Das Auto.

2014

Golf, GTI & Golf R

Quick Reference Specification Book

2014 Volkswagen Golf, GTI, & Golf R Quick Reference Specification Book

TABLE OF CONTENTS

ENGINES

TRANSMISSIONS

GENERAL INFORMATION

Decimal and Metric Equivalents

Distance/Length

To calculate: mm x 0.03937 = in.

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

Tightening Torque

Nm-to-lb·ft (ft·lb)

To calculate: Nm x 0.738 = lb·ft

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

Nm-to-lb·in (in·lb), kg·cm

To calculate: Nm x 8·85 = lb·in • Nm x 10.20 = kg·cm

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

N·cm-to-lb·in (in·lb), kg·cm

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

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

kg·cm-to-lb·in (in·lb), N·cm

To calculate: 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.

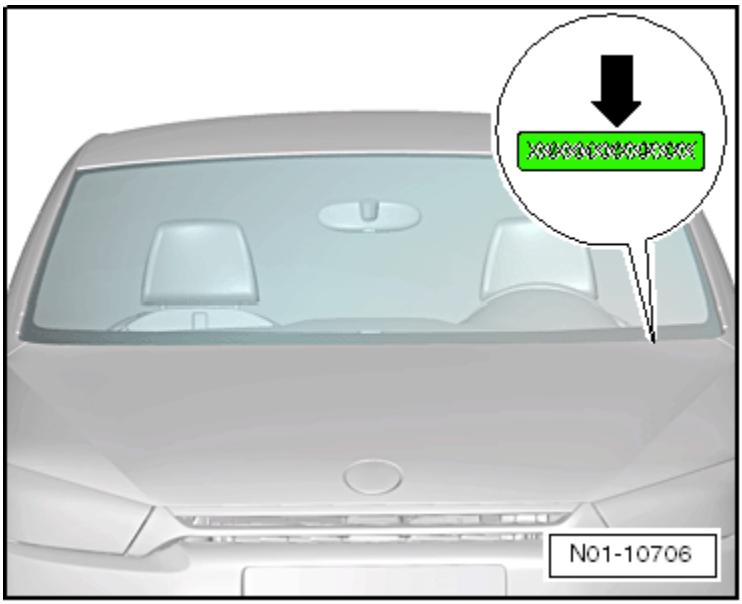
(CAUTIONS cont'd on next page)

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.

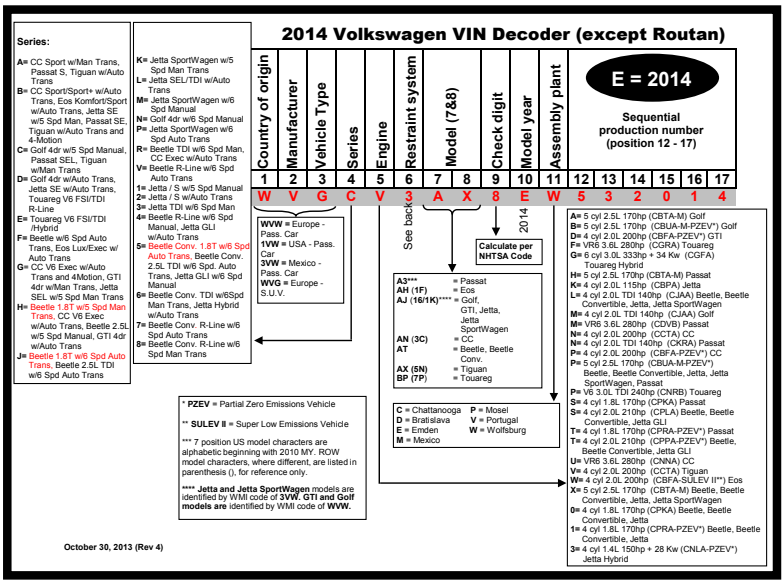
VEHICLE IDENTIFICATION

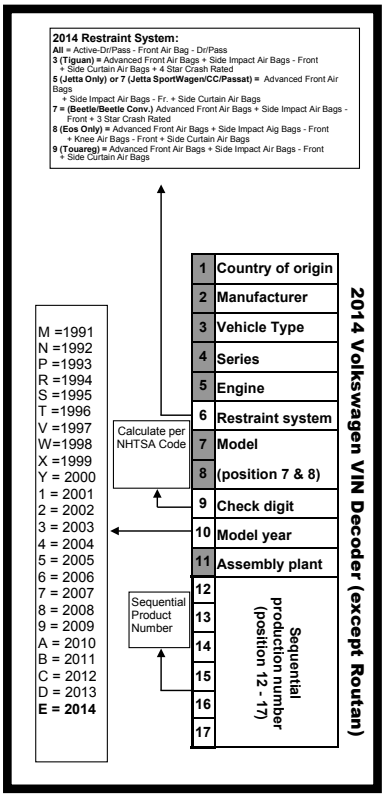
Vehicle Identification Number (VIN) Location



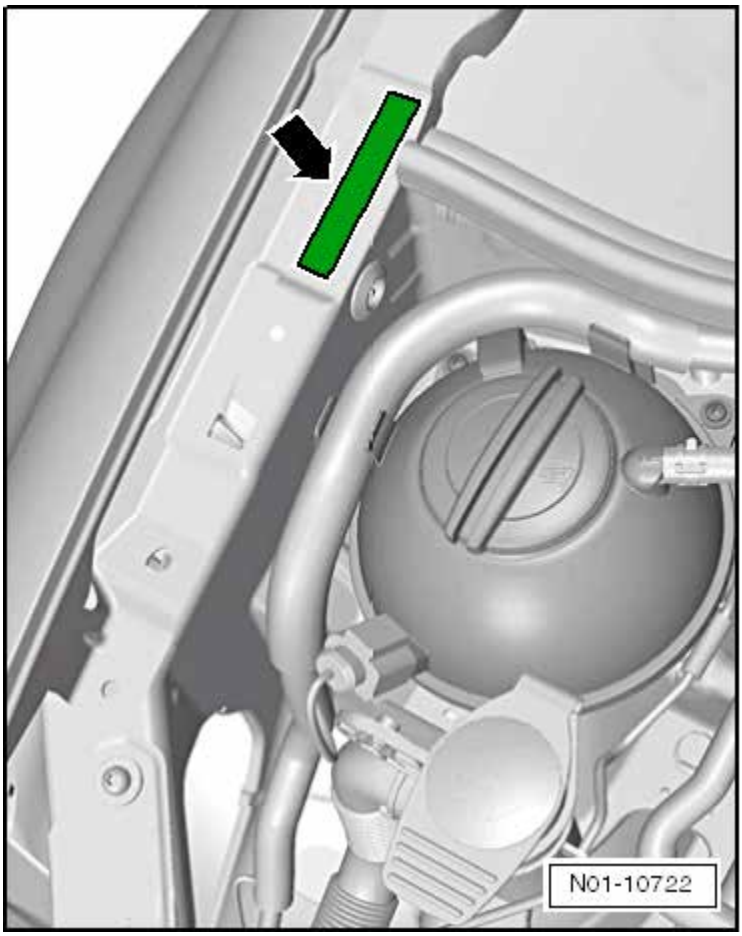
The VIN (➡) is on the left side of the vehicle in the area of the windshield wiper mount. It is visible from the outside (typical illustration shown).

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/5 Spd Man, Passat SE, Tiguan w/Auto Trans and 4-Motion
C= Golf 4dr w/5 Spd Manual, Passat SEL, Tiguan w/Man Trans
D= Golf 4dr w/Auto Trans, Jetta SE w/Auto Trans, Touareg V6 FSI/TDI R-Line
E= Touareg V6 FSI/TDI /Hybrid
F= Beetle w/6 Spd Auto Trans, Eos Lux/Exec w/ Auto Trans
G= CC V6 Exec w/Auto Trans and 4Motion, GTI 4dr w/Man Trans, Jetta SEL w/5 Spd Man Trans
H= Beetle 1.8T w/5 Spd Man Trans, CC V6 Exec w/Auto Trans, Beetle 2.5L w/5 Spd Manual, GTI 4dr w/Auto Trans
J= Beetle 1.8T w/6 Spd Auto Trans, Beetle 2.5L TDI w/6 Spd Auto Trans
K= Jetta SportWagen w/5 Spd Man Trans
L= Jetta SEL/TDI w/Auto Trans
M= Jetta SportWagen w/6 Spd Manual
N= Golf 4dr w/6 Spd Manual
P= Jetta SportWagen w/6 Spd Auto Trans
R= Beetle TDI w/6 Spd Man, CC Exec w/Auto Trans
V= Beetle R-Line w/6 Spd Auto Trans
1= Jetta / S w/5 Spd Manual
2= Jetta / S w/Auto Trans
3= Jetta TDI w/6 Spd Man
4= Beetle R-Line w/6 Spd Manual, Jetta GLI w/Auto Trans
5= Beetle Conv. 1.8T w/6 Spd Auto Trans, Beetle Conv. 2.5L TDI w/6 Spd. Auto Trans, Jetta GLI w/6 Spd Manual
6= Beetle Conv. TDI w/6Spd Man Trans, Jetta Hybrid w/Auto Trans
7= Beetle Conv. R-Line w/6 Spd Auto Trans
8= Beetle Conv. R-Line w/6 Spd Man Trans
Country of origin
Manufacturer
Vehicle Type
Series
Engine
Restraint system
Model (7&8)
Check digit
Model year
Assembly plant
E = 2014
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
See back
2014
WVW = Europe - Pass. Car
1VW = USA - Pass. Car
3VW = Mexico - Pass. Car
WVG = Europe - S.U.V.
Calculate per NHTSA Code
A3**** = Passat
AH (1F) = Eos
AJ (16/1K)**** = Golf, GTI, Jetta, Jetta SportWagen
AN (3C) = CC
AT = Beetle, Beetle Conv.
AX (5N) = Tiguan
BP (7P) = Touareg
C = Chattanooga
D = Bratislava
E = Emden
M = Mexico
P = Mosel
V = Portugal
W = Wolfsburg
A= 5 cyl 2.5L 170hp (CBTA-M) Golf
B= 5 cyl 2.5L 170hp (CBUA-M-PZEV*) Golf
D= 4 cyl 2.0L 200hp (CBFA-PZEV*) 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 115hp (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
M= VR6 3.6L 280hp (CDVB) Passat
N= 4 cyl 2.0L 200hp (CCTA) CC
N= 4 cyl 2.0L TDI 140hp (CKRA) Passat
P= 4 cyl 2.0L 200hp (CBFA-PZEV*) CC
P= 5 cyl 2.5L 170hp (CBUA-M-PZEV*) Beetle, Beetle Convertible, Jetta, Jetta SportWagen, Passat
P= V6 3.0L TDI 240hp (CNRB) Touareg
S= 4 cyl 1.8L 170hp (CPKA) Passat
S= 4 cyl 2.0L 210hp (CPLA) Beetle, Beetle Convertible, Jetta GLI
T= 4 cyl 1.8L 170hp (CPRA-PZEV*) Passat
T= 4 cyl 2.0L 210hp (CPPA-PZEV*) Beetle, Beetle Convertible, Jetta GLI
U= VR6 3.6L 280hp (CNNA) CC
V= 4 cyl 2.0L 200hp (CCTA) Tiguan
W= 4 cyl 2.0L 200hp (CBFA-SULEV II**) Eos
X= 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-PZEV*) Beetle, Beetle Convertible, Jetta
3= 4 cyl 1.4L 150hp + 28 Kw (CNLA-PZEV*) 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 3VW. GTI and Golf models are identified by WMI code of WVW.
October 30, 2013 (Rev 4)

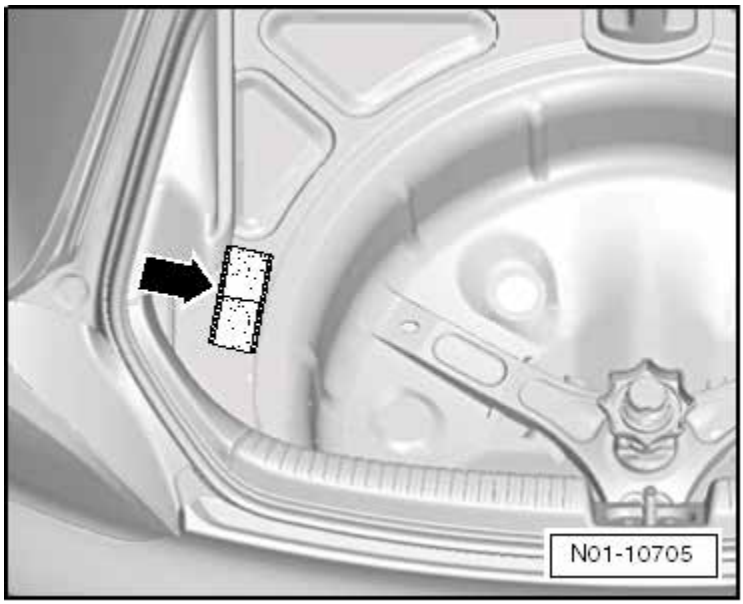

2014 Restraint System:
All = Active-Dr/Pass - Front Air Bag - Dr/Pass
3 (Tiguan) = Advanced Front Air Bags + Side Impact Air Bags - Front + Side Curtain Air Bags + 4 Star Crash Rated
5 (Jetta Only) or 7 (Jetta SportWagen/CC/Passat) = Advanced Front Air Bags + Side Impact Air Bags - Fr. + Side Curtain Air Bags
7 = (Beetle/Beetle Conv.) Advanced Front Air Bags + Side Impact Air Bags - Front + 3 Star Crash Rated
8 (Eos Only) = Advanced Front Air Bags + Side Impact Aig 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
Calculate per NHTSA Code
Sequential Product Number
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 13 14 15 16 17
Sequential production number (position 12 - 17)
2014 Volkswagen VIN Decoder (except Routan)

VIN on Longitudinal Member Extension



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

Vehicle Data Label



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

SALES CODES

Engine Codes

CJAA	2.0L TDI 4-cylinder 4V turbo diesel
CBFA/CCTA	2.0L TFSI 4-cylinder 4V
CZRA	2.0L TFSI 4-cylinder 4V
CBTA/CBUA	2.5L 5-cylinder 4V

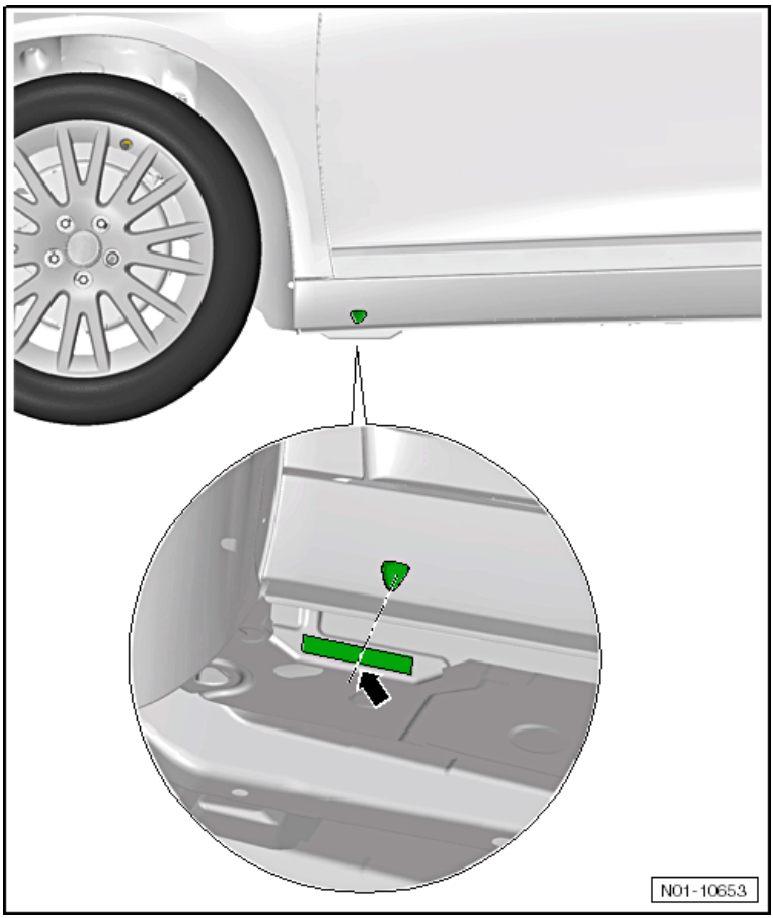
Transmission Codes

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

VEHICLE LIFTING

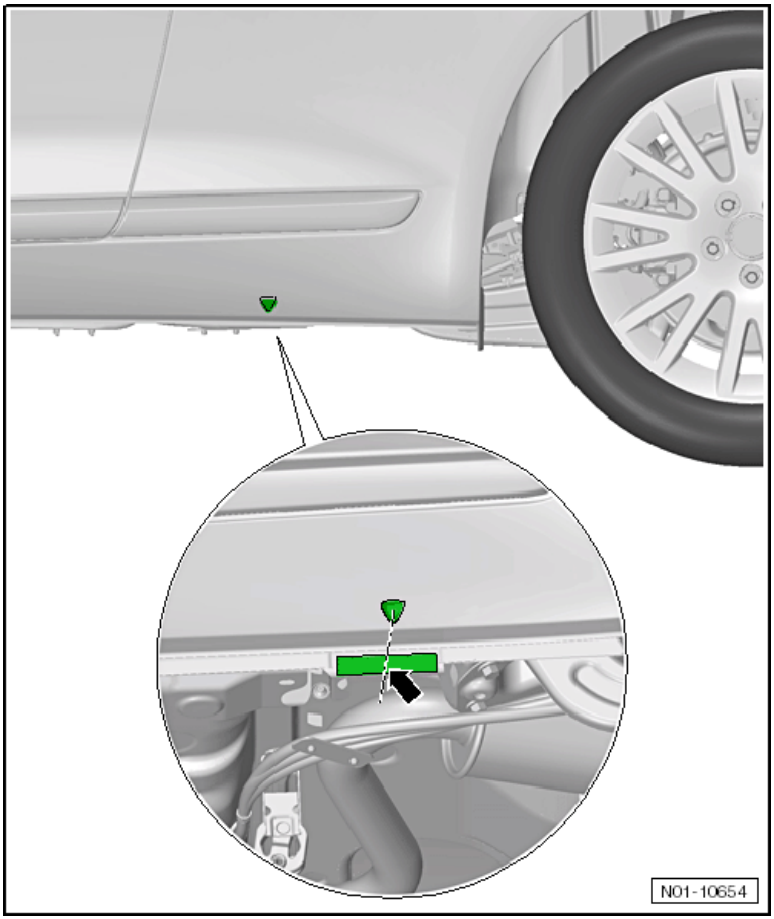
Hoist and Jack Mounting Points

Front



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

Rear

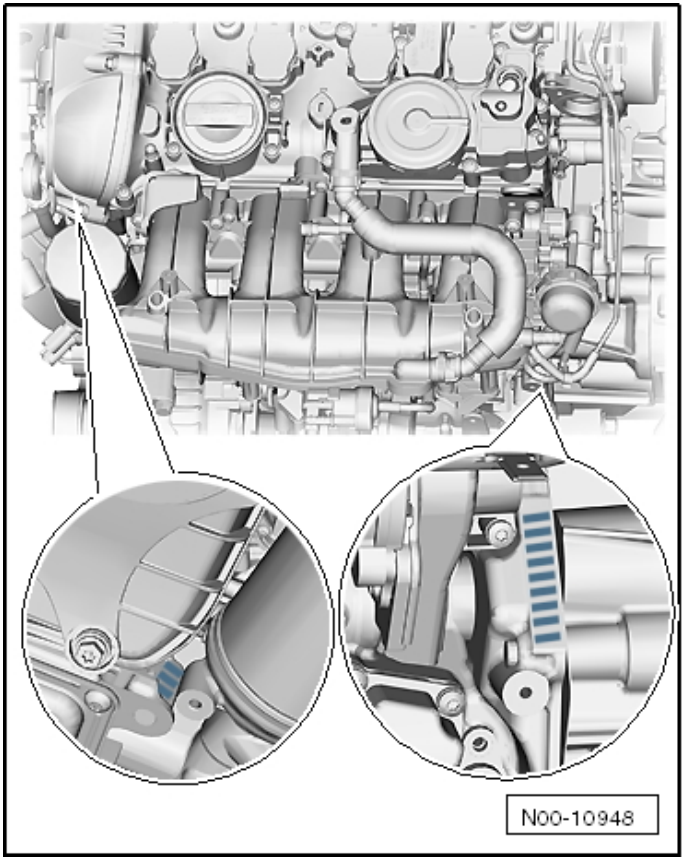


Position the support plate in the side member vertical reinforcement area (➡).

ENGINE MECHANICAL – 2.0L CBFA AND CCTA

General, Technical Data

Engine Number Location



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

The engine code is also printed on the cylinder block behind the oil filter.

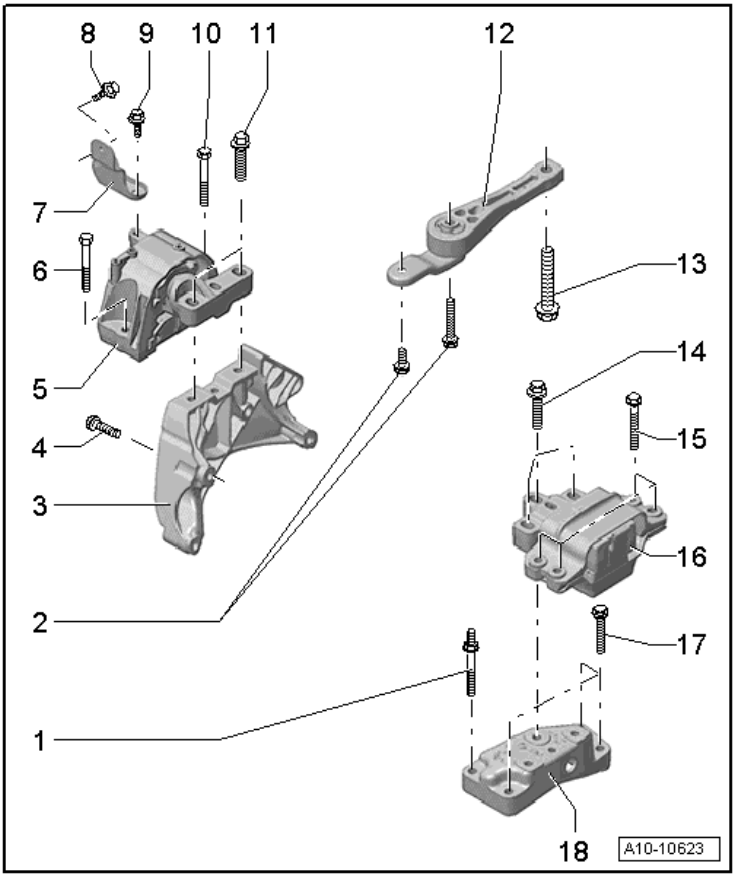
Engine Data

Code letters		CBFA	CCTA
Manufactured from		from 01.08	from 01.08
Emissions values		SULEV [1]	ULEV 2 [2]
Displacement	liter	2.0	2.0
Output	kW at RPM	147 @ 5100	147 @ 5100
Torque	Nm at RPM	280 @ 1700	280 @ 1700
Bore	diameter mm	82.5	82.5
Stroke	mm	92.8	92.8
Compression ratio		9.6:1	9.6:1
Research Octane Number (RON)		95	95
Injection system/ignition system		FSI	FSI
Ignition sequence		1-3-4-2	1-3-4-2
Turbocharger, Supercharger		Turbocharger	Turbocharger
Variable valve timing		Yes	Yes
Secondary Air Injection (AIR)		Yes	No
Valves per cylinder		4	4
Oil pressure control		No	No

[1] SULEV = Super Ultra Low Emissions Vehicle
[2] ULEV = Ultra Low Emissions Vehicle

Engine Assembly – 2.0L CBFA and CCTA

Engine/Transmission Mount Overview



1 - Bolt
- ☐ Tightening specifications, refer to the correct transmission.

2 - Bolt
- ☐ Tightening specification, refer to Suspension, Wheels and Steering; Front Suspension

3 - Engine Mount Bracket

4 - Bolt
- ☐ 40 Nm + 180° turn
- ☐ Always replace

5 - Engine Mount

6 - Bolt
- ☐ 40 Nm + 90° turn
- ☐ Always replace

7 - Support

8 - Bolt
- ☐ 20 Nm + 90° turn
- ☐ Always replace

9 - Bolt
- ☐ 20 Nm + 90° turn
- ☐ Always replace

10 - Bolt
- ☐ 40 Nm + 90° turn
- ☐ Always replace

11 - Bolt
- ☐ 60 Nm + 90° turn
- ☐ Always replace

12 - Pendulum Support

13 - Bolt
- ☐ 100 Nm + 90° turn
- ☐ Always replace

14 - Bolt
- ☐ 60 Nm + 90° turn
- ☐ Always replace

15 - Bolt
- ☐ 40 Nm + 90° turn
- ☐ Always replace

16 - Transmission Mount
- ☐ The illustration shows the DSG® version.

17 - Bolt
- ☐ Tightening specifications, refer to the correct transmission.

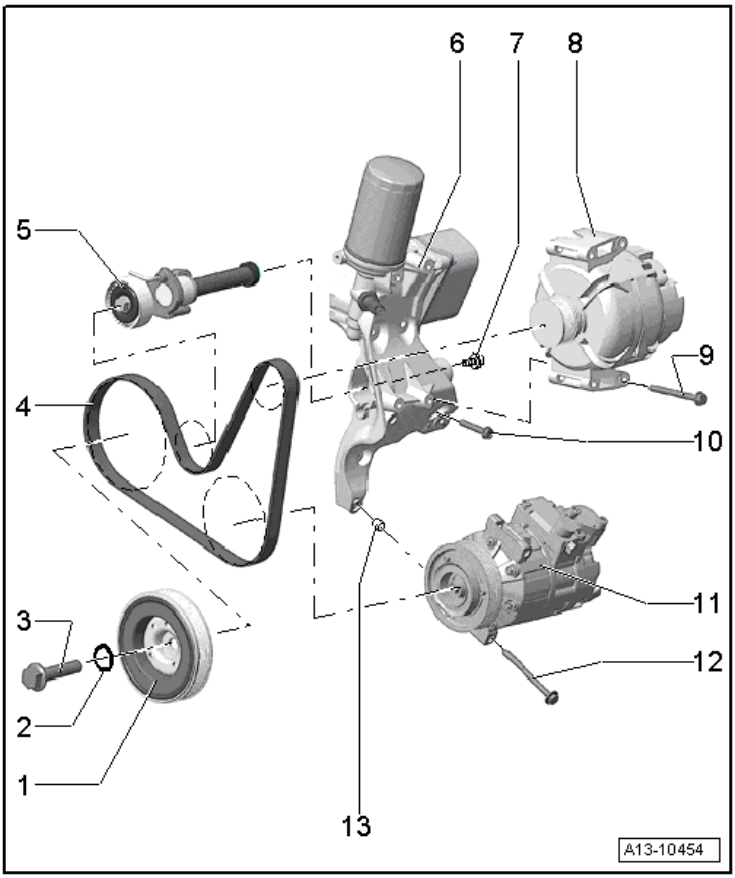
18 - Transmission Mount Bracket

Fastener Tightening Specifications

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

Crankshaft, Cylinder Block – 2.0L CBFA and CCTA

Ribbed Belt Drive Overview



1 - Vibration Damper
2 - O-ring
- ☐ Always replace

3 - Bolt
- ☐ 150 Nm + 90° turn
- ☐ Always replace

4 - Ribbed Belt
5 - Belt Tensioner
6 - Accessory Bracket
7 - Bolt
- ☐ 10 Nm

8 - Generator

9 - Bolt

- ☐ 23 Nm

10 - Bolt

- ☐ Tightening sequence, see Accessory Bracket Bolt Tightening Sequence below

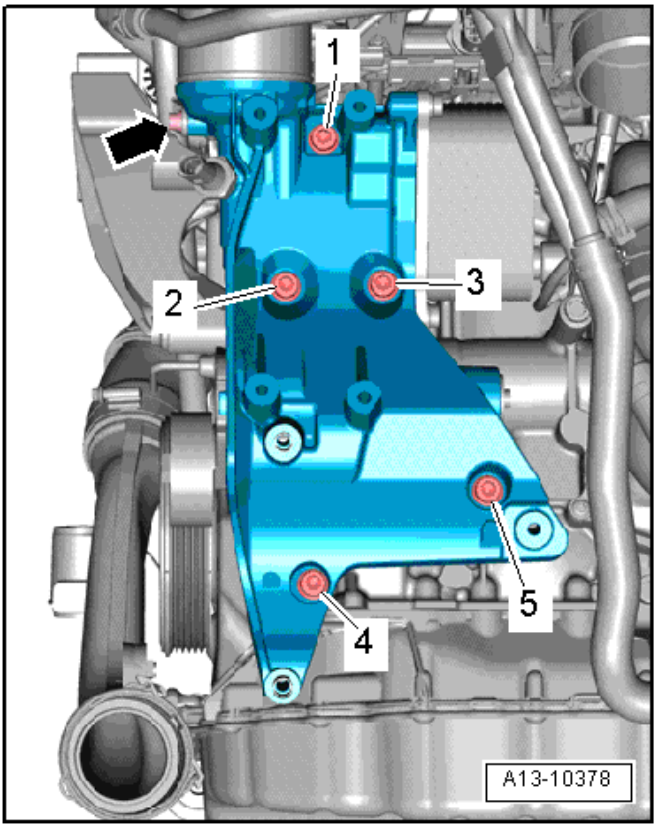
11 - Air Conditioning (A/C) Compressor

12 - Bolt

- ☐ 25 Nm

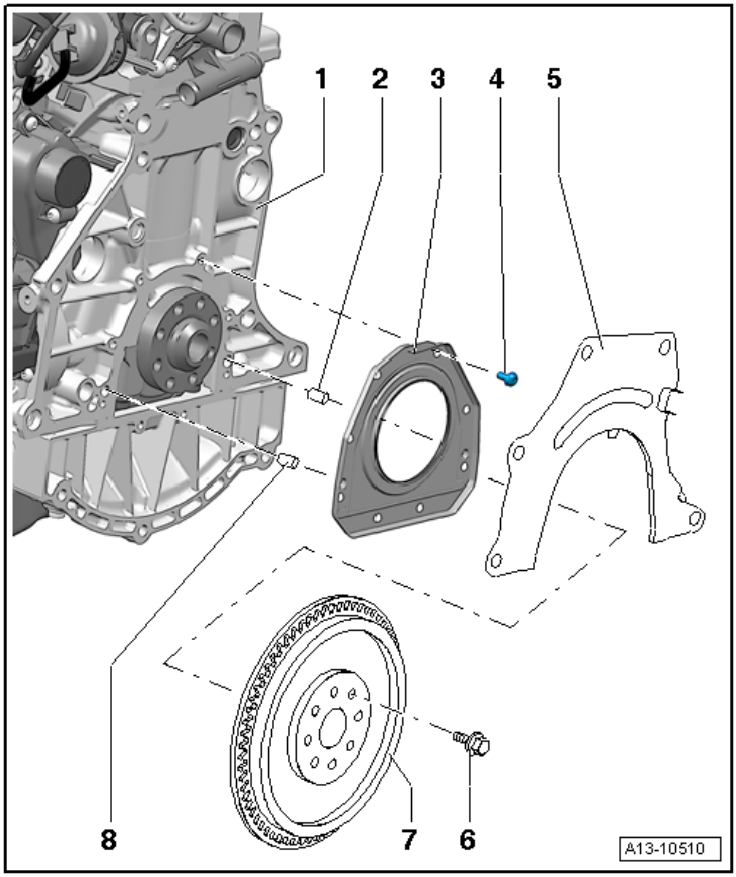
13 - Alignment Sleeve

Accessory Bracket Bolt Tightening Sequence



Step	Component	Nm
1	Tighten bolts 1 through 5 in sequence	Hand-tighten
2	Tighten bolts 1 through 5 in sequence	20
3	Tighten bolts 1 through 5 in sequence	an additional 90° (¼ turn)

Sealing Flange and Dual Mass Flywheel/Drive Plate Overview

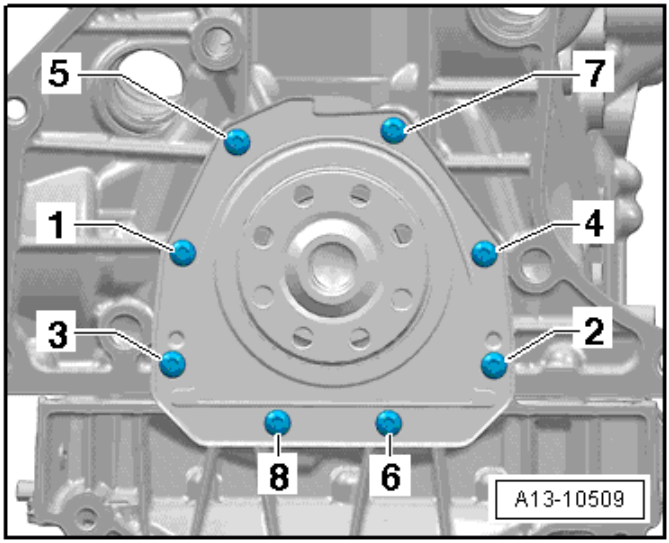


1 - Cylinder Block
2 - Alignment Pin
3 - Sealing Flange
4 - Bolt
- ☐ Tightening sequence, see Sealing Flange Bolt Tightening Sequence below

5 - Intermediate Plate
6 - Bolt
- ☐ 60 Nm + 90° turn
- ☐ Always replace

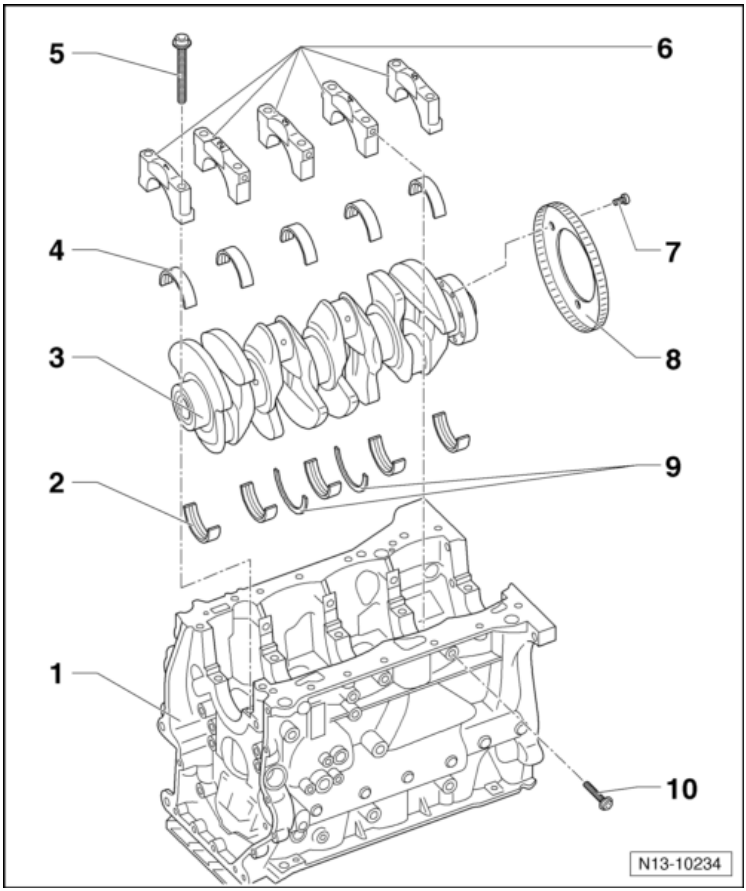
7 - Dual Mass Flywheel/Drive Plate
8 - Alignment Pin
- ☐ Not installed

Sealing Flange Tightening Specifications



Step	Component	Nm
1	Tighten bolts 1 through 8 in sequence	Hand-tighten
2	Tighten bolts 1 through 8 in sequence	9

Crankshaft Overview

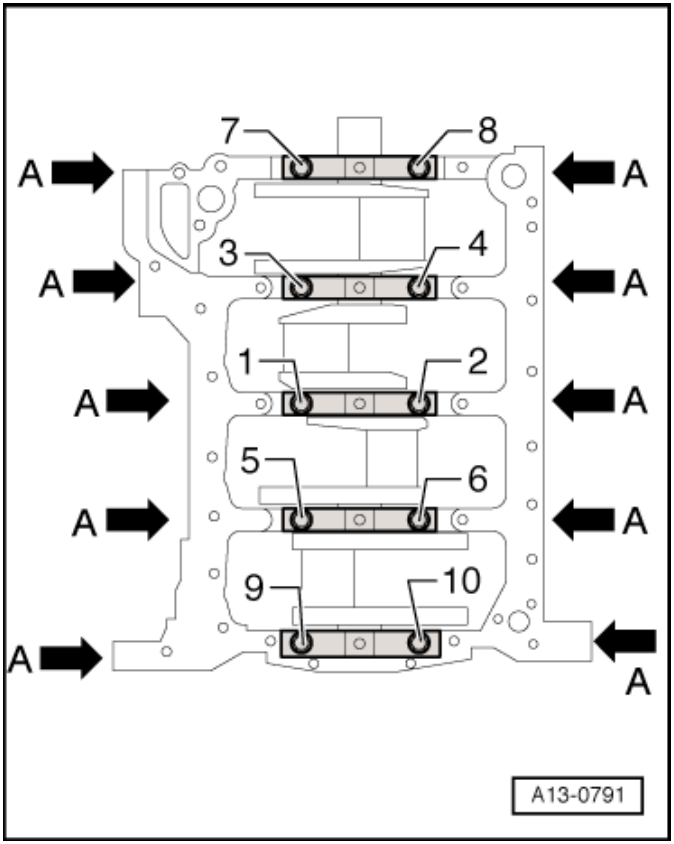


1 - Cylinder Block
2 - Bearing Shell, Lower
3 - Crankshaft
4 - Bearing Shell, Upper
5 - Bolt
- ☐ Tightening sequence, see Crankshaft Bolt Tightening Sequence below

6 - Bearing Cap
7 - Bolt
- ☐ 10 Nm + 90° turn
- ☐ Always replace

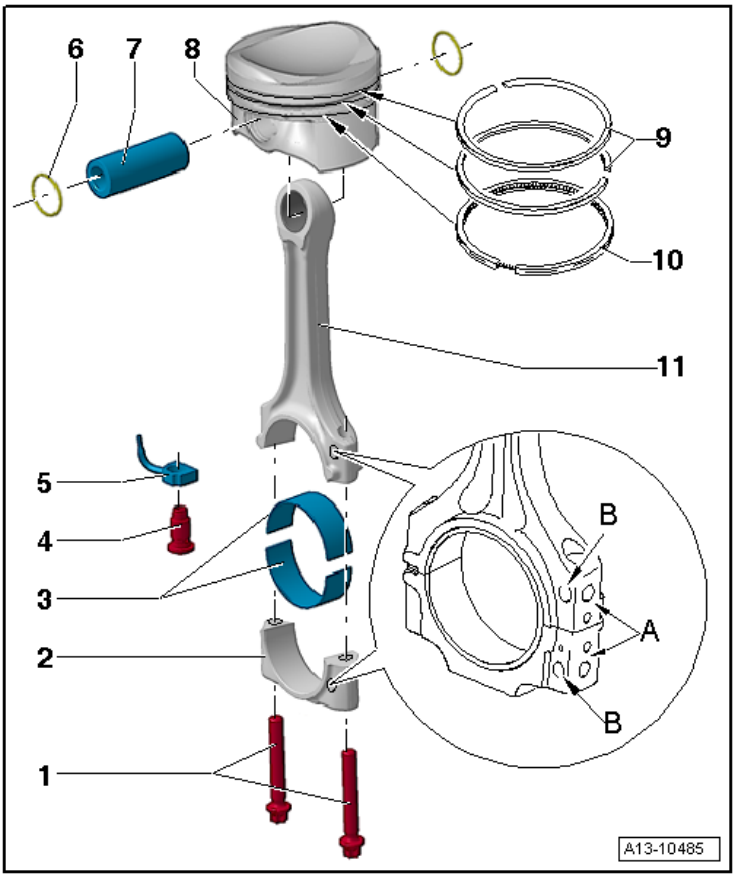
8 - Sensor Wheel
9 - Thrust Washers
10 - Bolt
- ☐ Tightening sequence, see Crankshaft Bolt Tightening Sequence below

Crankshaft Assembly Tightening Specifications



Step	Component	Nm
1	Tighten bolts 1 through 10 and A in sequence	Hand-tighten
2	Tighten bolts 1 through 10 in sequence	65
3	Tighten bolts 1 through 10 in sequence	an additional 90° (¼ turn)
4	Tighten bolts A	20
5	Tighten bolts A	an additional 90° (¼ turn)

Piston and Connecting Rod Overview



1 - Bolt
- ☐ 45 Nm + 90° turn
- ☐ Always replace

2 - Connecting Rod Bearing Cap
3 - Bearing Shell
4 - Pressure Relief Valve
- ☐ 27 Nm

5 - Oil Spray Jet
6 - Lock Ring
7 - Piston Pin
8 - Piston
9 - Compression Rings
10 - Oil Scraping Ring
11 - Connecting Rod

Crankshaft Dimensions

Reconditioning 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 Ring End Gaps

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

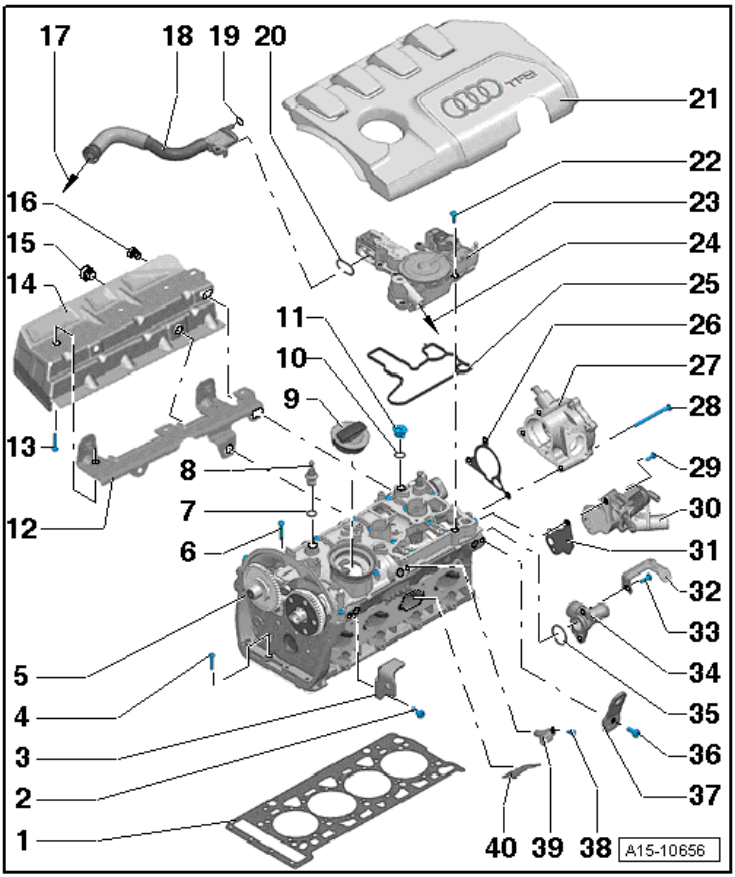
Piston and Cylinder Dimensions

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

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

Cylinder Head, Valvetrain – 2.0L CBFA and CCTA

Cylinder Head Overview



1 - Cylinder Head Gasket
- ☐ Always replace

2 - Bolt
- ☐ 25 Nm

3 - Transport Strap

4 - Bolt
- ☐ Tightening sequence, see Cylinder Head Bolt Tightening Sequence below

5 - Cylinder Head

6 - Bolt
- ☐ Tightening sequence, see Cylinder Head Bolt Tightening Sequence below

7 - O-ring
- ☐ Always replace
- ☐ Lubricate with engine oil

8 - Ball Stud
- ☐ 5 Nm

9 - Cap

10 - O-ring
- ☐ Always replace
- ☐ Lubricate with engine oil

11 - Sealing Plug

12 - Bracket

13 - Bolt
- ☐ 9 Nm

14 - Heat Shield

15 - Bolt
- ☐ 20 Nm

16 - Bolt
- ☐ 20 Nm

17 - To the Intake Hose/Turbocharger

18 - Ventilation Pipe

19 - O-ring
- ☐ No replacement part

20 - Seal
- ☐ No replacement part

21 - Engine Cover

22 - Bolt
- ☐ Tightening sequence, se Crankcase Ventilation Bolt Tightening Sequence below

23 - Cap

24 - To Intake Manifold

25 - Gasket
- ☐ No replacement part

26 - Gasket
- ☐ Replace if damaged

27 - Vacuum Pump

28 - Bolt
- ☐ 9 Nm

29 - Bolt
- ☐ 9 Nm
- ☐ For engine code CBFA only

30 - Secondary Air Injection Solenoid Valve -N112-
- ☐ For engine code CBFA only

31 - Gasket
- ☐ Always replace
- ☐ For engine code CBFA only

32 - Mounting Plate

33 - Bolt
- ☐ 9 Nm

34 - Connection

Cylinder Head Overview (cont'd)

35 - O-ring
- ☐ Always replace
- ☐ Coat with coolant

36 - Bolt
- ☐ 25 Nm

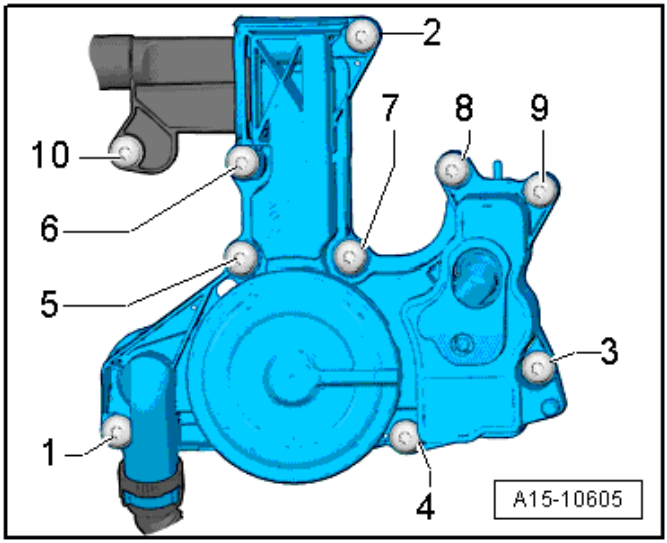
37 - Transport Strap

38 - Bolt
- ☐ 9 Nm

39 - Camshaft Position Sensor -G40-

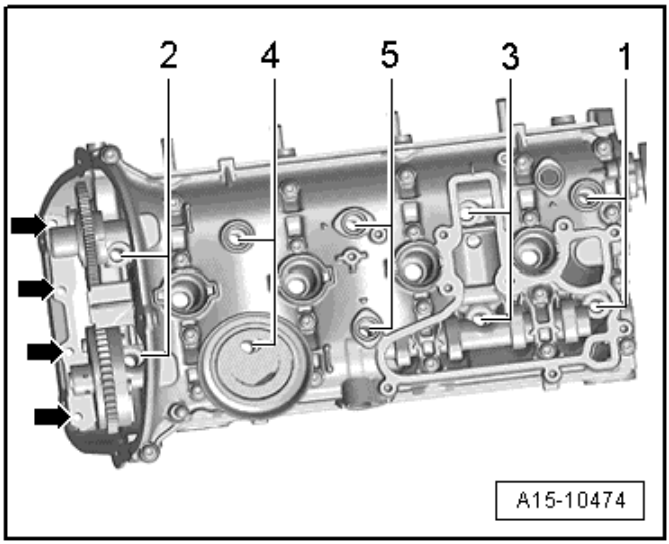
40 - Partition Plate

Crankcase Ventilation Tightening Specification



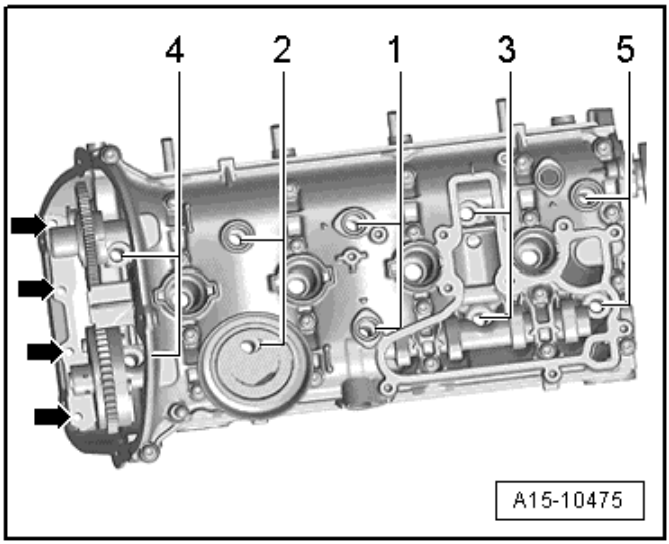
Step	Component	Nm
1	Tighten bolts 1 through 10 in sequence	11

Loosening the Cylinder Head Bolts



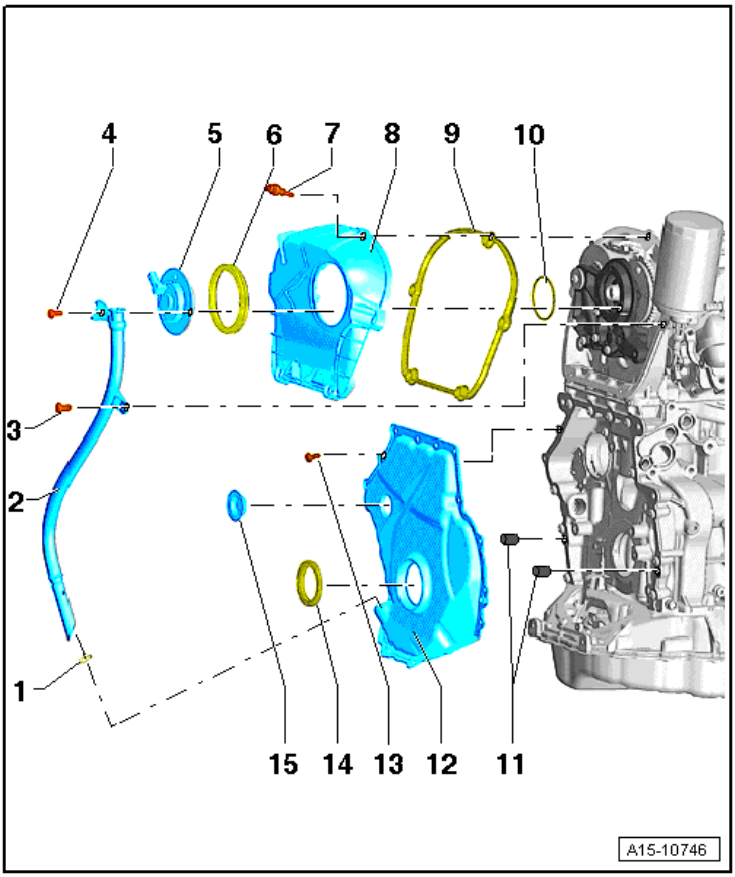
Step	Component
1	Remove bolts -arrows-.
2	Loosen cylinder head bolts in sequence -1 through 5-.

Cylinder Head Tightening Specifications



Step	Component	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 bolts (➡)	8
5	Tighten bolts (➡)	an additional 90° (¼ turn)

Timing Chain Cover Overview



1 - O-ring
- ☐ Always replace
- ☐ Coat with oil before installing

2 - Oil Dipstick Guide Tube

3 - Bolt
- ☐ 9 Nm

4 - Bolt
- ☐ 9 Nm

5 - Camshaft Adjustment Valve 1 -N205-

6 - Seal
- ☐ Coat with oil before installing

7 - Bolt
- ☐ Tightening sequence, see Upper Timing Chain Cover below

8 - Upper Timing Chain Cover
- ☐ Tightening sequence, see Upper Timing Chain Cover Bolt Tightening Sequence below

9 - Seal

10 - O-ring

- ☐ Always replace
- ☐ Coat with oil before installing

11 - Alignment Sleeves

12 - Lower Timing Chain Cover

- ☐ Tightening sequence with 15 bolts, see Lower Timing Chain Cover Bolt Tightening Sequence, with 15 Bolts below
- ☐ Tightening sequence with 8 bolts, see Lower Timing Chain Cover Bolt Tightening Sequence, with 8 Bolts below

13 - Bolt

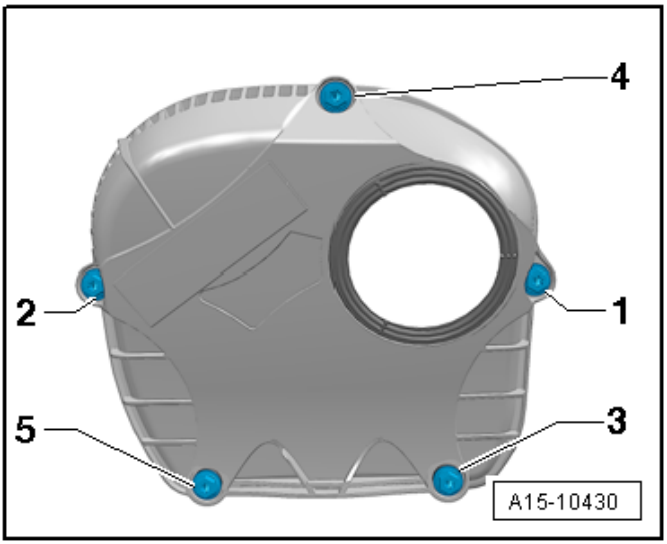
- ☐ Always replace

14 - Seal

15 - Sealing Plug

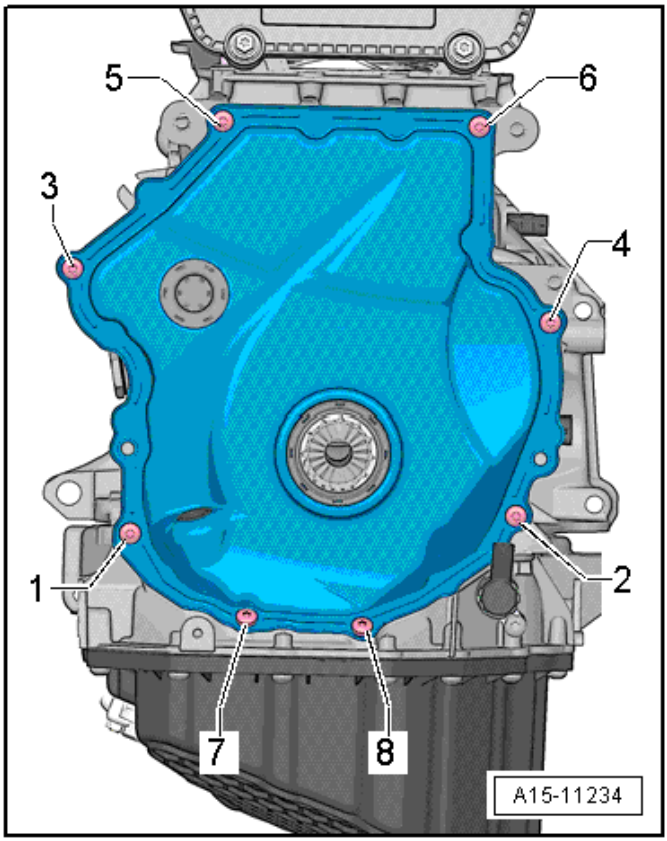
- ☐ Always replace

Upper Timing Chain Cover Tightening Specifications



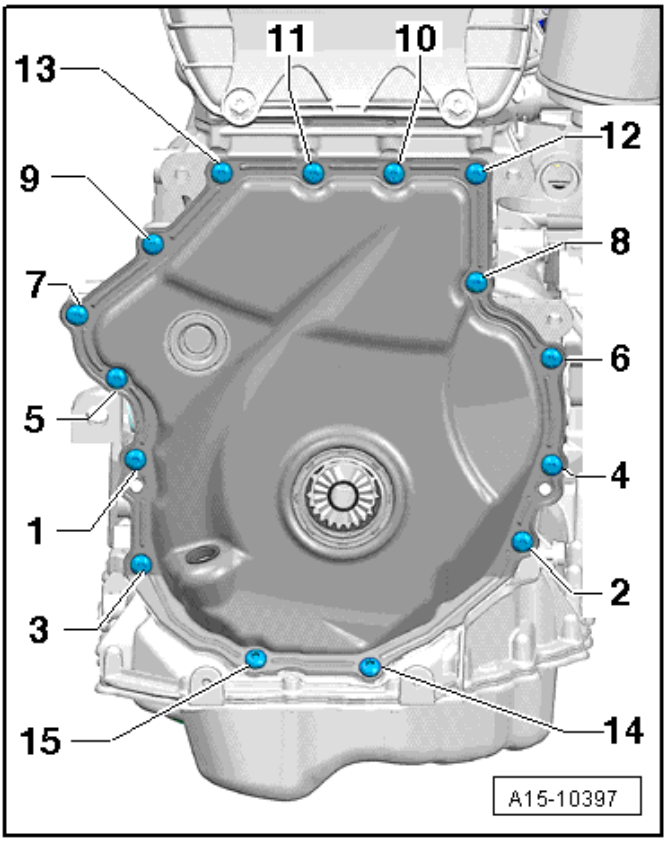
Step	Component	Nm
1	Tighten bolts 1 through 5 in sequence in several stages	Hand-tighten
1	Tighten bolts 1 through 5 in sequence	9

Lower Timing Chain Cover with 8 Bolts Tightening Specifications



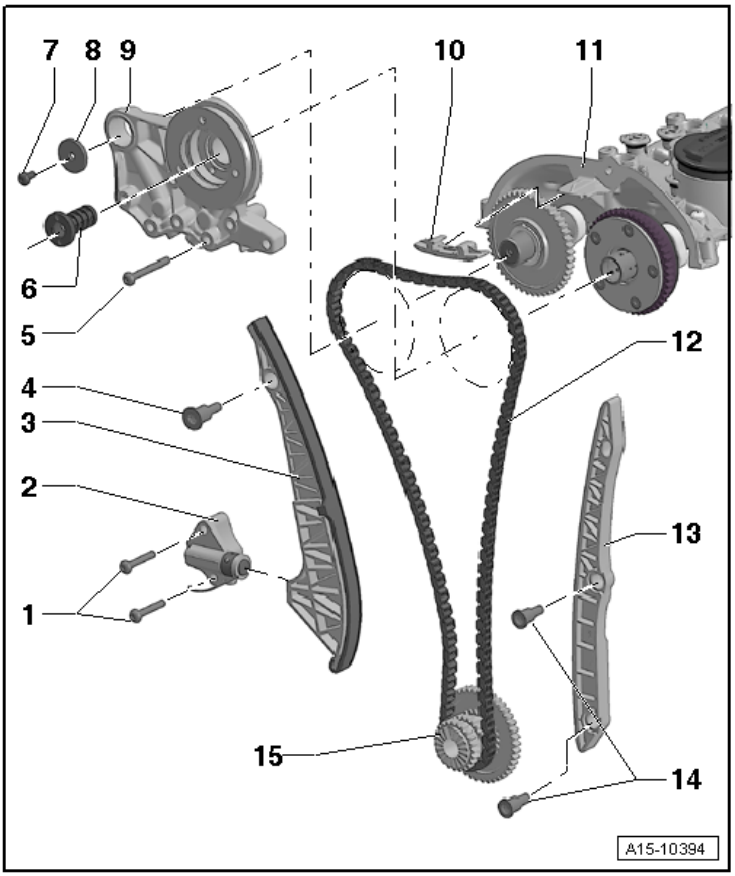
Step	Component	Nm
1	Tighten bolts 1 through 8 in sequence	4
2	Tighten bolts 1 through 15 in sequence	an additional 45° (⅛ turn)

Lower Timing Chain Cover with 15 Bolts Tightening Specifications



Step	Component	Nm
1	Tighten bolts 1 through 15 in sequence	8
2	Tighten bolts 1 through 15 in sequence	an additional 45° (⅛ turn)

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
- ☐ Always replace

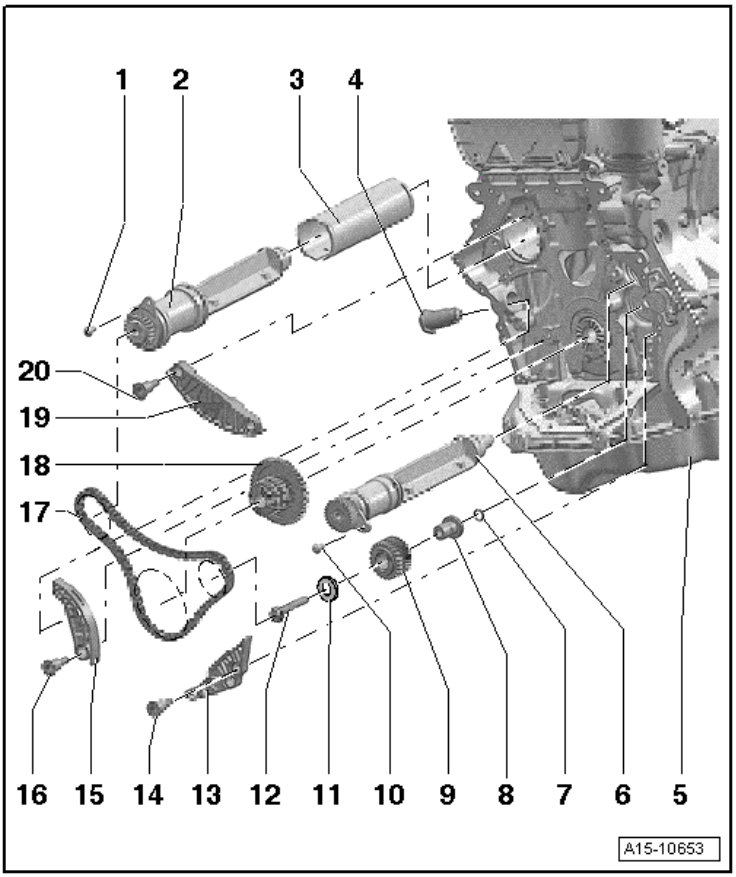
8 - Washer

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 - Chain Sprocket

Balance Shaft Timing Chain Overview



1 - Bolt
- ☐ 9 Nm

2 - Balance Shaft
3 - Balance Shaft Tube
4 - Chain Tensioner
- ☐ 85 Nm

5 - Cylinder Block
6 - Balance Shaft
7 - O-ring
- ☐ Lubricate with engine oil

8 - Bearing Pin
- ☐ Lubricate with engine oil

9 - Intermediate Shaft Sprocket
10 - Bolt
- ☐ 9 Nm

11 - Washer

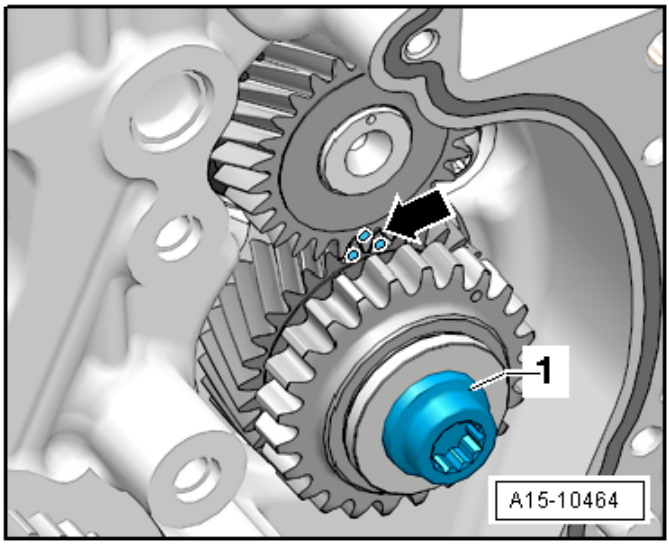
12 - Bolt
- ☐ Tightening sequence, see Intermediate Sprocket Bolt Tightening Sequence below

13 - Guide Rail
14 - Guide Pin
- ☐ 20 Nm

15 - Tensioning Rail
16 - Guide Pin
- ☐ 20 Nm

17 - Timing Chain
18 - Crankshaft Chain Sprocket
19 - Guide Rail
20 - Guide Pin
- ☐ 20 Nm

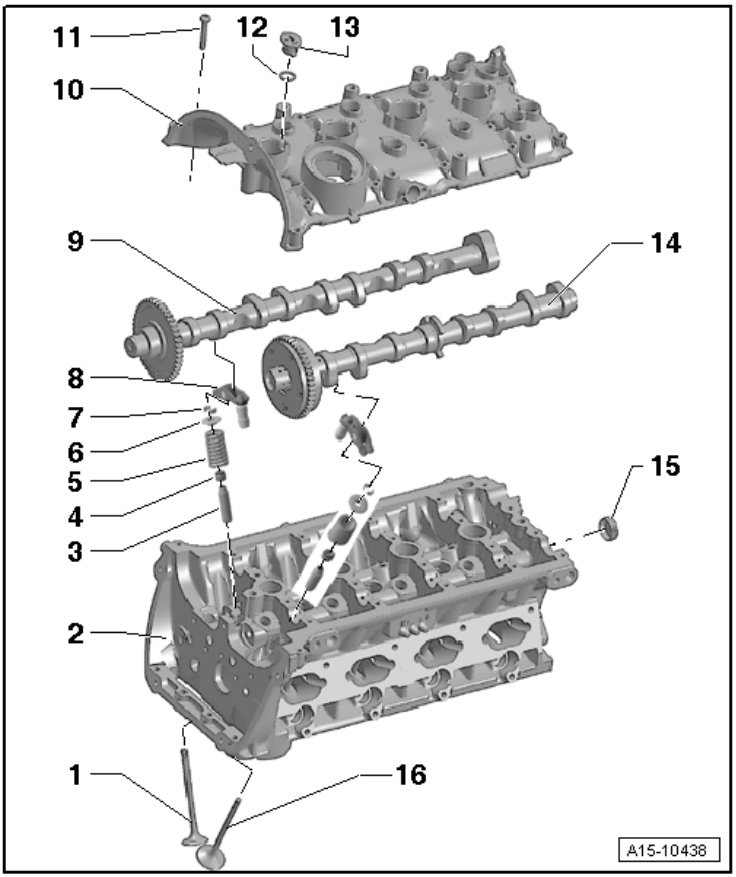
Intermediate Sprocket Bolt Tightening Sequence



Tighten the bolt -1- in four stages:

Step	Component	Nm
1	Tighten bolt -1-	10
2	Turn the sprocket.	
3	The sprocket must not have any play; if so, loosen and retighten again. Tighten bolt -1-	30
4	Tighten bolt -1-	additional 90° (1/4) turn.

Valvetrain Overview



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

12 - O-ring
- ☐ Always replace

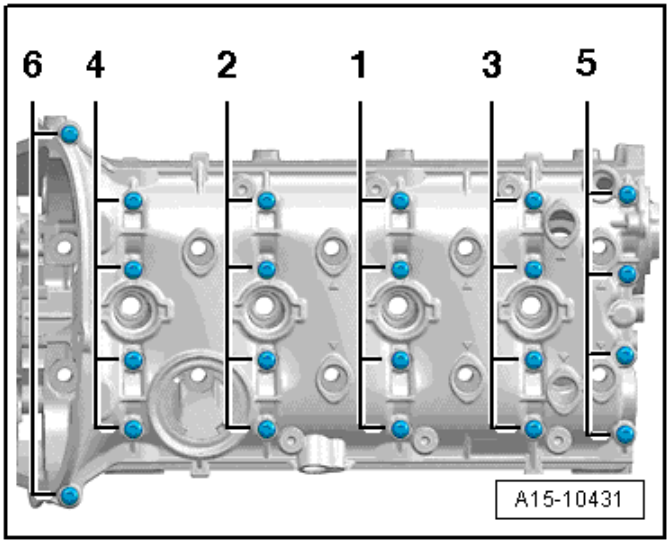
13 - Plug
14 - Intake Camshaft

15 - Cap

☐ Always replace

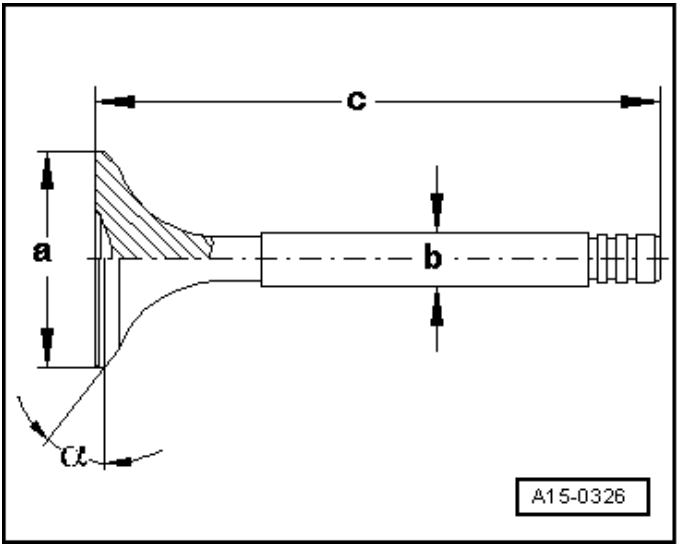
16 - Intake valve

Cylinder Head Cover Tightening Specifications



Step	Component	Nm
1	Tighten bolts 1 through 6 in sequence in several stages	Hand-tighten
2	Tighten bolts 1 through 6 in sequence	8
3	Tighten bolts 1 through 6 in sequence	an additional 90° (¼ turn)

Valve Dimensions



Dimension		Intake valve	Exhaust valve
Diameter a	mm	33.85 ± 0.10	28.0 ± 0.1
Diameter b	mm	5.98 ± 0.007	5.955 ± 0.007
c	mm	103.97	101.87
α	∠°	45	45

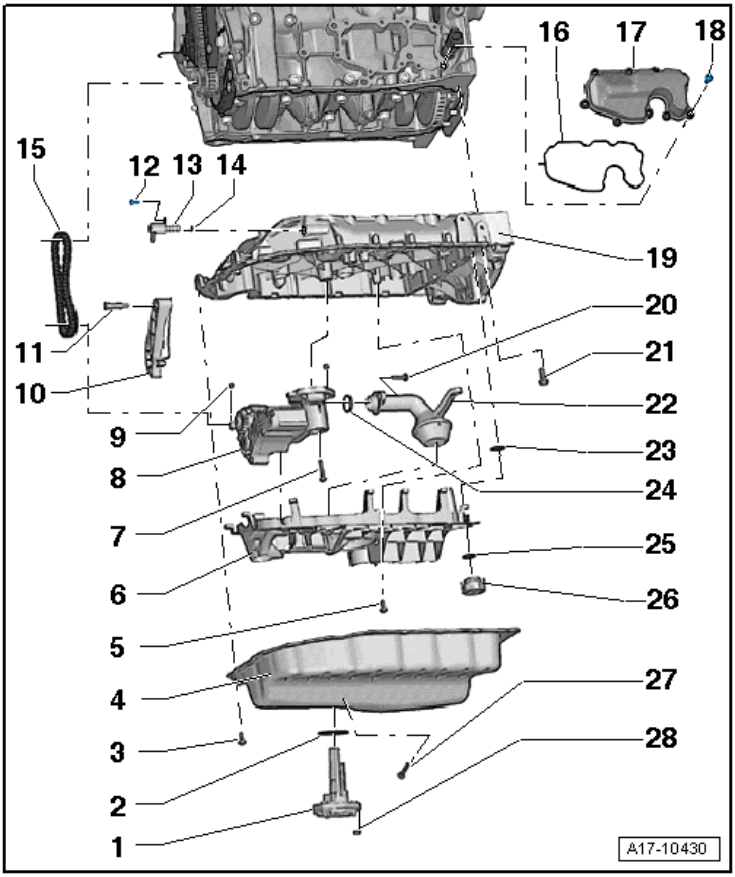
Note: Intake and exhaust valves must not be refaced by grinding. Only lapping is permitted.

Compression Pressures

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

Lubrication – 2.0L CBFA and CCTA

Oil Pan and Oil Pump Overview



1 - Oil Level Thermal Sensor -G266-
- ☐ Not available in the US/Canadian market

2 - Gasket
- ☐ Always replace
- ☐ Not available in the US/Canadian market

3 - Bolt
- ☐ Replace
- ☐ Tightening sequence, see Lower Oil Bolt Tightening Sequence 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 - Centering Sleeve
10 - Chain Tensioner
11 - Guide Pin
- ☐ 9 Nm

12 - Bolt
- ☐ 9 Nm
- ☐ Not available in the US/Canadian market.

13 - Oil Pressure Regulation Valve -N428-
- ☐ Not available in the US/Canadian market.

14 - O-ring
- ☐ Always replace
- ☐ Not available in the US/Canadian market

15 - Oil Pump Drive Chain
16 - Gasket
- ☐ Always replace

17 - Oil Separator
18 - Bolt
- ☐ Tightening sequence, see Oil Separator Bolt Tightening Sequence, below

19 - Upper Oil Pan
20 - Bolt
- ☐ 9 Nm

21 - Bolt
- ☐ Always replace
- ☐ Tightening sequence, see Upper Oil Pan Bolt Tightening Sequence below

22 - Oil Suction Pipe
23 - O-ring
- ☐ Always replace

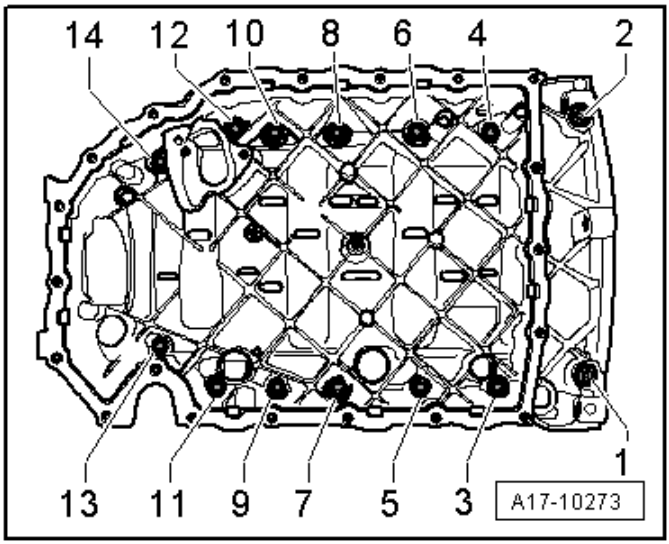
24 - O-ring
- ☐ Always replace

25 - O-ring
- ☐ Always replace

26 - Check Valve
27 - Oil Drain Plug
- ☐ 30 Nm
- ☐ Always replace.

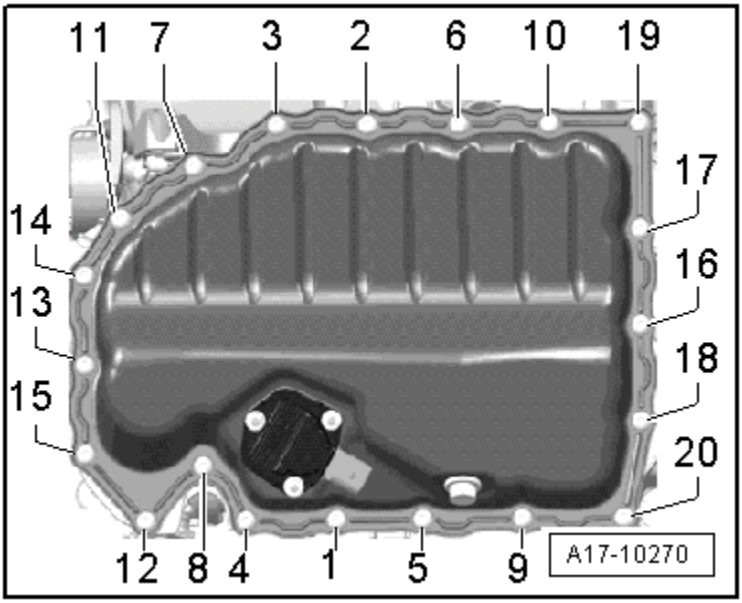
28 - Nut
- ☐ 9 Nm

Upper Oil Pan Tightening Specifications



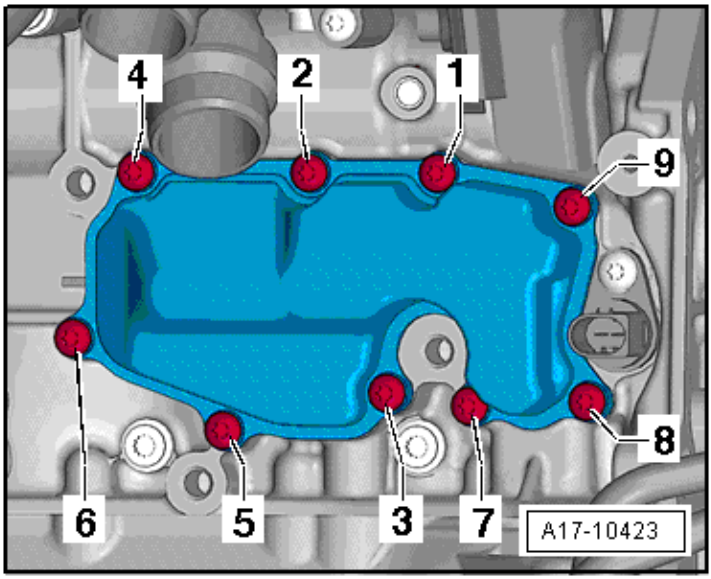
Step	Component	Nm
1	Tighten bolts 1 through 14 in sequence	Hand-tighten
2	Tighten bolts 1 through 14 in sequence	15
3	Tighten bolts 1 through 14 in sequence	an additional 90° (¼ turn)

Oil Pan Tightening Specifications



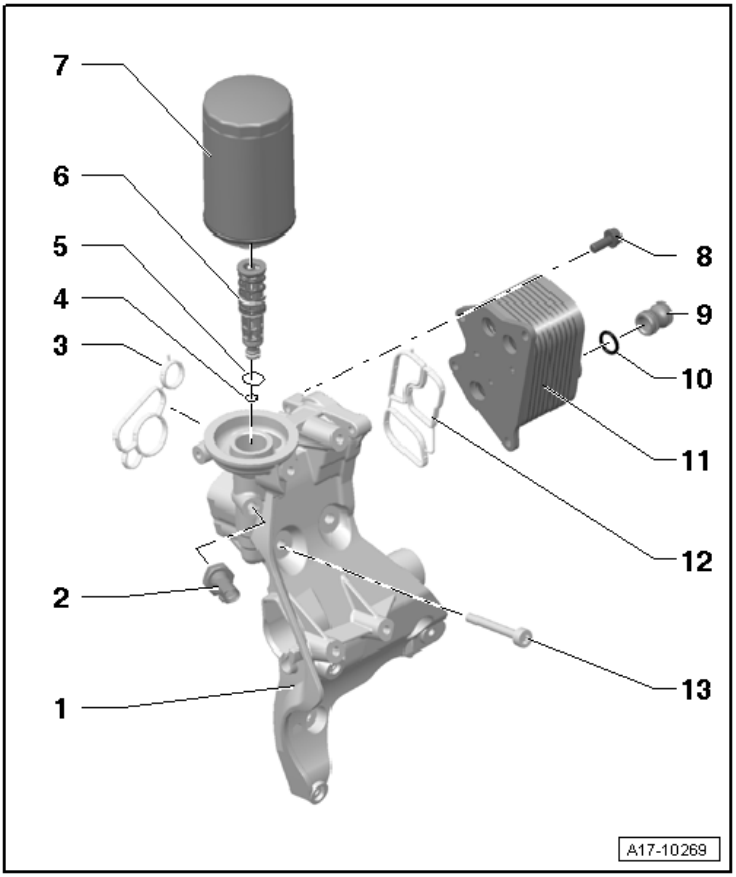
Step	Component	Nm
1	Tighten bolts 1 through 20 in sequence	Hand-tighten
2	Tighten bolts 1 through 20 in sequence	8
3	Tighten bolts 1 through 20 in sequence	an additional 45° (⅛ turn)

Oil Separator Tightening Specification



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

Oil Filter, Oil Cooler and Oil Pressure Switch Overview



1 - Accessory Bracket
2 - Oil Pressure Switch -F1-
☐ 20 Nm
3 - Gasket
☐ Always replace
4 - O-ring
☐ Always replace
5 - O-ring
☐ Always replace
6 - Valve Unit
7 - Oil Filter Element
☐ 22 Nm
8 - Bolt
☐ 15 Nm
9 - Connection

10 - Seal

- ☐ Always replace

11 - Engine Oil Cooler

12 - Gasket

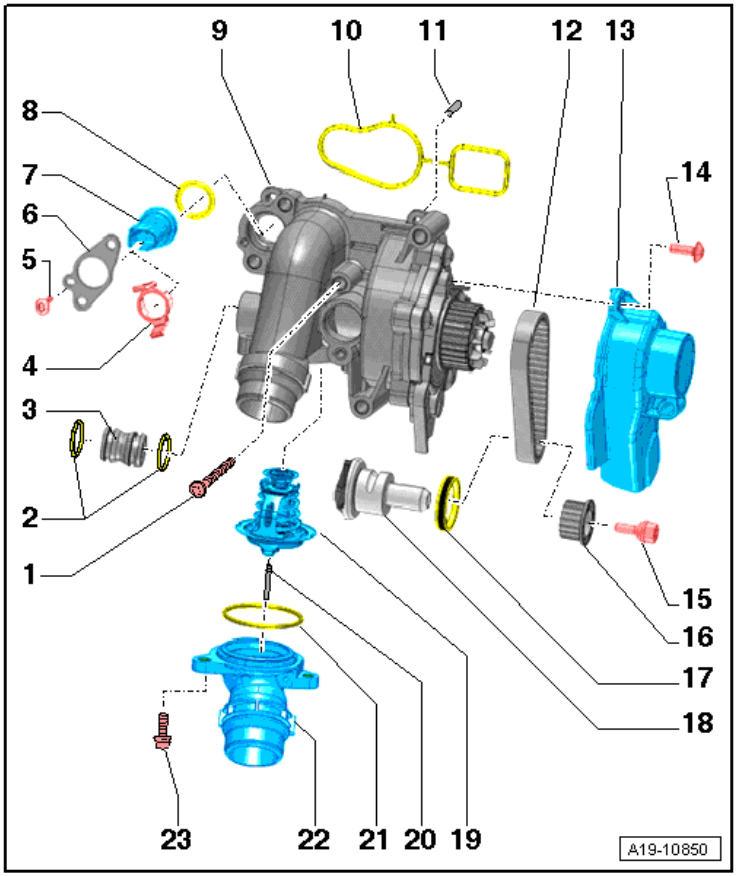
- ☐ Always replace

13 - Bolt

- ☐ Tightening sequence, refer to Ribbed Belt Drive Overview; Accessory Bracket Bolt Tightening Sequence

Cooling System – 2.0L CBFA and CCTA

Coolant Pump and Thermostat Overview



1 - Bolt
- ☐ 9 Nm
- ☐ Tightening sequence, see Coolant Pump Bolt Tightening Sequence below

2 - O-ring
- ☐ Always replace

3 - Connection

4 - Clip

5 - Bolt
- ☐ 4 Nm
- ☐ Only with the threaded version of the ECT sensor.

6 - Retaining Plate
- ☐ Only with the threaded version of the ECT sensor.

7 - Engine Coolant Temperature Sensor -G62-

8 - O-ring
- ☐ Always replace

9 - Coolant Pump

10 - Gasket
- ☐ Always replace

11 - Centering Pin

12 - Toothed Belt

13 - Toothed Belt Cover

14 - Bolt
- ☐ 9 Nm

15 - Bolt
- ☐ 10 Nm + 90° turn
- ☐ Always replace

16 - Toothed Belt Drive Gear

17 - Shaft Seal

18 - Balance Shaft

19 - Coolant Thermostat

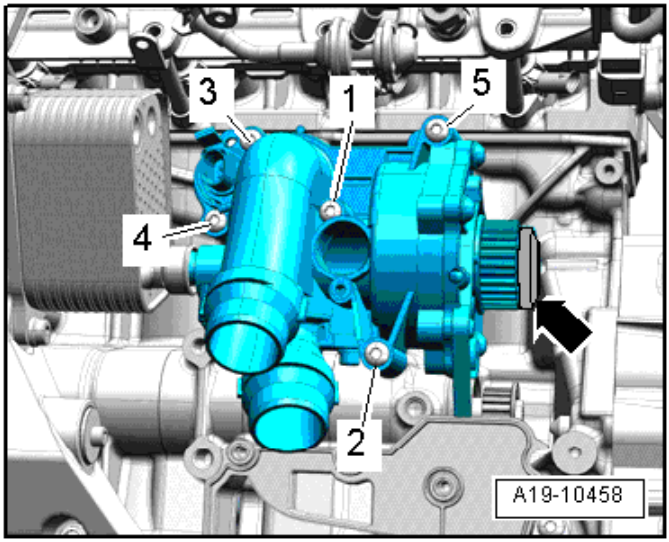
20 - Centering Pin

21 - O-ring
- ☐ Always replace

22 - Cover for Theremostat

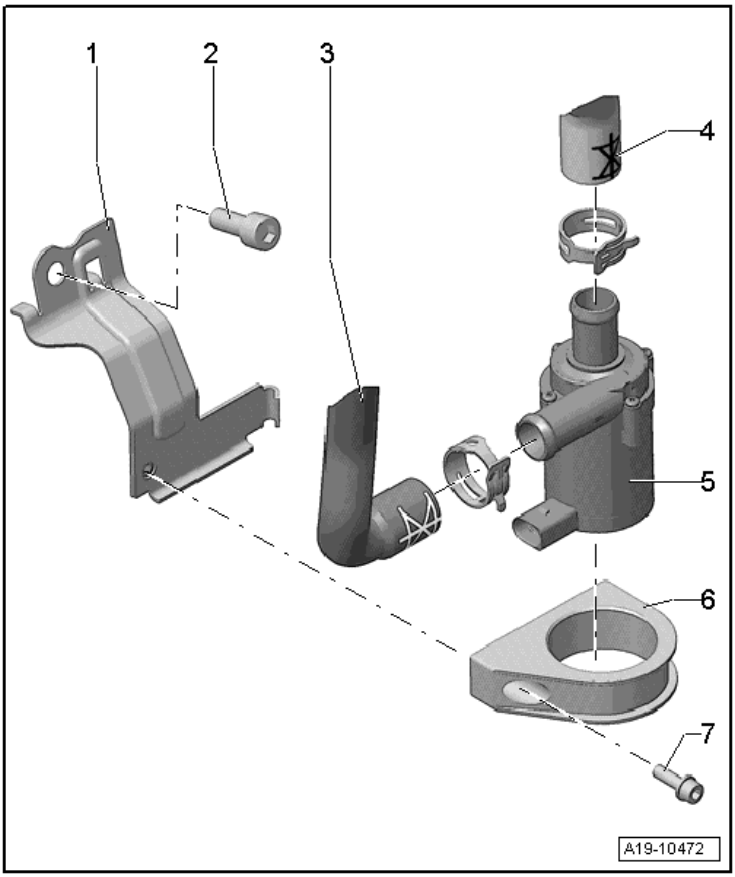
23 - Bolt
- ☐ 9 Nm

Coolant Pump Tightening Specification



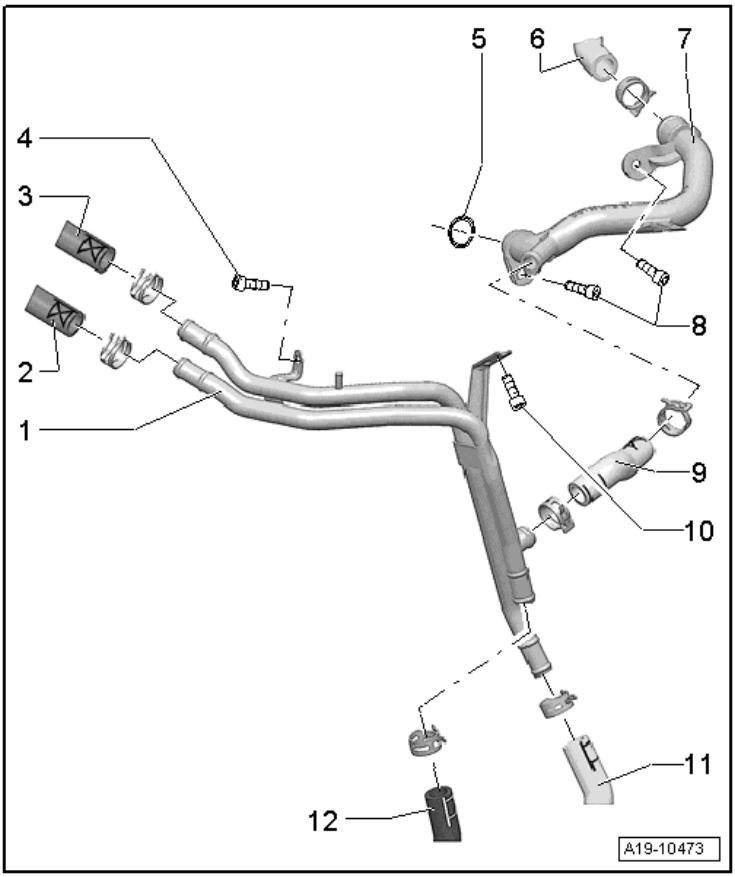
Step	Component	Nm
1	Tighten bolts 1 through 5 in sequence	9

After-Run Coolant Pump -V51- 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

Coolant Pipes Overview



1 - Front Coolant Pipes
2 - Coolant Hose
3 - Coolant Hose
4 - Bolt
- ☐ 3.5 Nm

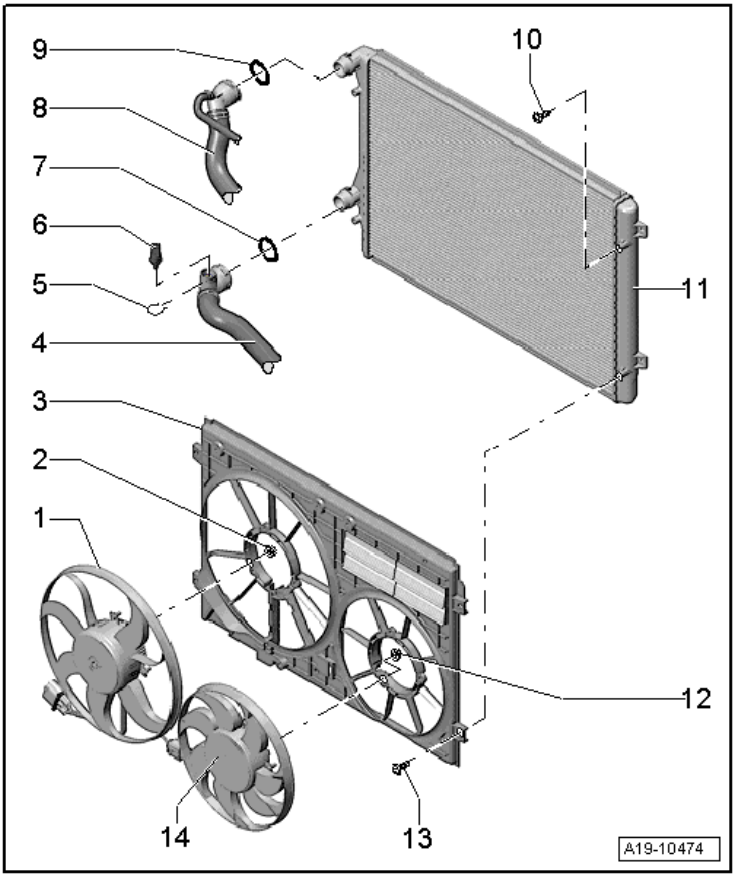
5 - O-ring
- ☐ Always replace

6 - Coolant Hose
7 - Small Coolant Pipe
8 - Bolt
- ☐ 9 Nm

9 - Coolant Hose
10 - Bolt
- ☐ 3.5 Nm

11 - Coolant Hose
12 - Coolant Hose

Radiator, Fan Shroud and Fan Overview



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

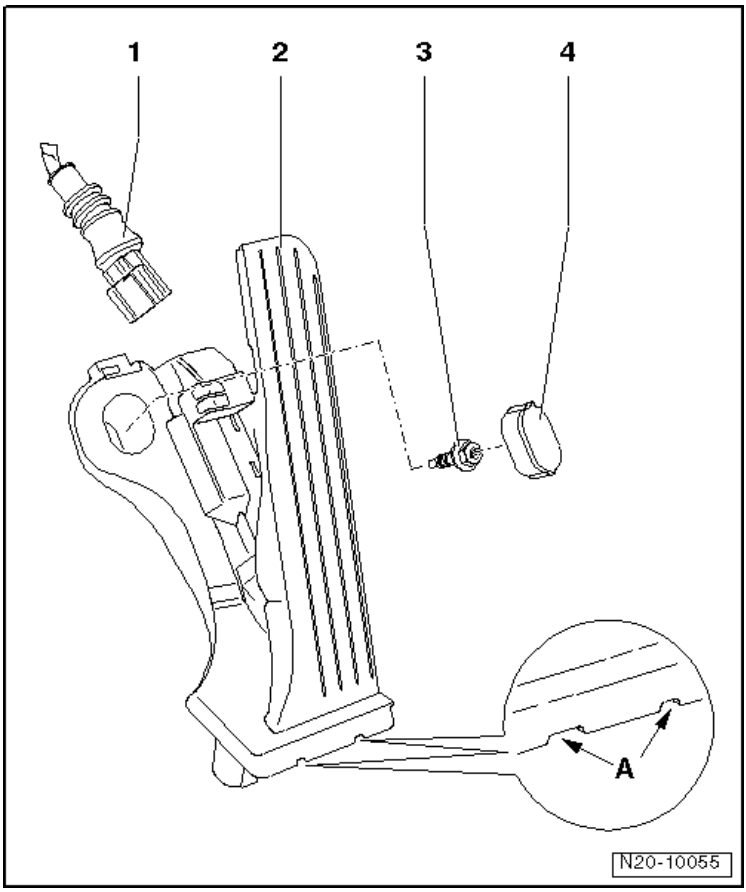
13 - Bolt

☐ 5 Nm

14 - Coolant Fan 2 -V177-

Fuel Supply – 2.0L CBFA and CCTA

Accelerator Pedal Module Overview



1 - Connector

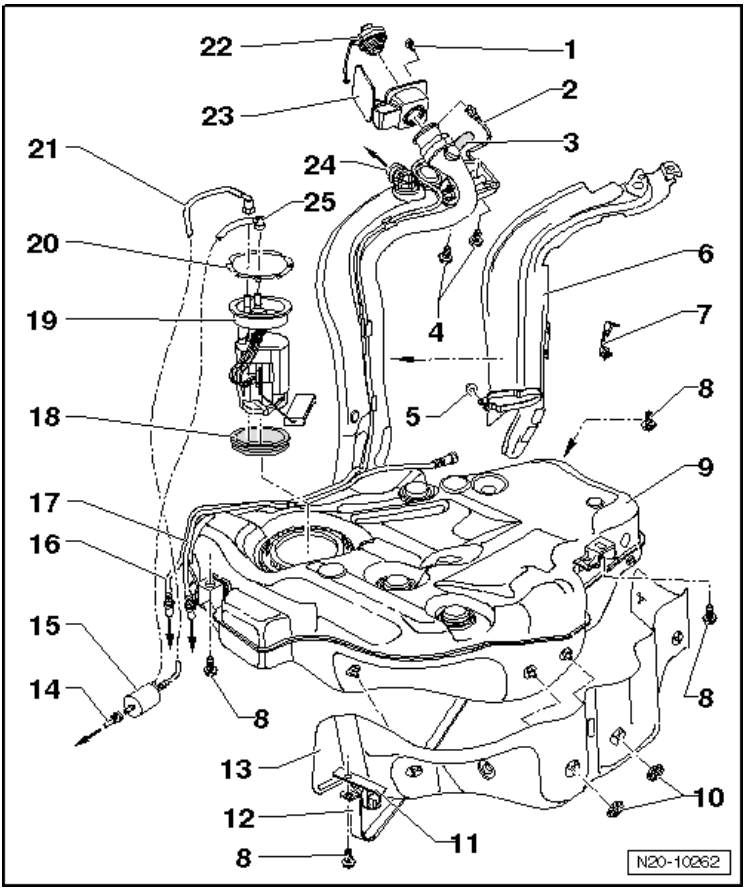
2 - Accelerator Pedal Position Sensor -G79- with Accelerator Pedal Position Sensor 2 -G185-

3 - Bolt

☐ 22 Nm

4 - Cap

Fuel Tank and Attachments Overview



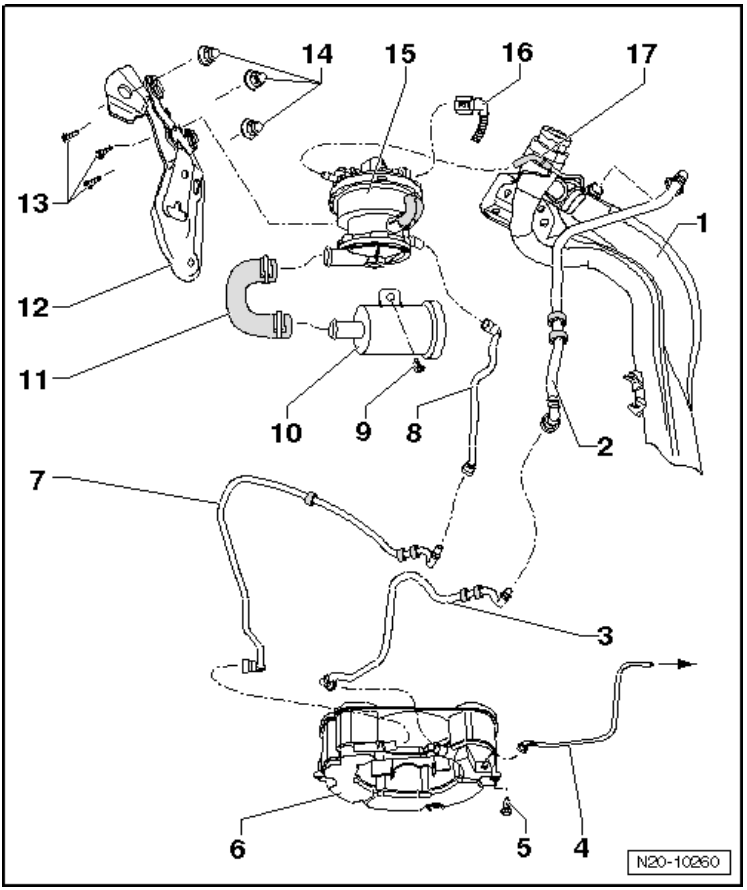
1 - Bolt
2 - Ground Connection
3 - Vacuum Line
4 - Bolt
☐ 10 Nm
5 - Rivet
6 - Protective Plate
7 - Wire Bracket
8 - Bolt
☐ 25 Nm
9 - Fuel Tank
10 - Retainer
11 - Exhaust System Bracket
12 - Securing Strap
13 - Heat Shield
14 - Supply Line
15 - Fuel Filter

16 - Vacuum Line
17 - Vent Line
18 - Seal
- ☐ Always replace

19 - Fuel Delivery Unit
20 - Lock Ring
- ☐ 110 Nm

21 - Return Line
22 - Cap
23 - Fuel Filler Door Unit
24 - To EVAP Canister
25 - Supply Line

EVAP System Overview



1 - Fuel Filler Tube
2 - Vent Line
3 - Vent Line
4 - Vent Line
5 - Bolt
☐ 8 Nm
6 - EVAP Canister
7 - Connecting Line
8 - Connecting Line
9 - Bolt
☐ 3 Nm
10 - Air Filter Housing
11 - Connecting Hose
12 - Bracket
13 - Bolt
☐ 2 Nm

14 - Nut

☐ 6 Nm

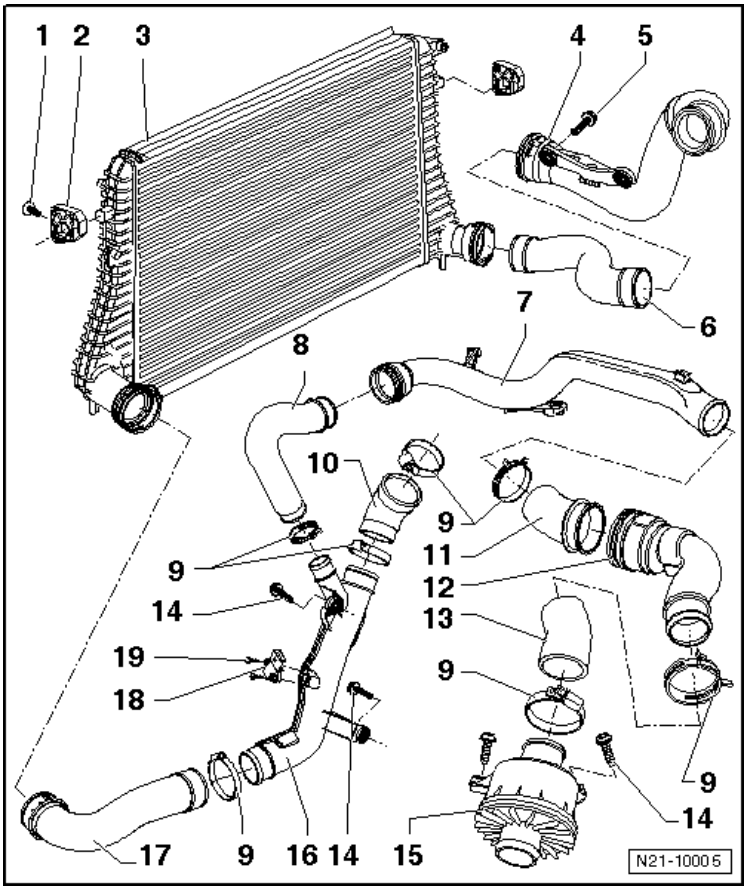
15 - Leak Detection Pump -V144-

16 - Connector

17 - Vacuum Line

Turbocharger – 2.0L CBFA and CCTA

Charge Air Cooler System 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 - 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

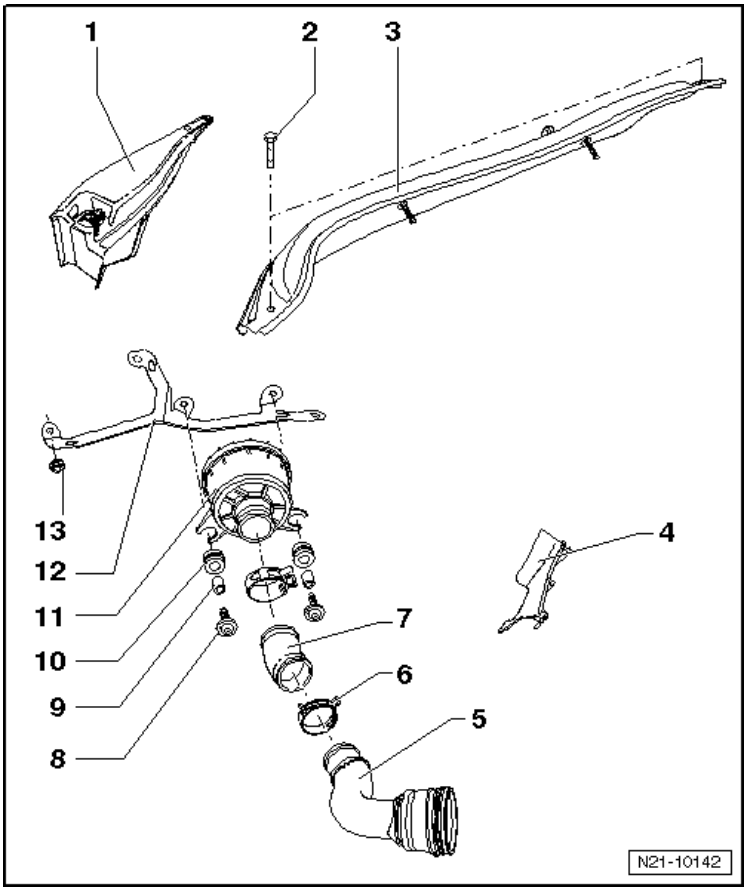
17 - Charge Air Hose

18 - Charge Air Pressure Sensor -G31-

19 - Bolt

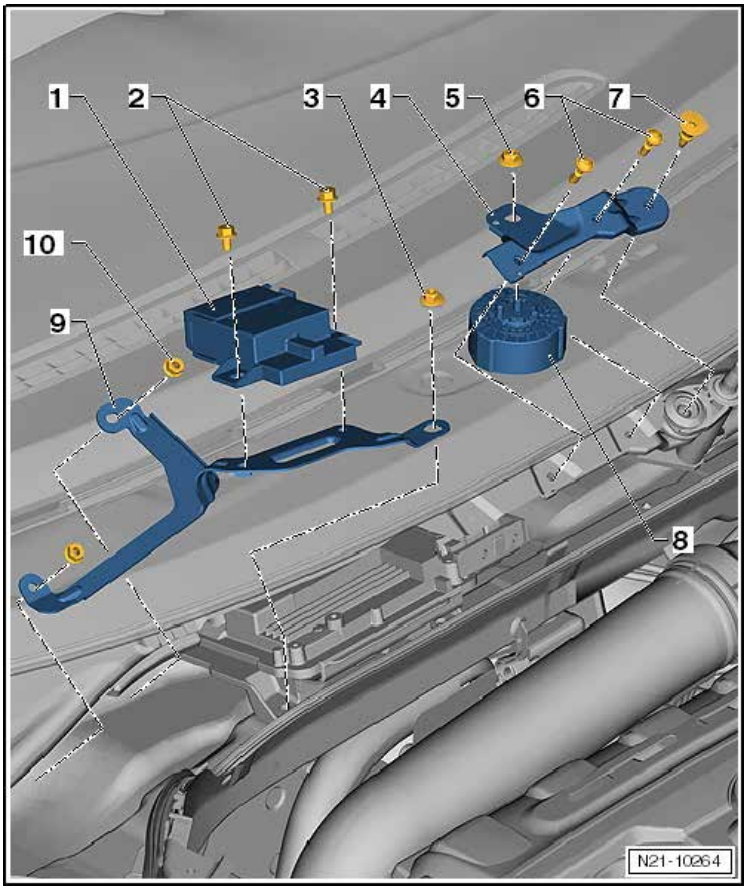
- ☐ 5 Nm

Noise Generator Overview



1 - Cover
2 - Bolt
☐ 8 Nm
3 - Plenum Chamber Bulkhead
4 - Hood
5 - Charge Air Pipe
6 - Clmap
7 - Charge Air Hose
8 - Bolt
☐ 8 Nm
9 - Spacer Sleeve
10 - Rubber Bushing
11 - Noise Generator
12 - Bracket
13 - Nut
☐ 8 Nm

Structure-Borne Sound Actuator -R214- and Structure-Borne Sound Control Module -J869- Overview



1 - Structure Borne Sound Control Module -J869-
2 - Bolt
- ☐ 8 Nm

3 - Nut
- ☐ 8 Nm

4 - Structure-Borne Sound Actuator -R214- Bracket
5 - Nut
- ☐ 15 Nm

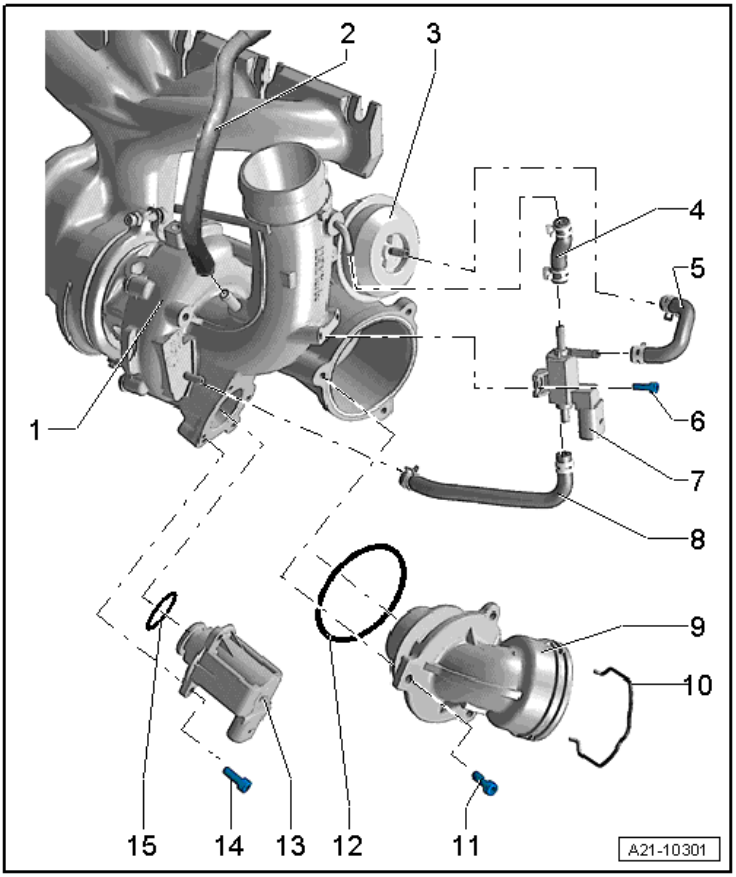
6 - Bolt
- ☐ 8 Nm

7 - Bolt
- ☐ 8 Nm

8 - Structure-Borne Sound Actuator -R214-

9 - Structure Borne Sound Control Module -J869- Bracket
10 - Nut
- ☐ 8 Nm

Wastegate Bypass Regulator Valve -N75- and Turbocharger Recirculation Valve -N249-

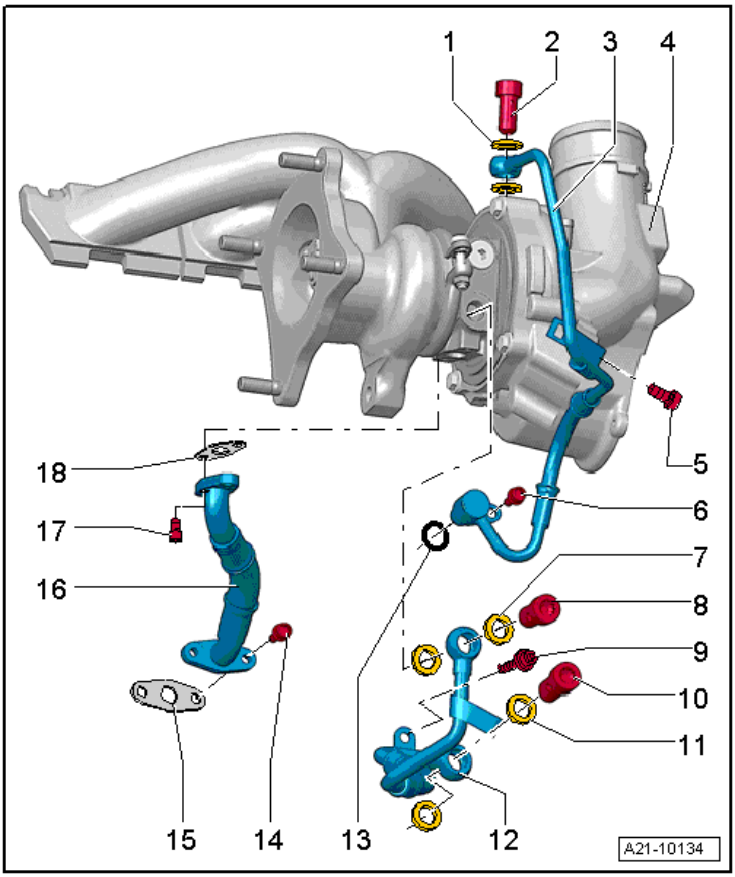


1 - Turbocharger
2 - To Evaporative Emission (EVAP) Canister
3 - Turbocharger Vacuum Diaphragm
4 - Hose
5 - Hose
6 - Bolt
☐ 3 Nm
7 - Wastegate Bypass Regulator Valve -N75-
8 - Hose
9 - Connection
10 - Clip
11 - Bolt
☐ 9 Nm
12 - Seal

13 - Turbocharger Recirculation Valve -N249-
14 - Bolt
- ☐ 7 Nm

15 - Seal

Coolant Supply and Oil Return Pipes Overview



1 - Seal
- ☐ Always replace

2 - Banjo Bolt
- ☐ 33 Nm

3 - Oil Supply Pipe

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 Pipe

13 - O-ring
- ☐ Always replace

14 - Bolt
- ☐ 9 Nm

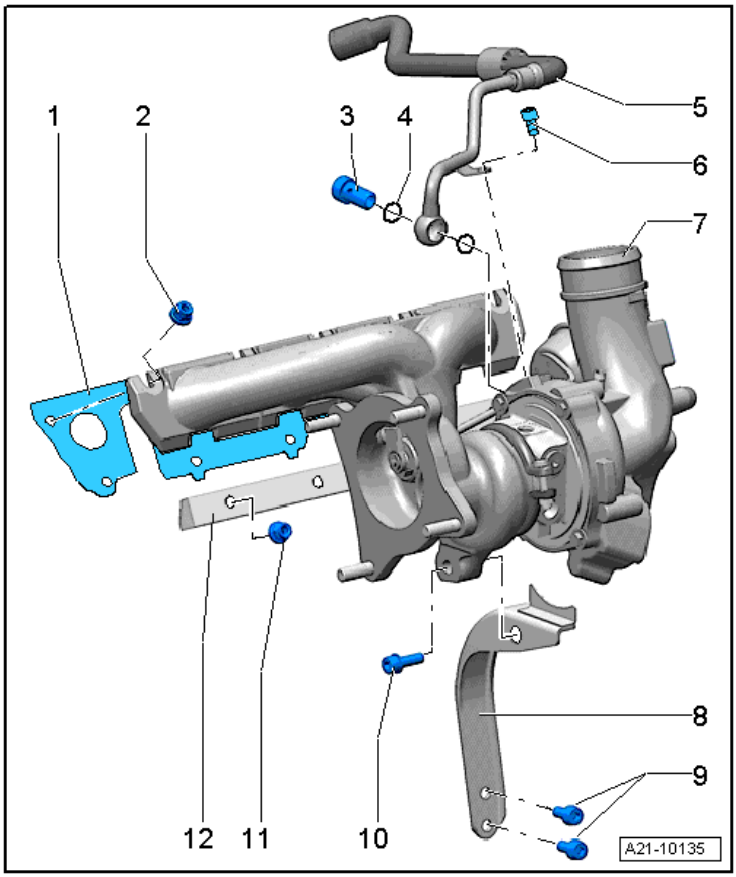
15 - Seal
- ☐ Always replace

16 - Oil Return Pipe

17 - Bolt
- ☐ 9 Nm

18 - Seal
- ☐ Always replace

Turbocharger and Coolant Return Pipe Overview



1 - Gasket
- ☐ Always replace

2 - Nut
- ☐ Tightening sequence, see Turbocharger Nut Tightening Sequence below
- ☐ Always replace
- ☐ Coat exhaust manifold stud bolts with Hot Bolt Paste -G 052 112 A3-.

3 - Banjo Bolt
- ☐ 38 Nm

4 - Seal
- ☐ Always replace

5 - Coolant Return Pipe

6 - Bolt
- ☐ 9 Nm

7 - Turbocharger

8 - Bracket

9 - Bolt

- ☐ 30 Nm
- ☐ Coat the bolt with Hot Bolt Paste -G 052 112 A3-.

10 - Bolt

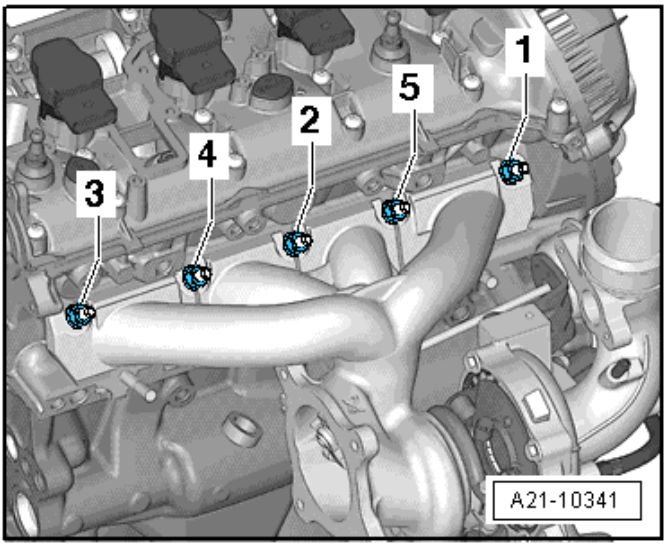
- ☐ 30 Nm
- ☐ Coat the bolt with Hot Bolt Paste -G 052 112 A3-.

11 - Nut

- ☐ 30 Nm
- ☐ Always replace
- ☐ Coat the exhaust manifold stud bolts with Hot Bolt Paste -G 052 112 A3-.

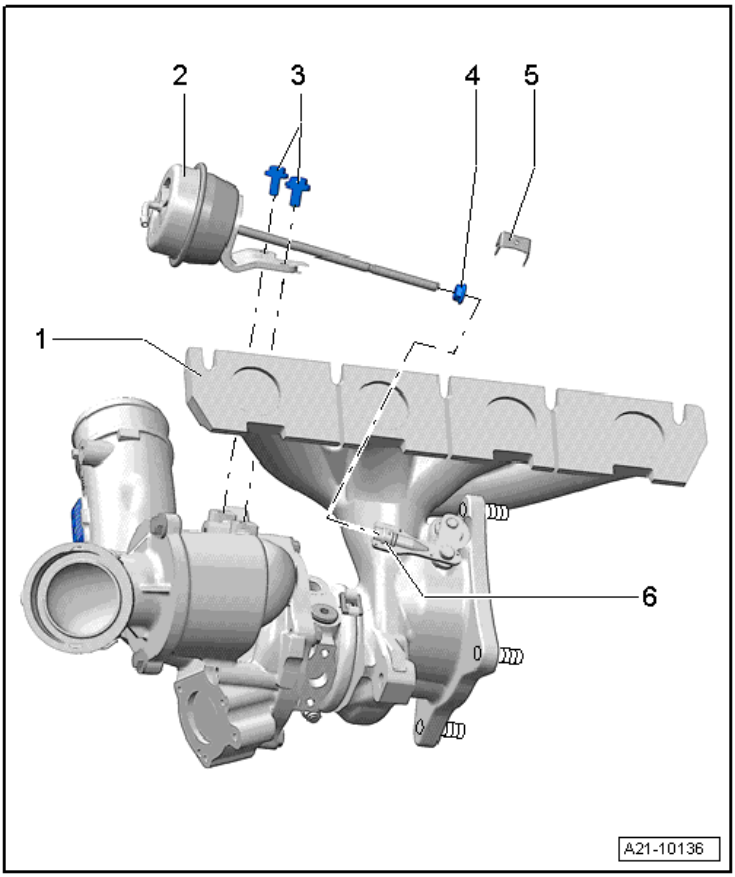
12 - Fastening Strip

Turbocharger Nut Tightening Specifications



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

Vacuum Diaphragm Overview



1 - Turbocharger
2 - Vacuum Diaphragm
3 - Bolt
- ☐ 10 Nm

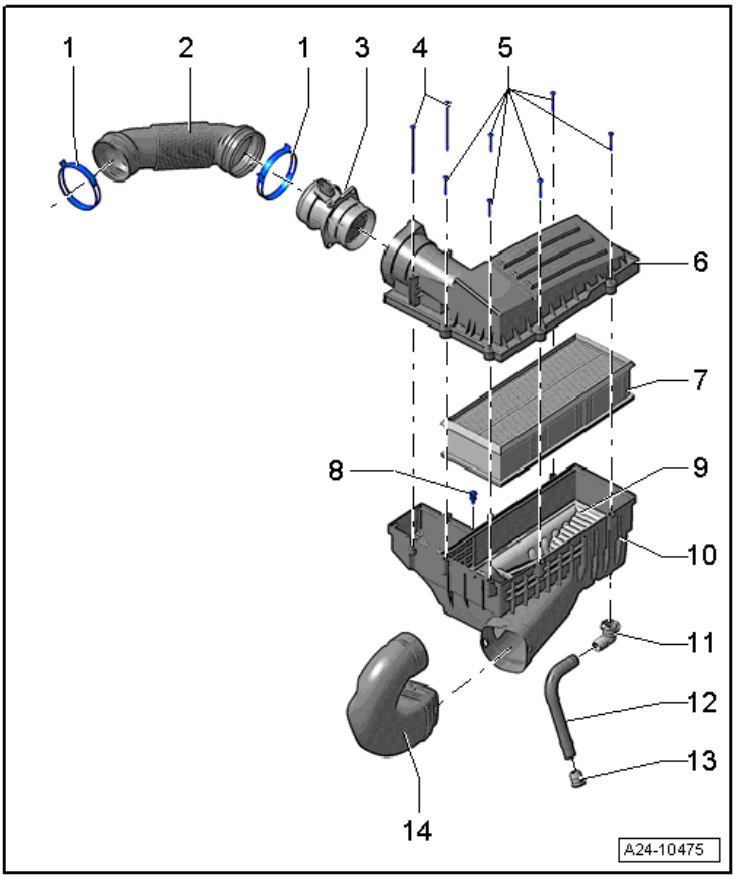
4 - Nut
- ☐ 9 Nm
- ☐ Not available with engine codes CCTA and CBFA.

5 - Securing Plate
- ☐ Not available with engine codes CCTA and CBFA.

6 - Knurled Nut
- ☐ Not available with engine codes CCTA and CBFA.

Multiport Fuel Injection – 2.0L CBFA and CCTA

Air Filter Housing Overview



1 - Spring Clamp
2 - Connecting Pipe
3 - Mass Airflow Sensor -G70-
4 - Bolt
- ☐ 1.5 Nm

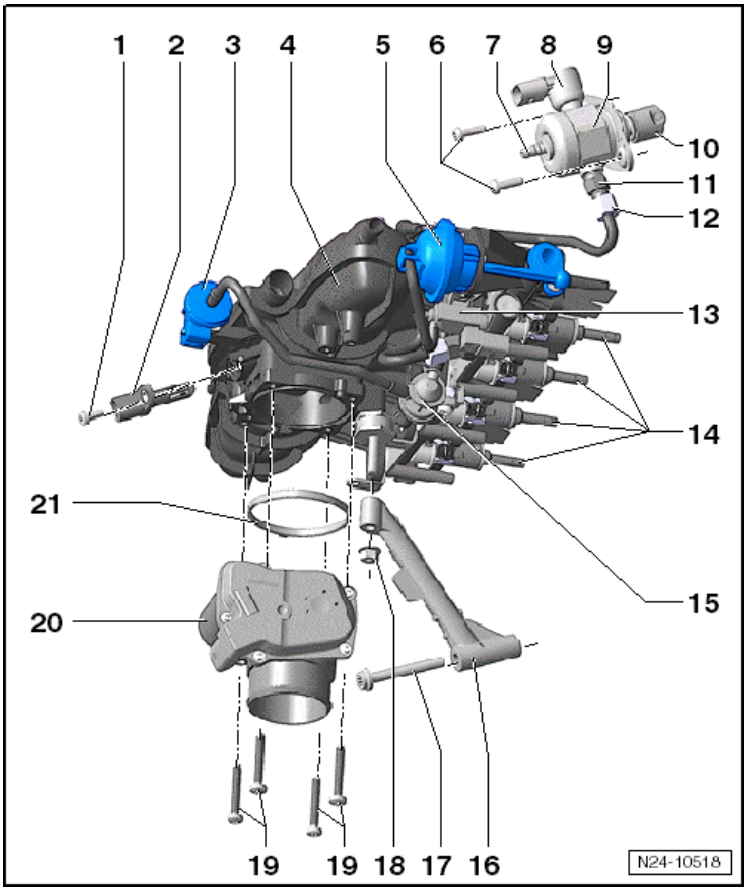
5 - Bolt
- ☐ 1.5 Nm

6 - Upper Air Filter Housing
7 - Air Filter Element
8 - Bolt
- ☐ 8 Nm

9 - Snow Screen
- ☐ Not installed on all vehicles.

10 - Lower Air Filter Housing
11 - Water Drain Hose Connection
12 - Water Drain Hose
13 - Shutter Valve
14 - Intake Air Duct

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 Diaphragm for the Channel Separating Plate
6 - Bolt
- ☐ M6 threads = 8 Nm + 90° turn
- ☐ M8 threads = 20 Nm
- ☐ Always replace

7 - Fuel Line Connection
8 - Fuel Pressure Regulator Valve -N276-
9 - High Pressure Pump
10 - Cam Follower
11 - High Pressure Fuel Line Connection
12 - Fuel Supply Line to High Pressure Fuel Pump
- ☐ 18 Nm

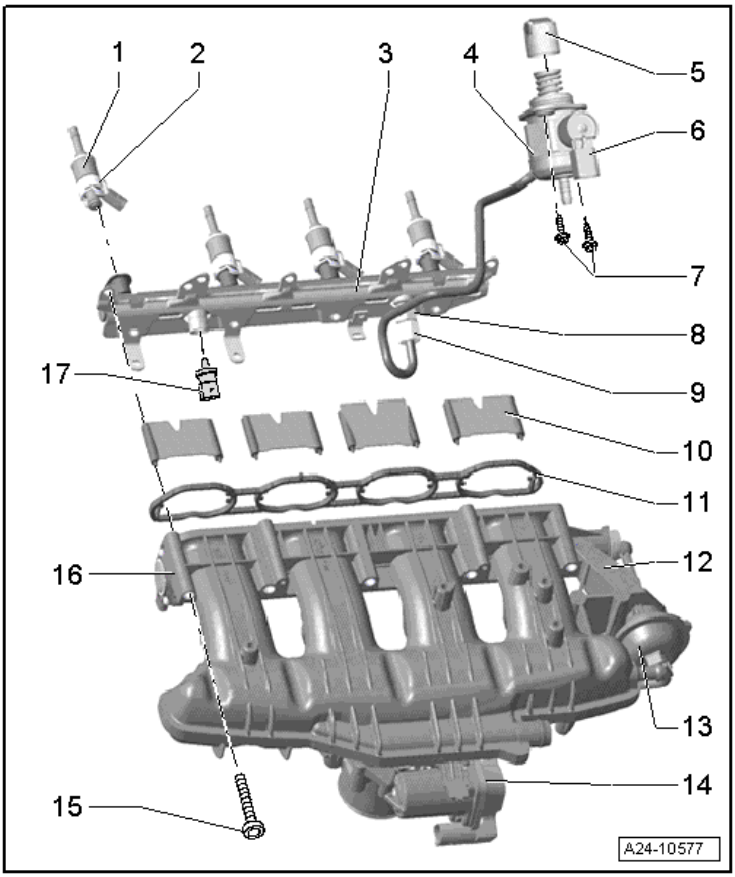
13 - Intake Manifold Runner Control Valve -N316-
14 - Fuel Injector
15 - Check Valve/Restrictor
16 - Intake Manifold Support
17 - Bolt
- ☐ 23 Nm

18 - Nut
- ☐ 10 Nm

19 - Bolt
- ☐ 5 Nm

20 - Throttle Valve Control Module -J338-
21 - Seal
- ☐ Always replace

Fuel Rail and Injector Overview



1 - Fuel Injector
2 - Support Ring
3 - Fuel Rail
4 - High Pressure Pump
5 - Cam Follower
6 - Fuel Pressure Regulator Valve -N276-
7 - Bolt
- ☐ M6 threads = 8 Nm + 90° turn
- ☐ M8 threads = 20 Nm
- ☐ Always replace

8 - Fuel Supply Line Connection
- ☐ 22 Nm
- ☐ Always replace

9 - Fuel Supply Line to Fuel Rail
- ☐ 18 Nm

10 - Channel Separating Plates

11 - Seal

- ☐ Always replace

12 - Intake Manifold

13 - Vacuum Diaphragm for the Channel Separating Plate

14 - Throttle Valve Control Module -J338-

15 - Bolt

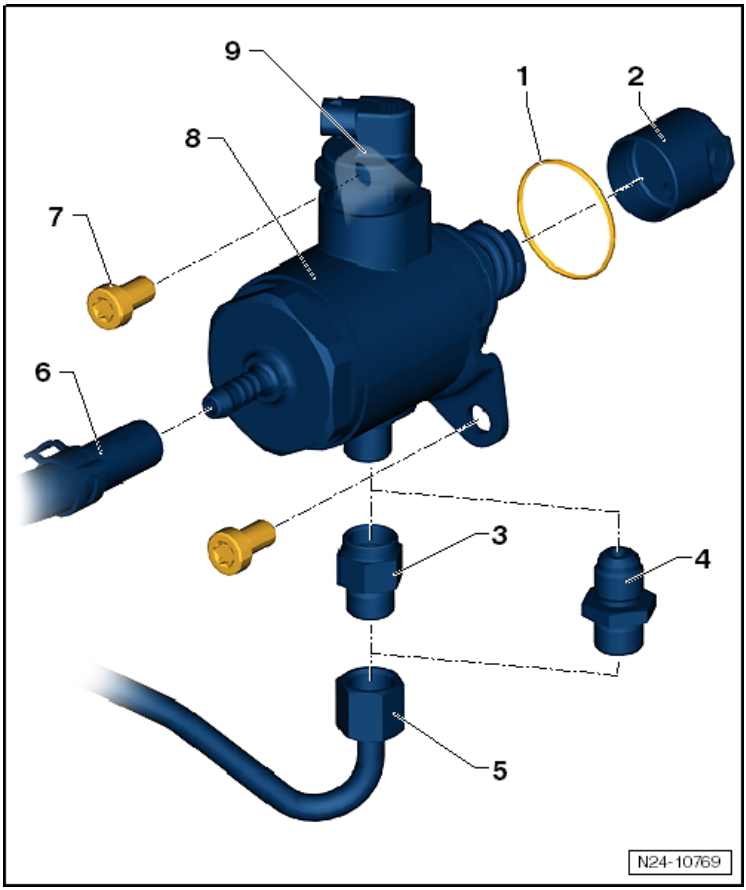
- ☐ Tighten to 3 Nm, and then tighten to 9 Nm.

16 - Intake Manifold Runner Position Sensor -G336-

17 - Fuel Pressure Sensor -G247-

- ☐ 27 Nm
- ☐ Coat threads with clean engine oil.

High Pressure Pump Overview



1 - O-ring
- ☐ Always replace

2 - Cam Follower

3 - High Pressure Fuel Line Connection (with Inner Threads)
- ☐ 40 Nm
- ☐ Always replace

4 - High Pressure Fuel Line Connection (with Outer Threads)
- ☐ 25 Nm
- ☐ Always replace

5 - High Pressure Fuel Line Union Nut
- ☐ 18 Nm

6 - Fuel Supply Line from the Fuel Tank

7 - Bolt
- ☐ M6 threads = 8 Nm + 90° turn
- ☐ M8 threads = 20 Nm
- ☐ Always replace

8 - High Pressure Pump

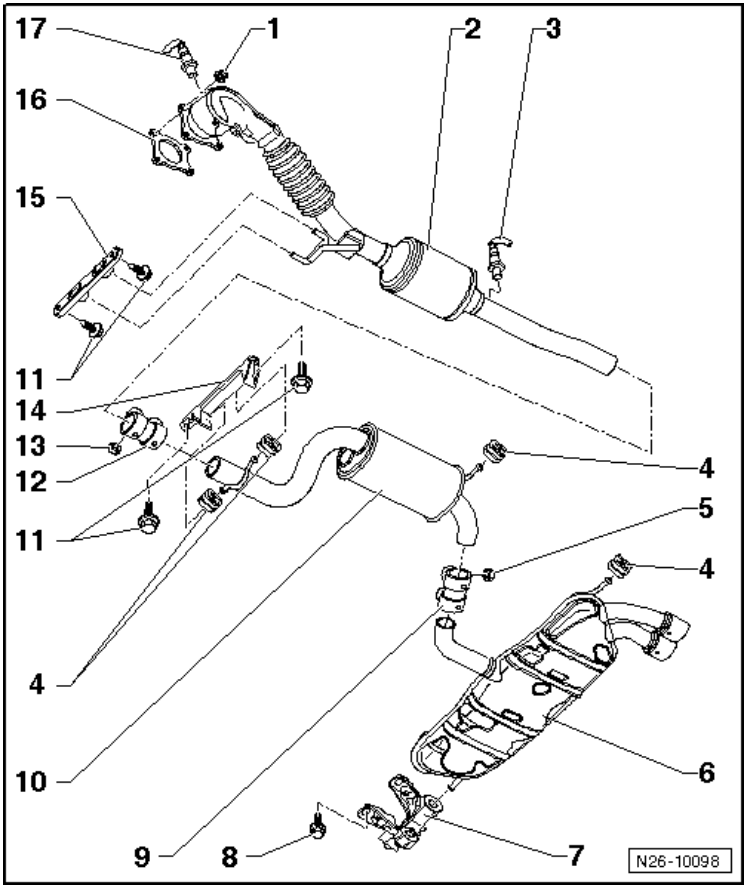
Technical Data

Engine codes	CBFA and CCTA
Idle check	
Idle speed (RPM) [1)]	640 to 800
Engine speed (RPM) limitation	approximately 6500

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

Exhaust System – 2.0L CBFA and CCTA

Exhaust System Overview



1 - Nut

- ☐ 40 Nm
- ☐ Always replace.
- ☐ Coat the stud bolts on the exhaust manifold with Hot Bolt Paste -G 052 112 A3-.

2 - Front Exhaust Pipe with Catalytic Converter

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

- ☐ 55 Nm
- ☐ When reusing the old Oxygen Sensor after Three Way Catalytic Converter -G130-, grease only the threads with Hot Bolt Paste -G 052 112 A3-, the paste must not get into the slots in the oxygen sensor body.

4 - Retaining Loop

5 - Nut

- ☐ Clamping sleeve with 2 individual clamps: 25 Nm
- ☐ Clamping sleeve with a continuous clamp: 35 Nm

6 - Rear Muffler

7 - Suspended Mount

8 - Bolt

- ☐ 25 Nm

9 - Rear Clamping Sleeve

10 - Center Muffler

11 - Bolt

- ☐ 25 Nm

12 - Front Clamping Sleeve

13 - Nut

- ☐ Clamping sleeve with 2 individual clamps: 25 Nm
- ☐ Clamping sleeve with a continuous clamp: 35 Nm

14 - Suspended Mount

15 - Suspended Mount

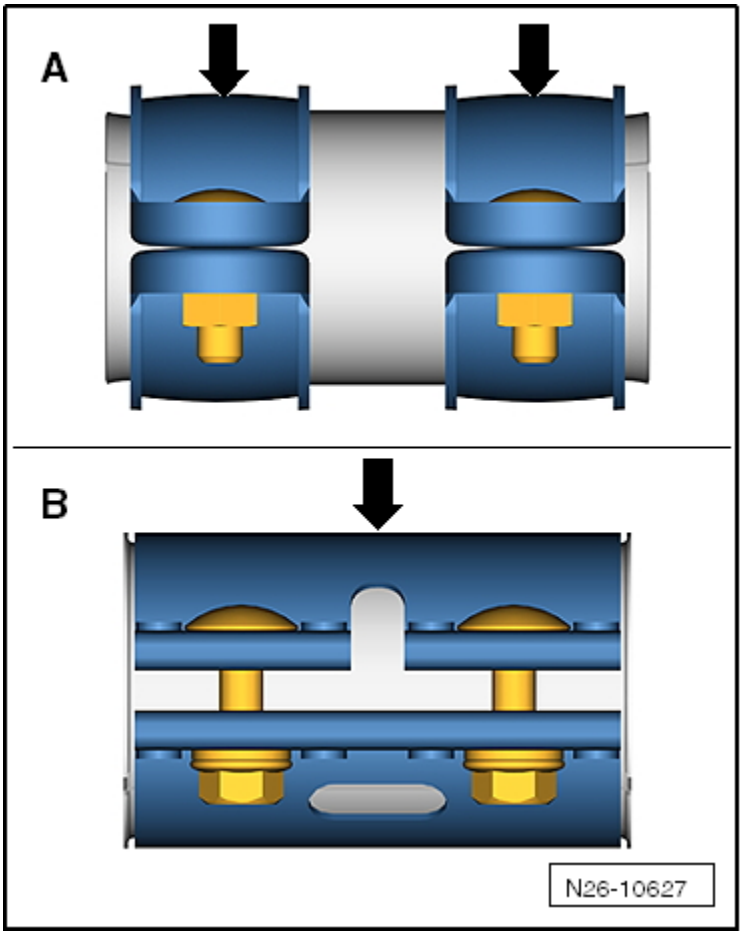
16 - Gasket

- ☐ Always replace

17 - Heated Oxygen Sensor -G39-

- ☐ 55 Nm
- ☐ When reusing the old Heated Oxygen Sensor -G39-, grease only the threads with Hot Bolt Paste -G 052 112 A3-, the paste must not get into the slots in the oxygen sensor body.

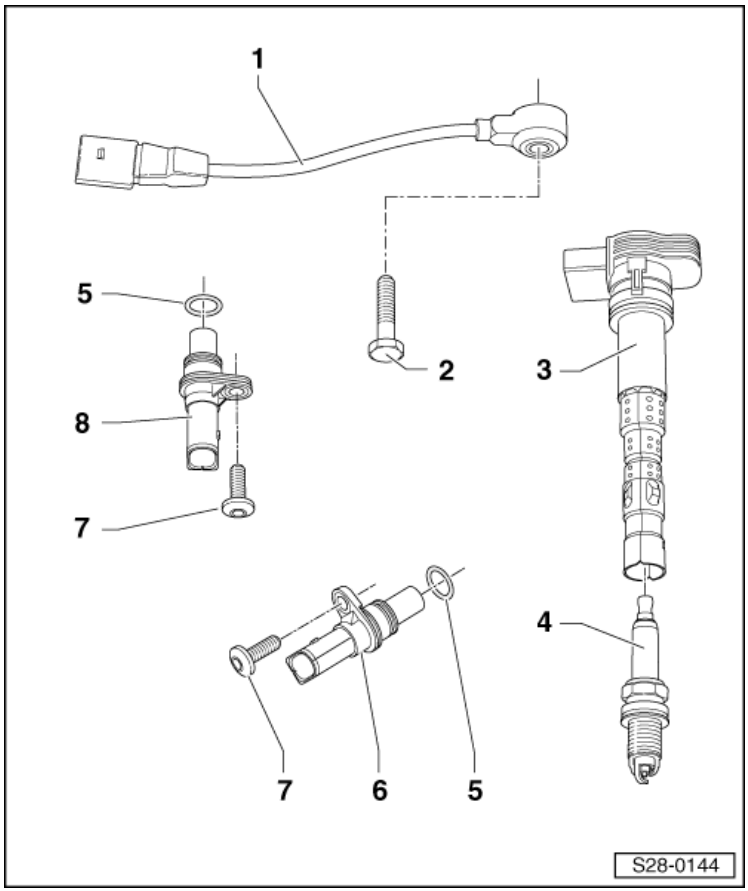
Tightening Torque and Installed Dimension of the Clamping Sleeve



-A- Clamping sleeve with two individual clamps.	
1	Tightening specification: 25 Nm
2	Installed dimension -a-: 5 mm (only for the front clamping sleeve)
-B- Clamping sleeve with a continuous clamp.	
1	Tightening specification: 35 Nm
2	Installed dimension -a-: 8.5 mm (only for front clamping sleeve)

Ignition – 2.0L CBFA and CCTA

Ignition System Component Overview



1 - Knock Sensor 1 -G61-

2 - Bolt

- ☐ 20 Nm

3 - Ignition Coil 1 with Power Output Stage -N70-, Ignition Coil 2 with Power Output Stage -N127-, Ignition Coil 3 with Power Output Stage -N291- and Ignition Coil 4 with Power Output Stage -N292-

4 -Spark Plug

- ☐ 5 Nm

5 - O-ring

- ☐ Always replace

6 - O-ring

- ☐ Always replace

7 - Bolt

- ☐ 10 Nm

8 - Camshaft Position Sensor -G40-

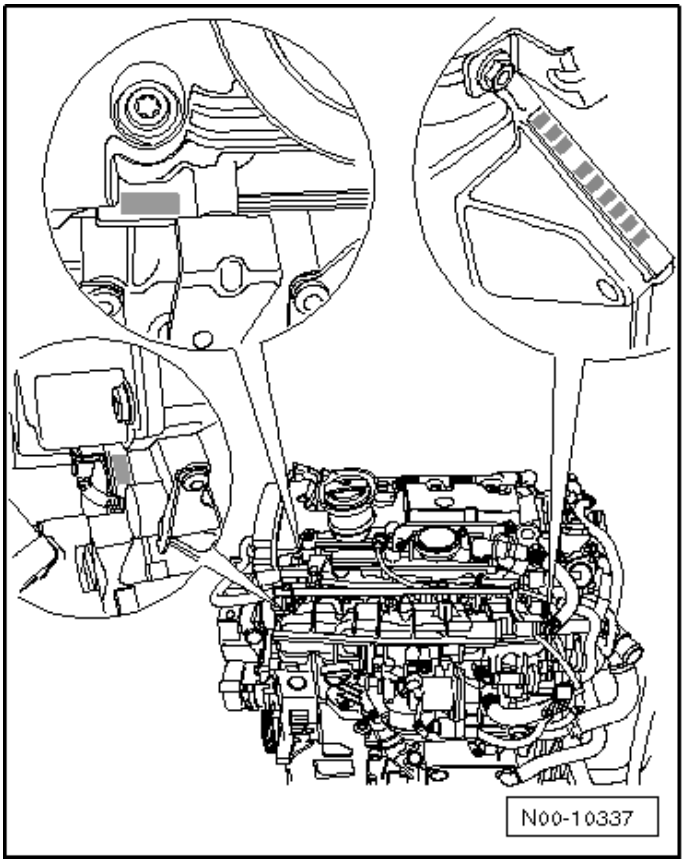
Technical Data

Engine codes	**CBFA and CCTA**
Ignition sequence	1-3-4-2
Spark plugs	
VW/Audi	101 905 631 H
Electrode gap	1.0 to 1.1 mm
Tightening specifications	25 Nm
Change intervals	Refer to Maintenance Intervals Rep. Gr. 03

ENGINE MECHANICAL – 2.0L CRZA

General, Technical Data

Engine Number Location



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

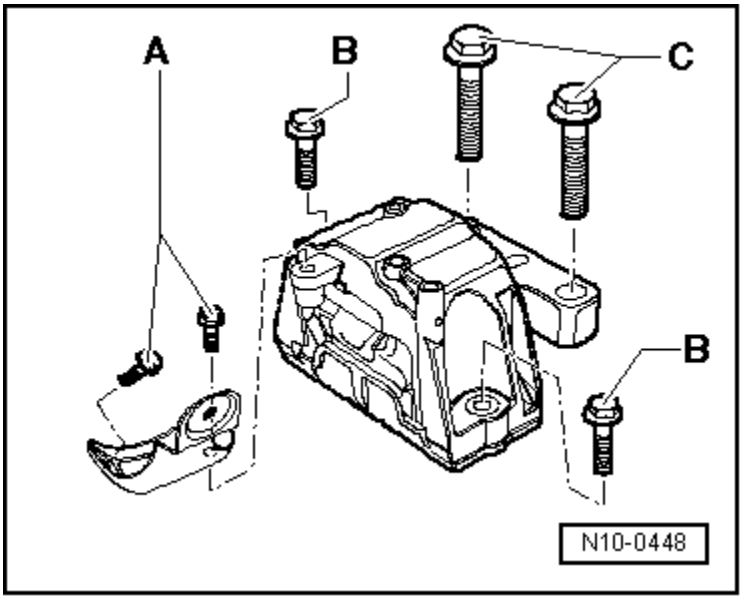
The engine code is also printed on the cylinder block behind the oil filter.

Engine Data

Engine code		**CRZA**
Manufactured		from 10.11
Emission values in accordance with		ULEV II
Displacement	cm^3	1984
Output	KW at RPM	188 @ 6000
Torque	Nm at RPM	330 @ 2500
Bore	diameter mm	82.5
Stroke	mm	92.8
Compression ratio		9.8
Valves per cylinder		4
Research Octane Number (RON)		98
Fuel injection, ignition		Motronic MED 9.1
Mixture generation		Uniform
Knock control		2 sensors
Oxygen Sensor (O2) regulation		2 sensors
Catalytic converter		Yes
Variable valve timing		Yes
Electronic Power Control (EPC)		Yes

Engine Assembly – 2.0L CRZA

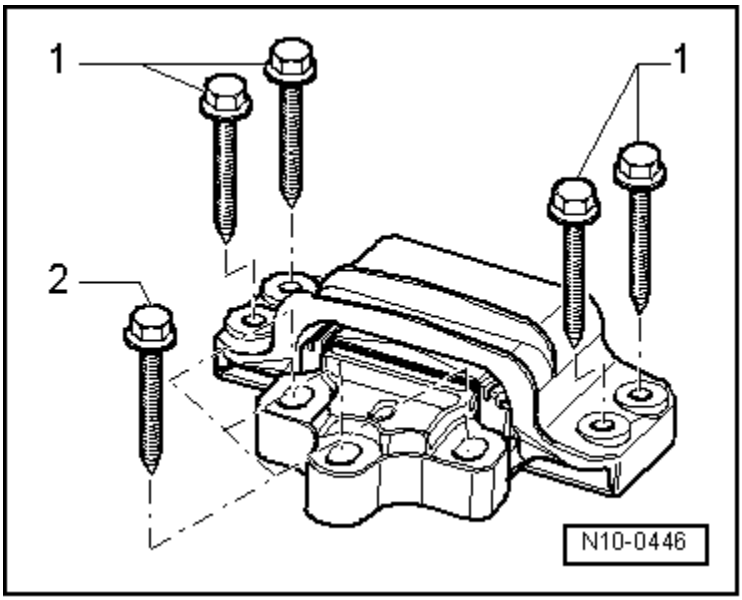
Engine Mount Tightening Specifications



Component	Nm
Bolts A [1)]	20 plus an additional 90° (¼ turn)
Bolts B [1)]	40 plus an additional 90° (¼ turn)
Bolts C [1)]	60 plus an additional 90° (¼ turn)

[1)] Replace fastener(s).

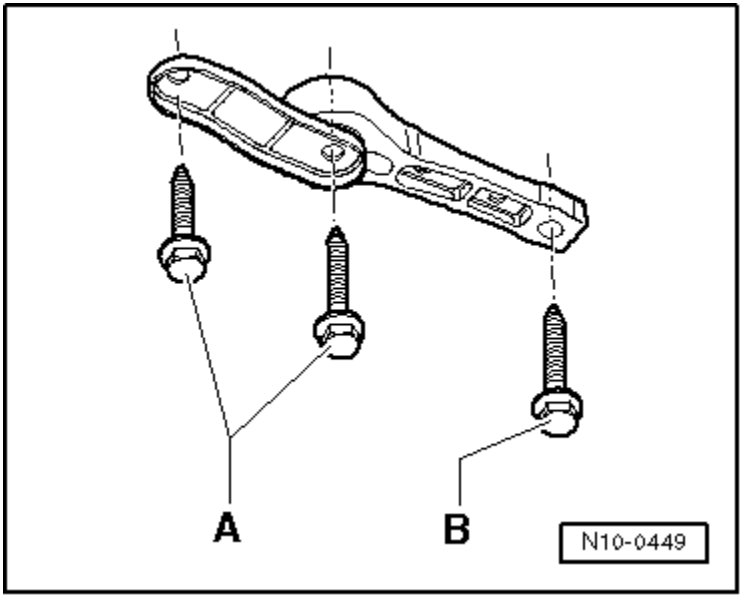
Transmission Mount Tightening Specifications



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

[1)] Replace fastener(s).

Pendulum Support Tightening Specifications



Component	Nm
Bolts A with a strength category of 8.8 [1]	40 plus an additional 90° (¼ turn)
Bolts A with a strength category of 10.9 [1]	50 plus an additional 90° (¼ turn)
Bolt B [1]	100 plus an additional 90° (¼ turn)

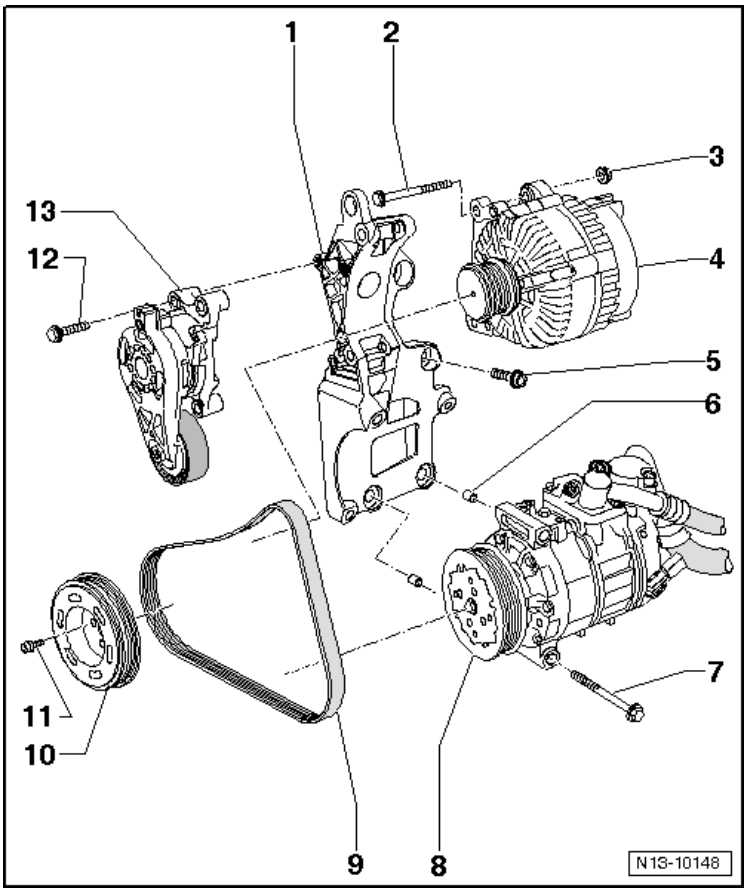
[1] Replace fastener(s).

Fastener Tightening Specifications

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

Crankshaft, Cylinder Block – 2.0L CRZA

Ribbed Belt Drive Overview



1 - Accessory Bracket
- ☐ Follow the tightening sequence, see Accessory Bracket Tightening Sequence below

2 - Bolt
- ☐ 23 Nm

3 - Nut
- ☐ 23 Nm

4 - Generator

5 - Bolt
- ☐ 40 Nm
- ☐ Follow the tightening sequence, see Accessory Bracket Tightening Sequence below

6 - Bushing

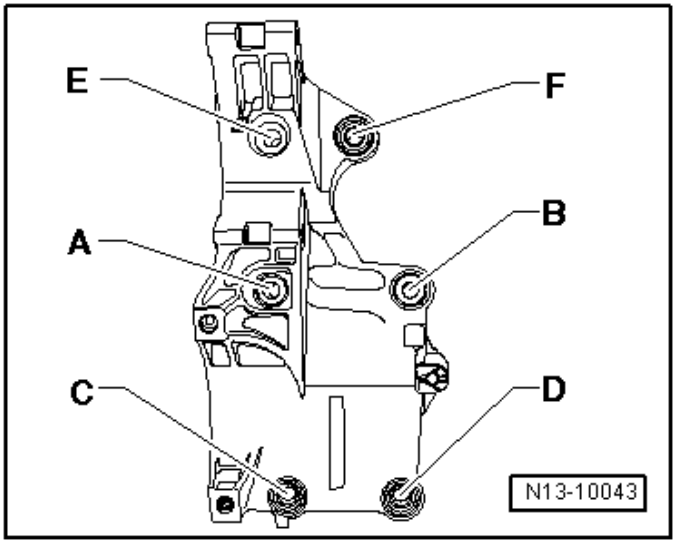
7 - Bolt
- ☐ 25 Nm

8 - Air Conditioning (A/C) Compressor
9 - Ribbed Belt
10 - Vibration Damper
11 - Bolt
- ☐ 20 Nm + 90° turn
- ☐ Always replace

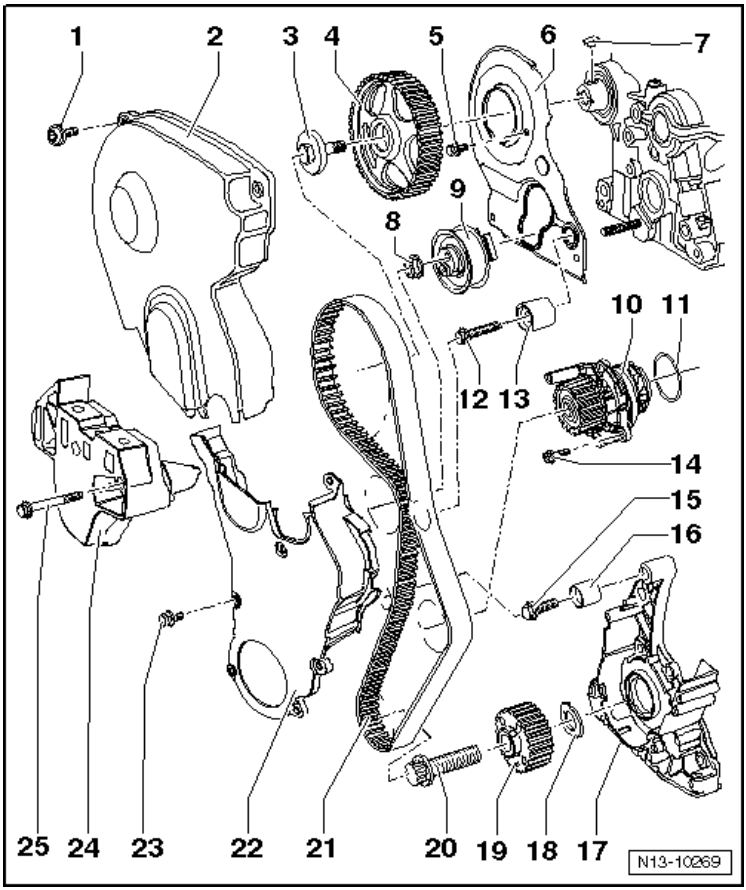
12 - Bolt
- ☐ 23 Nm

13 - Ribbed Belt Tensioner

Accessory Bracket Bolt Tightening Sequence



Toothed Belt Overview



1 - Bolt
- ☐ 10 Nm

2 - Upper Toothed Belt Guard

3 - Bolt
- ☐ 50 Nm + 180° turn
- ☐ Always replace

4 - Camshaft Sprocket

5 - Bolt
- ☐ 10 Nm
- ☐ Install using locking fluid.

6 - Rear Toothed Belt Guard

7 - Woodruff Key

8 - Nut
- ☐ 25 Nm

9 - Toothed Belt Tensioner

10 - Coolant Pump

11 - O-ring
- ☐ Always replace

12 - Bolt
- ☐ 25 Nm

13 - Idler Roller

14 - Bolt
- ☐ 15 Nm

15 - Bolt
- ☐ 35 Nm

16 - Idler Roller

17 - Sealing Flange

18 - Disc (Diamond Coated)
- ☐ Replace

19 - Crankshaft Toothed Belt Gear

20 - Bolt
- ☐ 90 Nm + 90° turn
- ☐ Always replace

21 - Toothed Belt

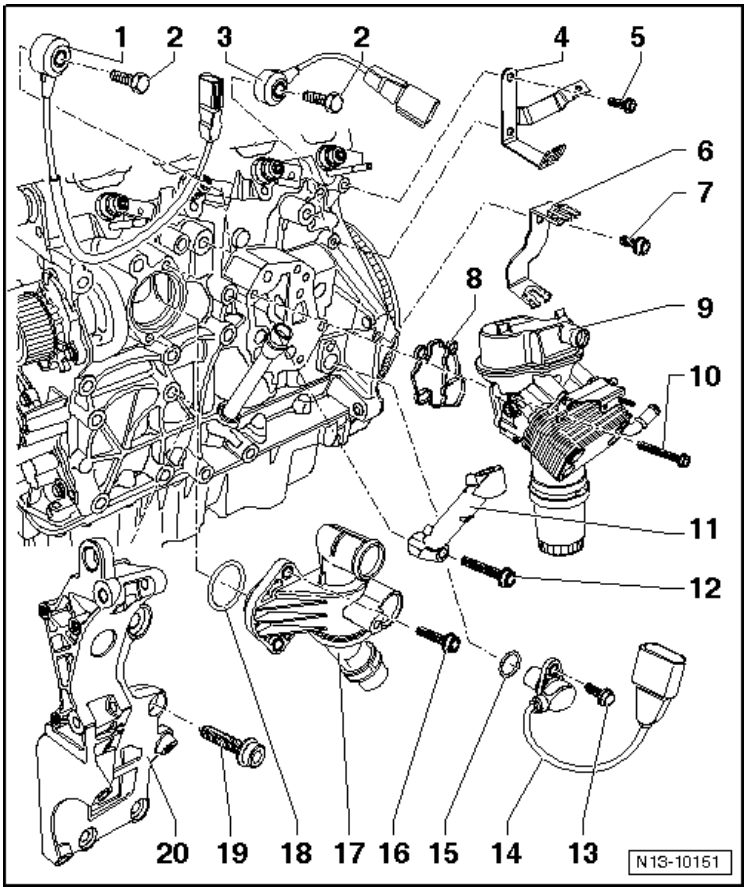
22 - Lower Toothed Belt Guard

23 - Bolt
- ☐ 8 Nm

24 - Engine Mount Bracket

25 - Bolt
- ☐ 45 Nm

Cylinder Block Overview



1 - Knock Sensor 1 -G61-
2 - Bolt
- ☐ 20 Nm

3 - Knock Sensor 2 -G66-
4 - Wire Bracket
5 - Bolt
6 - Wire Bracket
7 - Bolt
8 - Gasket
- ☐ Always replace

9 - Oil Filter Adapter
10 - Bolt
- ☐ 15 Nm + 90° turn
- ☐ Always replace

11 - Intake Manifold Support
12 - Bolt
- ☐ 23 Nm

13 - Bolt
- ☐ 10 Nm

14 - Engine Speed Sensor -G28-

15 - Seal
- ☐ Always replace

16 - Bolt
- ☐ 15 Nm

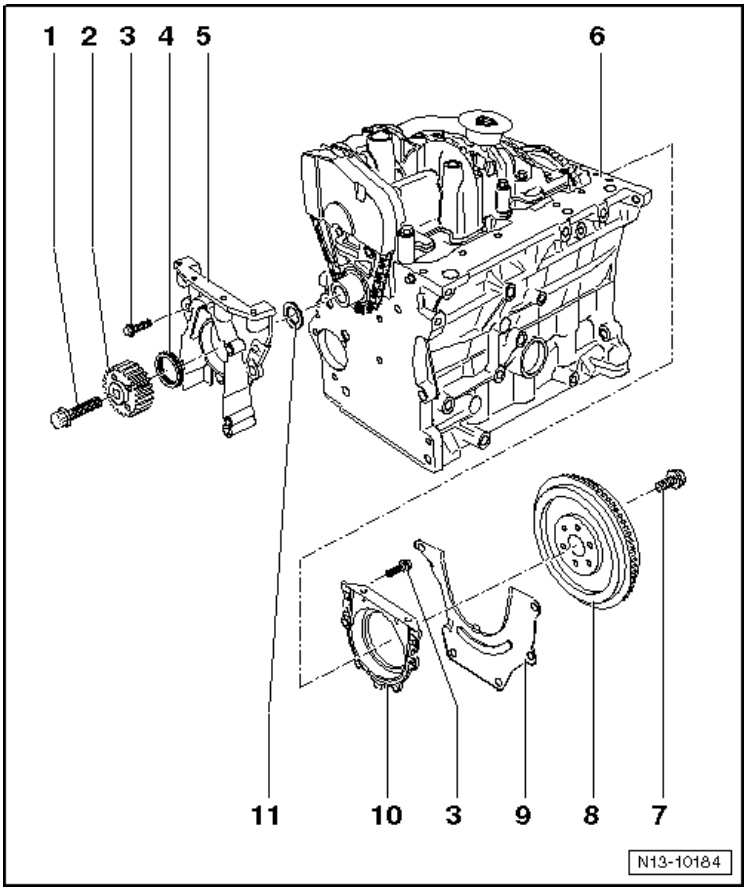
17 - Coolant Thermostat Housing with Thermostat

18 - O-ring
- ☐ Always replace

19 - Bolt
- ☐ 40 Nm

20 - Accessory Bracket

Sealing Flange Overview



1 - Bolt
- ☐ 90 Nm + 90° turn
- ☐ Always replace

2 - Crankshaft Toothed Belt Gear

3 - Bolt
- ☐ 20 Nm

4 - Seal

5 - Sealing Flange, Belt Pulley Side

6 - Cylinder Block

7 - Bolt
- ☐ 60 Nm + 90° turn
- ☐ Always replace

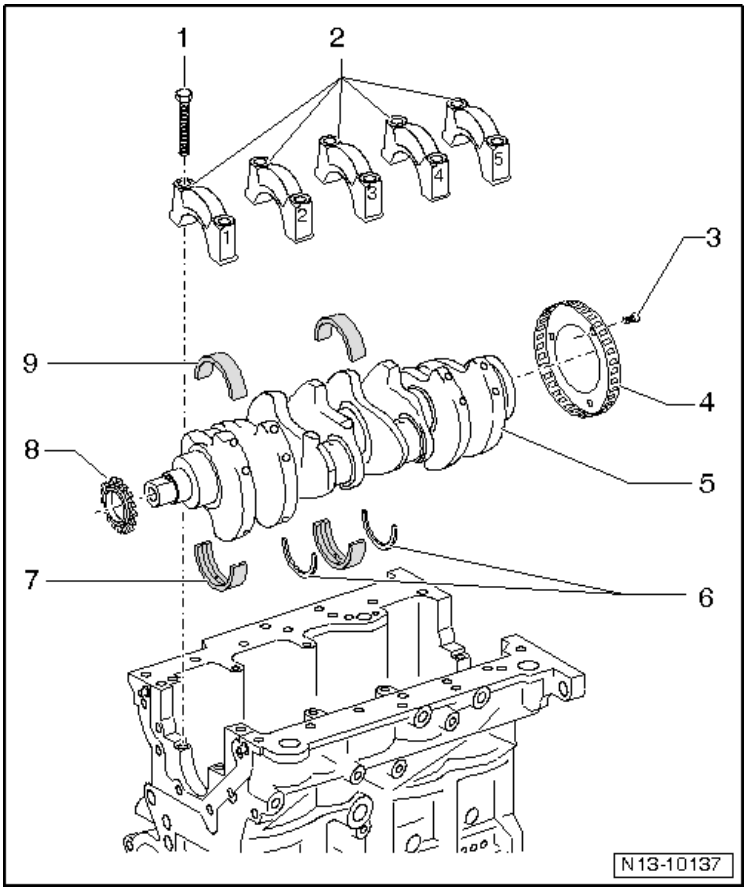
8 - Flywheel

9 - Intermediate Plate

10 - Sealing Flange with Seal

11 - Disc (Diamond Coated)
- ☐ Always replace

Crankshaft Overview



1 - Bolt
- ☐ 65 Nm + 90° turn
- ☐ Always replace

2 - Bearing Cap

3 - Screw
- ☐ 10 Nm + 90° turn
- ☐ Always replace

4 - Sensor Wheel

5 - Crankshaft

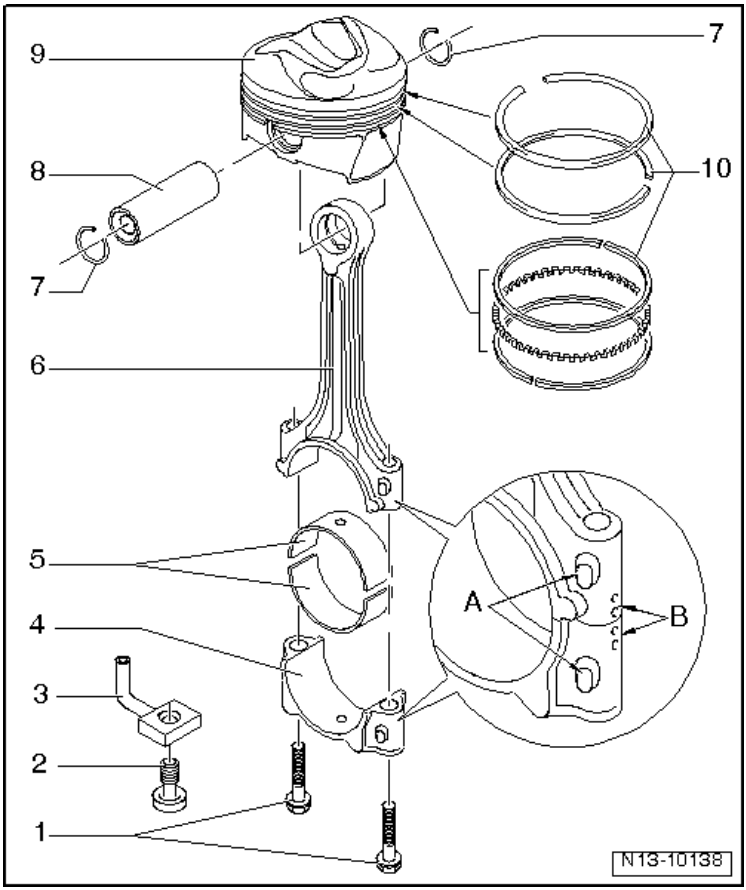
6 - Thrust Washers

7 - Bearing Shell, for the Cylinder Block

8 - Sprocket

9 - Bearing Shell, for the Bearing Cap

Piston and Connecting Rod Overview



1 - Bolt
- ☐ 45 Nm + 90° turn
- ☐ Always replace
- ☐ Lubricate the threads and contact surfaces.

2 - Bolt with Pressure Relief Valve
- ☐ 27 Nm

3 - Oil Spray Jet
4 - Connecting Rod Bearing Cap
5 - Bearing Shell
6 - Connecting Rod
7 - Circlip
8 - Piston Pin
9 - Piston
10 - Piston Rings

Crankshaft Dimensions

Reconditioning dimension in mm [1]	Crankshaft bearing pin diameter		Connecting rod bearing pin diameter	
Basic dimension	54.00	-0.017 -0.037	47.80	-0.022 -0.042
1st oversize	53.75	-0.017 -0.037	47.55	-0.022 -0.042
2nd oversize	53.50	-0.017 -0.037	47.30	-0.022 -0.042
Stage III	53.25	-0.017 -0.037	47.05	-0.022 -0.042

Piston Ring End Gaps

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

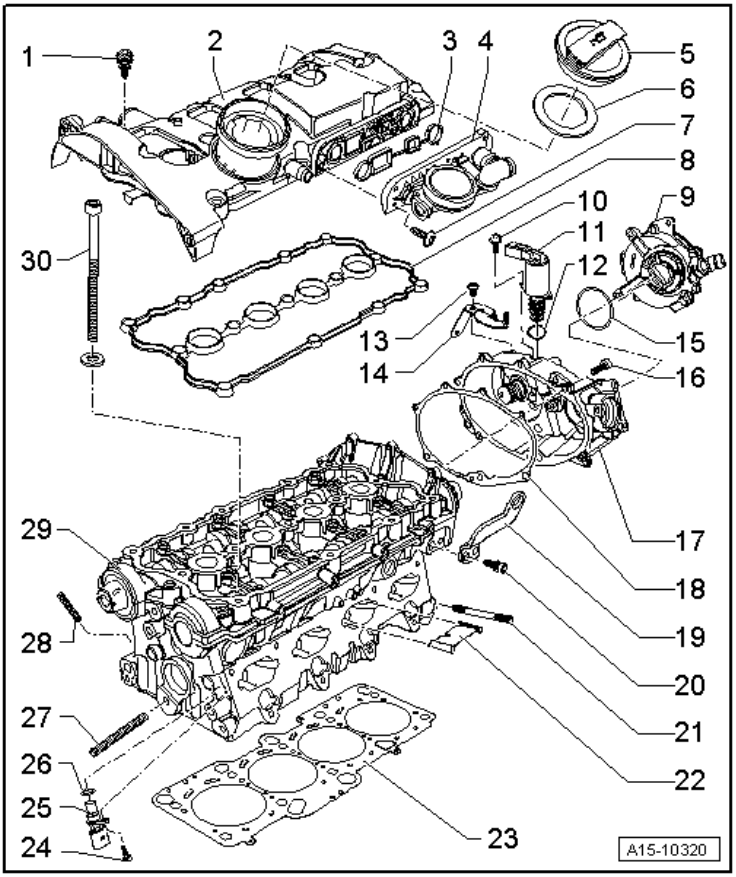
Piston and Cylinder Dimensions

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

[1] Measurements without graphite coating (thickness = 0.02 mm). The graphite coating wears off.

Cylinder Head, Valvetrain – 2.0L CRZA

Cylinder Head Overview



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

2 - Cylinder Head Cover
3 - Gasket
4 - Crankcase Ventilation Valve
5 - Cap
6 - Gasket
7 - Bolt
- ☐ 4 Nm

8 - Cylinder Head Cover Gasket
9 - Vacuum Pump
10 - Bolt
- ☐ 4 Nm

11 - Camshaft Adjustment Valve 1 -N205-

12 - Seal
- ☐ Always replace

13 - Bolt
- ☐ 10 Nm

14 - Wire Bracket

15 - Seal

16 - Bolt
- ☐ 10 Nm

17 - Housing

18 - Gasket
- ☐ Always replace

19 - Transport Strap

20 - Bolt
- ☐ 25 Nm

21 - Stud Bolt
- ☐ 10 Nm

22 - Partition

23 - Cylinder Head Gasket
- ☐ Always replace

24 - Bolt
- ☐ 10 Nm

25 - Camshaft Position Sensor -G40-

26 - Seal

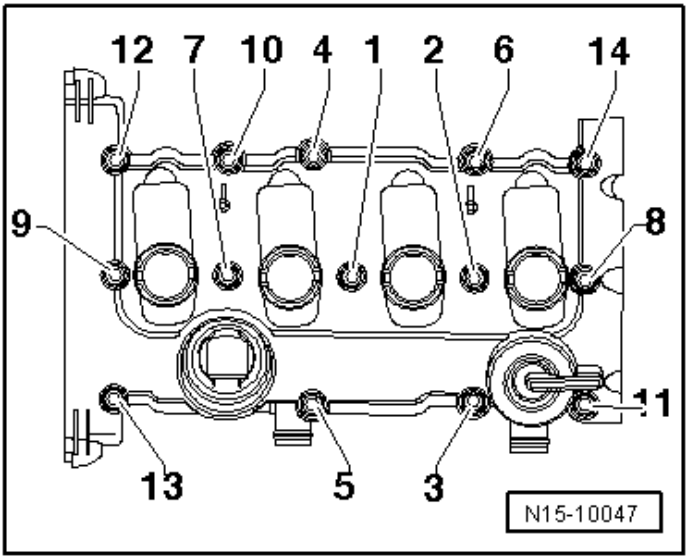
27 - Stud Bolt
- ☐ 10 Nm

28 - Stud Bolt
- ☐ 20 Nm

29 - Cylinder Head

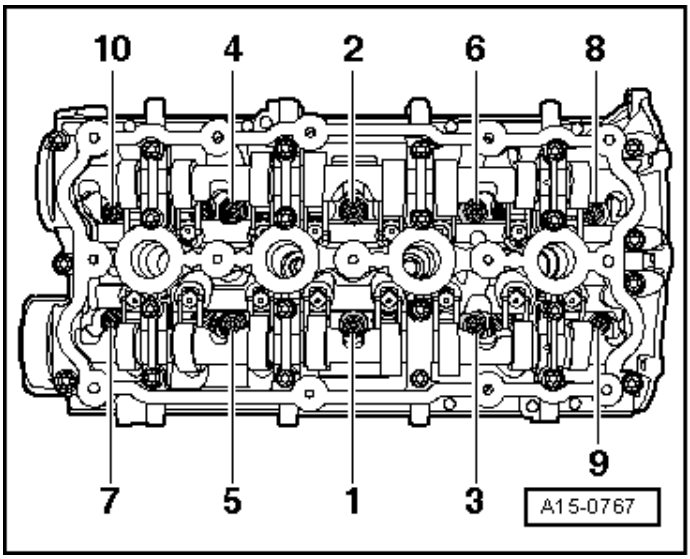
30 - Bolt
- ☐ 40 Nm + 180° turn
- ☐ Always replace

Cylinder Head Cover Tightening Specifications



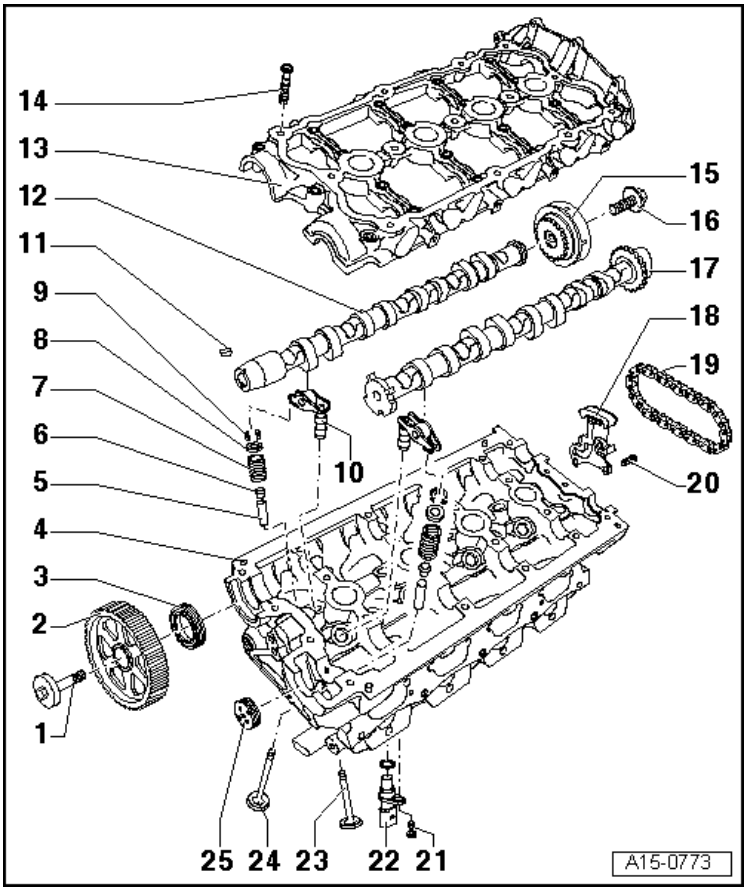
Step	Component	Nm
1	Tighten the cylinder head cover bolts in multiple steps and in the sequence shown	10

Cylinder Head Tightening Specifications



Step	Component	Nm
1	Tighten bolts 1 through 10 in sequence using a torque wrench	40
2	Tighten bolts 1 through 10 in sequence using a ratchet	an additional 90° (¼ turn)
3	Tighten bolts 1 through 10 in sequence using a ratche	an additional 90° (¼ turn)

Valvetrain Overview



1 - Bolt
- ☐ 50 Nm + 180° turn
- ☐ Always replace

2 - Camshaft Sprocket
3 - Seal
4 - Cylinder Head
5 - Valve Guide
6 - Valve Stem Seal
7 - Valve Spring
8 - Spring Seat
9 - Valve Retainer
10 - Hydraulic Lash Adjuster
11 - Woodruff Key
12 - Exhaust Camshaft
13 - Guide Frame

14 - Bolt
- ☐ 8 Nm + 90° turn
- ☐ Always replace

15 - Camshaft Adjuster

16 - Bolt
- ☐ 20 Nm + 45° turn
- ☐ Always replace

17 - Intake Camshaft

18 - Chain Tensioner

19 - Timing Chain

20 - Bolt
- ☐ 10 Nm

21 - Bolt
- ☐ 10 Nm

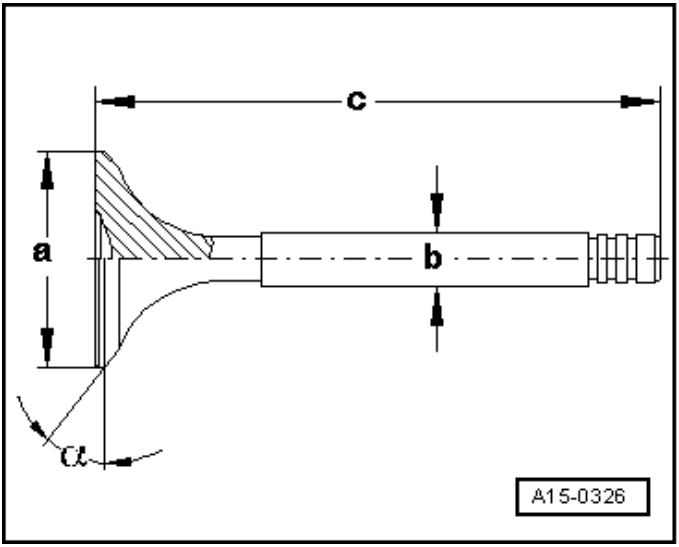
22 - Camshaft Position Sensor -G40-

23 - Exhaust Valve

24 - Intake Valve

25 - Sealing Cap
- ☐ Always replace

Valve Dimensions



Dimension		Intake valve	Exhaust valve
Diameter a	mm	33.75 - 33.95	27.90 - 28.10
Diameter b	mm	5.98	5.95
c	mm	103.97	101.87
α	∠°	45	45

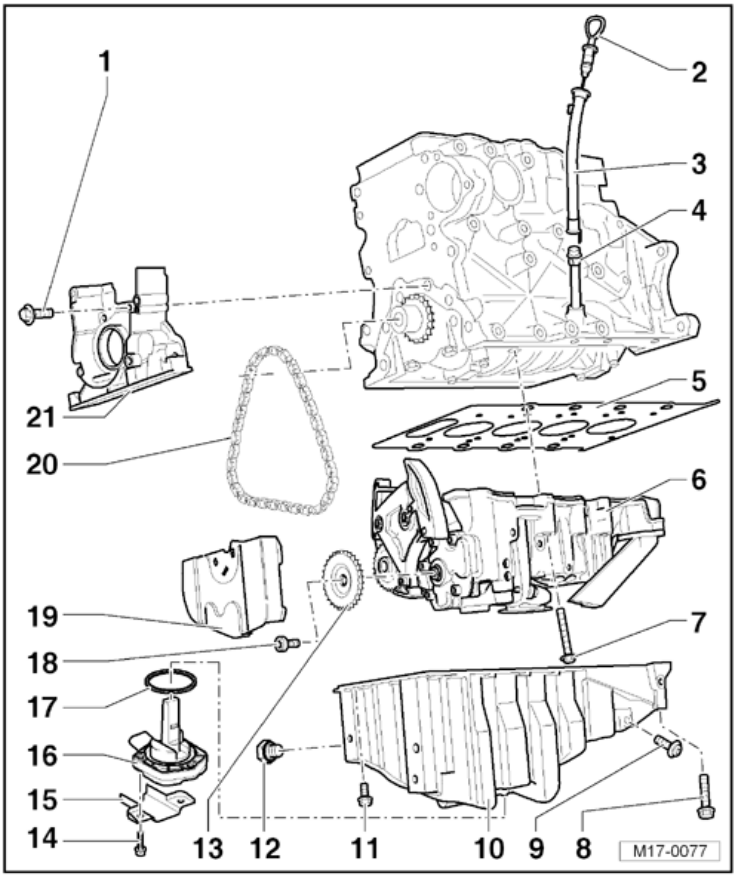
Note: Intake and exhaust valves must not be refaced by grinding. Only lapping is permitted.

Compression Pressures

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

Lubrication – 2.0L CRZA

Oil Pan and Oil Pump Overview



1 - Bolt
- ☐ 15 Nm

2 - Oil Dipstick

3 - Guide Tube

4 - Guide Tube

5 - Intermediate Plate

6 - Oil Pump with Balance Shaft Drive

7 - Bolt
- ☐ 15 Nm + 90° turn
- ☐ Always replace

8 - Bolt
- ☐ 15 Nm

9 - Bolt
- ☐ 8 Nm

10 - Oil Pan

11 - Bolt
- ☐ 15 Nm

12 - Oil Drain Plug
- ☐ 30 Nm
- ☐ Always replace

13 - Chain Sprocket

14 - Bolt
- ☐ 10 Nm

15 - Shield

16 - Oil Level Thermal Sensor -G266-

17 - Seal
- ☐ Always replace

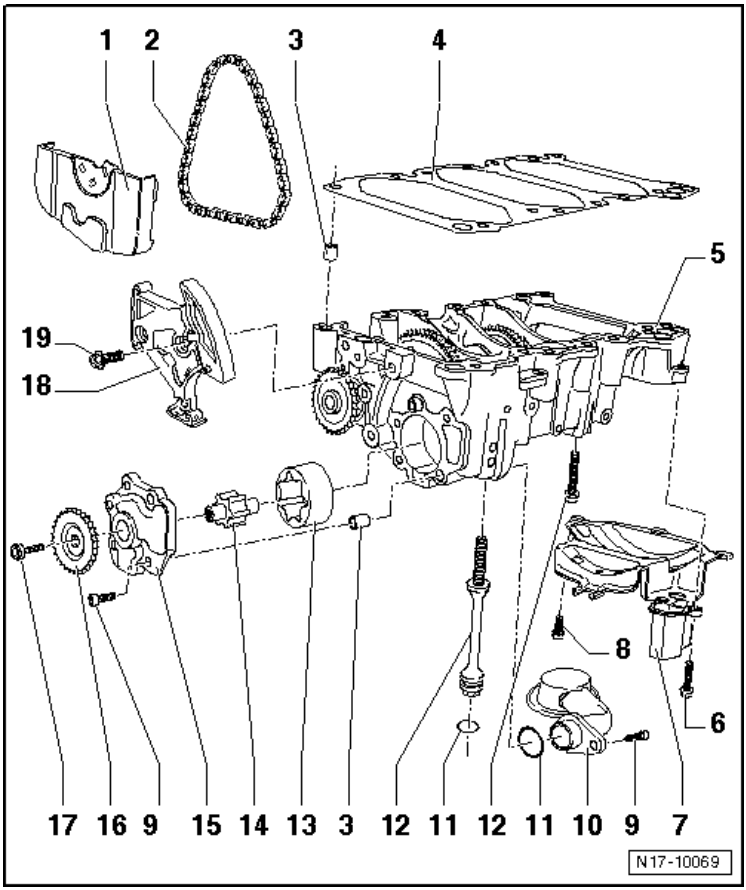
18 - Bolt
- ☐ 20 Nm + 90° turn
- ☐ Always replace

19 - Protective Plate

20 - Chain

21 - Sealing Flange

Oil Pump and Balance Shaft Drive



1 - Protective Plate
2 - Chain
3 - Alignment Sleeves
4 - Intermediate Plate
5 - Oil Pump with Balance Shaft Drive
6 - Bolt
- ☐ 9 Nm

7 - Windage Tray
8 - Bolt
- ☐ 40 Nm

9 - Bolt
- ☐ 8 Nm

10 - Oil Intake Pipe
11 - O-ring
- ☐ Always replace

12 - Bolt
- ☐ 15 Nm + 90° turn
- ☐ Always replace

13 - Outer Rotor

14 - Inner Rotor

15 - Oil Pump Cover

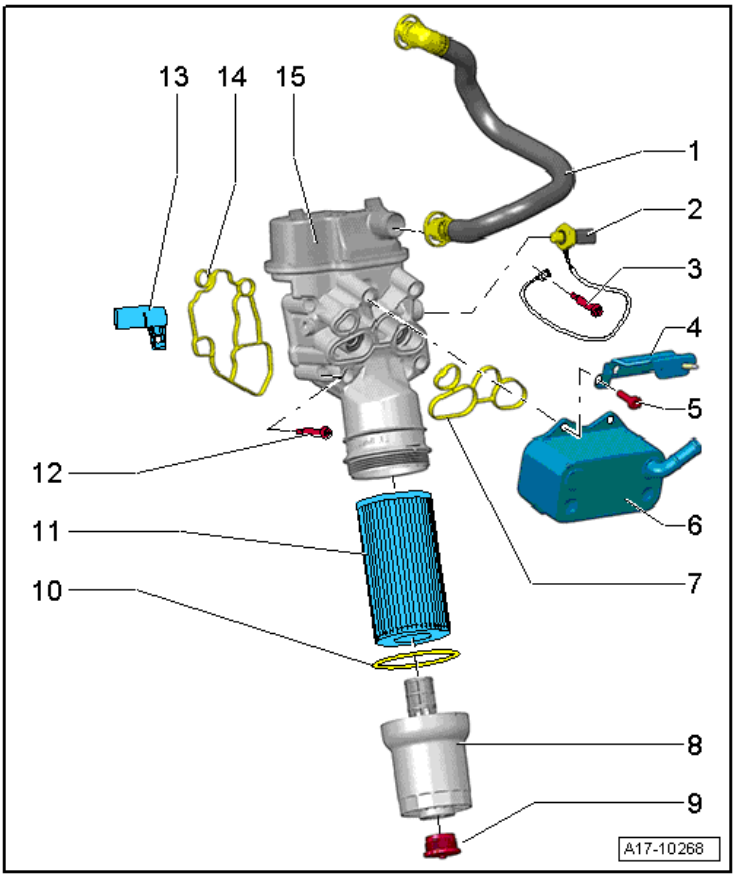
16 - Chain Sprocket

17 - Bolt
- ☐ 20 Nm + 90° turn
- ☐ Always replace

18 - Chain Tensioner with Tensioning Rail

19 - Bolt
- ☐ 15 Nm

Oil Filter Adapter Overview



1 - Vent Tube
2 - Oil Pressure Switch -F1-
☐ 21 Nm
3 - Bolt
☐ 15 Nm
4 - Bracket
5 - Bolt
☐ 15 Nm
6 - Engine Oil Cooler
7 - Gasket
☐ Always replace
8 - Oil Filter Housing
☐ 25 Nm
9 - Cap
10 - Seal
☐ Always replace
11 - Oil Filter Element

12 - Bolt
- ☐ 15 Nm + 90° turn
- ☐ Always replace

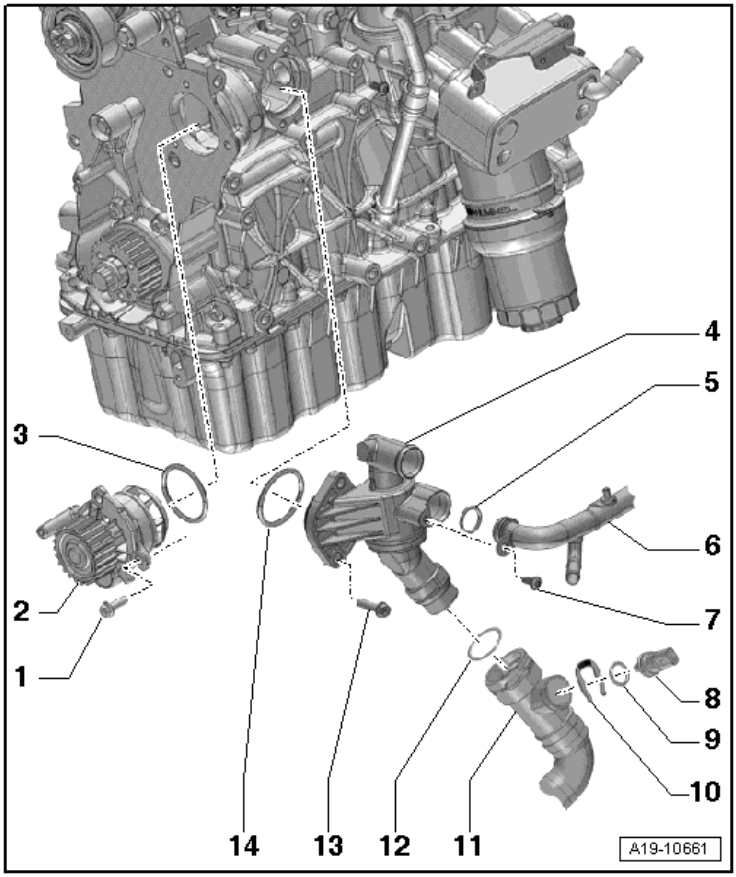
13 - Oil Baffle

14 - Gasket
- ☐ Always replace

15 - Oil Filter Adapter

Cooling System – 2.0L CRZA

Coolant Pump/Thermostat Overview



1 - Bolt
- ☐ 15 Nm

2 - Coolant Pump

3 - O-ring
- ☐ Always replace

4 - Coolant Thermostat with Housing

5 - O-ring
- ☐ Always replace

6 - Front Coolant Pipe 1

7 - Bolt
- ☐ 9 Nm

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

9 - O-ring
- ☐ Always replace

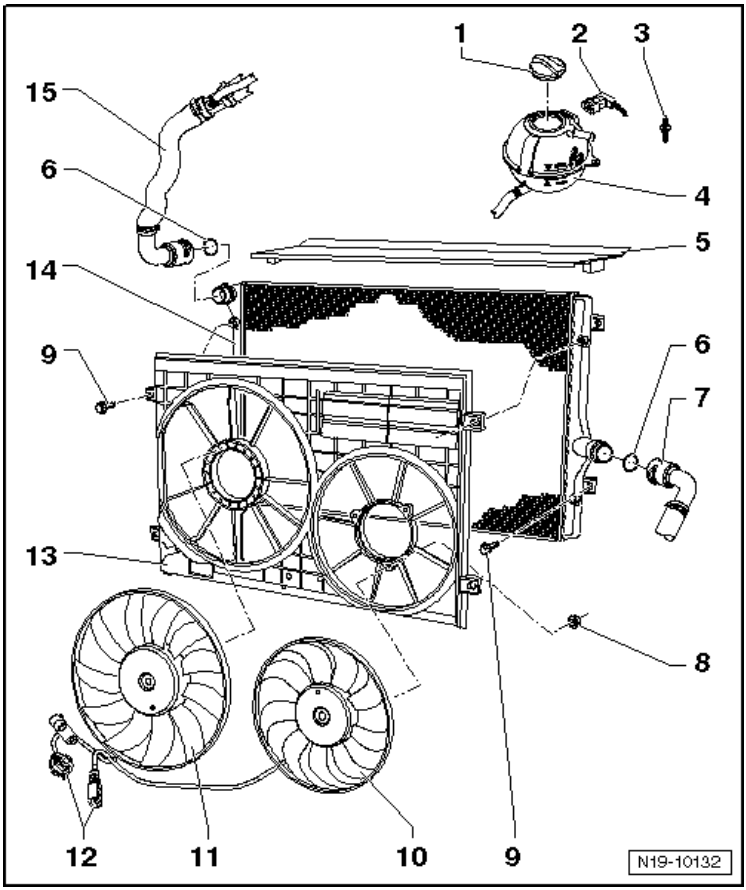
10 - Clamp

11 - Coolant Hose
12 - O-ring
- ☐ Always replace

13 - Bolt
- ☐ 9 Nm

14 - O-ring
- ☐ Always replace

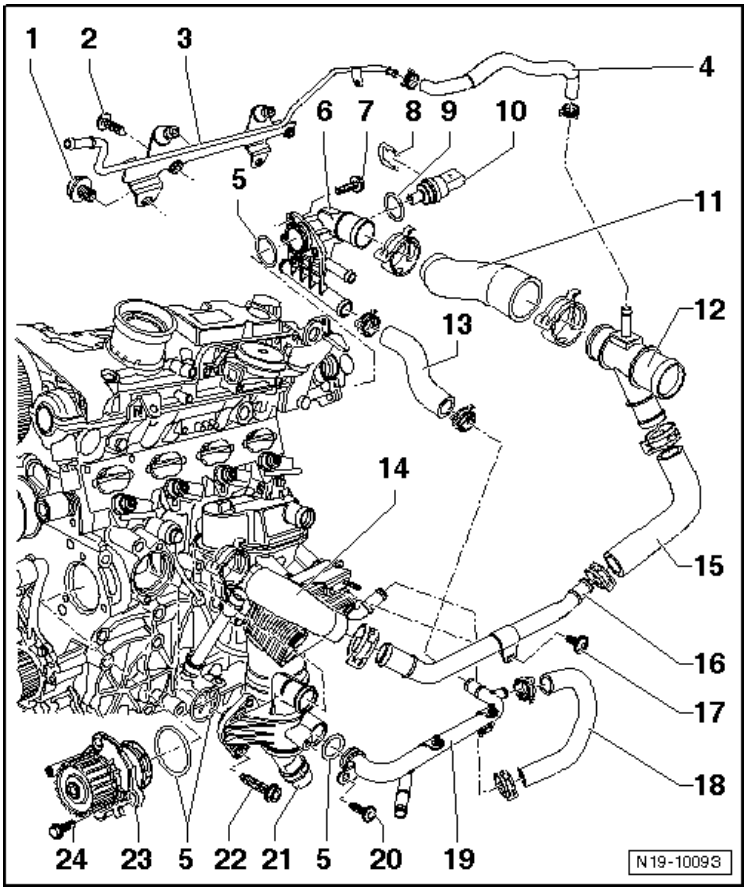
Cooling System Components Overview, Body Side



1 - Cap
2 - Connector
3 - Stud Bolt
☐ 5 Nm
4 - Expansion Tank
5 - Sealing Strip
6 - O-ring
7 - Lower Coolant Hose
8 - Nut
☐ 5 Nm
9 - Bolt
☐ 5 Nm
10 - Coolant Fan 2 -V177-
11 - Coolant Fan -V7-
12 - Connector
13 - Fan Shroud

14 - Radiator
15 - Upper Coolant Hose

Cooling System Components Overview, Engine Side



1 - Bolt
- ☐ 40 Nm

2 - Bolt
- ☐ 23 Nm

3 - Coolant Line

4 - Connecting Hose

5 - O-ring
- ☐ Always replace

6 - Water Connection

7 - Bolt
- ☐ 10 Nm

8 - Retaining Clip

9 - O-ring
- ☐ Always replace

10 - Engine Coolant Temperature Sensor -G62-

11 - Connecting Hose

12 - Distributor Piece

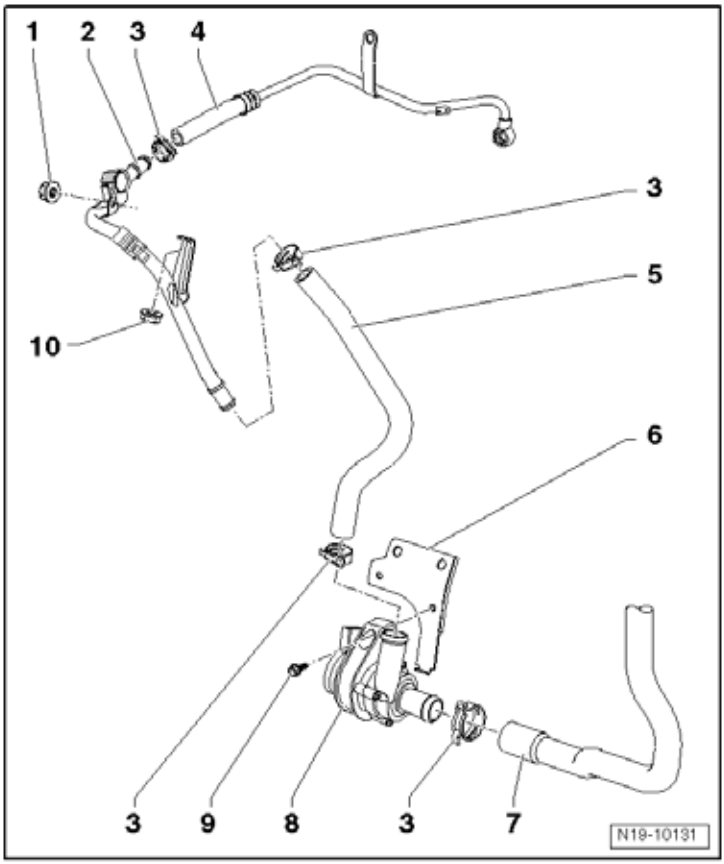
13 - Connecting Hose
14 - Connecting Hose
15 - Connecting Hose
16 - Coolant Line
17 - Bolt
- ☐ 5 Nm

18 - Coolant Hose
19 - Coolant Line
20 - Bolt
- ☐ 10 Nm

21 - Coolant Thermostat Housing with Coolant Thermostat
22 - Bolt
- ☐ 15 Nm

23 - Coolant Pump
24 - Bolt
- ☐ 15 Nm

Coolant Recirculation Pump Overview



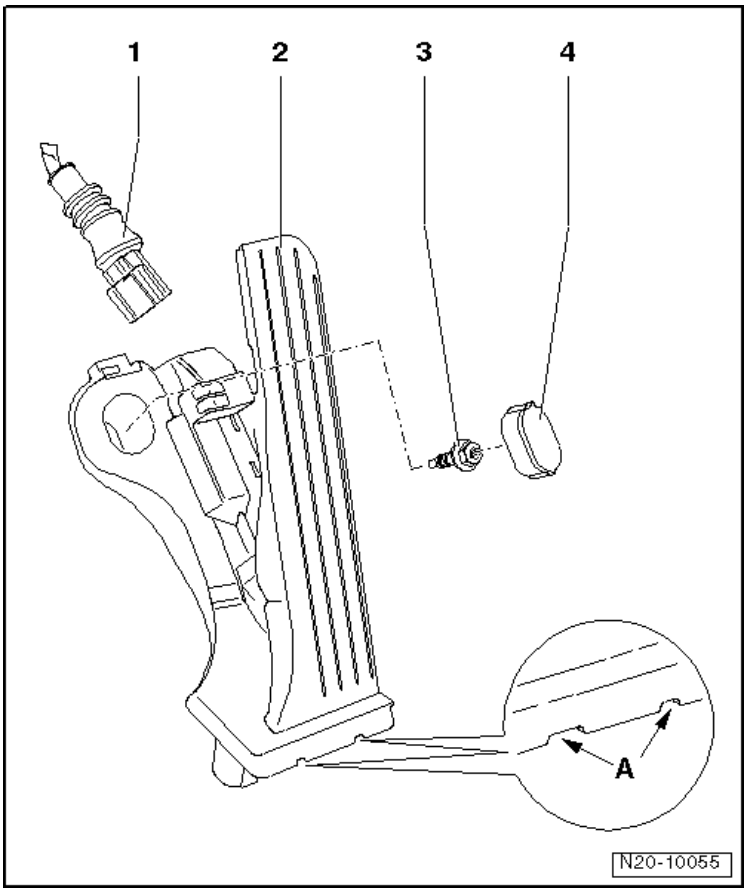
1 - Nut
- ☐ 3 Nm

2 - Coolant Line
3 - Spring Clamp
4 - Coolant Line
5 - Coolant Hose
6 - Bracket
7 - Coolant Hose
8 - Coolant Recirculation Pump -V50-
9 - Bolt
- ☐ 5 Nm

10 - Nut
- ☐ 5 Nm

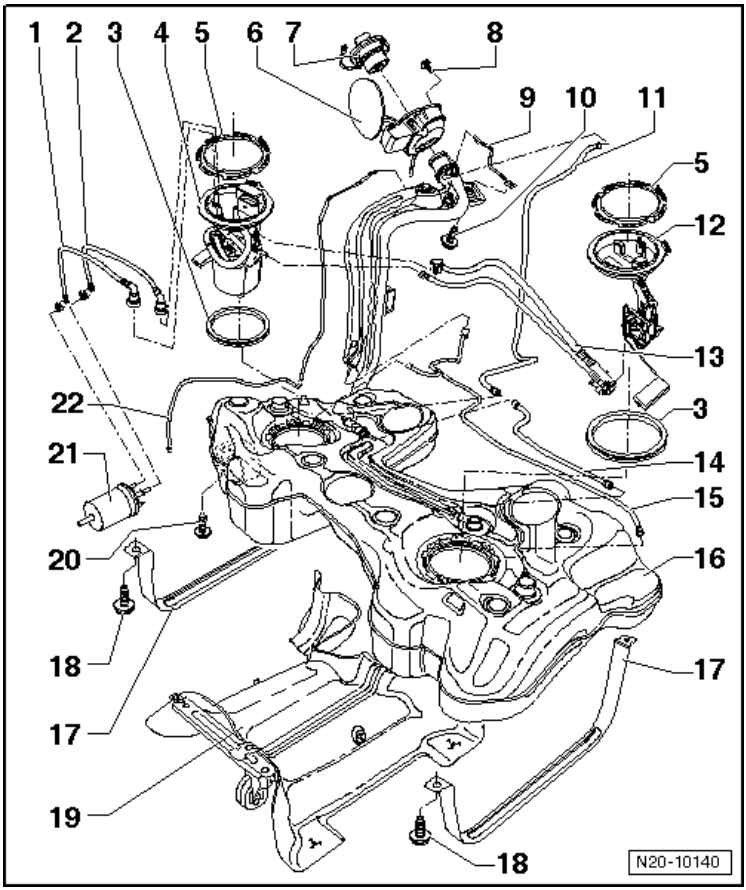
Fuel Supply – 2.0L CRZA

Accelerator Pedal Module Overview



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

Fuel Tank and Attachments Overview



1 - Supply Line
2 - Return Line
3 - Seal
- ☐ Always replace

4 - Fuel Delivery Unit
5 - Lock Ring
- ☐ 110 Nm

6 - Fuel Filler Door Unit
7 - Cap
8 - Bolt
9 - Ground Connection
10 - Bolt
- ☐ 10 Nm

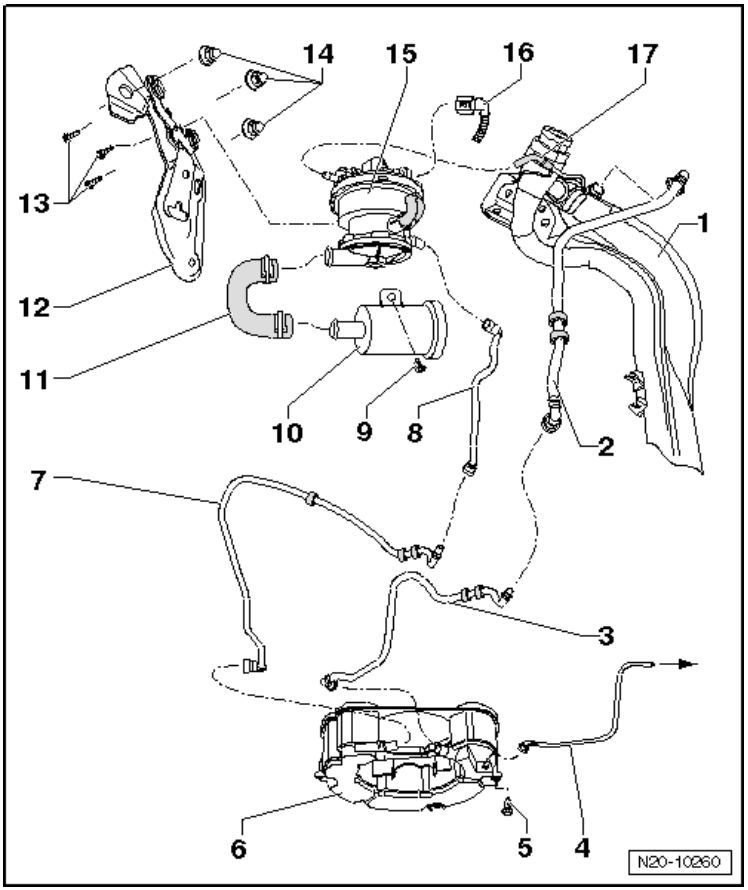
11 - Vent Tube
12 - Fuel Level Sensor 2 -G169-
13 - Suction Jet Pump
14 - Vent Line

15 - Vent Line
16 - Fuel Tank
17 - Securing Strap
18 - Bolt
- ☐ 25 Nm
- ☐ Always replace

19 - Heat Shield
20 - Screw
- ☐ 3 Nm

21 - Fuel Filter
22 - Vent Line

EVAP System Overview



1 - Fuel Filler Tube
2 - Vent Line
3 - Vent Line
4 - Vent Line
5 - Bolt
☐ 8 Nm
6 - EVAP Canister
7 - Connecting Line
8 - Connecting Line
9 - Bolt
☐ 3 Nm
10 - Air Filter Housing
11 - Connecting Hose
12 - Bracket
13 - Bolt
☐ 2 Nm

14 - Nut

☐ 6 Nm

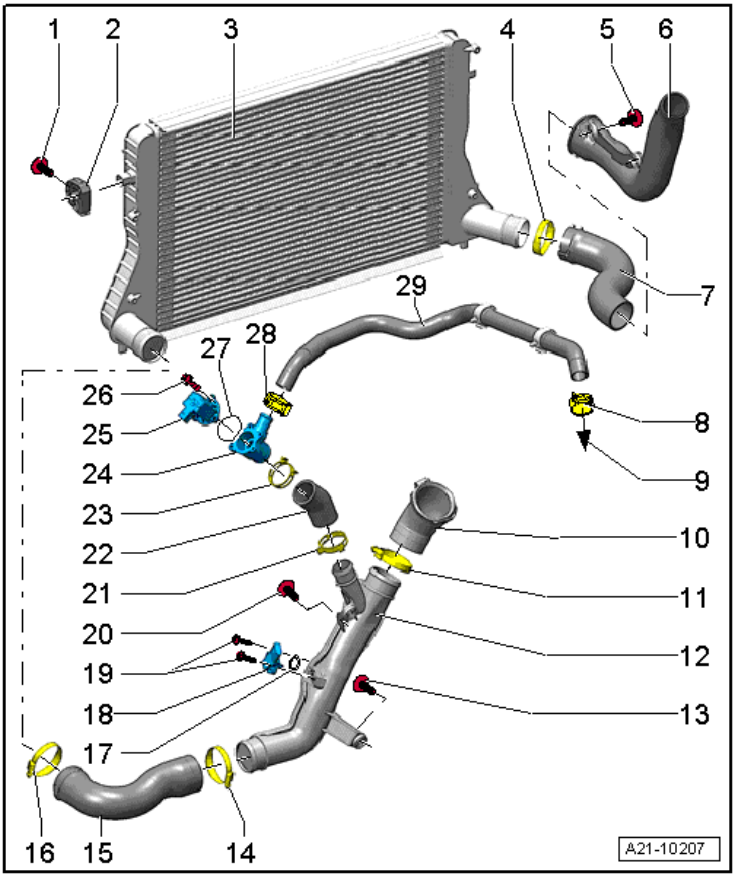
15 - Leak Detection Pump -V144-

16 - Connector

17 - Vacuum Line

Turbocharger – 2.0L CRZA

Charge Air Cooler System Overview



1 - Bolt
- ☐ 5 Nm

2 - Bracket
3 - Charge Air Cooler
4 - Clamp
5 - Bolt
- ☐ 10 Nm

6 - Charge Air Pipe
7 - Charge Air Hose
8 - Clamp
9 - To Intake Tube
10 - Charge Air Hose
11 - Clamp
12 - Charge Air Pipe

13 - Bolt
- ☐ 10 Nm

14 - Clamp
15 - Charge Air Hose
16 - Clamp
17 - Seal
- ☐ Always replace

18 - Charge Air Pressure Sensor -G31-
19 - Bolt
- ☐ 5 Nm

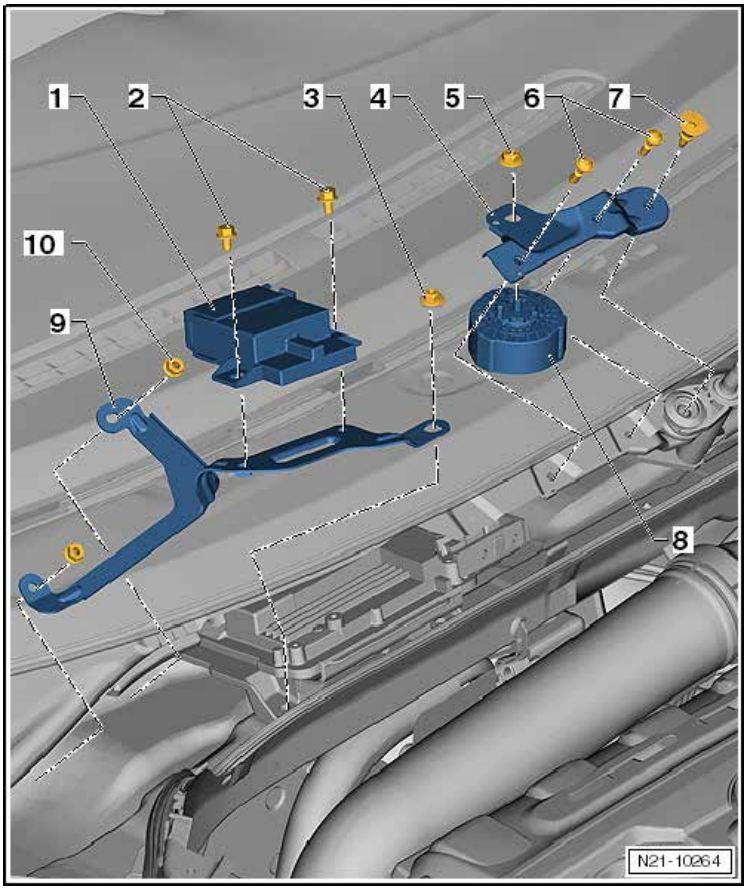
20 - Bolt
- ☐ 10 Nm

21 - Clamp
22 - Hose
23 - Clamp
24 - Intermediate Flange
25 - Turbocharger Recirculation Valve -N249-
26 - Bolt
- ☐ 7 Nm

27 - Seal
- ☐ Always replace

28 - Clamp
29 - Hose

Structure-Borne Sound Actuator -R214- and Structure-Borne Sound Control Module -J869- Overview



1 - Structure Borne Sound Control Module -J869-
2 - Bolt
- ☐ 8 Nm

3 - Nut
- ☐ 8 Nm

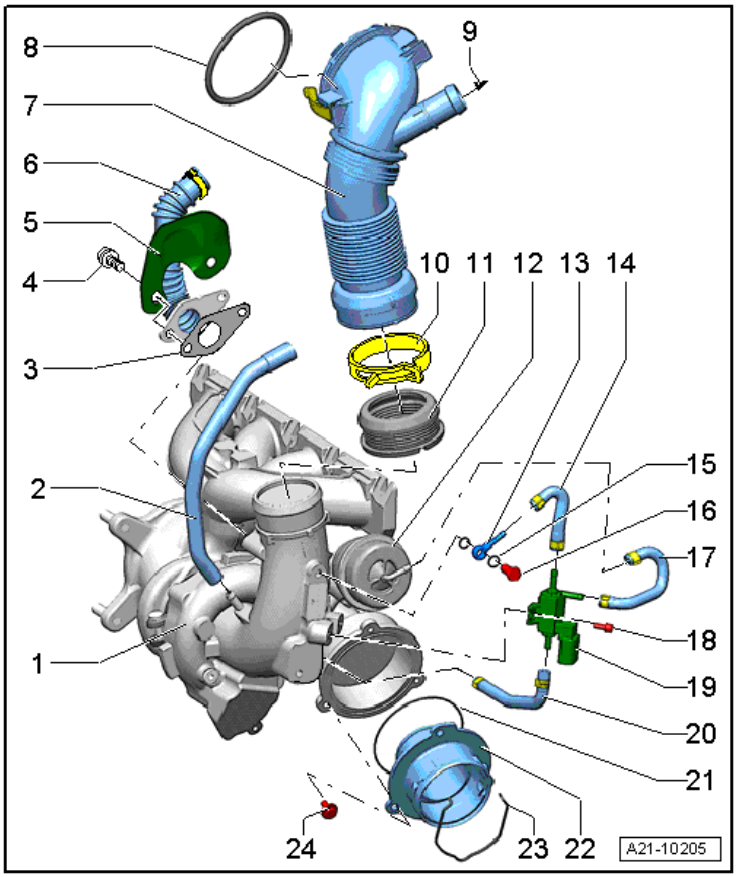
4 - Structure-Borne Sound Actuator -R214- Bracket
5 - Nut
- ☐ 15 Nm

6 - Bolt
- ☐ 8 Nm

7 - Bolt
- ☐ 8 Nm

8 - Structure-Borne Sound Actuator -R214-
9 - Structure Borne Sound Control Module -J869- Bracket
10 - Nut
☐ 8 Nm

Wastegate Bypass Regulator Valve and Intake Tube



1 - Turbocharger
2 - Hose
3 - Gasket
- ☐ Always replace

4 - Bolt
- ☐ 9 Nm

5 - Heat Shield
6 - Vent Tube
7 - Intake Tube
8 - Seal
- ☐ Always replace

9 - To Turbocharger Recirculation Valve
10 - Clamp
11 - Gasket
12 - Vacuum Diaphragm
13 - Connection
14 - Hose

15 - Seal
- ☐ Always replace

16 - Banjo Bolt
- ☐ 8 Nm

17 - Hose

18 - Bolt
- ☐ 3 Nm

19 - Wastegate Bypass Regulator Valve -N75-

20 - Hose

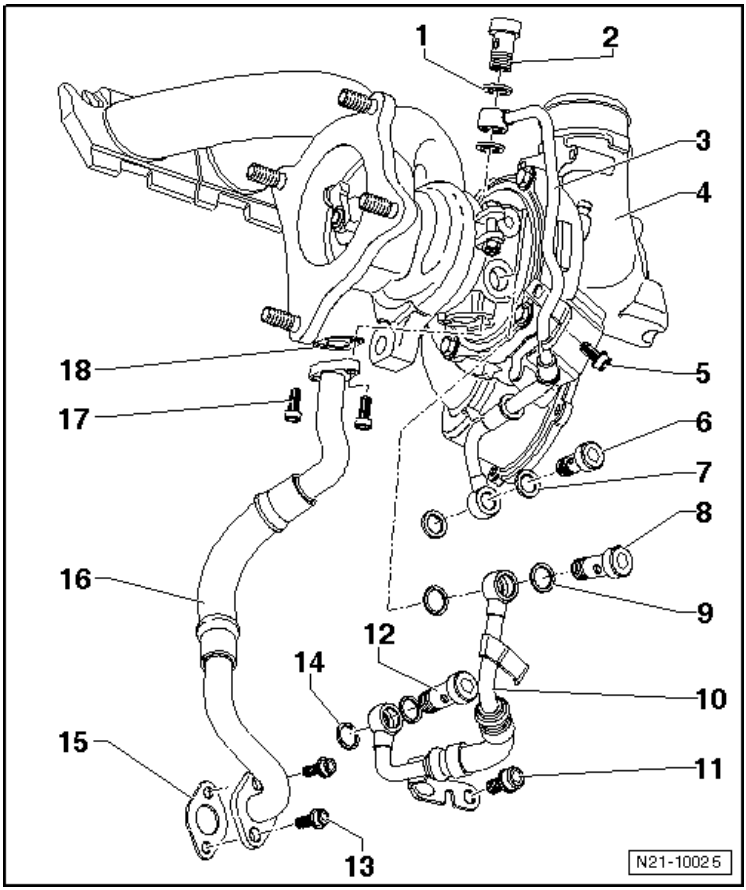
21 - Seal
- ☐ Always replace

22 - Connection

23 - Clip

24 - Bolt
- ☐ 9 Nm

Coolant Supply and Oil Pipes Overview



1 - Seal
- ☐ Always replace

2 - Banjo Bolt
- ☐ 30 Nm

3 - Oil Supply Pipe

4 - Turbocharger

5 - Bolt
- ☐ 9 Nm

6 - Banjo Bolt
- ☐ 30 Nm

7 - Seal
- ☐ Always replace

8 - Banjo Bolt
- ☐ 35 Nm

9 - Seal
- ☐ Always replace

10 - Coolant Supply Pipe
11 - Bolt
- ☐ 23 Nm

12 - Banjo Bolt
- ☐ 35 Nm

13 - Bolt
- ☐ 9 Nm

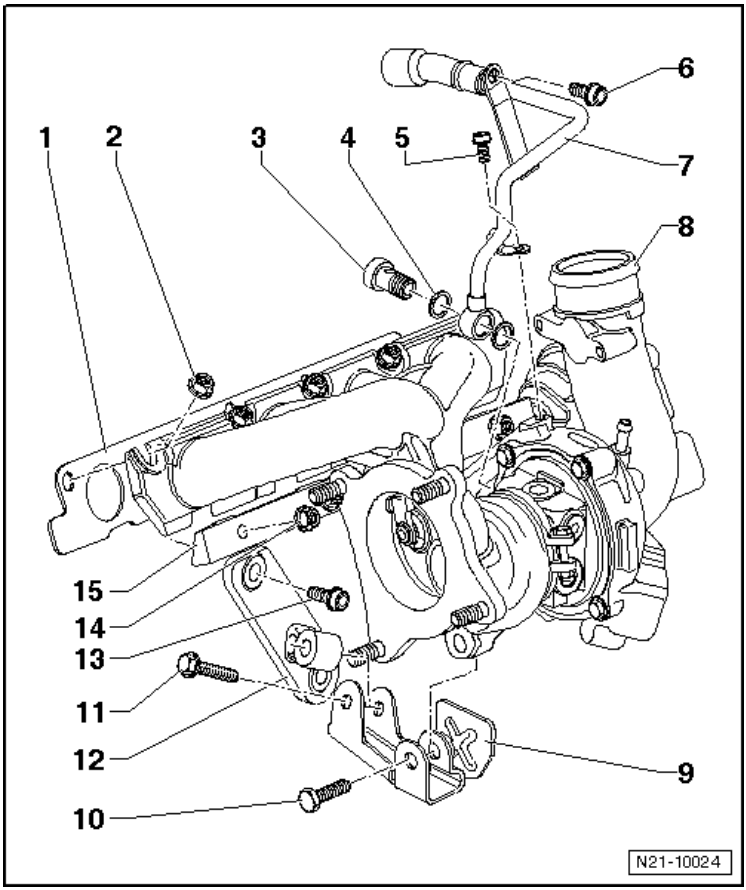
14 - Seal
- ☐ Always replace

15 - Gasket
- ☐ Always replace

16 - Oil Return Pipe
17 - Bolt
- ☐ 9 Nm

18 - Gasket
- ☐ Always replace

Turbocharger and Coolant Return Pipe Overview



1 - Gasket
- ☐ Always replace

2 - Nut
- ☐ 20 Nm
- ☐ Always replace
- ☐ Coat the stud bolts for the exhaust manifold with hot bolt paste.

3 - Banjo Bolt
- ☐ 35 Nm

4 - Seal
- ☐ Always replace

5 - Bolt
- ☐ 9 Nm

6 - Bolt
- ☐ 23 Nm

7 - Coolant Return Pipe

8 - Turbocharger

9 - Support

10 - Bolt

- ☐ 30 Nm
- ☐ Coat the bolt with hot bolt paste

11 - Bolt

- ☐ 30 Nm
- ☐ Coat the bolt with hot bolt paste.

12 - Support

13 - Bolt

- ☐ 23 Nm

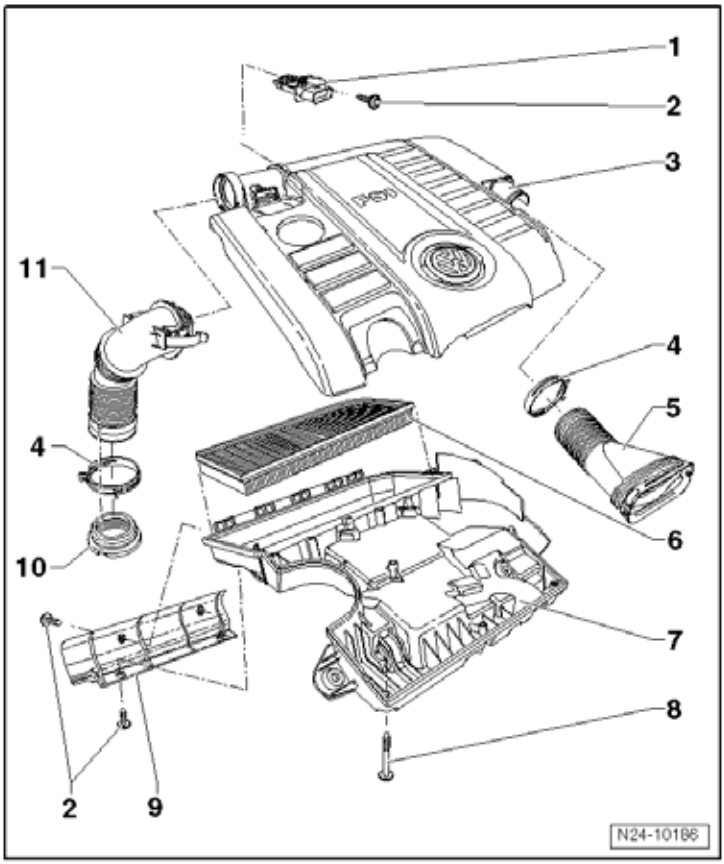
14 - Nut

- ☐ 30 Nm
- ☐ Always replace
- ☐ Coat the stud bolts with hot Bolt paste

15 - Bracket

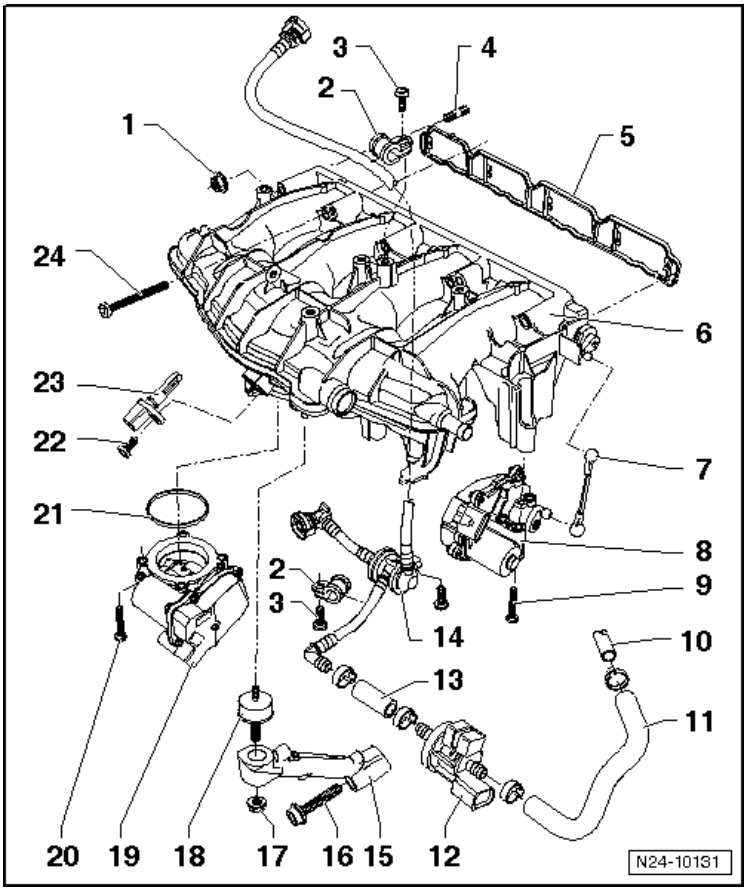
Multiport Fuel Injection – 2.0L CRZA

Engine Cover with Air Filter Overview



1 - Mass Airflow Sensor -G70-
2 - Screw
☐ 3 Nm
3 - Engine Cover/Upper Air Filter Housing
4 - Clamp
5 - Intake Air Duct
6 - Air Filter Element
7 - Lower Air Filter Housing
8 - Screw
☐ 3 Nm
9 - Heat Shield
10 - Rubber Grommet
11 - Intake Tube

Intake Manifold Overview



1 - Nut
- ☐ 10 Nm

2 - Clamp

3 - Bolt
- ☐ 3 Nm

4 - Stud Bolt
- ☐ 10 Nm

5 - Gasket
- ☐ Always replace

6 - Intake Manifold

7 - Connecting Link

8 - Intake Flap Motor -V157- with Intake Manifold Runner Position Sensor -G336-

9 - Bolt
- ☐ 7 Nm

10 - To Evaporative Emission (EVAP) Canister

11 - Hose

12 - EVAP Canister Purge Regulator Valve 1 -N80-
13 - Hose
14 - Double Check-Valve
15 - Intake Manifold Support
16 - Bolt
- ☐ 25 Nm

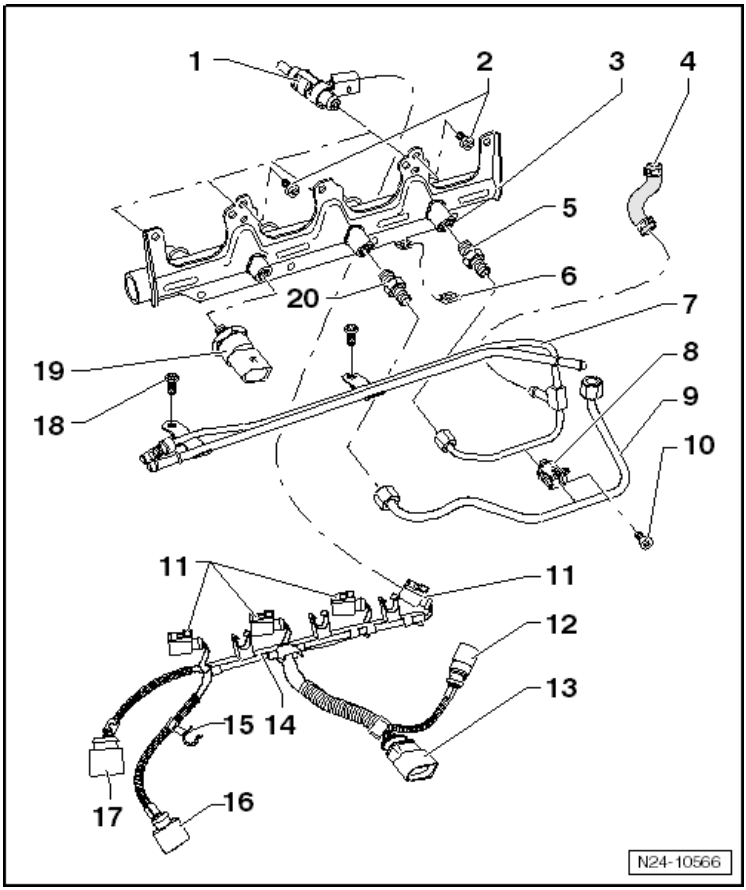
17 - Nut
- ☐ 10 Nm

18 - Bonded Rubber Bushing
19 - Throttle Valve Control Module -J338-
20 - Bolt
- ☐ 7 Nm

21 - Seal
22 - Bolt
- ☐ 5 Nm

23 - Intake Air Temperature Sensor -G42-
24 - Bolt
- ☐ 10 Nm

Fuel Rail and Injector Overview



1 - Cylinder 1 Fuel Injector -N30- to Cylinder 4 Fuel Injector -N33-
2 - Bolt
- ☐ 8 Nm

3 - Fuel Rail
4 - Low Pressure Fuel Hose
5 - Pressure Relief Valve
- ☐ 30 Nm

6 - Plate Nut
7 - Low Pressure Pipe
- ☐ Tighten the union nut to 22 Nm

8 - Bracket
9 - High Pressure Pipe
- ☐ 27 Nm

10 - Bolt
- ☐ 3 Nm

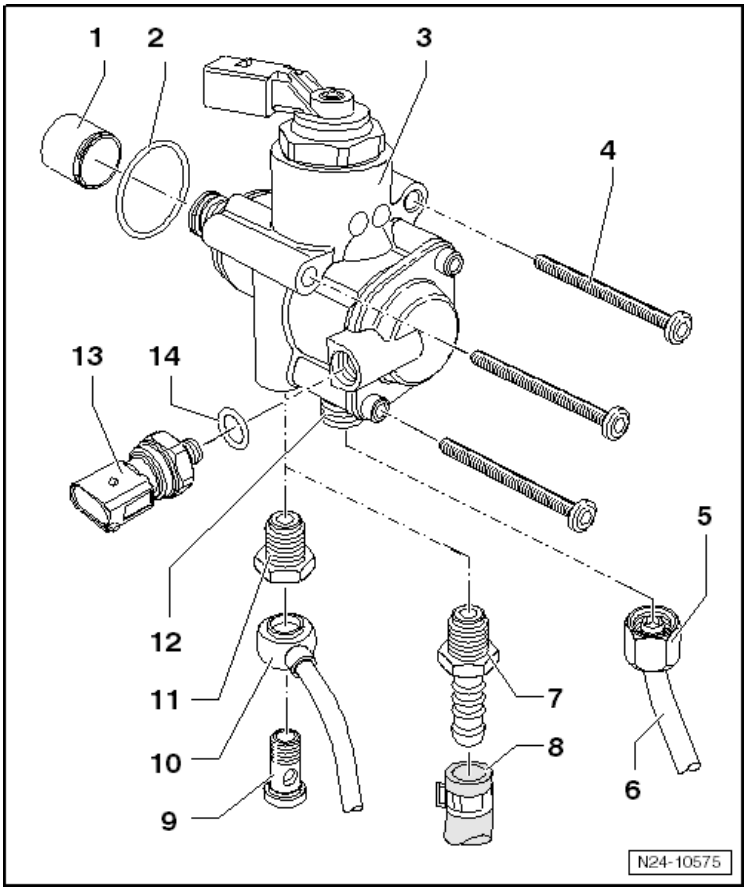
11 - Connector
12 - Connector

13 - Connector
14 - Wire Strip
15 - Clip
16 - Intake Manifold Runner Position Sensor -G336-
17 - Connector
18 - Bolt
- ☐ 5 Nm

19 - Fuel Pressure Sensor -G247-
- ☐ 22 Nm

20 - Threaded Connection
- ☐ 30 Nm

High Pressure Pump Overview



1 - Cam Follower
2 - O-ring
- ☐ Always replace

3 - High Pressure Pump with Fuel Pressure Regulator Valve -N276-
4 - Bolt
- ☐ 3 Nm

5 - Union Nut
- ☐ 27 Nm

6 - High Pressure Pipe
7 - Threaded Connection
- ☐ 30 Nm
- ☐ Replace only after it has been loosened.

8 - Low Pressure Fuel Hose
9 - Banjo Bolt with Conical Seal Seat
- ☐ Not installed in the US/Canadian market.

10 - Fuel Pipe
- ☐ Not installed in the US/Canadian market.

11 - Threaded Connection

- ☐ Not installed in the US/Canadian market.

12 - High Pressure Pipe Threaded Connection

- ☐ 40 Nm

13 - Low Fuel Pressure Sensor -G410-

- ☐ 15 Nm

14 - Seal

- ☐ Always replace

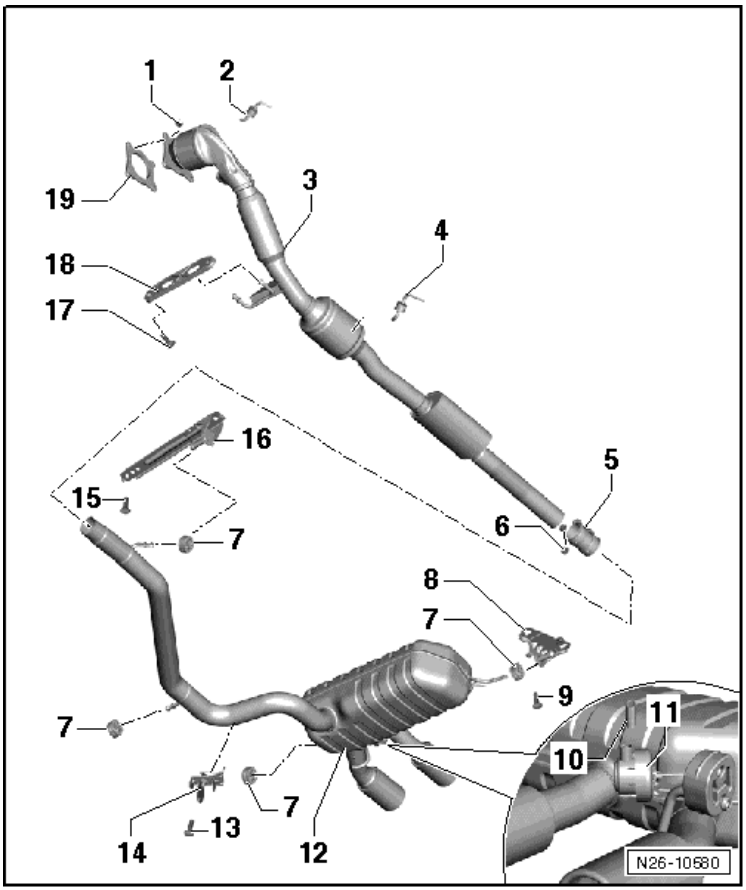
Technical Data

Engine codes	CRZA
Idle check	
Idle speed (RPM) [1)]	660 to 860
Engine Control Module (ECM) System designation	Motronic MED 9.1
Engine speed (RPM) limitation	approximately 6800

[1)] If the ECM voltage supply drops below 12 volts, the idle speed is increased in stages up to 990 RPM. Idle speed is not adjustable.

Exhaust System – 2.0L CRZA

Exhaust System Overview



1 - Nut

- ☐ 40 Nm
- ☐ Always replace.
- ☐ Coat the stud bolts on the exhaust manifold with hot bolt paste -G 052 112 A3-.

2 - Heated Oxygen Sensor -G39-

- ☐ 55 Nm
- ☐ Only use hot bolt paste -G 052 112 A3- to grease the threads, do not let the paste get onto the slits of the oxygen sensor body.

3 - Exhaust Pipe with Catalytic Converter

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

- ☐ 55 Nm
- ☐ Only use hot bolt paste -G 052 112 A3- to grease the threads, do not let the paste get onto the slits of the oxygen sensor body.

5 - Clamping Sleeve

6 - Nut
- ☐ 23 Nm

7 - Retaining Loop

8 - Suspended Mount

9 - Bolt
- ☐ 23 Nm

10 - Vacuum Hose
- ☐ Not available in the US/Canadian market.

11 - Vacuum Actuator
- ☐ Not available in the US/Canadian market.

12 - Rear Muffler

13 - Bolt
- ☐ 23 Nm

14 - Suspended Mount

15 - Bolt
- ☐ 23 Nm

16 - Bracket

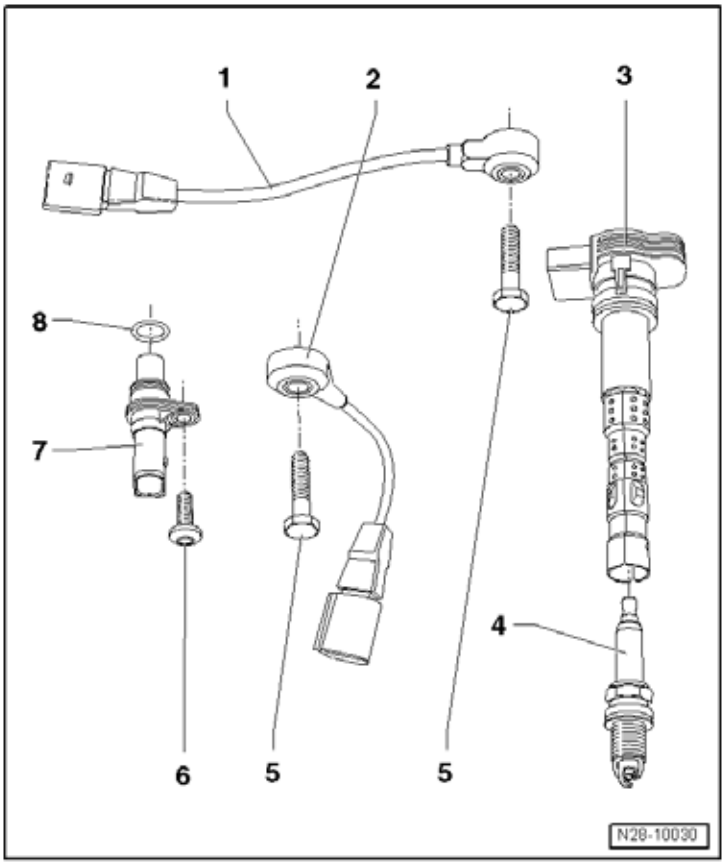
17 - Bolt
- ☐ 23 Nm

18 - Suspended Mount

19 - Gasket
- ☐ Always replace

Ignition – 2.0L CRZA

Ignition System Component Overview



1 - Knock Sensor 1 -G61-
2 - Knock Sensor 2 -G66-
3 - Ignition Coil with Power Output Stage -(N70, N127, N291, N292)-
4 -Spark Plug
5 - Bolt
- ☐ 20 Nm

6 - Bolt
- ☐ 10 Nm

7 - Camshaft Position Sensor -G40-
8 - O-ring

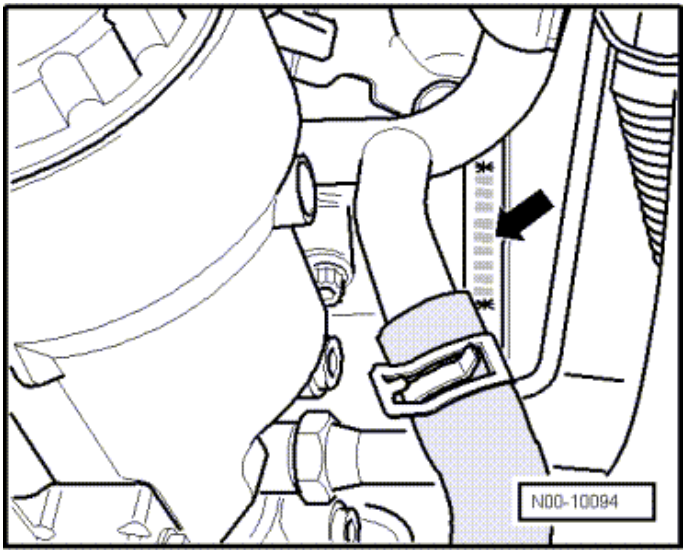
Technical Data

Engine codes	CRZA
Ignition sequence	1-3-4-2
Spark plugs	
VW/Audi	101 905 631 H
Electrode gap	0.7 to 0.8 mm
Tightening specifications	25 Nm
Change intervals	Refer to Maintenance Intervals Rep. Gr. 03

ENGINE MECHANICAL – 2.0L CJAA

General, Technical Data

Engine Number Location



The engine number (engine code and serial number) (➡) is located at the front of the engine/transmission joint. The engine code and serial number are also located on a label found on the toothed belt guard.

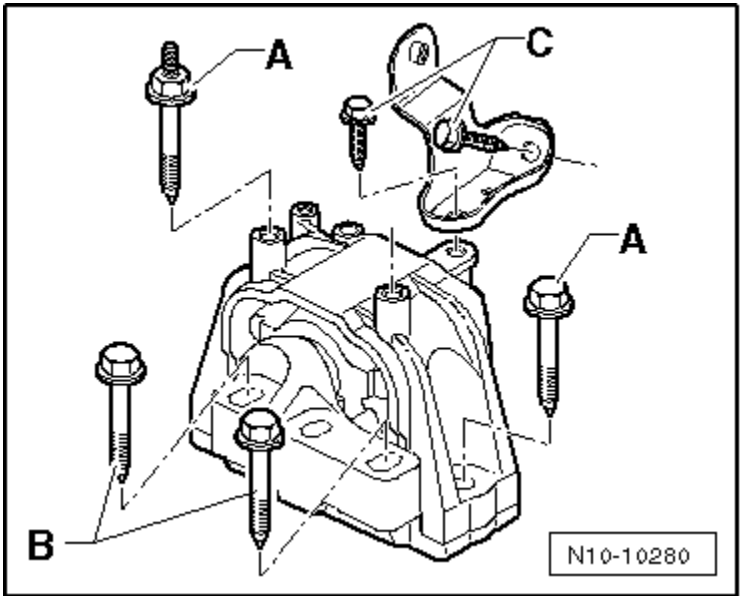
Engine Data

Identification code		**CJAA**
Manufactured		From 09.09
Emission values in accordance with		ULEV2 [2] Standard
Displacement	liter	2.0
Output	kW at RPM	103 @ 4200
Torque	Nm at RPM	320 @ 1750 to 2500
Bore	diameter mm	81.0
Stroke	mm	95.5
Valves per cylinder		4
Compression ratio		16.5
Fuel	conforms to	ASTM D 975 Standard [1]
Ignition sequence		1-3-4-2
Balance shaft module		No
Catalytic converter		Yes
Exhaust Gas Recirculation (EGR)		Yes
Turbocharger, Supercharger		Yes
Charge Air Cooler (CAC)		Yes
Particulate filter		Yes
Selective Catalytic Reduction (SCR) system		No

[1] With a sulfur content less than 15 mg/kg of diesel fuel.
[2] SULEV = Super Ultra Low Emissions Vehicle.

Engine Assembly – 2.0L CJAA

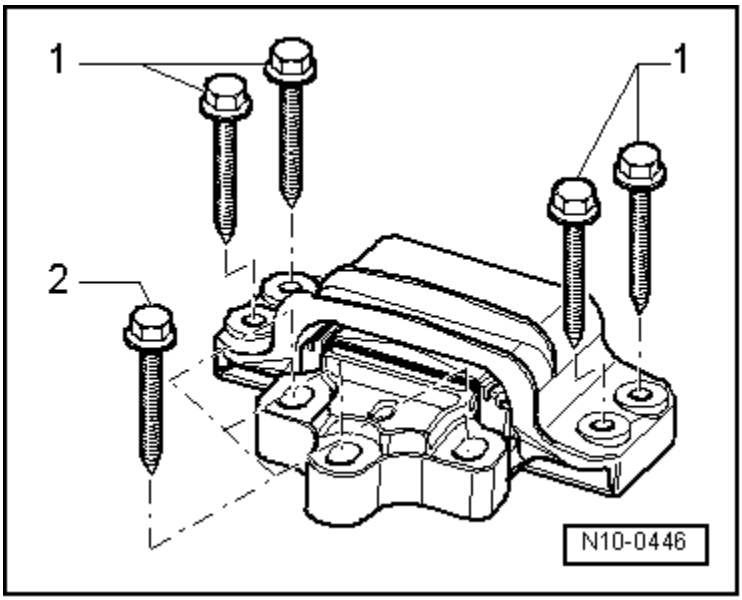
Engine Mount Tightening Specifications



Component	Nm
Bolts A [1)]	40 plus an additional 90° (¼ turn)
Bolts B [1)]	60 plus an additional 90° (¼ turn)
Bolts C [1)]	20 plus an additional 90° (¼ turn)

[1)] Replace fastener(s).

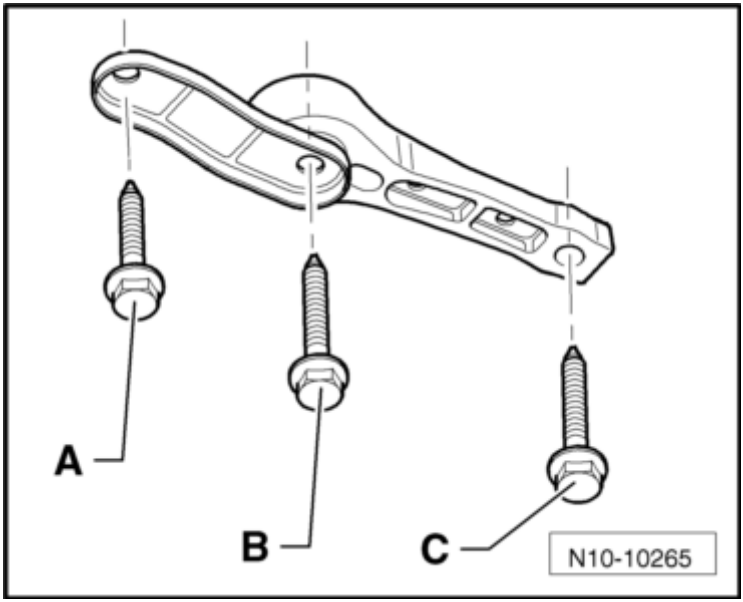
Transmission Mount Tightening Specifications



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

[1)] Replace fastener(s).

Pendulum Support Tightening Specifications



Component	Nm
Bolts A [1]	50 plus an additional 90° (¼ turn)
Bolts B[1]	50 plus an additional 90° (¼ turn)
Bolt C [1]	100 plus an additional 90° (¼ turn)

[1] Replace fastener(s).

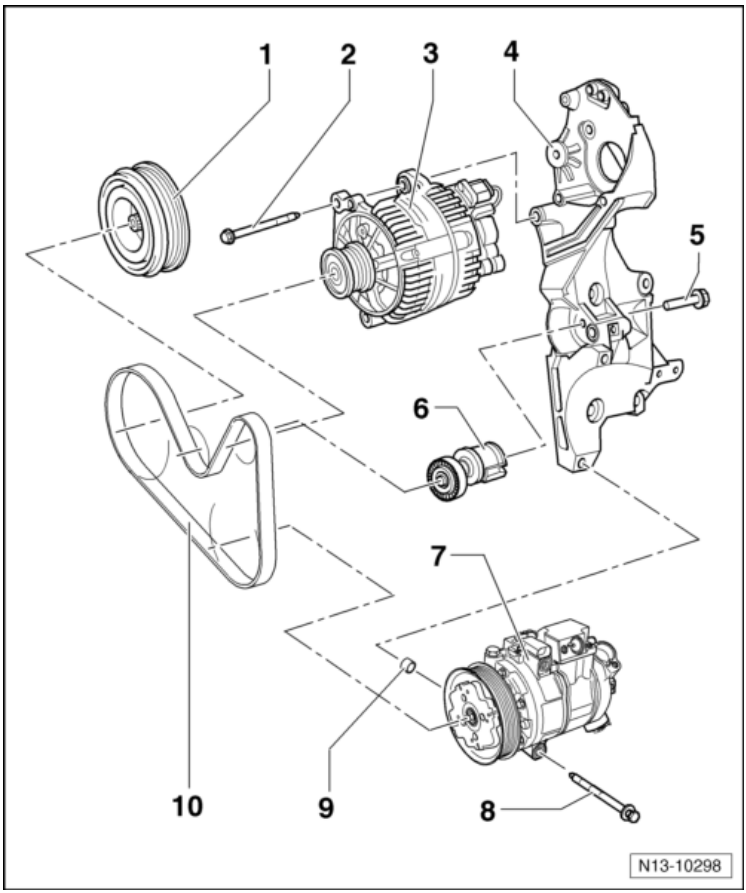
Fastener Tightening Specifications

Component	Fastener size	Nm
Bolts and nuts	M6	10
	M7	15
	M8	25
	M10	40
	M12	60 [1]

[1] The M12 collar bolt tightening specification: 75 Nm.

Crankshaft, Cylinder Block – 2.0L CJAA

Ribbed Belt Drive Overview



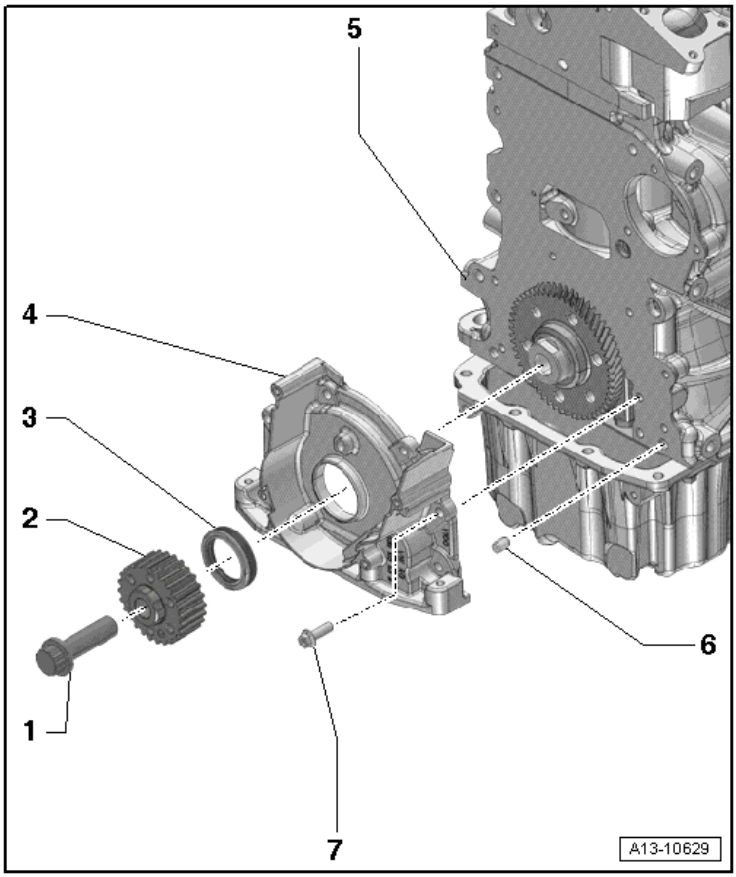
1 - Vibration Damper
2 - Bolt
- ☐ 25 Nm

3 - Generator
4 - Accessory Bracket
5 - Bolt
- ☐ 20 Nm + 180° turn
- ☐ Always replace

6 - Ribbed Belt Tensioner
7 - A/C Compressor -V454-
8 - Bolt
- ☐ 25 Nm

9 - Alignment Sleeve
10 - Ribbed Belt

Cylinder Block Assembly Overview, Belt Pulley Side



1 - Bolt

- ☐ 180 Nm + an additional 135° (3/8) turn [the additional tightening can be done in steps, for example 90° (1/4) + 45° (1/8) turn]

2 - Crankshaft Sprocket - Toothed Belt

3 - Seal

4 - Sealing Flange

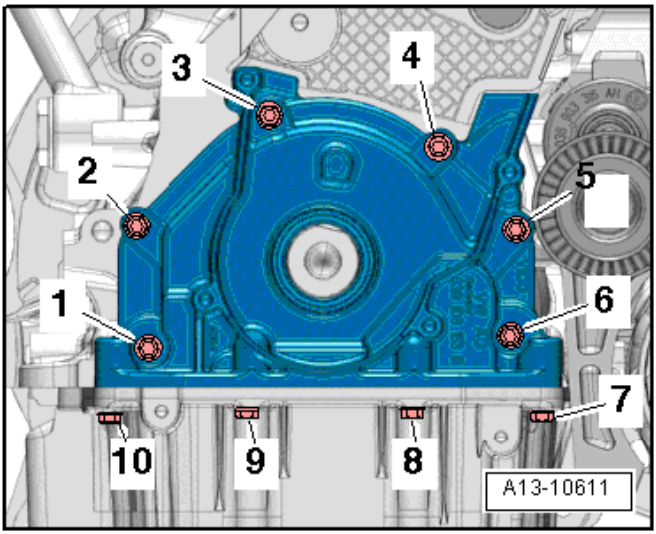
5 - Cylinder Block

6 - Alignment Pin

7 - Bolt

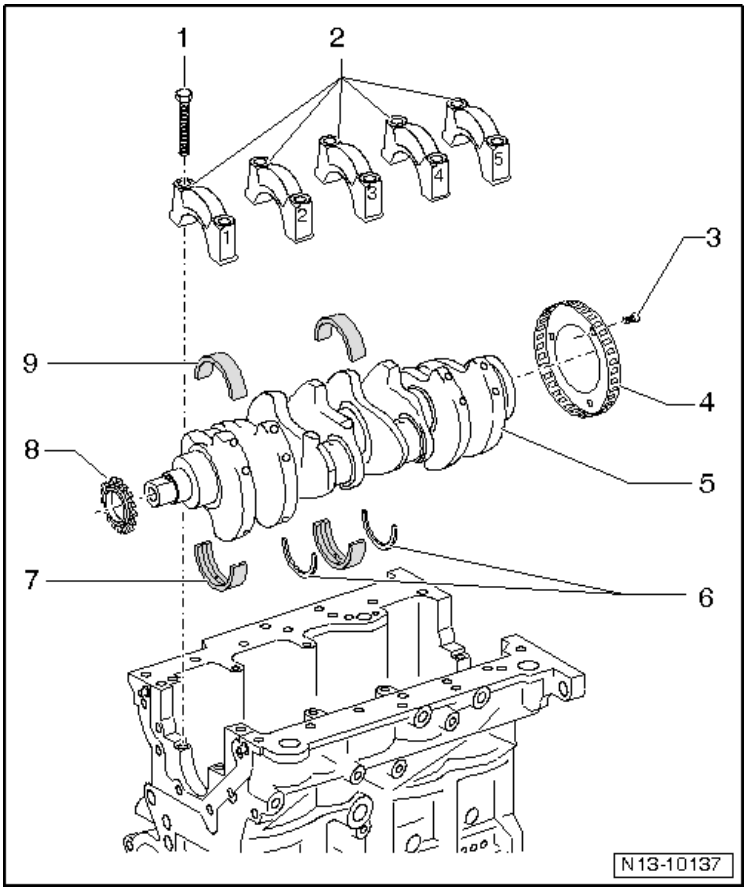
- ☐ Tightening specification and sequence, see Ribbed Belt Pulley Side Sealing Flange - Tightening Specifications and Sequence below

Ribbed Belt Pulley Side Sealing Flange - Tightening Specifications and Sequence



Step	Component	Nm
1	Tighten bolts 1 through 10	Hand tighten
2	Tighten bolts 1 through 6 diagonally in steps	15
3	Tighten bolts 7 through 10 in sequence	15

Cylinder Block Overview

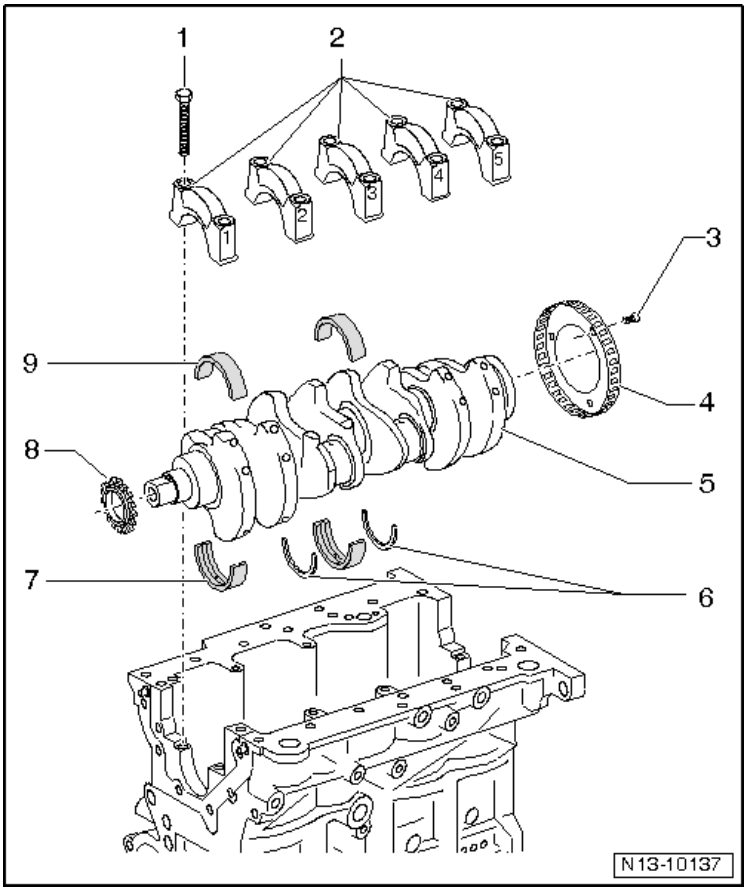


1 - Seal
2 - Sealing Flange
3 - Cylinder Block
4 - Bolt
- ☐ 60 Nm + 90° turn
- ☐ Always replace

5 - Flywheel
6 - Intermediate Plate
7 - Bolt
- ☐ 15 Nm

8 - Sealing Flange with Seal
9 - Engine Speed Sensor -G28-
- ☐ Bolt 5 Nm

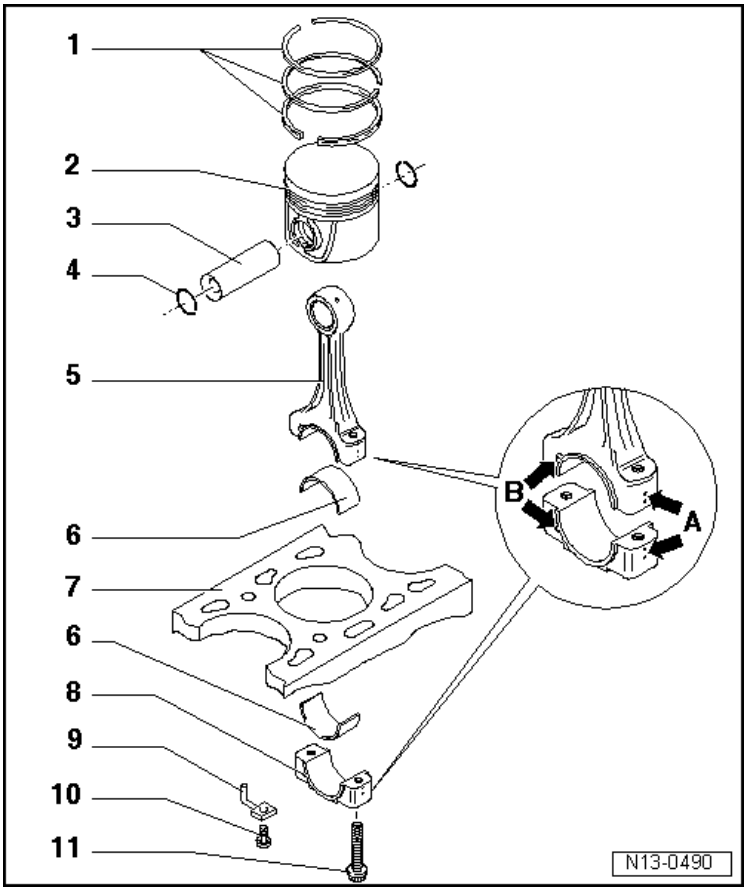
Crankshaft Overview



1 - Bearing Shell
2 - Bolt
- ☐ 65 Nm + 90° turn
- ☐ Always replace

3 - Bearing Cap
4 - Thrust Washer
5 - Needle Bearing
6 - Crankshaft
7 - Thrust Washer

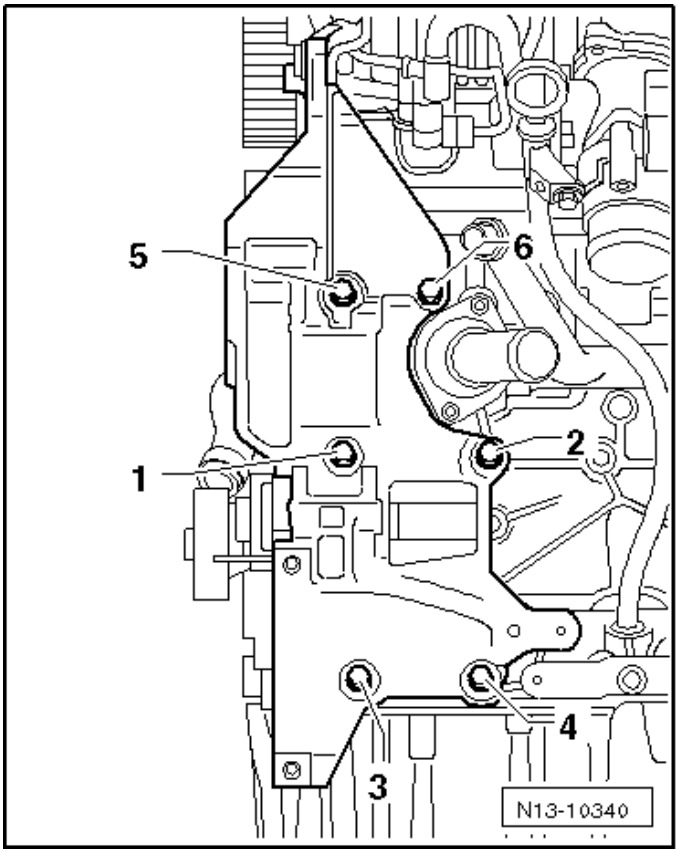
Piston and Connecting Rod Overview



1 - Piston Rings
2 - Piston
3 - Piston Pin
4 - Lock Ring
5 - Connecting Rod
6 - Bearing Shell
7 - Cylinder Block
8 - Connecting Rod Bearing Cap
9 - Oil Spray Jet
10 - Bolt
- ☐ 25 Nm

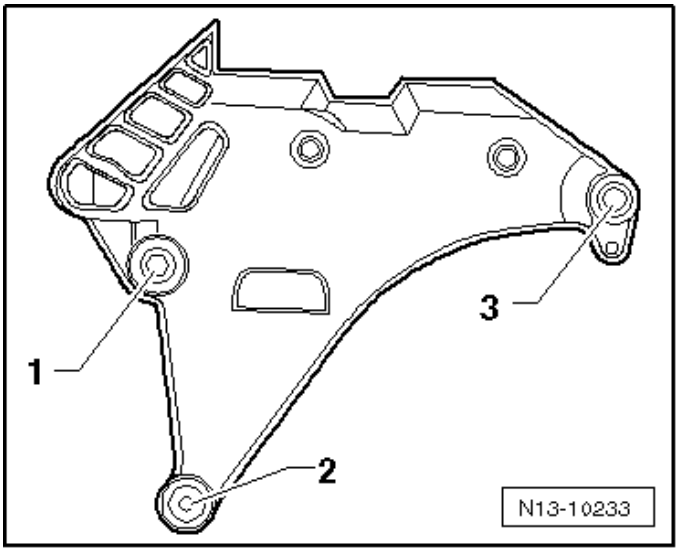
11 - Bolt
- ☐ 30 Nm + 90° turn
- ☐ Always replace

Accessory Bracket Bolt Tightening Sequence and Specification



Step	Component	Nm
	Bolts - 1 and 2- M10 x 52.	
	Bolts - 5 and 6- M10 x 60.	
	Bolts - 3 and 4- M10 x 30.	
1	Tighten bolts 1 through 6 in sequence	Hand tighten
2	Tighten bolts 1 through 6 in sequence	40
3	Tighten bolts 3 and 4	45 plus an additional 45° (⅛ turn)
4	Tighten bolts 1, 2, 5 and 6	additional 90° (¼ turn)

Engine Mount Bracket Bolt Tightening Sequence and Specification



Step	Component	Nm
1	Tighten bolts 1 through 3 in sequence	40 plus an additional 180° (½ turn)

Crankshaft Dimensions

Reconditioning dimension in mm [1)]	Crankshaft bearing pin diameter		Connecting rod bearing pin diameter	
Basic dimension	54.00	-0.022 -0.042	50.90	-0.022 -0.042

Piston Ring End Gaps

Piston ring dimensions in mm	New	Wear limit
Number 1 Compression Ring	0.20 to 0.40	1.0
Number 2 Compression Ring	0.20 to 0.40	1.0
Oil scraping ring	0.25 to 0.50	1.0

Piston Ring Clearance

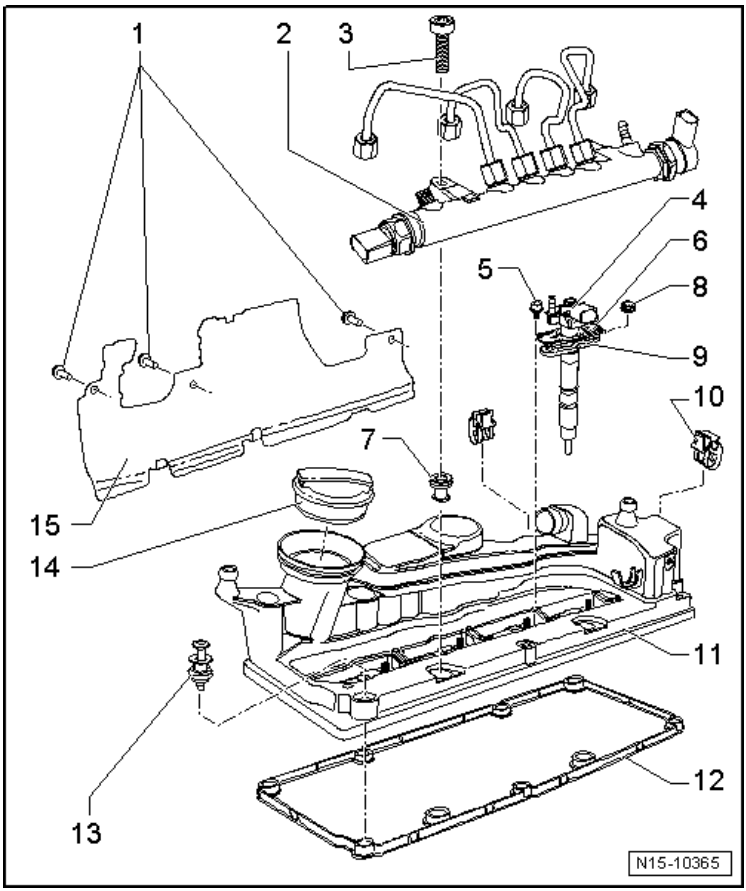
Piston ring dimensions in mm	New	Wear limit
Number 1 Compression Ring	0.06 to 0.09	0.25
Number 2 Compression Ring	0.05 to 0.08	0.25
Oil scraping rings	0.03 to 0.06	0.15

Piston and Cylinder Dimensions

	Piston diameter	Cylinder bore diameter
Basic dimension	80.96	81.01

Cylinder Head, Valvetrain – 2.0L CJAA

Cylinder Head Cover Overview



1 - Bolt
- ☐ 5 Nm

2 - Fuel Rail (High Pressure Reservoir)

3 - Bolt
- ☐ 22 Nm

4 - Fuel Injector (Piezo Injection Unit)

5 - Bolt
- ☐ 5 Nm

6 - Sealing Cap

7 - Bushing

8 - Nut
- ☐ 10 Nm

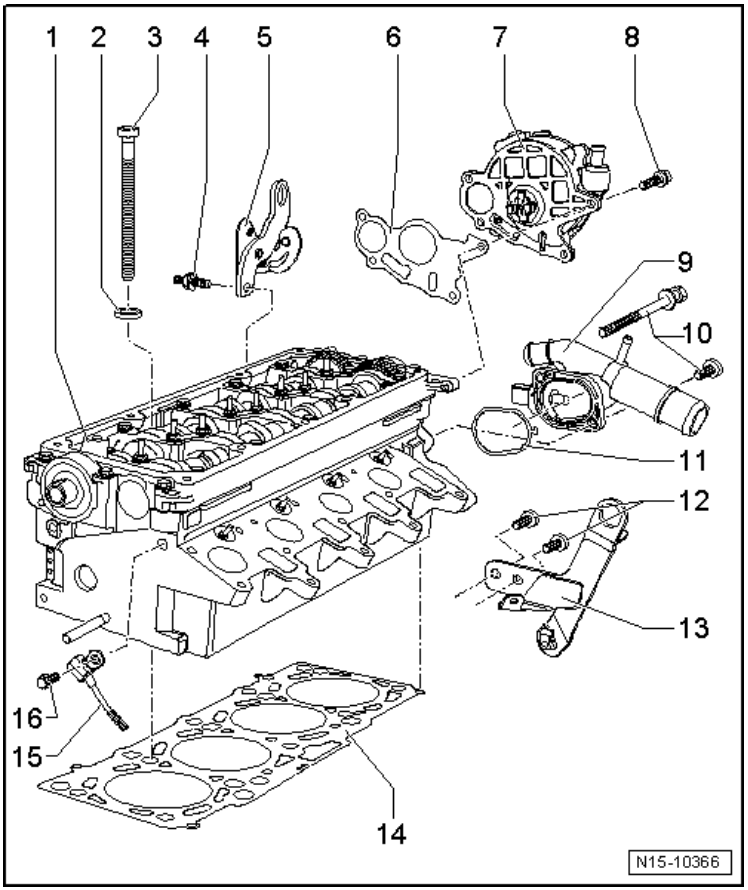
9 - Tensioning Plate

10 - Wire Guide

11 - Cylinder Head Cover
12 - Gasket
13 - Bolt
- ☐ 10 Nm

14 - Oil Fill Cap
15 - Heat Shield

Cylinder Head Overview



1 - Cylinder Head
2 - Washer
3 - Cylinder Head Bolt
4 - 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

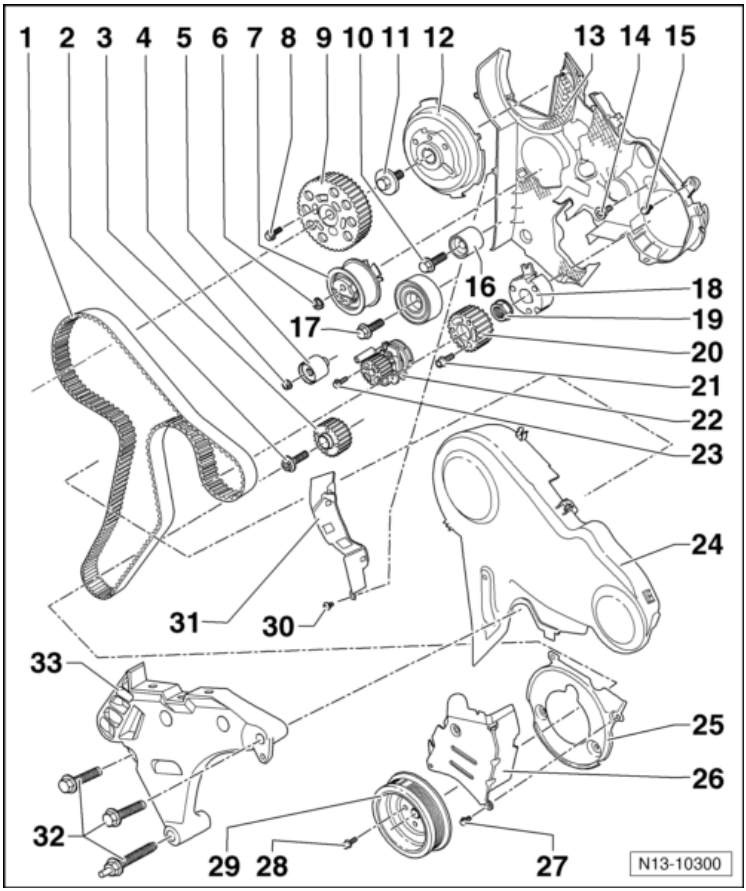
14 - Cylinder Head Gasket

15 - Camshaft Position Sensor -G40-

16 - Bolt

- ☐ 10 Nm

Toothed Belt Overview



1 - Toothed Belt

2 - Bolt

- ☐ 180 Nm + an additional 135° (3/8) turn [the additional tightening can be done in steps, for example 90° (1/4) + 45° (1/8) turn]
- ☐ Replace after removing

3 - Crankshaft - Toothed Belt Gear

4 - Nut

- ☐ 20 Nm

5 - Idler Roller

6 - Nut

- ☐ 20 Nm + 45° turn

7 - Tensioning Roller

8 - Bolt

- ☐ 20 Nm + 45° turn

9 - Camshaft Sprocket

10 - Bolt
- ☐ 20 Nm

11 - Bolt
- ☐ 100 Nm

12 - Hub

13 - Rear Toothed Belt Guard

14 - Bolt
- ☐ 20 Nm

15 - Bolt
- ☐ 10 Nm
- ☐ Always replace

16 - Idler Roller

17 - Bolt
- ☐ 50 Nm + 90° turn
- ☐ Always replace

18 - Hub

19 - Nut
- ☐ 95 Nm

20 - Toothed Belt Gear

21 - Bolt
- ☐ 20 Nm

22 - Coolant Pump

23 - Bolt
- ☐ 15 Nm

24 - Upper Toothed Belt Guard

25 - Lower Toothed Belt Guard

26 - Center Toothed Belt Guard

27 - Bolt
- ☐ 10 Nm
- ☐ Always replace

28 - Bolt
- ☐ 10 Nm + 90° turn
- ☐ Always replace

29 - Belt Pulley/Vibration Damper

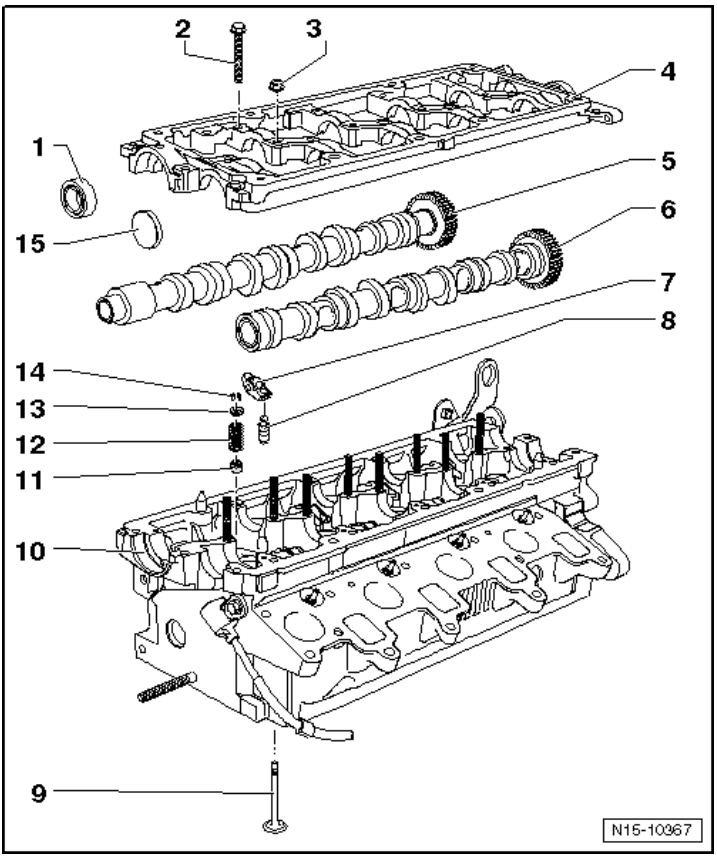
30 - Bolt
- ☐ 5 Nm

31 - Shield

32 - Bolt
- ☐ 40 Nm + 180° turn
- ☐ Always replace
- ☐ Follow the tightening sequence, refer to Engine Mount Bracket

33 - Engine Mount Bracket

Valvetrain Overview

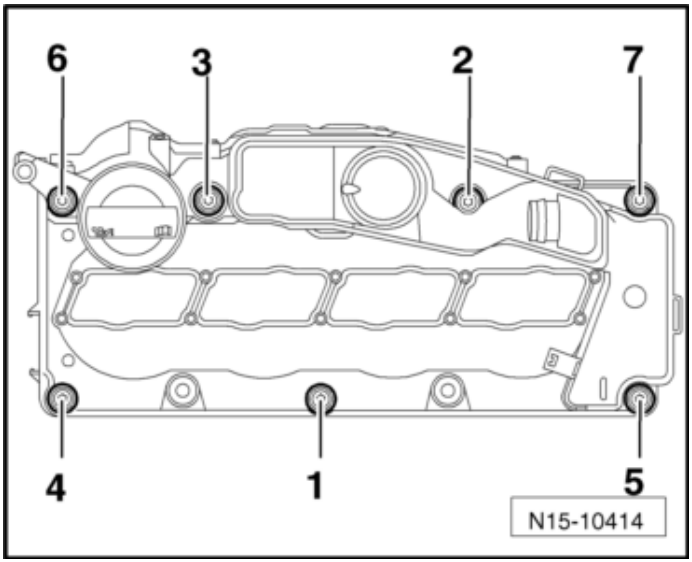


1 - Seal
2 - Bolt
- ☐ 10 Nm

3 - Nut
- ☐ 10 Nm

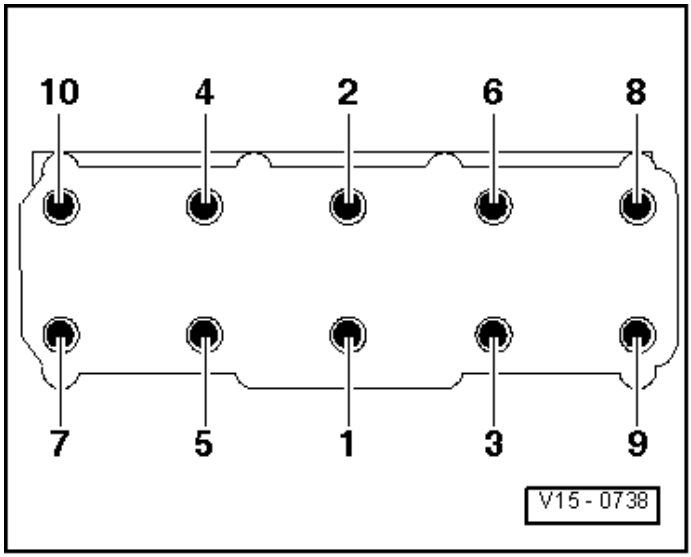
4 - Bearing Frame
5 - Exhaust Camshaft
6 - Intake Camshaft
7 - Roller Rocker Arm
8 - Hydraulic Lash Adjuster
9 - Valve
10 - Cylinder Head
11 - Valve Stem Seal
12 - Valve Spring
13 - Valve Spring Retainer
14 - Valve Retainer
15 - Sealing Cap
- ☐ Always replace

Cylinder Head Cover Bolt Tightening Sequence and Specification



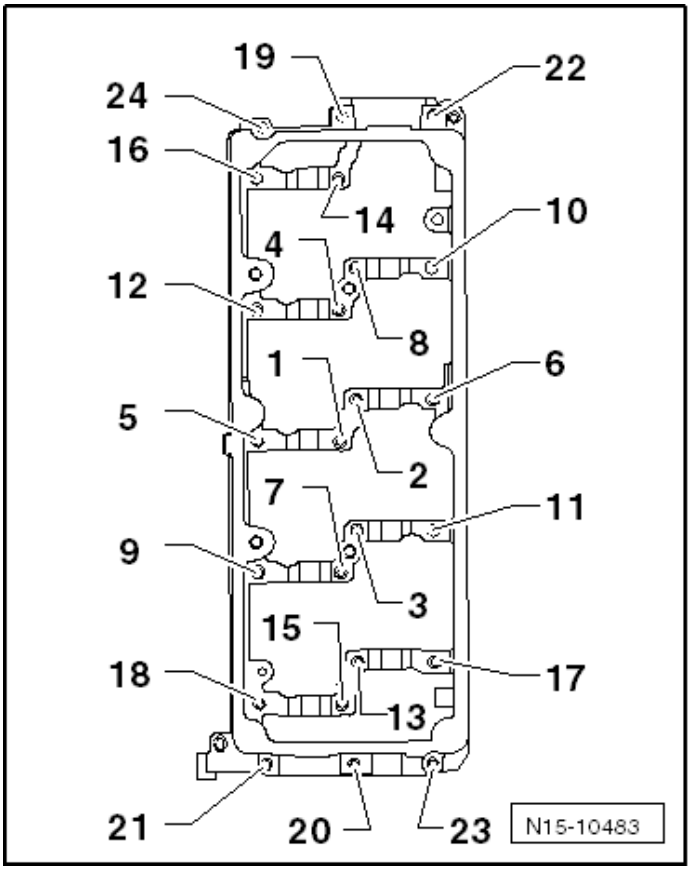
Step	Component	Nm
1	Tighten bolts 1 through 7 in sequence	Hand tighten
2	Tighten bolts 1 through 7 in sequence	10

Cylinder Head Bolt Tightening Sequence and Specification



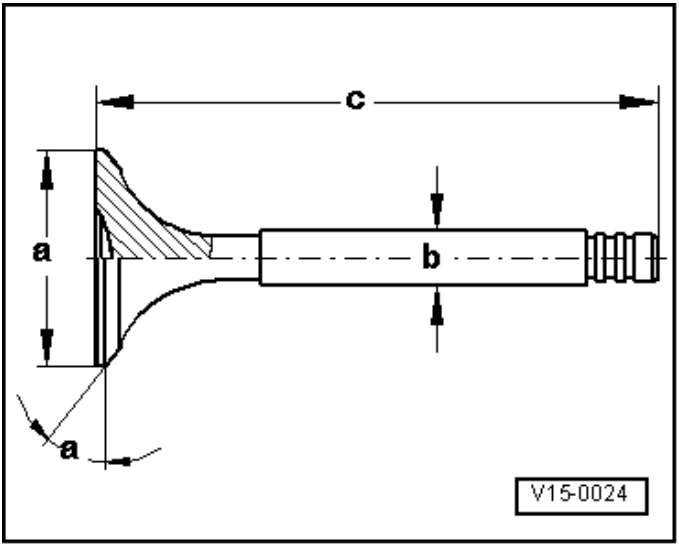
Step	Component	Nm
Tighten the bolts using a torque wrench:		
1	First pass	30
2	Second pass	50
Tighten the bolts further using a ratchet:		
3	Third pass	an additional 90° (¼ turn)
4	Final pass	an additional 90° (¼ turn)

Bearing Frame Bolt Tightening Sequence and Specification



Step	Component	Nm
1	Tighten bolts 1 through 24 in sequence	Hand tighten
2	The bearing frame must be in contact with the entire contact surface of the cylinder head.	
3	Tighten bolts 1 through 24 in sequence	10

Valve Dimensions



Dimension		Intake valve	Exhaust valve
Diameter a	mm	26.60	26.00
Diameter b	mm	5.940	5.940
Distance c	mm	99.30	99.10
α	∠°	45	45

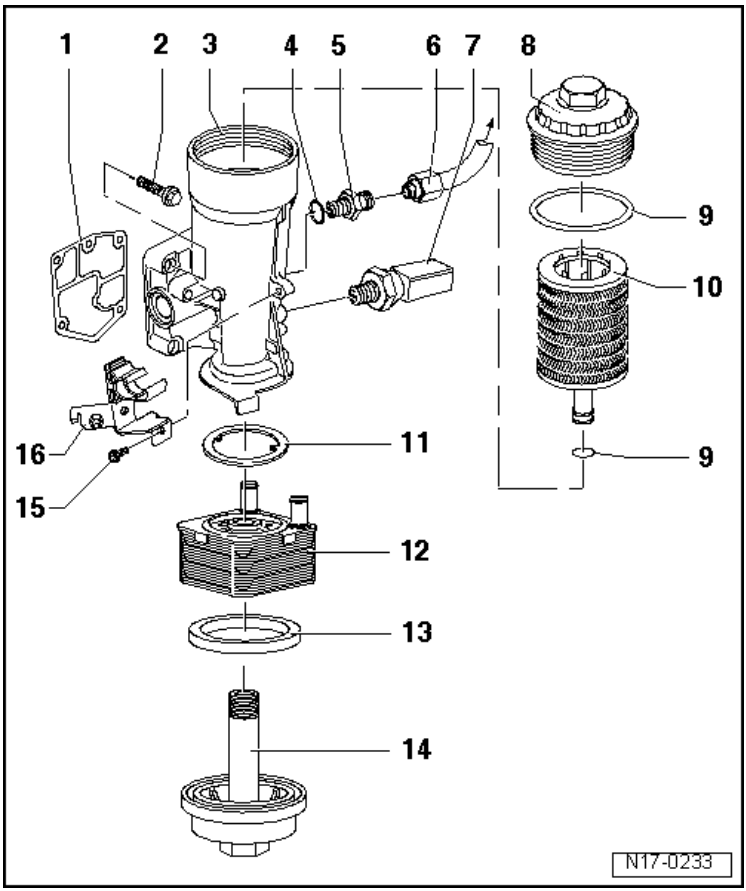
Note: Intake and exhaust valves must not be refaced by grinding. Only lapping is permitted.

Compression Pressures

New Bar positive pressure	Wear limit Bar positive pressure	Difference between cylinders Bar positive pressure
25.0 to 31.0	19	Max. 5.0

Lubrication – 2.0L CJAA

Oil Filter Adapter and Engine Oil Cooler Overview



1 - Gasket
- ☐ Always replace

2 - Bolt
- ☐ 15 Nm + 90° turn
- ☐ Always replace
- ☐ First, tighten the upper left and lower right bolts, and then tighten all 4 bolts in a diagonal sequence.

3 - Oil Filter Adapter

4 - Seal
- ☐ Always replace

5 - Connection
- ☐ 30 Nm

6 - Oil Supply Line
- ☐ 22 Nm

7 - Oil Pressure Switch -F1-
- ☐ 22 Nm
- ☐ Always replace

8 - Cap
- ☐ 25 Nm

9 - O-ring
- ☐ Always replace

10 - Oil Filter Element

11 - Seal
- ☐ Always replace

12 - Oil Cooler

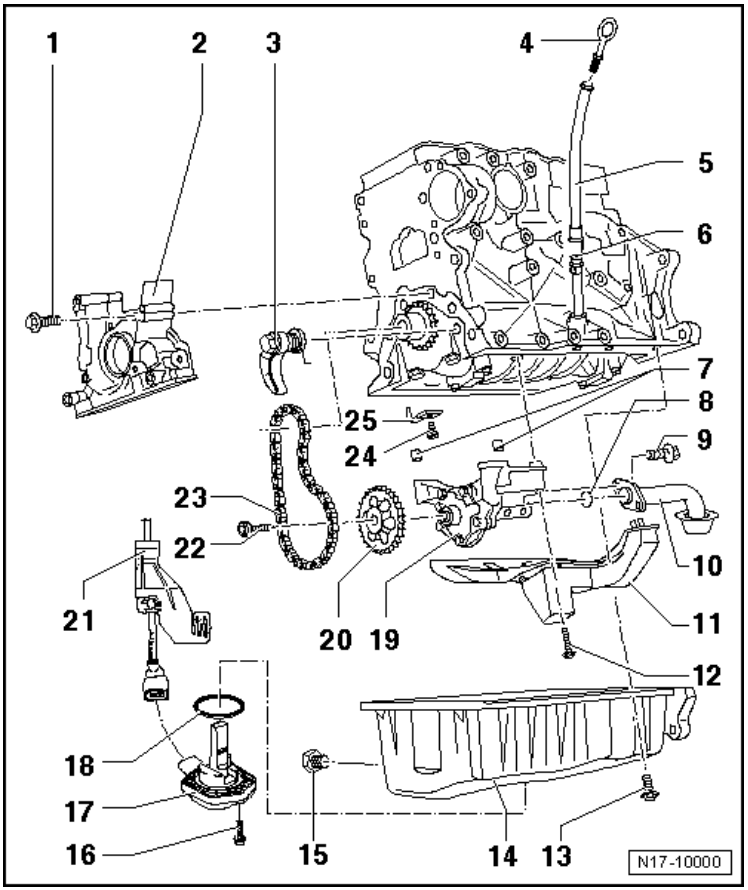
13 - Seal
- ☐ Always replace

14 - Cover
- ☐ 25 Nm

15 - Bolt
- ☐ 10 Nm

16 - Bracket

Oil Pump/Oil Pan Overview



1 - Bolt
- ☐ 15 Nm

2 - Sealing Flange

3 - Chain Tensioner with Tensioning Rail
- ☐ 15 Nm

4 - Oil Dipstick

5 - Guide Tube, Upper

6 - Guide Tube, Lower

7 - Alignment Sleeve

8 - O-ring
- ☐ Always replace

9 - Bolt
- ☐ 15 Nm

10 - Suction Pipe

11 - Windage Tray

12 - Bolt
- ☐ 15 Nm

13 - Bolt
- ☐ 15 Nm

14 - Oil Pan

15 - Oil Drain Plug
- ☐ 30 Nm
- ☐ Always replace

16 - Bolt
- ☐ 10 Nm

17 - Oil Level Thermal Sensor -G266-

18 - Seal
- ☐ Always replace

19 - Oil Pump

20 - Oil Pump Chain Sprocket

21 - Bracket

22 - Bolt
- ☐ 20 Nm + 90° turn
- ☐ Always replace

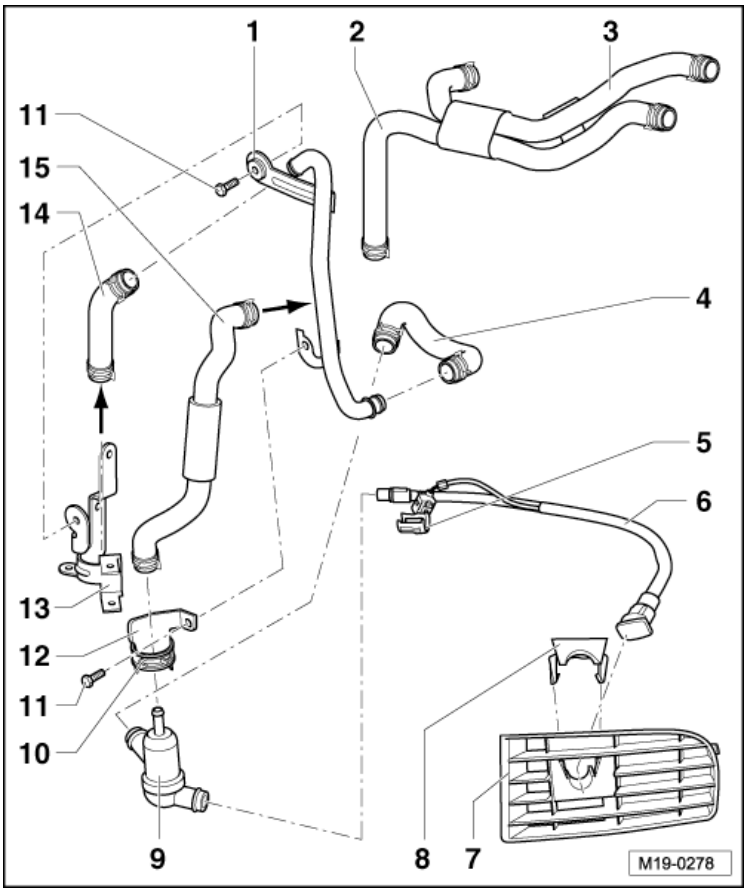
23 - Chain

24 - Bolt
- ☐ 25 Nm

25 - Oil Spray Jet

Cooling System – 2.0L CJAA

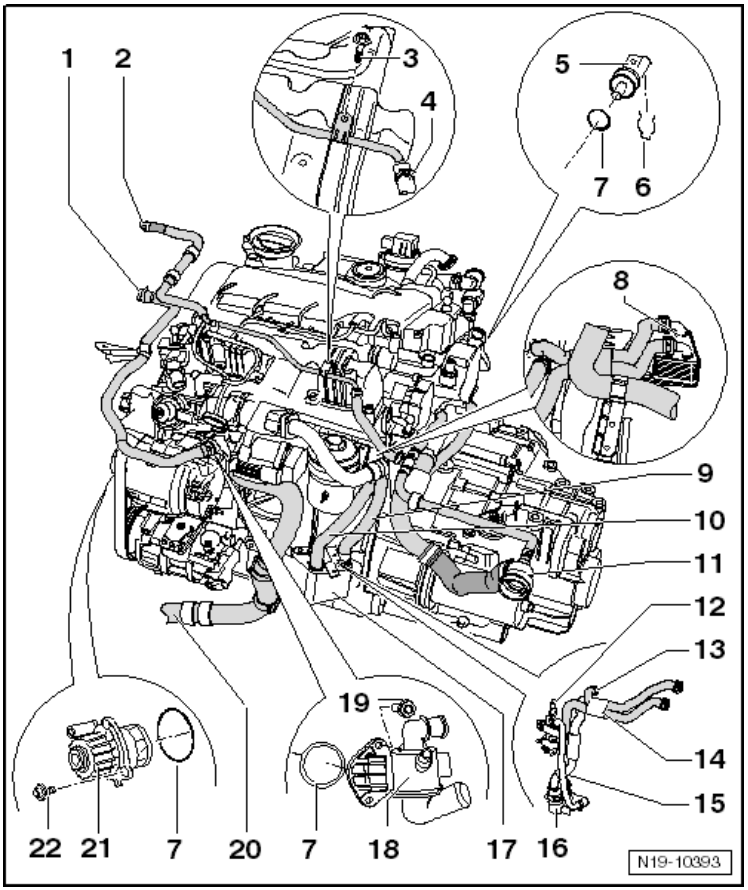
Engine Pre-Heater Overview



1 - Engine Pre-Heater Coolant Pipe
2 - Coolant Hose from the Cylinder Block Connection to the Transmission Oil Cooler
3 - Coolant Hose from the Transmission Oil Cooler to the Engine Oil Cooler
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 Air Intake Grille
8 - Bracket
9 - Engine Pre-Heater
10 - Engine Pre-Heater Clamp
11 - Bolt
☐ 10 Nm

12 - Engine Pre-Heater Bracket
13 - Bracket for Wiring Harness and Coolant Pipe
14 - Coolant Hose from the Engine Oil Cooler to the Engine Pre-Heater Coolant Pipe
15 - Coolant Hose from the Engine Pre-Heater to the Coolant Hose on the Cylinder Block

Coolant Pipe Overview, Engine Side

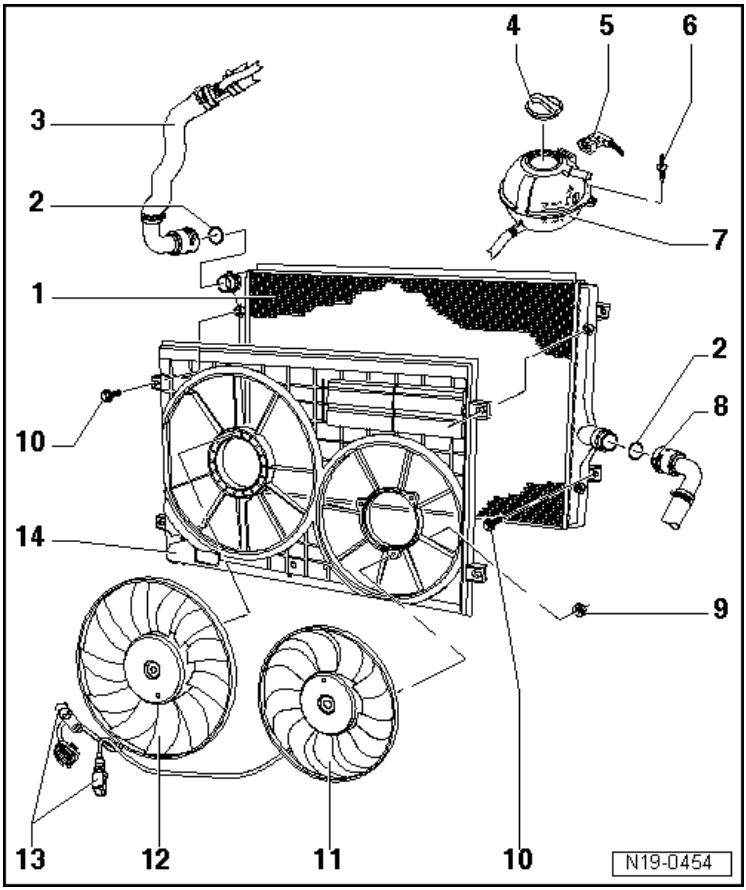


1 - Lower Coolant Expansion Tank Hose
2 - Upper Coolant Expansion Tank Hose
3 - Bolt
☐ 10 Nm
4 - Ventilation Pipe
5 - Engine Coolant Temperature Sensor -G62-
6 - Clip
7 - O-ring
☐ Always replace
8 - Transmission Oil Cooler
9 - Engine Oil Cooler Coolant Supply Hose
10 - Engine Oil Cooler Coolant Return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

15 - Coolant Pipe
16 - Engine Pre-Heater
17 - Engine Oil Cooler
18 - 4/2-Way Valve
19 - Bolt
- ☐ 10 Nm

20 - Hose to the Radiator Lower Connection
21 - Coolant Pump
22 - Bolt
- ☐ 40 Nm

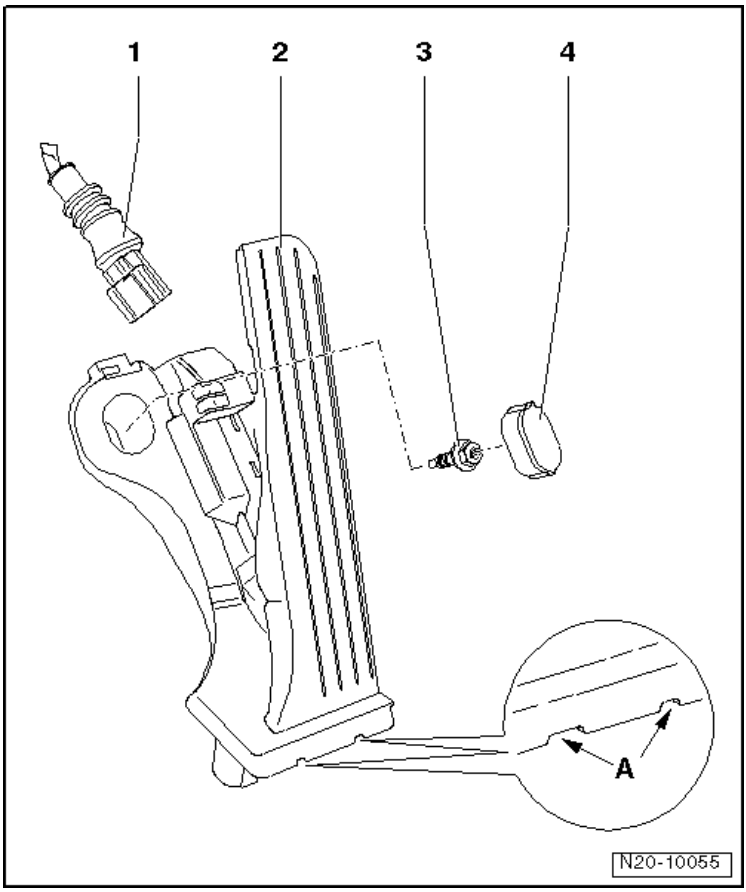
Radiator/Fan Shroud Overview



1 - Radiator
2 - O-ring
3 - Upper Coolant Hose
4 - Cap
5 - Connector
6 - Bolt
☐ 5 Nm
7 - Expansion Tank
8 - Lower Coolant Hose
9 - Nut
☐ 5 Nm
10 - Bolt
☐ 5 Nm
11 - Coolant Fan -V7-
12 - Right Coolant Fan -V35-
13 - Connector
14 - Fan Shroud

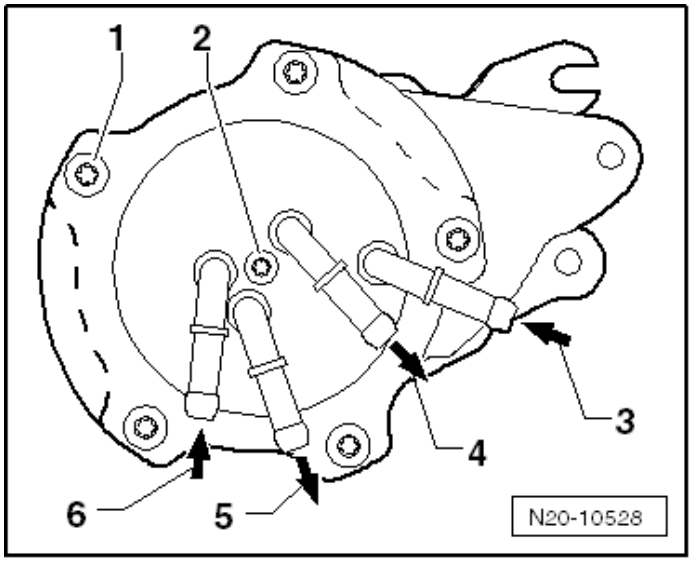
Fuel Supply – 2.0L CJAA

Accelerator Pedal Module Overview



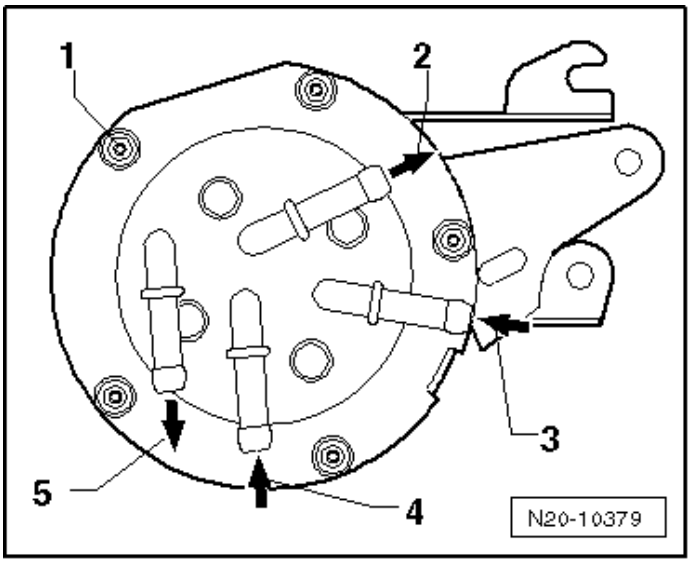
1 - Connector
2 - Accelerator Pedal Position Sensor -G79- with Accelerator Pedal Position Sensor 2 -G185-
3 - Bolt
☐ 22 Nm
4 - Cap

Fuel Filter Flange Overview Fuel Filter Flange, Version A



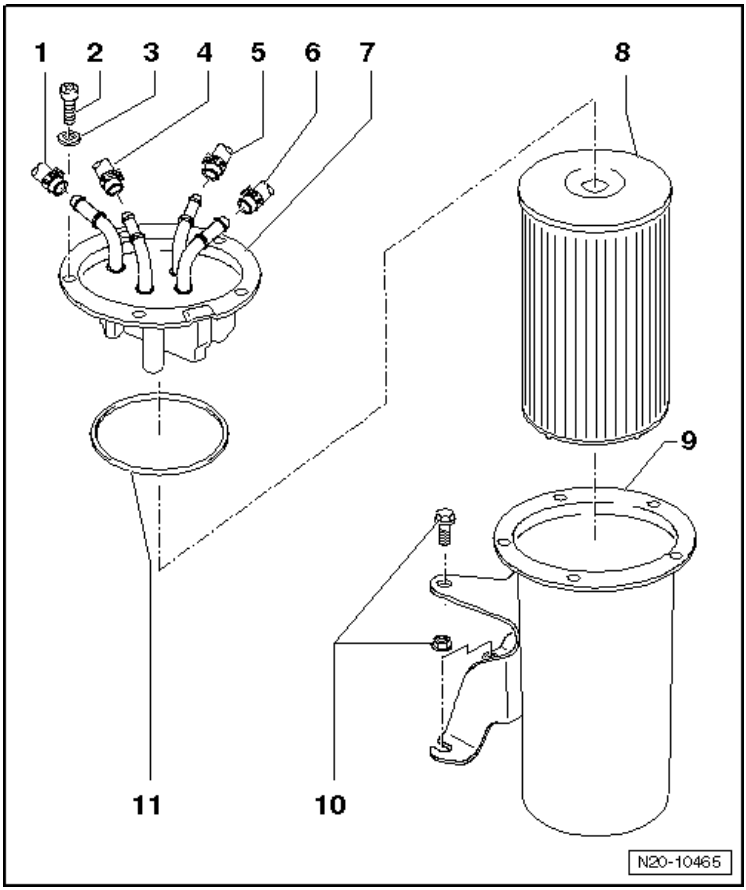
Step	Component	Nm
1	Tighten bolts 1 through 6 in sequence	10

Fuel Filter Flange, Version B



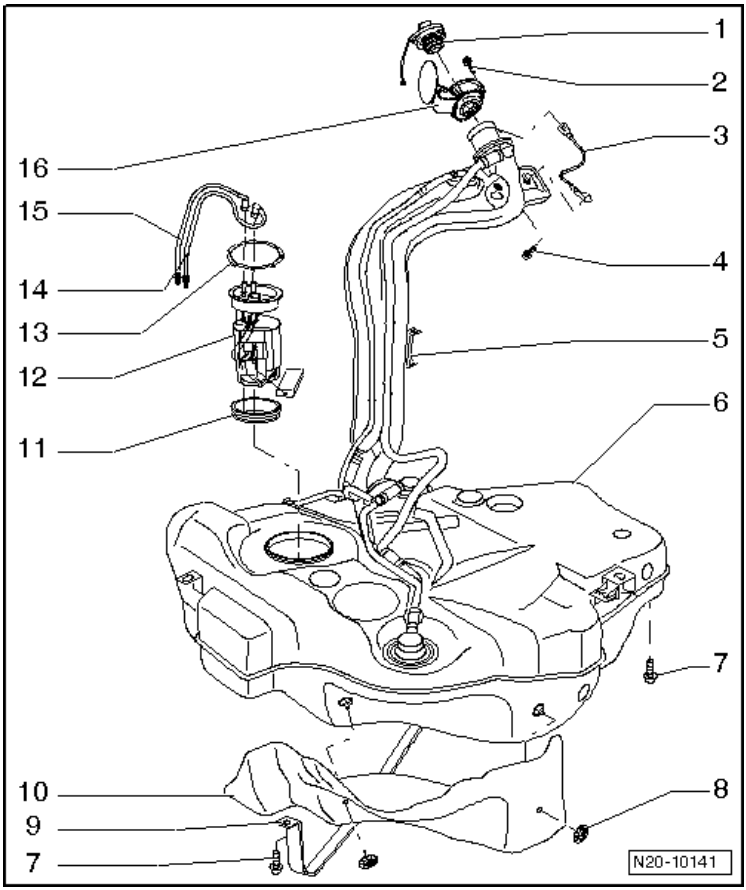
Step	Component	Nm
1	Tighten bolts 1 through 5 in sequence	5

Fuel Filter Overview



1 - Fuel Line
2 - Bolt
☐ 5 Nm
3 - Washer
4 - Fuel Line
5 - Fuel Line
6 - Fuel Line
7 - Fuel Filter Flange
8 - Fuel Filter Element
9 - Fuel Filter Housing
10 - Bolt/Nut
☐ 10 Nm
11 - Seal

Fuel Tank and Attachments Overview



1 - Cap
2 - Bolt
- ☐ 1.5 Nm

3 - Ground Connection
4 - Bolt
- ☐ 10 Nm

5 - Wiring Router
6 - Fuel Tank
7 - Bolt
- ☐ 25 Nm
- ☐ Always replace

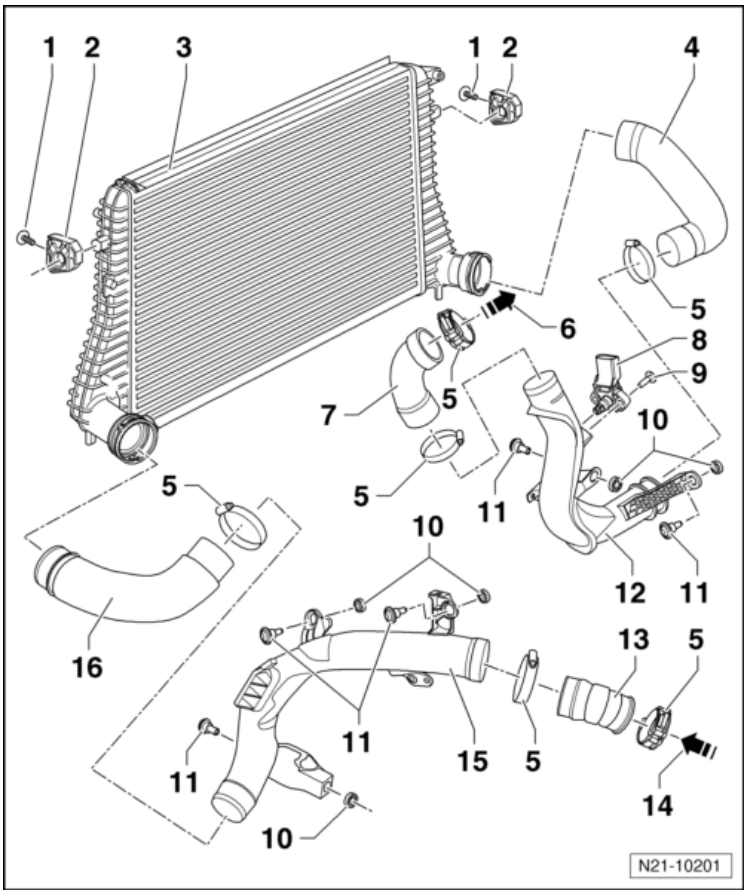
8 - Retainer
9 - Securing Strap
10 - Heat Shield
11 - Seal
12 - Fuel Delivery Unit

13 - Lock Ring
- ☐ 110 Nm

14 - Supply Line
15 - Return Line
16 - Fuel Filler Door Unit

Turbocharger – 2.0L CJAA

Charge Air Cooler System Overview



1 - Bolt
- ☐ 5 Nm

2 - Mount
3 - Charge Air Cooler
4 - Charge Air Hose
5 - Screw Clamp
- ☐ 5.5 Nm

6 - To Throttle Valve Control Module -J338-
7 - Charge Air Hose
8 - Charge Air Pressure Sensor -G31- with the Intake Air Temperature Sensor -G42-
9 - Bolt
- ☐ 2 Nm

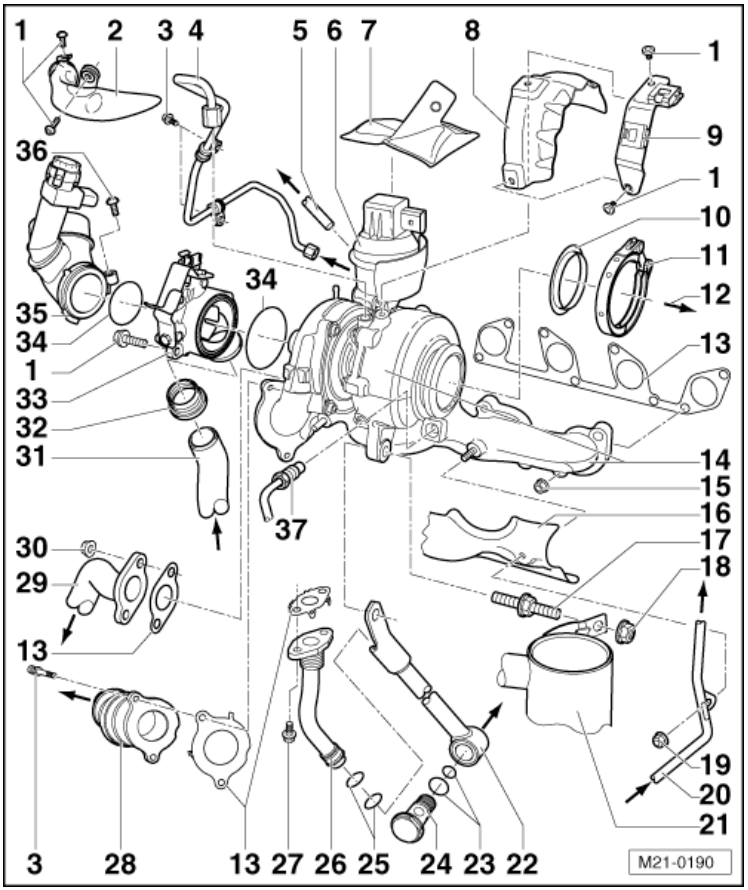
10 - Rubber Grommet

11 - Bolt

- ☐ 8 Nm

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

Turbocharger and Components 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
- ☐ 23 Nm
- ☐ Always replace
- ☐ Coat the stud bolts in the cylinder head 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 - EGR Filter
22 - Support
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 - Pulsation Damper
29 - Connecting Pipe
- ☐ Always replace

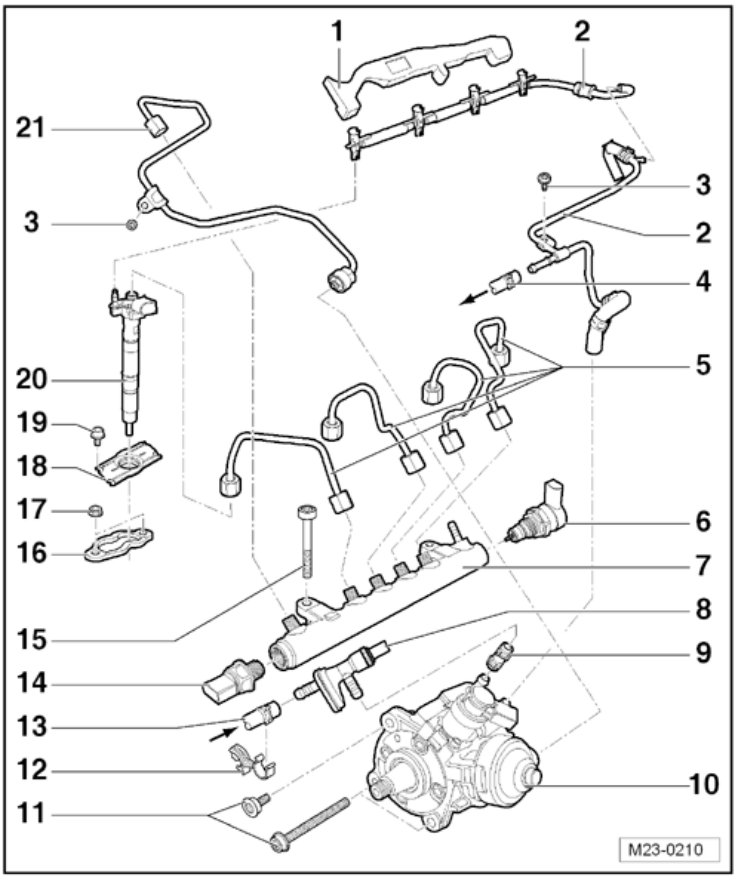
30 - Nut
- ☐ 20 Nm
- ☐ Coat the stud bolts on the exhaust manifold/turbocharger with hot bolt paste -G 052 112 A3-.

31 - Connecting Pipe
32 - Seal
33 - Connecting Adapter
34 - O-ring
35 - Adapter
36 - Bolt
- ☐ 8 Nm

37 - Exhaust Gas Temperature Sensor 1 -G235-
- ☐ 45 Nm

Diesel Fuel Injection – 2.0L CJAA

Fuel System Component Overview



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

11 - Bolt

- ☐ Tighten the long bolts: 20 Nm + an additional 180° (1/2) turn.
- ☐ Tighten the short bolts: 20 Nm + an additional 45° (1/8) turn.
- ☐ Always replace

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

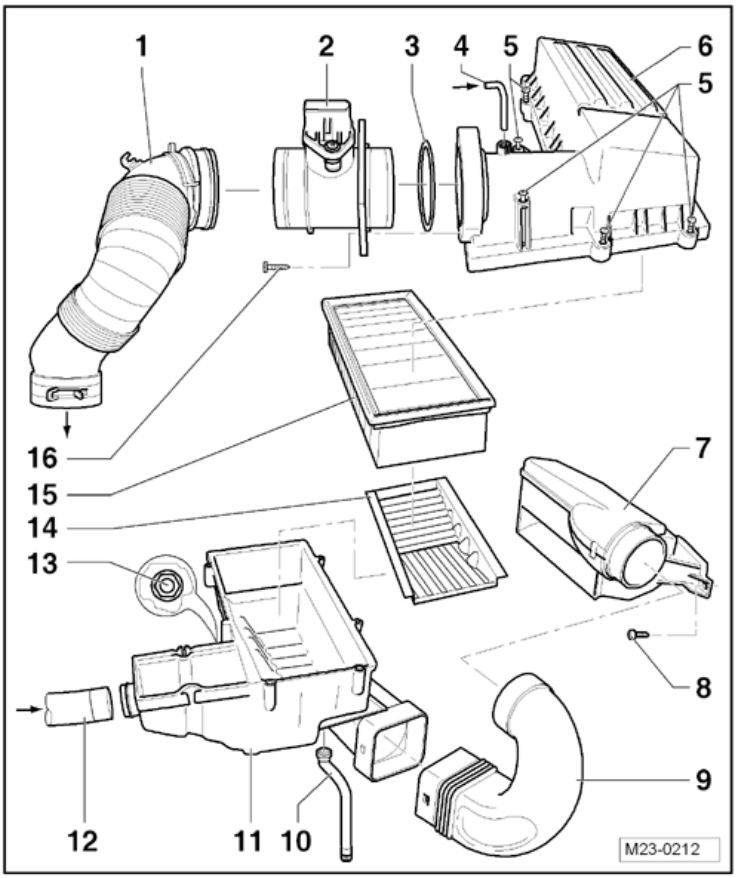
- ☐ 5 Nm

20 - Fuel Injector (Piezo Injector)

21 - High Pressure Lines

- ☐ 28 Nm

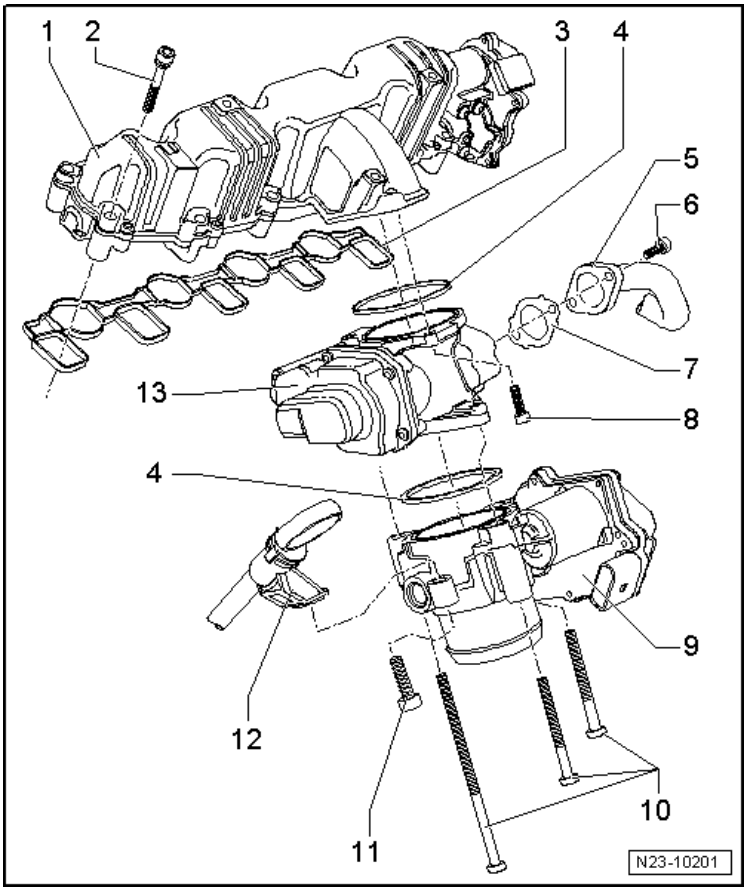
Air Filter Housing Overview



1 - Intake Hose
2 - Mass Airflow Sensor -G70-
3 - O-ring
4 - Vacuum Hose
5 - Bolt
☐ 2 Nm
6 - Upper Air Filter Housing
7 - Intake Air Duct
8 - Bolt
☐ 5 Nm
9 - Intake Air Duct
10 - Water Drain Hose
11 - Lower Air Filter Housing
12 - Intake Hose
13 - Bolt
☐ 8 Nm

14 - Snow Screen
15 - Air Filter Element
16 - Bolt
- ☐ 3.5 Nm

Intake Manifold and Attachments Overview



1 - Intake Manifold
2 - Bolt
- ☐ 8 Nm

3 - Gasket
- ☐ Always replace

4 - Seal
- ☐ Always replace

5 - Connecting Pipe
6 - Bolt
- ☐ 20 Nm

7 - Gasket
- ☐ Always replace

8 - Bolt
- ☐ 10 Nm

9 - Throttle Valve Control Module -J338-
10 - Bolt
- ☐ 10 Nm

11 - Bolt

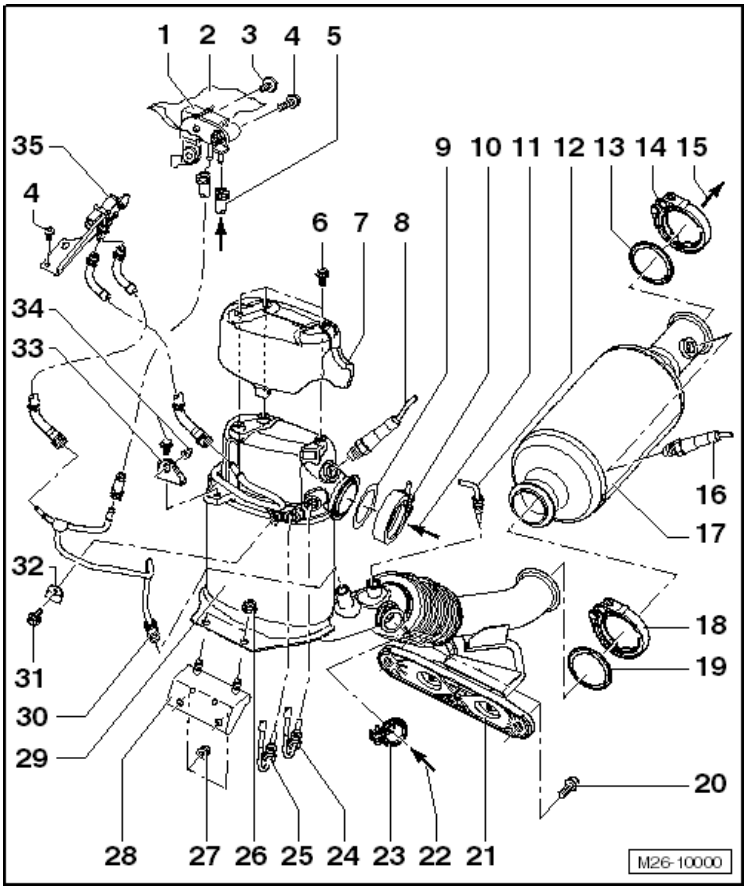
- ☐ 10 Nm

12 - Oil Dipstick

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

Exhaust System – 2.0L CJAA

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 - Heat Shield

8 - Heated Oxygen Sensor -G39-
- ☐ 52 Nm

9 - Seal
- ☐ Always replace

10 - Securing Clamp
- ☐ 7 Nm
- ☐ Always replace

11 - From Turbocharger

12 - Exhaust Gas Temperature Sensor 4 -G648-
- ☐ 45 Nm
- ☐ Coat only the threads with hot bolt paste -G 052 112 A3-.

13 - Seal
- ☐ Always replace

14 - Securing 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 - Securing Clamp
- ☐ 7 Nm
- ☐ Always replace

19 - Seal
- ☐ Always replace

20 - Bolt
- ☐ 25 Nm

21 - Suspended Mount

22 - From Exhaust Gas Recirculation (EGR) Filter

23 - Securing 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

Particulate Filter with NOx Reduction Catalytic Converter Overview (cont'd)

31 - Bolt
- ☐ 9 Nm

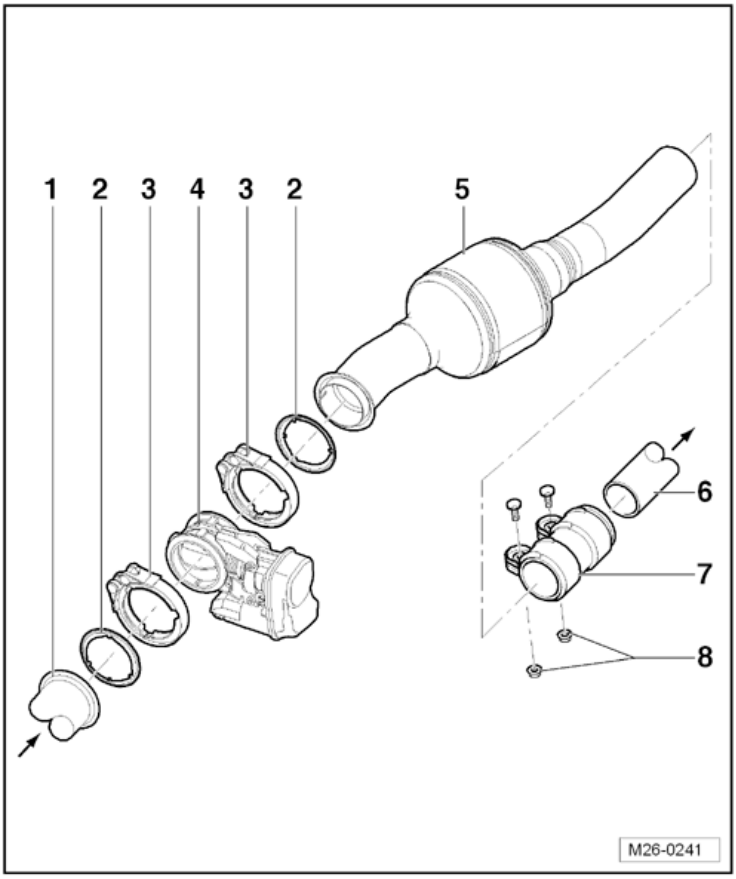
32 - Bracket

33 - Bracket

34 - Bolt/Nut
- ☐ 23 Nm

35 - Differential Pressure Sensor -G505-

Exhaust Door Control Unit -J883- with NOx Reduction Catalytic Converter Overview



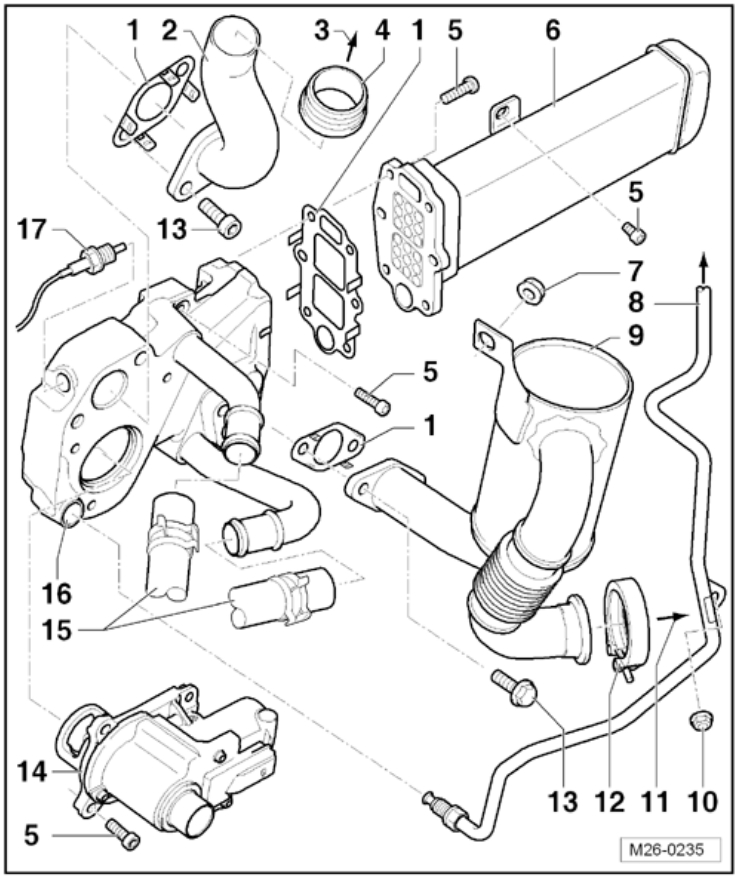
1 - From the Exhaust Pipe with Catalyst and Particulate Filter
2 - Seal
- ☐ Always replace

3 - Securing Clamp
- ☐ 7 Nm
- ☐ Always replace

4 - Exhaust Door Control Unit -J883-
5 - NOx Reduction Catalytic Converter
6 - Front Muffler
7 - Clamping Sleeve
- ☐ Tightening specification and installed position, see Clamping Sleeve Locations below

8 - Threaded Connection
- ☐ Tightening specification and installed position, see Clamping Sleeve Locations below

Exhaust Gas Recirculation (EGR) System Component Overview



1 - Gasket
- ☐ Always replace

2 - Connecting Pipe

3 - To Connection on the Turbocharger

4 - Seal

5 - Bolt
- ☐ 8 Nm

6 - EGR Cooler

7 - Nut
- ☐ 23 Nm

8 - Control Line
- ☐ 23 Nm

9 - Filter

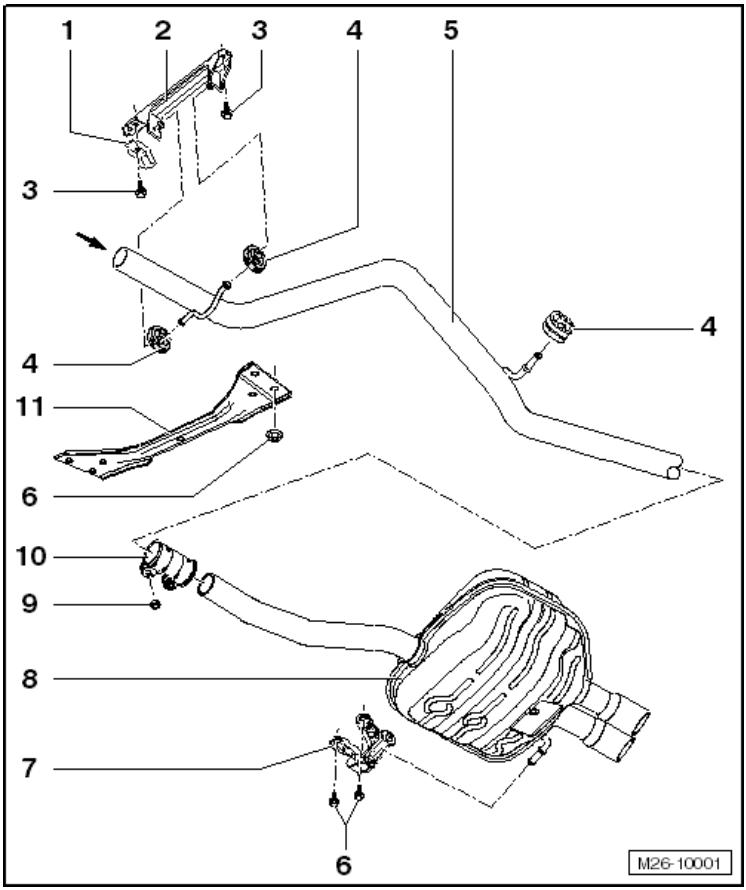
10 - Nut
- ☐ 23

11 - To Particulate Filter
12 - Securing Clamp
- ☐ 3.5 Nm

13 - Bolt
- ☐ 23 Nm

14 - Valve 2 for EGR -N213-
15 - Coolant Hose
16 - Housing
17 - EGR Temperature Sensor -G98-
- ☐ 20 Nm

Muffler and Mounts Overview



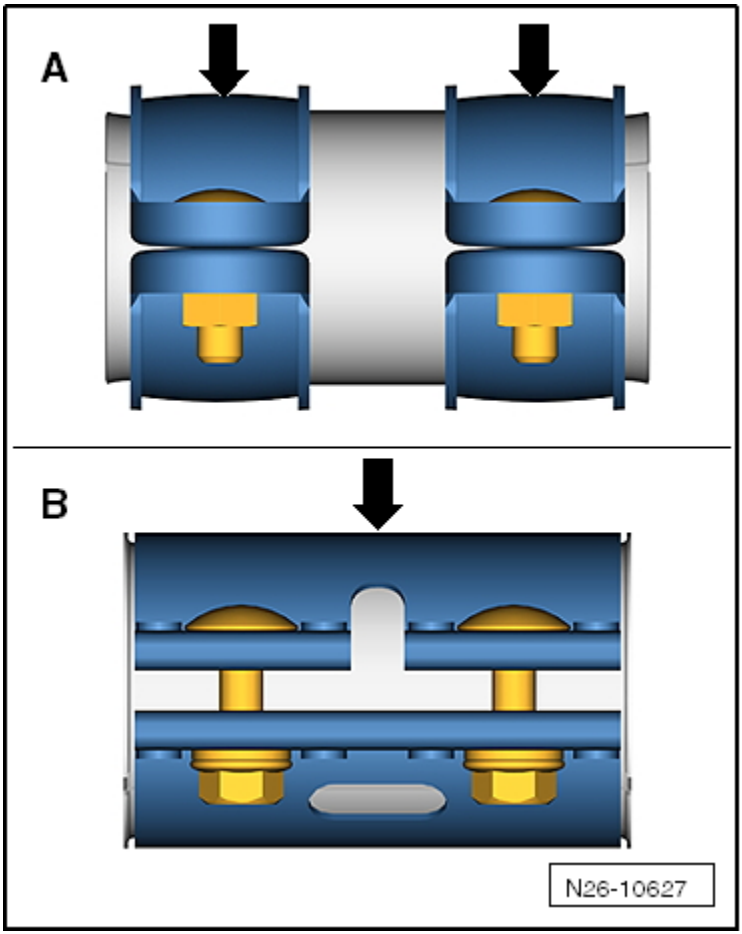
1 - Mounting Strap
2 - Suspended Mount
3 - Bolt
- ☐ 23 Nm
- ☐ Always replace

4 - Retaining Loop
5 - Exhaust Pipe
6 - Bolt/Nut
- ☐ 23 Nm

7 - Suspended Mount
8 - Rear Muffler
9 - Nut
- ☐ Tightening specification, see Clamping Sleeve Locations below

10 - Repair Clamping Sleeve
11 - Tunnel Brace

Tightening Torque and Installed Dimension of the Clamping Sleeve



-A- Clamping sleeve with two individual clamps.	
1	Tightening specification: 25 Nm
2	Installed dimension -a-: 5 mm (only for the front clamping sleeve)
-B- Clamping sleeve with a continuous clamp.	
1	Tightening specification: 35 Nm
2	Installed dimension -a-: 8.5 mm (only for front clamping sleeve)

Ignition/ Glow Plug System – 2.0L CJAA

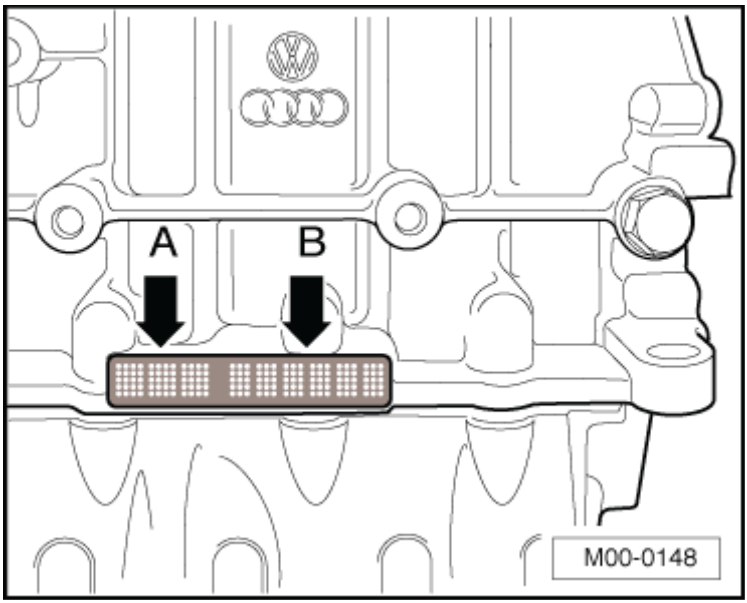
Fastener Tightening Specifications

Component	Nm
Fuel line bracket to intake manifold bolt	8
Glow plug	12

ENGINE MECHANICAL – 2.0L CBTA AND CBUA

General, Technical Data

Engine Number



The engine code (A) and serial number (B) are located on the rear side of the engine, above the cylinder block/upper oil pan partition. In addition, a sticker with the engine code and serial number is applied to the cylinder head cover.

Engine Data

Engine code		CBTA	CBUA
Manufactured			
Rabbit from MY 2004		from 05.07	from 05.07
Golf from MY 2010		from 05.09	from 05.09
Emission values in accordance with			
Rabbit from MY 2004		ULEV 2 [1]	SULEV [2]
Golf from MY 2010		Tier2/BIN5 (US coalition)	SULEV [2]
Displacement	cm^3	2480	2480
Output	kW at RPM	125 @ 5700	125 @ 5700
Torque	Nm at RPM	240 @ 4250	240 @ 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
Research Octane Number (RON)	minimum	95 unleaded [3]	95 unleaded [3]
Fuel injection, ignition		Motronic ME 7.1.1 [4]	Motronic ME 7.1.1 [4]
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, G-charger		No	No
Secondary Air Injection (AIR) system			
Rabbit from MY 2004		Yes	Yes
Golf from MY 2009		No	Yes

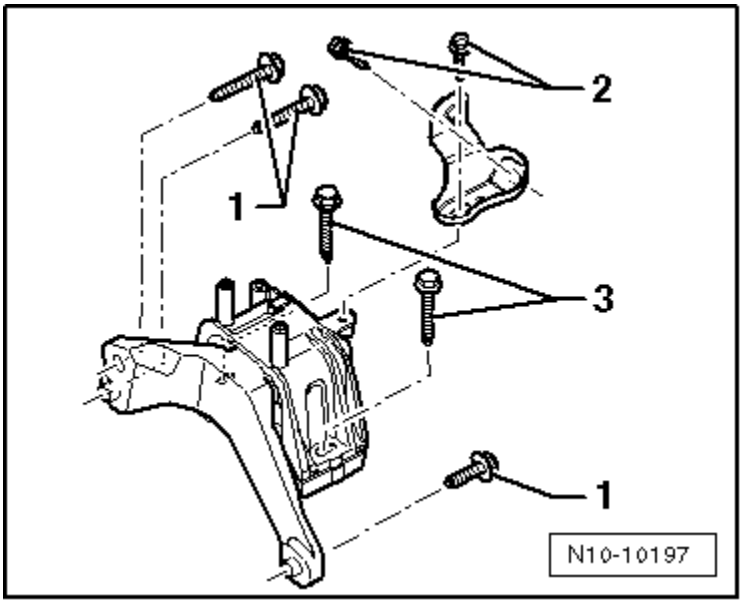
[1] ULEV 2: Ultra Low Emission Vehicle 2.
[2] SULEV: Super Ultra Low Emission Vehicle.
[3] Unleaded RON 91 is permitted but performance is reduced.
[4] From MY 2010 Motronic ME 17.5

Engine Assembly – 2.5L CBTA and CBUA

Fastener Tightening Specifications

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

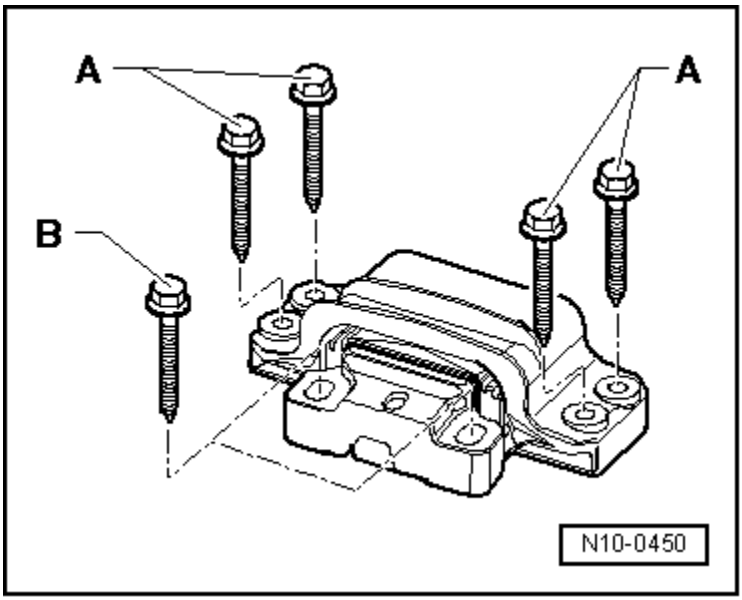
Engine Mount Tightening Specifications



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

[1] Replace fastener(s).

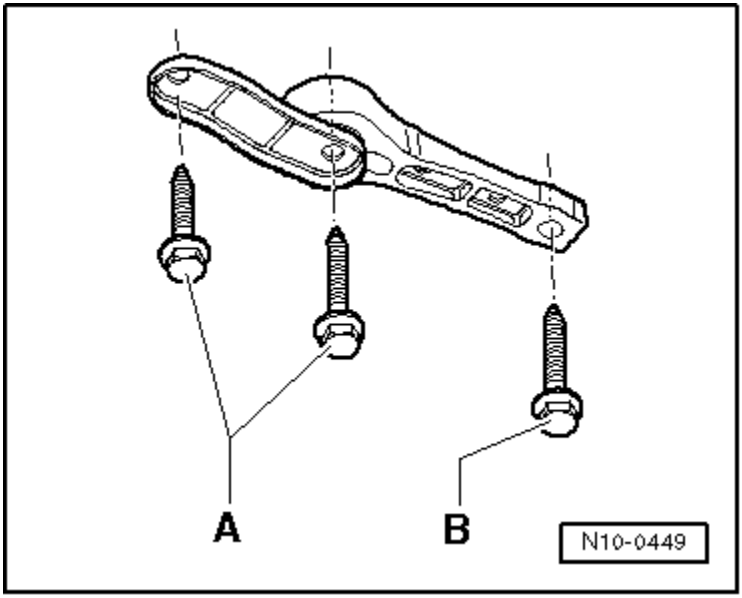
Transmission Mount Tightening Specifications



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

[1] Replace fastener(s).

Pendulum Support Tightening Specifications



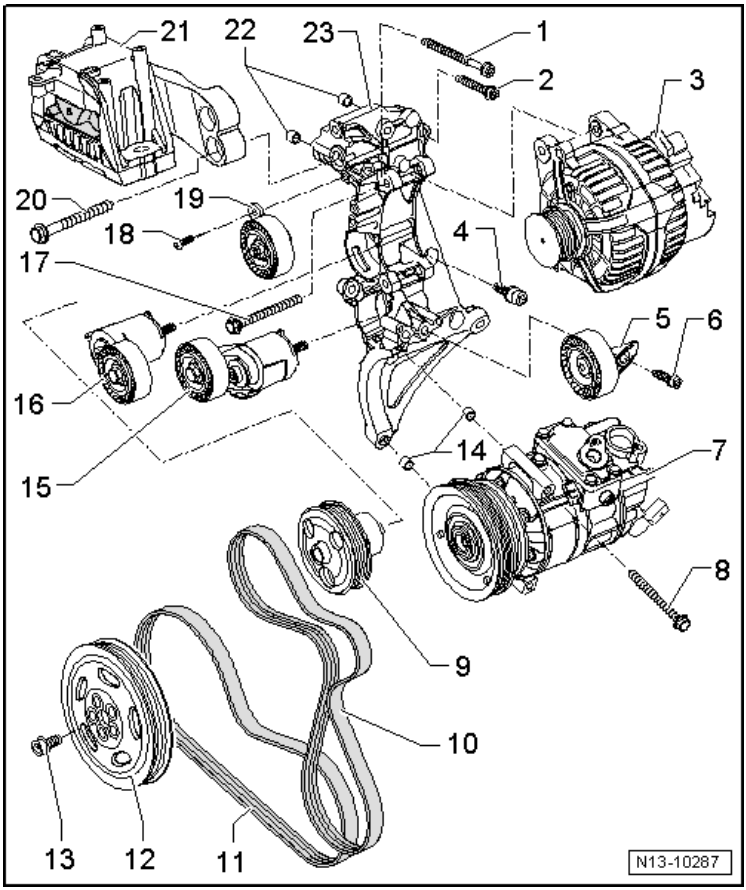
Secure the pendulum support to the transmission first and then to the subframe. To remove, first remove bolt B, then bolts A.

Component	Fastener size	Nm
Bolts A [1]	8.8	40 plus an additional 90° (¼ turn)
	10.9	50 plus an additional 90° (¼ turn)
Bolt B [1]	-	100 plus an additional 90° (¼ turn)

[1] Replace fastener(s).

Crankshaft, Cylinder Block – 2.5L CBTA and CBUA

Ribbed Belt Drive Overview



1 - Bolt
- ☐ 25 Nm

2 - Bolt
- ☐ 25 Nm

3 - Generator

4 - Bolt
- ☐ 25 Nm

5 - Lower Idler Pulley with Bracket

6 - Bolt
- ☐ 25 Nm

7 - A/C Compressor

8 - Bolt
- ☐ 25 Nm

9 - Coolant Pump
10 - Ribbed Belt, Generator, Power Steering Pump and Coolant Pump
11 - Ribbed Belt, A/C Compressor
12 - Vibration Damper
13 - Bolt
- ☐ 50 Nm + 90° turn
- ☐ Always replace
- ☐ Use a strength category 10.9 bolt only.

14 - Bushing
15 - Belt Tensioner, A/C Compressor
- ☐ 35 Nm

16 - Belt Tensioner, Generator, Power Steering Pump and Coolant Pump
- ☐ 35 Nm

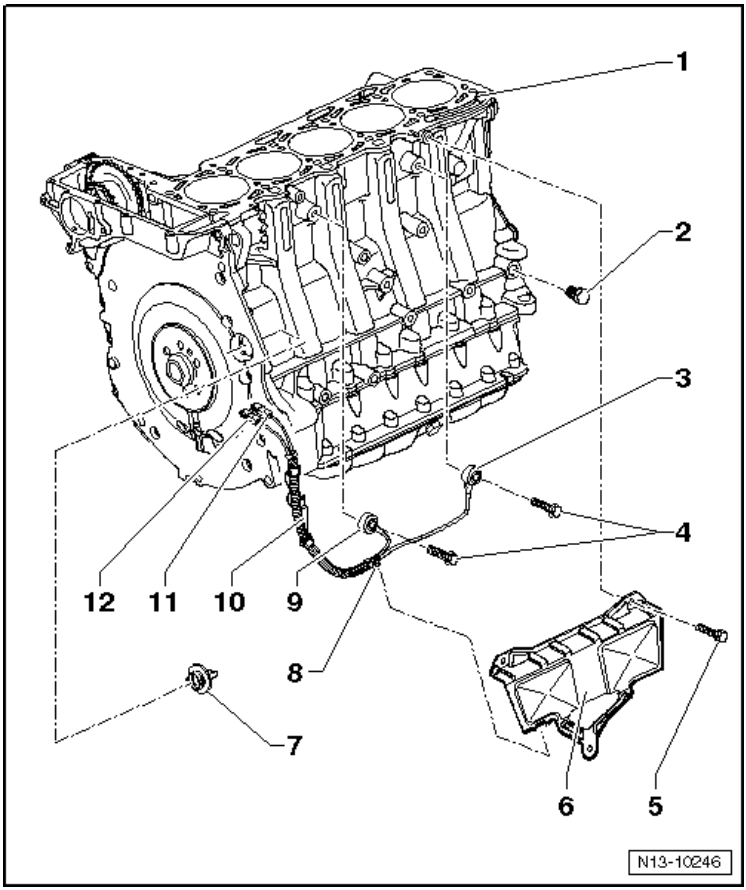
17 - Bolt
- ☐ 25 Nm

18 - Bolt
- ☐ 8 Nm

19 - Upper Idler Pulley with Bracket
20 - Bolt
- ☐ 40 Nm + 90° turn
- ☐ Always replace

21 - Engine Mount
22 - Bushing
23 - Accessory Bracket

Engine Overview, Rear

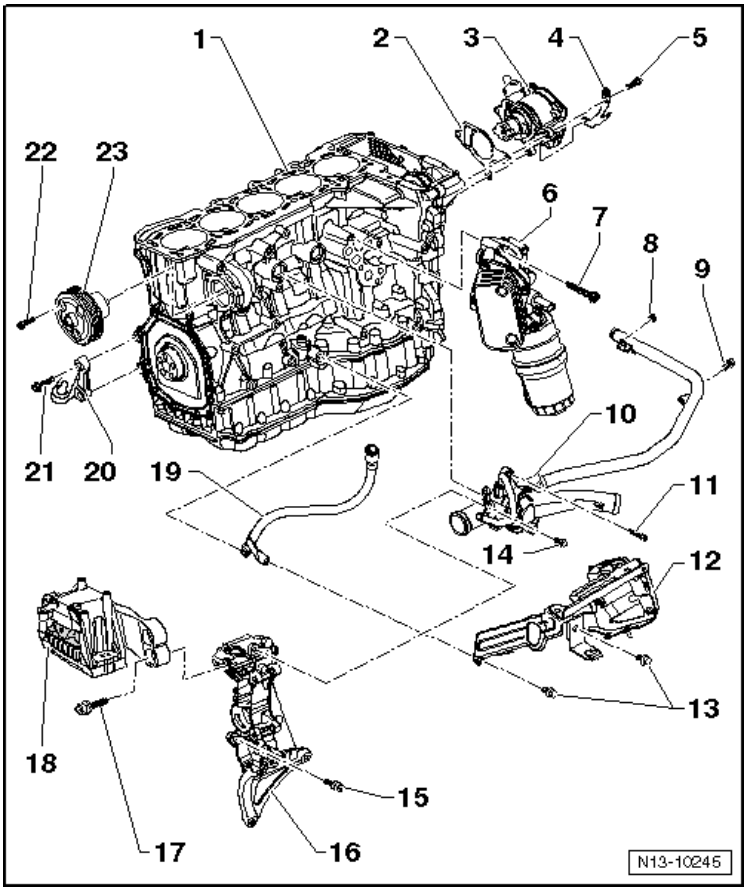


1 - Cylinder Block
2 - Alignment Pin
3 - Knock Sensor 1 -G61-
4 - Bolt
- ☐ 20 Nm

5 - Bolt
- ☐ 10 Nm

6 - Cover
7 - Plug
8 - Wire Clip
9 - Knock Sensor 2 -G66-
10 - Wire Bracket
11 - Connector
12 - Connector

Engine Overview, Front/Side



1 - Cylinder Block
2 - Gasket
- ☐ Always replace

3 - Brake Booster Vacuum Pump
4 - Bracket
5 - Bolt
- ☐ 10 Nm

6 - Oil Filter Adapter
7 - Bolt
- ☐ 25 Nm

8 - Nut
- ☐ 10 Nm

9 - Bolt
- ☐ 10 Nm

10 - Thermostat Housing
11 - Bolt
- ☐ 10 Nm

12 - Intake Manifold Support
13 - Bolt
- ☐ 25 Nm

14 - Bolt
- ☐ 10 Nm

15 - Bolt
- ☐ 25 Nm

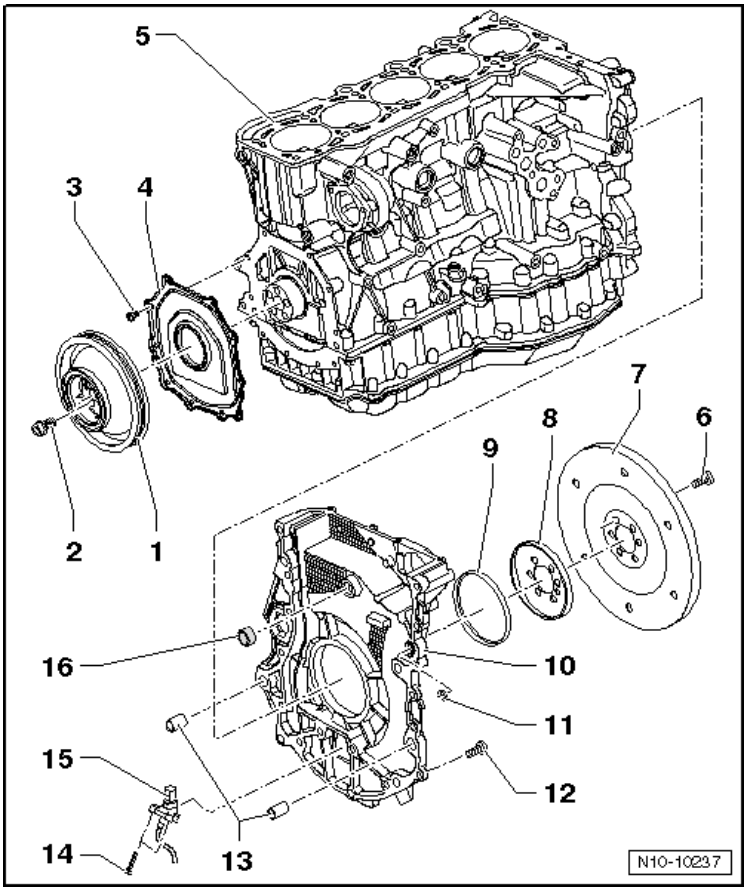
16 - Accessory Bracket
17 - Bolt
- ☐ 40 Nm + 90° turn
- ☐ Always replace

18 - Engine Mount
19 - Guide Tube
20 - Bracket
21 - Bolt
- ☐ 25 Nm

22 - Bolt
- ☐ 10 Nm

23 - Coolant Pump

Sealing Flange and Drive Plate/Flywheel Overview



1 - Vibration Damper
- ☐ There are different versions.

2 - BoltS
- ☐ 50 Nm + 90° turn
- ☐ Always replace
- ☐ Use a strength category 10.9 bolt only.

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 - Seal, Transmission Side

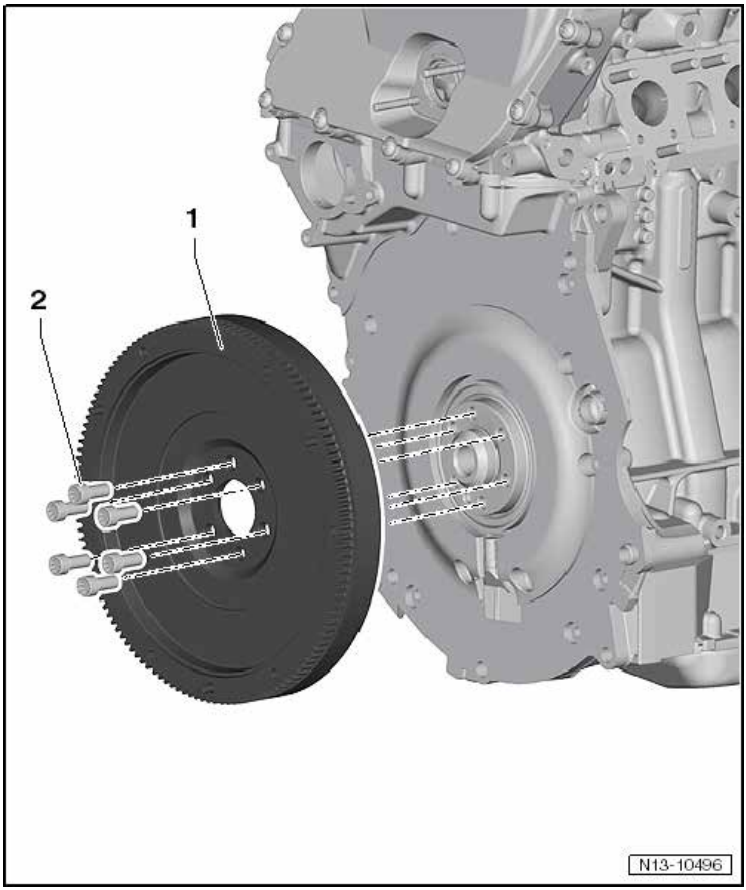
10 - Sealing Flange, Transmission Side
11 - O-ring
- ☐ Always replace

12 - Bolt
- ☐ 25 Nm

13 - Alignment Sleeves
14 - Bolt
- ☐ 5 Nm

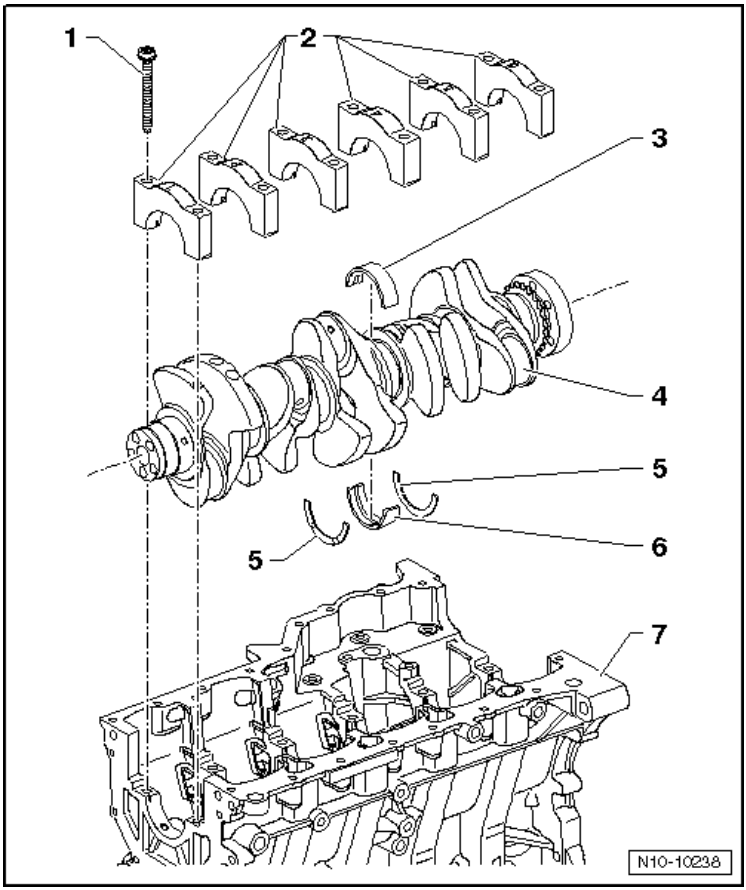
15 - Engine Speed Sensor -G28-
16 - Seal
- ☐ Always replace

Flywheel Overview



1 - Flywheel
2 - Bolt
- ☐ 60 Nm + 90° turn
- ☐ Always replace

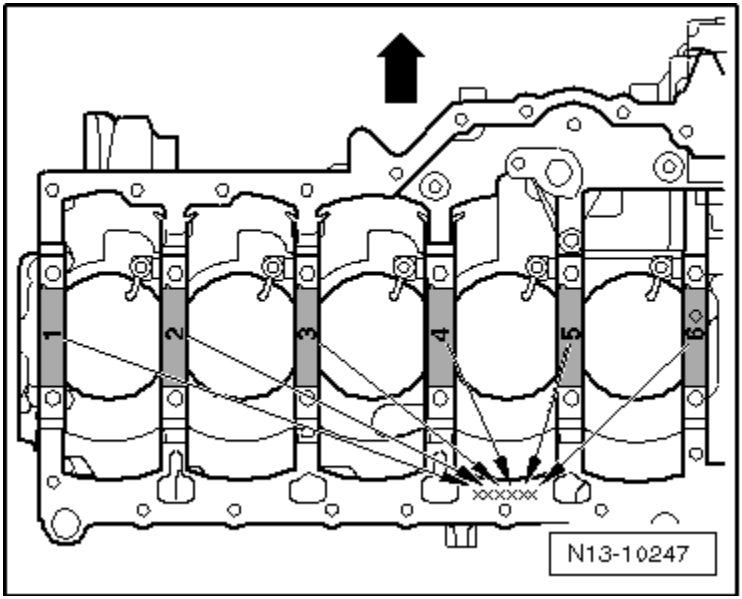
Crankshaft Overview



1 - Bolt
- ☐ 40 Nm + 90° turn
- ☐ Always replace

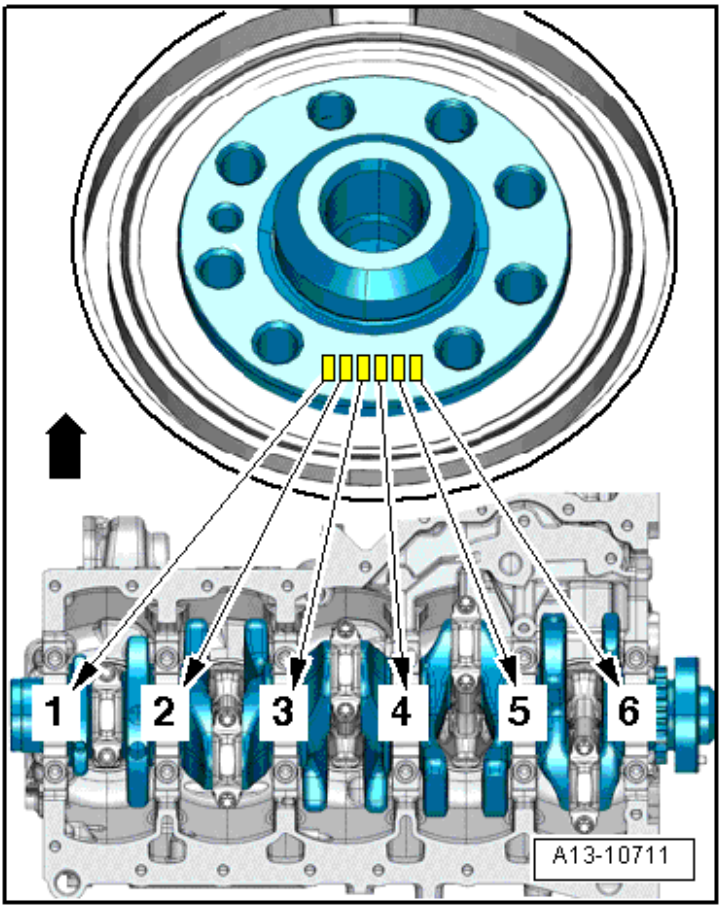
2 - Bearing Cap
3 - Bearing Shell for the Bearing Cap
4 - Crankshaft
5 - Thrust Washers
6 - Bearing Shell for the Cylinder Block
7 - Cylinder Block

Allocation, Upper Bearing Shells (Cylinder Block)



Letter on Cylinder Block	Colored Dot on the Bearing Shell
G =	Yellow
B =	Blue
R =	Red

Allocation, Lower Bearing Shells (Bearing Cap)

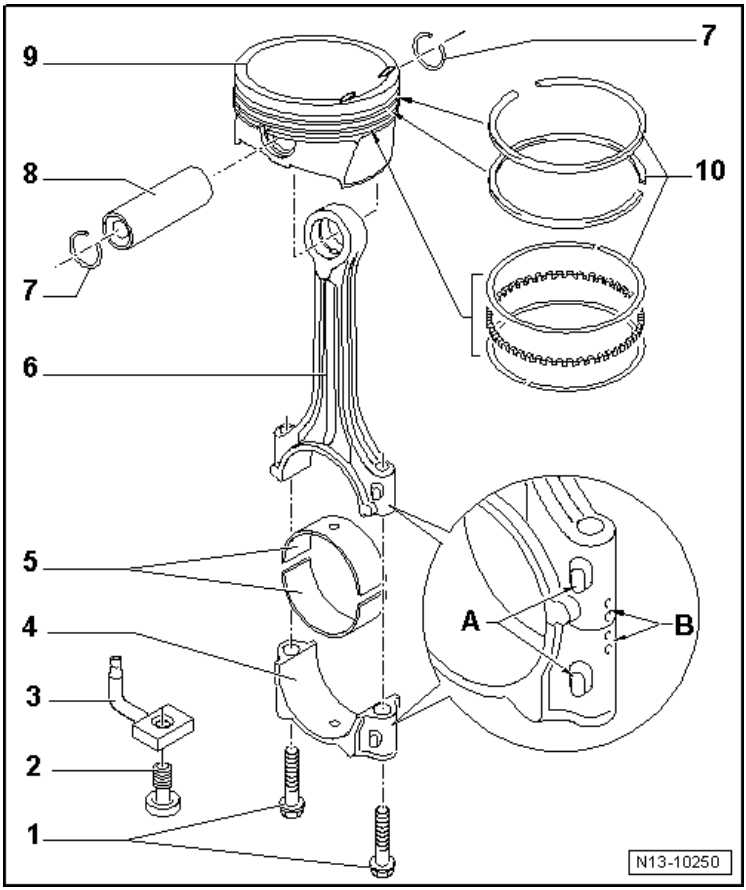


Bearing shells with the correct thickness are allocated to the bearing cap at the factory. Colored dots on the sides of the bearing shells identify bearing shell thickness. The allocation of the bearing shell for the bearing cap is identified by a series of letters on the crankshaft/ vibration damper pulley flange. The first letter of the row of letters represents bearing “1”, the second letter is for bearing “2”, etc.

Letter on crankshaft/vibration damper pulley flange	Colored dot on bearing shell
R	Red
G	Yellow
B	Blue
W	White

NOTE: ➡ points in direction of travel.

Piston and Connecting Rod Overview



1 - Bolt
- ☐ 30 Nm + 90° turn
- ☐ Always replace
- ☐ Lubricate the threads and contact surface.

2 - Pressure Relief Valve
- ☐ 27 Nm

3 - Oil Spray Jet
4 - Connecting Rod Bearing Cap
5 - Bearing Shell
6 - Connecting Rod
7 - Circlip
8 - Piston Pin
9 - Piston
10 - Piston Rings

Crankshaft Dimensions

Honing dimensions in mm	Crankshaft bearing pin diameter		Connecting rod bearing pin diameter	
Basic dimension	58.00	-0.022	47.80	-0.022
		-0.042		-0.042
1st oversize	57.75	-0.02	47.55	-0.022
		-0.042		-0.042
2nd oversize	57.50	-0.022	47.30	-0.022
		-0.042		-0.042
Stage III	57.25	-0.022	47.05	-0.022
		-0.042		-0.042

Piston Ring End Gaps

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

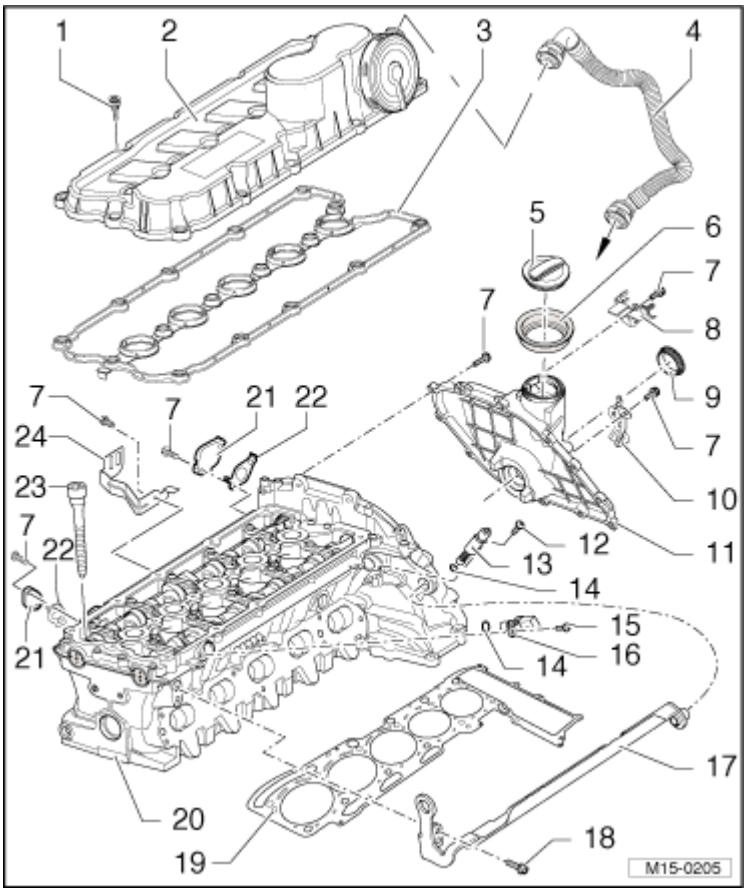
Piston and Cylinder Dimensions

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

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

Cylinder Head, Valvetrain – 2.5L CBTA and CBUA

Cylinder Head Overview



1 - Bolt
- ☐ 10 Nm

2 - Cylinder Head Cover
3 - Cylinder Head Cover Gasket
4 - Crankcase Ventilation Hose
5 - Cap
6 - Gasket
7 - Bolt
- ☐ 10 Nm

8 - Wire Bracket
9 - Seal
10 - Wire Bracket
11 - Timing Chain Cover

12 - Bolt
- ☐ 2 Nm

13 - Camshaft Adjustment Valve 1 -N205-
14 - O-ring
15 - Bolt
- ☐ 10 Nm

16 - Camshaft Position Sensor -G40-
17 - Transport Strap
18 - Bolt
- ☐ 25 Nm

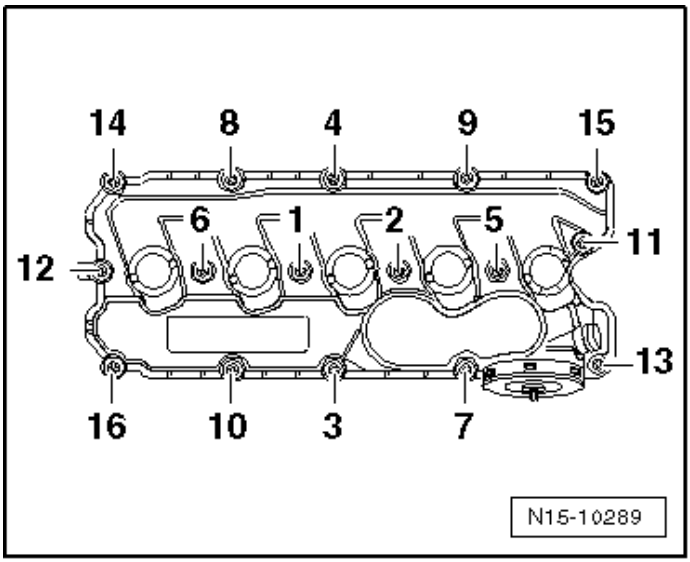
19 - Cylinder Head Gasket
- ☐ Always replace

20 - Cylinder Head
21 - Cap
22 - Gasket
- ☐ Always replace

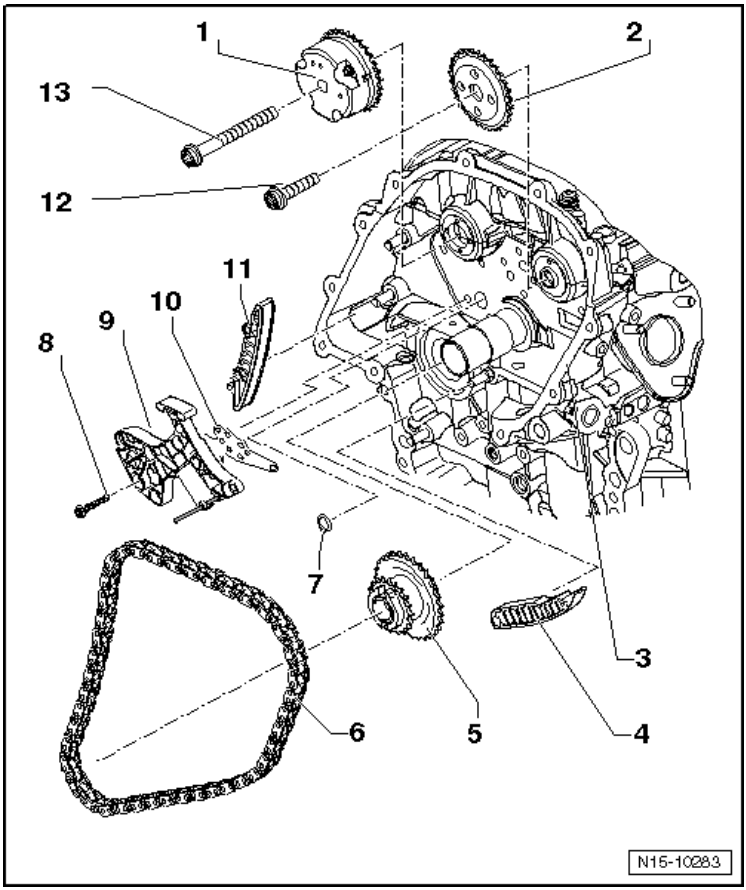
23 - Bolt
- ☐ 40 Nm + 180° turn
- ☐ Always replace
- ☐ Follow the loosening and tightening sequence. see Cylinder Head below

24 - Wire Bracket

Cylinder Head Cover Bolt Tightening Sequence



Camshaft Timing Chain Overview



1 - Intake Camshaft Adjuster
2 - Exhaust Camshaft Sprocket
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

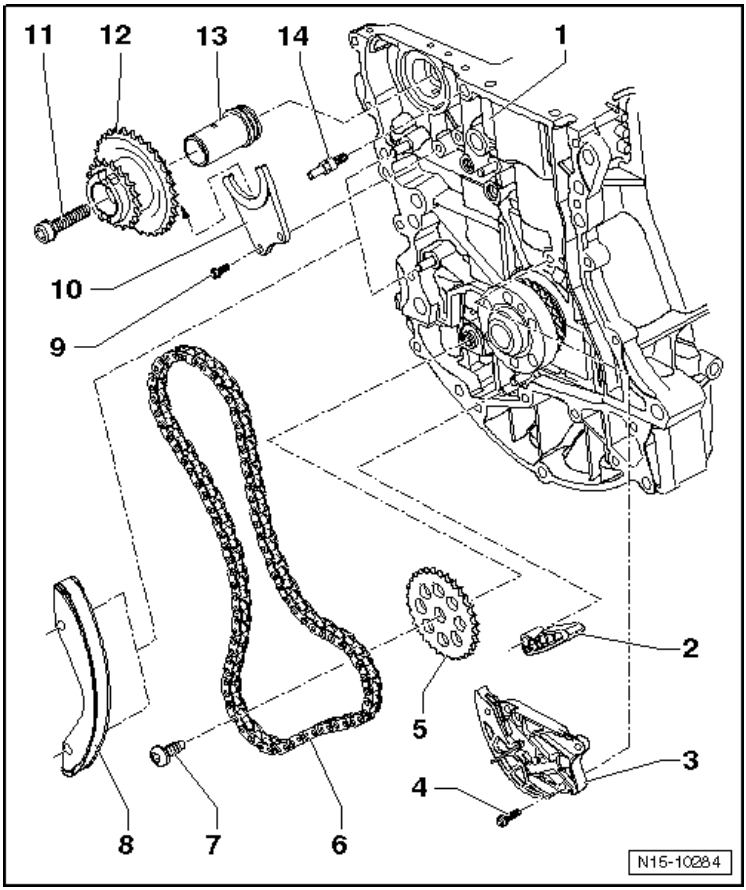
12 - Bolt

- ☐ 60 Nm + 90° turn
- ☐ Always replace

13 - Bolt

- ☐ 60 Nm + 90° turn
- ☐ Always replace

Oil Pump Timing Chain Overview



1 - Cylinder Block
2 - Guide Rail
3 - Chain Tensioner
4 - Bolt
- ☐ 10 Nm

5 - Oil Pump Sprocket
6 - Oil Pump Timing Chain
7 - Bolt
- ☐ 20 Nm + 90° turn
- ☐ Always replace

8 - Guide Rail
9 - Bolt
- ☐ 10 Nm

10 - Axial Bearing Disc

11 - Bolt

- ☐ 60 Nm + 90° turn
- ☐ Always replace

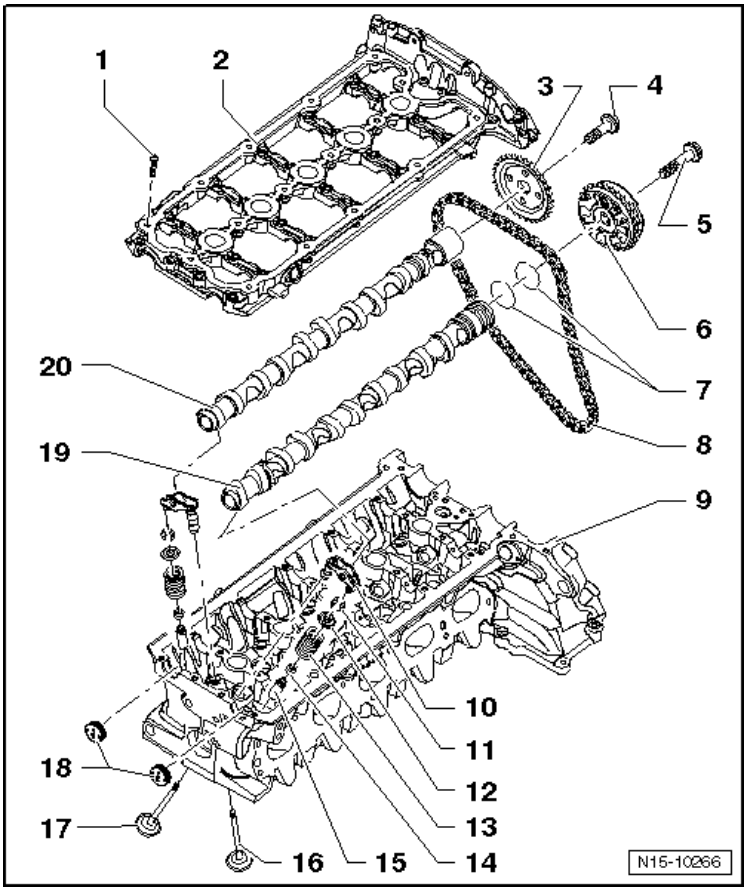
12 - Camshaft and Oil Pump Timing Chains Double Sprocket

13 - Gear Shaft

14 - Threaded Pin

- ☐ 40 Nm

Valvetrain Overview



1 - Bolt
- ☐ 8 Nm + 90° turn
- ☐ Always replace

2 - Guide Frame
3 - Exhaust Camshaft Sprocket
4 - Bolt
- ☐ 60 Nm + 90° turn
- ☐ Always replace

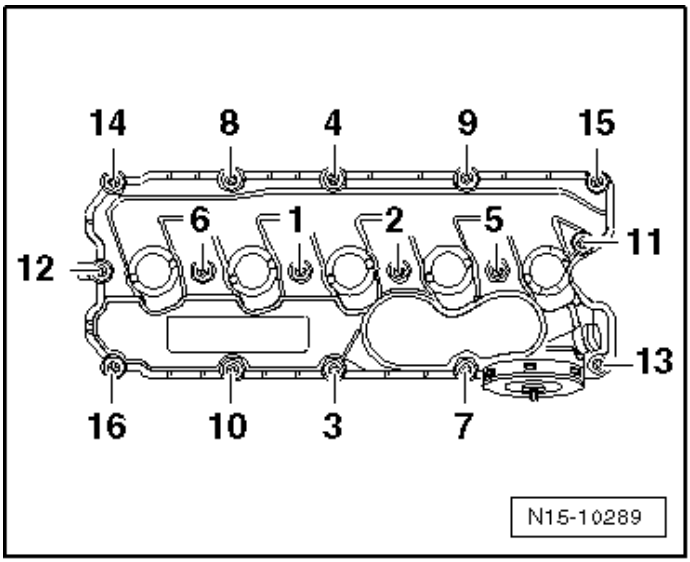
5 - Bolt
- ☐ 60 Nm + 90° turn
- ☐ Always replace

6 - Intake Camshaft Adjuster
7 - Seals
8 - Timing Chain
9 - Cylinder Head
10 - 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 Plug
- ☐ Always replace

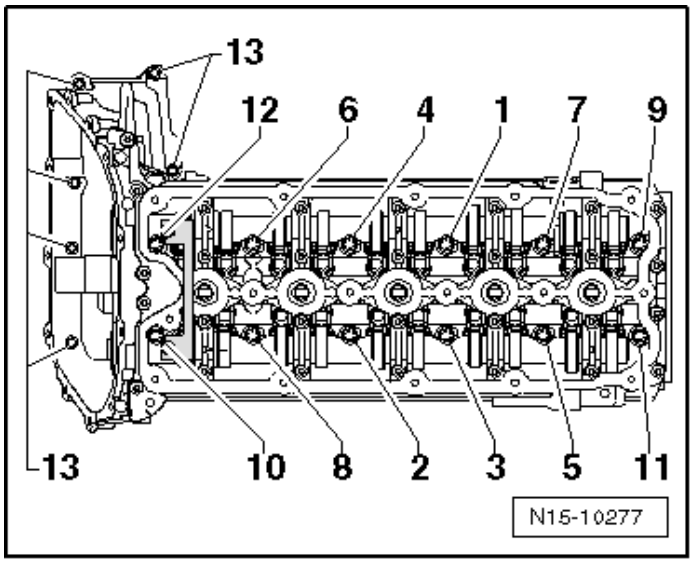
19 - Intake Camshaft
20 - Exhaust Camshaft

Cylinder Head Cover Bolt Tightening Sequence and Specification



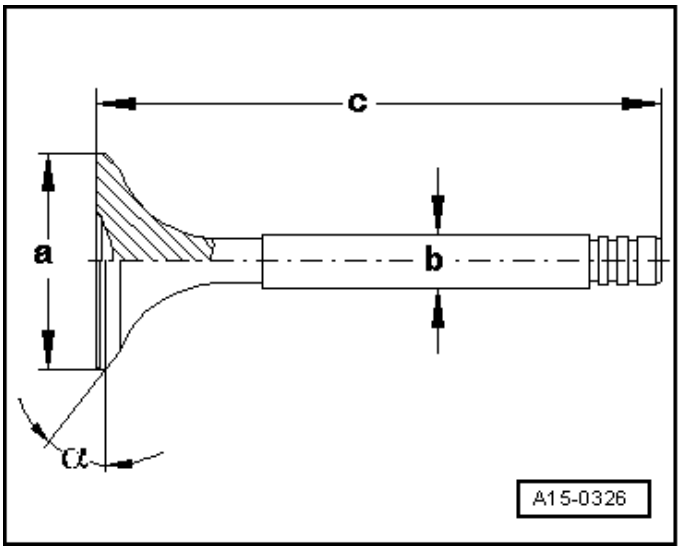
Step	Component	Nm
1	Tighten the bolts in the sequence shown	10

Cylinder Head Bolt Tightening Sequence and Specification



Steps	Component	Nm
1	Install the cylinder head bolts in sequence	Hand tighten
2	Tighten the bolts in sequence, using a torque wrench.	40
3	Tighten the bolts in sequence, using a ratchet.	an additional 90° (¼ turn)
4	Tighten the bolts in sequence, using a ratchet.	an additional 90° (¼ turn)

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 to105.34	103.64 to 104.14
α	∠°	45	45

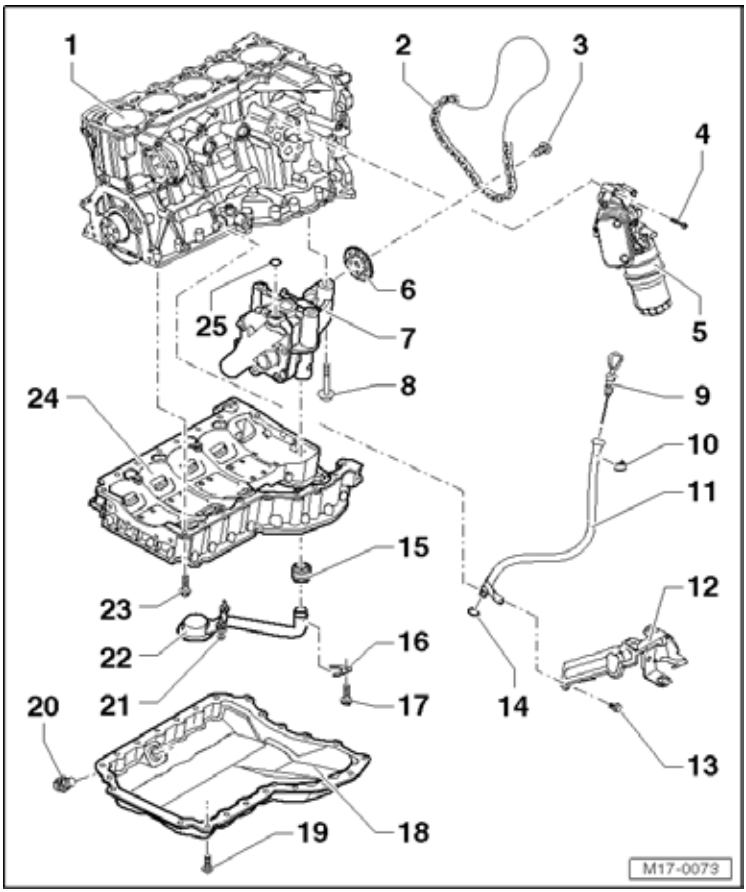
Note: Intake and exhaust valves must not be refaced by grinding. Only lapping is permitted.

Compression Pressures

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

Lubrication – 2.5L CBTA and CBUA

Oil Pan and Oil Pump Overview



1 - Cylinder Block
2 - Oil Pump Timing Chain
3 - Bolt
- ☐ 20 Nm + 90° turn
- ☐ Always replace

4 - Bolt
- ☐ 25 Nm

5 - Oil Filter Adapter
6 - Oil Pump Sprocket
7 - Oil Pump
8 - Bolt
- ☐ 25 Nm

9 - Oil Dipstick
10 - Retaining Ring
11 - Guide Tube

12 - Intake Manifold Support
13 - Bolt
- ☐ 25 Nm

14 - O-ring
- ☐ Always replace

15 - Seal
- ☐ Always replace

16 - Bracket
17 - Bolt
- ☐ 10 Nm

18 - Lower Oil Pan
19 - Bolt
- ☐ 10 Nm

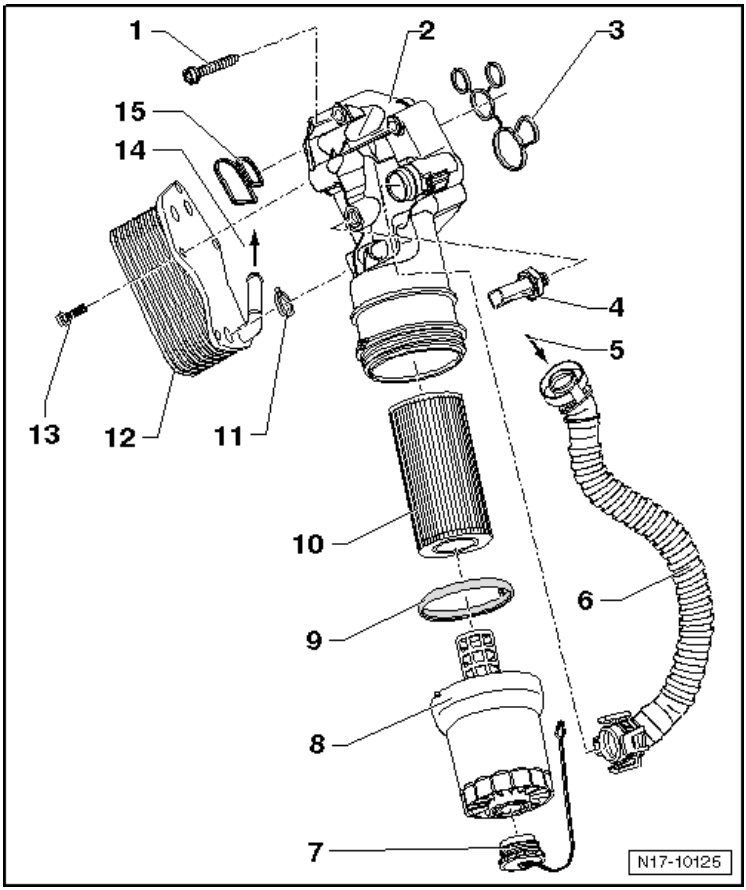
20 - Oil Pan Drain Plug
- ☐ 30 Nm
- ☐ Always replace

21 - Coupling Element
- ☐ Bolt - 10 Nm

22 - Oil Intake Pipe
23 - Bolt
- ☐ 25 Nm

24 - Upper Oil Pan
25 - O-ring
- ☐ Always replace

Oil Filter Adapter Overview



1 - Bolt
- ☐ 25 Nm

2 - Oil Filter Adapter

3 - Gasket
- ☐ Always replace

4 - Oil Pressure Switch -F1-
- ☐ 20 Nm

5 - From Intake Tube

6 - Vent Hose

7 - Cap

8 - Oil Filter Housing
- ☐ 25 Nm

9 - Seal
- ☐ Always replace

10 - Oil Filter Element

11 - Gasket
- ☐ Always replace

12 - Engine Oil Cooler
13 - Bolt
- ☐ 25 Nm

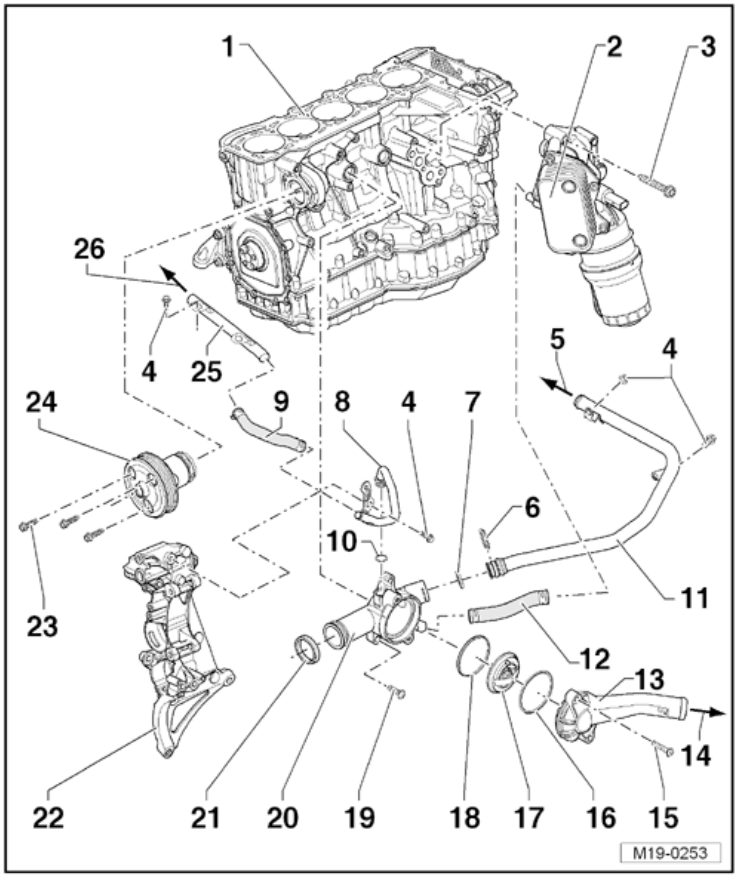
14 - To Thermostat Housing
15 - Gasket
- ☐ Always replace

Fastener Tightening Specifications

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

Cooling System – 2.5L CBTA and CBUA

Coolant Pump and Thermostat Overview
Part 1: Belt Pulley Side



1 - Cylinder Block
2 - Engine Oil Cooler
3 - Bolt
☐ 25 Nm
4 - Bolt/Nut
☐ 10 Nm
5 - To Heater Core Lower Connection
6 - Retaining Clip
7 - O-ring
☐ Always replace
8 - Front Coolant Pipe
9 - Connecting Hose

10 - O-ring
- ☐ Always replace

11 - Coolant Pipe
12 - Connecting Hose
13 - Cover
14 - To Radiator Lower Connection
15 - Bolt
- ☐ 5 Nm

16 - O-ring
- ☐ Always replace

17 - Coolant Thermostat
18 - Seal
- ☐ Always replace

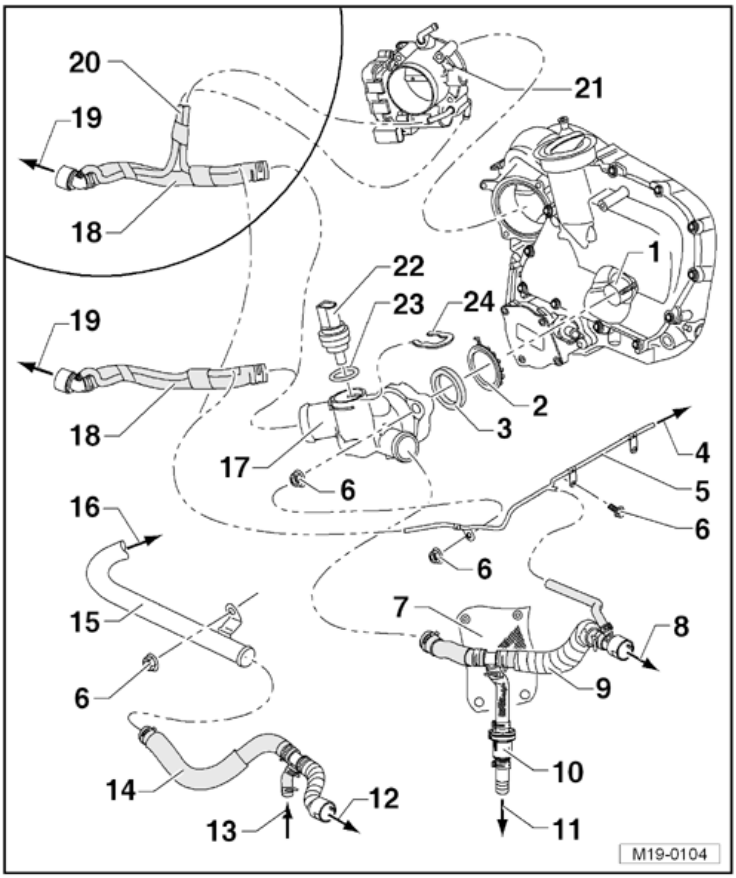
19 - Bolt
- ☐ 25 Nm

20 - Coolant Thermostat Housing
21 - Seal
- ☐ Always replace

22 - Accessory Bracket
23 - Bolt
- ☐ 10 Nm

24 - Coolant Pump
25 - Right Coolant Pipe
26 - To Expansion Tank Lower Connection

Part 2: Transmission Side

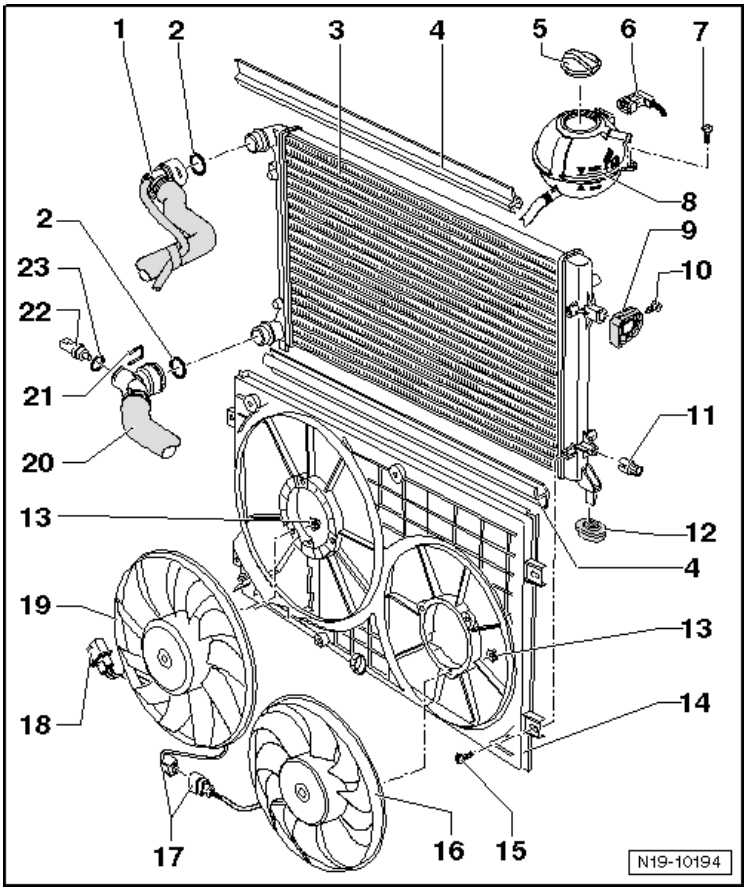


1 - Coolant Connection
2 - Thrust Ring
3 - Seal
4 - To Expansion Tank Upper Connection
5 - Rear Coolant Pipe
6 - Bolt/Nut
☐ 10 Nm
7 - Heat Shield
8 - To Heater Core Upper Connection
9 - Supply Hose
10 - Bypass Thermostat
11 - To Automatic Transmission Fluid Cooler
12 - To Heater Core Lower Connection
13 - From Automatic Transmission Fluid Cooler
14 - Return Hose
15 - Coolant Pipe
16 - To Coolant Thermostat Housing

17 - Flange
18 - Supply Hose
19 - To Radiator Upper Connection
20 - Coolant Hoses
21 - Throttle Valve Control Module -J338-e
22 - Engine Coolant Temperature Sensor -G62-
23 - O-ring
- ☐ Always replace

24 - Retaining Clip

Radiator and Fan Overview

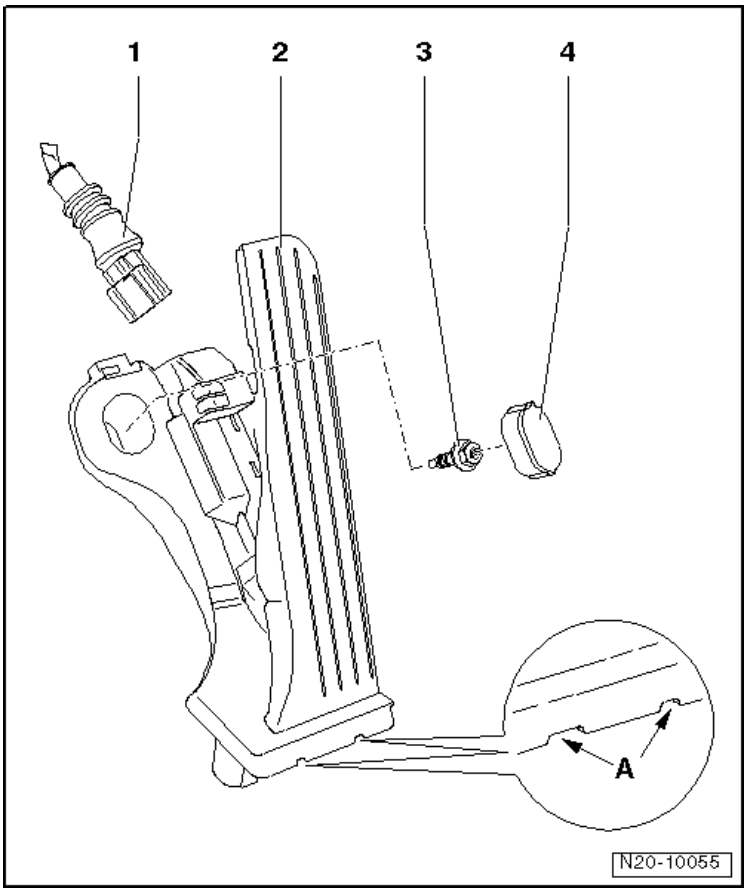


1 - Upper Coolant Hose
2 - O-ring
3 - Radiator
4 - Gasket
5 - Cap
6 - Connector
7 - Bolt
☐ 3 Nm
8 - Expansion Tank
9 - Bracket
10 - Bolt
☐ 5 Nm
11 - Spacer Piece
12 - Support
13 - Nut
☐ 5 Nm
14 - Fan Shroud

15 - Bolt
- ☐ 5 Nm

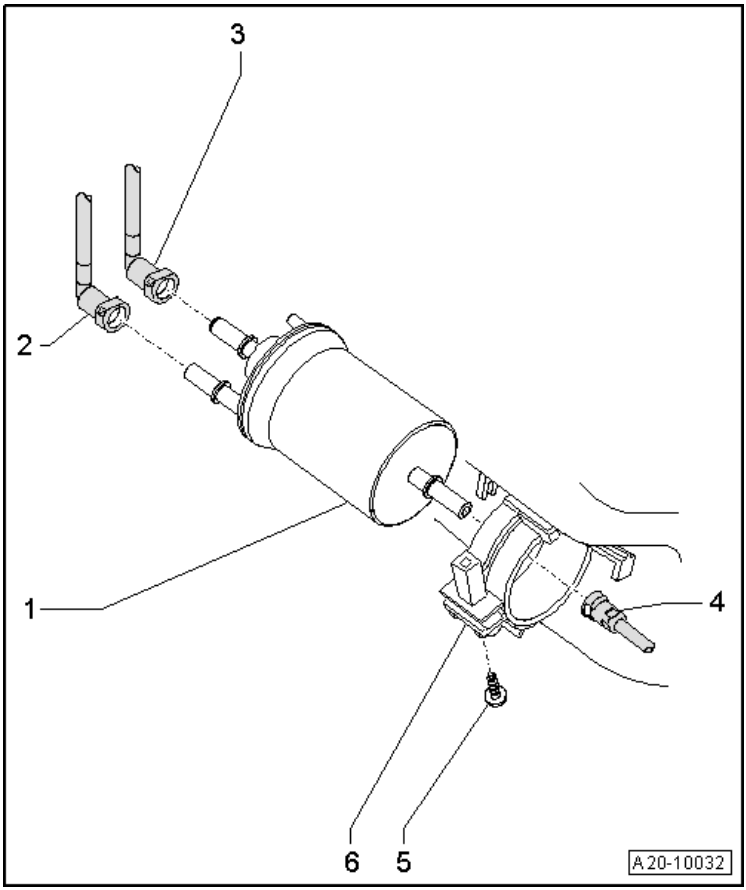
16 - Coolant Fan 2 -V177-
17 - Connector
18 - Connector
19 - Coolant Fan -V7-
20 - Lower Coolant Hose
21 - Retaining Clip
22 - Engine Coolant Temperature Sensor on Radiator Outlet -G83-
23 - O-ring
- ☐ Always replace

Accelerator Pedal Module Overview



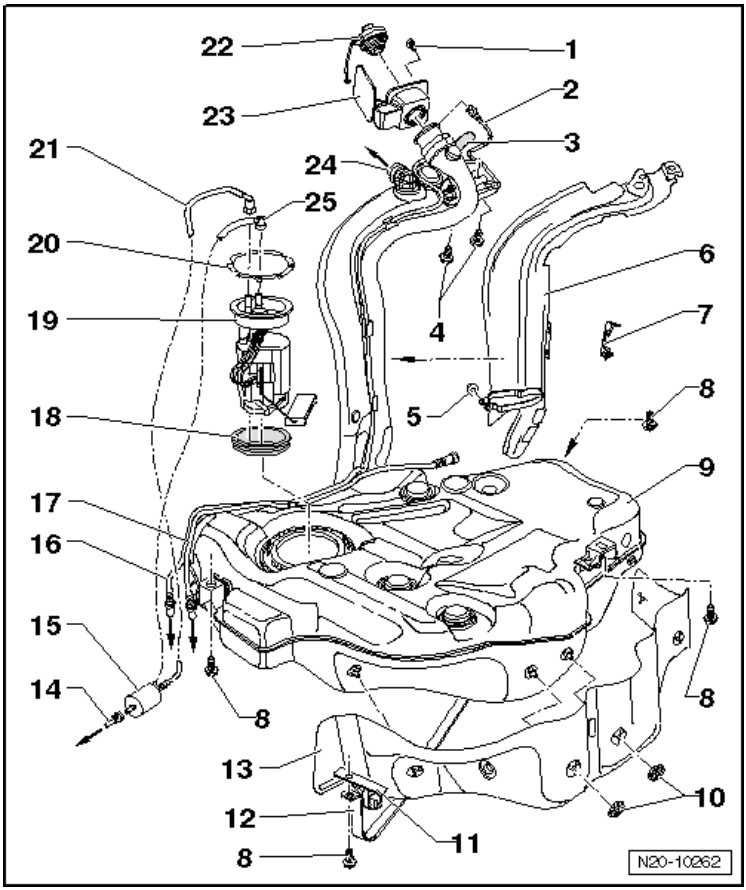
1 - Connector
2 - Accelerator Pedal Position Sensor -G79- with Accelerator Pedal Position Sensor 2 -G185-
3 - Bolt
☐ 10 Nm
4 - Cap

Fuel Filter Overview



1 - Fuel Filter
2 - Fuel Supply Line
3 - Fuel Return Line
4 - Fuel Line
5 - Screw
☐ 3 Nm
6 - Fuel Filter Bracket

Fuel Tank and Attachments Overview



1 - Bolt
2 - Ground Connection
3 - Vacuum Line
4 - Bolt
- ☐ 10 Nm

5 - Rivet
6 - Protective Plate
7 - Wire Router
8 - Bolt
- ☐ 25 Nm
- ☐ Always replace

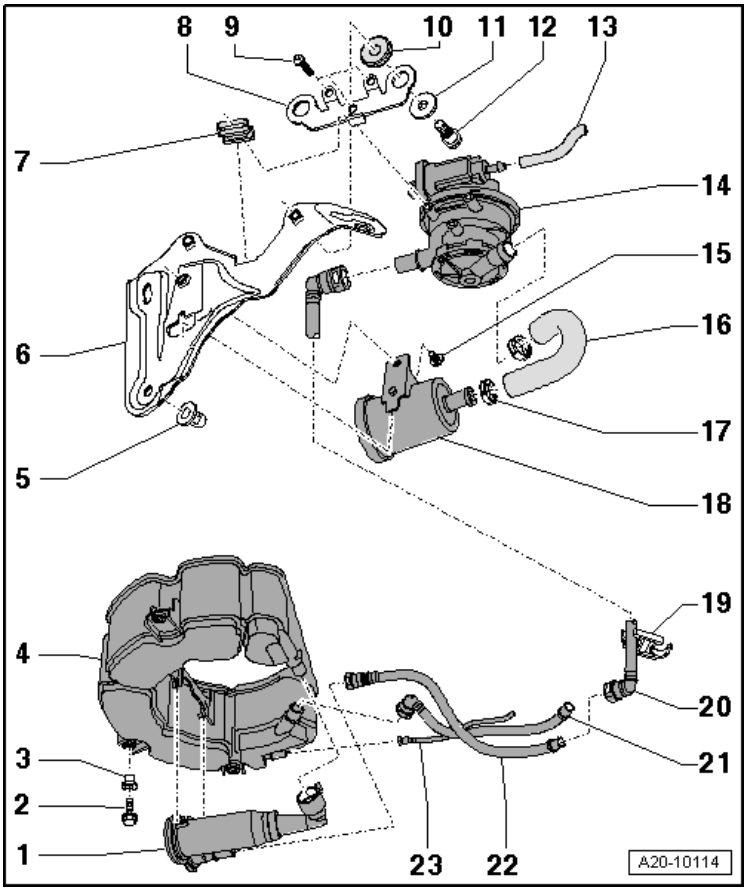
9 - Fuel Tank
10 - Retainer
11 - Exhaust System Bracket
12 - Securing Strap
13 - Heat Shield

14 - Supply Line
15 - Fuel Filter
16 - Vacuum Line
17 - Vent Line
18 - Seal
- ☐ Always replace

19 - Fuel Delivery Unit
20 - Lock Ring
- ☐ 110 Nm

21 - Return Line
22 - Cover
23 - Fuel Filler Door Unit
24 - To EVAP Canister
25 - Supply Line

EVAP System Overview



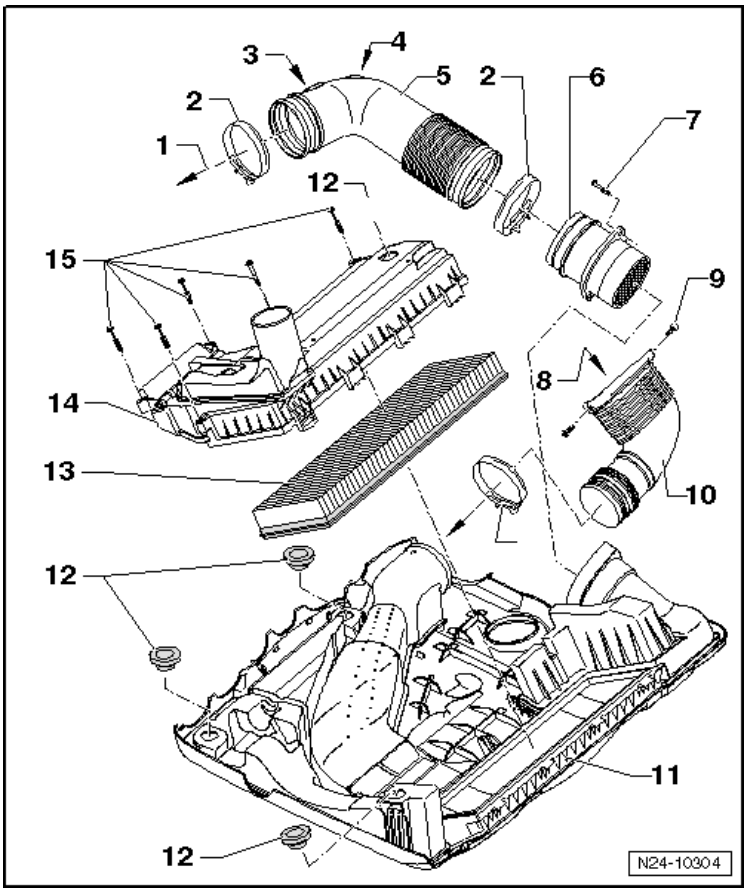
1 - Evaporative Emission (EVAP) Filter
2 - Bolt
☐ 8 Nm
3 - Bushing
4 - EVAP Canister
5 - Nut
☐ 6 Nm
6 - Bracket
7 - Mount
8 - Bracket
9 - Bolt
☐ 4 Nm
10 - Rubber Grommet
11 - Washer
12 - Bolt
☐ 8 Nm
13 - Vent Line

14 - Leak Detection Pump -V144-
15 - Bolt
- ☐ 4 Nm

16 - Connecting Hose
17 - Clamp
18 - Air Filter
19 - Bracket
20 - Connecting Pipe
21 - Vent Line
22 - Vent Line
23 - Vent Line

Multiport Fuel Injection – 2.5L CBTA and CBUA

Engine Cover with Air Filter Overview

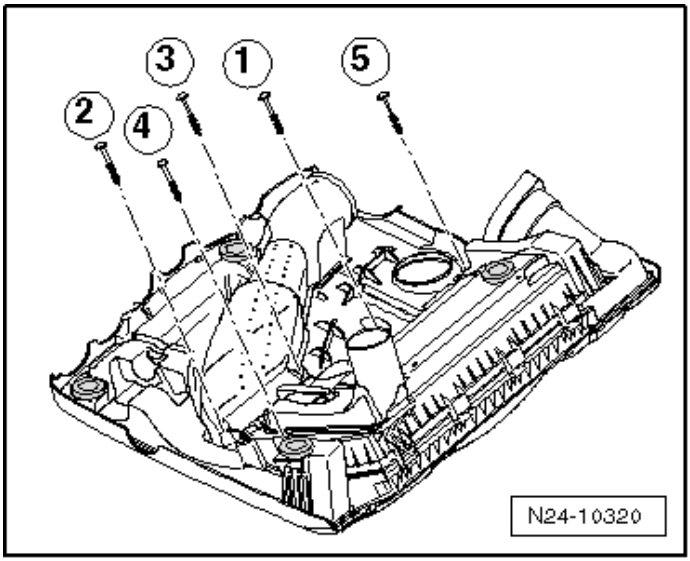


1 - To Throttle Valve Control Module -J338-
2 - Spring Type Clamp
3 - Connection
4 - Connection
5 - Connecting Pipe
6 - Mass Airflow Sensor -G70- with Intake Air Temperature Sensor -G42-
7 - Bolt
☐ 3 Nm
8 - From Air Duct on the Lock Carrier
9 - Bolt
☐ 1.5 Nm
10 - Intake Air Duct

11 - Upper Air Filter Housing/Engine Cover
12 - Rubber Bushing
13 - Filter Element
14 - Lower Air Filter Housing
15 - Bolt

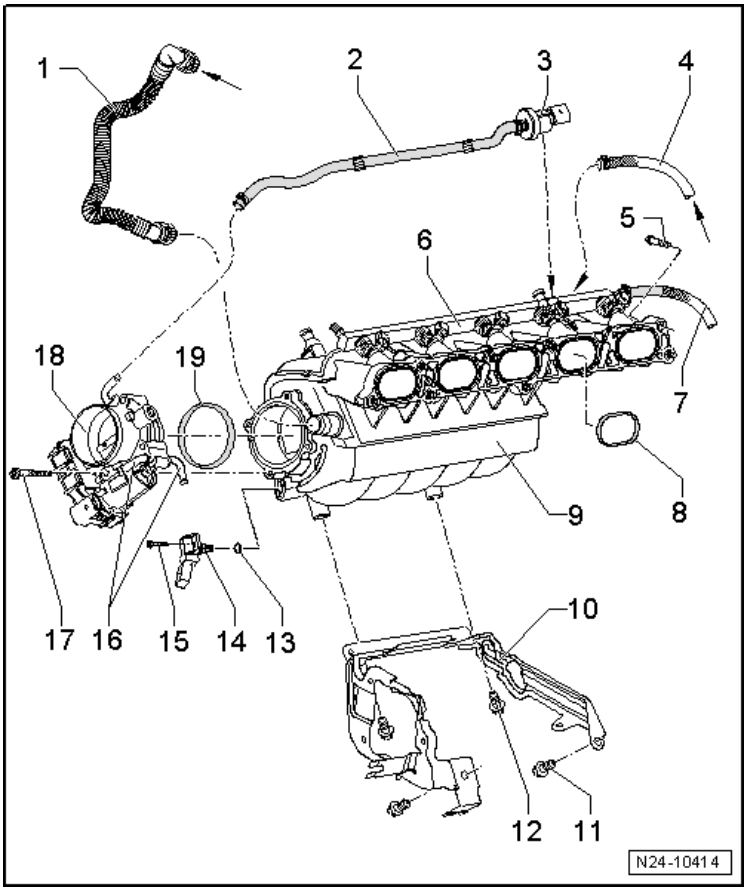
- ☐ 2 Nm
- ☐ Follow the tightening sequence, see Lower Air Filter Housing Bolt Tightening Sequence below

Lower Air Filter Housing Bolt Tightening Sequence



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

Intake Manifold Overview



1 - Connecting Hose
2 - Ventilation Hose
3 - EVAP Canister Purge Regulator Valve 1 -N80-
4 - Vacuum Hose
5 - Bolt
- ☐ 9 Nm

6 - Fuel Rail
7 - Fuel Supply Line
8 - Gasket
- ☐ Always replace

9 - Intake Manifold
10 - Intake Manifold Support
- ☐ Not installed on all vehicles.

11 - Bolt
- ☐ 25 Nm

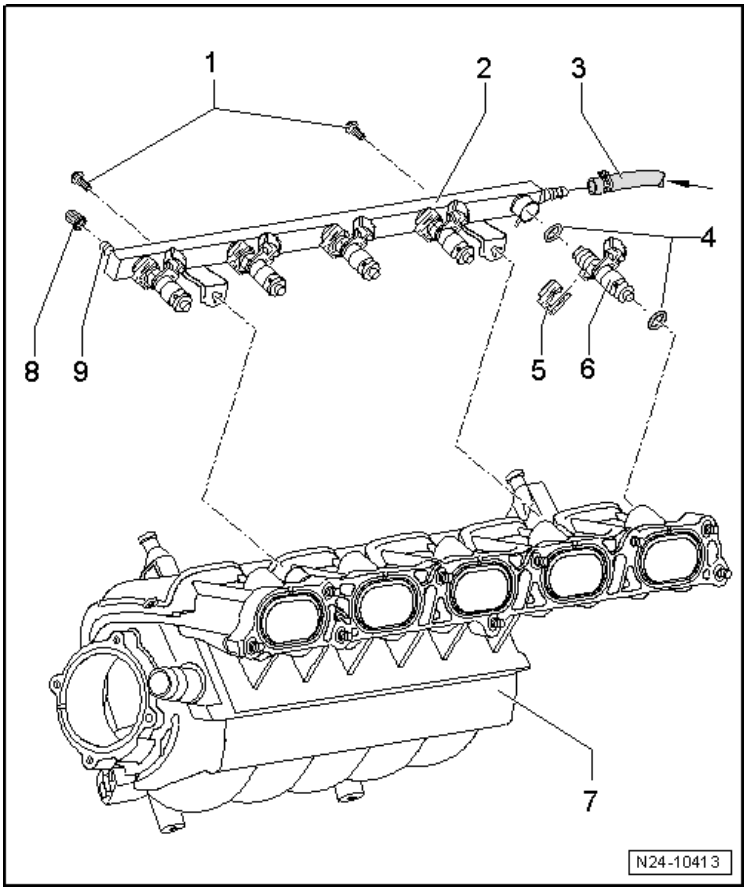
12 - Bolt
- ☐ 16 Nm

13 - O-ring
14 - Manifold Absolute Pressure Sensor -G71-
15 - Bolt
- ☐ 3.5 Nm

16 - Coolant Connections
17 - Bolt
- ☐ 6.5 Nm

18 - Throttle Valve Control Module -J338-
19 - Gasket

Fuel Rail and Injector Overview

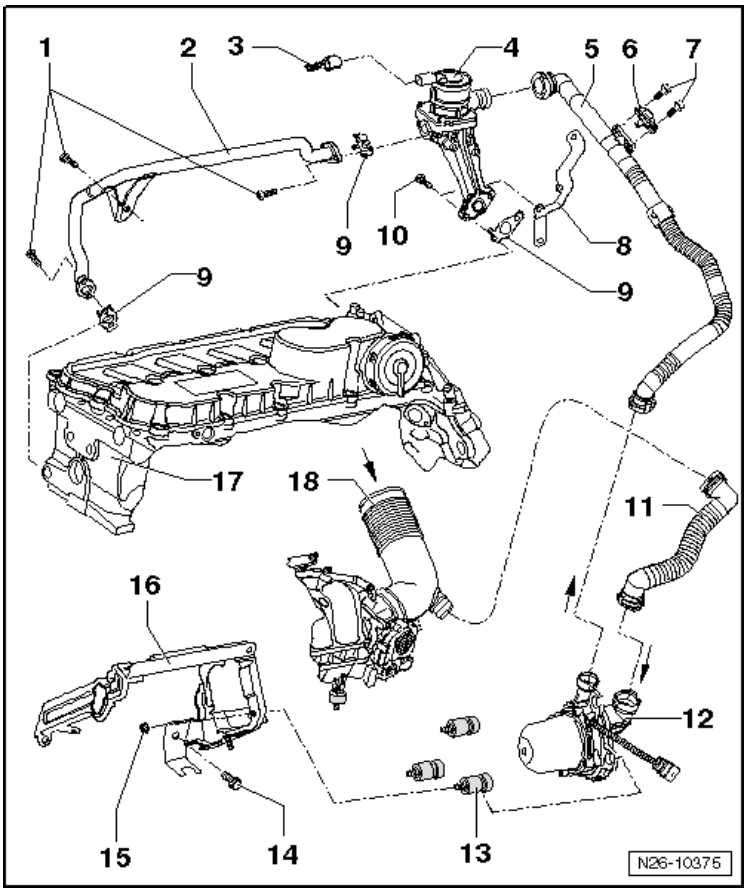


1 - Bolt
- ☐ 3.5 Nm

2 - Fuel Rail
3 - Fuel Supply Line
4 - O-ring
5 - Retaining Clip
6 - Fuel Injector -N30, N31, N32, N33, N83-
7 - Intake Manifold
8 - Cap
9 - Bleed Valve

Exhaust System – 2.5L CBTA and CBUA

Secondary Air Injection System Overview



1 - Bolt
- ☐ 10 Nm

2 - Secondary Air Injection (AIR) Pipe
3 - Connector
4 - Secondary Air Injection Solenoid Valve -N112-
5 - Connecting Pipe
6 - Secondary Air Injection Sensor 1 -G609-
7 - Bolt
- ☐ 2 Nm

8 - Bracket
9 - Gasket
10 - Bolt
- ☐ 10 Nm

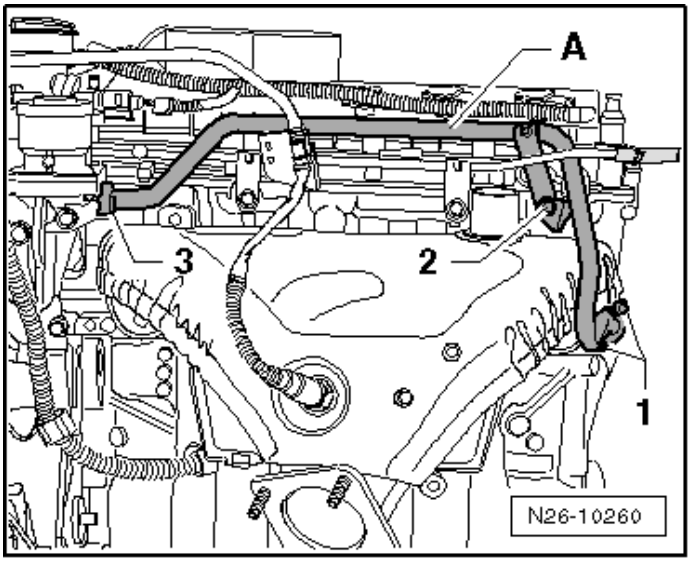
11 - Connecting Pipe
12 - Secondary Air Injection Pump Motor -V101-

13 - Rubber Bushing
14 - Bolt
- ☐ 25 Nm

15 - Nut
- ☐ 10 Nm

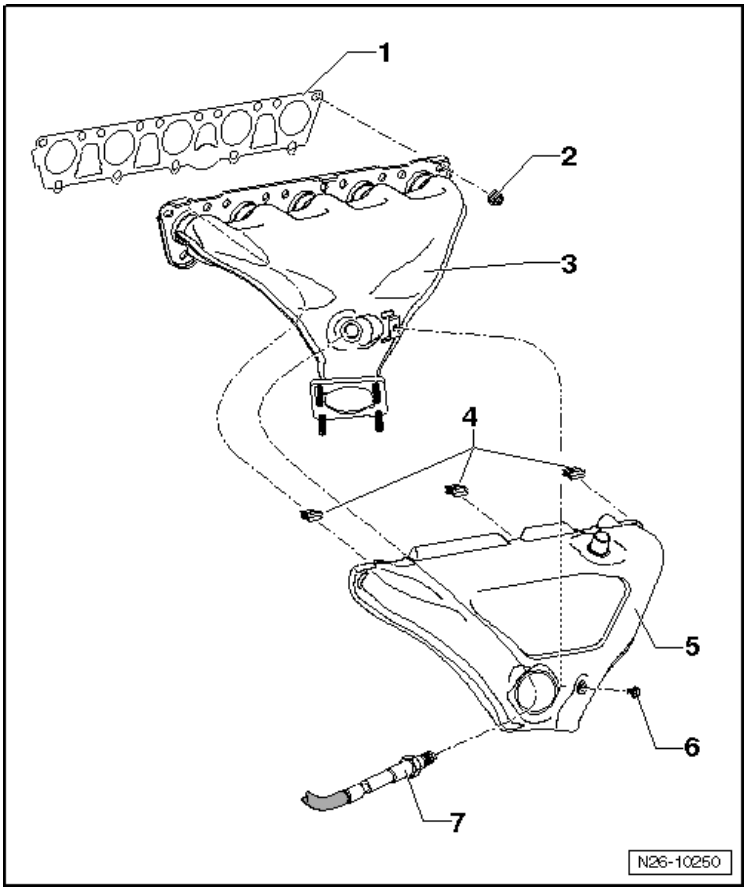
16 - Intake Manifold Support
17 - Cylinder Head
18 - Connecting Pipe

AIR Pipe Bolt Tightening Sequence



Step	Component	Nm
1	Tighten bolts 1 to 3 in sequence	10

Exhaust Manifold Overview



1 - Gasket
- ☐ Always replace

2 - Nut
- ☐ 25 Nm
- ☐ Always replace

3 - Exhaust Manifold

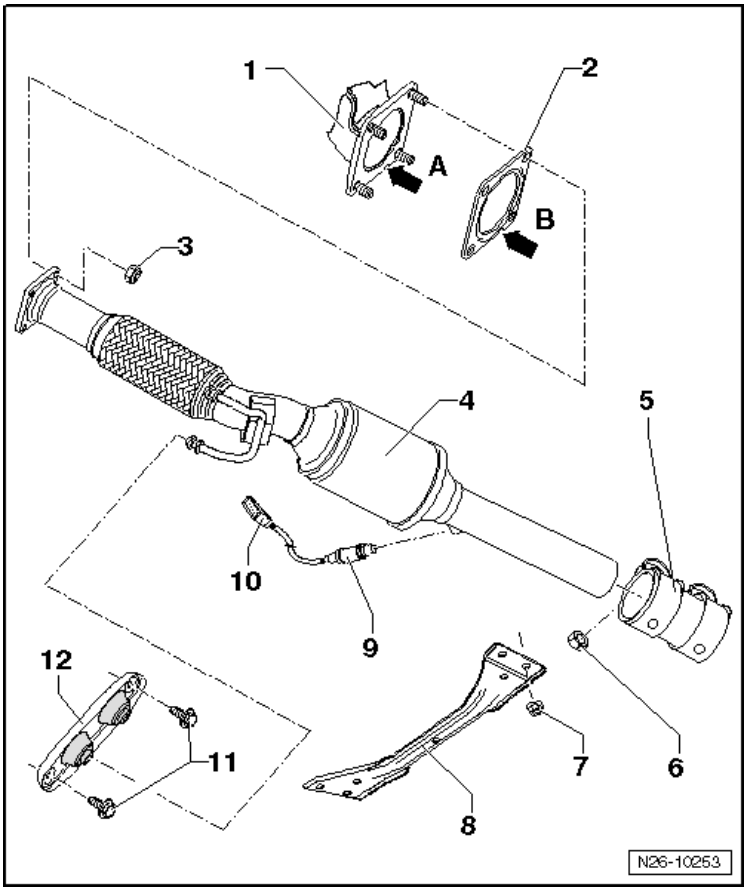
4 - Clip

5 - Heat Shield

6 - Bolt
- ☐ 10 Nm

7 - Heated Oxygen Sensor -G39-
- ☐ 55 Nm
- ☐ When reusing an old oxygen sensor again, only use hot bolt paste to grease the threads. Do not let the paste get onto the slits of the oxygen sensor body.

Exhaust Pipe with Catalytic Converter Overview



1 - Exhaust Manifold
- ☐ Coat the stud bolts with hot bolt paste.

2 - Gasket
- ☐ Always replace

3 - Nut
- ☐ 25 Nm
- ☐ Always replace

4 - Exhaust Pipe with Catalytic Converter

5 - Clamp

6 - Bolt
- ☐ 25 Nm

7 - Nut
- ☐ 23 Nm

8 - Front Cross Member

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

- ☐ 55 Nm
- ☐ When reusing an old oxygen sensor again, only use hot bolt paste to grease the threads. Do not let the paste get onto the slits of the oxygen sensor body.

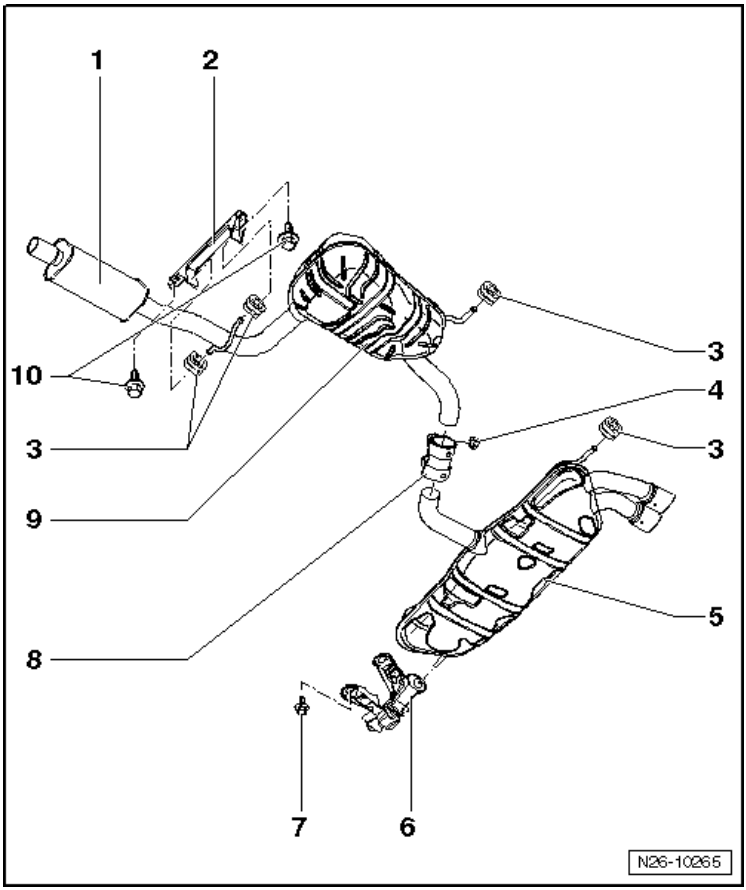
10 - Connector

11 - Bolt

- ☐ 25 Nm

12 - Suspended Mount

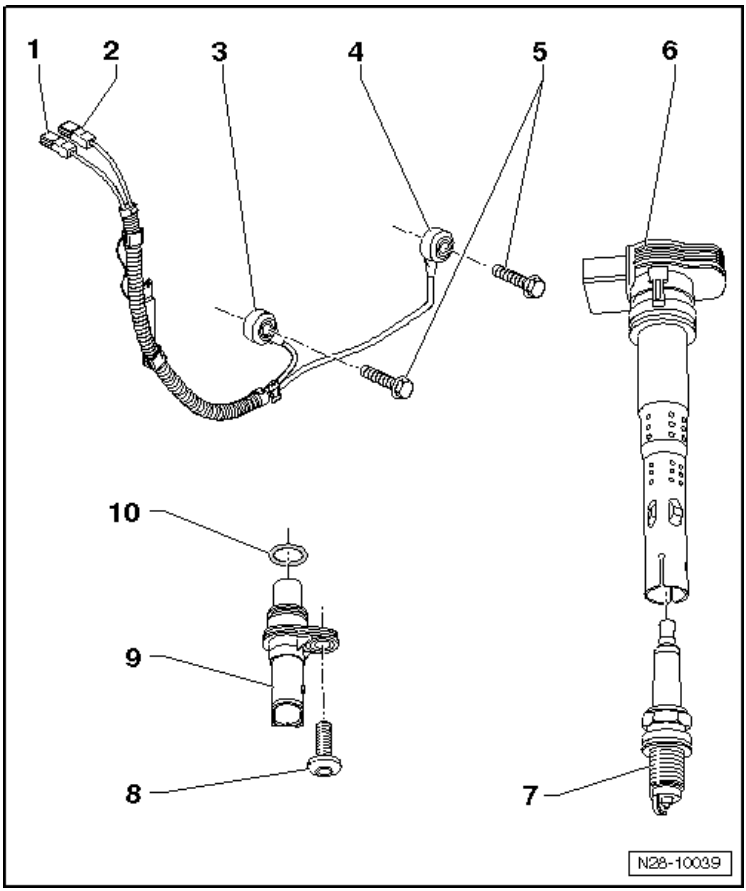
Muffler Overview



1 - Front Muffler
2 - Suspended Mount
3 - Retaining Ring
4 - Nut
☐ 25 Nm
5 - Rear Muffler
6 - Suspended Mount
7 - Bolt
☐ 25 Nm
8 - Repair Clamp
9 - Center Muffler
10 - Bolt
☐ 25 Nm

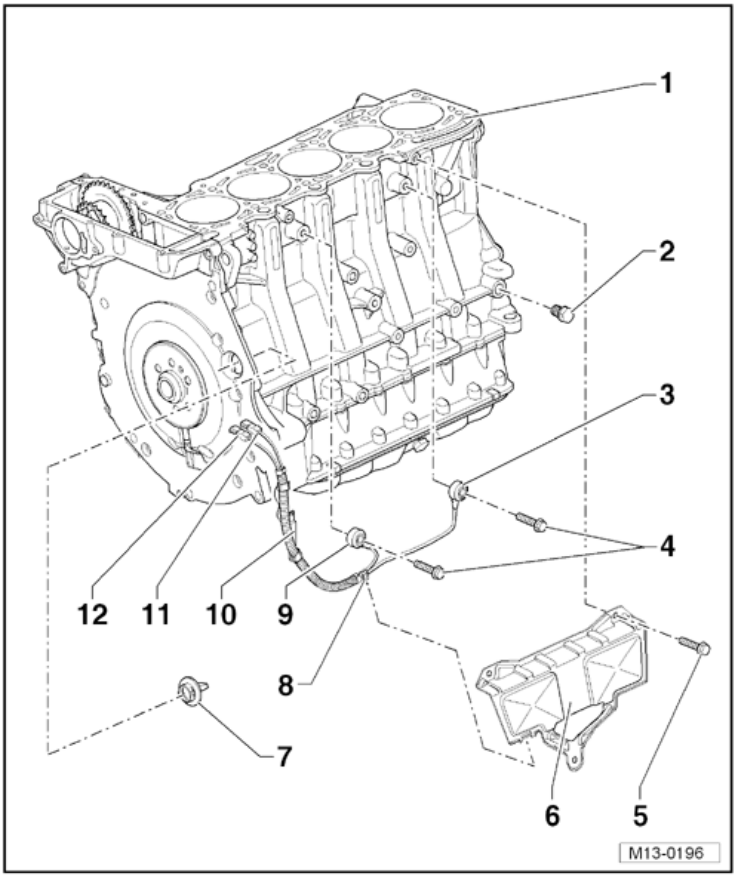
Ignition – 2.0L CBTA and CBUA

Ignition System Component Overview



1 - Knock Sensor 2 Connector
2 - Knock Sensor 1 Connector
3 - Knock Sensor 2 -G66--
4 - Knock Sensor 1 -G61-
5 - Bolt
☐ 20 Nm
6 - Ignition Coil with Power Output Stage -N70, N127, N291, N292, N323-
7 - Spark Plug
☐ 25 Nm
8 - Bolt
☐ 10 Nm
9 - Camshaft Position Sensor -G40-
10 - O-ring

Knock Sensor 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 - Plug
8 - Wire Clip
9 - ock Sensor 2 -G66-
10 - Wire Bracket
11 - Connector
12 - Connector

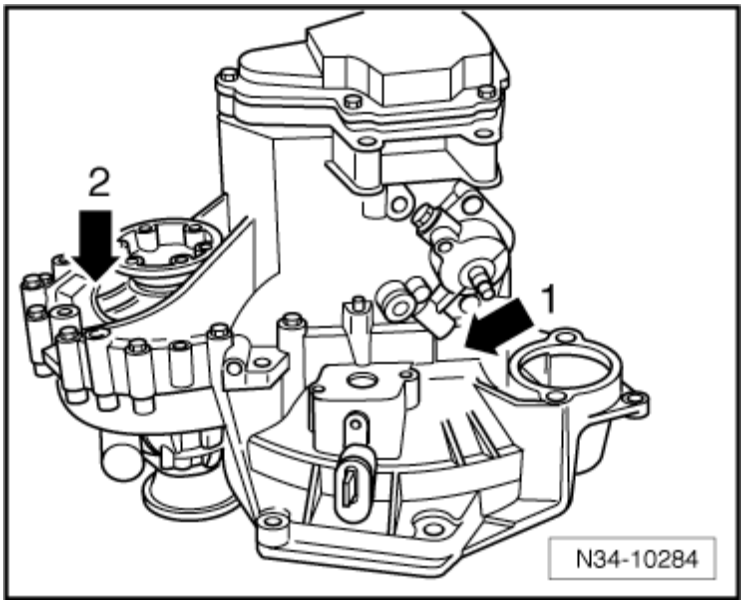
Technical Data

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

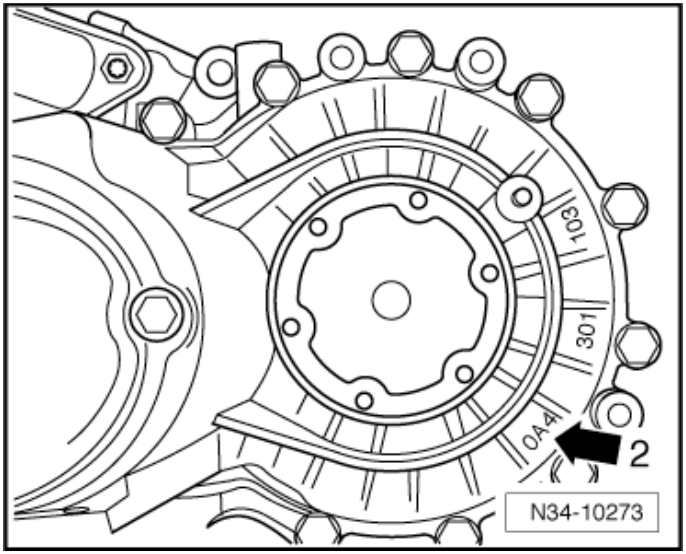
MANUAL TRANSMISSION – 0A4

General, Technical Data

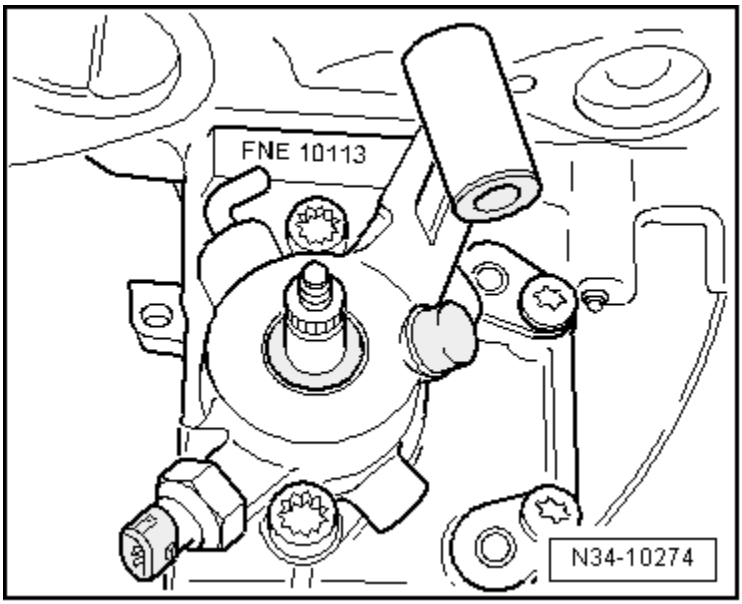
Transmission Identification



Code letters and build date -arrow 1- manual transmission 0A4 -arrow 2-



Manual transmission 0A4 -arrow 2-



Transmission code letters and build date

Example:

FNE	10	11	3
Identification codes	Day	Month	Year (2003) of manufacture

Engine Codes, Transmission Allocation, Ratios and Capacities

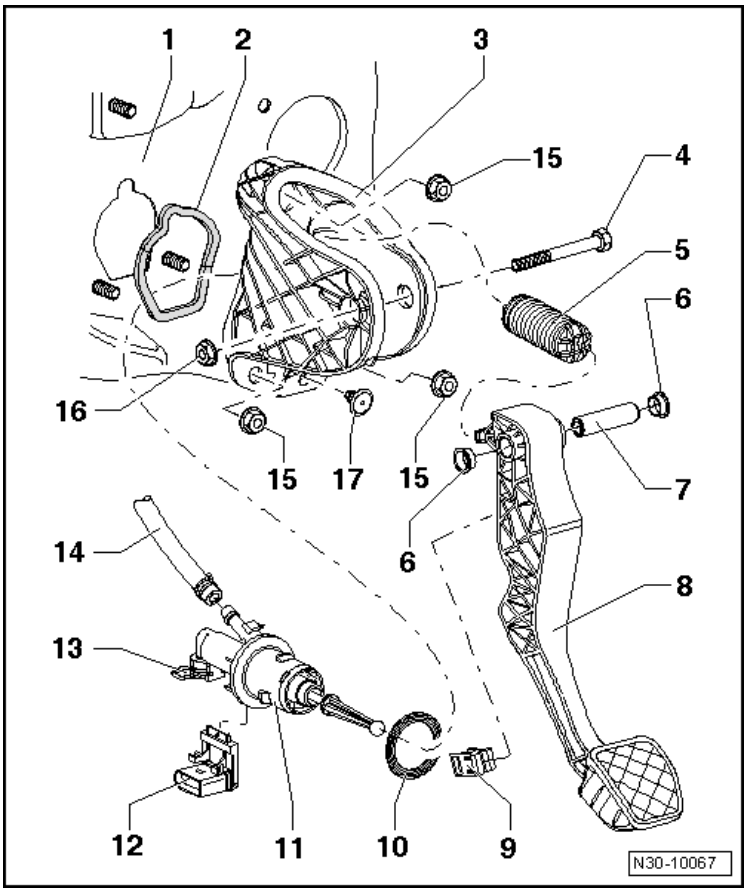
Manual transmission		**6-Speed 0A4**	
Identification codes		KCD	KPF
Manufactured	from through	08.2009 09.2009	08.2009 05.2010
Allocation	Engine	2.5 L - 125 kW	2.5 L - 125 kW
Ratio: $Z_1 : Z_2$	Final drive	62:17= 3.647	61:18= 3.778
Drive axle flange diameter		100 mm	100 mm

Manual transmission		**6-Speed 0A4**	
Identification codes		LEA	
Manufactured	from through	05.2010	
Allocation	Engine	2.5 L - 125 kW	
Ratio: $Z_1 : Z_2$	Final drive	61:18= 3.778	
Drive axle flange diameter		100 mm	

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

- Individual gear ratios
- Transmission fluid
- Clutch allocation

Clutch Pedal Overview



1 - Bulkhead
2 - Gasket
- ☐ Always replace

3 - Mounting Bracket
4 - Bolt
5 - Over-Center Spring
6 - Bushing
7 - Pin
8 - Clutch Pedal
9 - Mount
10 - Gasket
- ☐ Always replace

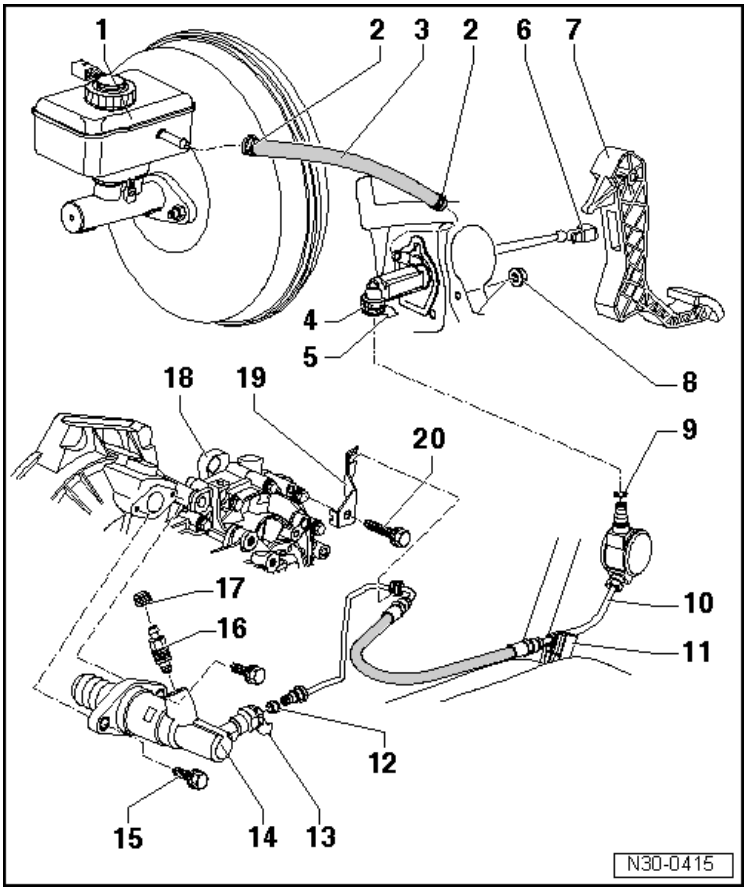
11 - Master Cylinder
12 - Clutch Position Sensor -G476-
13 - Circlip

14 - Supply Hose
15 - Nut, Self Locking
- ☐ 25 Nm
- ☐ Always replace

16 - Nut
- ☐ 25 Nm
- ☐ Always replace

17 - Jounce Bumper

Hydraulics Overview



1 - Brake Fluid Reservoir
2 - Spring Clamp
- ☐ Not installed on all vehicles.

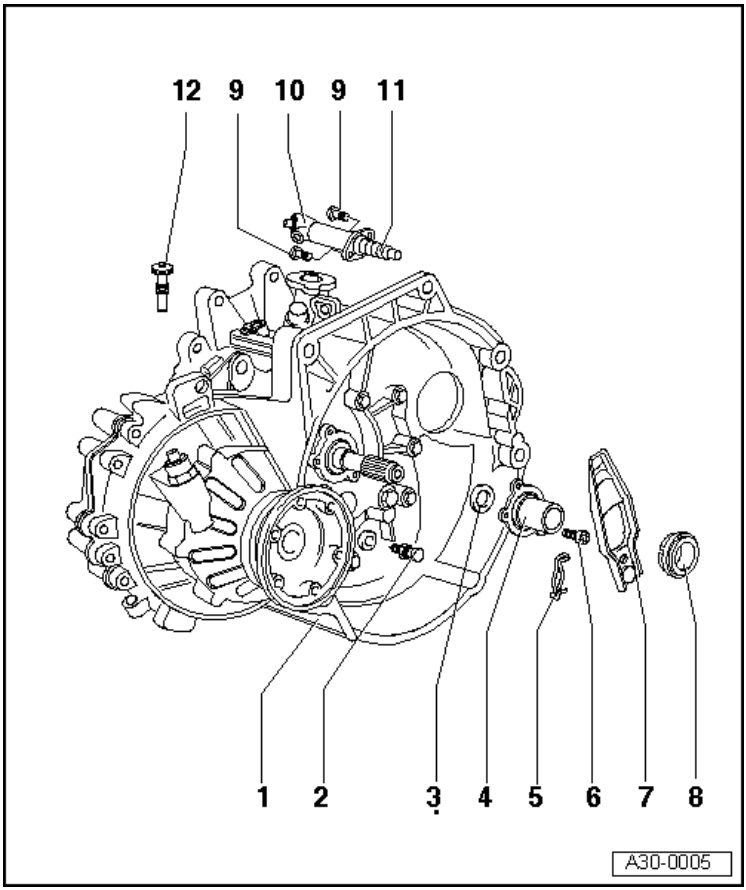
3 - Supply Hose
4 - Clutch Master Cylinder
5 - Circlip
6 - Mount
7 - Clutch Pedal
8 - Nut, Self Locking
- ☐ 25 Nm
- ☐ Always replace

9 - Seal/O-ring
10 - Hose/Line Assembly
11 - Bracket
12 - Seal/O-ring
13 - Clip
14 - Clutch Slave Cylinder

15 - Bolt
- ☐ 20 Nm

16 - Vent Valve
17 - Cap
18 - Transmission
19 - Bracket
20 - Bolt
- ☐ 20 Nm

Clutch Release Mechanism Overview



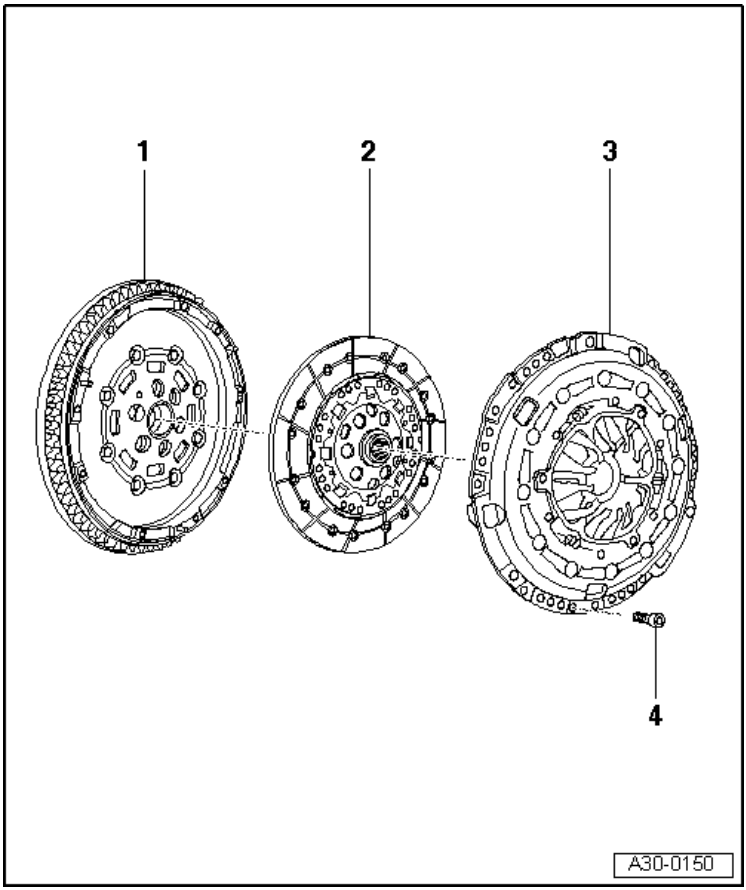
1 - Transmission
2 - Ball Stud
- ☐ 25 Nm

3 - Input Shaft Seal
4 - Guide Sleeve
5 - Spring
6 - Bolt
- ☐ 20 Nm

7 - Clutch Release Lever
8 - Release Bearing
9 - Bolt
- ☐ 20 Nm

10 - Clutch Slave Cylinder
11 - Plunger
12 - Assembly Bolt

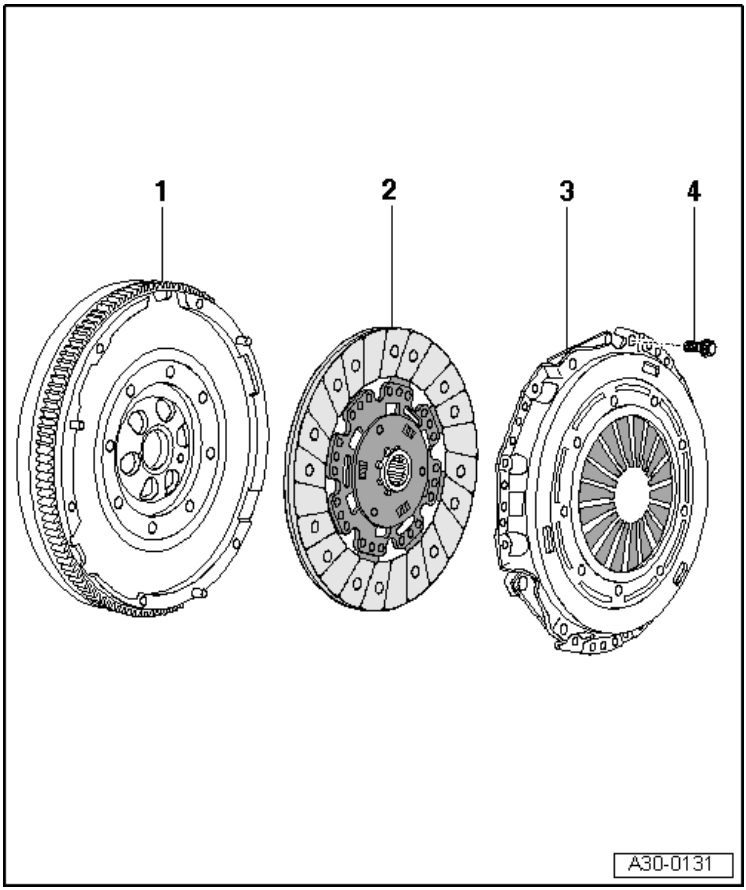
Luk Clutch Assembly Overview



1 - Dual Mass Flywheel
2 - Clutch Disc
3 - SAC Pressure Plate
4 - Bolt

- ☐ M6 bolt: 13 Nm
- ☐ M7 bolt: 20 Nm
- ☐ Loosen and tighten in small steps and in a diagonal sequence.

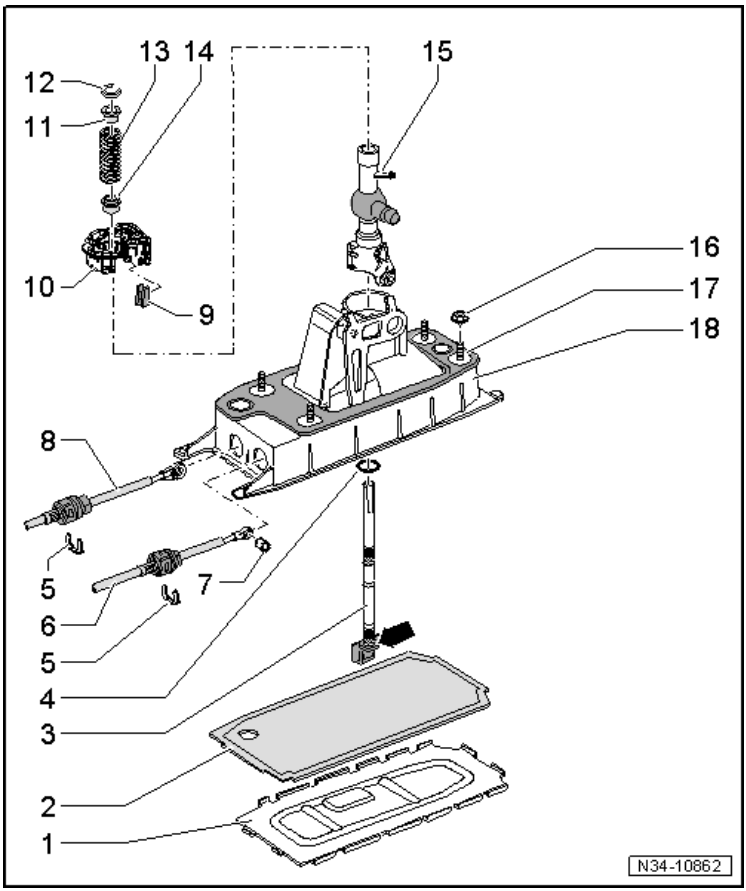
Sachs Clutch Assembly Overview



1 - Dual Mass Flywheel
2 - Clutch Disc
3 - Pressure Plate
4 - Bolt
- ☐ M6 bolt: 13 Nm
- ☐ M7 bolt: 20 Nm
- ☐ Loosen and tighten in small steps and in a diagonal sequence.

Controls, Housing – 0A4

Shift Lever and Housing Overview



1 - Base Plate
- ☐ Always replace

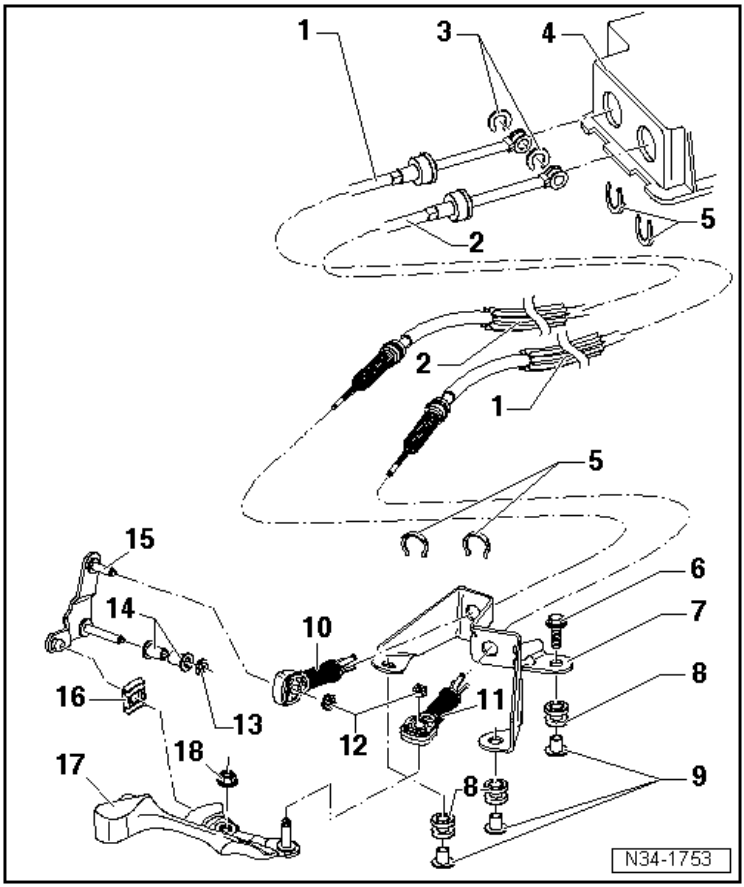
2 - Gasket
- ☐ Always replace

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

14 - Bushing
15 - Shift Lever Guide
16 - Nut
- ☐ M6 nut: 8 Nm
- ☐ M8 nut: 25 Nm

17 - Gasket
18 - Shift Housing

Shift and Selector Cables, with a Metal Cable Bracket and Relay Lever



1 - Shift Cable
2 - Selector Cable
3 - Lock Washer
☐ Always replace
4 - Shift Housing
5 - Lock Washer
☐ Always replace
6 - Bolt
☐ 20 Nm
7 - Cable Bracket
8 - Grommet
9 - Spacer Support
10 - Grommet
11 - Cable Retainer

12 - Lock Washer
- ☐ Always replace

13 - Lock Washer
- ☐ Always replace

14 - Bushing

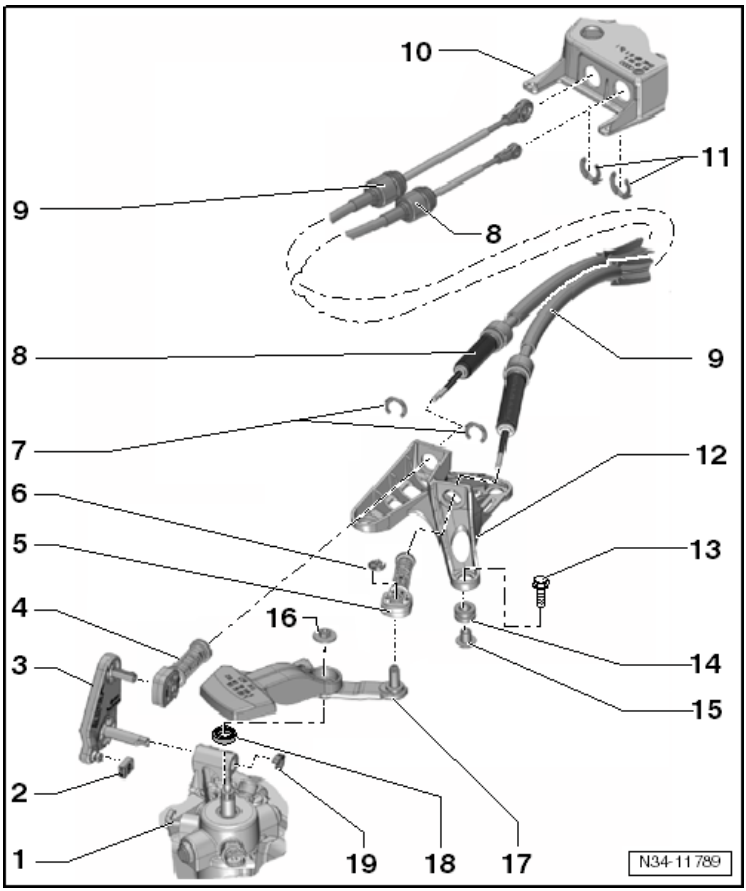
15 - Relay Lever

16 - Sliding Shoe

17 - Relay Lever

18 - Self-Locking Nut
- ☐ 23 Nm
- ☐ Always replace

Shift and Selector Cables, with a Plastic Cable Bracket and Relay Lever



1 - Gear Shift Unit
2 - Sliding Shoe
3 - Relay Lever
4 - Cable Retainer
5 - Cable Retainer
6 - Lock Washer
☐ Always replace
7 - Lock Washer
☐ Always replace
8 - Selector Cable
9 - Shift Cable
10 - Shift Housing
11 - Lock Washer
☐ Always replace
12 - Cable Bracket

13 - Bolt
- ☐ 20 Nm

14 - Grommet

15 - Spacer

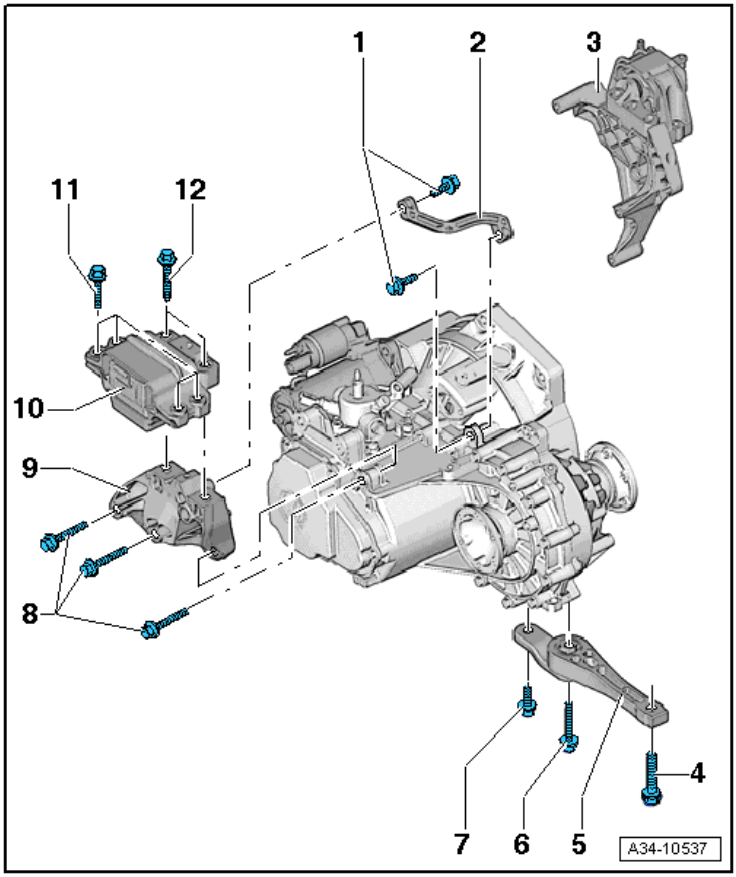
16 - Nut
- ☐ 23 Nm
- ☐ Always replace

17 - Transmission Shift Lever

18 - Seal

19 - Clip

Engine and Transmission Mount and Bracket Overview



1 - Bolt
- ☐ Tighten bolts hand tight
- ☐ 20 Nm + 90° turn
- ☐ Always replace

2 - Transmission Support

3 - Engine Mount with Engine Mount Bracket

4 - Bolt
- ☐ Refer to Suspension, Wheels, Steering; Front Suspsension

5 - Pendulum Support

6 - Bolt
- ☐ Refer to Suspension, Wheels, Steering; Front Suspsension

7 - Bolt
- ☐ Refer to Suspension, Wheels, Steering; Front Suspsension

8 - Bolt

- ☐ 40 Nm + 90° turn
- ☐ Always replace

9 - Transmission Mount Bracket

10 - Transmission Mount

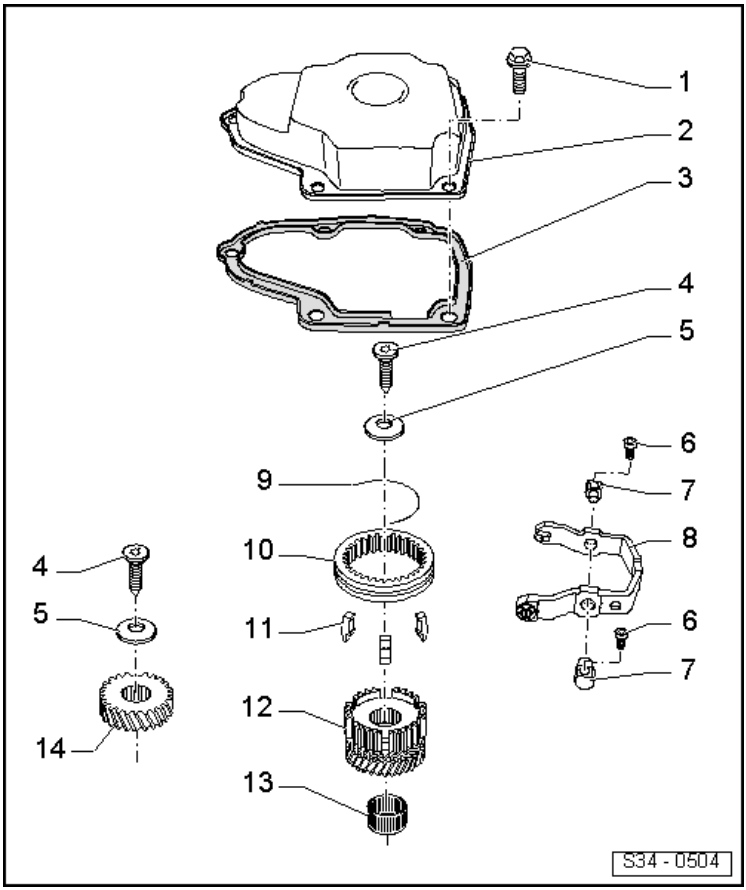
11 - Bolt

- ☐ Refer to Engine Mechanical, Fuel Injection and Ignition; Engine Assembly

12 - Bolt

- ☐ 60 Nm + 90° turn
- ☐ Always replace

Transmission Housing Cover and 5th Gear



1 - Bolt
- ☐ 18 Nm

2 - Transmission Housing Cover

3 - Gasket

4 - Bolt
- ☐ 80 Nm + 90° turn
- ☐ Always replace

5 - Concave Washer

6 - Bolt
- ☐ 25 Nm

7 - Base for Selector Fork

8 - 5th Gear Selector Fork

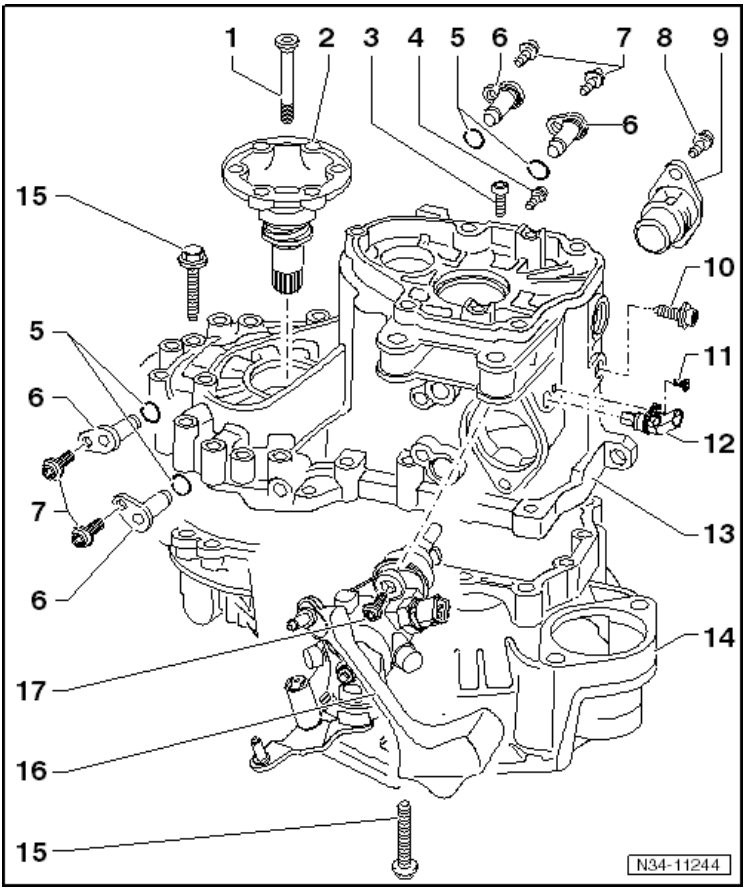
9 - Spring

10 - 5th Gear Locking Collar

11 - Locking Pieces

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

Transmission Housing and Shift Unit



1 - Bolt
- ☐ 25 Nm
- ☐ Always replace

2 - Flange Shaft with Pressure Spring

3 - Torx® Bolt
- ☐ 25 Nm
- ☐ Always replace

4 - Sealing Cap

5 - O-ring
- ☐ Always replace

6 - Support Pin

7 - Bolt
- ☐ 25 Nm

8 - Bolt
- ☐ 25 Nm

9 - Sealing Cap

10 - Bolt

- ☐ 25 Nm
- ☐ Always replace

11 - Bolt

- ☐ 5 Nm

12 - Transmission Neutral Position Sensor -G701-

13 - Transmission Housing

14 - Bolt

- ☐ There are different bolts and tightening specifications:
- ☐ Outer hex head = steel bolt = 15 Nm + 90° turn.
- ☐ Only on aluminum transmissions with M8 aluminum bolts = use steel bolts as a replacement part.
- ☐ Always replace, for the correct allocation refer to the Parts Catalog.

15 - Bolt

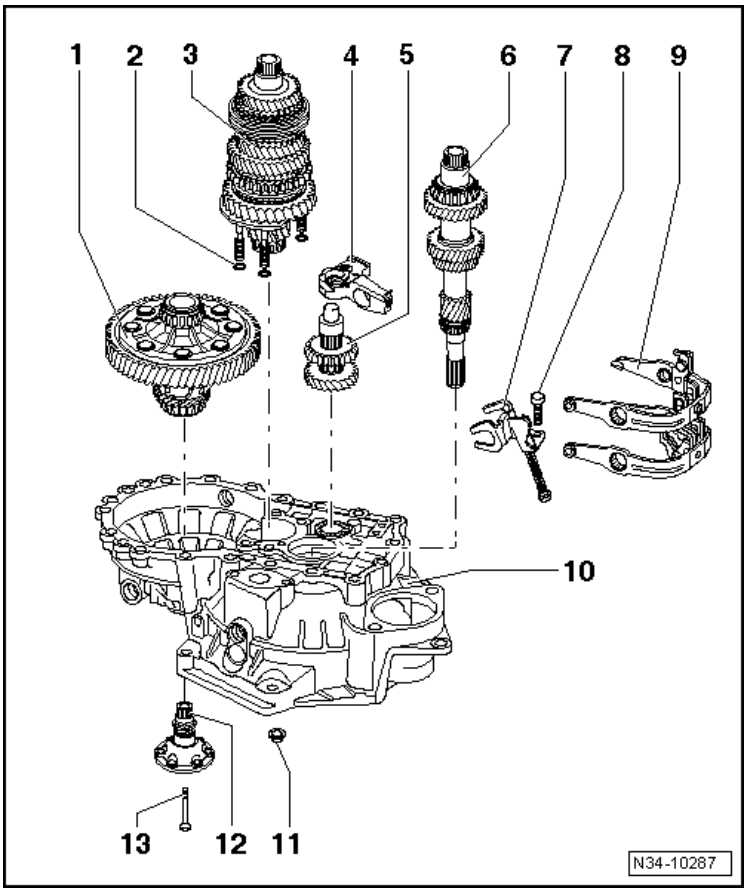
- ☐ 25 Nm + 90° turn
- ☐ Always replace

16 - Gear Shift Unit

17 - Bolt

- ☐ 25 Nm

Input Shaft, Output Shafts, Differential, and Shift Forks

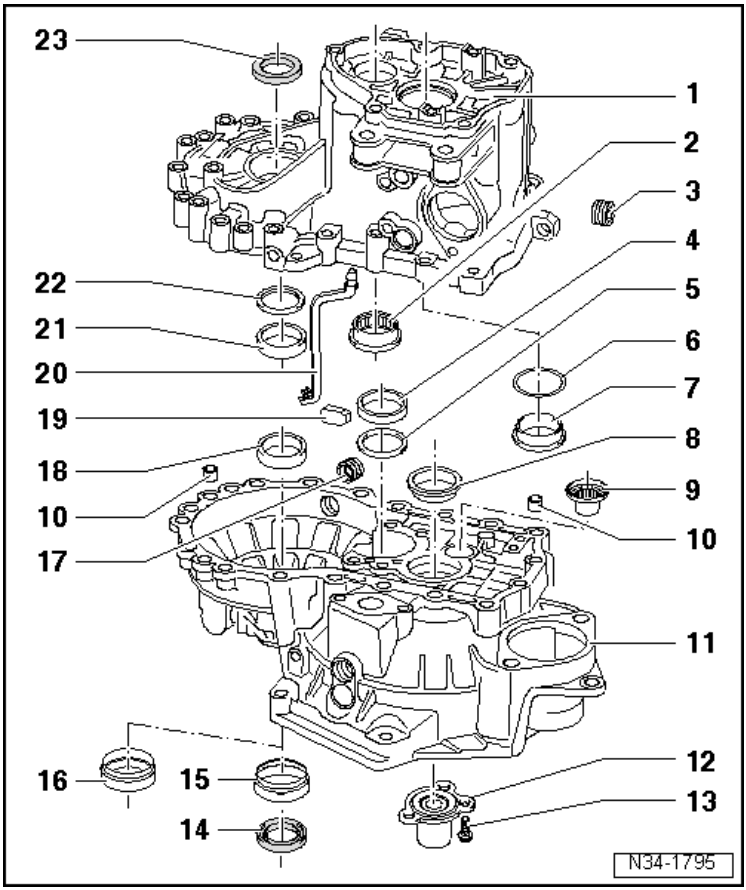


1 - Differential
2 - Seal
3 - Output Shaft
4 - Reverse Gear Shaft Support
5 - Reverse Shaft
6 - Input Shaft
7 - Reverse Gear Selector Fork
8 - Torx® Bolt
- ☐ 25 Nm

9 - Selector Fork with Rail
10 - Clutch Housing
11 - Nut
- ☐ 25 Nm + 90° turn
- ☐ Always replace

12 - Flange Shaft with Pressure Spring
13 - Bolt
- ☐ 25 Nm

Transmission and Clutch Housings Overview



1 - Transmission Housing
2 - Needle Bearing
3 - Oil Fill Plug
- ☐ 35 Nm

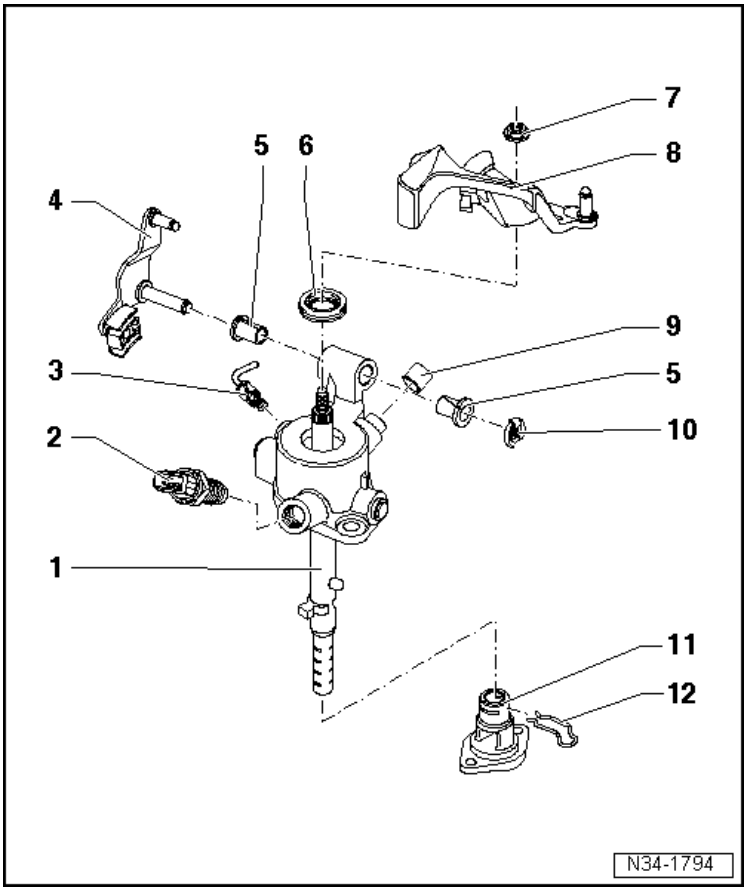
4 - Outer Race/Tapered Roller Bearing
5 - Adjusting Shim
6 - Adjusting Shim
7 - Outer Race/Tapered Roller Bearing
8 - Outer Race/Tapered Roller Bearing
9 - Needle Sleeve
10 - Alignment Sleeve
11 - Clutch Housing
12 - Guide Sleeve
13 - Bolt
- ☐ 20 Nm

14 - Seal
15 - Sleeve

16 - Seal and Sleeve (One-Piece)
17 - Oil Drain Plug
- ☐ 35 Nm

18 - Outer Race/Tapered Roller Bearing
19 - Magnet
20 - Oil Catch Tray
21 - Outer Race/Tapered Roller Bearing
22 - Adjusting Shim
23 - Seal

Gear Shift Unit Overview



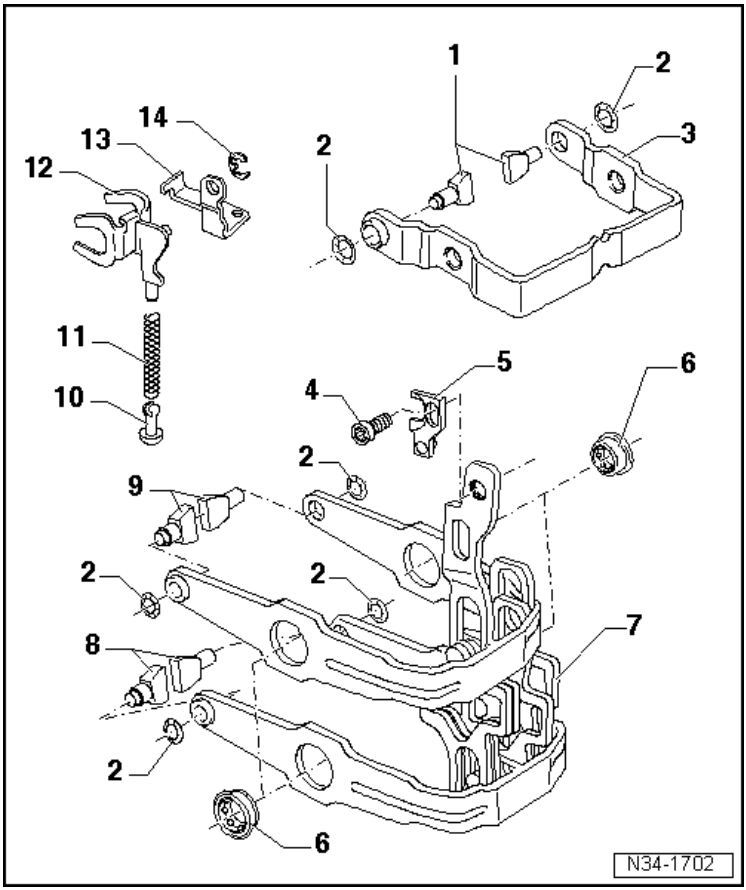
1 - Gear Shift Unit
2 - Backup Lamp Switch -F4-
- ☐ 20 Nm

3 - Locking Pin
4 - Relay Lever
5 - Bushing
6 - Seal
7 - Nut
- ☐ 23 Nm
- ☐ Always replace

8 - Transmission Shift Lever
9 - Cap
10 - Lock Washer
- ☐ Always replace

11 - Cover
12 - Spring

Selector Forks Overview

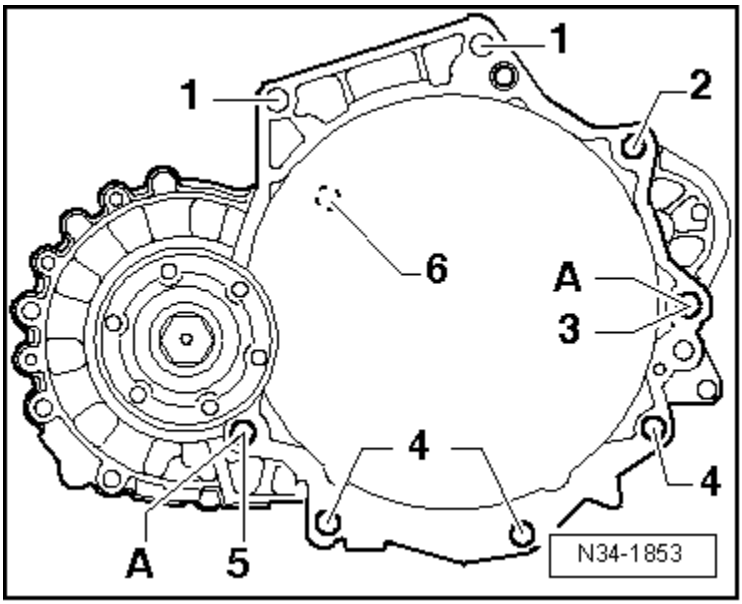


1 - 5th Gear Shift Segment
2 - Lock Washer
- ☐ Always replace

3 - 5th Gear Selector Fork
4 - Bolt
- ☐ 25 Nm

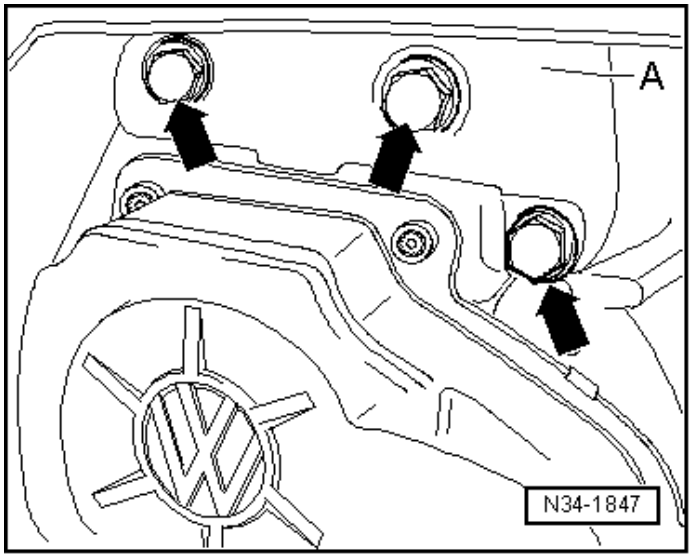
5 - 5th Gear Shift Jaw
6 - Angular Contact Ball Bearing
7 - Selector Fork with Rails
8 - 1st/2nd Gear Shift Segment
9 - 3rd/4th Gear Shift Segment
10 - Gliding Piece
11 - Spring
12 - Reverse Gear Selector Fork
13 - Support for the Reverse Gear Selector Fork
14 - Locking Ring

Transmission to Engine Tightening Specifications



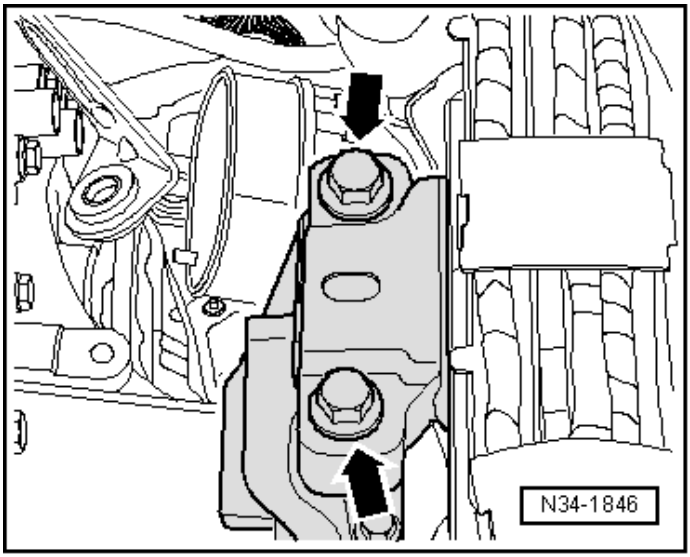
Item	Fastener size	Quantity	Nm
1	M12 x 65	2	80
2	M12 x 170 Also for the starter to transmission	1	80
3	M12 x 170 Also for the starter to transmission	1	80
4	M10 x 65	1	40
5	M12 x 95	1	80
6	M6 x 8 Small flywheel cover plate (not present here)	1	10

Transmission Mount Bracket to Transmission Bolt Tightening Specification



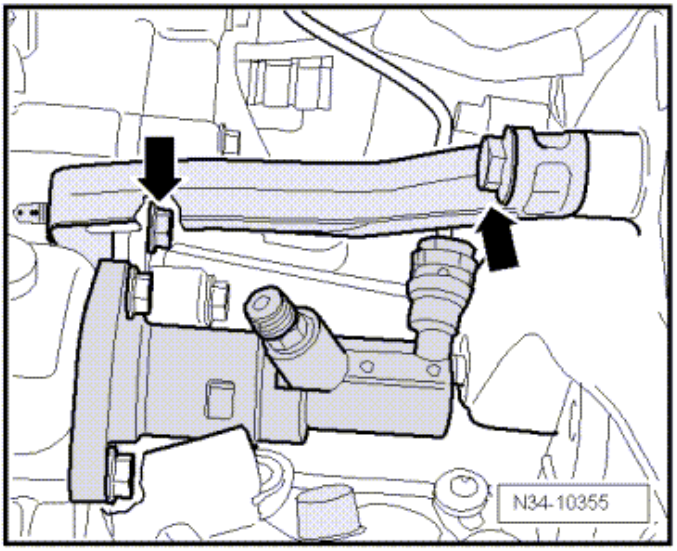
Step	Component	Nm
1	Replace bolts -arrows-	
2	Bolts -arrows-	Hand tighten
3	Bolts -arrows-	40 Nm + 90° (1/4) additional turn

Transmission Mount to Transmission Mount Bracket Bolt Tightening Specification



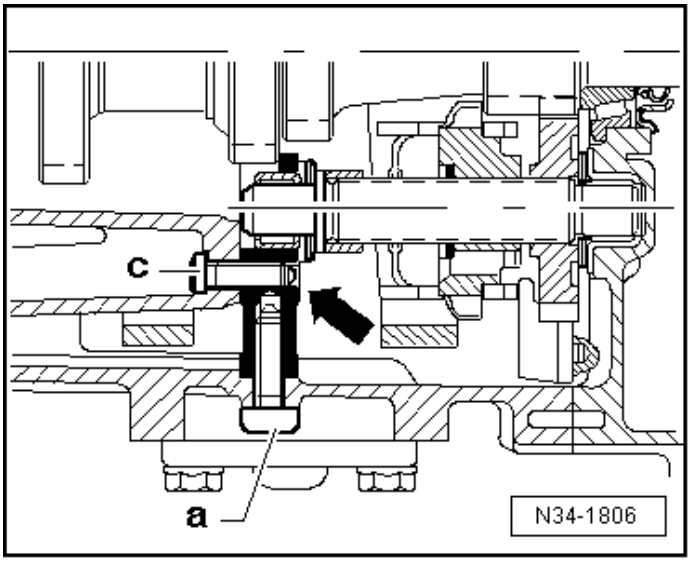
Step	Component	Nm
1	Replace bolts -arrows-	
2	Bolts -arrows-	Hand tighten
3	Bolts -arrows-	60 Nm + 90° (1/4) additional turn

Transmission Support to Transmission Bracket and Transmission Bolt Tightening Specification

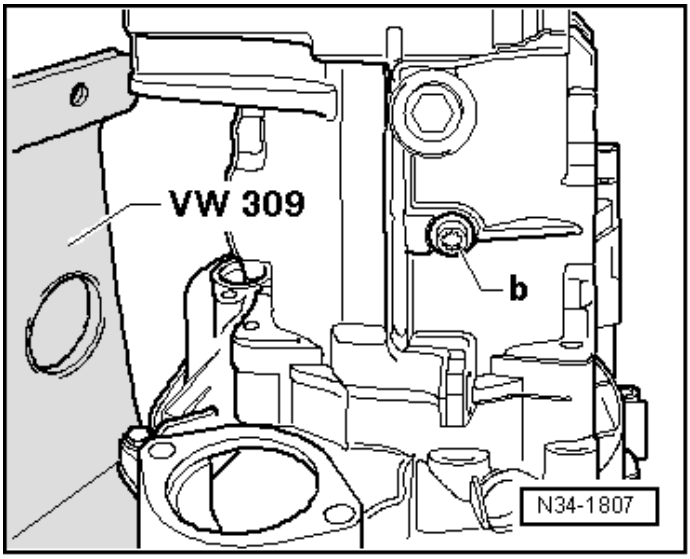


Step	Component	Nm
1	Replace bolts -arrows-	
2	Bolts -arrows-	Hand tighten
3	Bolts -arrows-	20 Nm + 90° (1/4) additional turn

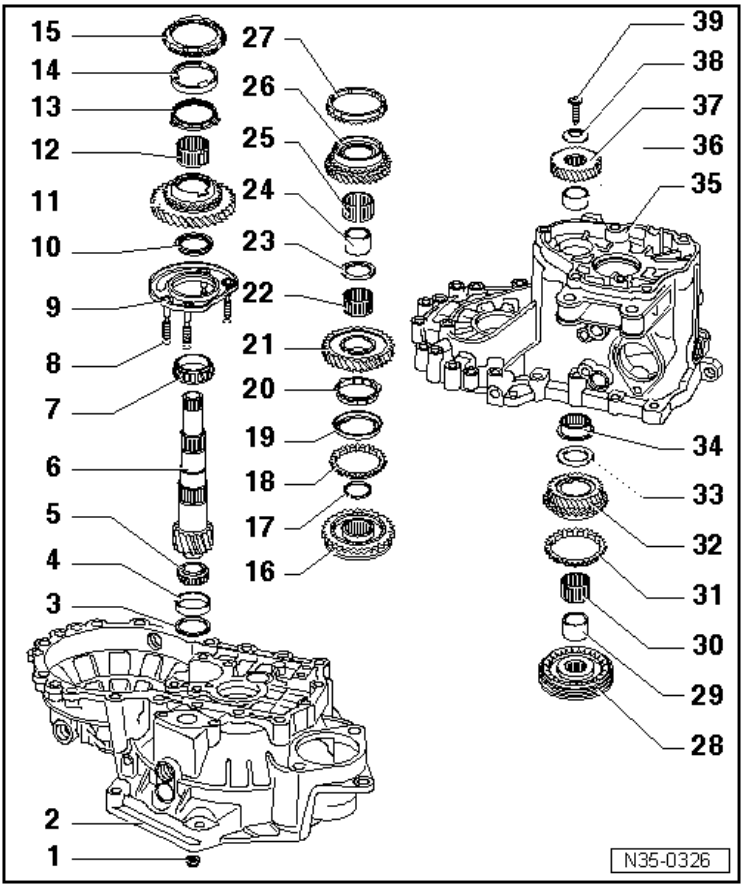
Reverse Shaft Support to Transmission Housing Bolt Tightening Sequence and Specification



Step	Component	Nm
Tighten the new bolts for the reverse shaft support -arrow- as follows:		
1	Tighten the bolt -a- to 30 Nm.	
2	Tighten the bolt -b- (lower illustration) to 25 Nm.	
3	Tighten the bolt -c- to 25 Nm.	



Output Shaft Overview



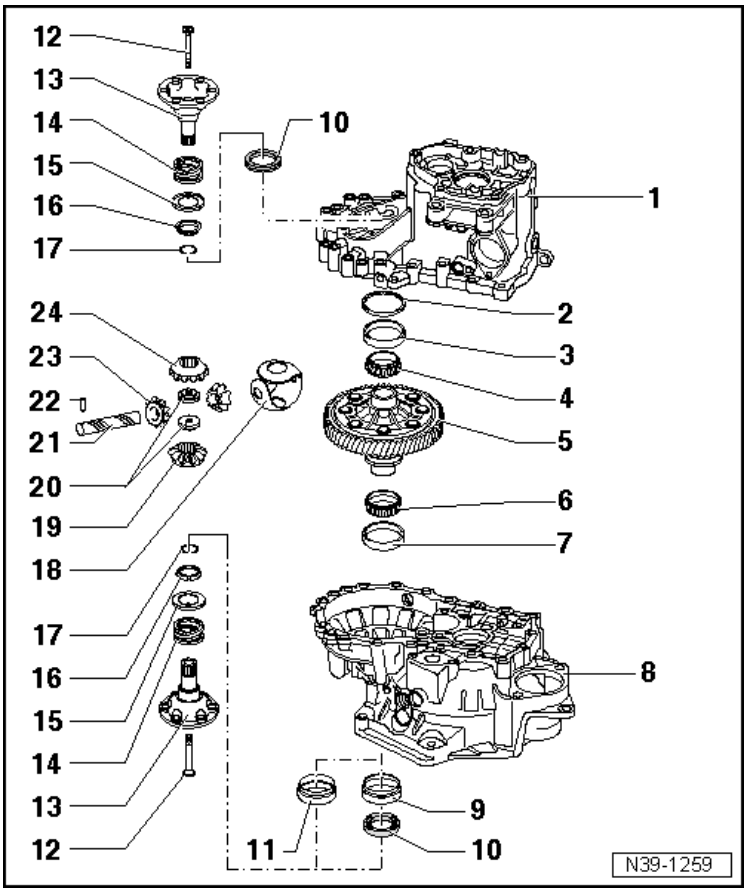
1 - Nut
- ☐ 25 Nm + 90° turn
- ☐ Always replace

2 - Clutch Housing
3 - Adjusting Shim
4 - Small Outer Race/Tapered Roller Bearing
5 - Bearing Inner Race/Small Tapered Roller Bearing
6 - Output Shaft
7 - Bearing Inner Race/Large Tapered Roller Bearing
8 - Seal
9 - Bearing Support
10 - Thrust Washer
11 - 1st Gear
12 - Needle Bearing
13 - Synchronizer Ring

14 - 1st Gear Outer Race
15 - 1st Gear Synchronizer Ring
16 - Locking Collar with Synchronizer Hub for 1st and 2nd Gears
17 - Lock Ring
18 - 2nd Gear Synchronizer Ring
19 - 2nd Gear Outer Race
20 - Synchronizer Ring
21 - 2nd Gear
22 - Needle Bearing
23 - Thrust Washer
24 - Sleeve for the 3rd Gear Needle Bearing
25 - Needle Bearing
26 - 3rd Gear
27 - 3rd Gear Synchronizer Ring
28 - Locking Collar with Synchronizer Hub for 3rd and 4th Gears
29 - Sleeve
30 - Needle Bearing
31 - 4th Gear Synchronizer Ring
32 - 4th Gear
33 - Thrust Washer
34 - Needle Bearing
35 - Transmission Housing
36 - Sleeve
37 - 5th Gear
38 - Plate Spring
39 - Bolt
- ☐ 80 Nm + 90° turn
- ☐ Always replace

Rear Final Drive, Differential – 0A4

Differential Overview



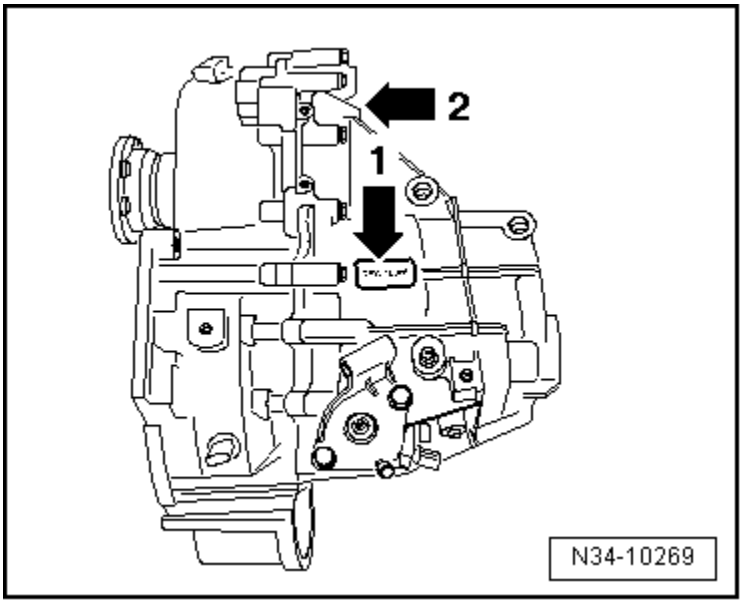
1 - Transmission Housing
2 - Adjusting Shim
3 - Outer Race/Tapered Roller Bearing
4 - Inner Race/Tapered Roller Bearing
5 - Differential Housing
6 - Inner Race/Tapered Roller Bearing
7 - Outer Race/Tapered Roller Bearing
8 - Clutch Housing
9 - Sleeve
10 - Seal
11 - Seal and Sleeve (One Piece)
12 - Bolt
☐ 25 Nm
13 - Flange Shaft
14 - Flange Shaft Pressure Spring

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

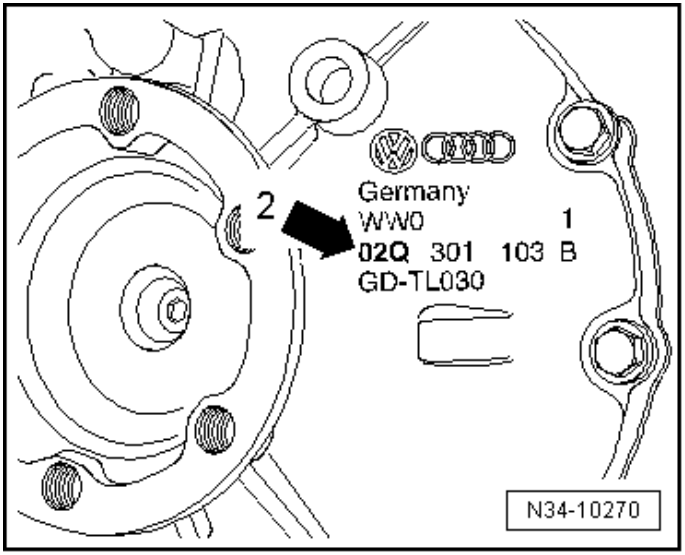
MANUAL TRANSMISSION – 02Q

General, Technical Data

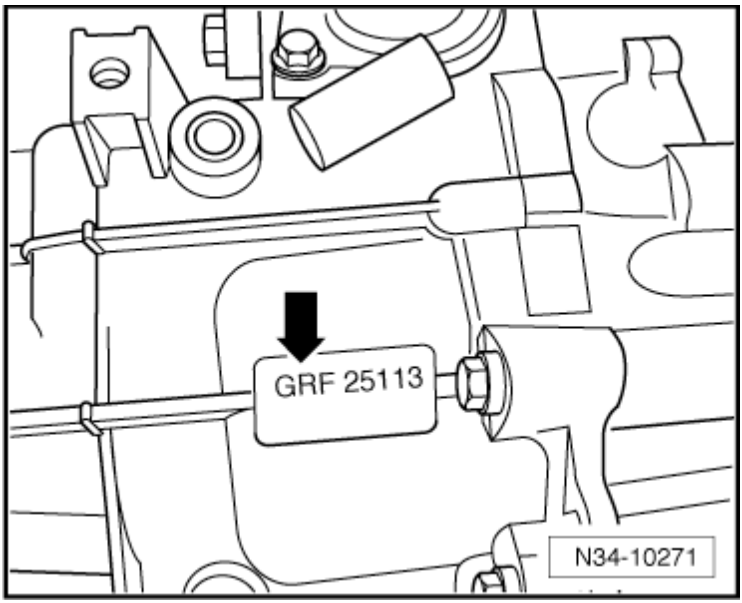
Transmission Identification



Code letters and build date -arrow 1- manual transmission 02Q -arrow 2-



Manual Transmission 02Q -arrow 2-



Engine Code and Build Date -arrow-

Example:

GRF	25	11	3
Identification codes	Day	Month	Year (2003) of manufacture

Engine Codes, Transmission Allocation, Ratios and Capacities

Manual transmission		**6-Speed 02Q**	
Identification codes		KZS	LHD
Manufactured	from through	05/2009	05.2009 05.2011
Allocation	Engine	2.0 L - 147 KW	2.0 L - 103 kW turbo diesel
Ratio: $Z_1 : Z_2$	Final drive I	70:19 = 3.684	69:20 = 3.450
	Final drive II	70:24 = 2.917	69:25 = 2.760
Drive axle flange diameter		107 mm	107 mm

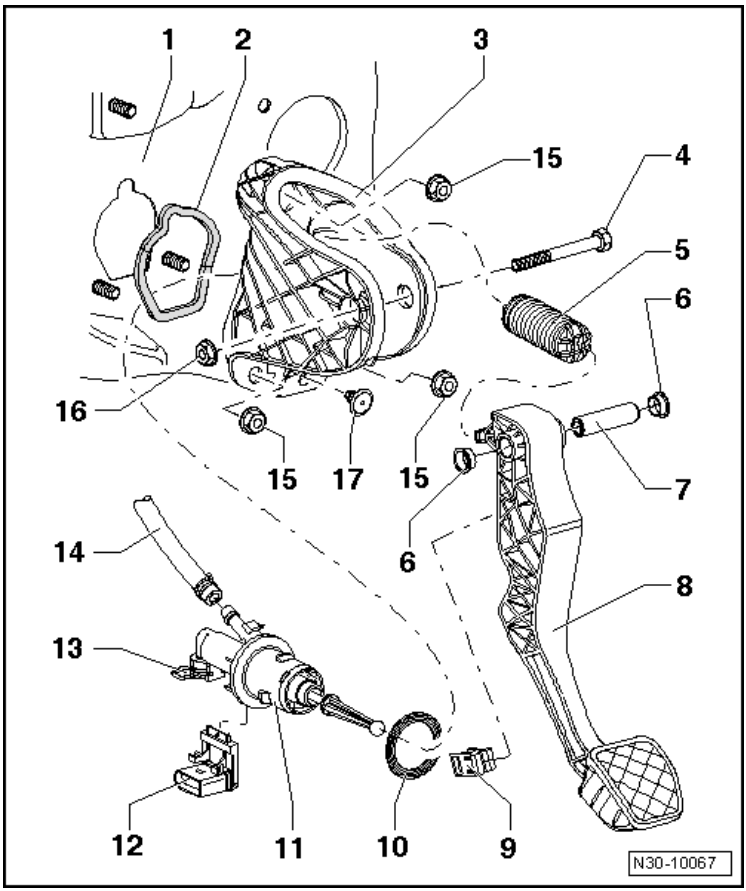
Manual transmission		**6-Speed 02Q**	
Identification codes		NFP	KZV
Manufactured	from through	05.2011	11.2009
Allocation	Engine	2.0 L - 103 kW turbo diesel	2.0L - 188 kW TFSI
Ratio: $Z_1 : Z_2$	Final drive I	69:20 = 3.450	72 : 17 = 4.235
	Final drive II	69:25 = 2.760	72 : 22 = 3.273
Drive axle flange diameter		107 mm	

- Final drive I for “1st” to “4th” gear
- Final drive II for “5th”, “6th” and reverse gears

Refer to the Electronic Parts Catalog (ETKA) for the following:
- Individual gear ratios
- Transmission fluid
- Clutch allocation

Clutch – 02Q

Clutch Pedal Overview



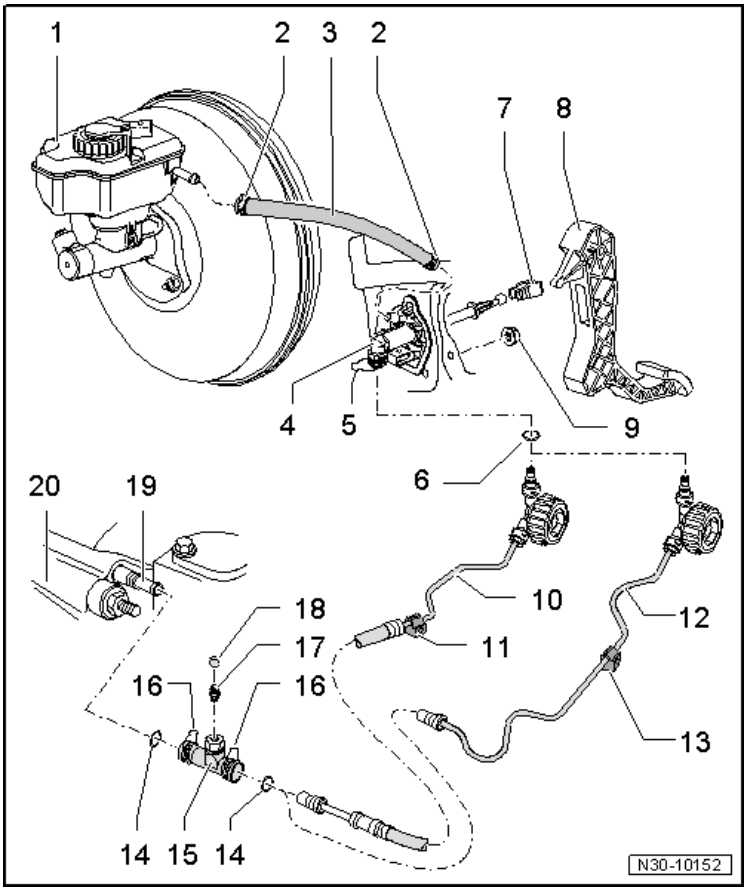
1 - Bulkhead
2 - Gasket
☐ Always replace
3 - Mounting Bracket
4 - Bolt
5 - Over-Center Spring
6 - Bushing
7 - Pin
8 - Clutch Pedal
9 - Mount
10 - Gasket
☐ Always replace
11 - Master Cylinder
12 - Clutch Position Sensor -G476-
13 - Circlip

14 - Supply Hose
15 - Nut, Self Locking
- ☐ 25 Nm
- ☐ Always replace

16 - Nut
- ☐ 25 Nm
- ☐ Always replace

17 - Jounce Bumper

Hydraulics Overview



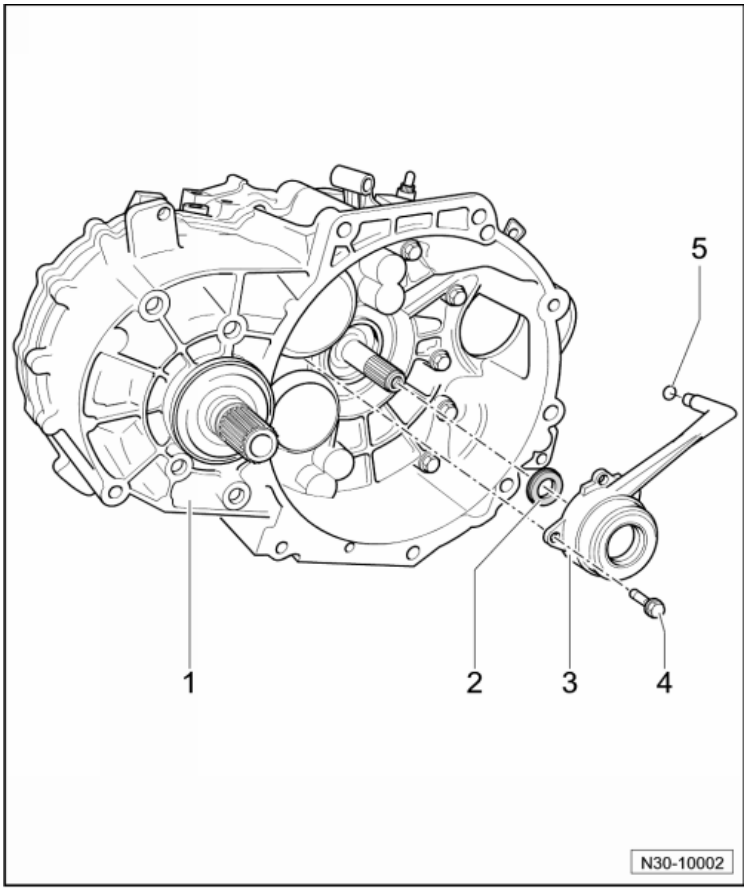
1 - Brake Fluid Reservoir
2 - Spring Clamp
- ☐ Not installed on all vehicles.

3 - Supply Hose
4 - Master Cylinder
5 - Clip
6 - Seal/O-ring
7 - Mount
8 - Clutch Pedal
9 - Nut
- ☐ 15 Nm
- ☐ Always replace

10 - Hose/Line Assembly
11 - Bracket
12 - Pipe
13 - Bracket
14 - Seal/O-ring

15 - Breather Assembly
16 - Clip
17 - Breather Valve
18 - Cap
19 - Clutch Slave Cylinder
20 - Transmission

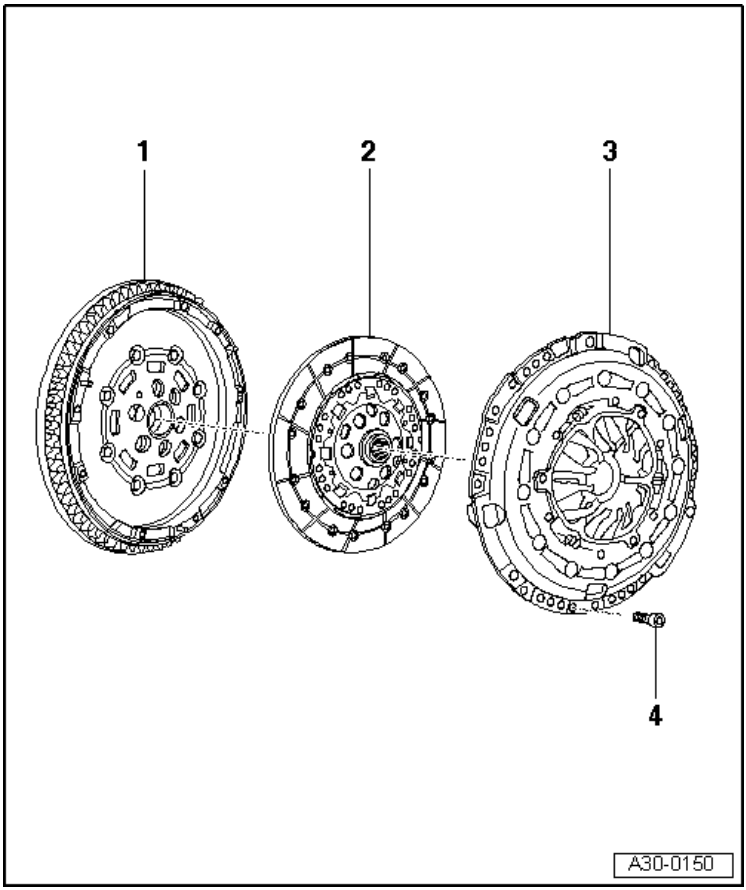
Clutch Release Mechanism Overview



1 - Transmission
2 - Input Shaft Seal
3 - Clutch Slave Cylinder with Release Bearing
4 - Bolt
- ☐ Without locking fluid, tighten to 12 Nm (slave cylinder with a metal housing only)
- ☐ With locking fluid, tighten to 15 Nm (slave cylinder with a plastic housing only)
- ☐ Always replace

5 - O-ring

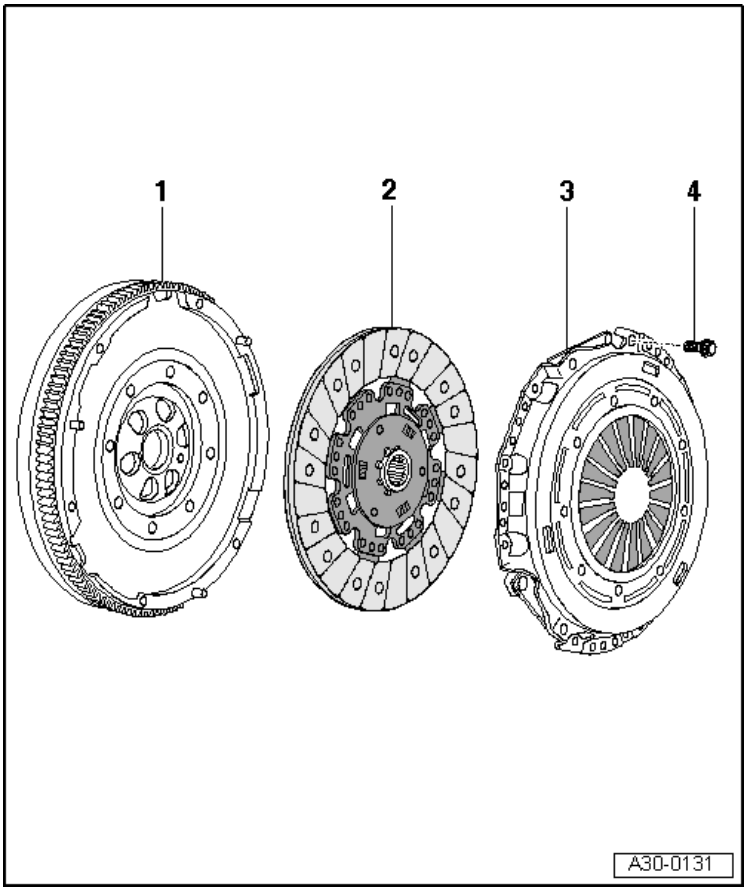
Luk Clutch Assembly Overview



1 - Dual Mass Flywheel
2 - Clutch Disc
3 - SAC Pressure Plate
4 - Bolt

- ☐ M6 bolt: 13 Nm
- ☐ M7 bolt: 20 Nm
- ☐ Loosen and tighten in small steps and in a diagonal sequence.

Sachs Clutch Assembly Overview

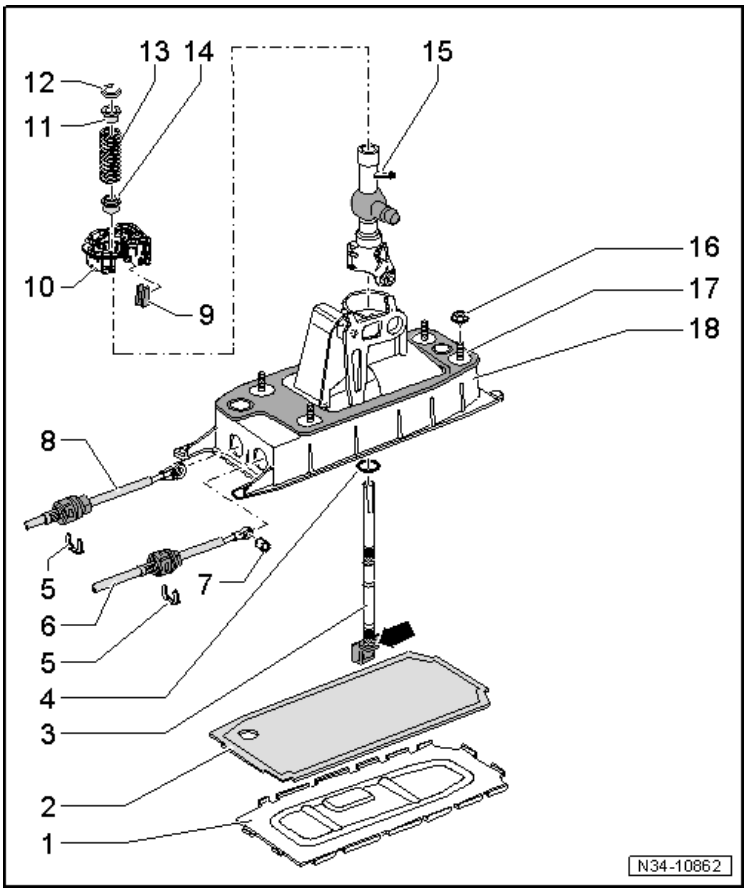


1 - Dual Mass Flywheel
2 - Clutch Disc
3 - Pressure Plate
4 - Bolt

- ☐ M6 bolt: 13 Nm
- ☐ M7 bolt: 20 Nm
- ☐ Loosen and tighten in small steps and in a diagonal sequence.

Controls, Housing – 02Q

Shift Lever and Housing Overview



1 - Base Plate
- ☐ Always replace

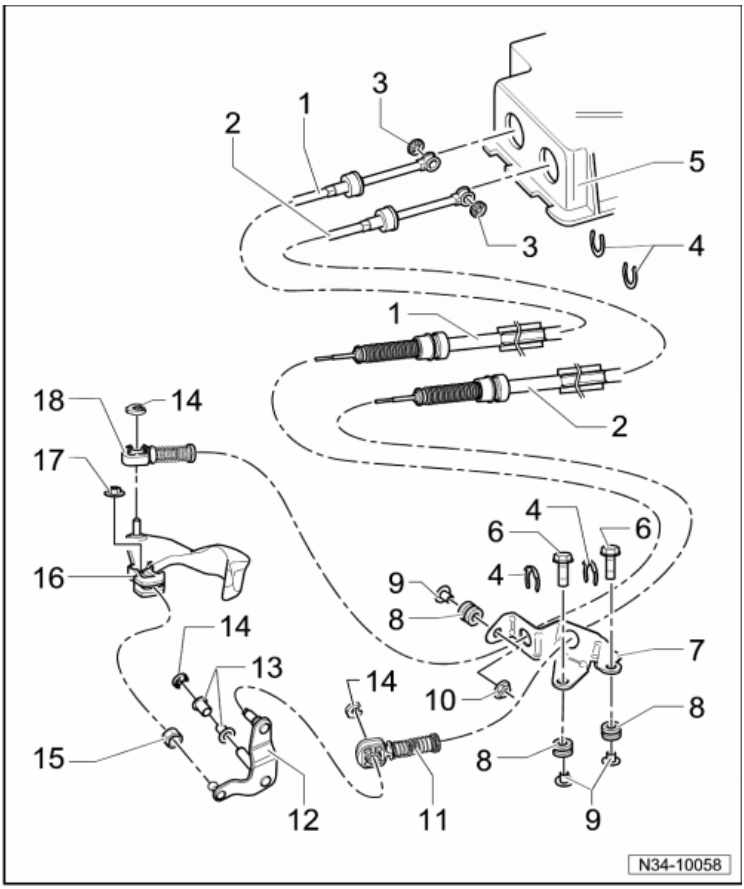
2 - Gasket
- ☐ Always replace

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

14 - Bushing
15 - Shift Lever Guide
16 - Nut
- ☐ M6 nut: 8 Nm
- ☐ M8 nut: 25 Nm

17 - Gasket
18 - Shift Housing

Shift and Selector Cables, with a Metal Cable Bracket and Relay Lever



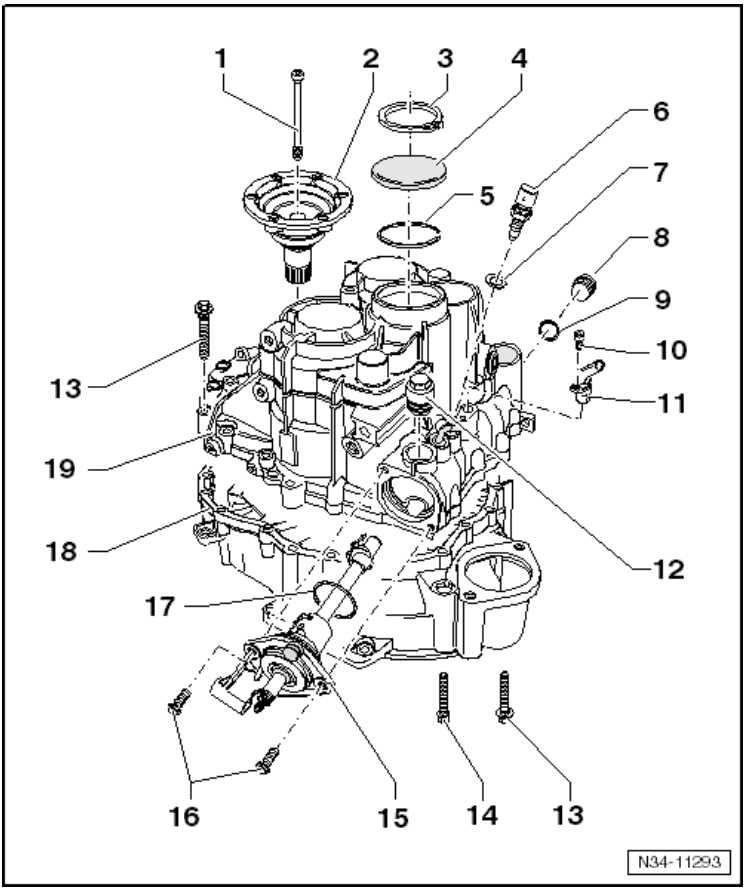
1 - Shift Cable
2 - Selector Cable
3 - Lock Washer
☐ Always replace
4 - Lock Washer
☐ Always replace
5 - Shift Housing
6 - Bolt
☐ 20 Nm
7 - Cable Bracket
8 - Grommet
9 - Spacer
10 - Nut
☐ 20 Nm
11 - Cable Retainer

12 - Relay Lever
13 - Bushing
14 - Lock Washer
- ☐ Always replace

15 - Sliding Shoe
16 - Transmission Shift Lever
17 - Self-Locking Nut
- ☐ 23 Nm
- ☐ Always replace

18 - Cable Retainer

Transmission Housing and Gear Shift Unit Overview



1 - Countersunk Bolt
2 - Flange Shaft with Pressure Spring
3 - Lock Ring
4 - Sealing Cap
5 - Lock Ring
6 - Back-up Lamp Switch -F4-
- ☐ 20 Nm

7 - Seal
8 - Drain Plug
- ☐ Tightening specification, see Different Versions of the Oil Fill and Drain Plugs below

9 - Seal
- ☐ Always replace

10 - Bolt
- ☐ 6 Nm

11 - Transmission Neutral Position Sensor -G701-

12 - Locking Screw
- ☐ Metal: 45 Nm
- ☐ Plastic: 30 Nm
- ☐ Always replace

13 - Bolt
- ☐ There are different bolts and tightening specifications:
- ☐ Internal hex round head M9 aluminum bolt = 15 Nm + an additional 180° (1/2) turn
- ☐ Outer hex head = steel bolt = 15 Nm an additional 90° (1/4) turn

14 - Bolt
- ☐ There are different bolts and tightening specifications:
- ☐ Internal hex round head M9 aluminum bolt = 15 Nm + an additional 180° (1/2) turn
- ☐ Outer hex head = steel bolt = 15 Nm an additional 90° (1/4) turn

15 - Gear Shift Unit

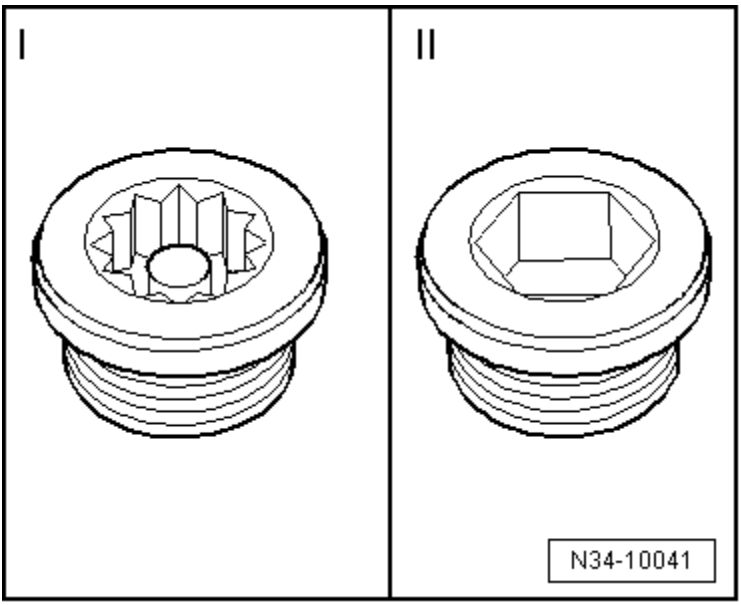
16 - Bolt
- ☐ 20 Nm
- ☐ Always replace

17 - O-ring
- ☐ Always replace

18 - Clutch Housing

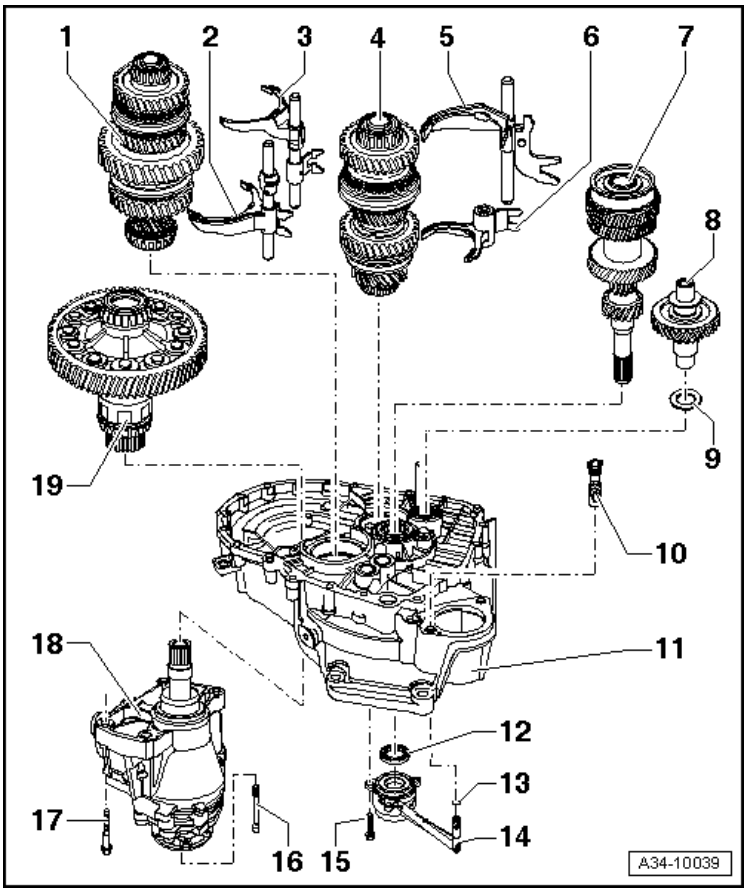
19 - Transmission Housing

Different Versions of the Oil Fill and Drain Plugs



- I - Oil fill or drain plug with a multipoint socket head, 45 Nm
- II - Oil fill or drain plug with a hex socket head, 30 Nm

Input Shaft, Output Shaft, Differential, Bevel Box and Selector Rods (AWD)



1 - Output Shaft, 1st to 4th Gears
2 - Gearshift Rod and Shift Fork for 1st and 2nd Gear
3 - Gearshift Rod and Shift Fork for 3rd and 4th Gear
4 - 5th/6th and Reverse Gear Output Shaft
5 - Gearshift Rod and Shift Fork for 5th and 6th Gear
6 - Reverse Gear Shift Fork
7 - Input Shaft
8 - Reverse Shaft
9 - Thrust Washer
10 - Bleeder
11 - Clutch Housing
12 - Input Shaft Seal
13 - Seal
14 - Clutch Slave Cylinder with Release Bearing

15 - Bolt

- ☐ Always replace

16 - Countersunk Bolt

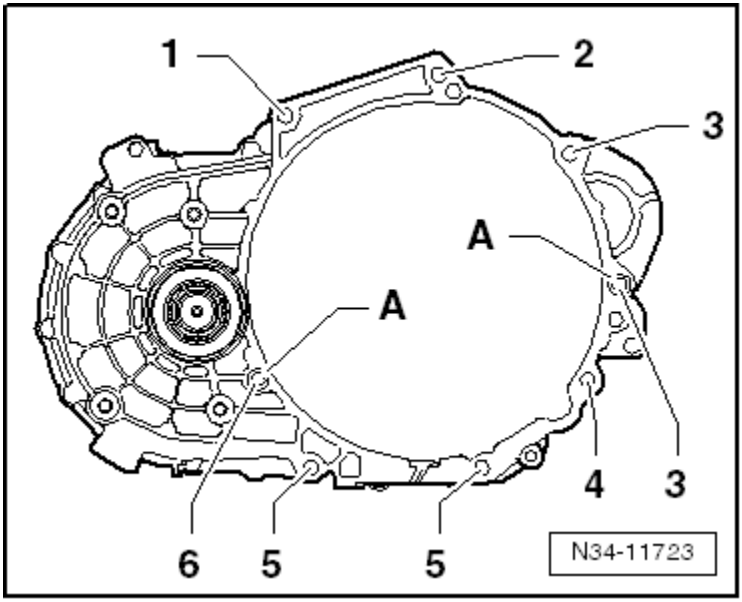
17 - Bolt

- ☐ 40 Nm + 90° turn
- ☐ Always replace

18 - Bevel Box

19 - Differential

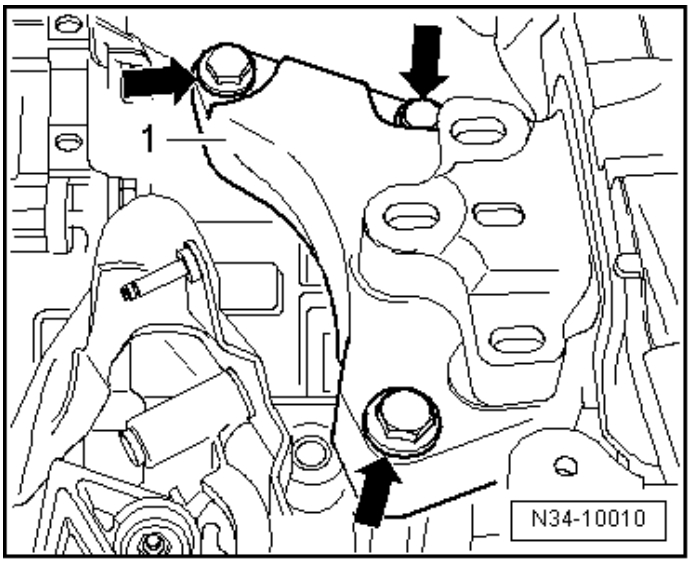
Transmission to Engine Tightening Specifications



Item	Fastener size	Quantity	Nm
1	M12 x 55 With a long M8 threaded pin	1	80
2	M12 x 55 With a short M8 threaded pin or M12 x 50 Without threaded pin	1	80
3	M12 x 165 With an M8 threaded pin Also starter to transmission	2	80
4	M10 x 105	1	40
5	M10 x 50	2	80
6	M12 x 70 or M12 x 65	1	80
	M6 x 8 Small flywheel cover plate (not present here)	1	10

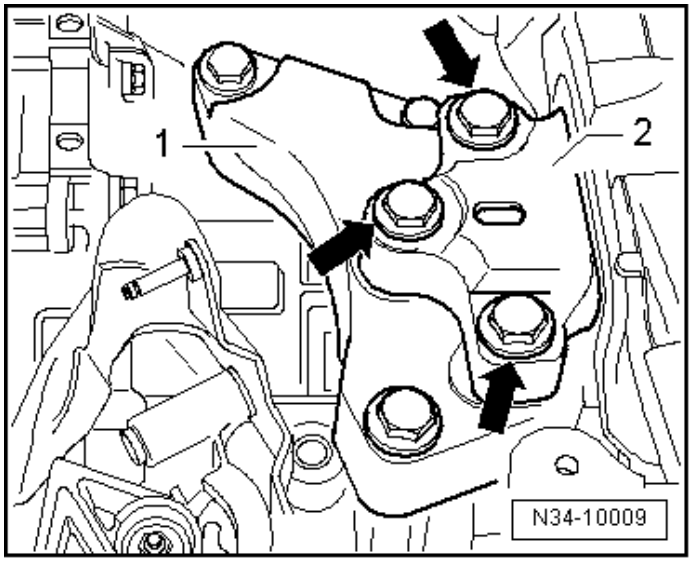
-A-: Alignment sleeve for centering

Transmission Mount Bracket to Transmission



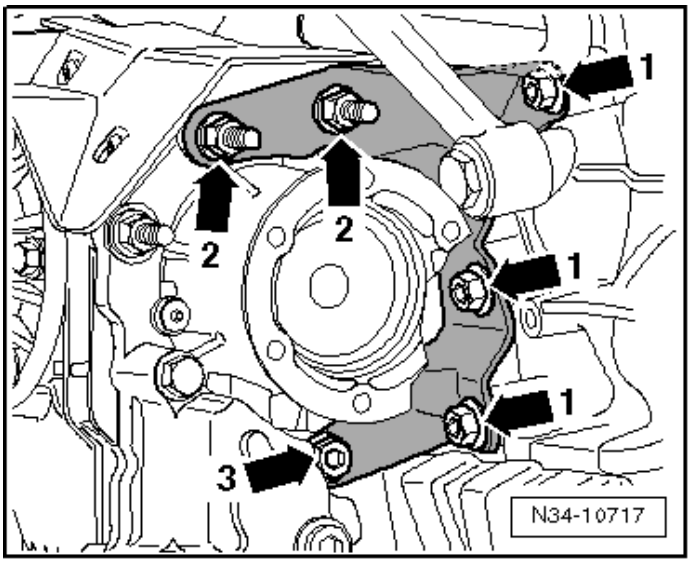
Step	Component	Nm
Replace the transmission mount bracket -1- to transmission bolts -arrows-.		
1	Bolts -arrows-	60 Nm + 90° (1/4) additional turn

Transmission Mount to Transmission Mount Bracket Bolt Tightening Specification



Step	Component	Nm
Replace the transmission mount -2- to transmission mount bracket bolts -arrows-.		
1	Bolts -arrows-	60 Nm + 90° (1/4) additional turn

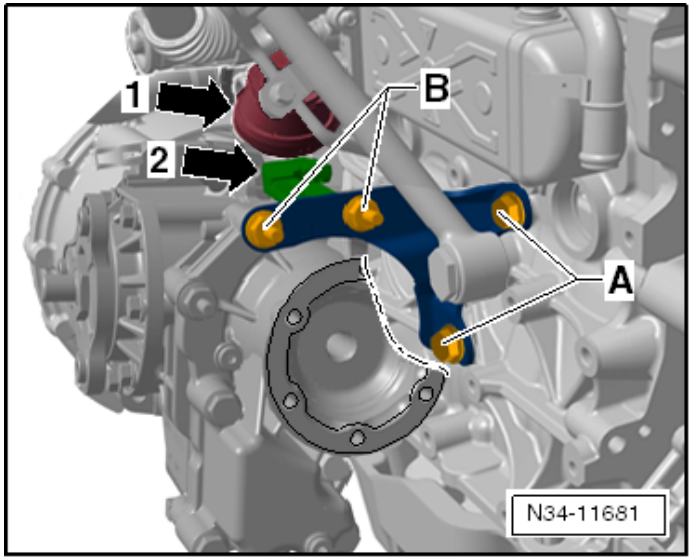
Transmission Mount



Item	Bolt	Quantity
1	M10 x 21	3
2	M10 x 45	2
3	M10 x 62	1

Step	Component	Nm
The following assembly sequence must be followed when installing the transmission mount:		
1	Bolts -arrows-	Hand tighten
2	Bolts arrows 2 and 3	40
3	Bolts arrows 1	40

Vehicles with a Vacuum Diaphragm -arrow 1-



Item	Bolt	Quantity
A	M10 x 21	2
B	M10 x 45	2

Step	Component	Nm
The following assembly sequence must be followed when installing the transmission mount:		
1	All bolts	Hand tighten
2	Tighten the bolts -A-	40
3	Tighten the bolts -B-	40

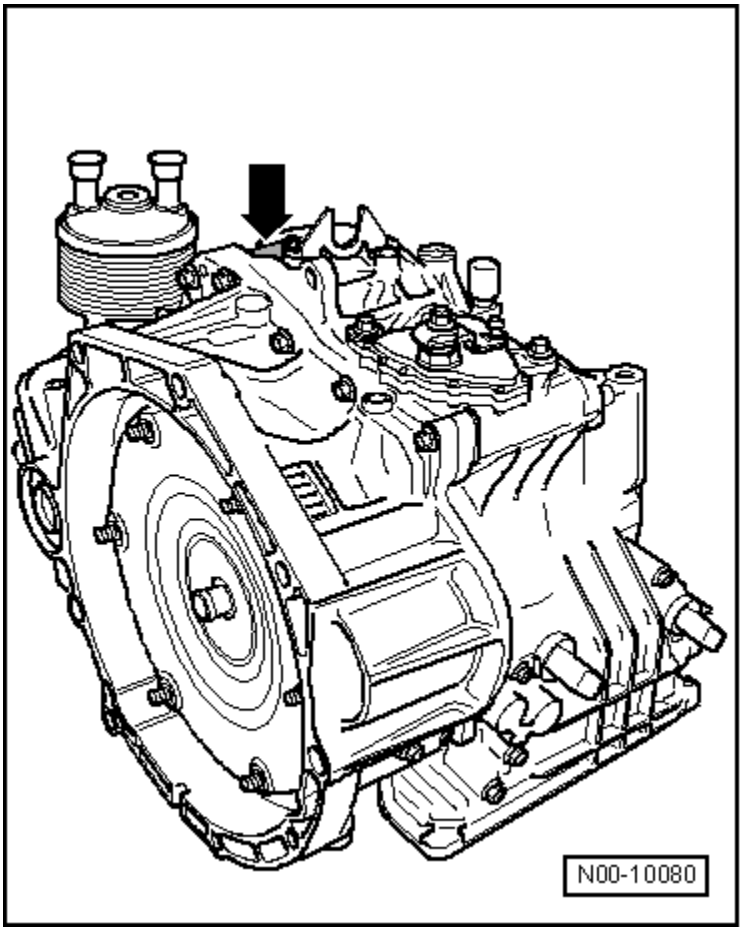
Rear Final Drive, Differential – 0A4

Components	Fastener Size	Nm
Left flange shaft to transmission housing	-	33

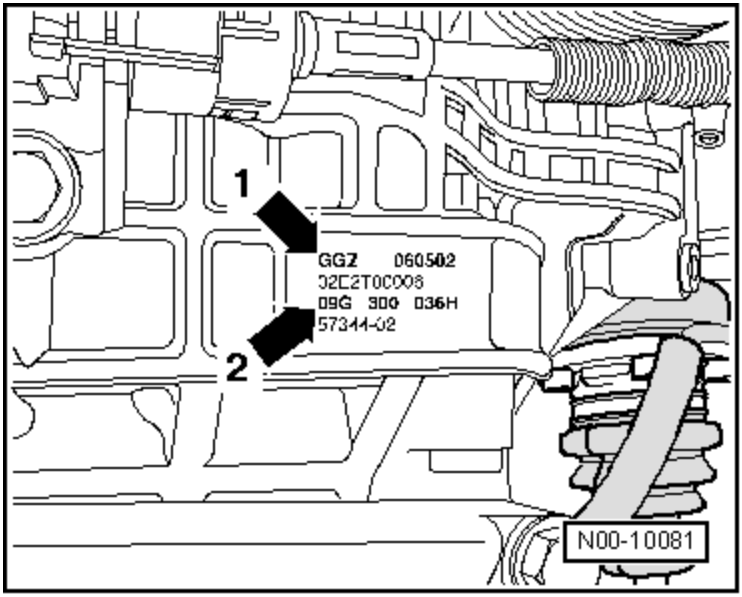
AUTOMATIC TRANSMISSION – 09G

General, Technical Data

Identification on Transmission



Code letters (➡).



Example:

GGZ	08	05	02
Identification codes	Day	Month	Production year (2002)

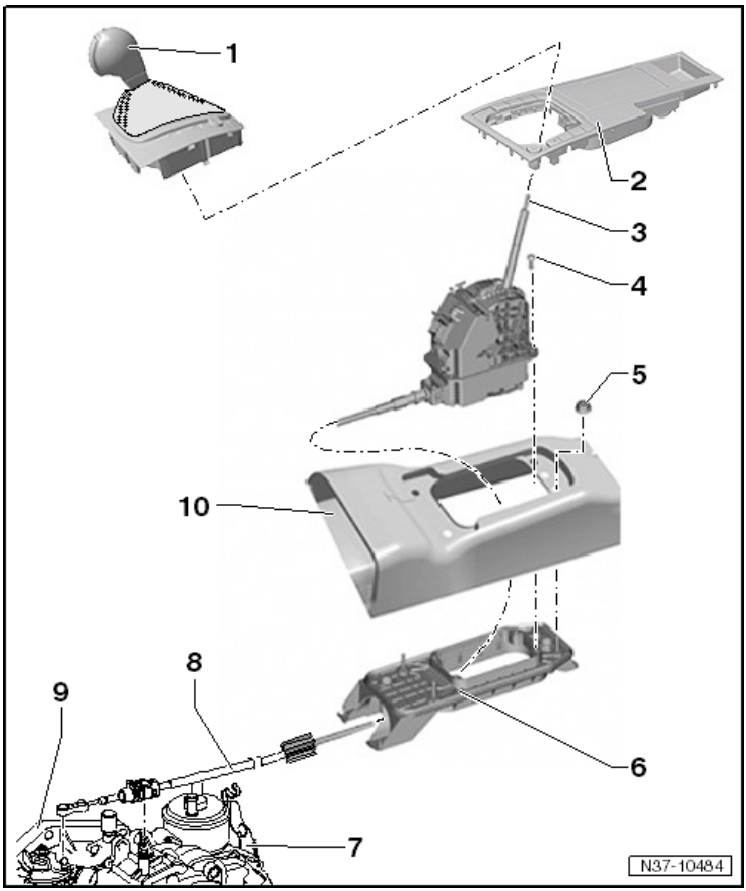
The transmission code letters are also included on the vehicle data labels.

Engine and Transmission Code Allocation

Engine	Automatic Transmission (09G
2.5 L -125 kW	KGL and MAN

Controls, Housing – 09G

Selector Mechanism Overview

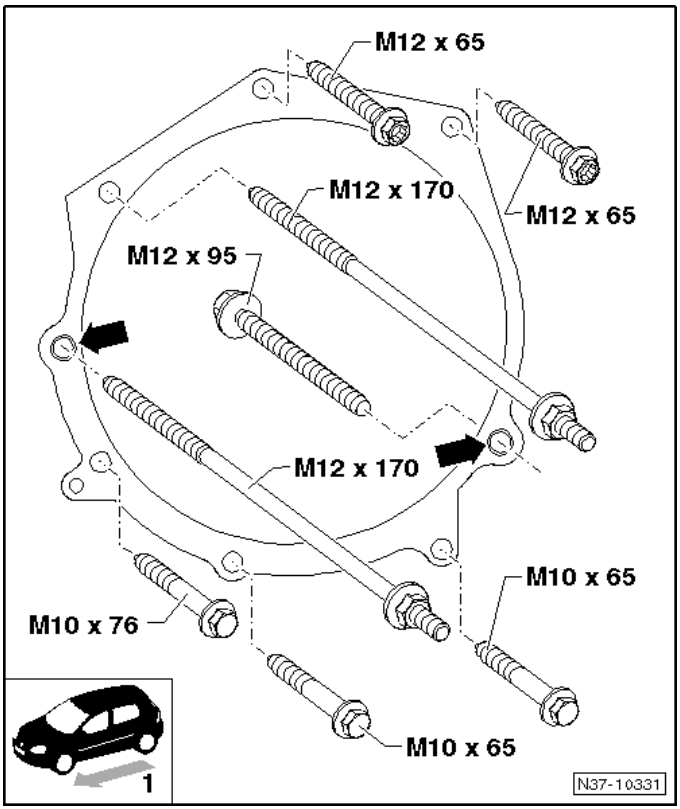


1 - Handle with Cover
2 - Center Console Cover
3 - Selector Mechanism with Selector Lever and Cable
4 - Bolt
- ☐ 8 Nm

5 - Nut
- ☐ 8 Nm

6 - Selector Housing
7 - Retainer
8 - Selector Lever Cable
9 - Transmission
10 - Tunnel/Body

Transmission to Engine Tightening Specifications

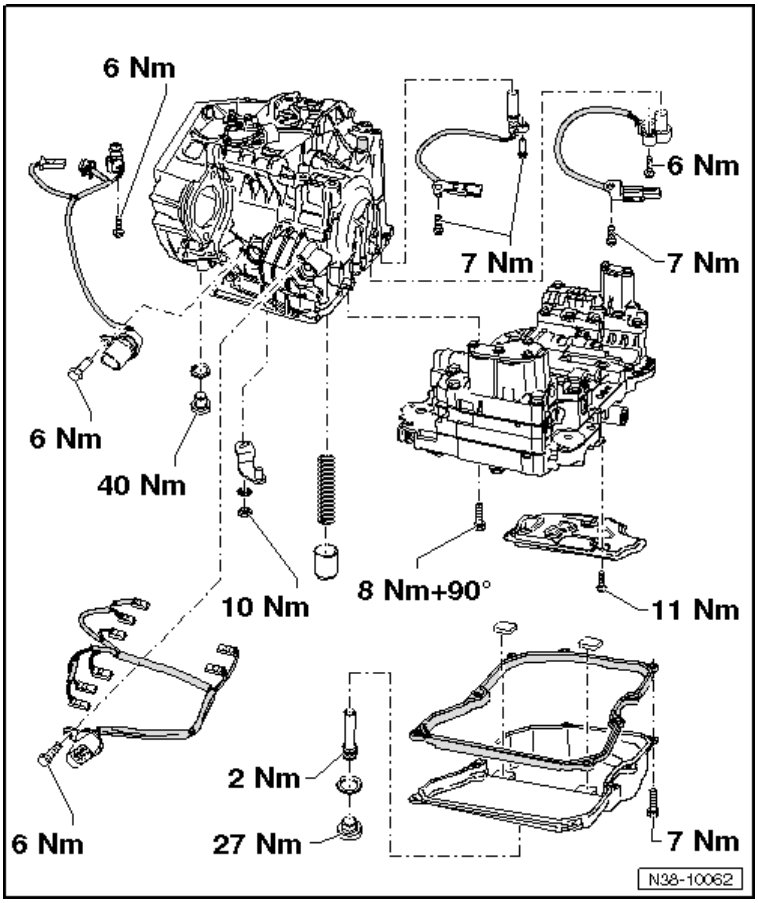


Component	Fastener size	Nm
Drive plate-to-converter	-	60
Bolts	M12	80
Bolts if using the insert tool 18 mm -T10179-	-	65
Bolts located in the lower flange	M10	40
➡ Alignment pins for centering		

Transmission fluid cooler bolts 8 Nm.

Gears, Hydraulic Controls – 09G

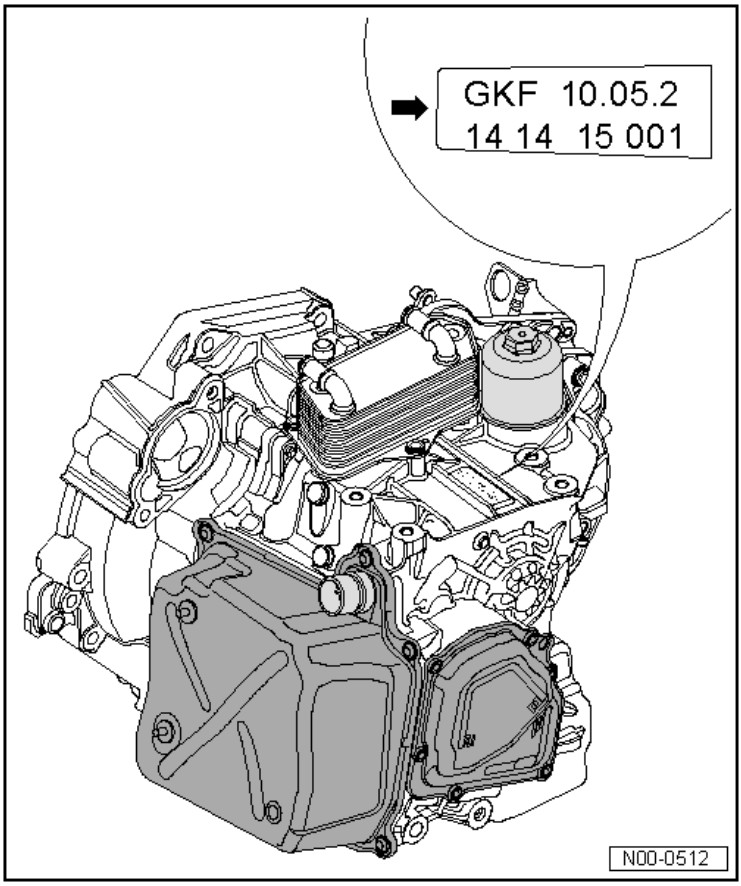
Fastener Tightening Specifications



DIRECT SHIFT GEARBOX (DSG®) TRANSMISSION – 02E

General, Technical Data

Identification on Transmission

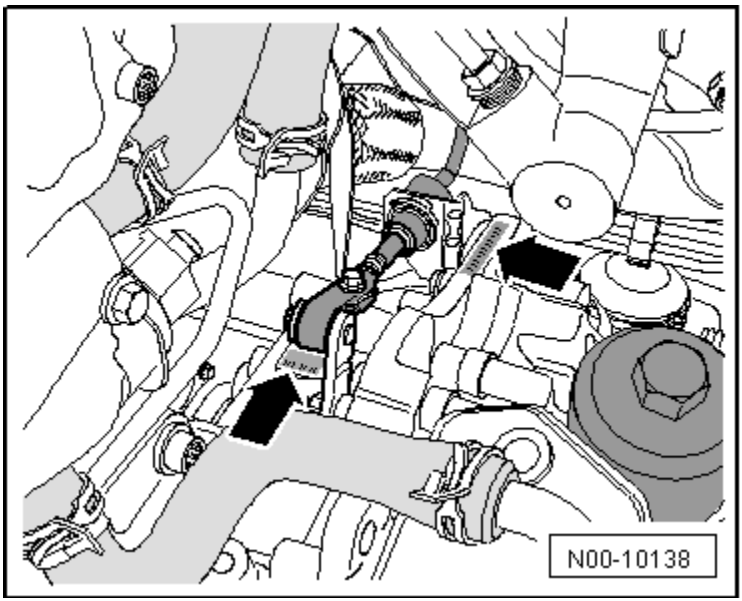


Example:

GKF	10	05	02
Identification codes	Day	Month	Production year (2002)
Plant Code	**Time**		**Serial Number**
14	14 15		001

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

Transmission Code Letter



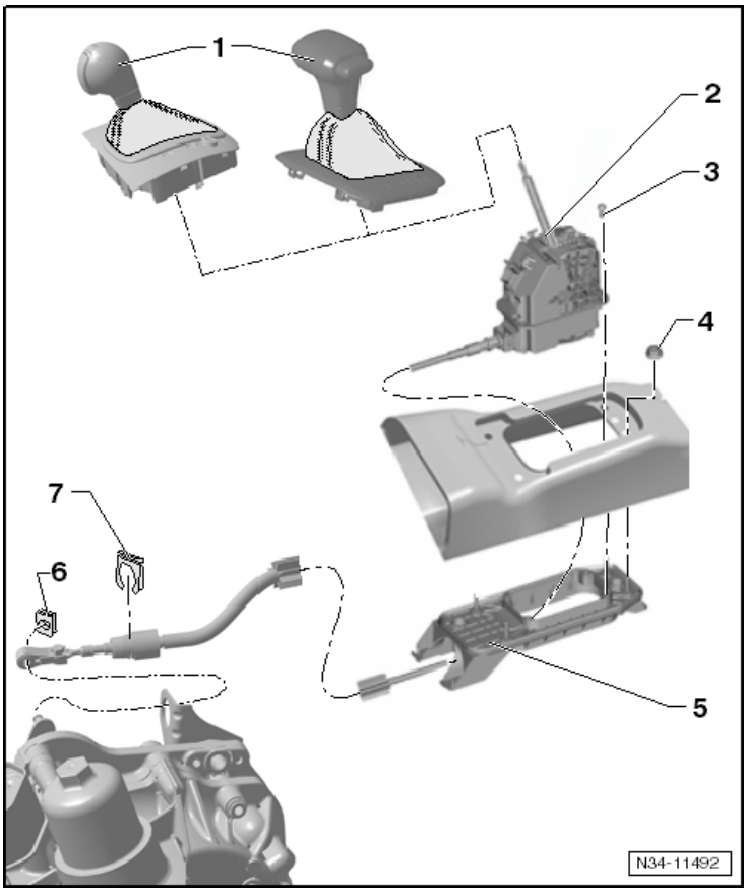
The transmission code letters are on the transmission in at least in two different locations. On the transmission near the selector lever cable two -arrows-.

Engine and Transmission Code Allocation

Direct Shift Gearbox (DSG®) 02E	
LTE, LQV, KQC, MFL, MSV, NJK	LTL, LQZ, MDJ, MMA, MSY, NJR, NJL, NLR
2.0L - 103 kW TDI CR	2.0L - 147 kW FSI-Turbo

Controls, Housing – 02E

Selector Mechanism Overview



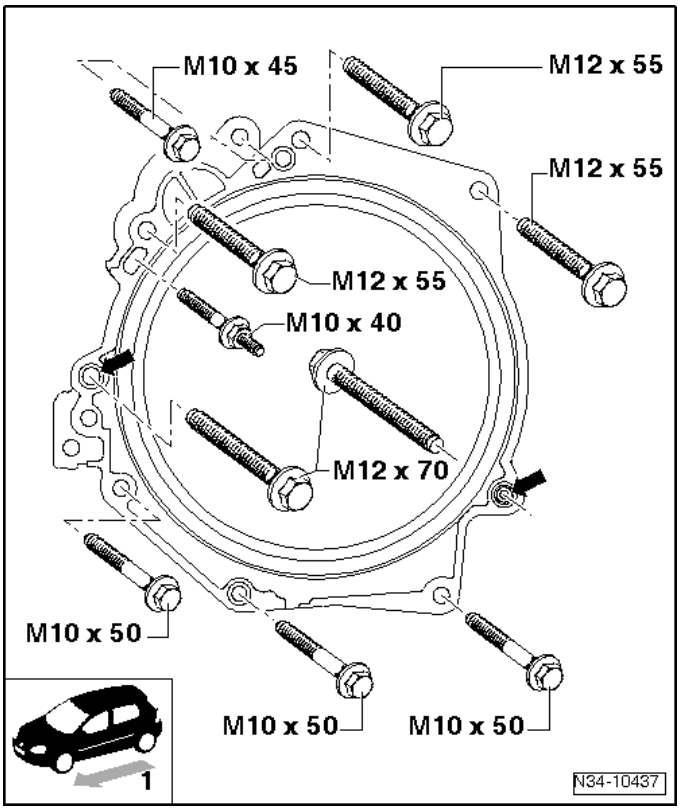
1 - Selector Handle with Cover
2 - Selector Lever and Selector Mechanism with Selector Lever Cable
3 - Bolt
- ☐ 8 Nm

4 - Nut
- ☐ 8 Nm

5 - Selector Housing
6 - Lock Washer
- ☐ Always replace after removing

7 - Lock Washer
- ☐ Always replace after removing

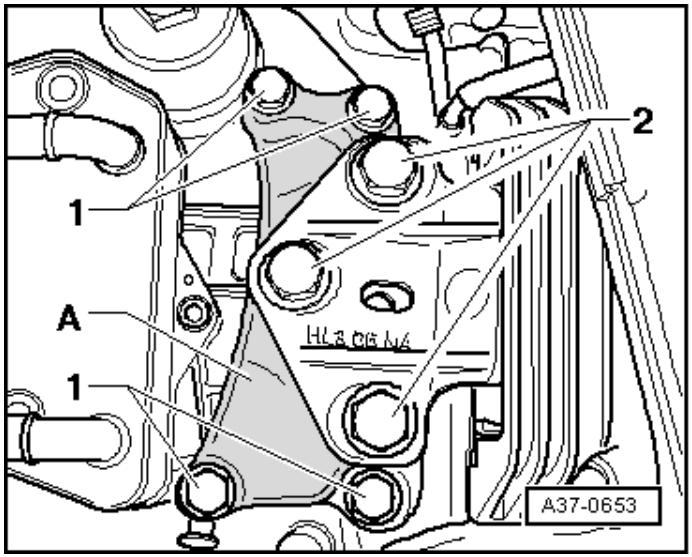
Transmission to Engine Tightening Specifications



Component	Fastener size	Nm
Bolts	M12	80
Bolts if using the insert tool 18 mm -T10179-	-	65
Bolts	M10	40
➡ Arrows - Alignment Sleeves		

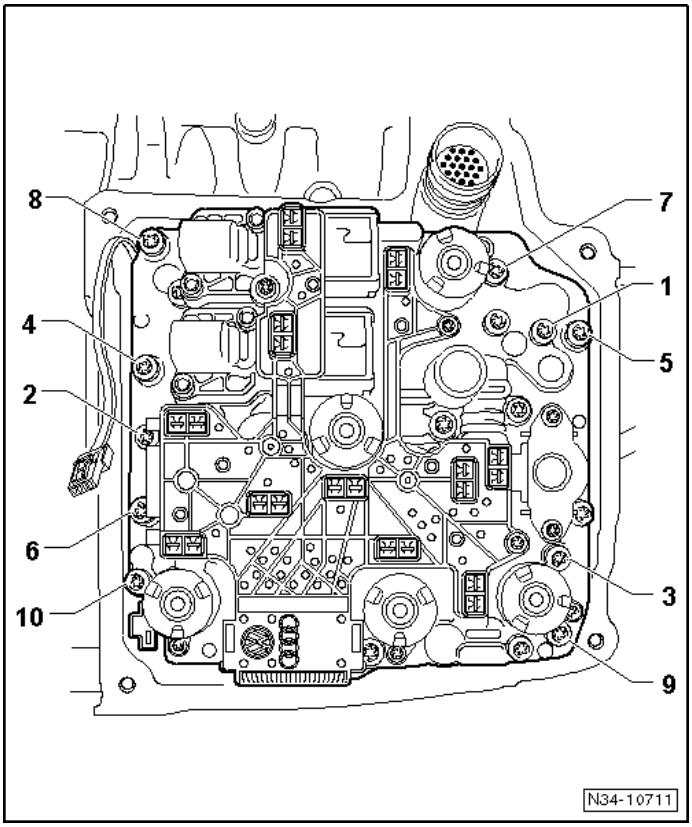
Transmission fluid cooler bolts 8 Nm.

Transmission Mount to Transmission Mount Bracket Bolt Tightening Specification



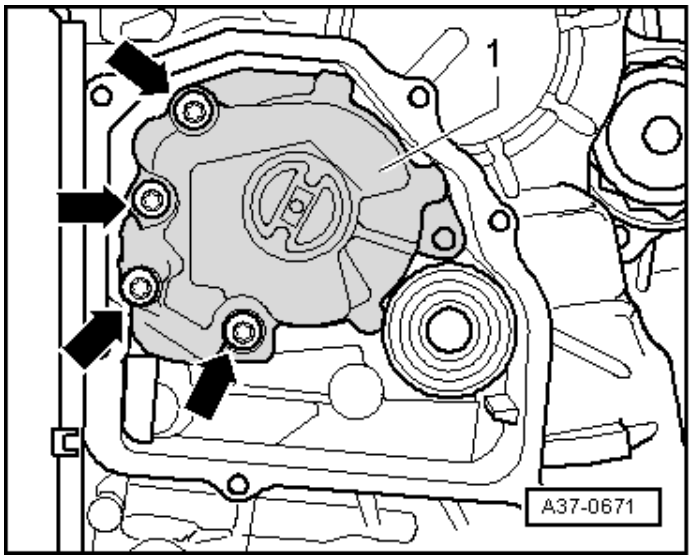
Step	Component	Nm
First, install all the new bolts by hand.		
1	Tighten transmission mount bracket -A- to transmission bolts -1-	40 Nm + 90° (1/4) additional turn
2	When tightening the bolts -2-, the bracket can be pried into position with a screwdriver. Tightening specification for bolts -2-	60 Nm + 90° (1/4) additional turn

Mechatronic Unit Bolt Tightening Sequence and Specification



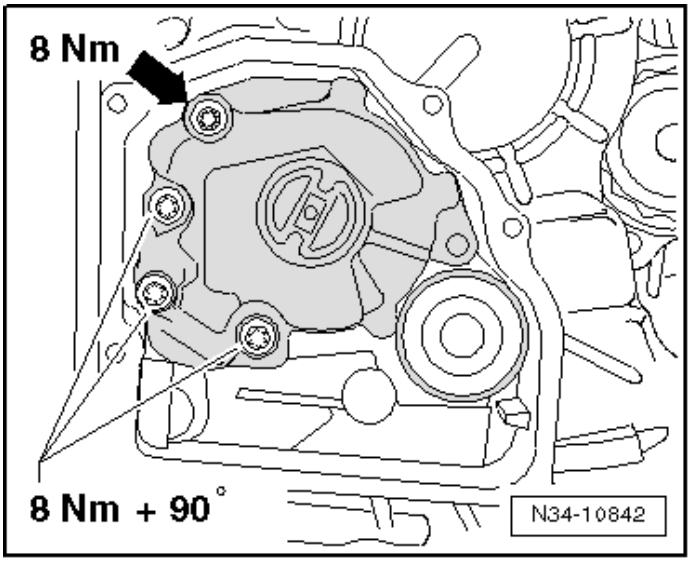
Step	Component	Nm
Install new bolts -1 through 10- hand tight.		
1	Tighten bolts -1 through 10-	5 Nm + 90° (1/4) additional turn

Oil Pump Bolt, Variety and Tightening Specification



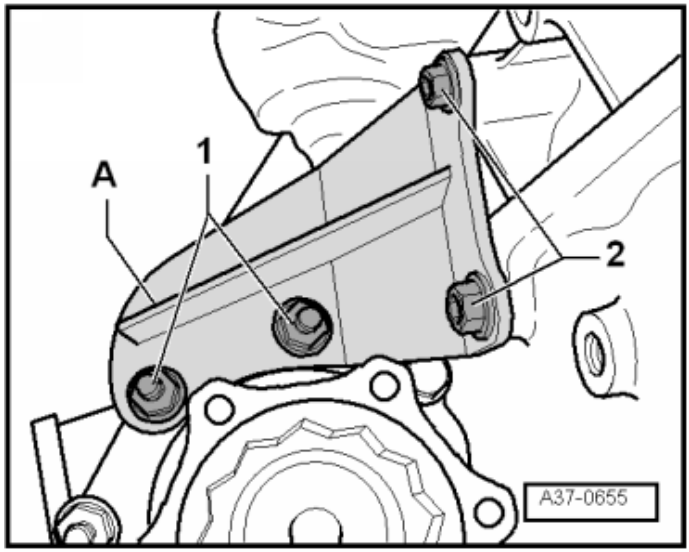
Step	Component	Nm
1	Tighten bolts -arrows-	5 + 90° (1/4) additional turn

Transmission Mount to Transmission Mount Bracket Bolt Tightening Specification



Step	Component	Nm
3 bolts have a flat head, the upper bolt is countersunk		
-	Countersunk bolt: tighten using Wrench - Pump/ Injector Long Reach -T10054-.	8
-	Flat head bolts	8 + 90° (1/4) additional turn

Bevel Box to Transmission Bracket Bolt Tightening Sequence and Specification (R32 models only)

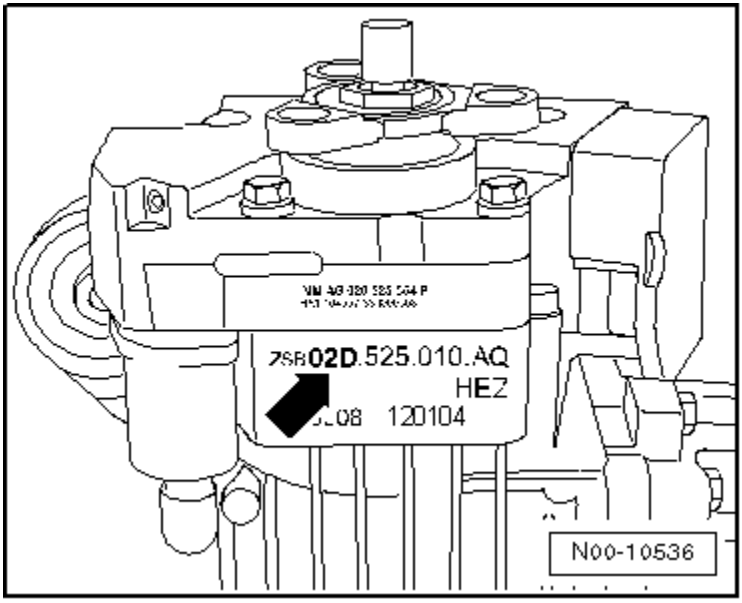


Step	Component	Nm
Install the bolts -1 and 2- by hand.		
1	Tighten bolts -1-	3
2	Tighten bolts -2-	35
3	Tighten bolts -1-	45

REAR FINAL DRIVE

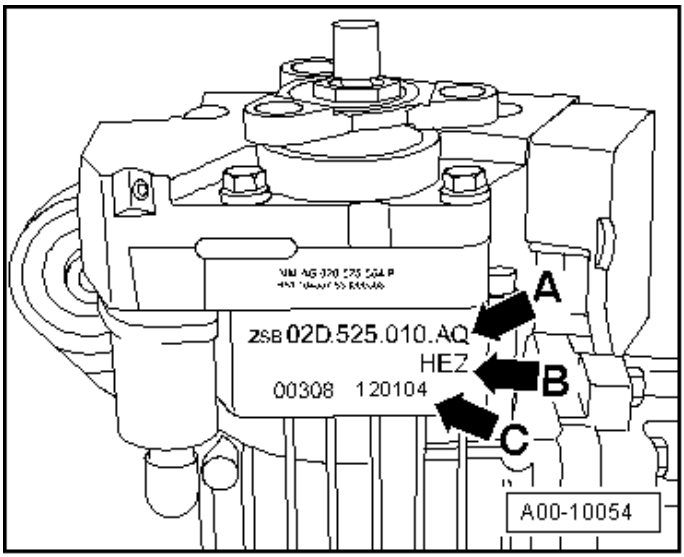
General, Technical Data

Rear Final Drive Identification



The Identification (ID) -arrow- on the bottom side of the final drive identifies which final drive is installed. Example identification on an 02D final drive.

Rear Final Drive Identification *(cont'd)*



-Arrow A- final drive part number.

-Arrow B- final drive code letters.

-Arrow C- Final drive build date.

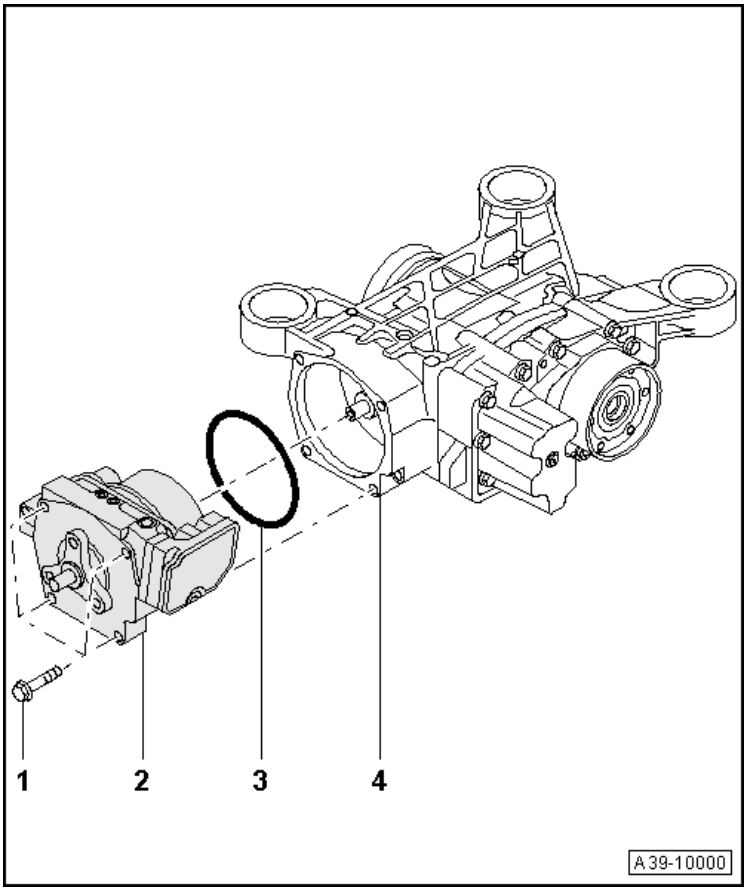
Example:

HEZ	12	01	04
Identification codes	Day	Month	Year (2004) of manufacture

Code Letters and Transmission Allocation

Rear Final Drive - 0BR Generation IV Haldex Clutch)	
Transmission type	Automatic Transmission - 02Q
Code letters	KMC and MMK
Engine	2.0L - 188 kW
Final drive capacity	Refer to the Fluid Capacity Tables, Rep. Gr. 03
Haldex clutch capacity	Refer to the Fluid Capacity Tables, Rep. Gr. 03
Replacement capacity in Haldex clutch. Change intervals, refer to Maintenance Intervals, Rep. Gr. 03	Refer to the Fluid Capacity Tables, Rep. Gr. 03
Driveshaft flange diameter	100 mm

Haldex Clutch Overview



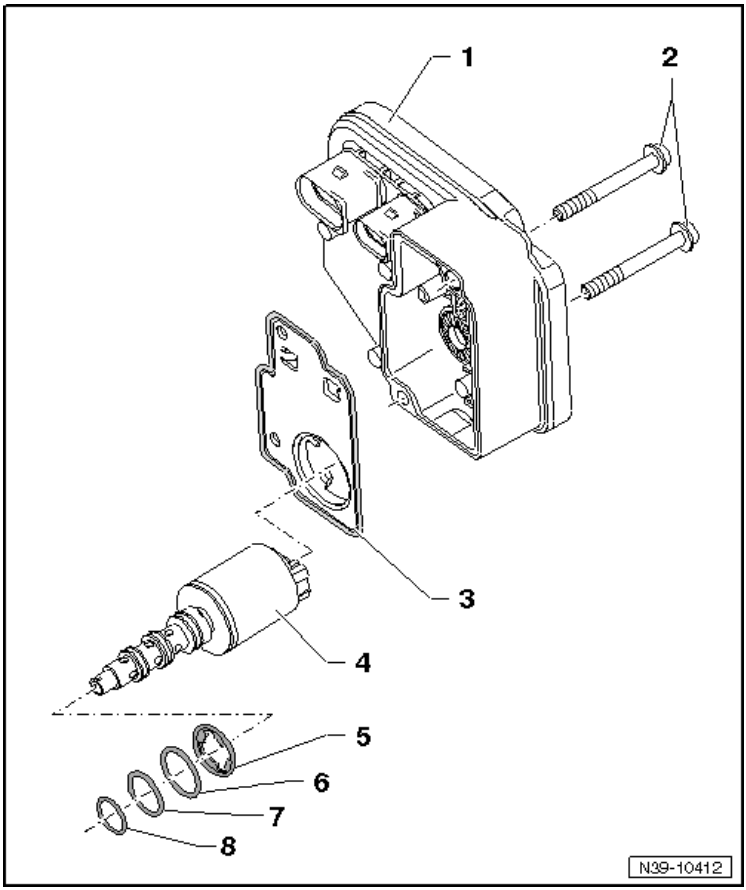
1 - Bolt
- ☐ 50 Nm

2 - Haldex Clutch

3 - O-ring
- ☐ Always replace
- ☐ Insert using high performance gear oil for Haldex coupling -052 175 A1-.

4 - Drive

All Wheel Drive Control Module J492 Overview



1 - All-Wheel Drive Control Module -J492-
2 - Bolt
- ☐ 6 Nm

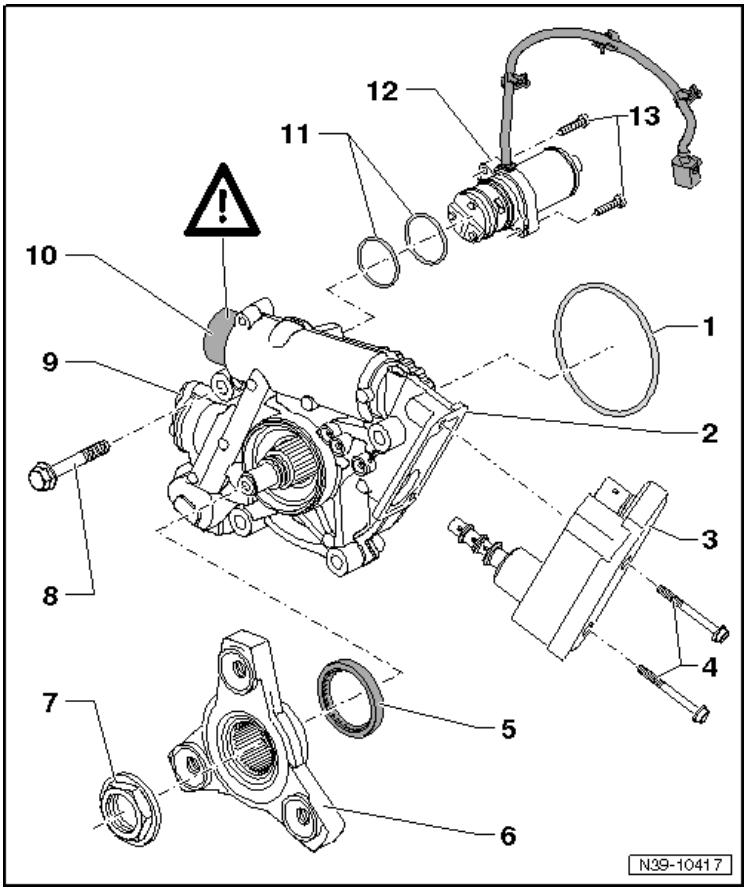
3 - Cover
4 - Haldex Clutch Control Valve -N373-
5 - Seal
- ☐ Always replace

6 - Seal
- ☐ Always replace

7 - Seal
- ☐ Always replace

8 - Seal
- ☐ Always replace

Haldex Clutch Components Overview



1 - Seal
- ☐ Always replace

2 - Haldex Clutch Housing

3 - All Wheel Drive Control Module -J492-

4 - Bolt
- ☐ 6 Nm

5 - Input Flange Seal

6 - Input Flange

7 - Nut
- ☐ 210 Nm
- ☐ Secure using liquid locking fluid -D 000 600-.

8 - Bolt
- ☐ 50 Nm

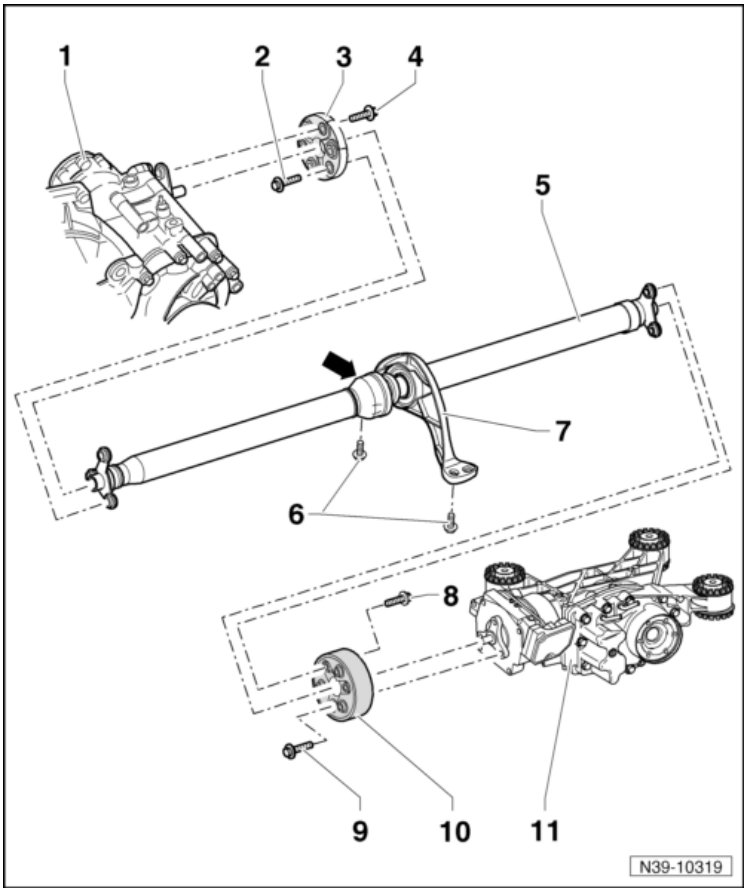
9 - Cover

10 - Cover

11 - Seal
- ☐ Always replace

12 - Haldex Clutch Pump -V181-
13 - Bolt
- ☐ 6 Nm

Driveshaft Overview



1 - Transmission with Bevel Box
2 - 12 Point Bolt
- ☐ Do not loosen.

3 - Front Flexible Disc
4 - 12 Point Bolt
- ☐ 50 Nm + 90° turn
- ☐ M10 x 30
- ☐ Always replace

5 - Driveshaft
6 - Bolt
- ☐ 25 Nm

7 - Intermediate Bearing
8 - Bolt
- ☐ 50 Nm + 90° turn
- ☐ Always replace

9 - Bolt

- ☐ 50 Nm + 90° turn
- ☐ Always replace

10 - Rear Flexible Disc with Vibration Damper

11 - Rear Final Drive