7 - Nut

23 Nm

8 - Front Crossmember

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

55 Nm

10 - Connector

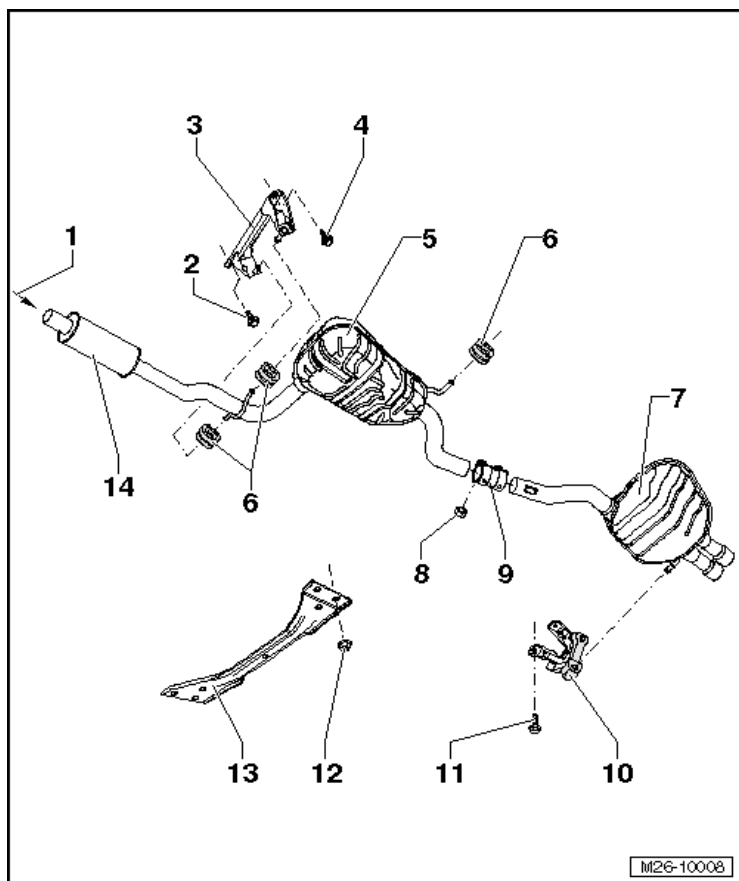
11 - Bolt

23 Nm

12 - Suspended Mount

**Engine –
2.5L CBTA, CBUA**

Muffler and Mounts Overview



1 - from Front Exhaust Pipe with Catalytic Converter

2 - Bolt

- 26 Nm
- Always replace

3 - Suspended Mount

4 - Bolt

- 26 Nm

5 - Center Muffler

6 - Retaining Loop

7 - Rear Muffler

8 - Nut

- 26 Nm

9 - Repair Clamp

10 - Suspended Mount

11 - Bolt

- 23 Nm

12 - Nut

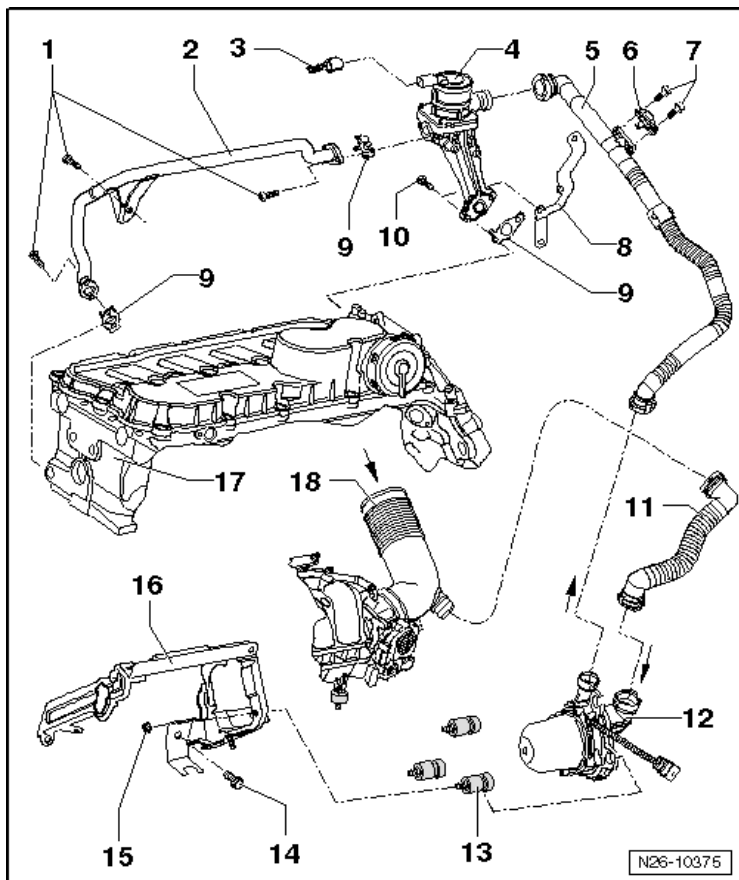
- 20 Nm

13 - Rear Crossmember

14 - Front Muffler

- Fom MY 06.

Secondary Air Injection System Overview



1 - Bolt

- 10 Nm

2 - Secondary Air Injection Pipe

- For engine code CBUA only

3 - Connector

4 - Secondary Air Injection Solenoid Valve -N112-

5 - Pressure Tube

6 - Secondary Air Injection Sensor 1 -G609

7 - Screw

- 2 Nm

8 - Bracket

9 - Gasket

10 - Bolt

- 10 Nm

11 - Vent Tube

12 - Secondary Air Injection Pump Motor -V101-

13 - Rubber Bushing

14 - Bolt

□ 25 Nm

15 - Nut

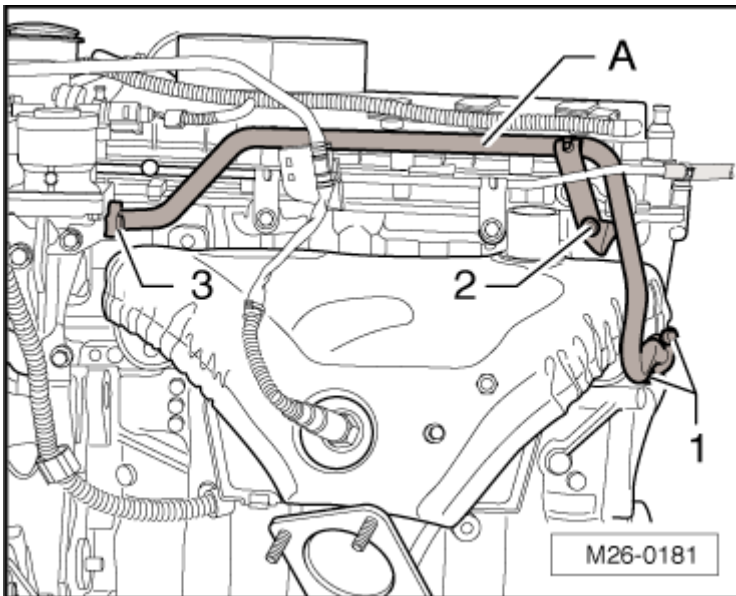
□ 10 Nm

16 - Intake Manifold Support

17 - Cylinder Head

18 - Connecting Pipe

**Secondary Air Injection Pipe
Tightening Specifications**



Engine –
2.5L CBTA, CBUA

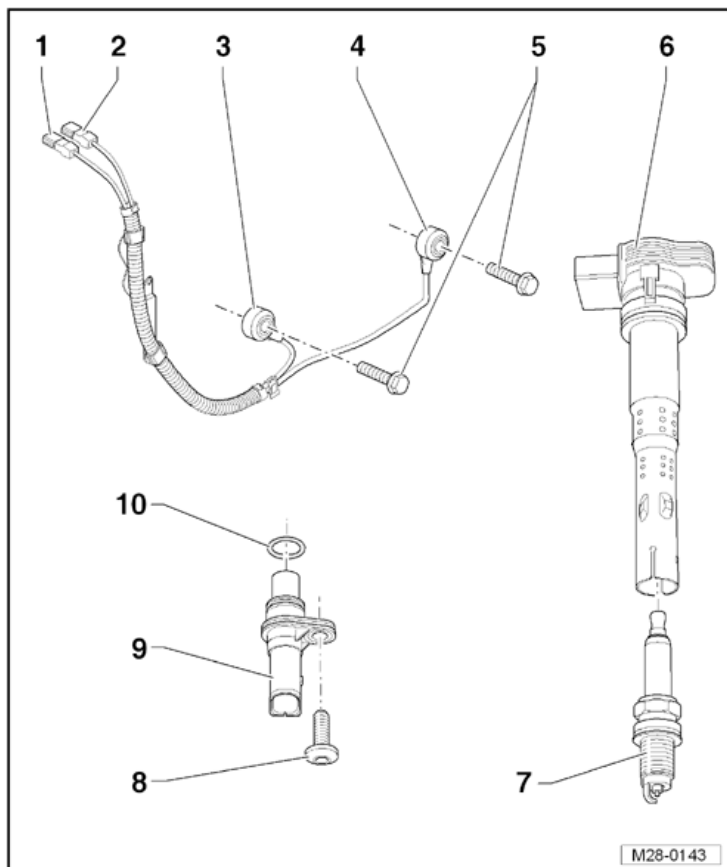
Replace all seals for the secondary air injection pipe (A).
Install all bolts only hand tight. Tighten bolts 1, 2 and 3 in sequence
to 10 Nm.

Ignition System – 2.5L CBTA, CBUA

Technical Data

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

Ignition Component Overview



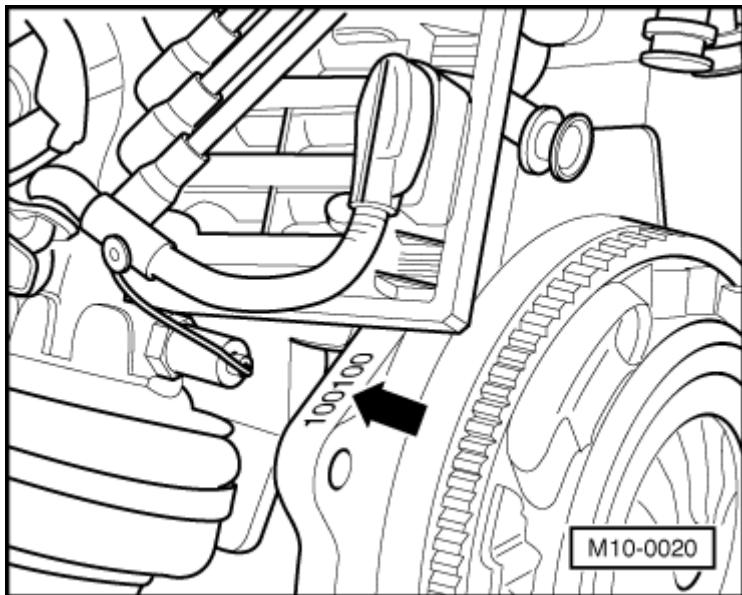
Engine –
2.5L CBTA, CBUA

- 1 - Harness Connector for the Knock Sensor 2
- 2 - Harness Connector for the Knock Sensor 1
- 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

ENGINE – 2.0L CBFA, CCTA

General Information – 2.0L CBFA, CCTA

Engine Number



The engine number (engine code and serial number) is located at the front of the engine/transmission joint.

The engine number consists of up to nine alphanumeric characters. The first three letters are the engine code. The next six digits are the engine 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. There is also a label ➔ on the toothed belt guard that shows the engine code and the engine serial number. The engine code is also included on the vehicle data plates.

Vehicles with a Four Digit Engine Code:

- Four digit engine codes begin with the letter "C".
- The first three positions describe the engine type and are stamped onto the engine.
- The fourth position describes the engine output and torque.
- The 4 digit engine code is also stored in the ECM and is also found on the type plate and the vehicle data label.

Engine Data

Code Letters		CBFA	CCTA
Manufactured		from 11.07	from 11.07
Emission values Standard		SULEV ¹⁾	ULEV 2 ²⁾
Displacement	liter	2.0	2.0
Output	kW at RPM	147 at 5100	147 at 5100
Torque	Nm at RPM	280 at 1700	280 at 1700
Bore	Diameter mm	82.5	82.5
Stroke	mm	92.8	92.8
Compression ratio		9.6:1	9.6:1
Valves per cylinder		4	4
Research Octane Number (RON)	Minimum	minimum 95	minimum 95
Fuel injection		FSI ³⁾	FSI ³⁾
Ignition sequence		1-3-4-2	1-3-4-2
On Board Diagnostic (OBD)		yes	yes
Knock control		Knock Sensor (KS) 1	Knock Sensor (KS) 1
Catalytic converter		Yes	Yes
Oxygen Sensor (O2S) regulation		3 sensors	2 sensors
Exhaust Gas Recirculation (EGR)		No	No
Turbocharger		Yes	Yes
Variable intake manifold		Yes	Yes
Variable Valve Timing (VVT)		Yes	Yes
Secondary Air Injection (AIR) system		Yes	No
Valves per cylinder		4	4
Oil pressure control		No	No

¹⁾ Super Ultra Low Emission Vehicle

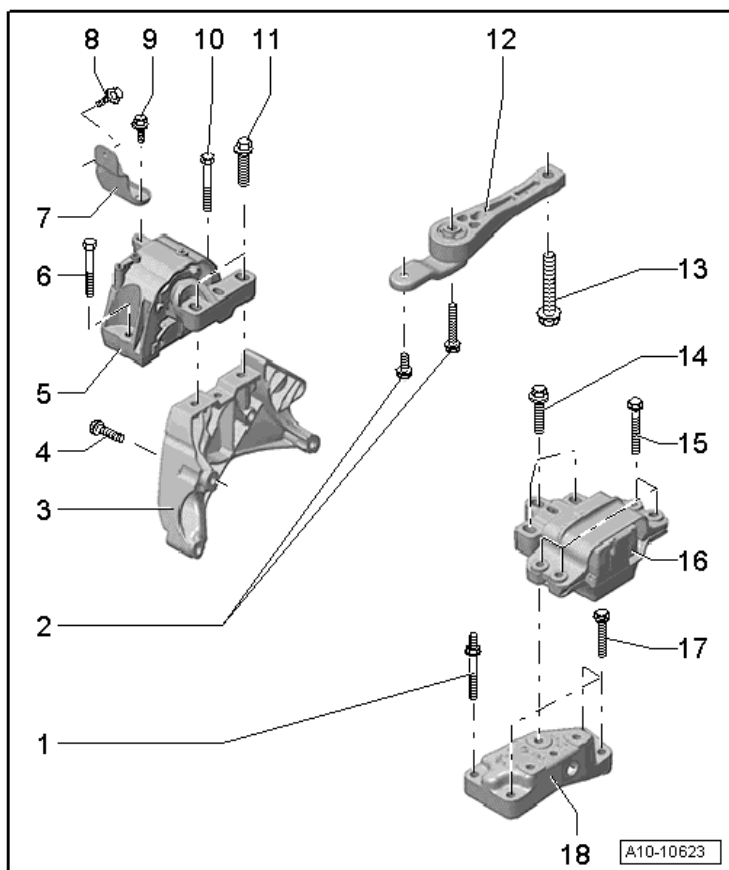
²⁾ Ultra Low Emission Vehicles 2

³⁾ Fuel Straight Injection

Engine –
2.0L CBFA, CCTA

Engine Assembly – 2.0L CBFA, CCTA

Engine and Transmission Mount Overview



1 - Bolt

- Tightening specification, refer to Transmission section

2 - Bolt

- 50 Nm + 90° turn
- Replace after removing

3 - Engine Mount Bracket

4 - Bolt

- 40 Nm + 90° turn
- Replace after removing

5 - Engine Mount

6 - Bolt

- 40 Nm + 90° turn
- Replace after removing

7 - Bracket

8 - Bolt

- 20 Nm + 90° turn
- Replace after removing

9 - Bolt

- 20 Nm + 90° turn
- Replace after removing

10 - Bolt

- 40 Nm + 90° turn
- Replace after removing

11 - Bolt

- 60 Nm + 90° turn
- Replace after removing

12 - Pendulum Support**13 - Bolt**

- 100 Nm + 90° turn
- Replace after removing

14 - Bolt

- 60 Nm + 90° turn
- Replace after removing

15 - Bolt

- 40 Nm + 90° turn
- Replace after removing

16 - Transmission Mount

- The illustration shows the Direct Shift Gearbox (DSG®) version.

17 - Bolt

- Tightening specification, refer to Transmission Section

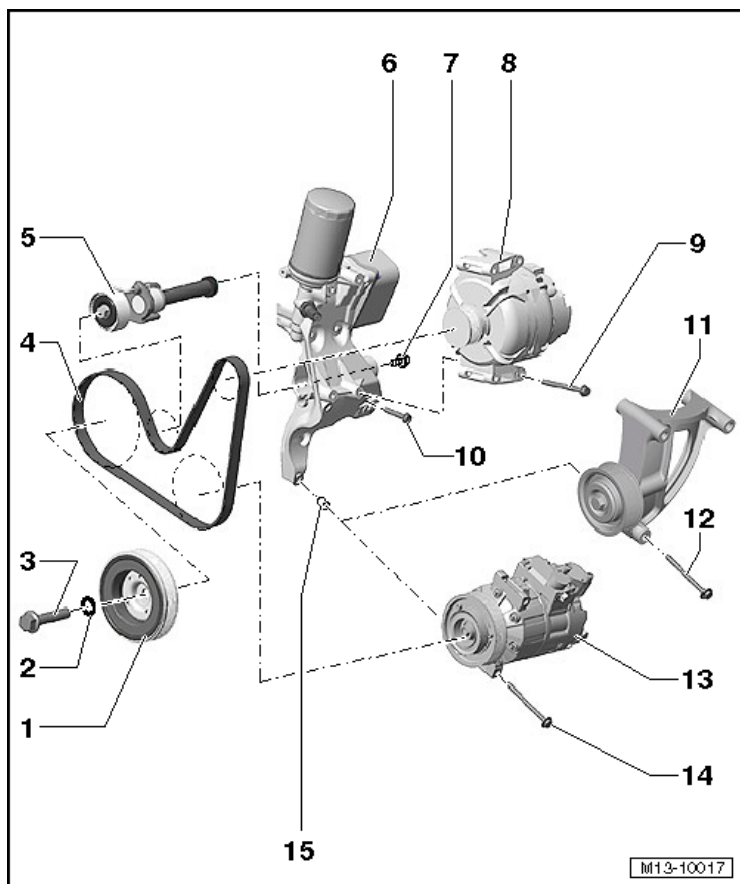
18 - Transmission Mount Bracket**Fastener Tightening Specifications**

Component	Fastener Size	Nm
Bolts and Nuts		
	M6	9
	M7	15
	M8	23
	M10	40
	M12	60

**Engine –
2.0L CBFA, CCTA**

Crankshaft, Cylinder Block – 2.0L CBFA, CCTA

Ribbed Belt Overview



- 1 - Vibration Damper
- 2 - O-ring
- 3 - Bolt
 - 150 Nm + 90° turn
 - Replace after removing
- 4 - Ribbed Belt
- 5 - Ribbed Belt Tensioner
- 6 - Accessory Bracket
- 7 - Bolt
 - 10 Nm
- 8 - Generator
- 9 - Bolt
 - 23 Nm

10 - Bolt

- Always replace
- Tightening sequence and tightening specification, see Accessory Bracket Bolt Tightening Sequence and Specification below

11 - Bracket with Idler Pulley

12 - Bolt

- 25 Nm

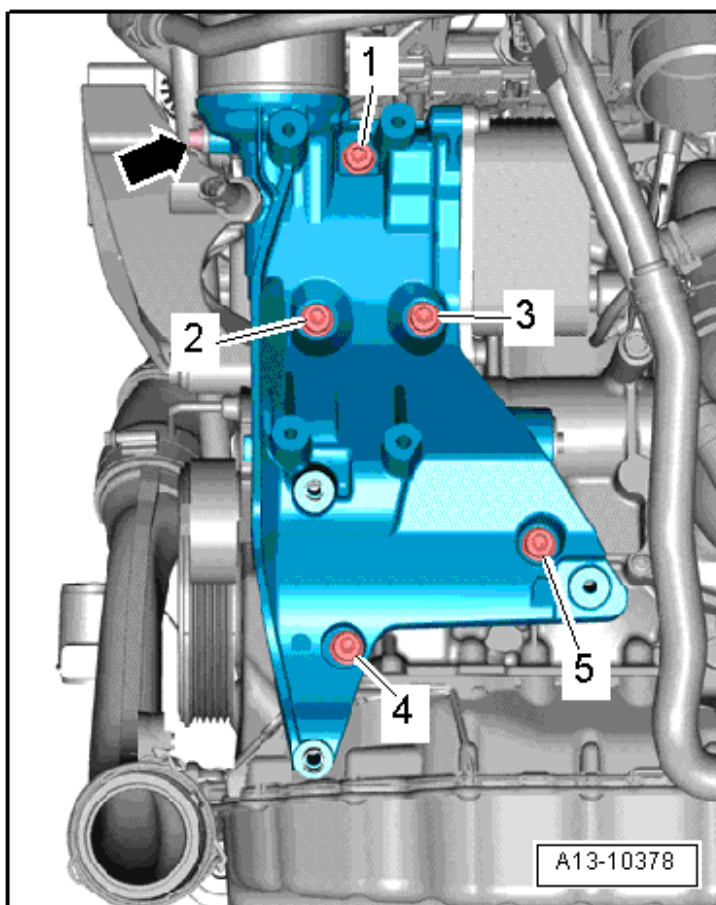
13 - A/C Compressor

14 - Bolt

- 25 Nm

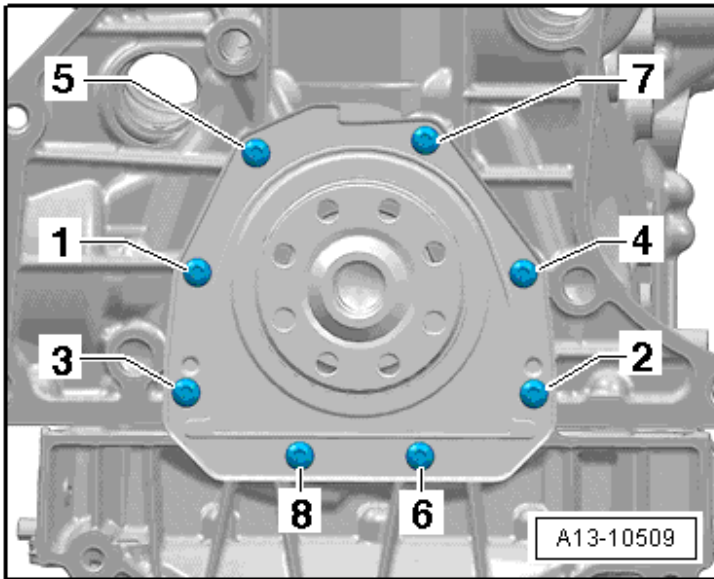
15 - Alignment Sleeve

Accessory Bracket Bolt Tightening Sequence and Specification



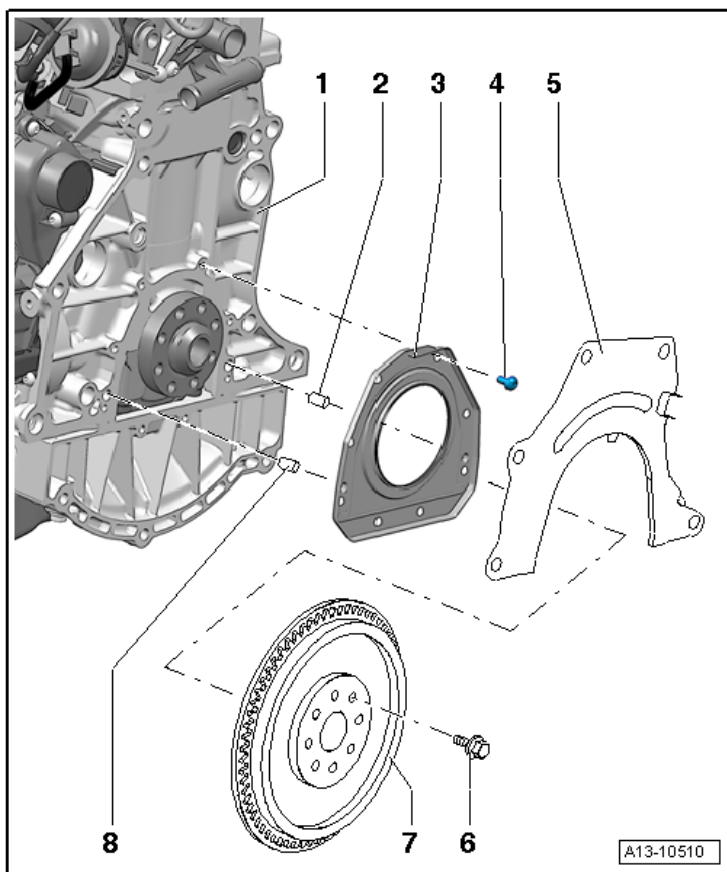
Step	Tighten	Nm
1	Position the accessory bracket and then install bolt -4-. Tighten the bolts in 3 passes in sequence -1 through 5-.	-
2	Tighten bolts by hand.	-
3	Tighten bolts 1 through 5 in sequence	20
4	Tighten bolts 1 through 5 in sequence	an additional 90° (¼ turn)

Transmission Side Sealing Flange Bolt Tightening Sequence and Specification



Step	Tighten	Nm
1	Tighten bolts 1 through 8 in sequence	Hand tight
2	Tighten bolts 1 through 8 in sequence	9

Transmission-Side Sealing Flange and Dual Mass Flywheel Overview



1 - Cylinder Block

2 - Alignment Pin

Not installed

3 - Sealing Flange, Transmission Side

4 - Bolt

For the tightening sequence and tightening specification, see Sealing Flange (Transmission Side) Bolt Tightening Sequence and Specification below

5 - Intermediate Plate

6 - Bolt

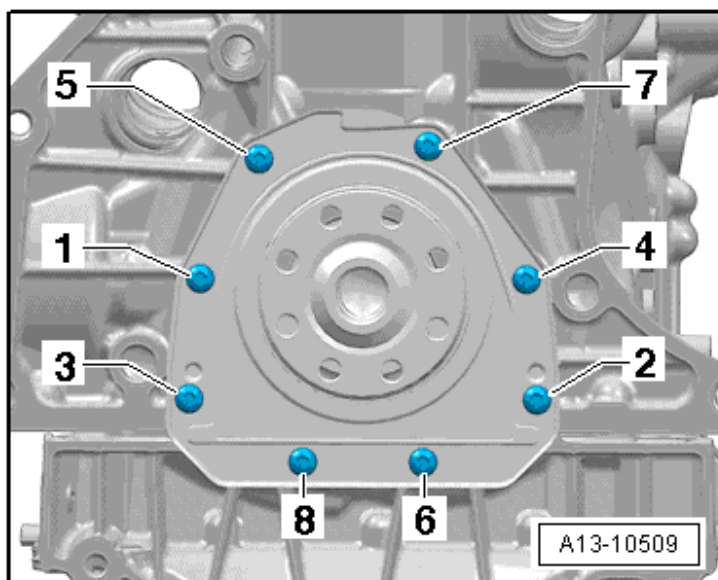
60 Nm + 90° turn

Replace after removing

7 - Dual Mass Flywheel

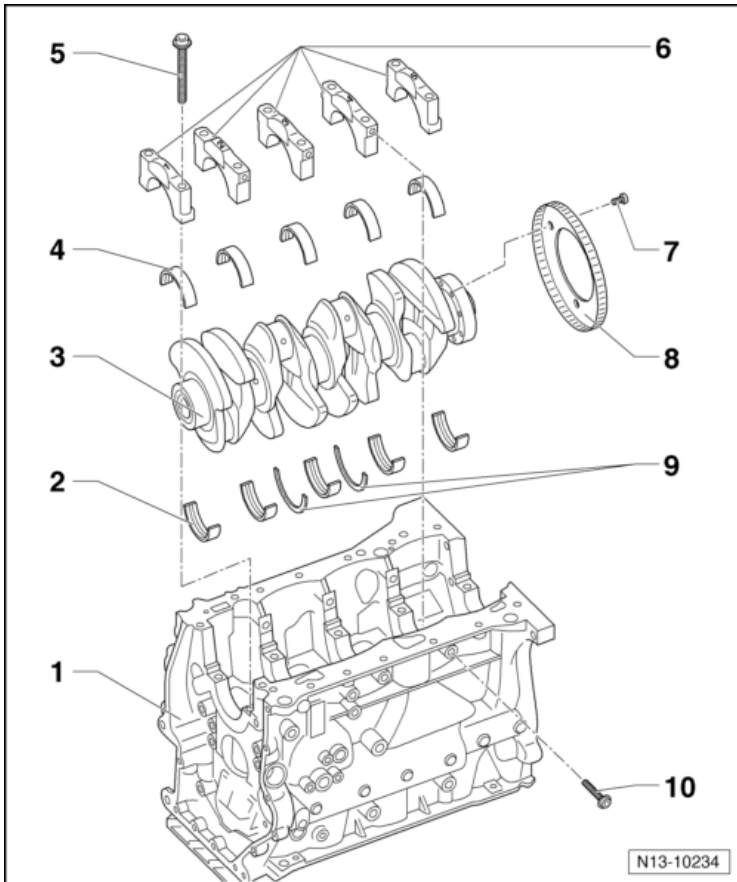
8 - Alignment Pin

Sealing Flange (Transmission Side) Bolt Tightening Sequence and Specification



Step	Tighten	Nm
1	Tighten bolts 1 through 8 in sequence	Hand tight
2	Tighten bolts 1 through 8 in sequence	9

Crankshaft Overview



1 - Cylinder Block

2 - Bearing Shell, for the Cylinder Block

3 - Crankshaft

4 - Bearing Shell, for the Bearing Cap

5 - Bolt

Always replace.

Tightening sequence and specification, see Crankshaft Bearing Cap Bolt Tightening Sequence and Specification below

6 - Bearing Cap

7 - Screw

10 Nm + 90° turn

Replace after removing

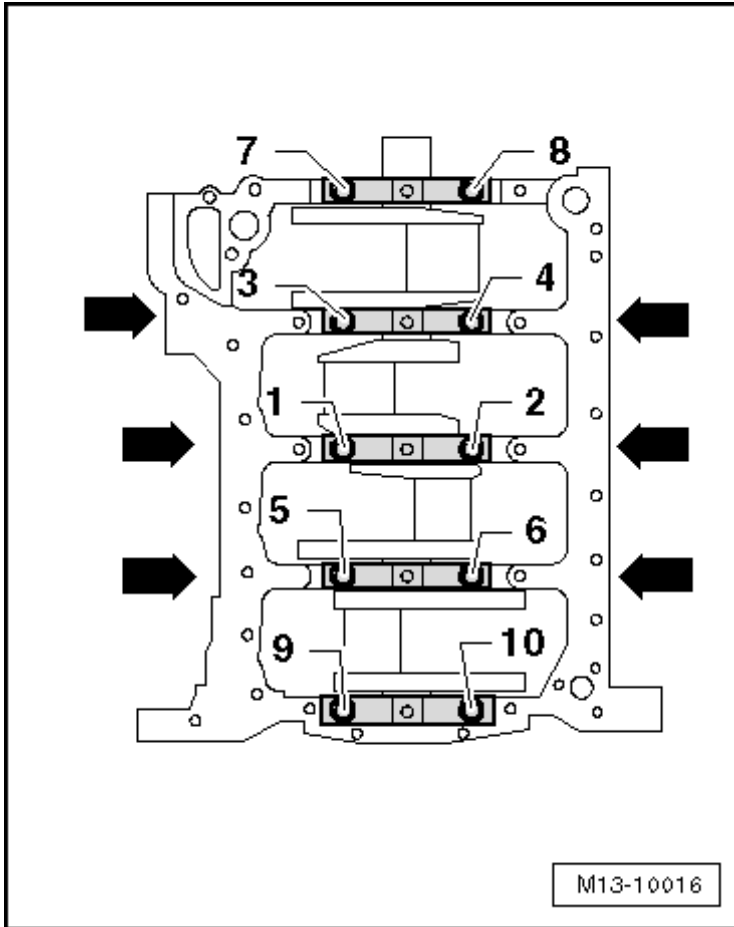
8 - Sensor Wheel

9 - Thrust Washers

10 - Bolt

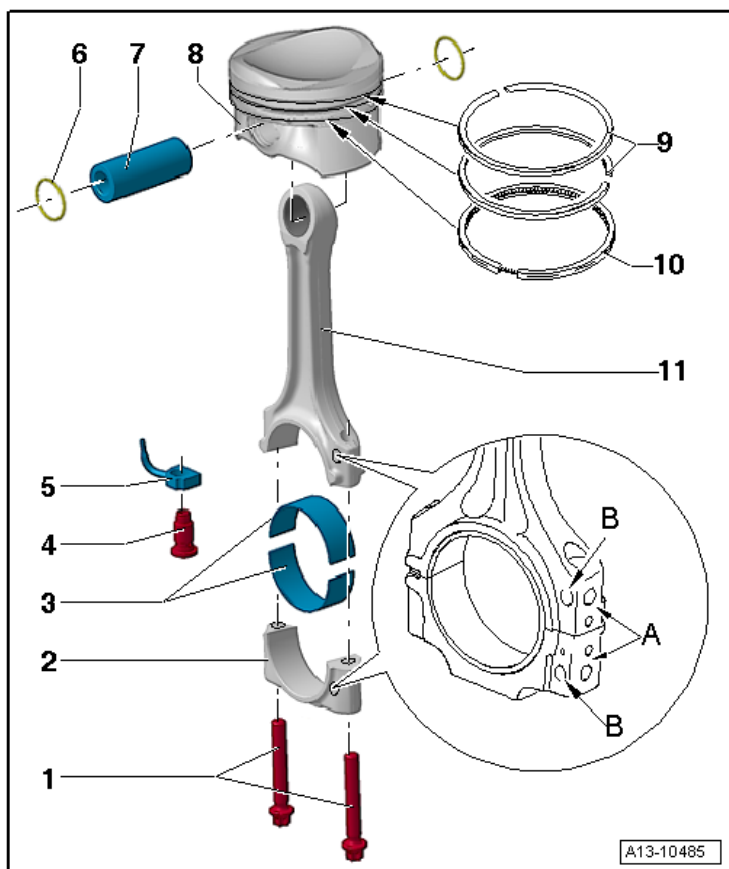
- Always replace.
- Tightening sequence and specification, see Crankshaft Bearing Cap Bolt Tightening Sequence and Specification below

Crankshaft Bearing Cap Bolt Tightening Sequence and Specification



Step	Tighten	Nm
1	Tighten bolts 1 through 10 in sequence	Hand tight
2	Tighten bolts 1 through 10 in sequence	65
3	Tighten bolts 1 through 10 in sequence using a ratchet	an additional 90° (¼ turn)
4	Tighten bolts 1 through 10 in sequence (➡)	20
5	Tighten the bolts (➡) using a ratchet	an additional 90° (¼ turn)

Piston and Connecting Rod Overview



- 1 - Connecting Rod Bolts**
 - 45 Nm + 90° turn
 - Replace after removing
- 2 - Connecting Rod Bearing Cap**
- 3 - Bearing Shells**
- 4 - Pipe for the Balance Shaft**
 - 27 Nm
- 5 - Oil Spray Jet**
- 6 - Locking Ring**
- 7 - Piston Pin**
- 8 - Piston**
- 9 - Compression Rings**
- 10 - Oil Scraping Ring**
- 11 - Connecting Rod**

Crankshaft Dimensions

Honing dimension in mm ¹⁾	Crankshaft bearing stub axle - diameter	Connecting rod bearing stub axle - 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	Cylinder bore - diameter
Basic dimension	82.465 ¹⁾	82.510

¹⁾ Measurements are without the graphite coating (thickness = 0.02 mm). The graphite coating wears off.

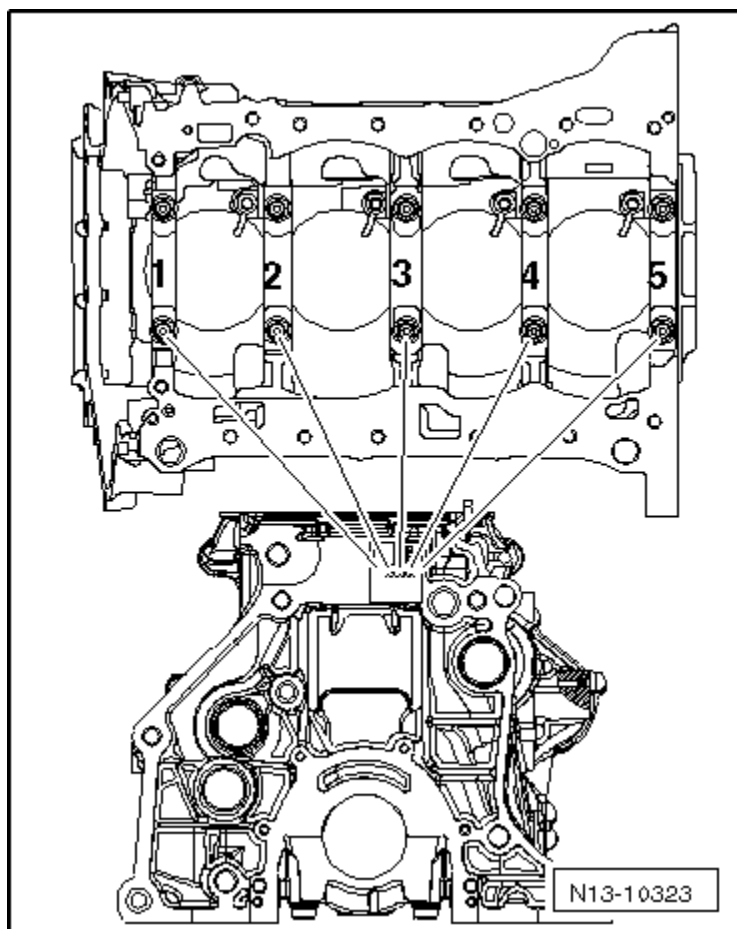
Piston Ring Gap

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

Piston Ring Groove Clearance

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

Upper Crankshaft Bearing Identification

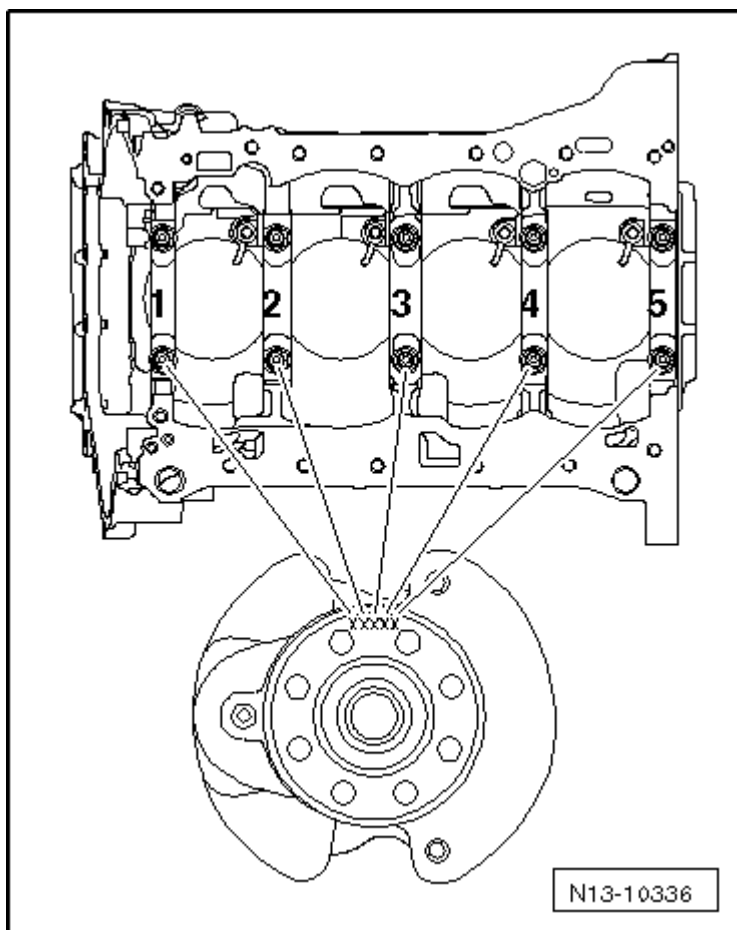


The bearing shells are allocated to the cylinder block with the correct thickness by the factory. Colored dots serve to identify the bearing thicknesses.

The code letters on the lower contact surface or on the top of the cylinder block identify which bearing shell and where it must be installed on the cylinder block (upper bearing shell).

The code letters on the crankshaft identify which bearing shell and where they must be installed in the bearing cap (lower bearing shell).

Lower Crankshaft Bearing Identification



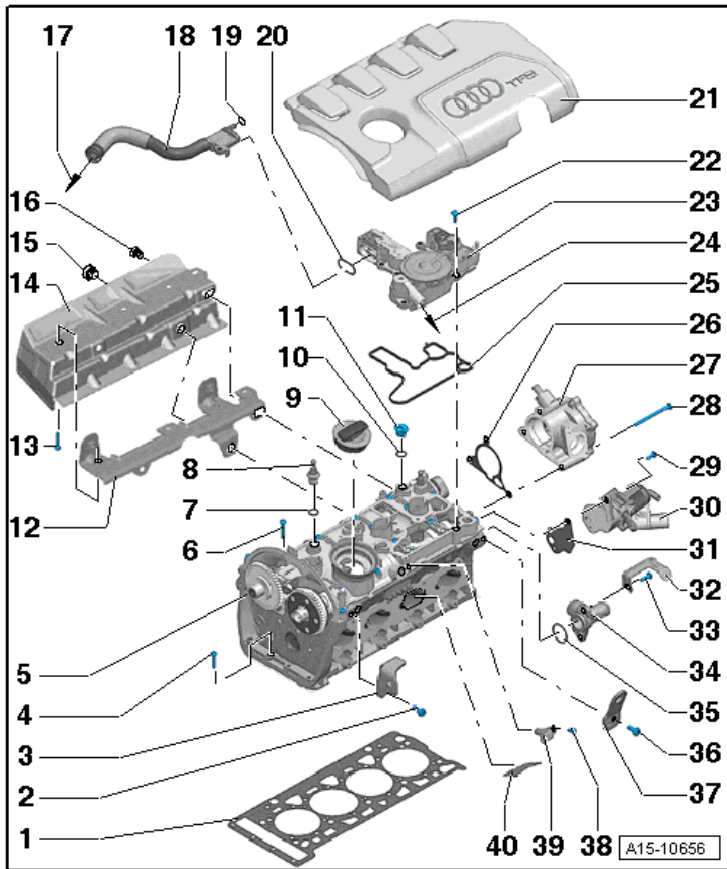
Note the letters and then match them to the color identification in the table:

Letter on cylinder block	Color of bearing
S	Black
R	Red
G	Yellow
B	Blue
W	White

If the colored marks are not yet stamped or are no longer readable, use the center (red) bearing shell. The lower crankshaft bearing shells are shipped as a replacement part with a yellow dot.

Cylinder Head, Valvetrain – 2.0L CBFA, CCTA

Cylinder Head Overview



1 - Cylinder Head Gasket

- Always replace

2 - Bolt

- 25 Nm

3 - Transport Strap

4 - Bolt

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

5 - Cylinder Head

- 6 - Bolt**
 - Always replace
 - Sequence when loosening, see Cylinder Head Bolt Loosening below
 - Tightening sequence and specification, see Cylinder Head Bolt Tightening Sequence and Specification below
- 7 - O-ring**
 - Always replace
- 8 - Plug**
 - 5 Nm
- 9 - Cap**
- 10 - O-ring**
 - No replacement part available
- 11 - Plug**
 - Always replace
- 12 - Bracket**
- 13 - Bolt**
 - 9 Nm
- 14 - Heat Shield**
- 15 - Bolt**
 - 20 Nm
- 16 - Bolt**
 - 20 Nm
- 17 - to Intake Manifold/Turbocharger**
- 18 - Ventilation Pipe**
- 19 - O-ring**
 - No replacement part available
- 20 - Gasket**
 - No replacement part available
- 21 - Engine Cover**
- 22 - Bolt**
 - Tightening sequence, see Crankcase Ventilation Bolt Tightening Sequence and Specification below
- 23 - Crankcase Ventilation**
 - Tightening sequence, see Crankcase Ventilation Bolt Tightening Sequence and Specification below
- 24 - to the Intake Manifold**
- 25 - Gasket**
 - No replacement part available
- 26 - Gasket**
- 27 - Vacuum Pump**
- 28 - Bolts (M6 x 70)**
 - 9 Nm
- 29 - Bolt**
 - 9 Nm
 - Only available for engine code CBFA
- 30 - Secondary Air Injection Solenoid Valve -N112-**
 - Only available for engine code CBFA

31 - Gasket

- Always replace.
- Only available for engine code CBFA

32 - Retaining Plate

33 - Bolt

- 9 Nm

34 - Connecting Piece

35 - O-ring

- Always replace

36 - Bolt

- 25 Nm

37 - Transport Strap

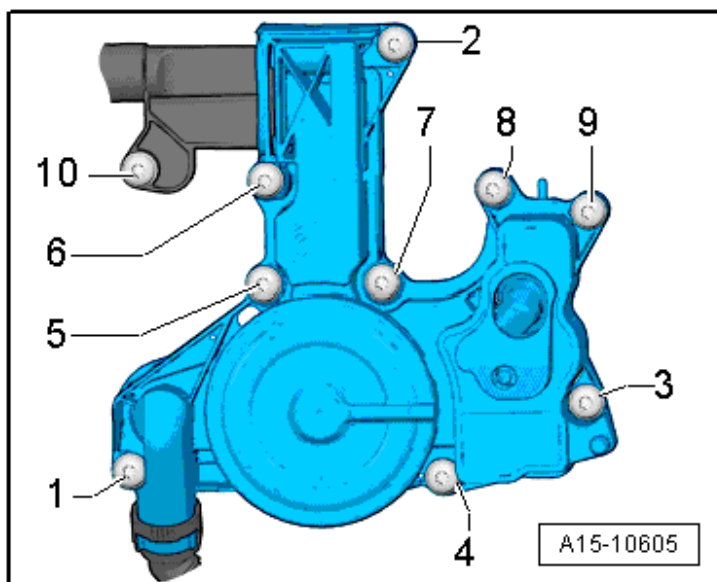
38 - Bolt

- 9 Nm

39 - Camshaft Position Sensor -G40-

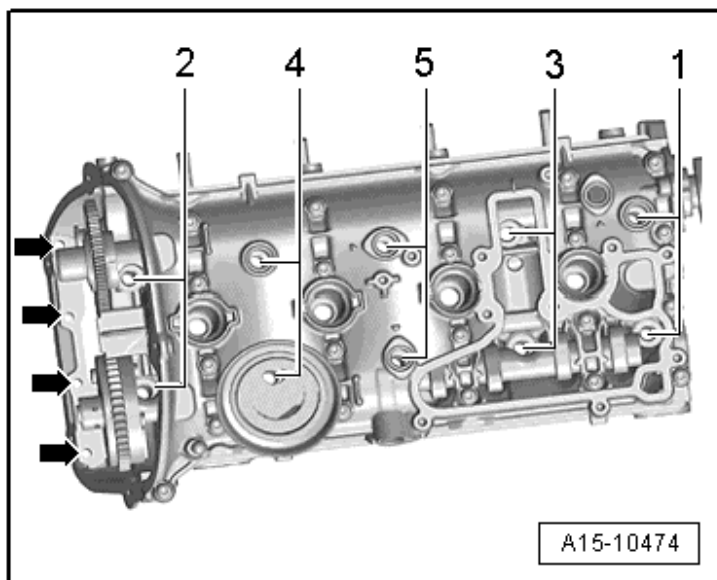
40 - Partition Plate

Crankcase Ventilation Bolt Tightening Sequence and Specification



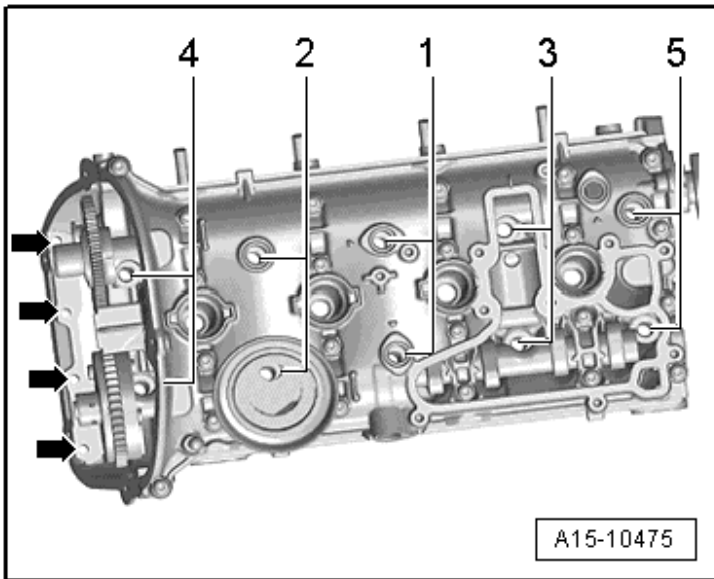
Tighten the crankcase ventilation bolts in sequence -1 through 10- to 11 Nm.

Cylinder Head Bolt Loosening



Remove the bolts -arrows-. Loosen the cylinder head bolts in sequence -1 through 5-.

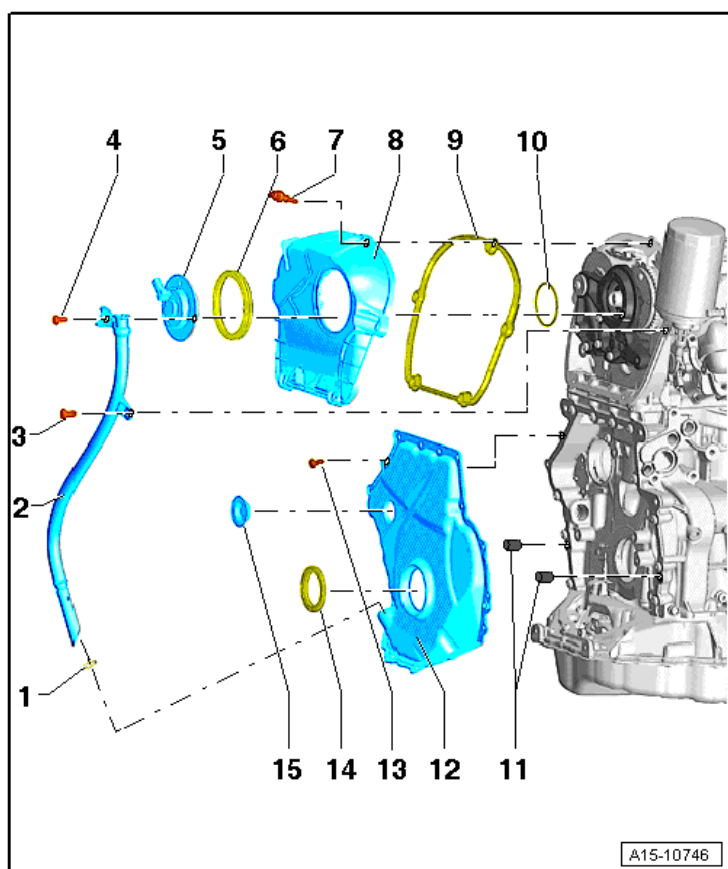
Cylinder Head Bolt Tightening Sequence and Specification



Step	Tighten	Nm
1	Tighten bolts 1 through 5 in sequence	40
2	Tighten bolts 1 through 5 in sequence	an additional 90° (¼ turn)
3	Tighten bolts 1 through 5 in sequence	an additional 90° (¼ turn)
4	Tighten the new bolts (➡) to 8 Nm.	8
5	Tighten the bolts (➡)	an additional 90° (¼ turn)

**Engine –
2.0L CBFA, CCTA**

Timing Chain Covers Overview



1 - O-ring

- Always replace

2 - Oil Dipstick Guide Tube

3 - Bolt

- 9 Nm

4 - Bolt

- 9 Nm

5 - Camshaft Adjustment Valve 1 -N205-

6 - Seal

7 - Bolt

- Tightening sequence and specification, see Upper Timing Chain Cover Bolt Tightening Sequence and Specification below

8 - Upper Timing Chain Cover

9 - Bolt

- 23 Nm

10 - O-ring

- Always replace

11 - Alignment Pins

12 - Lower Timing Chain Cover

13 - Bolt

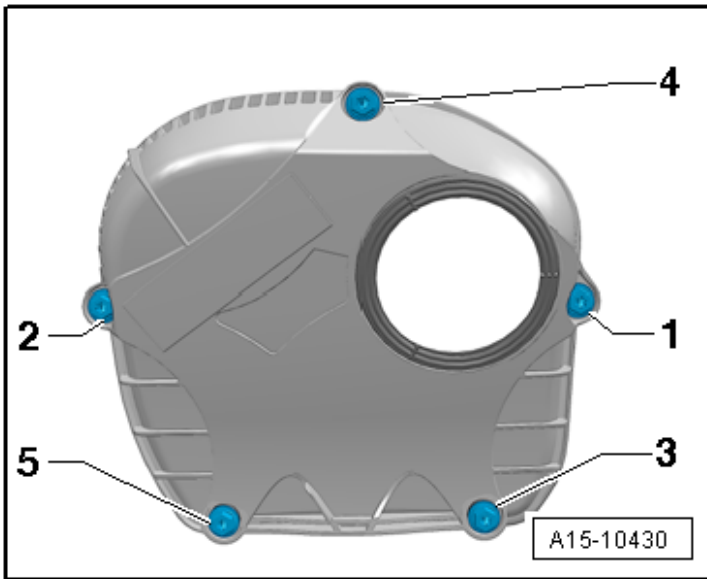
- Always replace
- Tightening sequence and specification, see Lower Timing Chain Cover Bolt Tightening Sequence and Specification below

14 - Seal

15 - Plug

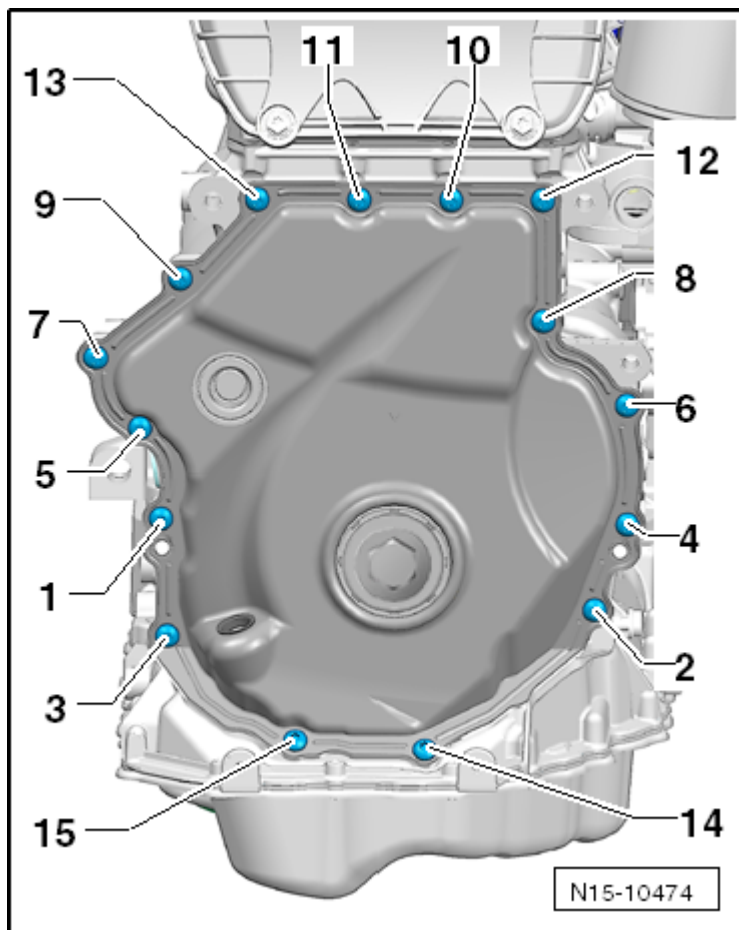
- Always replace

Upper Timing Chain Cover Bolt Tightening Sequence and Specification



Step	Tighten	Nm
1	Tighten bolts 1 through 5 in sequence	Hand tight
2	Tighten bolts 1 through 5 in sequence	9

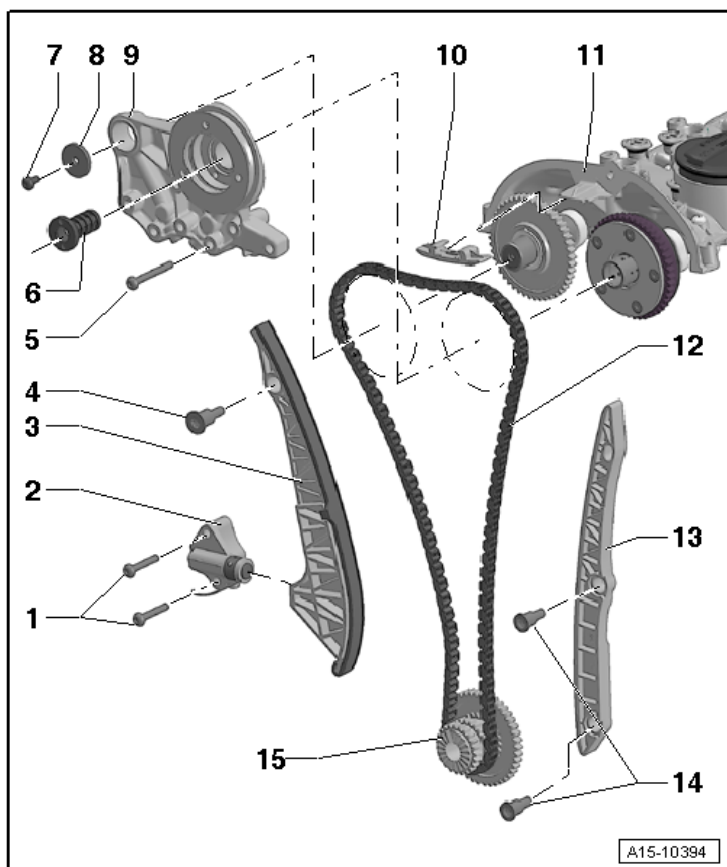
Lower Timing Chain Cover Bolt Tightening Sequence and Specification



Step	Tighten	Nm
1	Tighten bolts 1 through 15 in sequence	Hand tight
2	Tighten bolts 1 through 15 in sequence	8
3	Tighten bolts 1 through 15 in sequence	an additional 90° (¼ turn)

**Engine –
2.0L CBFA, CCTA**

Camshaft Timing Chain Overview



1 - Bolt

- 9 Nm

2 - Chain Tensioner

3 - Timing Chain Tensioning Rail

4 - Guide Pin

- 20 Nm

5 - Bolt

- 9 Nm

6 - Control Valve

- 35 Nm
- Left hand threads

7 - Bolt

- M6: 8 Nm + 90° turn
- M8: 20 Nm + 90° turn

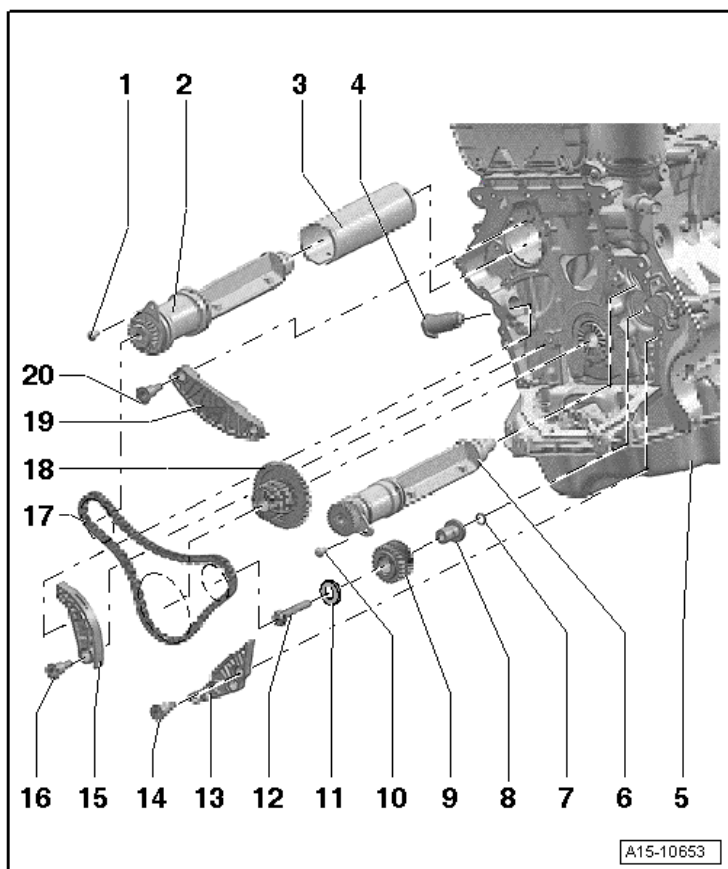
8 - Washer

9 - Bearing Bracket

10 - Camshaft Timing Chain Guide Rail

- 11 - Camshaft Housing**
- 12 - Camshaft Timing Chain**
- 13 - Camshaft Timing Chain Guide Rail**
- 14 - Guide Pin**
 - 20 Nm
- 15 - Crankshaft Sprocket**

Balance Shaft Timing Chain Overview



- 1 - Bolt
 - 9 Nm
- 2 - Balance Shaft
- 3 - Balance Shaft Pipe
- 4 - Chain Tensioner
 - 65 Nm
- 5 - Cylinder Block
- 6 - Balance Shaft
- 7 - O-ring
 - Always replace
- 8 - Bearing Pin
- 9 - Intermediate Shaft Sprocket
- 10 - Bolt
 - 9 Nm
- 11 - Washer

12 - Bolt

- Always replace
- Tightening sequence and specification, see Intermediate Shaft Sprocket Bolt Tightening Sequence and Specification below

13 - Guide Rail

14 - Guide Pin

- 20 Nm

15 - Tensioning Rail

16 - Guide Pin

- 20 Nm

17 - Balance Shaft Timing Chain

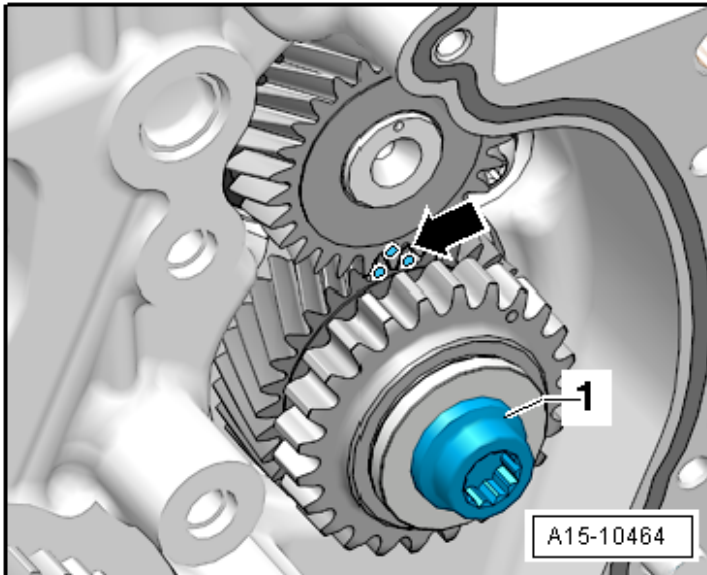
18 - Crankshaft Sprocket

19 - Guide Rail

20 - Guide Pin

- 20 Nm

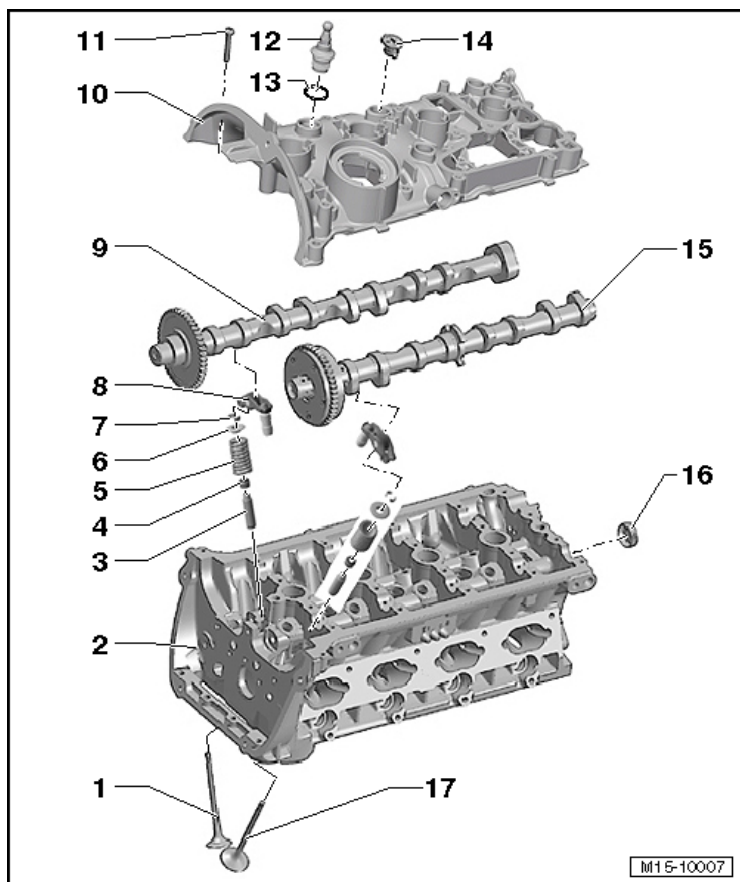
Intermediate Shaft Sprocket Bolt Tightening Sequence and Specification



Tighten with a new bolt as follows:

Stage	Bolts	Tightening specification/additional turn
1	-1-	Tighten to 10 Nm
2	-1-	Turn the sprocket. The sprocket cannot have any play. If it does, loosen it and retighten it.
3	-1-	Tighten to 30 Nm
4	-1-	Continue tightening the bolt an additional 90° (1/4) turn.

Valvetrain Overview



- 1 - Exhaust Valve
- 2 - Cylinder Head
- 3 - Valve Guide
- 4 - Valve Stem Seal
- 5 - Valve Spring
- 6 - Spring Plate
- 7 - Valve Retainers
- 8 - Roller Rocker Arm with Hydraulic Lash Adjuster
- 9 - Exhaust Camshaft
- 10 - Cylinder Head Cover
- 11 - Bolt
 - Always replace
 - Tightening sequence and specification, see Cylinder Head Cover Bolt Tightening Sequence and Specification below
- 12 - Plug
 - 5 Nm

13 - O-ring

- Always replace

14 - Plug with O-ring

- Always replace

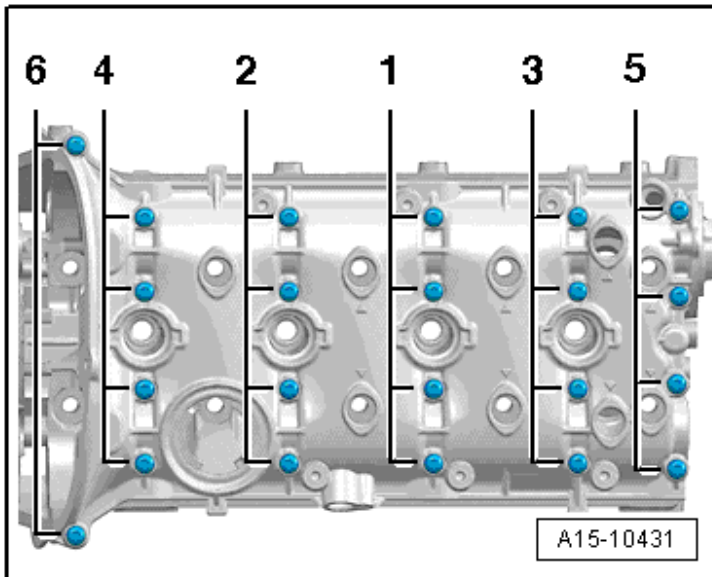
15 - Intake Camshaft

16 - Cap

- Always replace

17 - Intake Valve

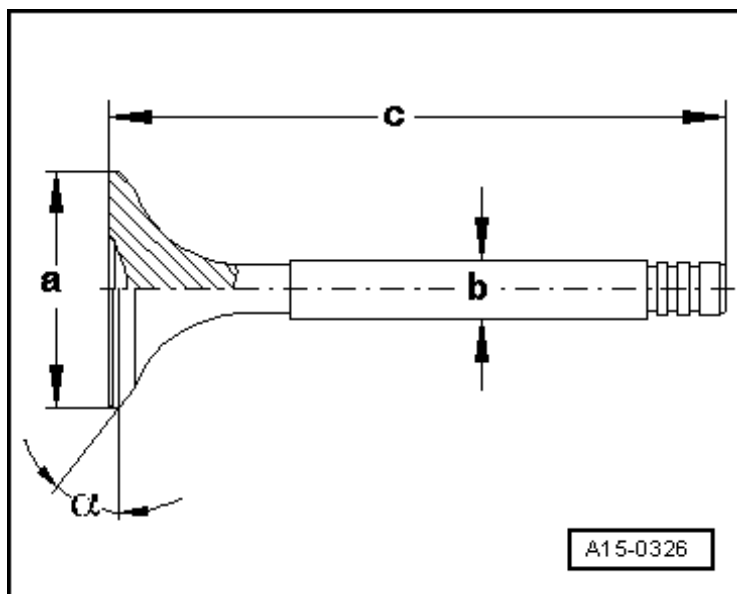
Cylinder Head Cover Bolt Tightening Sequence and Specification



Step	Tighten	Nm
1	Tighten bolts 1 through 6 in sequence	Hand tight
2	Tighten bolts 1 through 6 in sequence	8
3	Tighten bolts 1 through 6 in sequence	an additional 90° (¼ turn)

Engine -
2.0L CBFA, CCTA

Valve Dimensions

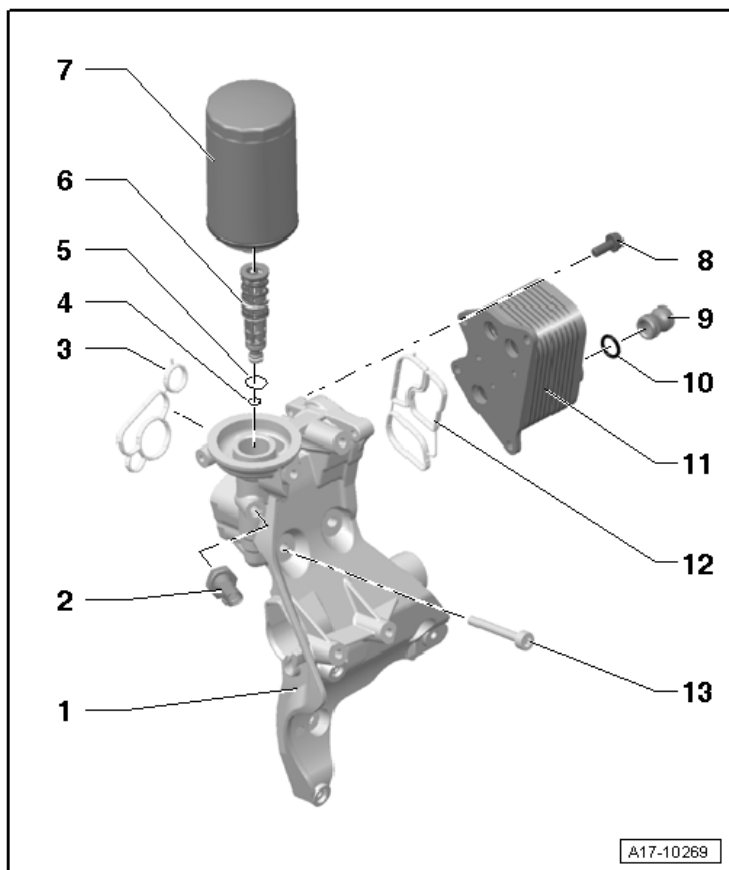


Dimension		Intake Valve	Exhaust Valve
Diameter a	mm	33.85 ± 0.10	28.00 ± 0.1
Diameter b	mm	5.980 ± 0.007	5.955 ± 0.007
c	mm	103.97	101.87
α	$^{\circ}$	45	45

**Engine –
2.0L CBFA, CCTA**

Lubrication – 2.0L CBFA, CCTA

Fastener Tightening Specifications



1 - Accessory Bracket

2 - Oil Pressure Switch -F1-

- 20 Nm

3 - Gasket

- Always replace

4 - O-ring

- No replacement part, part of the valve unit.

5 - O-ring

- No replacement part, part of the valve unit.

6 - Valve Unit

7 - Oil Filter Element

- 22 Nm

8 - Bolt

- 15 Nm

9 - Connection

10 - Seal

- Always replace

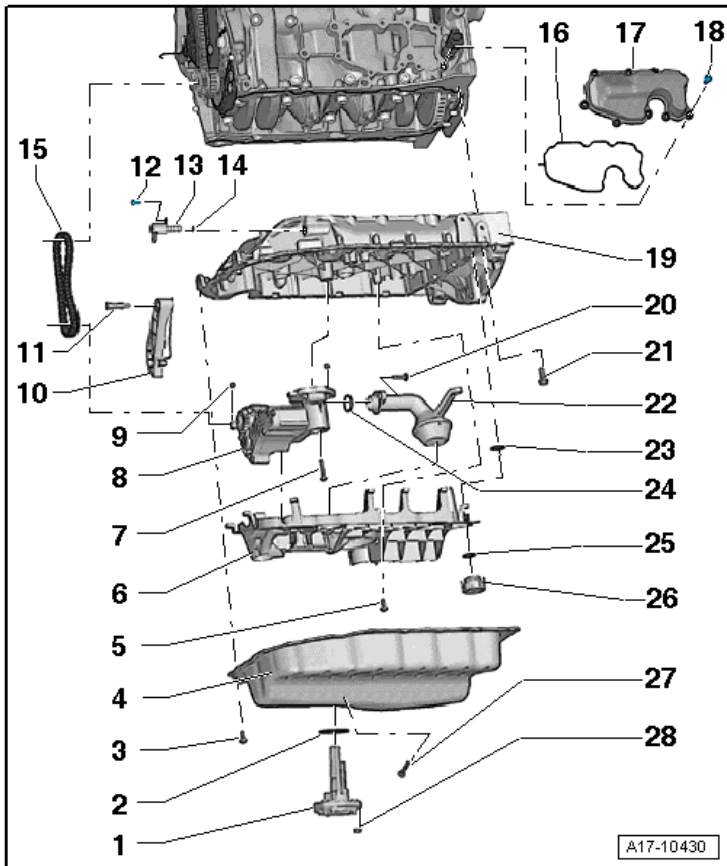
11 - Gasket

- Always replace

12 - Bolt

- Tightening sequence and specification. Refer to Accessory Bracket Bolt Tightening Sequence and Specification under Ribbed Belt Overview

Oil Pan and Pump Overview



1 - Oil Level Thermal Sensor -G266-

- Not available in the US/Canadian market.

2 - Gasket

- Not available in the US/Canadian market.

3 - Bolt

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

4 - Lower Oil Pan

5 - Bolt

- 9 Nm

6 - Oil Baffle

- Always replace

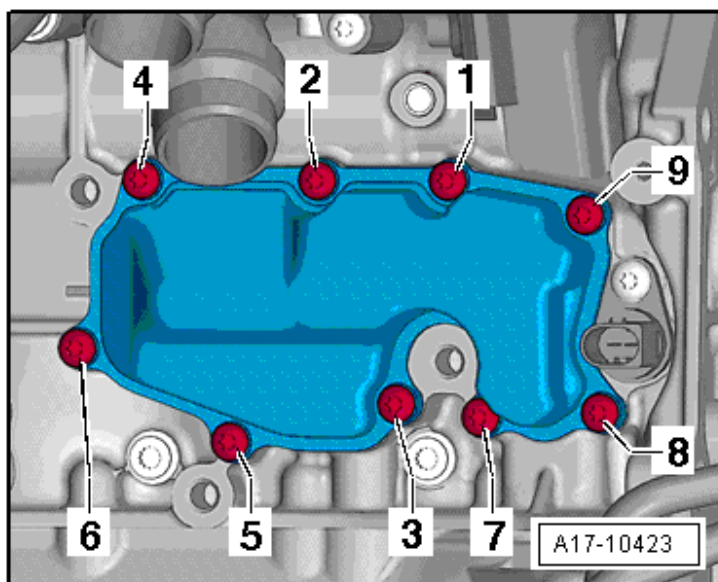
7 - Bolt

- M6: 9 Nm
- M8: 20 Nm

8 - Oil Pump

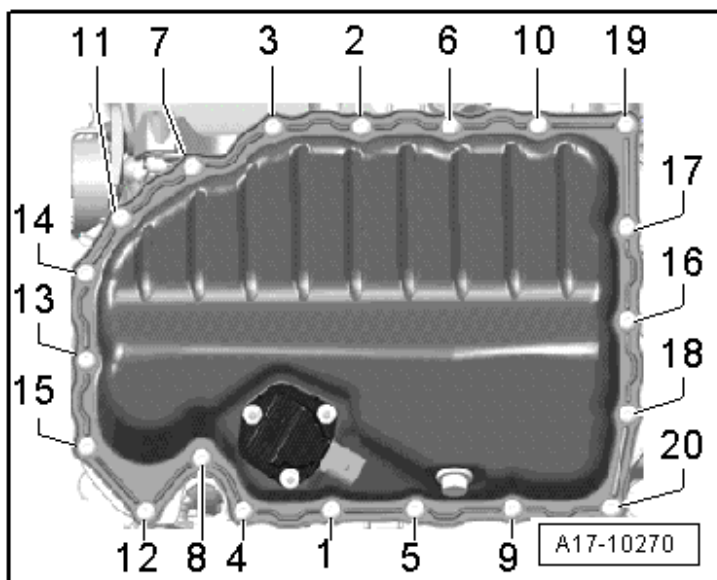
- 9 - Alignment Bushing**
- 10 - Chain Tensioner**
- 11 - Guide Pin**
 - 9 Nm
- 12 - Bolt**
 - 9 Nm
- 13 - Oil Pressure Regulation Valve -N428-**
- 14 - O-ring**
 - Not available in the US/Canadian market.
- 15 - Drive Chain**
- 16 - Gasket**
 - Always replace
- 17 - Oil Separator**
- 18 - Bolt**
 - Tightening sequence and specification, see Oil Separator below
- 19 - Upper Oil Pan**
- 20 - Bolt**
 - 9 Nm
- 21 - Bolt**
 - Always replace.
 - Tightening sequence and specification, see Upper Oil Pan Bolt Tightening Sequence and Specification below
- 22 - Oil Intake Pipe**
- 23 - Gasket**
 - Always replace
- 24 - O-ring**
 - Always replace
- 25 - O-ring**
 - No replacement part, part of the check valve.
- 26 - Non-Return Valve**
 - Always replace
- 27 - Oil Drain Plug**
 - 30 Nm
 - Always replace
- 28 - Nut**
 - 9 Nm
 - Not available in the US/Canadian market.

Oil Separator Bolt Tightening Sequence and Specification



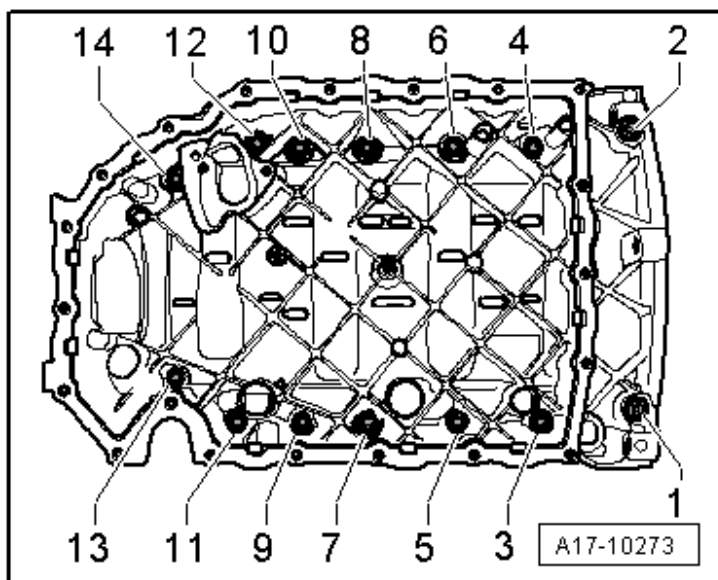
Step	Tighten	Nm
1	Tighten bolts 1 through 9 in sequence	9

Lower Oil Pan Bolt Tightening Sequence and Specification



Step	Tighten	Nm
1	Tighten bolts 1 through 20 in sequence	Hand tight
2	Tighten bolts 1 through 20 in sequence	8
3	Tighten bolts 1 through 20 in sequence	an additional 45° turn

Upper Oil Pan Bolt Tightening Sequence and Specification

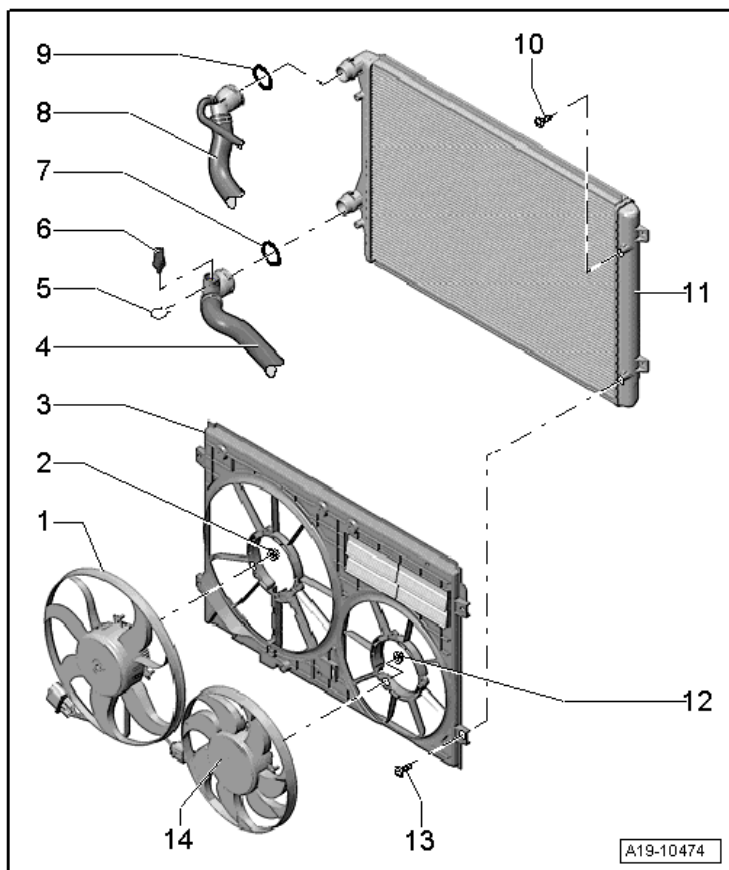


Step	Tighten	Nm
1	Tighten bolts 1 through 20 in sequence	Hand tight
2	Tighten bolts 1 through 20 in sequence	15
3	Tighten bolts 1 through 20 in sequence □ m	an additional 90° turn

**Engine –
2.0L CBFA, CCTA**

Cooling System – 2.0L CBFA, CCTA

Radiator, Fan Shroud and Coolant Fans Overview



- 1 - Coolant Fan -V7-
- 2 - Nut
 - 10 Nm
- 3 - Fan Shroud
- 4 - Lower Coolant Hose
- 5 - Retaining Clip
- 6 - Engine Coolant Temperature Sensor on Radiator -G83-
- 7 - O-ring
- 8 - Upper Coolant Hose
- 9 - O-ring
- 10 - Bolt
 - 5 Nm
- 11 - Radiator
- 12 - Nut
 - 10 Nm

13 - Bolt

5 Nm

14 - olant Fan 2 -V177-

10 - Gasket

- Always replace

11 - Centering Pin

12 - Toothed Belt

13 - Toothed Belt Guard

14 - Bolt

- 9 Nm

15 - Bolt

- 17 Nm
- Always replace
- Left hand threads

16 - Toothed Belt Drive Gear

17 - Seal

18 - Balance Shaft

19 - Coolant Thermostat

20 - Centering Pin

21 - O-ring

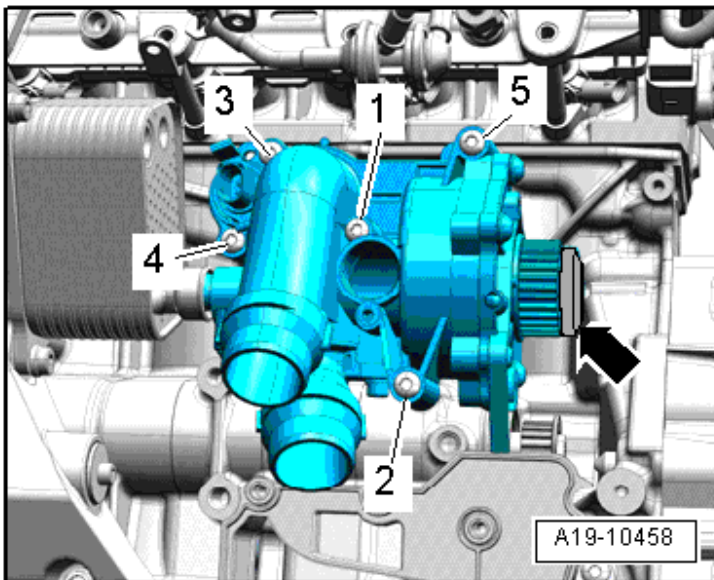
- Always replace

22 - Connecting Piece

23 - Bolt

- 9 Nm

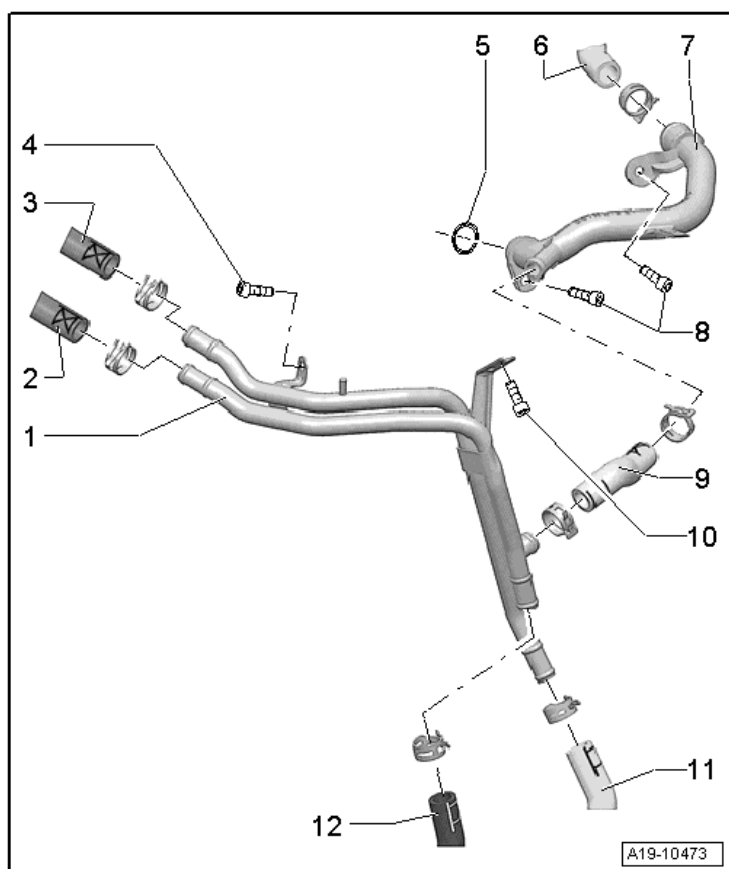
Coolant Pump Bolt Tightening Sequence and Specification



Engine -
2.0L CBFA, CCTA

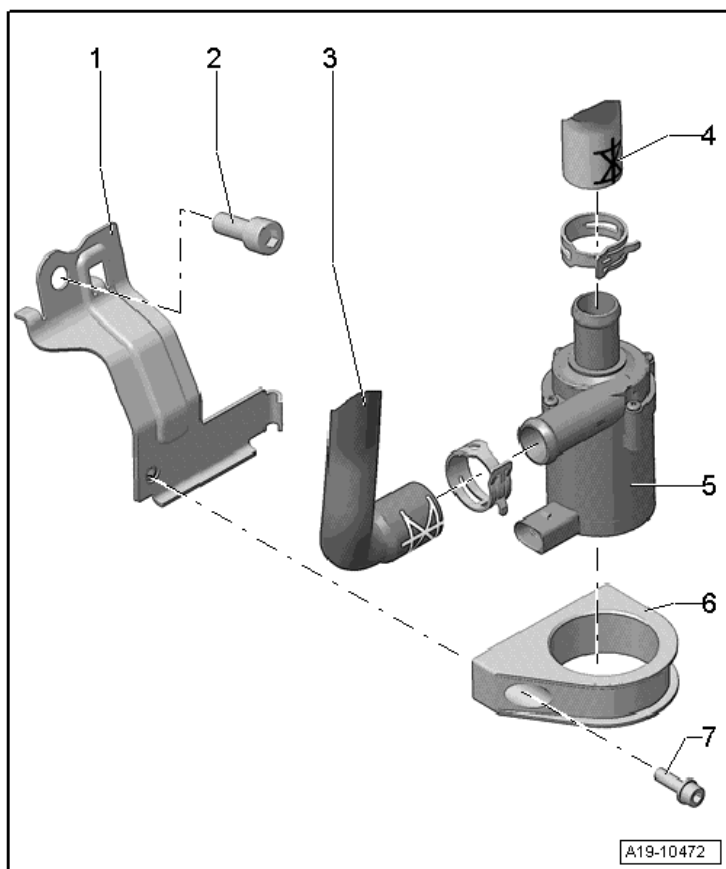
Tighten the coolant pump bolts in the sequence -1 through 5- shown to 9 Nm

Coolant Pipes Overview



- 1 - Front Coolant Pipes**
- 2 - Coolant Hose**
- 3 - Coolant Hose**
- 4 - Bolt**
 - 5 Nm
- 5 - O-ring**
 - Always replace
- 6 - Coolant Hose**
- 7 - Small Coolant Pipe**
- 8 - Bolt**
 - 9 Nm
- 9 - Coolant Hose**
- 10 - Bolt**
 - 5 Nm
- 11 - Coolant Hose**
- 12 - Coolant Hose**

After-Run Coolant Pump Overview

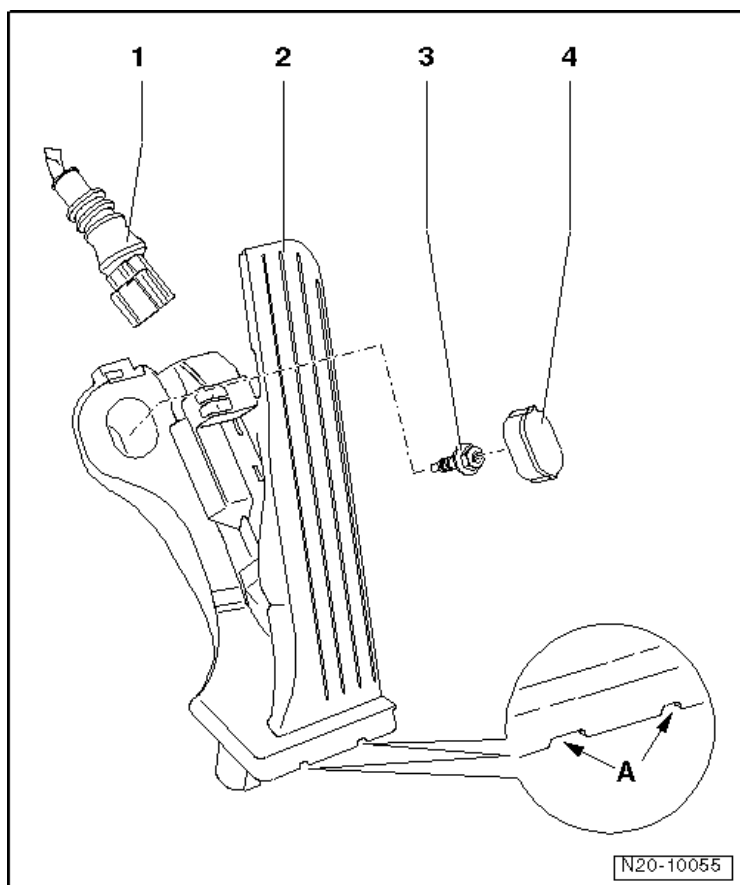


- 1 - Bracket
- 2 - Bolt
 - 40 Nm
- 3 - Coolant Hose
- 4 - Coolant Hose
- 5 - After-Run Coolant Pump -V51-
- 6 - Bracket
- 7 - Bolt
 - 8 Nm

Engine -
2.0L CBFA, CCTA

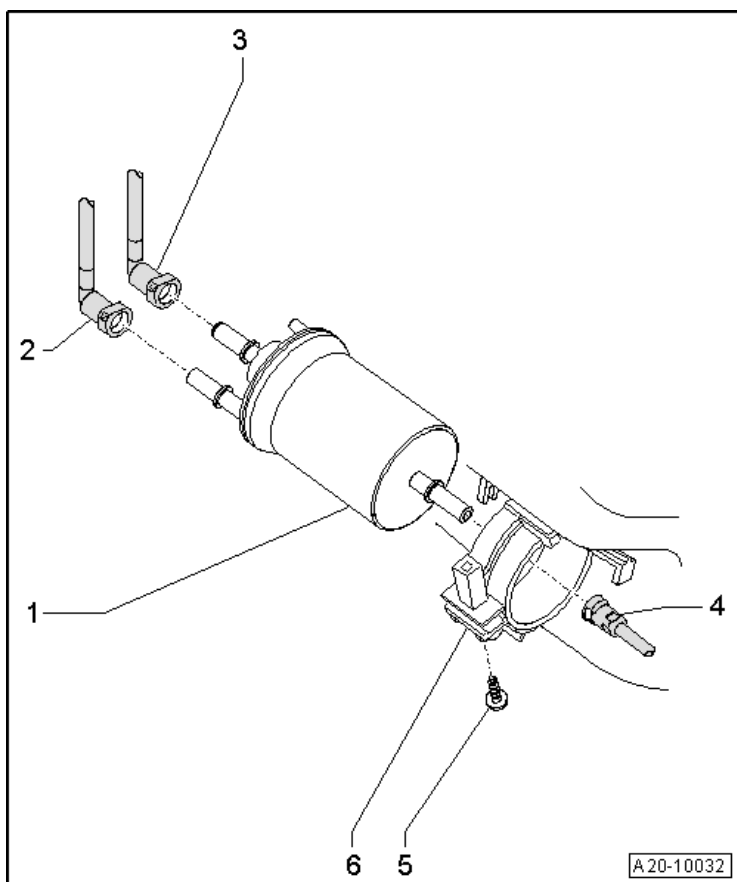
Fuel Supply – 2.0L CBFA, CCTA

Accelerator Pedal Module Overview



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

Fuel Filter Overview

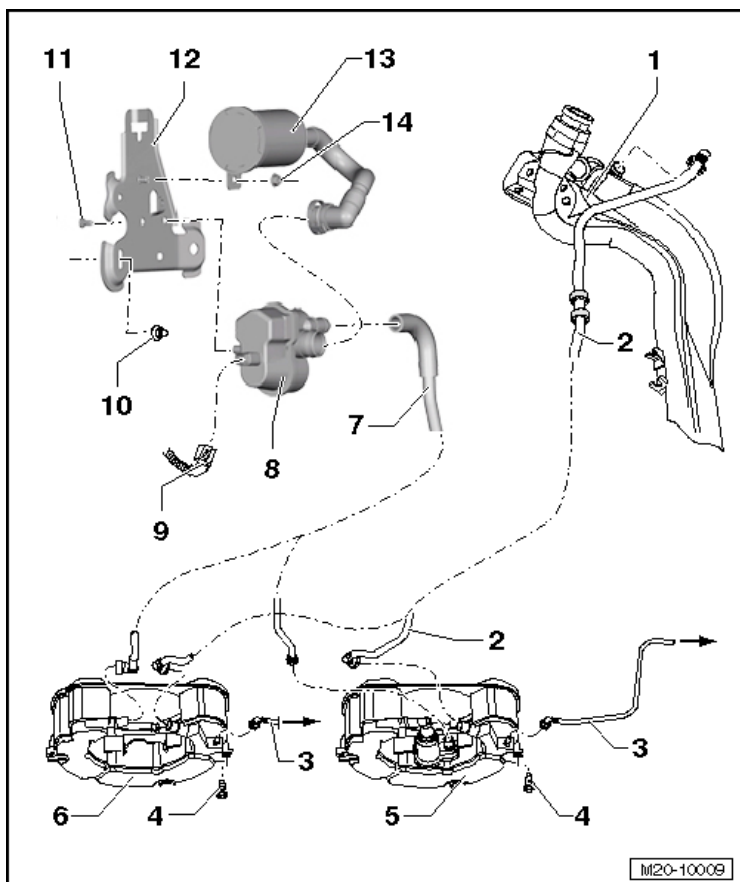


- 1 - Fuel Filter
- 2 - Fuel Supply Line
- 3 - Fuel Return Line
- 4 - Fuel Supply Line
- 5 - Bolt
- 3 Nm
- 6 - Bracket for Fuel Filter

Engine -
2.0L CBFA, CCTA

- 15 - Fuel Filter**
- 16 - Vacuum Line**
- 17 - Vent Line**
- 18 - Seal**
 - Always replace
- 19 - Fuel Delivery Unit**
- 20 - Lock Ring**
 - 110 Nm
- 21 - Fuel Return Line**
- 22 - Cap**
- 23 - Fuel Filler Door Unit**
- 24 - To EVAP Canister**
- 25 - Fuel Supply Line**

EVAP System Component Overview



1 - Fuel Tank

2 - Vent Line

3 - Vent Line

4 - Bolt

8 Nm

5 - Evaporative Emission (EVAP) Canister

For engine code CBFA

6 - EVAP Canister

For engine code CCTA

7 - Connecting Line

8 - Leak Detection Pump -V144-

9 - Connector

10 - Nut

6 Nm

11 - Bolt

3 Nm

12 - Bracket

10 - Filter Housing

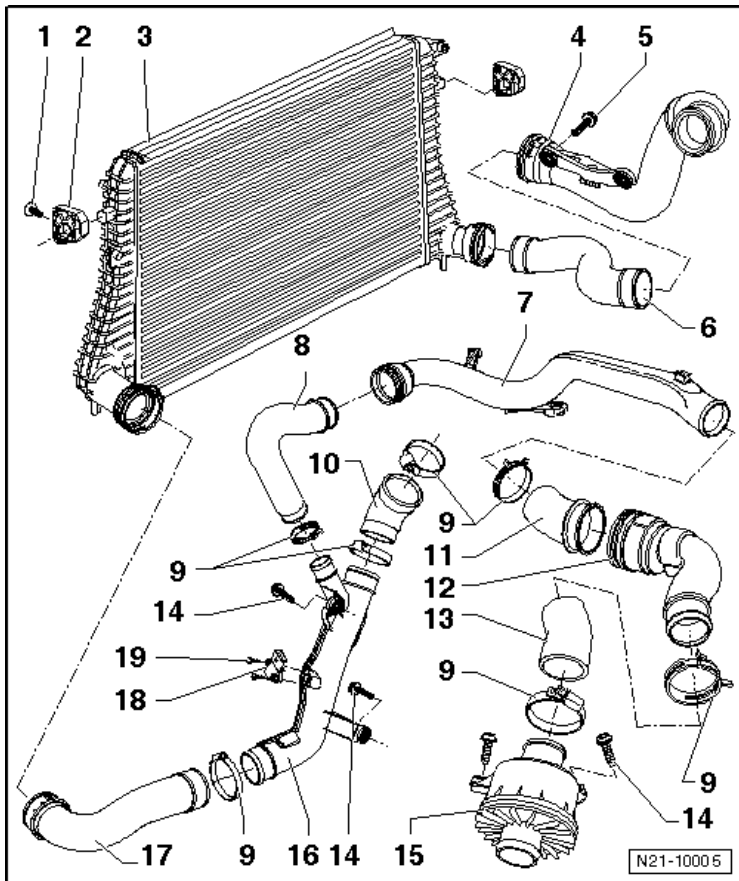
11 - Nut

2 Nm

**Engine –
2.0L CBFA, CCTA**

Turbocharger – 2.0L CBFA, CCTA

Charge Air Cooler Component Overview



1 - Bolt

□ 5 Nm

2 - Mount

3 - Charge Air Cooler

4 - Charge Air Pipe

5 - Bolt

□ 10 Nm

6 - Charge Air Hose

7 - Charge Air Pipe

8 - Charge Air Hose

9 - Hose Clamp

10 - Charge Air Hose

11 - Charge Air Hose

12 - Charge Air Pipe

13 - Charge Air Hose

14 - Bolt

8 Nm

15 - Noise Generator

16 - Charge Air Pipe

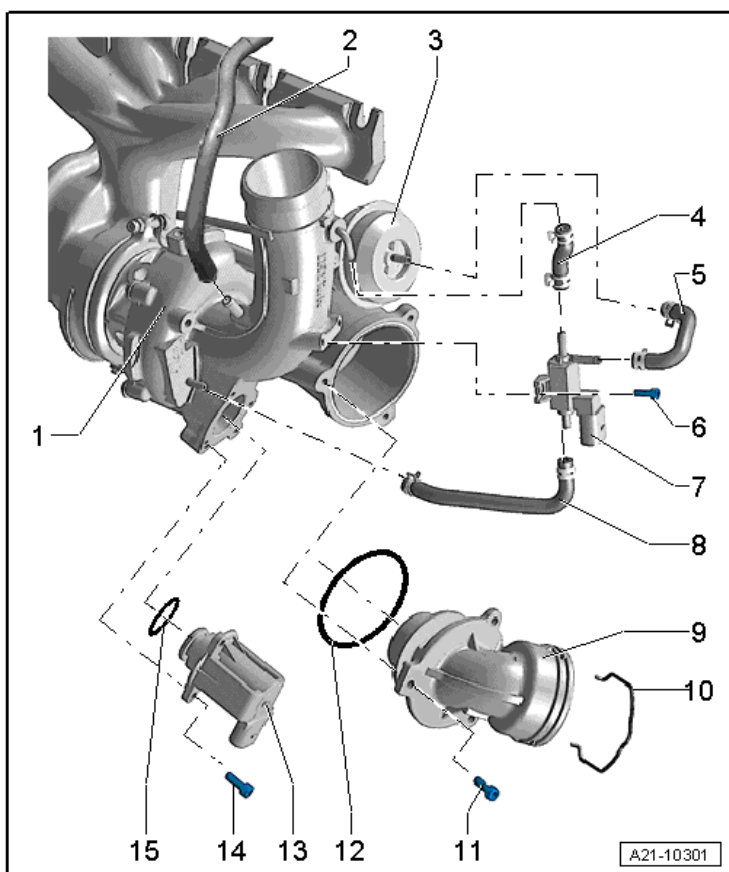
17 - Charge Air Hose

18 - Charge Air Pressure Sensor -G31-

19 - Bolt

5 Nm

Recirculation and Wastegate Bypass Regulation Valves



- 1 - Turbocharger
- 2 - Connecting Hose
- 3 - Charge Air Regulation Vacuum Diaphragm
- 4 - Connecting Hose
- 5 - Connecting Hose
- 6 - Bolt
 - 3 Nm
- 7 - Wastegate Bypass Regulator Valve -N75-
- 8 - Connecting Hose
- 9 - Connection
- 10 - Clip
- 11 - Bolt
 - 3 Nm
- 12 - Seal
- 13 - Turbocharger Recirculation Valve -N249-

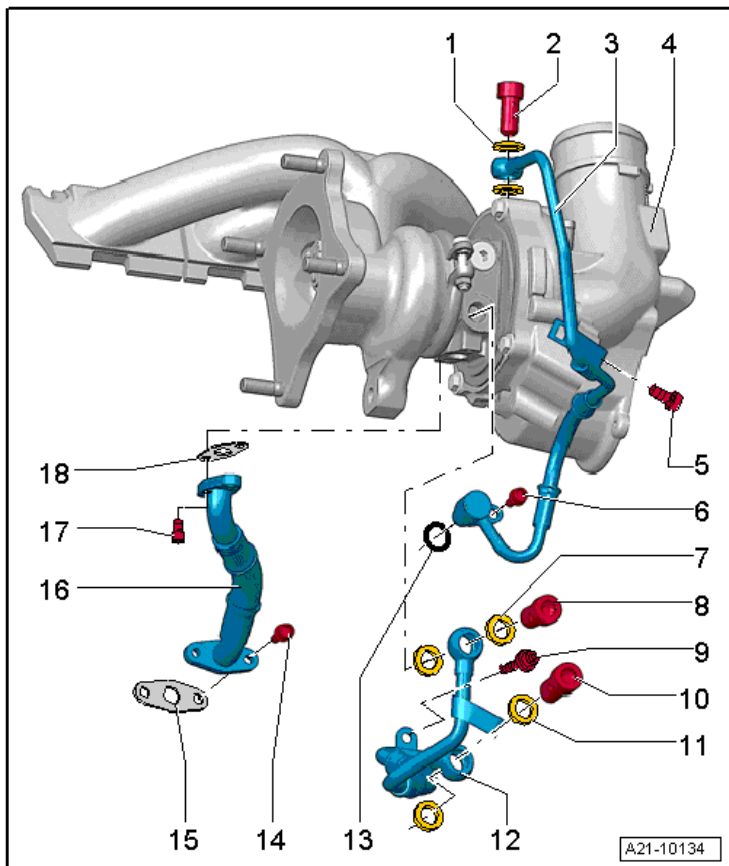
14 - Bolt

7 Nm

11 - Seal

**Engine –
2.0L CBFA, CCTA**

Coolant Supply, Oil Supply and Oil Return Line



1 - Seal

- Always replace

2 - Banjo Bolt

- 33 Nm

3 - Oil Supply Line

4 - Turbocharger

5 - Bolt

- 9 Nm

6 - Bolt

- 9 Nm

7 - Seal

- Always replace

8 - Banjo Bolt

- 38 Nm

9 - Bolt

- 9 Nm

10 - Banjo Bolt

- 38 Nm

11 - Seal

- Always replace

12 - Coolant Supply Line

13 - O-ring

- Always replace

14 - Bolt

- 9 Nm

15 - Gasket

- Always replace

16 - Oil Return Line

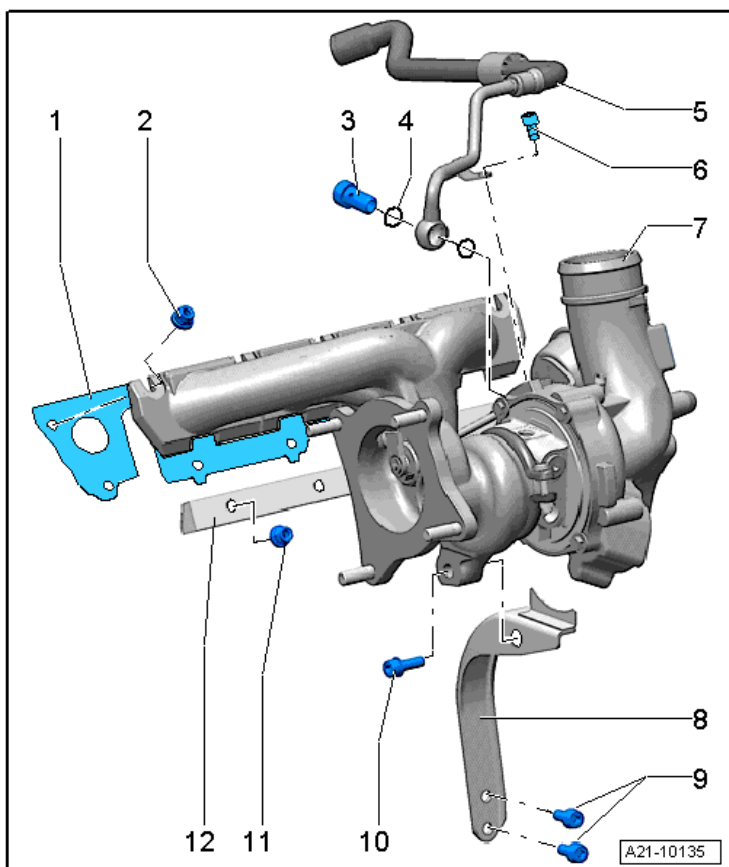
17 - Bolt

- 9 Nm

18 - Gasket

- Always replace

Coolant Return and Turbocharge Support



1 - Gasket

- Always replace
- Tightening sequence and specification, see Turbocharger Nut Tightening Sequence and Specification below

2 - Nut

- Always replace

3 - Banjo Bolt

- 38 Nm

4 - Seal

- Always replace

5 - Coolant Return Line

6 - Bolt

- 9 Nm

7 - Turbocharger

8 - Turbocharger Support

9 - Bolt

- 30 Nm

10 - Bolt

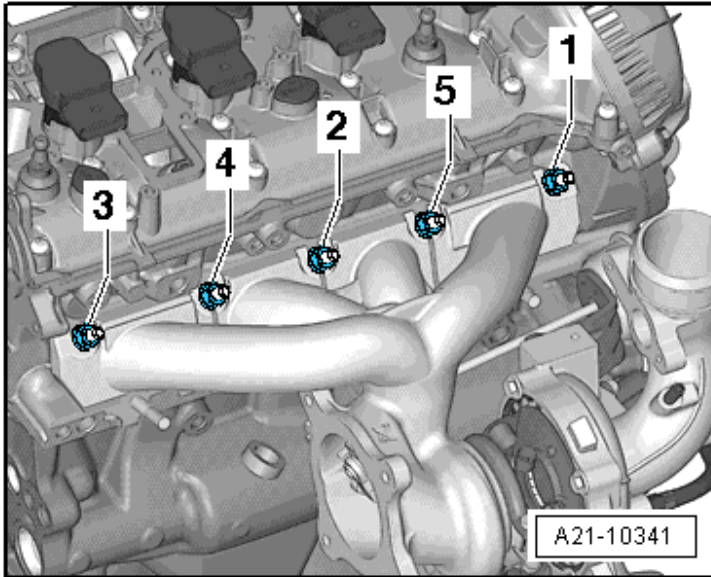
- 30 Nm
- Lubricate the bolts with hot bolt paste.

11 - Nut

- 30 Nm
- Always replace
- Lubricate the bolts with hot bolt paste.

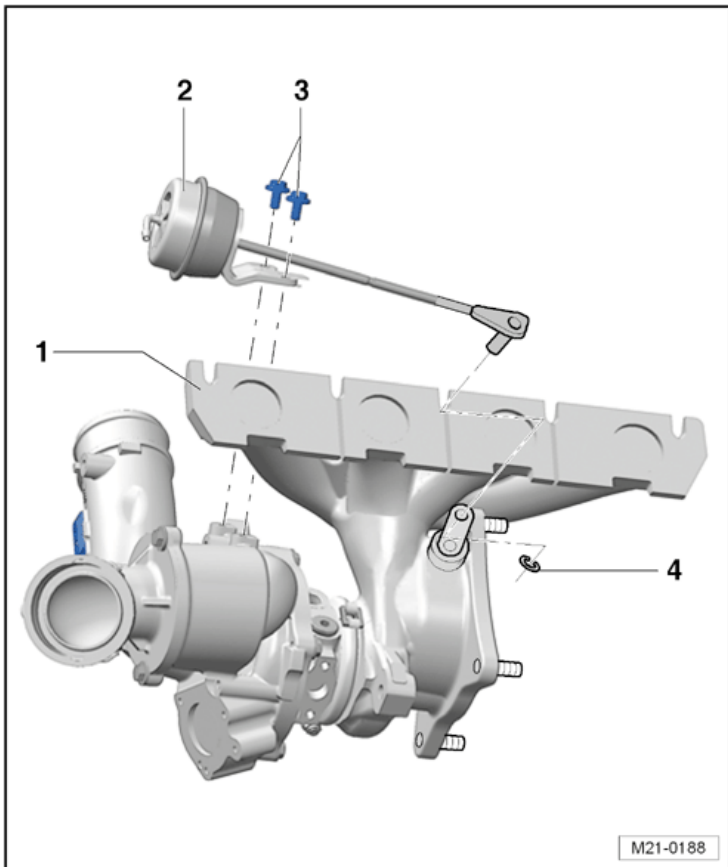
12 - Fastening Strip

Turbocharger Nut Tightening Sequence and Specification



Step	Tighten	Nm
1	Tighten nuts 1 through 5 in sequence	5
2	Tighten nuts 1 through 5 in sequence	12
3	Tighten nuts 1 through 5 in sequence	16
4	Tighten nuts 1 through 5 in sequence	25

Charge Air Regulation Vacuum Diaphragm

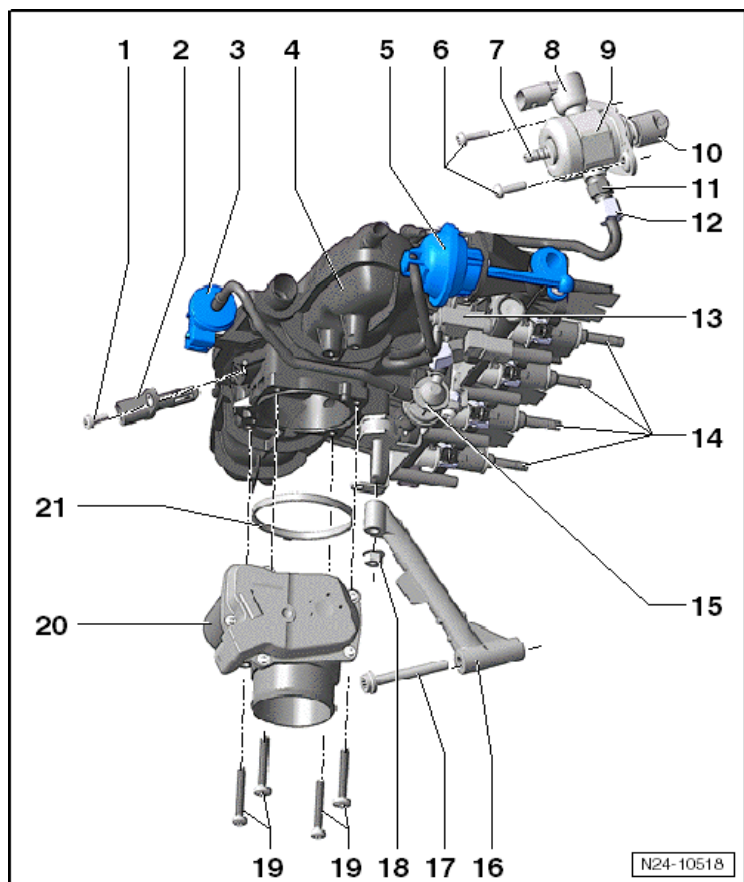


- 1 - Turbocharger
- 2 - Charge Air Regulation Vacuum Diaphragm
- 3 - Bolt
 - 5 Nm
- 4 - Circlip

**Engine –
2.0L CBFA, CCTA**

- 11 - Lower Air Filter Housing**
- 12 - Connection for the Water Drain Hose**
- 13 - Water Drain Hose**
- 14 - Shutter Valve**
- 15 - Intake Air Duct**
- 16 - Bolt**
 - 8 Nm

Intake Manifold Overview



1 - Bolt

- 5 Nm

2 - Intake Air Temperature Sensor -G42-

3 - EVAP Canister Purge Regulator Valve 1 -N80-

4 - Intake Manifold

5 - Vacuum Actuator

6 - Bolt

- M6 threads: 8 Nm + 90° turn, always replace
- M8 threads: 20 Nm

7 - Connecting Piece

8 - Fuel Pressure Regulator Valve -N276-

9 - High Pressure Pump

10 - Cam Follower

11 - Connecting Piece

- 22 Nm
- Always replace

12 - High Pressure Fuel Line to Fuel Rail

- Union nut: 18 Nm

13 - Intake Manifold Runner Control Valve -N316-

14 - Fuel Injector

15 - Double Check-Valve

16 - Intake Manifold Support

17 - Bolt

- 23 Nm

18 - Nu

- 10 Nm

19 - Bolt

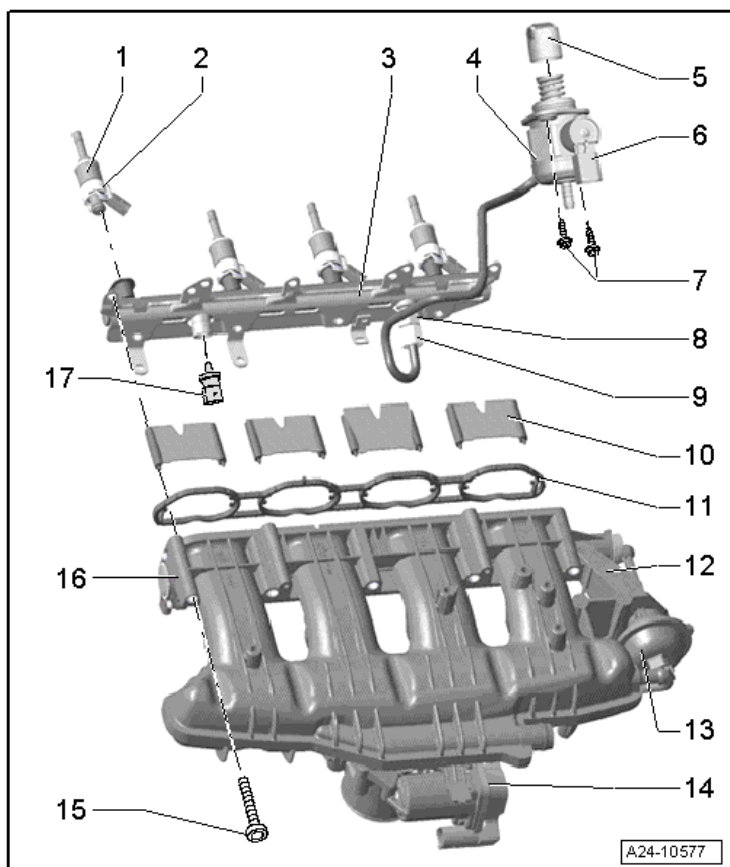
- 5 Nm

20 - Throttle Valve Control Module -J338-

21 - Seal

- Always replace

Fuel Rail Overview



1 - Fuel Injector

2 - Support Ring

3 - Fuel Rail

4 - High Pressure Pump

5 - Cam Follower

6 - Fuel Pressure Regulator Valve -N276-

7 - Bolts

M6 threads: 8 Nm + 90° turn, replace

M8 threads: 20 Nm

8 - Connecting Piece

22 Nm

Always replace

9 - High Pressure Fuel Line

Union nut: 18 Nm

10 - Intake Manifold Flaps

11 - Gasket

Always replace

12 - Intake Manifold

13 - Vacuum Actuator

14 - Throttle Valve Control Module -J338-

15 - Bolts

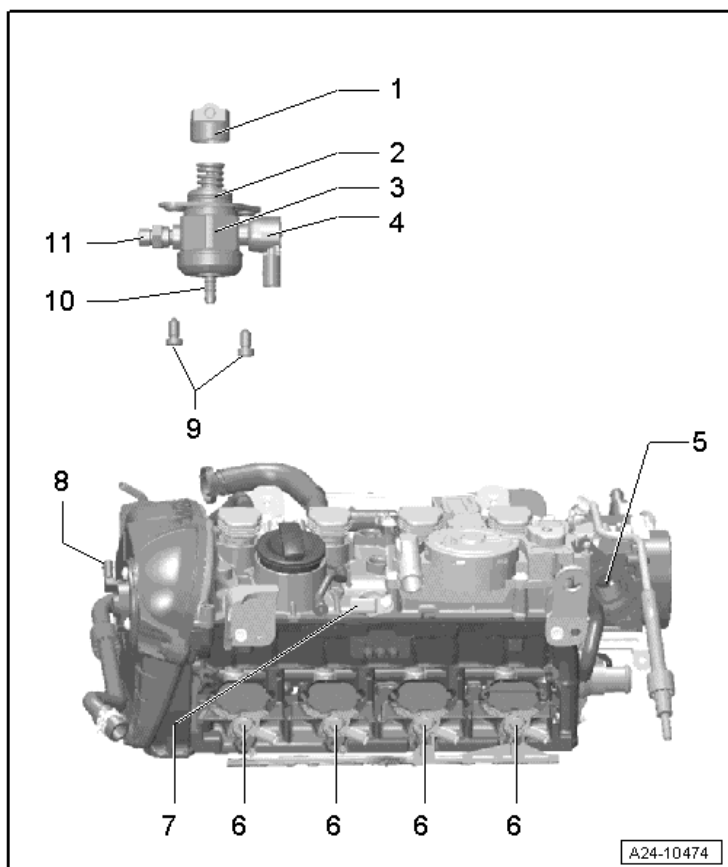
- Tighten to 3 Nm, and then tighten to 9 Nm

16 - Intake Manifold Runner Position Sensor -G336-

17 - Fuel Pressure Sensor -G247-

- 27 Nm

High Pressure Pump Overview



1 - Cam Follower

2 - O-ring

- Always replace

3 - High Pressure Pump

4 - Fuel Pressure Regulator Valve -N276-

5 - Bore in the Cylinder Head

6 - Fuel Injector

7 - Camshaft Position Sensor -G40-

8 - Camshaft Adjustment Valve 1 -N205-

9 - Bolt

- M6 threads: 8 Nm + 90° turn, replace
- M8 threads: 20 Nm

10 - Connecting Piece

11 - Connecting Piece

- 22 Nm
- Always replace

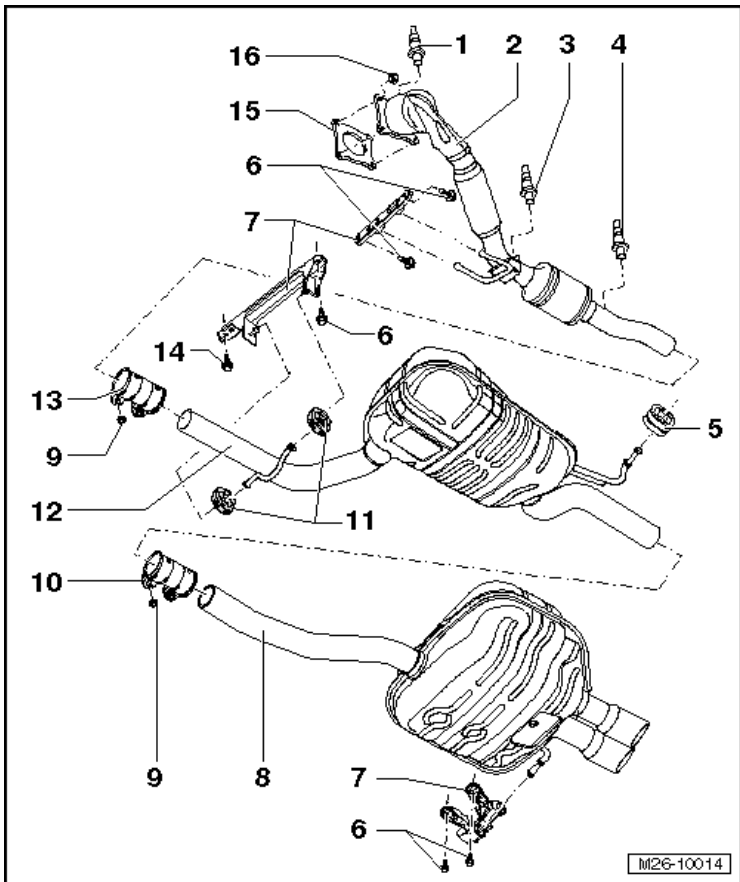
Technical Data

Engine Codes	CBFA and CCTA
Idle check	
Engine idle speed ¹⁾	640 to 800 ¹⁾ rpm
Engine speed limitation	Approximately 6500 ¹⁾ rpm

¹⁾ If the voltage supply to the Engine Control Module (ECM) drops below 12 volts, idle speed is raised in stages up to 990 rpm. Idle speed is not adjustable.

Exhaust System, Emission Controls – 2.0L CBFA, CCTA

Exhaust System Overview



- 1 - Heated Oxygen Sensor -G39-
 - 55 Nm
- 2 - Front Exhaust Pipe with Catalytic Converter
- 3 - Heated Oxygen Sensor 2 -G108-
 - 55 Nm
- 4 - Oxygen Sensor after Three Way Catalytic Converter -G130-
 - 55 Nm
- 5 - Retaining Loop
- 6 - Bolt
 - 23 Nm
- 7 - Suspended Mount
- 8 - Rear Muffler

9 - Nut

- 30 Nm

10 - Rear Clamping Sleeve

11 - Retaining Loop

12 - Front Muffler

13 - Front Clamping Sleeve

14 - Bolt

- 26 Nm
- Always replace

15 - Gasket

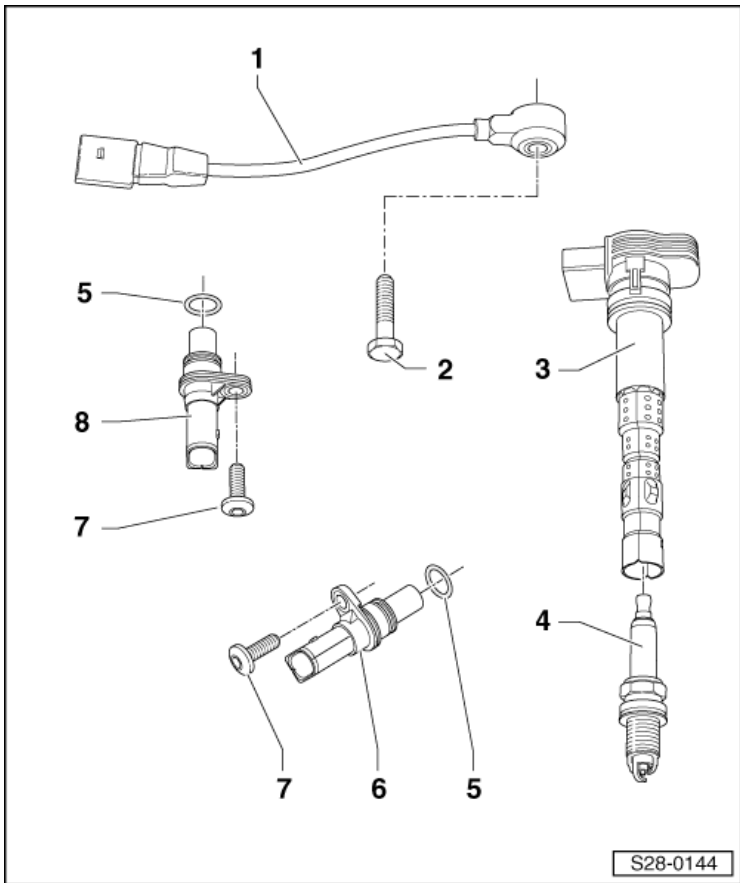
- Always replace

16 - Nut

- 40 Nm
- Always replace

Ignition – 2.0L CBFA, CCTA

Ignition System Component Overview



1 - Knock Sensor 1 -G61-

2 - Bolt

22 Nm

Tightening specification influences the function of the knock sensor.

3 - Ignition Coil with Power Output Stage

4 - Spark Plug

25 Nm

5 - O-ring

No replacement part available.

6 - Engine Speed Sensor -G28-

7 - Bolt

9 Nm

8 - Camshaft Position Sensor -G40-

Spark Plug Technical Data

Engine Codes	CBFA and CCTA
Ignition sequence	1-3-4-2
Spark plugs ¹⁾	
Volkswagen type	101 905 631 H
Electrode gap	1.0 to 1.1 mm
Tightening specification	25

¹⁾ Remove and install using the spark plug removal tool -3122 B-