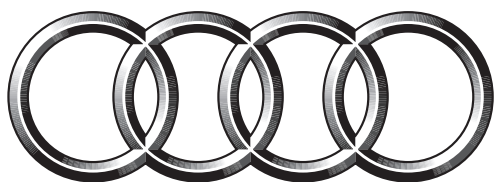


2009



Audi

TT Platform

Quick Reference
Specification Book

2009 Audi TT Platform

Quick Reference Specification Book

TABLE OF CONTENTS

General Information	1
Decimal and Metric Equivalents	1
Tightening Torque	2
Warnings and Cautions	4
Maintenance	9
Vehicle Identification	10
VIN on Lower Edge of Front Window	10
VIN on Suspension Strut Mount	10
VIN Decoder	11
Type Plate – Location	12
Vehicle Data Sticker	12
Sales Codes	13
Engine Codes	13
Transmission Codes	13
Vehicle Lifting	14
Lifting Points for Lifting Platform and Trolley Jack	14
Engine Mechanical, Fuel Injection & Ignition	15
General, Technical Data	15
Engine Number – Location – 2.0L – CCTA	15
Engine Number – Location – 3.2L – CBRA	16
Engine Data	16
Engine – Removing and Installing	18
Engine to Transmission – Tightening Torques – CBRA	18
Manual Transmission to Engine	18
Direct Shift Automatic Transmission to Engine Mounting	19
Assembly Mountings – Tightening Torques	20
Crankshaft/Cylinder Block – 4-Cylinder – Turbo Engine – 2.0L – CCTA	21
Accessory Assembly Bracket Tightening Sequence	21
Assembly Attachments Mounting – Tightening Torques	22
Sealing Flange – Tightening Sequence	23
Flywheel/Drive Plate – Tightening Torques	23
Crankshaft Assembly – Tightening Sequence	24
Crankshaft Dimensions	25
Identification on Crankshaft Bearing, Top	25
Piston and Connecting Rod – Tightening Torques	25

Crankshaft/Cylinder Block – 4-Cylinder – Turbo Engine –	
2.0L – CCTA (continued)	26
Piston Ring End Gaps	26
Piston Ring Clearance	26
Piston and Cylinder Dimensions	26
Crankshaft/Cylinder Block – 6-Cylinder – 3.2L – CBRA	27
Accessory Assembly Bracket Tightening Sequence	27
Sealing Flange Tightening Sequence	28
Assembly Attachments Mounting – Tightening Torques	28
Drive Chain – Tightening Torques	29
Brake Booster Vacuum Pump – Tightening Torques	29
Sealing Flanges and Vibration Damper – Tightening Torques	30
Crankshaft Assembly – Tightening Torques	30
Crankshaft Dimensions	30
Piston and Connecting Rod – Tightening Torques	30
Piston Ring End Gaps	30
Piston Ring Clearance	31
Piston and Cylinder Dimensions	31
Cylinder Head – 2.0L Engine – CCTA	31
Crankcase Ventilation – Tightening Sequence	31
Cylinder Head – Tightening Torques	32
Cylinder Head – Loosening Sequence	32
Cylinder Head – Tightening Sequence	33
Cylinder Head (Valve) Cover – Loosening Sequence	34
Cylinder Head (Valve) Cover – Tightening Sequence	35
Compression Pressures	35
Cylinder Head – 3.2L Engine – CBRA	36
Cylinder Head – Tightening Torques	36
Cylinder Head – Removal Sequence	36
Cylinder Head – Tightening Sequence	37
Cylinder Head Cover – Tightening Sequence	38
Compression Pressures	38
Valvetrain – 2.0L Engine – CCTA	38
Valvetrain – Tightening Torques	38
Valve Dimensions	39
Camshaft – Tightening Torques	39
Valvetrain – 3.2L Engine – CBRA	40
Valvetrain – Tightening Torques	40
Valve Dimensions	40
Camshaft – Tightening Sequence	41
Camshaft – Tightening Torques	41

Engine Lubrication – 2.0L – CCTA.....	42
Oil Pan Upper Section – Tightening Sequence	42
Oil Pan Lower Section – Tightening Sequence	43
Oil Separator – Tightening Torques	44
Lubrication System Components – Tightening Torques	44
Oil Filter Bracket – Tightening Torques.....	45
Engine Lubrication – 3.2L – CBRA.....	45
Lubrication System Components – Tightening Torques	45
Oil Filter Bracket – Tightening Torques.....	45
Engine Cooling – 2.0L – CCTA.....	45
Cooling System Components – Tightening Torques.....	45
After Run Coolant Pump V51 – Tightening Torques.....	46
Coolant Pump – Tightening Sequence	46
Coolant Pump – Tightening Torques	46
Recommended Coolant Mixture Ratios.....	46
Engine Cooling – 3.2L – CBRA.....	47
Cooling System Components (on Engine) – Tightening Torques	47
Cooling System Components (on Body) – Tightening Torques	47
Recommended Coolant Mixture Ratios.....	47
Fuel Storage and Supply – 2.0L – CCTA, 3.2L – CBRA.....	47
Fuel Pump – Tightening Torques.....	47
Fuel Tank – Tightening Torques.....	48
Accelerator Pedal Module – Tightening Torques	48
EVAP Canister System – Tightening Torques.....	48
Turbocharger – 2.0L – CCTA.....	49
Turbocharger – Tightening Sequence	49
Turbocharger – Tightening Torques.....	50
Charge Air Cooler – Tightening Torques.....	51
Noise Booster – Tightening Torques.....	51
Fuel Injection – 2.0L – CCTA.....	51
Fuel Injection System Data.....	51
Engine Cover/Air Filter – Tightening Torques	52
Intake Manifold – Tightening Torques.....	52
High Pressure Pump – Tightening Torques	52
Fuel Injection – 3.2L – CBRA.....	53
Fuel Injection System Data.....	53
Intake Manifold – Tightening Torques.....	53
Air Filter Assembly – Tightening Torques.....	53
Exhaust System – 2.0L – CCTA	54
Exhaust System – Tightening Torques	54

Exhaust System – 3.2L – CBRA.....	54
Exhaust System – Tightening Torques	54
Secondary Air Injection (AIR) System – Tightening Torques	55
Ignition System – 2.0L – CCTA, 3.2L – CBRA.....	55
Ignition – Tightening Torques.....	55
Spark Plug Data	55
Manual Transmission.....	56
General, Technical Data	56
02E Transmission Identification	56
02Q Manual Transmission Specifications.....	58
Clutch – 02Q.....	59
Pedal Cluster – Tightening Torques.....	59
Over-Center Spring – Tightening Torques	59
Hydraulic System – Tightening Torques	59
Slave Cylinder – Tightening Torques	59
Clutch (Sachs) – Tightening Torques.....	59
Clutch (LuK) – Tightening Torques	59
Cable Retainer Dimensions.....	60
Shift Cable Retainer – Tightening Torques	60
Manual Transmission – Installing – 02Q.....	61
02Q Selector Mechanism – Tightening Torques	61
02Q Transmission To Engine – Tightening Torques	61
02Q Transmission – Tightening Torques	61
02Q Transmission Pendulum Support.....	62
02Q Transmission Housing and Shift Mechanism – Tightening Torques.....	62
02Q Installation Position of Shafts and Selector Rods in Transmission.....	63
02Q Input Shaft, Output Shaft (Pinion Shaft), Differential and Shift Forks – Tightening Torques.....	63
02Q Transmission Housing and Clutch Housing – Tightening Torques.....	63
Automatic Transmission.....	64
General, Technical Data	64
02E Transmission Identification	64
02E Transmission Specifications.....	65
02E Direct Shift Automatic Transmission Capacities.....	68
02E Bevel Box Capacities	68
Automatic Transmission Controls – 02E.....	68
02E Selector Mechanism – Tightening Torques	68
02E Selector Shaft – Tightening Torques	68

02E Transmission Input Speed (RPM) Sensor G182 and Clutch Oil Temperature Sensor G509 – Tightening Torques	68
02E Direct Shift Gearbox (DSG) Mechatronic J743 – Tightening Torques	69
02E Direct Shift Gearbox (DSG) Mechatronic J743 – Tightening Sequence	69
02E Oil Pan – Tightening Torques	70
02E Drain Plug and Filter housing – Tightening Torques	70
Automatic Transmission Installing – 02E	71
02E Transmission To 2.0L TFSI Engine – Tightening Torques	71
02E Transmission To 3.2L MPI Engine – Tightening Torques	72
02E Oil Cooler – Tightening Torques	72
02E Oil Pump – Tightening Torques	72
02E Transmission Mount – Tightening Torques	73
Rear Final Drive	74
Identification	74
Identification Code Letters, Allocation, Gear Ratios and Capacities	77
Rear Final Drive – Tightening Torques	78
Suspension, Wheels, Brakes, Steering	79
Front Suspension	79
Front Axle – Curb Weight Data	79
Subframe – Tightening Torques	79
Control Arm – Tightening Torques	80
Stabilizer Bar – Tightening Torques	80
Pendulum Support – Tightening Torques	80
Suspension Strut – Tightening Torques	80
Drive Axle – Tightening Torques	81
Wheel Bearing Housing – Tightening Torques	81
Rear Suspension – Front Wheel Drive	82
Rear Axle – Curb Weight Data	82
Subframe – Tightening Torques	82
Left Rear Level Control System Sensor G76 – Tightening Torques	82
Wheel Bearing Housing – Tightening Torques	83
Trailing Link – Tightening Torques	83
Shock Absorbers – Tightening Torques	83
Stabilizer Bar – Tightening Torques	83

Rear Suspension – All Wheel Drive.....	84
Rear Axle – Curb Weight Data.....	84
Subframe – Tightening Torques.....	84
Left Rear Level Control System Sensor G76 – Tightening Torques	84
Wheel Bearing Housing – Tightening Torques	85
Trailing Link – Tightening Torques	85
Shock Absorbers – Tightening Torques	85
Stabilizer Bar – Tightening Torques.....	85
Drive Axle – Tightening Torques	86
Wheels, Tires, Wheel Alignment.....	86
Wheel Bolts – Tightening Torques	86
Tire Pressure Sensor – Tightening Torques	86
Wheel Alignment Data	87
Light Alloy Wheels with Metal Valve – Tightening Torques...	88
Brake System	88
Front Brakes – Technical Data.....	88
Rear Brakes Front Wheel Drive – Technical Data	89
Hydraulic Unit, Brake Booster/Brake Master Cylinder – ABS Mark 70 (ABS/ASR) and 60 (ABS/EDL/ASR/ESP) – Tightening Torques.....	90
ABS System Components on Front and Rear Axles – Tightening Torques.....	90
ESP Sensor Unit G419 – Tightening Torques.....	91
Front Wheel Brakes – Brake Caliper FN3/FNR-G – Tightening Torques.....	91
Rear Brakes (Disc Brakes) – Rear Brake CII/CII 38 – Tightening Torques.....	91
Parking Brake Lever – Tightening Torques.....	91
Hydraulic Components – Front Brake Caliper FN3/FNR-G – Tightening Torques.....	92
Hydraulic Components – Rear Brake Caliper CII/CII 38 – Tightening Torques.....	92
Hydraulic Unit, Brake Booster/Brake Master Cylinder – Tightening Torques.....	92
Steering	92
Steering – Technical Data.....	92
Steering Column – Tightening Torques	93
Steering Gear – Tightening Torques.....	93

Body.....	94
Body Dimensions.....	94
Front Dimensions	94
Center Dimensions	95
Rear Coupe Dimensions	96
Rear Roadster Dimensions	98
Body Exterior	98
Lock Carrier Service Position – Tightening Torques.....	98
Front Fender – Tightening Torques	98
Noise Insulation Panel – Tightening Torques	99
Underbody Trim – Tightening Torques.....	99
Front Hood – Tightening Torques	99
Rear Lid – Tightening Torques.....	99
Tank Flap Unit – Tightening Torques	99
Front and Rear Door – Tightening Torques	100
Sunroof – Tightening Torques.....	100
Front Bumper – Tightening Torques	100
Rear Bumper – Tightening Torques.....	100
Front and Rear Door Window – Tightening Torques	101
Front Wheel Housing Liner – Tightening Torques	101
Rear View Mirror – Tightening Torques	101
Radiator Grille – Tightening Torques	101
Strips and Trim – Tightening Torques	101
Body Interior	101
Storage Compartment – Tightening Torques.....	101
Passenger Protection – Tightening Torques.....	102
Interior Trim – Tightening Torques	102
Seat Frames – Tightening Torques.....	103
Heating and Air Conditioning.....	104
Refrigerant R134a – Capacity	104
Refrigerant (PAG) Oil Identification.....	104
Refrigerant (PAG) Oil Capacities	104
Refrigerant Oil Distribution	104
Refrigerant R134a Vapor Pressure Table.....	105
Heating and A/C Components – Tightening Torques.....	106
A/C System – Tightening Torques	106
A/C Refrigerant System – Tightening Torques	106
Electrical Equipment.....	107
Battery – Tightening Torques.....	107
Generator – Tightening Torques	107
Generator 2.0LTFSI – Tightening Torques.....	107
2.0L TFSI Generator Mounting Bracket Bolts – Tightening Sequence	107

Electrical Equipment (continued)	108
Generator 3.2L – Tightening Torques	108
Starter – Tightening Torques	108
Front Wiper Motor – Tightening Torques	108
Washer Reservoir – Tightening Torques.....	108
Rear Wiper/Washer – Tightening Torques.....	108
Headlamp Washer Spray Jets – Tightening Torques.....	108
Front and Rear Lamp – Tightening Torques	109
Horn – Tightening Torques	109
Instruments – Tightening Torques	109
Vehicle Level Sensors – Tightening Torques.....	109

GENERAL INFORMATION

Decimal and Metric Equivalents

Distance/Length

To calculate: mm x 0.03937 = in.

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

Tightening Torque

N·m -to- lb·ft (ft·lb)

To calculate: $N \cdot m \times 0.738 = lb \cdot ft$

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

N·m -to- lb·in (in·lb), kg·cm

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

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

N·cm -to- lb·in (in·lb), kg·cm

To calculate: $N \cdot cm \times 0.089 = lb \cdot in$ • $N \cdot cm \times 0.102 = kg \cdot cm$

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

kg·cm -to- lb·in (in.lb), N·cm

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

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

Warnings and Cautions

WARNINGS

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

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

- Friction materials (such as brake pads or shoes or clutch discs) contain asbestos fibers or other friction materials. Do not create dust by grinding, sanding, or cleaning with compressed air. Avoid breathing dust. Breathing any friction material dust can lead to serious diseases and may result in death.
- 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.
- 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.

Maintenance



TT and TTS 2009 FLUID CAPACITY CHART updated 27 Feb 2009



General Information

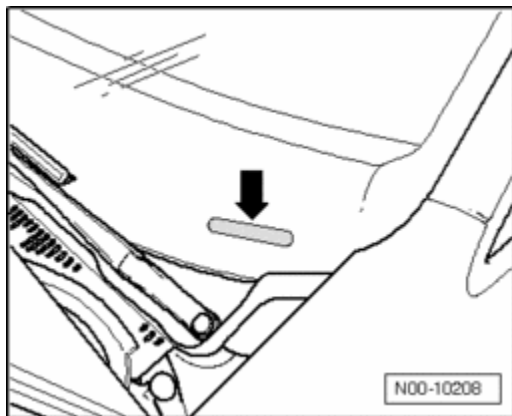
Vehicle (Sales Code)	Engine Oil <small>approx. qty. w/filter change</small>	Manual Trans	Auto Trans	Rear Final Drive	Cooling System	Power Steering	Brake System	A/C System	Windshield Fluid
TT - FWD (8J352X) Coupe (8J952X) Roadster	2.0 TFSI 200 hp (BPI) 4.5L (4.8 qt) <u>Audi Oil Spec:</u> VW 502 00 Use synthetic oil SAE 5W-40, SAE 5W-30 or SAE 0W-40	N/A	6-Spd DSG (02E) <u>New Fill:</u> 6.9L (7.3qt) <u>Change:</u> 5.5L (5.8qt) approx. <u>Oil PN</u> G 052 162 A2*	N/A	9.0L (9.5 qt)***	Electro- Mechanical (No Fluid)	1.0 L (1.1 qt) (approximately) <u>VW Brake Fluid Specification:</u> Use new fluid only. FMVSS 116 DOT 4 or SAE J 1703 <u>Fluid PN</u> B 000 750*	Capacity Information Not Available <u>Refrigerant</u> Use only R134a <u>Refrigerant Oil</u> Use a PAG oil with R134a	4.0 L (4.3 qt) <u>Fluid PN</u> G 052 164*
TT - quattro (8J359L) Coupe (8J959L) Roadster	2.0 TFSI 200 hp (CCTA) 4.5L (4.8 qt) <u>Audi Oil Spec:</u> VW 502 00 Use synthetic oil SAE 5W-40, SAE 5W-30 or SAE 0W-40		Oil PN G 052 162 A2*	08R 0.95L (1.0 qt) <u>Oil PN</u> G 052 145 S2*					
			Bevel Box <u>New Fill:</u> 0.9L (1.0 qt) <u>Oil PN</u> G 052 145 S2*	Hallex Clutch <u>New Fill:</u> 0.85L (0.9 qt) <u>Oil PN</u> G 060 175 A2*					
TTS - quattro (8J354L) Coupe (8J954L) Roadster	2.0 TFSI 265 hp (CDMA) 4.5L (4.8 qt) <u>VW Oil Spec:</u> VW 502 00 Use synthetic oil SAE 5W-40, SAE 5W-30 or SAE 0W-40			Replacement: 0.7L (0.8qt/24oz) <u>Oil PN</u> G 060 175 A2*	8.6L (9.1 qt)***				
<p>For proper fluid level and filling information, see the Repair Manual and/or Maintenance Manual in ElsaWeb. * Oil and fluid part numbers are for reference only. Always check with your Parts Department for the latest part information. ** Refer to Technical Bulletin 17-08-27 (2010043) for engine oils that meet this Audi oil standard. *** Audi Coolant Additive Specification and Part Number: (color is purple) G 12 plus-plus PN- G 012 A8G.</p>									

Page 1 of 2

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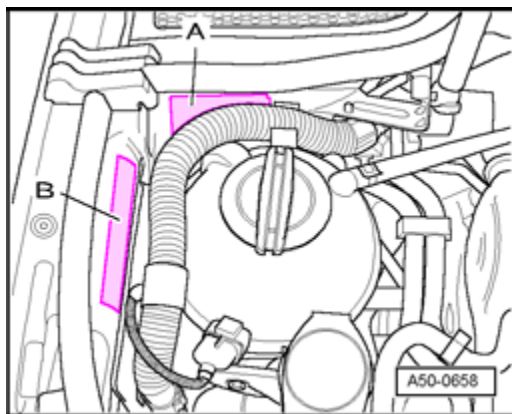
VEHICLE IDENTIFICATION

VIN on Lower Edge of Front Window



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

VIN on Suspension Strut Mount



The VIN - B - (chassis number) is stamped into the upper inner longitudinal member.

VIN Decoder

[illegible]

Vehicle Identification

2009 Restraint System:

- 6 = Side AirBags Front & Rear
- 7 = Side AirBags Front
- 8 = Side AirBags Front & Rear
- 9 = Side AirBags Front & Rear + Side Guard Air Curtain
- 9 (AB only) = Side AirBags Front & Rear + Side Guard Air Curtain
- 9 (AB only) = Side AirBags Front & Rear + Side Guard Air Curtain

2009 Audi VIN Decoder

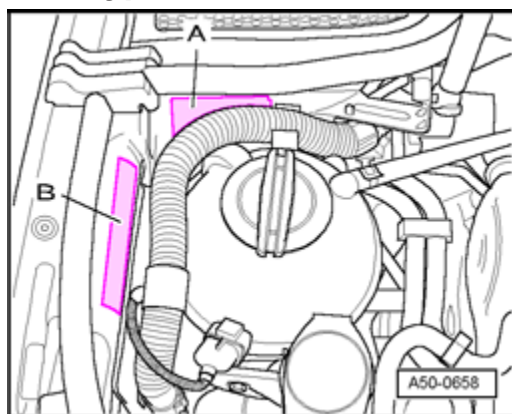
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Mfg. Make (1-3)			Series	Engine	Restraint system	Model (7&8)		Check digit	Model year	Assembly plant	Sequential product number (position 12 - 17)					

Calculate per NHTSA Code

Sequential Product Number

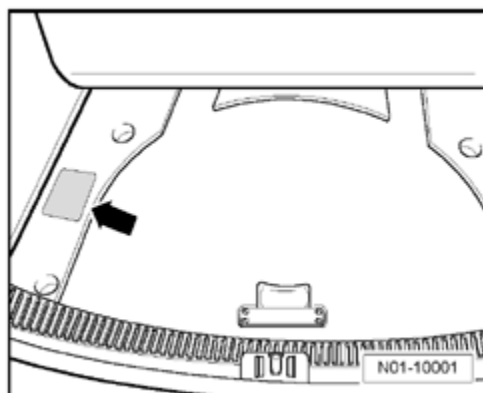
J = 1988
K = 1989
L = 1990
M = 1991
N = 1992
P = 1993
R = 1994
S = 1995
T = 1996
V = 1997
W = 1998
X = 1999
Y = 2000
1 = 2001
2 = 2002
3 = 2003
4 = 2004
5 = 2005
6 = 2006
7 = 2007
8 = 2008
9 = 2009

Type Plate – Location



The type plate - A - is fastened behind the right strut tower on the plenum chamber.

Vehicle Data Sticker



The vehicle data sticker ➡ is located in the left rear of the vehicle in the spare wheel well under the foam storage tray. The vehicle data sticker can also be found in the service schedule for the customer.

SALES CODES

Engine Codes

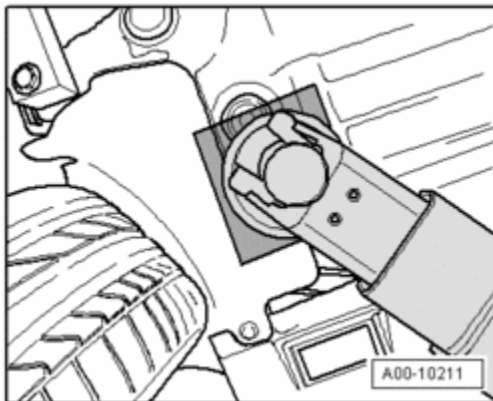
CCTA	2.0L 4-cylinder 4V turbo
CBRA	3.2L 6-cylinder 4V

Transmission Codes

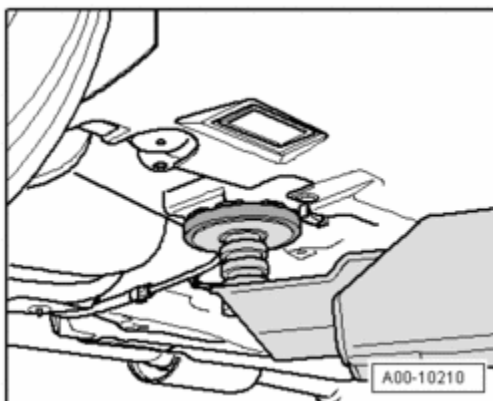
02Q	6-speed manual
02E	6-speed direct shift automatic

VEHICLE LIFTING

Lifting Points for Lifting Platform and Trolley Jack



Front: On the floor longitudinal reinforcement, in the area of the marking.



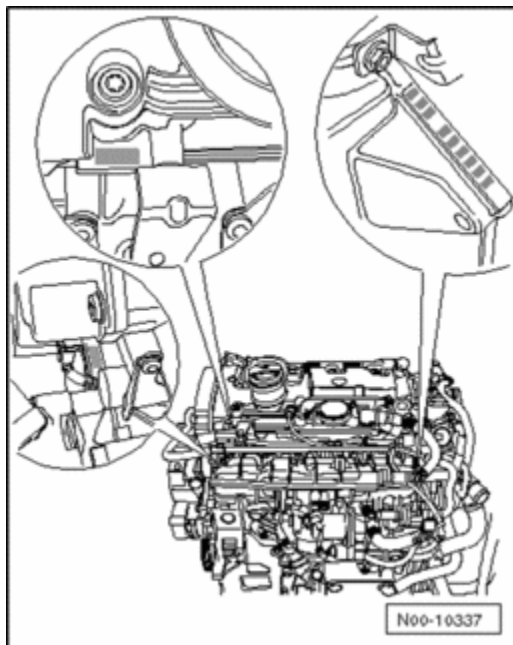
Rear: On aluminum case part in front of rear axle mounting point.

Note: The support plate must not touch the trailing arm mounting tab, the wheel guide could be damaged.

ENGINE MECHANICAL, FUEL INJECTION & IGNITION

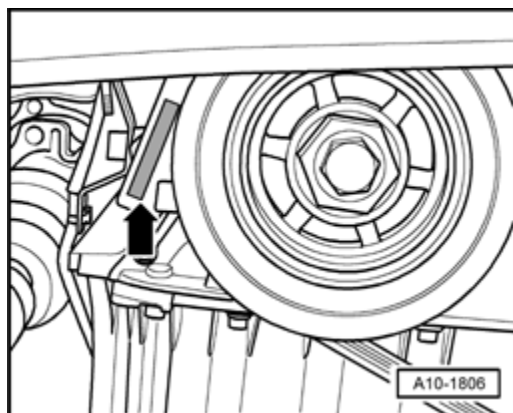
General, Technical Data

Engine Number – Location – 2.0L – CCTA



The engine number (engine code and serial number) is located at the left on the engine/transmission partition. The engine code is also stamped on the right side of the cylinder head and on the cylinder block. In addition, a sticker with the engine code and serial number is affixed to the timing belt cover. The engine code is also on the vehicle data plate.

Engine Number – Location – 3.2L – CBRA



The engine number (engine code and serial number) is located at the front near the crankshaft ribbed belt pulley ➡. In addition, a sticker with the engine code and serial number is affixed to the cylinder head cover. The engine code is also located on the the vehicle data plate.

Engine Data

Code letters		BUB	CBRA
Displacement	liter	3.189	3.189
Output	kW at RPM	184/6300	184/6300
Torque	Nm at RPM	320/2500 to 3000	320/2500 to 3000
Bore	dia. mm	84	84
Stroke	mm	95.9	95.9
Compression ratio		10.85	10.85
RON	at least	98 ¹⁾	98 ¹⁾
Fuel injection and ignition system		Motronic	Motronic
Ignition sequence		1-5-3-6-2-4	1-5-3-6-2-4
Emissions values		EU4	LEV2
Exhaust gas recirculation		No	No
Turbocharger, G-Charger		No	No
Oxygen sensor regulation		4 sensors	4 sensors
Variable valve timing		Yes	Yes
Variable intake manifold		Yes	Yes
Secondary Air Injection (AIR)		Yes	Yes
Valve per cylinder		4	4

¹⁾ Super unleaded RON 95 is permissible, although with reduced power.

Code letters		CCTA	CCZA
Displacement	liter	1.984	1.984
Output	kW at RPM	147/5100	147/5100
Torque	Nm at RPM	280/1700	280/1700
Bore	dia. mm	82.5	82.5
Stroke	mm	92.8	92.8
Compression ratio		9.6	9.6
RON		98 ¹⁾	98 ¹⁾
Fuel injection and ignition system		FSI	FSI
Ignition sequence		1-3-4-2	1-3-4-2
Knock control		Yes	Yes
Turbocharger		Yes	Yes
Exhaust gas recirculation		No	No
Variable intake manifold		No	No
Variable valve timing		Yes	Yes
Secondary Air Injection (AIR)		No	No

¹⁾ Unleaded RON 95 is also permissible, although with reduced power.

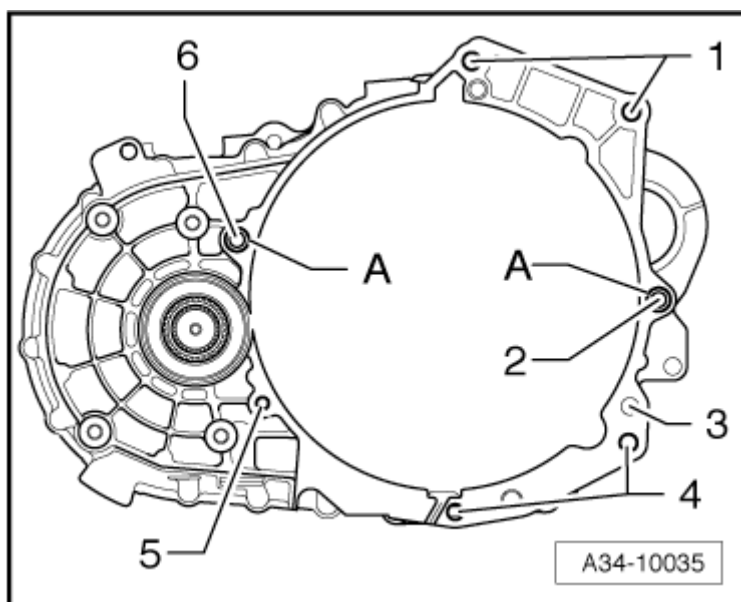
Engines		Gasoline engines	
Engine Code		BWA	BUB
Displacement	liter	2.0	3.2
Number of cylinders/valves per cylinder		4/4	6/4
Emissions category		EU IV	EU IV
Output	kW at RPM	147/5100 - 6000	184/6333
Torque	Nm at RPM	280/1800 - 5000	320/2500
Bore	mm	82.5	84.0
Stroke	mm	92.8	95.5
Compression ratio		10.5:1	10.85:1
Fuel injection/ignition		FSI	MPI
RON	min.	98 unleaded ¹⁾	98 unleaded ¹⁾

¹⁾ Unleaded RON 95 is also permissible, although with reduced power.

Engine – Removing and Installing

Engine to Transmission – Tightening Torques – CBRA

Components	Bolt Size	Nm
Bolts/nuts	M6	10
	M7	15
	M8	22
	M10	40
	M12	65
Exceptions: Ground (GND) wire		22

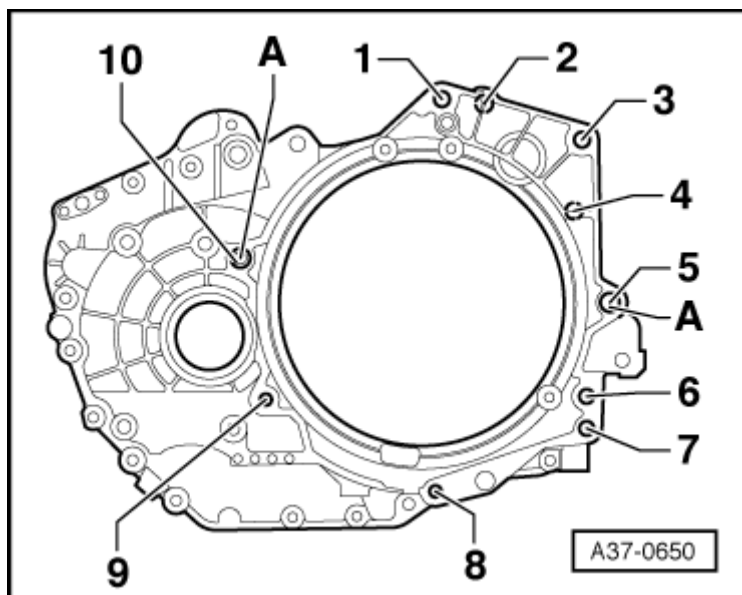


Manual Transmission to Engine

Item	Bolt	Nm
1 ¹⁾ , 3	M12 x 55	80
2 ²⁾	M12 x 65	80
4, 5 ²⁾	M10 x 50	40
6 ²⁾	M12 x 80	80
A	Alignment sleeves for centering	

¹⁾ Bolt with threaded pin M8.

²⁾ Install in transmission from engine side.



Direct Shift Automatic Transmission to Engine Mounting

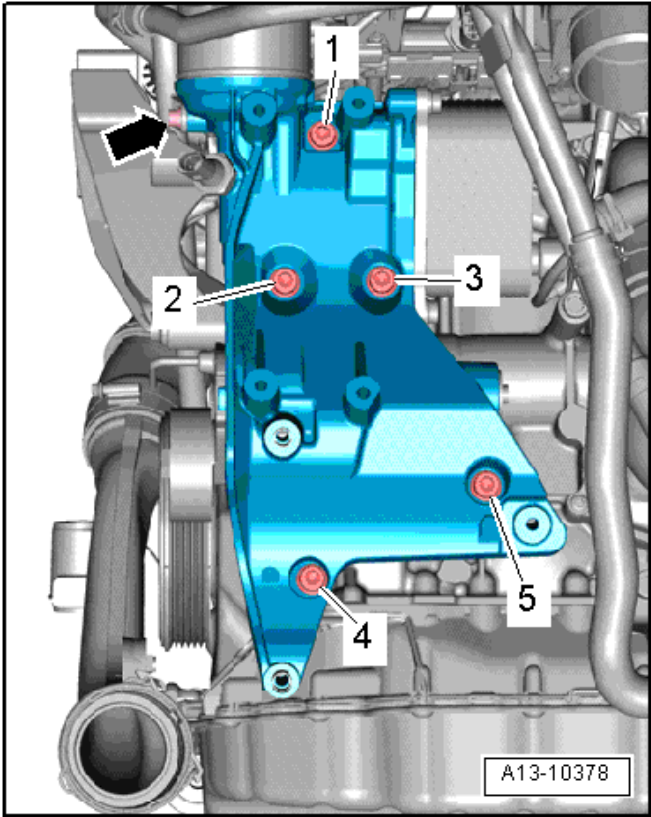
Item	Bolt	Nm
1, 3, 6	M12 x 55	80
2, 4	M10 x 45 (Starter Mount)	40
5, 10	M12 x 65	80
7, 8	M10 x 50	40
9	M10 x 45	40
A	Alignment sleeves for centering	

Assembly Mountings – Tightening Torques

Component	Nm
Mounting to body (always replace)	40 plus an additional 90° (¼ turn)
Mounting/bracket to body (always replace)	60 plus an additional 90° (¼ turn)
Support to mounting at body (always replace)	20 plus an additional 90° (¼ turn)
Transmission assembly mount to body (always replace)	60 plus an additional 90° (¼ turn)
Transmission assembly mounting/bracket to body (always replace)	40 plus an additional 90° (¼ turn)
Pendulum support mounting to body (always replace)	100 plus an additional 90° (¼ turn)
Pendulum support mounting/bracket to body (always replace)	40 plus an additional 90° (¼ turn)

**Crankshaft/Cylinder Block – 4-Cylinder –
Turbo Engine – 2.0L – CCTA**

**Accessory Assembly Bracket
Tightening Sequence**



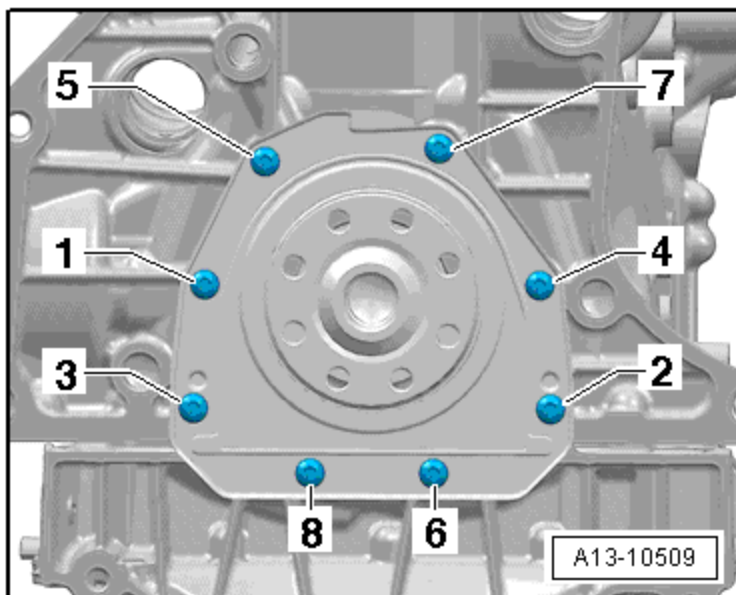
Tighten bolts in three stages as follows:

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

Assembly Attachments Mounting – Tightening Torques

Component	Nm
Generator to Engine bolt and nut	23
A/C compressor bolt	25
Pulley with divided tooth belt guard bolt	10 plus an additional 90° (¼ turn)
Divided tooth belt tensioner bolt	23
Upper toothed belt cover bolt	10
Camshaft gear to rear toothed belt cover bolt	50 plus an additional 180° (½ turn)
Rear toothed belt cover bolt	10
Semi-automatic tensioning roller to rear tooth belt cover bolt	25
Damper roller to rear toothed belt cover bolt	25
Coolant pump bolt	15
Damper roller to sealing flange bolt	35
Crankshaft toothed belt gear to sealing flange bolt	90 plus an additional 90° (¼ turn)
Engine mount bolt	45
Knock Sensor (KS) 1 G61 bolt	20
Knock Sensor (KS) 2 G66 bolt	20
Oil filter bracket to engine bolt	15 plus an additional 90° (¼ turn)
Engine speed (RPM) sensor G28 to intake manifold support to engine bolt	10
Coolant thermostat housing with coolant thermostat to engine bolt	15

Sealing Flange – Tightening Sequence

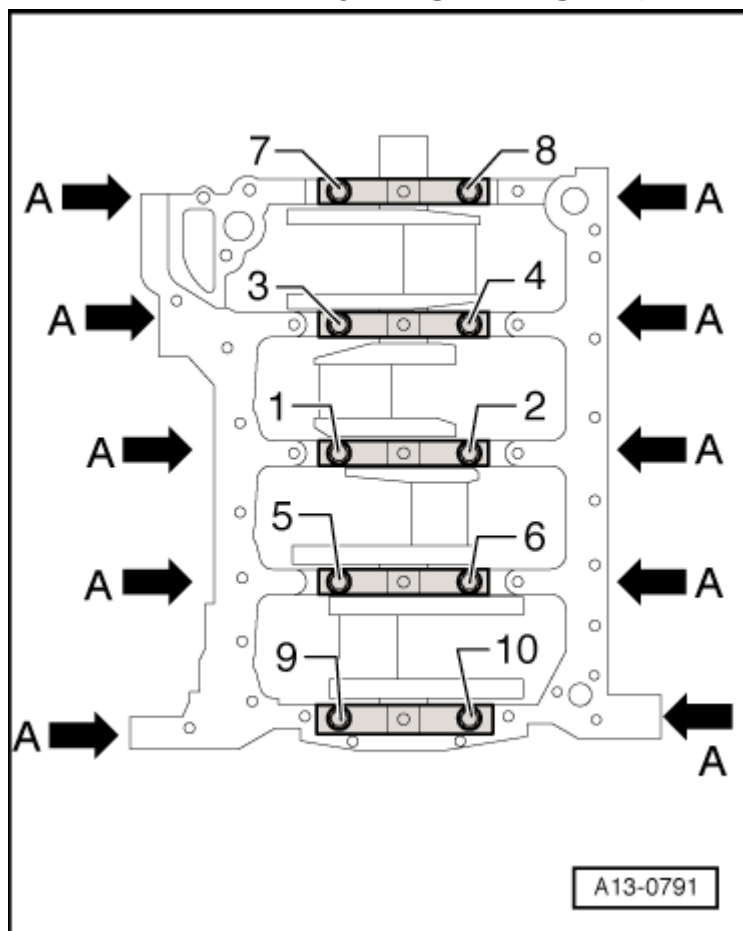


Step	Component	Nm
1	Tighten bolts 1 – 8 in sequence	Hand tighten
2	Tighten bolts 1 – 8 in sequence	9

Flywheel/Drive Plate – Tightening Torques

Component	Nm
Flywheel/drive plate to cylinder block bolt	60 plus an additional 90° (¼ turn)
Dual-mass flywheel to crankshaft	60 plus an additional 90° (¼ turn)
Sensor wheel to crankshaft bolts	10 plus an additional 90° (¼ turn)

Crankshaft Assembly – Tightening Sequence

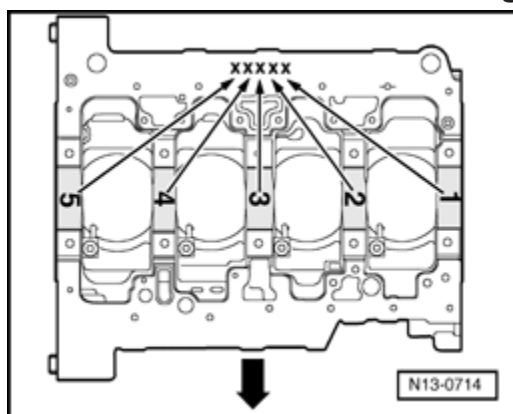


Step	Component	Nm
1	Tighten bolts 1 – 10 in sequence and ➡	Hand tighten
2	Tighten bolts 1 – 10 in sequence	65
3	Tighten bolts 1 – 10 in sequence	An additional 90° (¼ turn)
4	Tighten bolts ➡	20
5	Tighten bolts ➡	An additional 90° (¼ turn)

Crankshaft Dimensions

Honing dimension	Crankshaft bearing pins-diameter (mm)		Connecting rod bearing pins-diameter (mm)	
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

Identification on Crankshaft Bearing, Top



Arrow points in direction of travel.

The upper bearing shells are allocated to the cylinder block with the correct thickness from the factory. Colored spots serve to identify the bearing thicknesses. The letters marked on the lower sealing surface of the cylinder block identify which bearing thickness must be installed in which location. If color markings can no longer be read, use the blue bearing shell. The lower crankshaft bearing shells are always shipped as a replacement part with a yellow color marking.

Letter on crankshaft	Color of bearing
G	Yellow
B	Blue
W	White

Piston and Connecting Rod – Tightening Torques

Component	Nm
Connecting rod bearing cap to connecting rod bolts	45 plus an additional 90° (¼ turn)
Pressure relief valve to oil spray jet	27

Piston Ring End Gaps

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

Piston Ring Clearance

Piston ring		Ring to groove clearance	
		New	Wear limit
Compression rings	mm	0.04 to 0.08	0.15
Oil scraping ring	mm	0.02 to 0.06	0.15

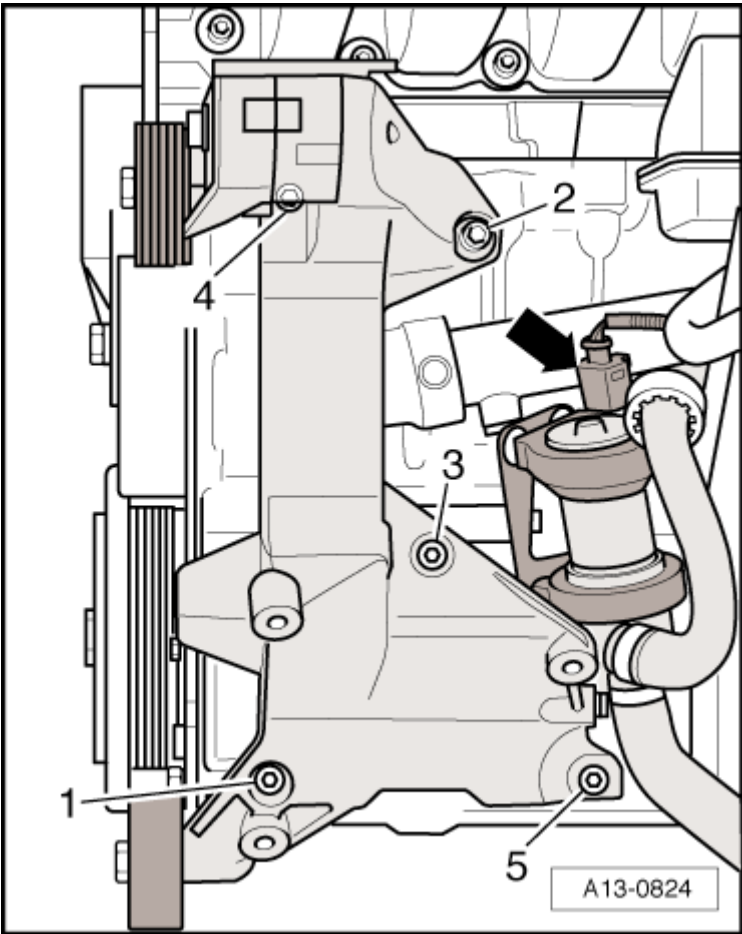
Piston and Cylinder Dimensions

Honing dimension		Piston diameter	Cylinder bore diameter
Basic dimension	mm	82.465 *	82.51

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

**Crankshaft/Cylinder Block – 6-Cylinder –
3.2L – CBRA**

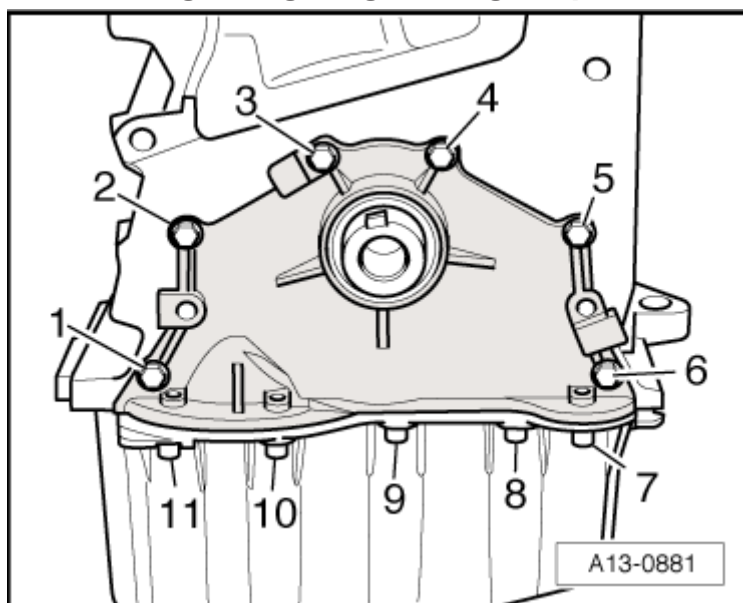
**Accessory Assembly Bracket
Tightening Sequence**



Tighten bolts in two stages as follows:

Step	Component	Nm
1	Tighten bolts 1 - 5 in sequence	Hand tighten
2	Tighten bolts 1 - 5 in sequence	23

Sealing Flange Tightening Sequence



Tighten bolts in three stages as follows:

Step	Component	Nm
1	Tighten bolts 1 - 11 in sequence	Hand tighten
2	Tighten bolts 1 - 6 diagonally in stages	10
3	Tighten bolts 7 - 11 in sequence	10

Assembly Attachments Mounting – Tightening Torques

Component	Nm
Assembly bracket bolts	23
Bracket with lower relay pulley for ribbed belt for A/C compressor to assembly bracket bolt	25
A/C compressor to assembly bracket bolts	25
Belt pulley/vibration damper bolt	100 plus an additional 180° (½ turn)
Generator to assembly bracket bolt	23
Tensioning device for ribbed belt bolt	50
Engine mount to assembly bracket bolts	40 plus an additional 90° (¼ turn)

Component	Nm
Vacuum pump for brake booster bracket to cylinder block bolt	10
Oil filter bracket with attachments to cylinder block bolt	23
Thermostat housing bolts	10
Intake manifold support bolts	25
Engine mount and thermostat housing assembly bracket to cylinder block bolt	25
Coolant pump to cylinder block bolts	8
Coolant pump ribbed pulley bolts	20
Idler roller bolts	40
Dual mass flywheel bolts	60 plus an additional 90° (¼ turn)
Cylinder block locking bolt	30
Knock Sensor (KS) 1 G61 to cylinder block bolt	20
Knock Sensor (KS) 2 G66 to cylinder block bolt	20
Trim strip to cylinder block bolt	10

Drive Chain – Tightening Torques

Component	Nm
Chain tensioner bolts	40
Chain sprocket for exhaust camshaft to engine bolt	60 plus an additional 90° (¼ turn)
Pin for tensioning track	10
Pin for guide rail	10
Mounting pin	18

Brake Booster Vacuum Pump – Tightening Torques

Component	Nm
Vacuum pump to control housing cover	10
Coolant pipe to bracket	10

Sealing Flanges and Vibration Damper – Tightening Torques

Component	Nm
Belt pulley/vibration damper to cylinder block bolt	70
Sealing flange on belt pulley side to cylinder block bolts	10
Vibration damper to crankshaft	100 plus an additional 90° (¼ turn)
Control housing cover bolts	25
Engine speed (RPM) sensor G28 to control housing cover bolts	5
Tensioning element to auxiliary component bracket	35
Sealing plug to cylinder block at rear	30

Crankshaft Assembly – Tightening Torques

Component	Nm
Bearing cap to cylinder block bolts	30 plus an additional 180° (½ turn)

Crankshaft Dimensions

Reconditioning dimension, dimensions in mm	Crankshaft bearing pin diameter	Connecting rod bearing pin diameter
Basic dimension ¹⁾	59.958 to 59.978	53.958 to 53.978

¹⁾ Reworking is not permitted.

Piston and Connecting Rod – Tightening Torques

Component	Nm
Connecting rod bearing cap to connecting rod bolts	30 plus an additional 90° (¼ turn)
Pressure relief valve to oil spray jet	27

Piston Ring End Gaps

Piston ring (dimensions in mm)	New	Wear limit
Compression ring	0.20 to 0.40	1.00
Tapered ring	0.20 to 0.40	1.00
Oil scraping ring	0.25 to 0.50	1.00

Piston Ring Clearance

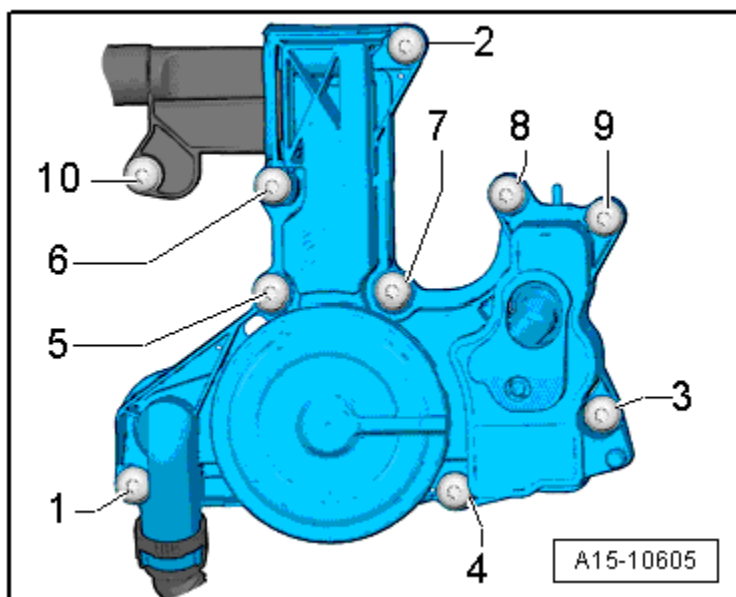
Piston ring (dimensions in mm)	New	Wear limit
Compression ring	0.04 to 0.09	0.15
Tapered ring	0.03 to 0.06	0.15
Oil scraping ring	0.02 to 0.06	0.15

Piston and Cylinder Dimensions

Reconditioning dimension, dimensions in mm	Piston diameter	Cylinder bore diameter
Basic dimension	83.965	84.010

Cylinder Head – 2.0L Engine – CCTA

Crankcase Ventilation – Tightening Sequence

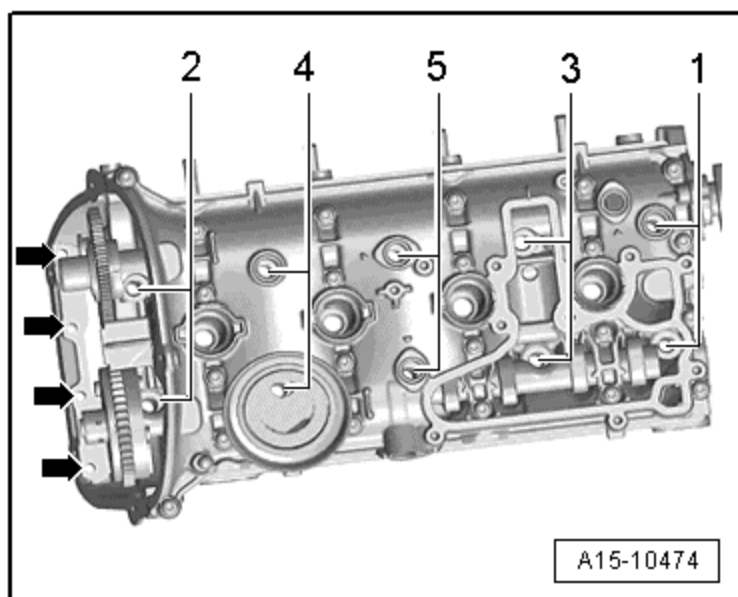


Step	Component	Nm
1	Tighten bolts 1 – 10 in sequence	11

Cylinder Head – Tightening Torques

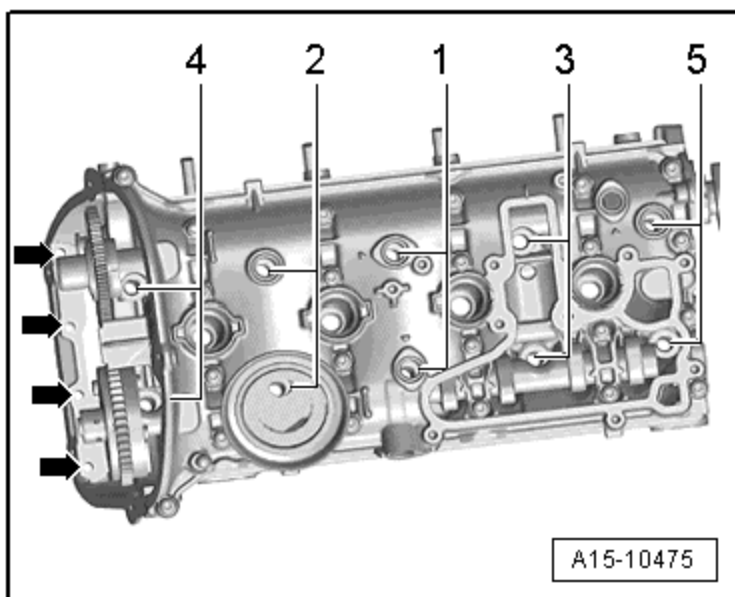
Component	Nm
Engine lifting eye bolt	25
Sealing plugs	5
Heat shield bracket bolts	9
Heat shield bolts	20
Mounting plate to connecting piece bolts	9
Valve housing to cylinder head cover bolt	4
Camshaft adjustment valve 1 N205 to housing bolt	4
Cable bracket to housing bolt	10
Housing to cylinder block bolt	10
Transport strap to cylinder block bolt	25
Stud bolt for intake manifold	10
Camshaft Position (CMP) sensor G40 to cylinder block bolt	10
Stud bolt for tensioning roller	10
Stud bolt for exhaust manifold	20

Cylinder Head – Loosening Sequence



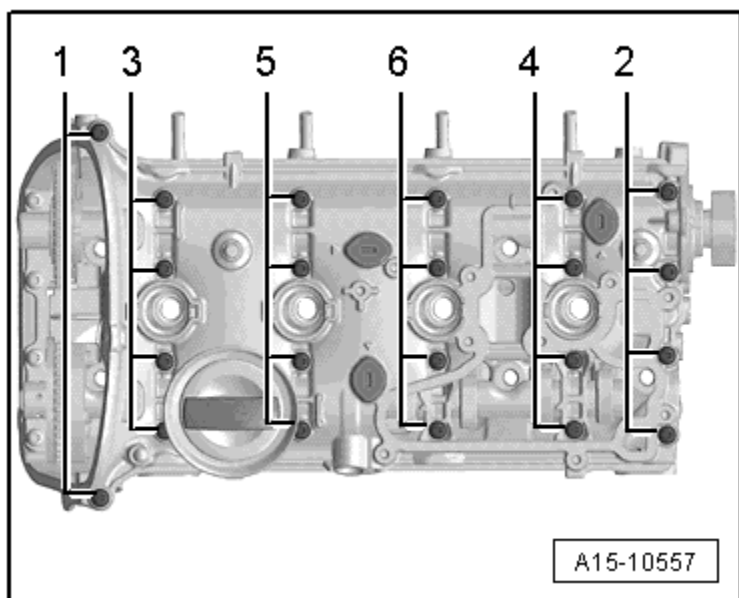
Step	Component
1	Remove bolts ➡
2	Loosen bolts 1 – 5 in sequence

Cylinder Head – Tightening Sequence



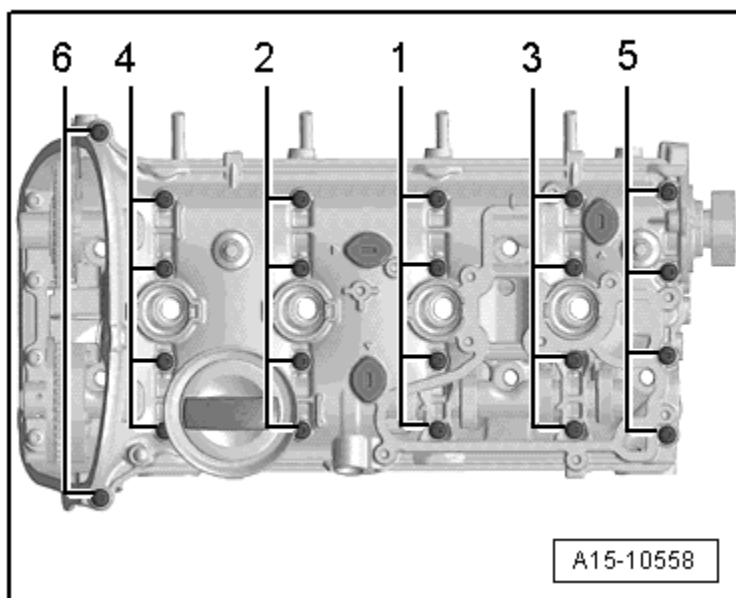
Step	Component	Nm
1	Tighten bolts 1 – 5 in sequence	40
2	Tighten bolts 1 – 5 in sequence	An additional 90° (¼ turn)
3	Tighten bolts 1 – 5 in sequence	An additional 90° (¼ turn)
4	Tighten bolts ➡	8
5	Tighten bolts ➡	An additional 90° (¼ turn)

Cylinder Head (Valve) Cover – Loosening Sequence



Loosen cylinder head cover bolts 1 to 6 in sequence.

Cylinder Head (Valve) Cover – Tightening Sequence



Step	Component	Nm
1	Replace bolts and tighten bolts 1 – 6 in sequence	Hand tighten in several stages
2	Tighten bolts 1 – 6 in sequence	8
3	Tighten bolts 1 – 6 in sequence	An additional 90° (¼ turn)

Compression Pressures

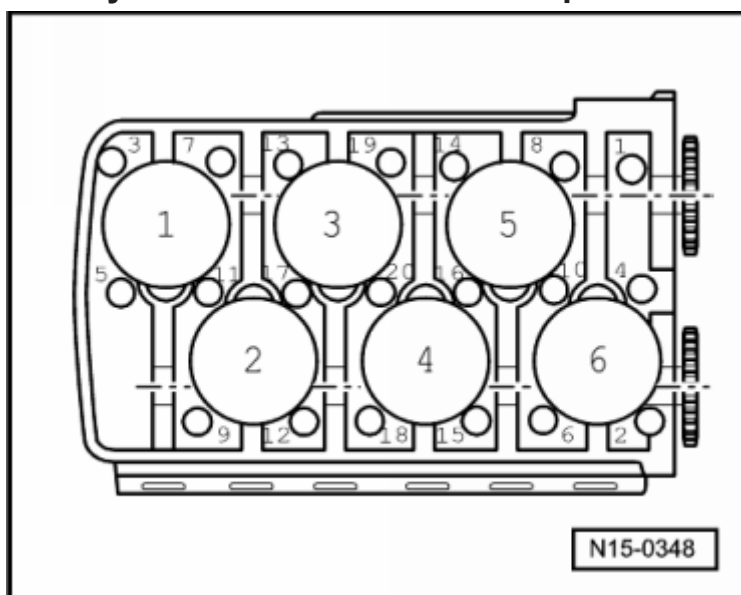
New bar positive pressure	Wear limit bar positive pressure	Difference between cylinders bar positive pressure
11.0 to 14.0	7.0	Max. 3.0

Cylinder Head – 3.2L Engine – CBRA

Cylinder Head – Tightening Torques

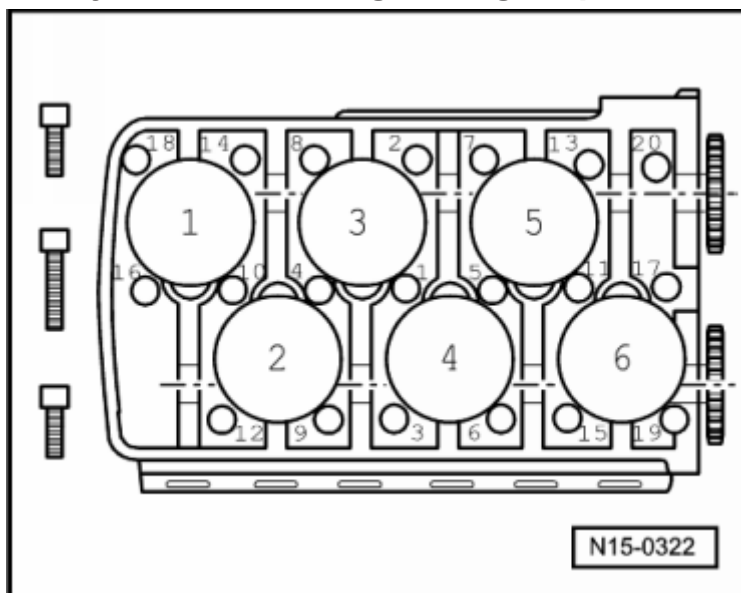
Component	Nm
Cylinder head cover bolt	10
Chain case cover to cylinder block bolts	10
Chain case cover to cylinder head	10
Coolant distribution housing to chain case cover	10
Chain tensioner for camshaft timing chain	40
Camshaft adjustment valve 1 N205 to cylinder block bolt	2
Camshaft Position (CMP) sensor G40 to cylinder block bolt	10
Lifting eye	23

Cylinder Head – Removal Sequence



Loosen cylinder head bolts 1-to-20 in sequence.

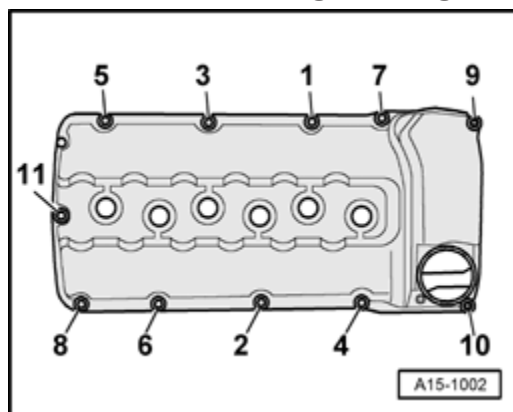
Cylinder Head – Tightening Sequence



Tighten bolts 1 to 20 in four stages as follows:

Step	Component	Nm
1	Tighten bolts 1 - 20 in sequence	Hand tighten
2	Tighten bolts 1 - 20 in sequence	30
3	Tighten bolts 1 - 20 in sequence	50
4	Tighten bolts 1 - 20 in sequence	Tighten an additional 180° (½ turn)

Cylinder Head Cover – Tightening Sequence



Component	Nm
Tighten bolts 1 - 11 in sequence	10

Compression Pressures

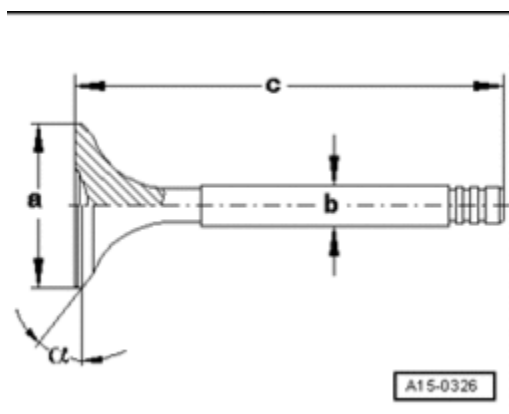
New bar positive pressure	Wear limit bar positive pressure	Difference between cylinders bar positive pressure
10.0 to 13.0	7.5	max. 3.0

Valvetrain – 2.0L Engine – CCTA

Valvetrain – Tightening Torques

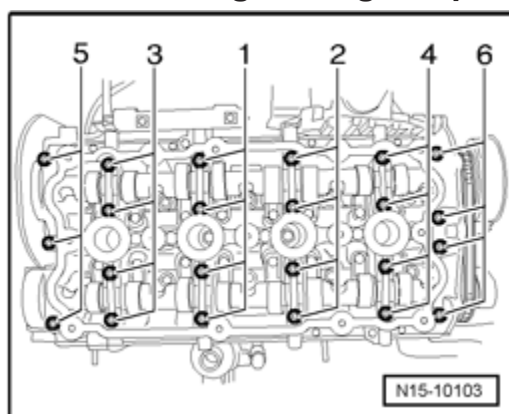
Component	Nm
Camshaft sprocket to cylinder head bolt	50 plus an additional 180° (½ turn)
Bearing bracket bolts	8 plus an additional 90° (¼ turn)
Camshaft adjuster to exhaust camshaft bolt	20 plus an additional 45° (⅛ turn)
Camshaft timing chain guide rail bolt	8 plus an additional 90° (¼ turn)
Guide pins	20
Control valve (left thread)	35
Camshaft chain tensioner bolts	9
Camshaft Position (CMP) sensor G40 to cylinder head bolt	9
Balance shaft chain tensioner bolt	65

Valve Dimensions



Dimension		Intake valve	Exhaust valve
Dia. a	mm	33.85 ± 0.10	28.0 ± 0.1
Dia. b	mm	5.98 ± 0.01	5.96 ± 0.01
c	mm	104.0 ± 0.2	101.9 ± 0.2
α	degrees	45	45

Camshaft – Tightening Torques



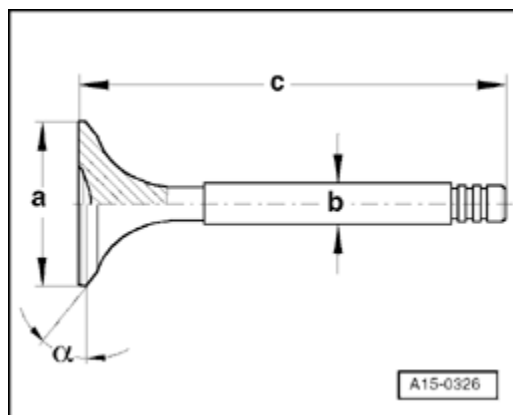
Component	Nm
Tighten bolts 1 - 6 in sequence	8 plus an additional 90° ($\frac{1}{4}$ turn)

Valvetrain – 3.2L Engine – CBRA

Valvetrain – Tightening Torques

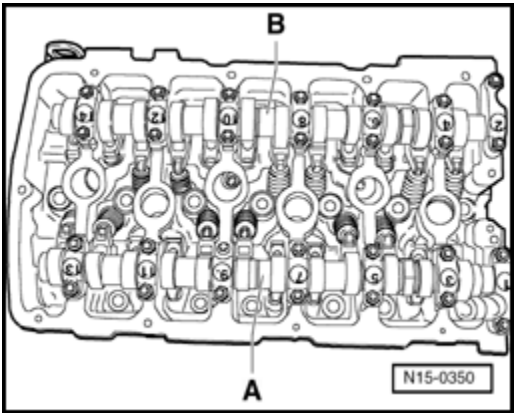
Component	Nm
Bearing bracket bolts	8 plus an additional 90° (¼ turn)
Chain sprocket for exhaust camshaft bolt	60 plus an additional 90° (¼ turn)
Camshaft adjuster for intake camshaft bolt	60 plus an additional 90° (¼ turn)

Valve Dimensions



Dimension		Short intake valve	Long intake valve	Short exhaust valve	Long exhaust valve
Dia. a	mm	31.00	31.00	27.00	27.00
Dia. b	mm	5.96	5.96	5.94	5.94
c	mm	102.20	136.10	102.50	136.40
α	degrees	45	45	45	45

Camshaft – Tightening Sequence

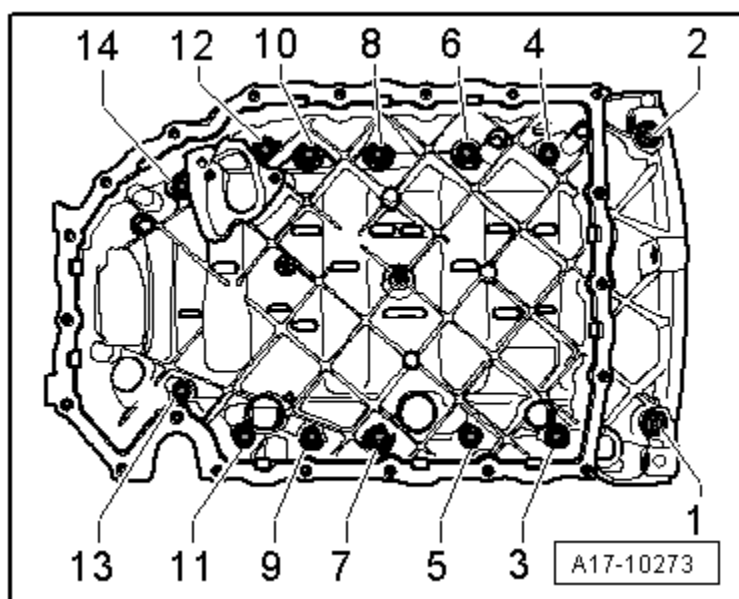


Camshaft – Tightening Torques

Component	Nm
Bearing cap to cylinder head	5 plus an additional 45°
Control housing to cylinder head	8

Engine Lubrication – 2.0L – CCTA

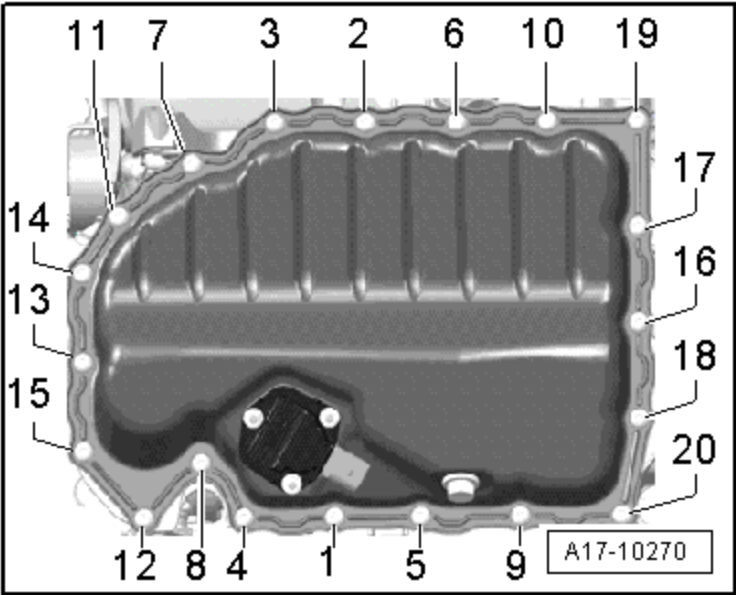
Oil Pan Upper Section – Tightening Sequence



Tighten bolts in three stages as follows:

Step	Component	Nm
1	Tighten bolts 1 - 14 in sequence	Hand tighten
2	Tighten bolts 1 - 14 in sequence	15
3	Tighten bolts 1 - 20 in sequence	Tighten an additional 90° (¼ turn)

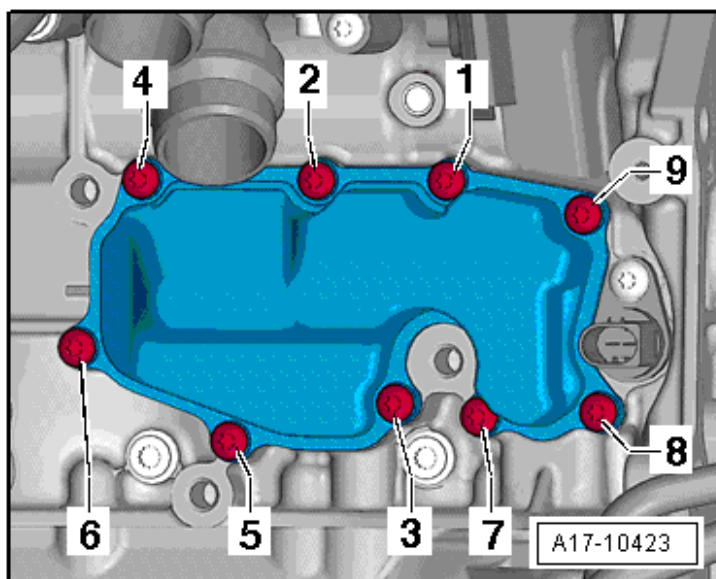
Oil Pan Lower Section – Tightening Sequence



Tighten bolts in three stages as follows:

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

Oil Separator – Tightening Torques



Component	Nm
Tighten bolts 1 - 9 in sequence	9

Lubrication System Components – Tightening Torques

Component	Nm
Sealing flange to engine bolt	15
Oil pump with balance shaft drive to cylinder block bolt	15 plus an additional 90° (¼ turn)
Oil pan bolt	15
Oil drain plug to oil pan bolt	15
Oil level thermal sensor G266 protective cap bolt	10
Chain sprocket to oil pump with balance shaft drive bolt	20 plus an additional 90° (¼ turn)
Oil pump with balance shaft drive cover to oil pump with balance shaft drive bolt	9
Oil pump with balance shaft drive cover bolt	40
Chain sprocket to oil pump cover to inner rotor to outer rotor to oil pump with balance shaft drive bolt	20 plus an additional 90° (¼ turn)
Chain tensioner with tensioning rail to oil pump with balance shaft drive bolt	15

Oil Filter Bracket – Tightening Torques

Component	Nm
Oil pressure switch F1 to oil filter bracket	20
Oil pressure switch F22 to oil filter bracket	20
Oil pressure switch F1 bolt	15
Reduced oil pressure switch F378	20
Oil cooler bracket to oil filter bracket bolts	15
Oil filter bracket bolts	15
Oil filter housing to oil filter element	25

Engine Lubrication – 3.2L – CBRA

Lubrication System Components – Tightening Torques

Component	Nm
Oil pump drive cover	8
Oil filter bracket with attachments to cylinder block bolt	23
Oil pump to cylinder block bolt	23
Intermediate shaft	10
Oil level thermal sensor G266	10
Oil pan to cylinder block	12
Oil drain plug	30
Oil pan to transmission	40

Oil Filter Bracket – Tightening Torques

Component	Nm
Oil filter bracket bolts	23
Oil pressure switch F1 to oil filter bracket	25
Oil filter housing to oil filter element	25
Oil cooler bracket to oil filter bracket bolts	25
Intake line to oil pump	10

Engine Cooling – 2.0L – CCTA

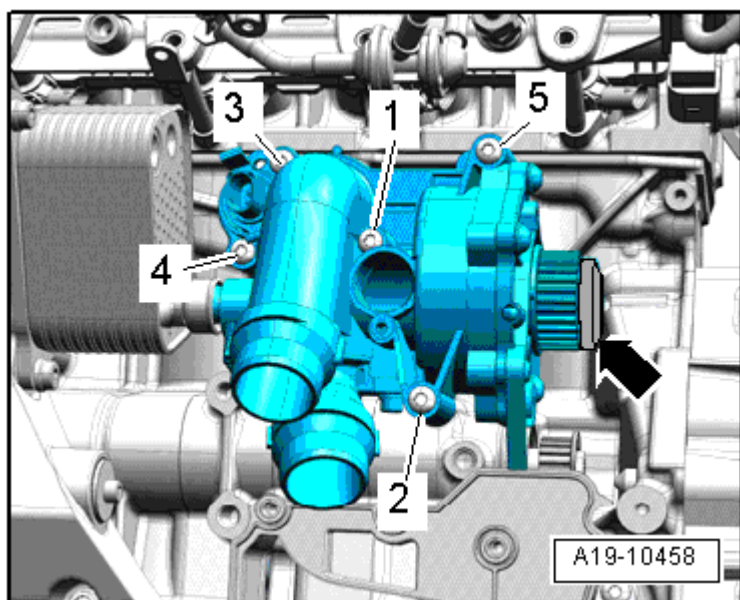
Cooling System Components – Tightening Torques

Component	Nm
Expansion tank bolt	5
Coolant fan to air shroud bolts	10
Air shroud to radiator bolts	5

After Run Coolant Pump V51 – Tightening Torques

Component	Nm
Coolant line upper nut	3
Coolant line lower nut	5
Coolant pump to bracket bolt	5

Coolant Pump – Tightening Sequence



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

Coolant Pump – Tightening Torques

Component	Nm
Drive gear to toothed belt bolts	10 plus an additional 90° (¼ turn)
Toothed belt cover bolts	9
Connecting piece bolts (thermostat)	9

Recommended Coolant Mixture Ratios

Frost protection to	Anti-freeze quantity	G 12	Water
-25°C	40%	3.2L	4.8L
-35°C	50%	4.0L	4.0L

Engine Cooling – 3.2L – CBRA

Cooling System Components (on Engine) – Tightening Torques

Component	Nm
Coolant pump bracket to accessory assembly bracket	10
Connecting pieces to coolant thermostat to coolant thermostat housing	10
Coolant thermostat housing to cylinder block bolt	10
Coolant pump to cylinder block	8
Coolant distribution housing to pipe connection nut	10
Automatic Transmission Fluid (ATF) cooler coolant line nut (only for vehicles with automatic transmission)	10

Cooling System Components (on Body) – Tightening Torques

Component	Nm
Expansion tank bolt	3
Radiator to bracket	5
Coolant fan to fan shroud	10
Fan shroud to radiator	5
Radiator support	10
Condenser to radiator	5

Recommended Coolant Mixture Ratios

Frost protection to	Anti-freeze quantity	G 12	Water
-25°C	40%	3.6L	5.4L
-35°C	50%	4.5L	4.5L

Fuel Storage and Supply – 2.0L – CCTA, 3.2L – CBRA

Fuel Pump – Tightening Torques

Component	Nm
Fuel tank bolt	26
Fuel delivery unit locking ring	110

Fuel Tank – Tightening Torques

Component	Nm
Securing strap to chassis nut	20
Heat shield for fuel tank	3
Flange with fuel filter locking ring	110
Fuel filter bracket bolt	3
Bolt cup for fuel filter	3

Accelerator Pedal Module – Tightening Torques

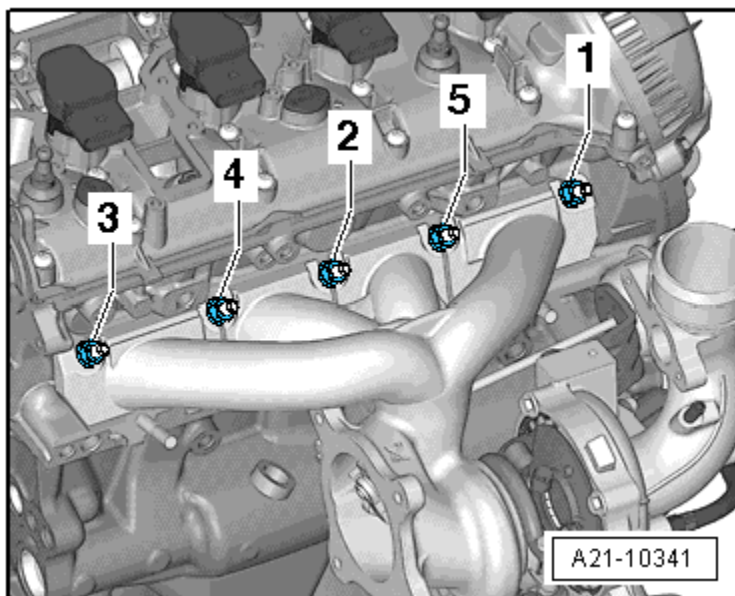
Component	Nm
Accelerator pedal module to body bolt	9

EVAP Canister System – Tightening Torques

Component	Nm
EVAP canister to body bolt	8
Air filter housing bolt	4
Leak Detection Pump (LDP) V144 bracket to LDP V144 bolt	4
Leak Detection Pump (LDP) V144 bracket to LDP V144 nut	6
Bracket for Leak Detection Pump (LDP) to wheel housing (CBRA)	8

Turbocharger – 2.0L – CCTA

Turbocharger – Tightening Sequence



Tighten bolts in four stages as follows:

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

Turbocharger – Tightening Torques

Component	Nm
Exhaust manifold stud bolt to turbocharger nuts	20 plus an additional 45° (1/8 turn)
Coolant return line to turbocharger bolt	35
Coolant return line bracket to turbocharger, upper bolt	23
Coolant return line bracket to turbocharger, lower bolt	9
Turbocharger bracket bolt	30
Turbocharger bracket to fastening strip bolt	30
Turbocharger bracket to fastening strip nut	30
Oil supply line to turbocharger nut	30
Fastening strip nut	30
Oil supply line to turbocharger bolt	20 plus an additional 45° (1/8 turn)
Coolant supply line to turbocharger bolts	20 plus an additional 45° (1/8 turn)
Coolant supply line bracket bolt	30
Coolant supply line bolt	9
Oil return line bolts	9
Oil return line to turbocharger bolts	9
Turbocharger vacuum diaphragm bolts	10
Turbocharger vacuum diaphragm nut	4
Heat shield bolts	20
Heat shield bracket bolts	9
Wastegate bypass regulator valve N75 bolts	3
Ring connection bolt	9
Connection to turbocharger bolt	7
Bracket to turbocharger bolt	7
Turbocharger recirculating valve N249 to turbocharger bolt	7
Turbocharger recirculating valve N249 to turbocharger nut	9
Bracket for turbocharger to cylinder block (use hot bolt paste Electronic Parts Catalog [ETKA])	30
Turbocharger bracket to turbocharger (use hot bolt paste Electronic Parts Catalog [ETKA])	30
Right charge air pipe to oil pan	10
Air guide pipe to bracket	10

Charge Air Cooler – Tightening Torques

Component	Nm
Air charge cooler mount	5
Right air guide pipe to oil pan	10
Air guide pipe to bracket	10
Charge air pipe to charge air hose bolt	10
Charge air pipe (with charge air pressure sensor G31) bolt	10
Charge air pressure sensor G31 to charge air pipe bolts	5

Noise Booster – Tightening Torques

Component	Nm
Plenum chamber bulkhead bolts	8
Spacer sleeves to noise booster to noise amplifier bracket bolts	8
Noise amplifier bracket bolts	8

Fuel Injection – 2.0L – CCTA

Fuel Injection System Data

Engine codes		BWA
Idle check		
Idle speed	RPM	620 to 800
Engine control module		
System designation		Motronic MED 9.1
Replacement part number		Electronic Parts Catalog (ETKA)
Engine speed (RPM) limitation	RPM	Approximately 6800
Fuel pressure		
Low pressure	bar	Approximately 6.0
High pressure	bar	Approximately 40 To 120

Engine Data		2.0L Turbo FSI engine
Idle speed cannot be adjusted, it is regulated by idle stabilization		640 to 800 RPM
Engine speed limitation via fuel injector shut-off		6500 RPM
Fuel pressure	Fuel supply pressure up to high-pressure pump (produced by an electric fuel pump in the fuel tank)	3.0 to 7.0 bar (the same under all operating conditions)
	Fuel high pressure (produced by a mechanical single-piston pump) at approximately 85 degree coolant temperature	Approximately 40 bar positive pressure at idle Approximately 150 bar positive pressure at certain operating points.

Engine Cover/Air Filter – Tightening Torques

Component	Nm
Mass Air Flow (MAF) sensor G70 to upper section of air filter/engine cover bolt	3
Air filter lower part bolts	3
Heat shield to air filter lower part bolts	3

Intake Manifold – Tightening Torques

Component	Nm
Retaining clip to intake manifold bolt	3
High pressure pump bolts	20
Connection for fuel supply line to fuel rail (replace)	22
High pressure fuel line	18
Intake manifold support bolt	23
Intake manifold support nut	10
Throttle valve control module J338 bolts	5
Fuel pressure sensor G247	27
Intake manifold bolts	9
Retaining clip stud bolt	10
Fuel supply line union nut	18
Throttle valve control module J338 bolts	7
Intake Air Temperature (IAT) sensor G42 to intake manifold bolt	5
Fuel supply line connectors (replace)	25
Fuel return line to high pressure pump (replace banjo fitting)	17

High Pressure Pump – Tightening Torques

Component	Nm
High pressure pump with fuel pressure regulator valve N276 bolts	20
Fuel pressure regulator valve N276 supply line	22
Fuel pressure regulator valve N276 return line	25
Low fuel pressure sensor G410 to high pressure pump with fuel pressure regulator valve N276	15

Fuel Injection – 3.2L – CBRA

Fuel Injection System Data

Engine data		3.2L/5V/184 kW Engine
Idle speed Cannot be adjusted, regulated by idle stabilization		600 to 700/min ¹⁾
Engine speed limitation via fuel injector shut-off		Approx. 6500 RPM
Fuel pressure at idle RPM		Approx. 4.0 bar positive pressure
Residual pressure after 10 min.		Min. 3.0 bar pressure
Fuel injector	Spray pattern	Two-hole injector/same on all valves
	Injection quantity (30 s)	128 to 140 ml

¹⁾ Current values → Data sheets for exhaust emission test.

Intake Manifold – Tightening Torques

Component	Nm
Intake manifold to cylinder head	13
Intake manifold support to intake manifold	20
Throttle valve control module J338 to intake manifold	10
Vacuum reservoir to intake manifold	5
Guide tube for oil dipstick to intake manifold	5
Mass Air Flow (MAF) sensor to upper section of air filter housing	1.5

Air Filter Assembly – Tightening Torques

Component	Nm
Mass Air Flow (MAF) sensor G70 with Intake Air Temperature (IAT) sensor G42 bolt	3
Upper air filter housing	5
Lower section of air filter bolts and retaining pins	10

Exhaust System – 2.0L – CCTA

Exhaust System – Tightening Torques

Component	Nm
Catalytic converter to exhaust manifold stub bolts nuts	40
Oxygen Sensor (O2S) behind Three Way Catalytic Converter (TWC) G130	55
Rear clamping sleeve nut	23
Bracket nut	
Center muffler suspended mount bolts	23
Front clamp sleeve nut	23
Oxygen sensor G39	55
Front exhaust pipe to turbocharger nuts	40
Tunnel brace bolts	23
Mount to subframe	25

Exhaust System – 3.2L – CBRA

Exhaust System – Tightening Torques

Component	Nm
Front exhaust pipe to exhaust manifold	40
Catalytic converter to front exhaust pipe	23
Oxygen sensor in front exhaust pipe	55
Exhaust system bracket to subframe	23
Exhaust manifold to cylinder head	23
Front exhaust pipe to exhaust manifold	40
Exhaust manifold heat shield to cylinder head	20
Oxygen sensor before catalytic converter in front exhaust pipe	55
Dome brace to body or bracket	20
Oxygen sensor behind catalytic converter in catalytic converter	55

Secondary Air Injection (AIR) System – Tightening Torques

Component	Nm
Secondary Air Injection (AIR) system combi-valve to bracket	9
Throttle valve control module J338 to intake manifold	9
Secondary Air Injection (AIR) pump to bracket	9
Secondary Air Injection (AIR) pump bracket M6	9
To cylinder block M8	20

Ignition System – 2.0L – CCTA, 3.2L – CBRA

Ignition – Tightening Torques

Component	Nm
Spark plug	30
Knock Sensor (KS) 1 G61 bolt	20
Knock Sensor (KS) 2 G66 bolt	20
Camshaft Position (CMP) sensor G40 bolt	10

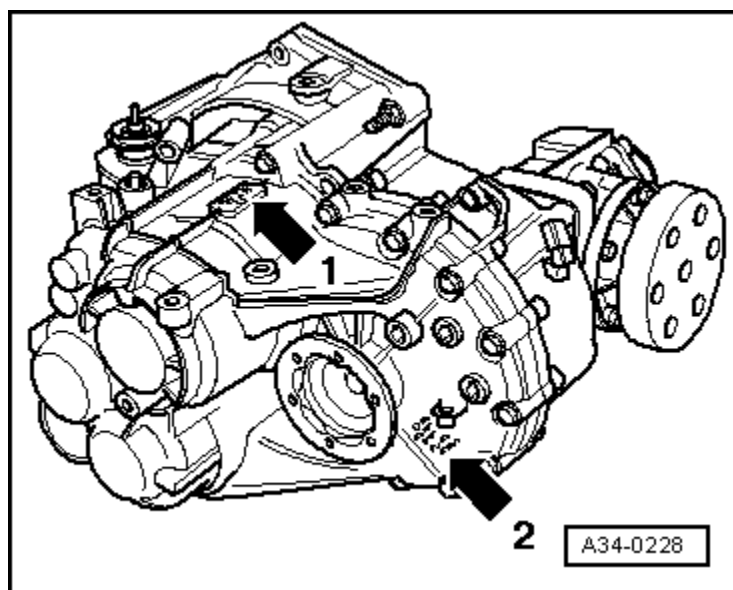
Spark Plug Data

Engine code	BWA
Electrode gap	0.7 to 0.8 mm
Tightening torque	30 Nm
Engine code	CBRA
Electrode gap	1.0 to 1.1 mm
Tightening torque	30 Nm

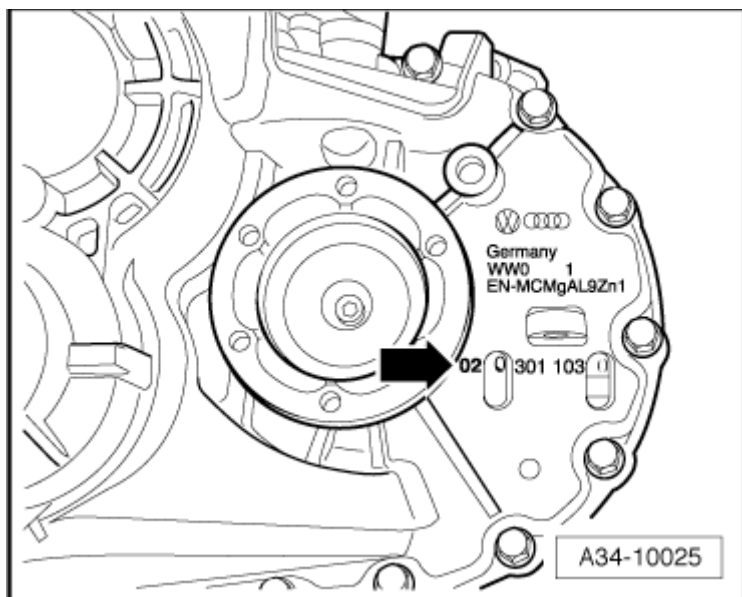
MANUAL TRANSMISSION

General, Technical Data

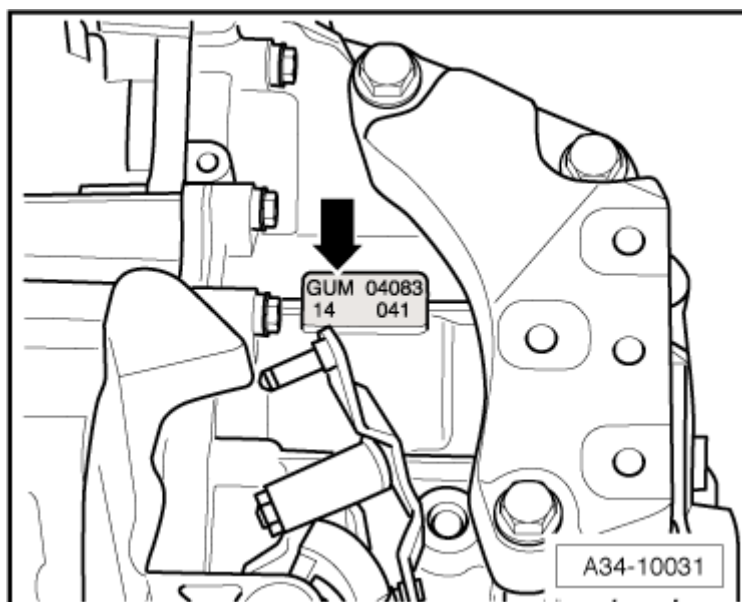
02Q Transmission Identification



Identification and date of construction 1 ➡.
Manual transmission 02Q All Wheel Drive 2 ➡.



Manual transmission 02Q All Wheel Drive 2 ➡.



Transmission code letters and date of manufacture ➡.

Example:	GUM	04	08	3
	Code letters	Day	Month	Year 2003 of production

02Q Manual Transmission Specifications

Manual transmission				
Code letters		JLV	JYV	KDP
Manufactured	from	04.06	11.06	06.07
	to	11.06		
Application	Model	Audi TT from 2007	Audi TT from 2007	Audi TT from 2007
	Engine	3.2 L - 184 kW	3.2 L - 184 kW	3.2 L - 184 kW
Gear ratios	Final drive I for 1st to 4th gear	72:17 = 4.235	72:17 = 4.235	72:17 = 4.235
Z2:Z1 = i	Final drive II for 5th/6th and reverse gears	72:22 = 3.273	72:22 = 3.273	72:22 = 3.273
	1st Gear	47:14 = 3.357	47:14 = 3.357	47:14 = 3.357
	2nd Gear	48:23 = 2.087	48:23 = 2.087	48:23 = 2.087
	3rd Gear	47:32 = 1.469	47:32 = 1.469	47:32 = 1.469
	4th Gear	37:34 = 1.088	37:34 = 1.088	37:34 = 1.088
	5th Gear	41:37 = 1.108	41:37 = 1.108	41:37 = 1.108
	6th Gear	31:34 = 0.912	31:34 = 0.912	31:34 = 0.912
	Reverse gear	34:23 x 14:14 = 3.990	34:23 x 14:14 = 3.990	34:23 x 14:14 = 3.990
itotal in top gear		2.985	2.985	2.985
Capacity in manual transmission		2.3 liters		
Capacity in bevel box		0.9 liters		
Clutch mechanism		Hydraulic		

The following information can be found in the Electronic Parts Catalog (ETKA):

- Gear oil specification
- Bevel box axle oil specification
- Drive shaft flanges allocation
- Clutch allocation
- Rear final drive allocation

Clutch – 02Q

Pedal Cluster – Tightening Torques

Component	Nm
Self-locking nut	25
Hex nut	25

Over-Center Spring – Tightening Torques

Component	Nm
Clutch pedal to mounting bracket (replace self-locking nut)	25

Hydraulic System – Tightening Torques

Component	Nm
Self-locking nut	25
Hydraulic system bolts	20

Slave Cylinder – Tightening Torques

Component	Nm
Metal slave cylinder to transmission (replace bolts)	12
Plastic slave cylinder to transmission (replace bolts)	15

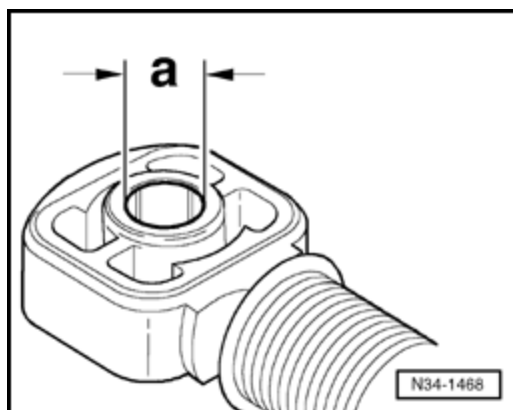
Clutch (Sachs) – Tightening Torques

Component	Nm
Bolt M7	20

Clutch (LuK) – Tightening Torques

Component	Nm
Bolt M6	13

Cable Retainer Dimensions



Allocation of cable retainers	Dimension "a" (mm)
Shift cable to transmission shift lever	10
Selector cable to relay lever	8

Shift Cable Retainer – Tightening Torques

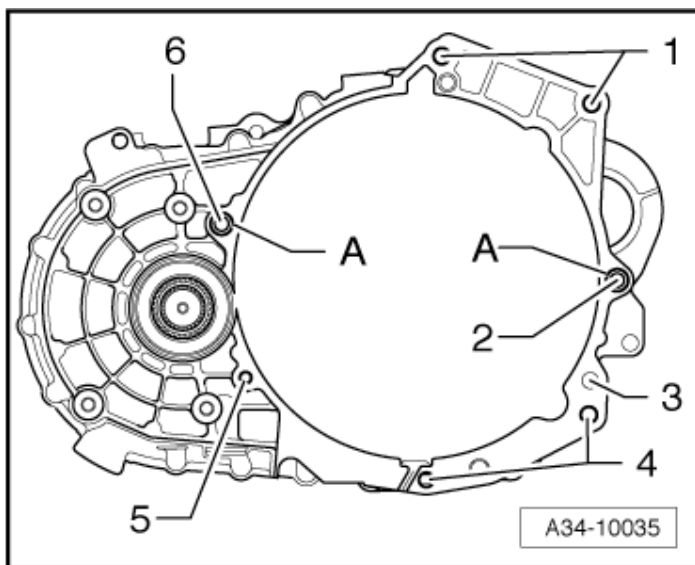
Component	Nm
Shift mechanism housing to body	8
Cable mounting bracket to transmission	20

Manual Transmission – Installing – 02Q

02Q Selector Mechanism – Tightening Torques

Component	Nm
Selector housing to body M8	25
Selector housing to body M6	8

02Q Transmission To Engine – Tightening Torques



Item	Bolt	Nm
1 ¹⁾ , 3	M12 x 55	80
2 ²⁾	M12 x 65	80
4, 5 ²⁾	M10 x 50	40
6 ²⁾	M12 x 80	80
A	Alignment sleeves for centering	

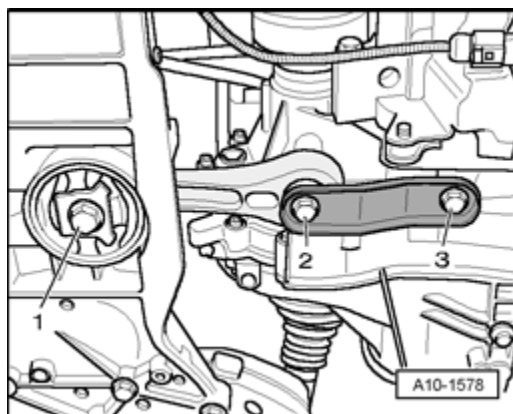
¹⁾ Bolt with threaded pin M8.

²⁾ Install in transmission from engine side.

02Q Transmission – Tightening Torques

Location/Fastener	Nm
Transmission plate to transmission	60 plus an additional 90° (¼ turn)
Transmission to left assembly mounting	60 plus an additional 90° (¼ turn)

O2Q Transmission Pendulum Support



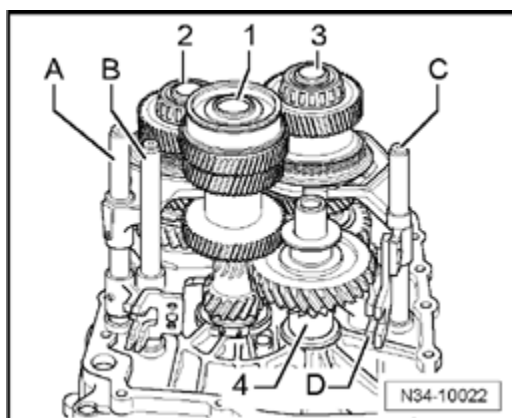
Item	Nm
Bolt - 1	100 plus an additional 90° (¼ turn)
Bolt - 2	40 plus an additional 90° (¼ turn)
Bolt - 3	40 plus an additional 90° (¼ turn)

Component	Nm
Small cover plate for flywheel	10
Right drive axle heat shield to cylinder block	25
Cable mounting bracket to transmission	20
Ground (GND) wire to upper starter bolt	23
Bracket for electrical wiring to lower starter bolt	23

O2Q Transmission Housing and Shift Mechanism – Tightening Torques

Component	Nm
Back up light switch F4	20
Selector shaft locking bolt	30
Clutch housing bolts (always replace)	15 plus an additional 90° (¼ turn)
Selector mechanism bolts (always replace)	20

02Q Installation Position of Shafts and Selector Rods in Transmission



Component
1 - Input shaft
2 - Output shaft 1st to 4th gears
3 - Output shaft for 5th/6th and reverse gear
4 - Reverse shaft
A - Selector rod for 3rd and 4th gear
B - Selector rod for 1st and 2nd gear
C - Selector rod for 5th and 6th gear
D - Reverse gear shift fork

02Q Input Shaft, Output Shaft (Pinion Shaft), Differential and Shift Forks – Tightening Torques

Component	Nm
Reverse gear shift fork Internal Torx® head bolt	25
Bearing mount nuts	25 plus an additional 90° (¼ turn)
Drive flange shaft with spring countersunk bolt	33
Shield for right drive axle	25

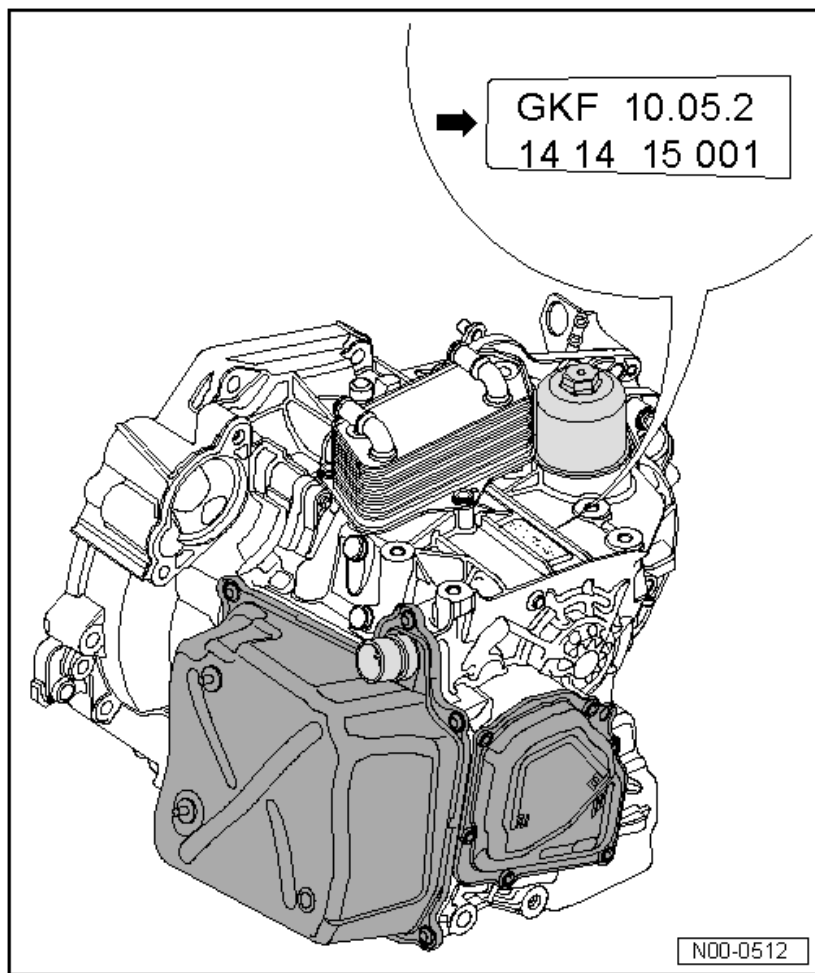
02Q Transmission Housing and Clutch Housing – Tightening Torques

Component	Nm
Self-locking socket head cap bolt (always replace)	20
Oil drain plug	30

AUTOMATIC TRANSMISSION

General, Technical Data

02E Transmission Identification



Example:

- GKF = Transmission code
- 10.05.2 = Production date May 10th, 2002.
- The rest of the numbers depend on manufacturing.

02E Transmission Specifications

Direct Shift Transmission			02E All Wheel Drive		
Transmission	Identification codes:		HXZ	JFP	JPZ
	Manufactured	from to	05.06	05.08	11.06
Allocation	Model		Audi TT from MY 2007	Audi TT from MY 2007	Audi TT from MY 2007
	Engine		3.2L - 184 kW 6-cylinder MPI	2.0L - 147 kW 4-cylinder TFSI	3.2L - 184 kW 6-cylinder MPI
Gear Ratios	Final drive I for 1st to 4th gear		72:15 = 4.800	69:17 = 4.059	72:15 = 4.800
Z2:Z1	Final drive II for 5th/6th gear and reverse gear		72:20 = 3.600	69:22 = 3.136	72:20 = 3.600
	1st gear		44:15 = 2.933	45:13 = 3.462	44:15 = 2.933
	2nd gear		44:24 = 1.833	43:20 = 2.150	44:24 = 1.833
	3rd gear		39:30 = 1.300	41:28 = 1.464	39:30 = 1.300
	4th gear		39:40 = 0.975	41:38 = 1.079	39:40 = 0.975
	5th gear		34:33 = 1.030	35:32 = 1.093	34:33 = 1.030
	6th gear		33:40 = 0.825	35:38 = 0.921	33:40 = 0.825
	Reverse gear		22:14 x 32:15 = 3.352	22:14 x 33:13 = 3.352	22:14 x 32:15 = 3.352
itotal in top gear			2.970	2.888	2.970
Allocation of rear final drive	Designation		Rear final drive 02D and 0AV		

Automatic Transmission

Direct Shift Transmission			02E All Wheel Drive		
Transmission	Identification codes:		JUQ	JYX	KDE
	Manufactured	from to	11.06	11.06	09.07
Allocation	Model		Audi TT from MY 2007	Audi TT from MY 2007	Audi TT from MY 2007
	Engine		3.2L - 184 kW 6-cylinder MPI	3.2L - 184 kW 6-cylinder MPI	3.2L - 184 kW 6-cylinder MPI
Gear Ratios	Final drive I for 1st to 4th gear		72:15 = 4.800	72:15 = 4.800	72:15 = 4.800
Z2:Z1	Final drive II for 5th/6th gear and reverse gear		72:20 = 3.600	72:20 = 3.600	72:20 = 3.600
	1st gear		44:15 = 2.933	44:15 = 2.933	44:15 = 2.933
	2nd gear		44:24 = 1.833	44:24 = 1.833	44:24 = 1.833
	3rd gear		39:30 = 1.300	39:30 = 1.300	39:30 = 1.300
	4th gear		39:40 = 0.975	39:40 = 0.975	39:40 = 0.975
	5th gear		34:33 = 1.030	34:33 = 1.030	34:33 = 1.030
	6th gear		33:40 = 0.825	33:40 = 0.825	33:40 = 0.825
	Reverse gear		22:14 x 32:15 = 3.352	22:14 x 32:15 = 3.352	22:14 x 32:15 = 3.352
itotal in top gear			2.970	2.970	2.970
Allocation of rear final drive	Designation		Rear final drive 02D and 0AV		

Direct Shift Transmission			02E All Wheel Drive			
Transmission	Identification codes:		KNL	KNN	KQA	KRF
	Manufactured	from to	11.07	05.08	05.08	01.08
Allocation	Model		Audi TT from MY 2007	Audi TT from MY 2007	Audi TT from MY 2007	Audi TT from MY 2007
	Engine		3.2L - 184 kW 6-cylinder MPI	2.0L - 195, 199 kW 4-cylinder TFSI	3.2L - 184 kW 6-cylinder MPI	2.0L - 195, 200 kW 4-cylinder TFSI
Gear Ratios	Final drive I for 1st to 4th gear		72:15 = 4.800	62:13 = 4.769	72:15 = 4.800	62:13 = 4.769
Z2:Z1	Final drive II for 5th/6th gear and reverse gear		72:20 = 3.600	62:18 = 3.444	72:20 = 3.600	62:18 = 3.444
	1st gear		44:15 = 2.933	38:13 = 2.923	44:15 = 2.933	38:13 = 2.923
	2nd gear		44:24 = 1.833	45:23 = 1.957	44:24 = 1.833	45:23 = 1.957
	3rd gear		39:30 = 1.300	35:25 = 1.400	39:30 = 1.300	35:25 = 1.400
	4th gear		39:40 = 0.975	32:31 = 1.032	39:40 = 0.975	32:31 = 1.032
	5th gear		34:33 = 1.030	28:26 = 1.077	34:33 = 1.030	28:26 = 1.077
	6th gear		33:40 = 0.825	27:31 = 0.871	33:40 = 0.825	27:31 = 0.871
	Reverse gear		22:14 x 32:15 = 3.352	22:14 x 27:13 = 3.264	22:14 x 32:15 = 3.352	22:14 x 27:13 = 3.264
itotal in top gear			2.970	3.000	2.970	3.000
Allocation of rear final drive	Designation		Rear final drive 02D and 0AV			

02E Direct Shift Automatic Transmission Capacities

Capacities	6-Speed Direct Shift Automatic Transmission 02E All Wheel Drive
Initial filling	6.9L
Change	Approximately 5.5L

02E Bevel Box Capacities

Capacities	Bevel Box
Initial filling	0.9L
Change	Filled for life, no change

Automatic Transmission Controls – 02E

02E Selector Mechanism – Tightening Torques

Component	Nm
Selector lever and selector mechanism bolt with spring	3.5
Mounting bracket bolts	20 plus an additional 90° (¼ turn)
Shift housing nuts	9
Selector lever and selector mechanism hex bolt with washer	8
Selector lever cable adjustment bolt (02E)	13

02E Selector Shaft – Tightening Torques

Component	Nm
Selector shaft lever to transmission	20

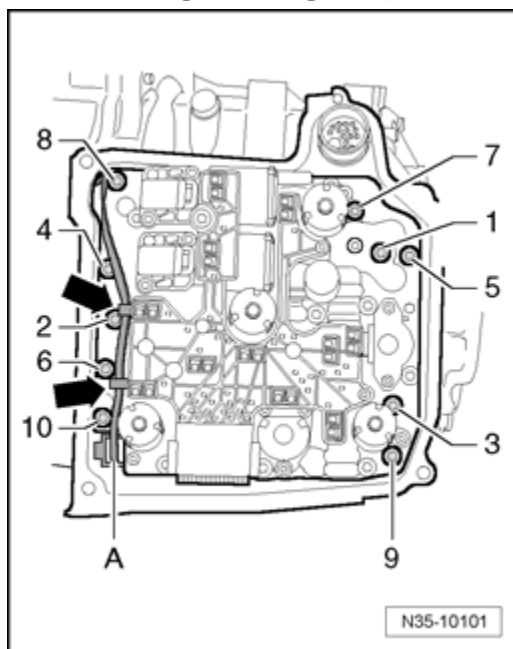
02E Transmission Input Speed (RPM) Sensor G182 and Clutch Oil Temperature Sensor G509 – Tightening Torques

Component	Nm
Sensor	10

02E Direct Shift Gearbox (DSG) Mechatronic J743 – Tightening Torques

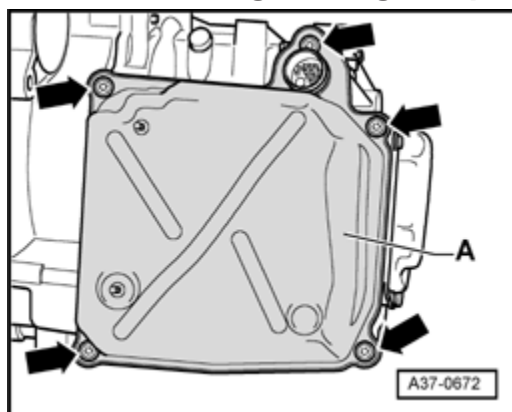
Component	Nm
Pendulum support overflow tube (8mm hex socket head)	3
Mechatronic cover bolts	10
Oil pump cover bolts (install bolts in a diagonal sequence)	8
Cable bracket on large cover nuts	10

02E Direct Shift Gearbox (DSG) Mechatronic J743 – Tightening Sequence



Component	Nm
Tighten bolts 1-10 in sequence	5 plus an additional 90° (¼ turn)
Transmission fluid pump cover to transmission (replace bolts)	8

02E Oil Pan – Tightening Torques



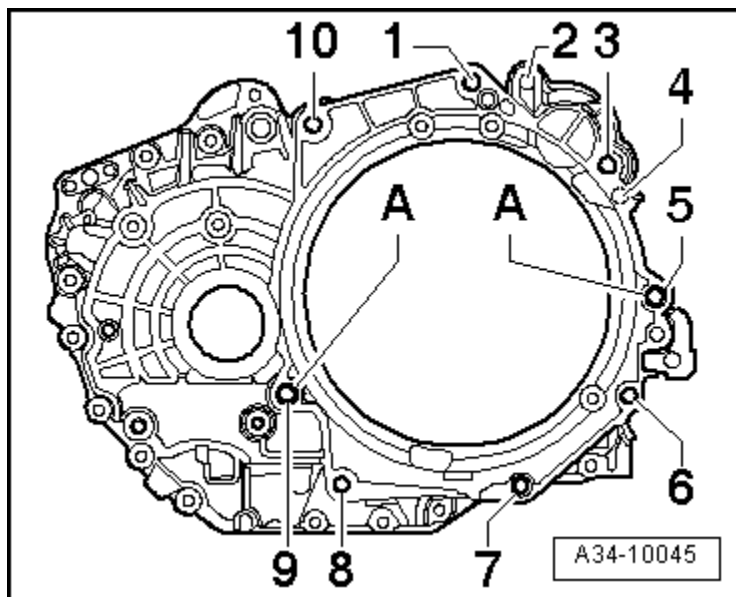
Component	Nm
Tighten the bolts ➡ diagonally in steps	16

02E Drain Plug and Filter housing – Tightening Torques

Component	Nm
Oil drain plug, M24	45
Oil filter housing	20

Automatic Transmission Installing – 02E

02E Transmission To 2.0L TFSI Engine – Tightening Torques

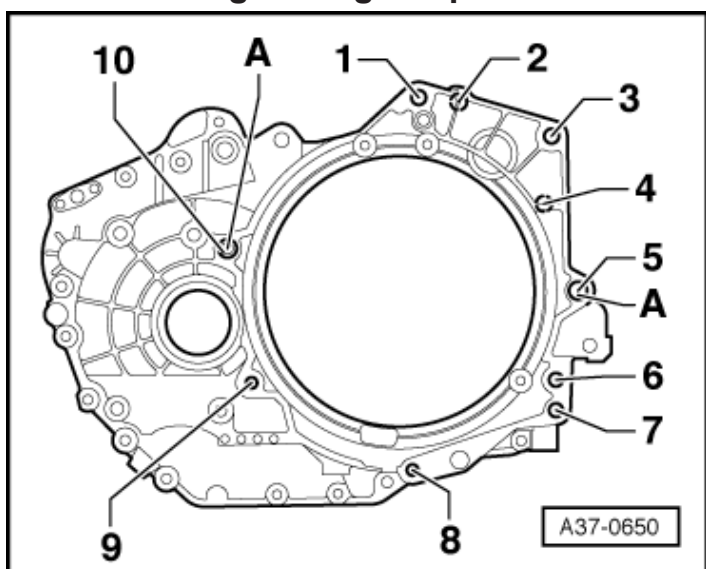


Automatic
Transmission

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

¹⁾ The bolt, item 3, is accessible only through the opening from the removed starter

02E Transmission To 3.2L MPI Engine – Tightening Torques



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

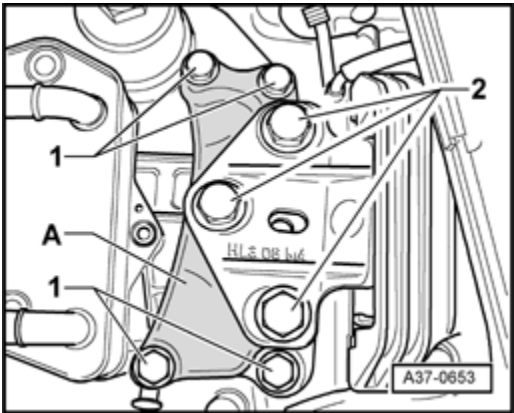
02E Oil Cooler – Tightening Torques

Component	Nm
Oil cooler bolts (replace bolts)	20 plus an additional 45° (½ turn)

02E Oil Pump – Tightening Torques

Step	Component	Nm
1	Oil pump bolts (all four)	5 plus an additional 90° (¼ turn)
2	Oil pump countersunk bolt	8
3	Oil pump (remaining 3 bolts)	8 plus an additional 90° (¼ turn)
4	Oil pump cover (tighten diagonally)	8

02E Transmission Mount – Tightening Torques

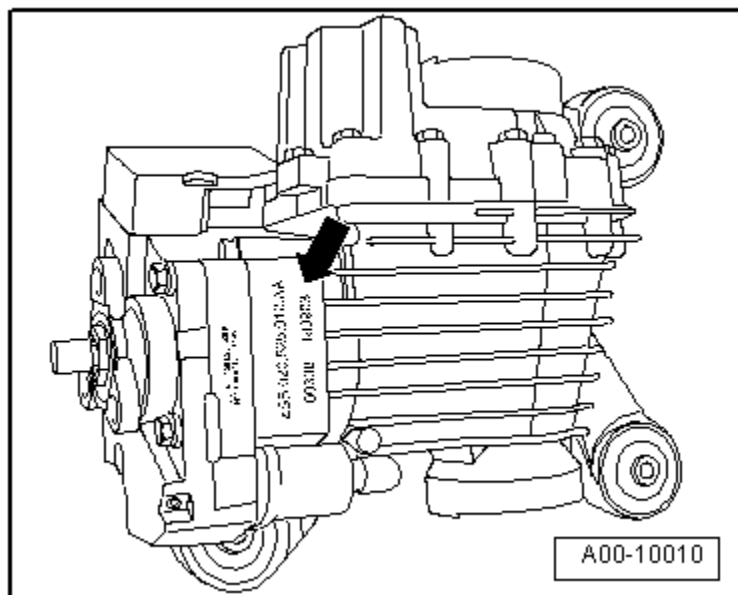


Automatic
Transmission

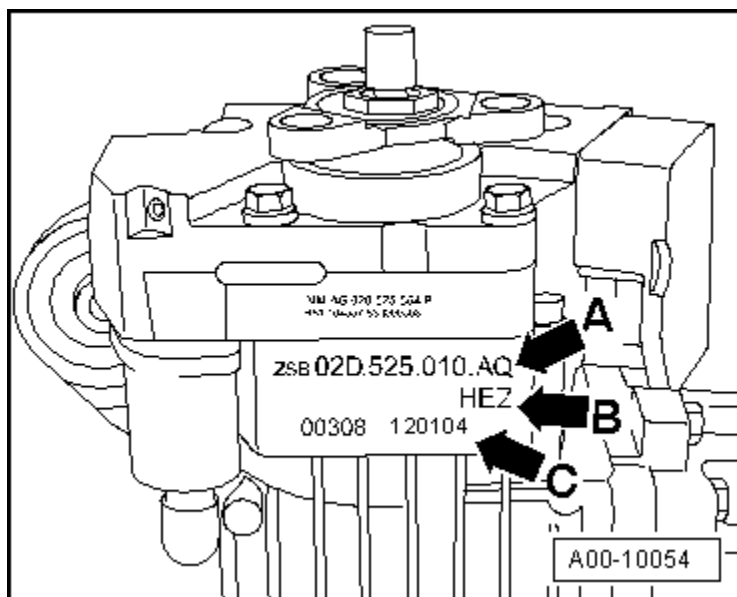
Component	Nm
Transmission mount to body (replace bolts)	40 plus an additional 90° (¼ turn)
Transmission mount to transmission support (replace bolts)	60 plus an additional 90° (¼ turn)

REAR FINAL DRIVE

Identification



Part number, transmission code and rear final drive production date ➡.



Rear final drive 02D

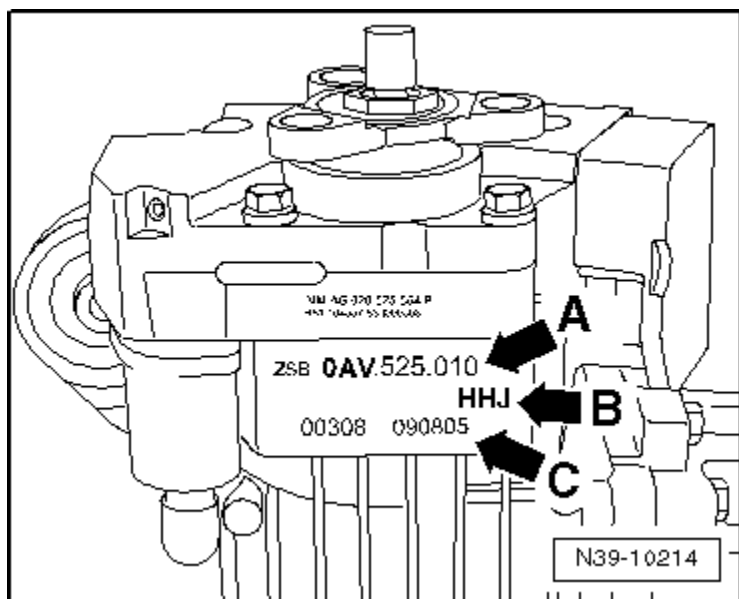
A ➡ Rear final drive part number

B ➡ Rear final drive code letters

C ➡ Rear final drive production date

Example:

02D.525.010.AQ	HEZ	12	01	04
Part number	Code letters	Day	Month	Production year (2004)



Rear final drive 0AV

A ➡ Rear final drive part number

B ➡ Rear final drive code letters

C ➡ Rear final drive production date

Example:

HHJ	09	08	05
Code letters	Day	Month	Production year (2005)

Identification Code Letters, Allocation, Gear Ratios and Capacities

Rear final drive		0AV		
Part number		0AV.525.010.B	0AV.525.010.D	0AV.525.010.F
Code letters		HVY	JJN	JUY
Manu- factured	from	11.05	11.06	03.07
	to	-	-	-
Appli- cation	Model	Audi TT from 2007	Audi TT from 2007	Audi TT from 2007
	Engine	3.2 L -184 kW	3.2 L -184 kW	3.2 L -184 kW
Gear ratio: Z2:Z1	Rear final drive	27:17 = 1.588	27:17 = 1.588	27:17 = 1.588
Drive shaft flange dia.		100 mm	100 mm	100 mm
Capacity in final drive		0.95 liters		
Capacity in Haldex clutch		0.85 liters		
Replacement capacity in Haldex clutch ¹⁾		0.65 liters		

¹⁾ Change interval. See Maintenance Service Circular for appropriate model and year.

Please retrieve the following information from Electronic Parts Catalog (ETKA):

- Rear final drive transmission oil specification
- Haldex clutch high performance oil specification
- Transmission allocation

Rear final drive		0AV
Part number		0AV.525.010.H
Code letters		JZX
Manufactured	from	08.06
	to	11.06
Application	Model	Audi TT from 2007
	Engine	3.2 L -184 kW
Gear ratio: Z2:Z1	Rear final drive	27:17 = 1.588
Drive shaft flange dia.		100 mm
Capacity in final drive		0.95 liters
Capacity in Haldex clutch		0.85 liters
Replacement capacity in Haldex clutch 1)		0.65 liters

¹⁾ Change interval. See Maintenance Service Circular for appropriate model and year.

Please retrieve the following information from Electronic Parts Catalog (ETKA):

- Rear final drive transmission oil specification
- Haldex clutch high performance oil specification
- Transmission allocation

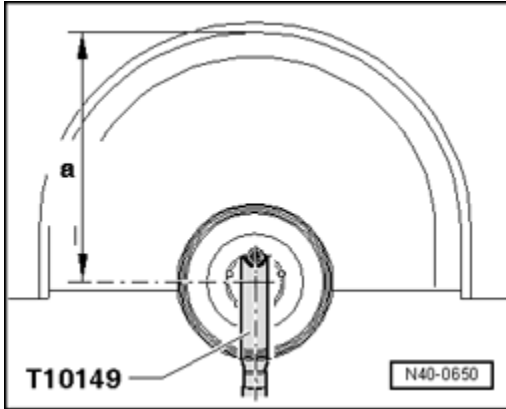
Rear Final Drive – Tightening Torques

Components	Nm
Rear final drive axle oil filler plug	40
All wheel drive control module bolts	6
Haldex drive to driveshaft flange nut	210
Haldex clutch pump V181 bolts	6
Haldex oil filler sealing cap	35

SUSPENSION, WHEELS, BRAKES, STEERING

Front Suspension

Front Axle – Curb Weight Data



Only perform the tightening of respective bolts/nuts when dimension a between wheel hub center and lower edge of wheel housing is reached.

Subframe – Tightening Torques

Threaded connection	Thread	Nm
To body	M12 x 1.5 x 100	70 plus an additional 90° (¼ turn)
To console	M12 x 1.5 x 75	70 plus an additional 90° (¼ turn)
Console to body	M12 x 1.5 x 90	70 plus an additional 90° (¼ turn)
Left front level control system sensor G78 to console	M6 x 16	9
Shielding plate	M6 self-tapping	6

Control Arm – Tightening Torques

Threaded connection	Thread	Nm
To console	M12 x 1.5 x 110	70 plus an additional 180° (½ turn)
To ball joint	M10	60
Mounting bracket to body	M12 x 1.5 x 90	70 plus an additional 90° (¼ turn)
Mounting bracket to console	M10 x 76	50 plus an additional 90° (¼ turn)
Left front level control system sensor G78	M6	9

Stabilizer Bar – Tightening Torques

Threaded connection	Thread	Nm
To subframe	M8 x 80	70 plus an additional 90° (¼ turn)
To coupling rod	M12	65
Coupling rod to suspension strut	M12	65

Pendulum Support – Tightening Torques

Threaded connection	Thread	Nm
To subframe	M14 x 1.5 x 70	100 plus an additional 90° (¼ turn)
To transmission	M10 x 35	40 plus an additional 90° (¼ turn)
	M10 x 75	40 plus an additional 90° (¼ turn)

Suspension Strut – Tightening Torques

Threaded connection	Thread	Nm
To body	M8 x 26	15 plus an additional 90° (¼ turn)
To wheel bearing housing	M12 x 1.5 x 80	70 plus an additional 90° (¼ turn)
Strut mounting to piston rod	M14 x 1.5	60

Drive Axle – Tightening Torques

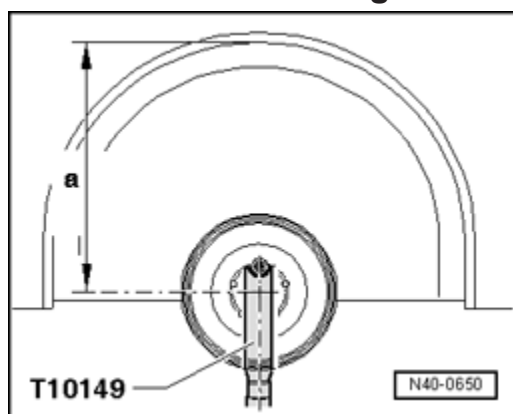
Threaded connection	Thread	Nm
To wheel hub with wheel bearing	M16 x 1.5 x 80	200 plus an additional 180° (½ turn)
To transmission flange, first to 10 Nm, then in diagonal sequence to	M8 x 48	40
	M10 x 52	70
	M10 x 23	70
Intermediate shaft to mounting bracket	M8 x 25	20

Wheel Bearing Housing – Tightening Torques

Threaded connection	Thread	Nm
Wheel hub with wheel bearing to	M12 x 1.5 x 45	70 plus an additional 90° (¼ turn)
Ball joint to wheel bearing housing		75
Shielding plate to wheel bearing housing	M6 x 10	12
Front speed sensor to wheel bearing housing	M6 x 16	8
Tie rod end to wheel bearing housing	M12 x 1.5	20 plus an additional 90° (¼ turn)

Rear Suspension – Front Wheel Drive

Rear Axle – Curb Weight Data



Only perform the tightening of respective bolts/nuts when dimension a between wheel hub center and lower edge of wheel housing is reached.

Subframe – Tightening Torques

Threaded connection	Thread	Nm
Eccentric bolt and nut to lower transverse link	M12 x 1.5	95
Eccentric bolt and nut to upper transverse link	M12 x 1.5	95
Stone impact protection on transverse link	M6 x 12	8
Subframe to body bolts	M12 x 1.5 x 90	90 plus an additional 90° (¼ turn)
To tie rod	M12 x 1.5 x 90	90 plus an additional 90° (¼ turn)

Left Rear Level Control System Sensor G76 – Tightening Torques

Threaded connection	Thread	Nm
To subframe	M5 x 20	5
To lower transverse link	M5 x 20	5

Wheel Bearing Housing – Tightening Torques

Threaded connection	Thread	Nm
To lower transverse link	M12 x 1.5 x 75	90 plus an additional 90° (¼ turn)
To upper transverse link	M14 x 1.5 x 95	130 plus an additional 90° (¼ turn)
To tie rod	M14 x 1.5 x 95	130 plus an additional 90° (¼ turn)
To wheel hub with wheel bearing	M16 x 1.5 x 70	180 plus an additional 180° (½ turn)
To speed sensor	M6 x 16	8
To shielding plate	M6 x 12	10

Trailing Link – Tightening Torques

Threaded connection	Thread	Nm
To wheel bearing housing	M12 x 25	90 plus an additional 45° (⅓ turn)
To mounting bracket	M12 x 1.5 x 80	90 plus an additional 90° (¼ turn)
Mounting bracket to body	M10 x 35	50 plus an additional 45° (⅓ turn)

Shock Absorbers – Tightening Torques

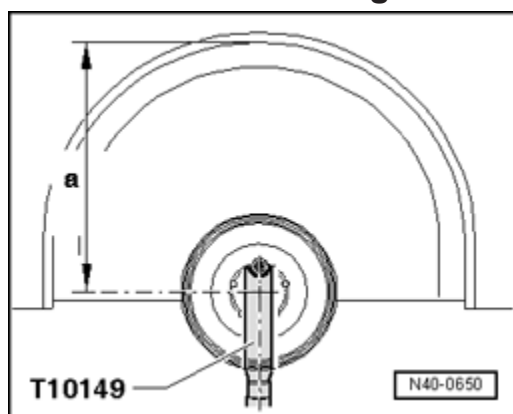
Threaded connection	Thread	Nm
To wheel bearing housing	M14 x 1.5 x 70	180
To shock absorber mount	M10 x 1.0	25
To body	M10 x 35	50 plus an additional 45° (⅓ turn)

Stabilizer Bar – Tightening Torques

Threaded connection	Thread	Nm
To subframe	M8 x 35	20 plus an additional 90° (¼ turn)
To coupling rod	M10	40
Coupling rod to wheel bearing housing	M10	40

Rear Suspension – All Wheel Drive

Rear Axle – Curb Weight Data



Only perform the tightening of respective bolts/nuts when dimension a between wheel hub center and lower edge of wheel housing is reached.

Subframe – Tightening Torques

Threaded connection	Thread	Nm
To lower transverse link	M12 x 1.5	95
To upper transverse link	M12 x 1.5	95
To body	M12 x 1.5 x 125	90 plus an additional 90° (¼ turn)
To tie rod	M12 x 1.5 x 100	90 plus an additional 90° (¼ turn)
To front crossmember	M10 x 115	50 plus an additional 180° (½ turn)
To final drive and	M12 x 1.5 x 85	60 plus an additional 90° (¼ turn)

Left Rear Level Control System Sensor G76 – Tightening Torques

Threaded connection	Thread	Nm
To subframe	M5 x 20	5
To lower transverse link	M5 x 20	5

Wheel Bearing Housing – Tightening Torques

Threaded connection	Thread	Nm
To lower transverse link	M12 x 1.5 x 75	90 plus an additional 90° (¼ turn)
To upper transverse link	M14 x 1.5 x 95	130 plus an additional 90° (¼ turn)
Stone impact protection on transverse link	M6 x 12	8
To tie rod	M14 x 1.5 x 95	130 plus an additional 90° (¼ turn)
To wheel hub with wheel bearing	M12 x 1.5 x 45	180 plus an additional 180° (½ turn)
To shielding plate	M6 x 12	10
To speed sensor	M6 x 16	8

Trailing Link – Tightening Torques

Threaded connection	Thread	Nm
To wheel bearing housing	M12 x 25	90 plus an additional 90° (¼ turn)
To mounting bracket	M12 x 1.5 x 80	90 plus an additional 90° (¼ turn)
Mounting bracket to body	M10 x 35	50 plus an additional 45° (⅛ turn)

Shock Absorbers – Tightening Torques

Threaded connection	Thread	Nm
To wheel bearing housing	M14 x 1.5 x 70	180
To shock absorber mount	M10 x 1.0	25
To body	M10 x 35	50 plus an additional 45° (⅛ turn)

Stabilizer Bar – Tightening Torques

Threaded connection	Thread	Nm
To subframe	M8 x 30	25 plus an additional 90° (¼ turn)
To coupling rod	M10 x 55	40
Coupling rod to wheel bearing housing	M10	40

Drive Axle – Tightening Torques

Threaded connection	Thread	Nm
To final drive	M8 x 48	20 plus an additional 90° (¼ turn)
To wheel hub	M16 x 1.5 x 80	200 plus an additional 180° (½ turn)

Wheels, Tires, Wheel Alignment

Wheel Bolts – Tightening Torques

Model/type	Nm
Audi models except RS 2 and RS 4 (type 8D)	120
RS 2	130
RS 4 (type 8D)	140
RS 4 (type 8E)	120
Q7	160
PAX wheels	140
A 6 (security)	140
A 8 (security)	140

Tire Pressure Sensor – Tightening Torques

Component	Nm
Union nut to tire pressure sensor	8

Wheel Alignment Data

Front axle	Standard suspension 1BA	Sport suspension Audi Magnetic Ride (AMR) 1BL	Sport suspension (quattro GmbH) 1BV	Sport suspension Audi Magnetic Ride (AMR) 1BQ
Individual toe	5' ± 5'	5' ± 5'	5' ± 5'	5' ± 5'
Total toe	10' ± 10'	10' ± 10'	10' ± 10'	10' ± 10'
Camber	-41' ± 30'	-41' ± 30'	-41' ± 30'	-41' ± 30'
Maximum permissible difference between both sides	max. 30'	max. 30'	max. 30'	max. 30'
Toe differential angle at 20° steering angle*	1° 18' ± 20'	1° 18' ± 20'	1° 20' ± 20'	1° 20' ± 20'
Maximum steering angle at inner wheel	36° 48'	36° 48'	36° 48'	36° 48'

* Wheel stop on outer wheel is reduced by this amount. It can also be indicated negatively in alignment computer, depending on manufacturer.

Rear axle	Standard suspension 1BA	Sport suspension Audi Magnetic Ride (AMR) 1BL	Sport suspension (quattro GmbH) 1BV	Sport suspension Audi Magnetic Ride (AMR) 1BQ
Total toe	25' ± 10'	25' ± 10'	25' ± 10'	25' ± 10'
Individual toe	12,5' ± 5'	12,5' ± 5'	12,5' ± 5'	12,5' ± 5'
Maximum permissible deviation from direction of rotation	max. 10'	max. 10'	max. 10'	max. 10'
Camber	-1° 20' ± 30'	-1° 20' ± 30'	-1° 20' ± 30'	-1° 20' ± 30'
Maximum permissible difference between both sides	max. 30'	max. 30'	max. 30'	max. 30'

Light Alloy Wheels with Metal Valve – Tightening Torques

Component	Nm
Metal valve hex nut	4
Decoration element self-locking hex socket bolts	5

Brake System

Front Brakes – Technical Data

Front axle						
Brake caliper PR number		1LJ	1LL	1LK	1LM	1LN
Front brake caliper		FN3	FN3	FNR-G-57	FNR-G-57	FNR-G-57
Pistons	dia. mm	54	54	57	57	57
Brake disc PR number		1LJ	1LJ	1LK	1LK	1LK
Front brake disc	dia. mm	312 (16)	312 (16)	340 (17)	340 (17)	340 (17)
Brake disc thickness, ventilated	mm	25	25	30	30	30

Front axle						
Brake pad wear limit	mm	21	21	27	27	27
Brake pads						
Pad thickness, new (not including backing plate)	mm	14	14	14	14	14
Brake pad wear limit (not including backing plate)	mm	2	2	2	2	2

Rear Brakes Front Wheel Drive – Technical Data

Rear wheel brake, Front-wheel drive			
Brake caliper PR number		2ED	1KZ
Rear brake caliper		CII 38HR	CII 38HR
Pistons	dia. mm	38	38
Brake disc PR number		2ED, 2EE	1KZ, 1KJ
Rear brake disc	dia. mm	286 (16)	286 (16)
Brake disc thickness, not ventilated	mm	12	12
Brake disc thickness, ventilated	mm	-----	-----
Brake disc wear limit	mm	9	9
Brake pads			
Pad thickness, new (not including backing plate)	mm	12	12
Brake pad wear limit (not including backing plate)	mm	2	2

Rear wheel brake, All-wheel drive						
Brake caliper PR number		1KJ	2EE	2EA	2EF	2EG
Rear brake caliper		CII 41HR	CII 41HR	CII 41HR	CII 41HR	CII 41HR
Pistons	dia. mm	41	41	41	41	41
Brake disc PR number		1KJ,1KZ	2EE, 2ED	2EA	2EF	2EG
Rear brake disc	dia. mm	286 (16)	286 (16)	310 (17)	310 (17)	310 (17)
Brake disc thickness, not ventilated	mm	12	12	-----	-----	-----
Brake disc thickness, ventilated	mm	-----	-----	22	22	22
Brake disc, wear limit	mm	9	9	19	19	19
Brake pads						
Pad thickness, new (not including backing plate)	mm	12	12	12	12	12
Brake pad wear limit (not including backing plate)	mm	2	2	2	2	2

Hydraulic Unit, Brake Booster/Brake Master Cylinder – ABS Mark 70 (ABS/ASR) and 60 (ABS/EDL/ASR/ESP) – Tightening Torques

Component	Nm
ABS control module J104 inner Torx® bolts	4
ABS hydraulic unit N55 bracket hex bolts	8
Air filter housing	10
Brake lines to hydraulic unit, M10 and M12	14

ABS System Components on Front and Rear Axles – Tightening Torques

Component	Nm
ABS speed sensor to wheel bearing housing, front	8
ABS speed sensor to stub axle, rear	8

ESP Sensor Unit G419 – Tightening Torques

Component	Nm
ESP sensor unit to bracket	20

Front Wheel Brakes – Brake Caliper FN 3/FNR-G – Tightening Torques

Component	Nm
Brake disc Phillips/Torx® bolts	5
Brake caliper guide pins	30
ABS speed sensor to wheel bearing housing	8
Brake line to brake caliper	19
Wheel bearing housing with fastened brake carrier ribbed bolt (FN3/FNR-G)	190
Brake hose bracket bolt (FNR-G)	25
Brake line to brake hose (FNR-G)	12

Rear Brakes (Disc Brakes) – Rear Brake CII/CII 38 – Tightening Torques

Component	Nm
ABS speed sensor to stub axle, Rear	8
Wheel bearing housing multipoint socket head bolts	90 plus an additional 90° (¼ turn)
Cover plate hex head bolts (Hex head bolt M6 x 10 changed from Torx® bolt M6 x 12) ¹⁾ (C38/CII)	9
Cover plate Torx® bolts (Hex head bolt M6 x 10 changed from Torx® bolt M6 x 12) ¹⁾	12
Brake disc Phillips head bolt	4
Brake line to brake hose	14
Brake caliper self-locking hex bolts (always replace)	35
Brake line to brake caliper	14

¹⁾ Replace hex head bolt with hex head bolt and Torx® bolt with Torx® bolt.

Parking Brake Lever – Tightening Torques

Component	Nm
Parking brake lever hex nuts	15

Hydraulic Components – Front Brake Caliper FN3/FNR-G – Tightening Torques

Component	Nm
Brake caliper bleed valve	10
Brake caliper bleed valve (FNR-G)	12
Brake caliper guide pins	30

Hydraulic Components – Rear Brake Caliper CII/CII 38 – Tightening Torques

Component	Nm
Brake caliper bleed valve	10
Brake caliper with parking brake cable lever self-locking hex bolts	35

Hydraulic Unit, Brake Booster/Brake Master Cylinder – Tightening Torques

Component	Nm
Pedal assembly self-locking hex nuts	25
Heat shield self-locking hex nuts (always replace)	20
Master brake cylinder/secondary piston circuit to hydraulic unit brake line	14
Master brake cylinder/primary piston circuit to hydraulic control unit brake line	14
Brake system vacuum pump V192 to bracket	18
Bracket to automatic transmission	18
Shield to bracket	10
Master brake cylinder at brake booster (always replace)	25
Brake lines to main brake cylinder	14
Brake booster to foot pedal assembly/cross panel (always replace)	25
ESP sensor unit to bracket	20

Steering

Steering – Technical Data

Front and all wheel drive	
Steering gear	Electromechanically assisted, maintenance-free rack-and-pinion steering
Maximum steering lock angle on inside wheel	36° 48'
Turning diameter	Approximately 10.9 m

Steering Column – Tightening Torques

Component	Thread	Nm
Strut to bracket	M8 x 100	20
Mounting bracket to strut	M8 x 20	25
Steering column to bracket	M8 x 35	20
Strut to body	M8 x 48	25
Instrument panel bracket nut (always replace)		20
Instrument panel bracket screws		9
Lower brace screws		20
Left center section bracket screws		9
Left support screws		9
Right center section bracket screws		9
Right support screws		9
Intermediate plate screws		9
Driver's side instrument panel cover mounting bracket screws		3
Universal joint to steering gear	M8 x 32	20 plus an additional 90° (¼ turn)
Lower steering column trim to steering column switch module		3.5
Steering wheel on steering column		50
Handle to steering column adjustment clamping lever		3.5
Steering column electronic systems control module J527 to steering column switch module		0.4

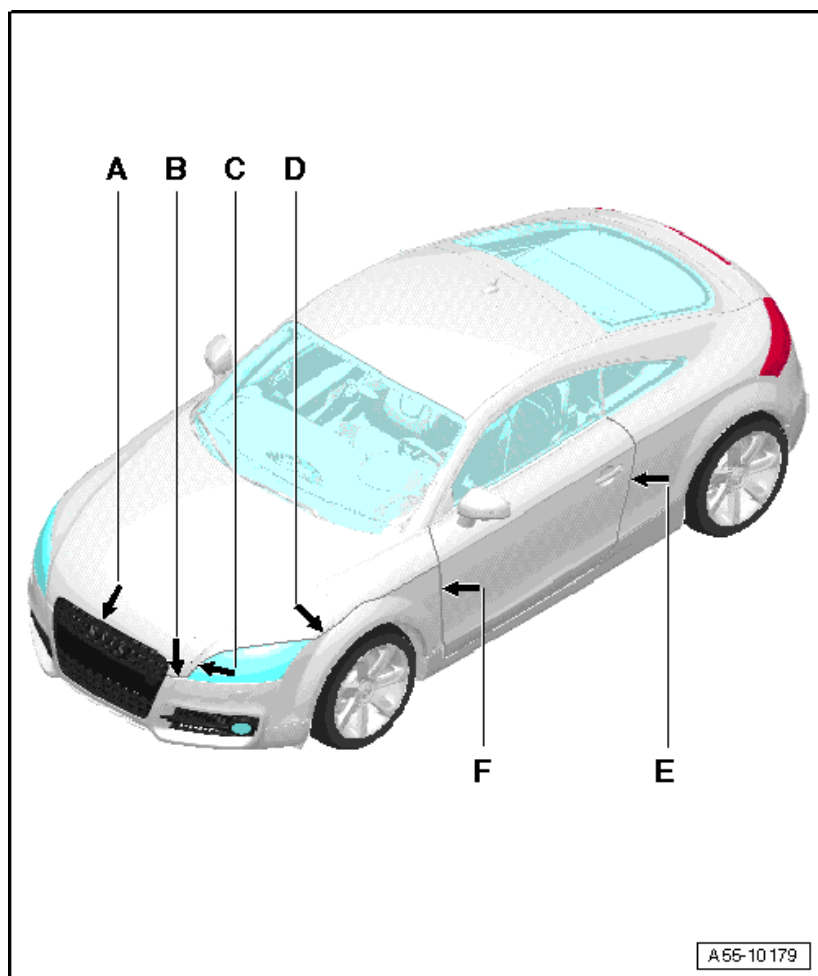
Steering Gear – Tightening Torques

Component	Thread	Nm
To subframe	M10 x 76	50 plus an additional 90° (¼ turn)
To shielding plate	M6 self-tapping	6
Tie rod end to wheel bearing housing	M12 x 1.5	20 plus an additional 90° (¼ turn)
Tie rod end to tie rod	M16 x 1.5	55
Tie rod to steering rack	M16 x 1.5	100

BODY

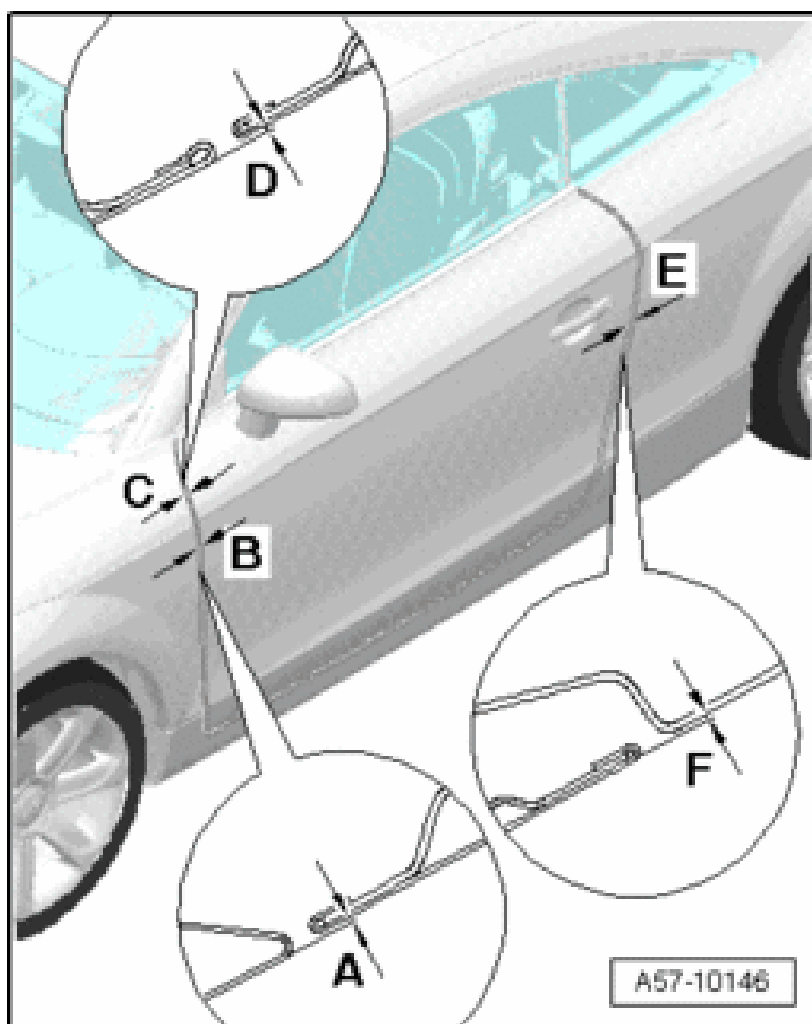
Body Dimensions

Front Dimensions



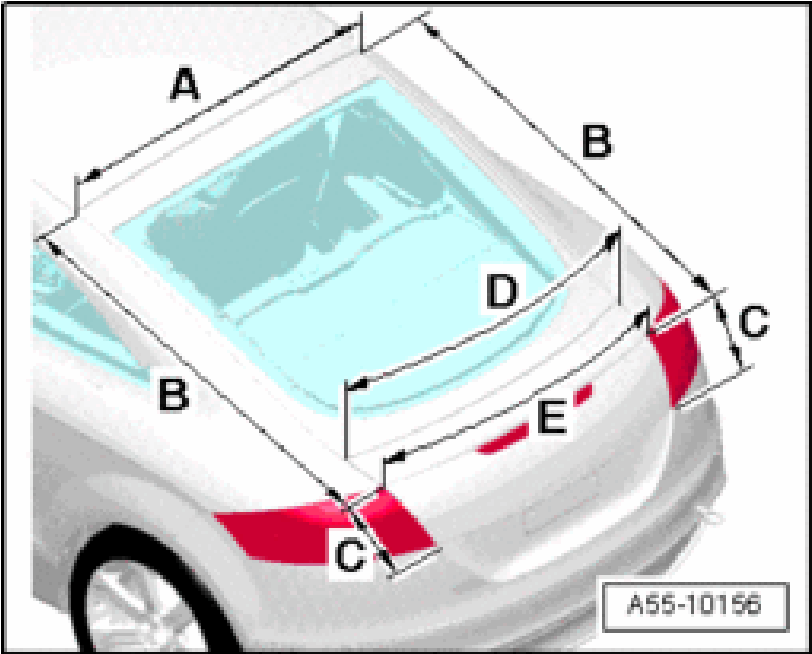
Component	mm
A	4.5 mm \pm 0.5 mm
B	4.5 mm \pm 0.5 mm
C	3.5 mm \pm 0.5 mm
D	3.5 mm \pm 0.5 mm
E	3.5 mm \pm 0.5 mm
F	3.5 mm \pm 0.5 mm

Center Dimensions

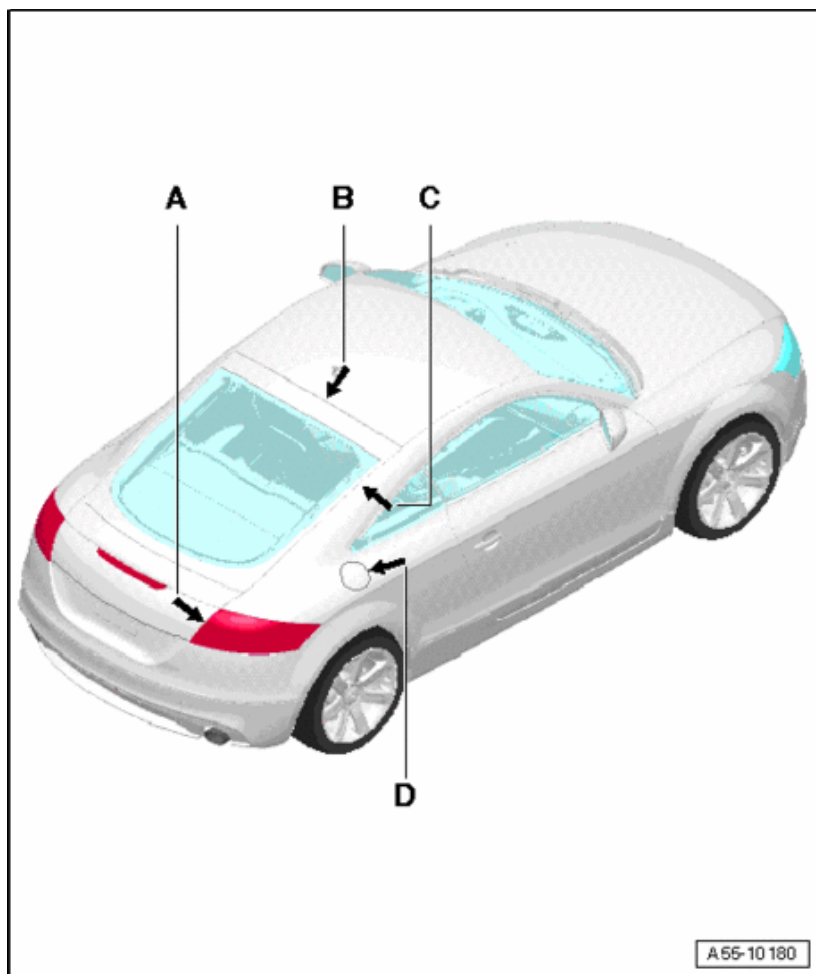


Component	mm
A	3.5 mm \pm 0.5 mm
B	3.5 mm \pm 0.5 mm
C	0 mm to -1 mm
D	0 mm to +1 mm
E	3.5 mm \pm 0.5 mm

Rear Coupe Dimensions

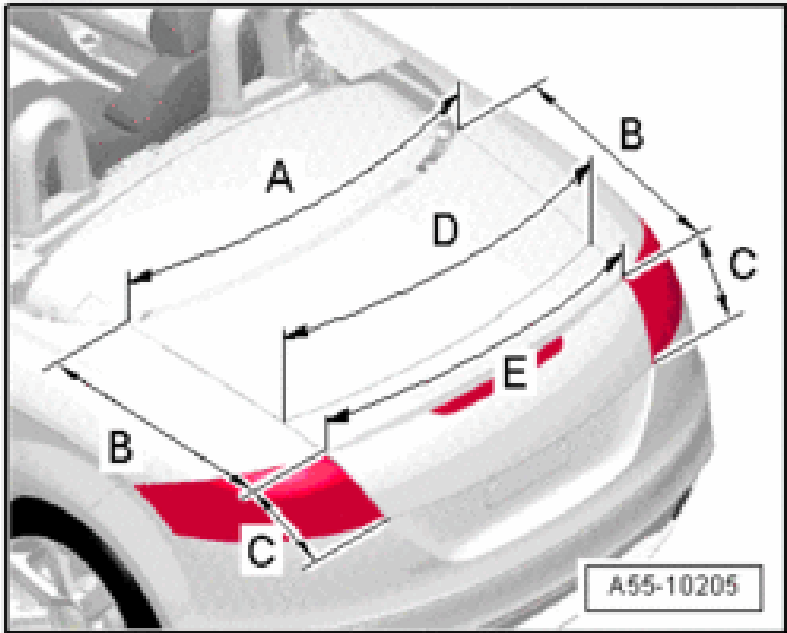


Component	mm
A	4.5 mm ± 0.5 mm
B	3.5 mm ± 0.5 mm
C	4.0 mm ± 0.5 mm
D	2.0 mm ± 0.5 mm
E	2.0 mm ± 0.5 mm



Component	mm
A	4.0 mm \pm 0.5 mm
B	4.5 mm \pm 0.5 mm
C	3.5 mm \pm 0.5 mm
D	2 mm all around

Rear Roadster Dimensions



Component	mm
A	4.0 mm ± 0.5 mm
B	4.5 mm ± 0.5 mm
C	3.5 mm ± 0.5 mm
D	2 mm all around
E	2.0 mm ± 0.5 mm

Body Exterior

Lock Carrier Service Position – Tightening Torques

Component	Nm
Lock carrier bolts, upper	8
Lock carrier bolts, lower	60
Side impact member screws to noise insulation frame	30

Front Fender – Tightening Torques

Component	Nm
Front fender bolts	11
Fender connecting piece hex nut	7.5

Noise Insulation Panel – Tightening Torques

Component	Nm
Noise insulation panel side bolts	2
Noise insulation panel end bolts	6
Noise insulation frame bolts	23

Underbody Trim – Tightening Torques

Component	Nm
Underbody cover hex nuts	2
Rear underbody bolts	2

Front Hood – Tightening Torques

Component	Nm
Hood hex nut	22
Gas filled strut ball studs	21
Hood hinge bolts	25
Hood hinge nuts	32
Hood catch nuts	9
Release lever bracket bolts	2.0
Hood lock bolts	12

Rear Lid – Tightening Torques

Component	Nm
Rear lid bolts	21
Gas filled strut ball studs	21
Striker	21
Rear lid hinge hex head nut	21
Rear lid latch bracket nuts	21
Rear lid handle unlock switch E234 bolts	4
Rear lid lock nuts	21

Tank Flap Unit – Tightening Torques

Component	Nm
Fuel filler flap	1

Front and Rear Door – Tightening Torques

Component	Nm
Outer door plate bolts (bolt has point and thinner washer)	32
Inner door part bolts (bolt without point but with thick washer)	32
Inner door part bolts (bolt with point and thick washer)	32
Upper door hinge	32
Lower door hinge	32
Door lock to inner door part bolt	25
Side impact protection bolts	20
Side impact protection nuts	20

Sunroof – Tightening Torques

Component	Nm
Spring glider bolts (always replace)	1.8
Electrical drive motor bolts	3.5
Slotted guide rail Torx® bolts	5
Installation unit bolts	8

Front Bumper – Tightening Torques

Component	Nm
Bumper cover bolts (3 on top)	6.5
Bumper cover screw (3 per side)	1.5
Vent grille screw	1.5
Left guide piece bolts	1.5
Right guide piece bolts	1.5
Bumper shock absorber bolt	23
Bumper carrier bolts	23
Lower part of spoiler bolts	1.5

Rear Bumper – Tightening Torques

Component	Nm
Rear bumper cover bolts T-24	2
Rear bumper cover screws	1.5
Rear bumper cover cap nuts	4
Securing strip hex nuts	4
Guide trim hex nuts	2
Crossmember bolts	23

Front and Rear Door Window – Tightening Torques

Component	Nm
Window regulator bolts	8
Window regulator motor bolts	3.5
Window guide trim bolts	2

Front Wheel Housing Liner – Tightening Torques

Component	Nm
Wheel housing liner bolts	2

Rear View Mirror – Tightening Torques

Component	Nm
Mirror base plate bolts	8
Assembly component bolts	1

Radiator Grille – Tightening Torques

Component	Nm
Radiator grille bolts	2

Strips and Trim – Tightening Torques

Component	Nm
Sill panel extension bolts	2
Retaining strip to sill panel bolts	1.2

Body Interior

Storage Compartment – Tightening Torques

Component	Nm
Front center console bolts	3.5
Front center armrest	14
Storage compartment/ashtray unit bolts	3.5
Instrument panel center vent bolts	3.5
Center instrument panel trim bolts	3.5
Steering column trim bolts	3.5
Driver side trim bolts	3
Sun visor bolts	4
Glove compartment bolts	3.5
Driver side footwell cover bolts	2.5
Roof grab handle bolts	4

Passenger Protection – Tightening Torques

Component	Nm
Seatbelt to outer floor assembly anchorage point	55
Belt anchor bolt	55
Front seat belt height adjuster bolt	55
Belt latch to seat bolt	20
Automatic belt retractor bolt	55
Rear center 3-point seatbelt belt latch hex nut	55
Rear center lap belt bolt	55
Rear double belt latch bolt	55
Airbag control module J234 nuts	8
Passenger side airbag unit bolts	10
Side airbag bolts	10
Side head curtain airbag cap nuts	5
Front door crash sensor bolts	5
Rear wheel housing crash sensor bolts	7

Interior Trim – Tightening Torques

Component	Nm
Instrument panel bolts	3
Instrument panel above tunnel bolts	8
Instrument panel aligning bolts	2
Footwell trim bolts	1.5
Instrument panel below heating or A/C mechanism (2 bolts)	9
Instrument panel tunnel area bolts	20
Instrument panel tunnel area nuts	18
Fuse holder bolts	2
Fuse holder nuts	18
Door trim handle molding area bolts	1.5
Door trim handle molding area (4 surrounding bolts)	2
Door mirror triangle cover bolt	2
Upper A-pillar and B-pillar trim airbag emblem bolt	4
B-pillar trim bolts	4
C-pillar trim nut	1.5
Side trim bolts	2
Rear lid trim handle recess bolts	2
Luggage compartment cover side storage compartment bolts	1.5
Luggage compartment side trim bolts	8
Molded headliner bolts	2

Seat Frames – Tightening Torques

Component	Nm
Front seat frame bolts	40
Tunnelside side trim on front seat	2
Seat bracket and operation lever bolts	3.5
Front seat backrest bolts (always replace)	34.5
Bucket seat pan bolts	24
Rear seat center backrest bolt	9
Rear seat belt buckle to floor bolt	40
Rear seat side upholstery bolt	8
Rear seat side upholstery nut	8
Rear seat storage unit with center armrest bolts	9

HEATING AND AIR CONDITIONING

Refrigerant R134a – Capacity

A/C compressor	Manufacturer	Total capacity (grams)
7SEU17C	Denso	525 ± 25
PXE16	Sanden	525 ± 25
DSC17E	Zexel	525 ± 25

Refrigerant (PAG) Oil Identification

Obtain using following Part No.:	
7SEU17C; Denso	G 052 300 A2
PXE16; Sanden	G 052 154 A2
DSC17E; Zexel	G 052 200 A2

Refrigerant (PAG) Oil Capacities

Model	Production	Total capacity (cm³)
1K0 820 803 G Sanden	from 10.04	110 ± 10
1K0 820 803 K Sanden	from 10.04	110 ± 10
1K0 820 803 E Denso	from 10.04	140 ± 10
1K0 820 803 H Zexel	from 10.04	120 ± 10

Refrigerant Oil Distribution

Component	Approximate % of total amount of oil in component
A/C compressor	50
Condenser	10
Suction hose	10
Evaporator	20
Fluid reservoir	10

Refrigerant R134a Vapor Pressure Table

Temperature in°C	Pressure in bar (positive pressure) of R134a
-45	-0.61
-40	-0.49
-35	-0.34
-30	-0.16
-25	0.06
-20	0.32
-15	0.63
-10	1.00
-5	1.43
0	1.92
5	2.49
10	3.13
15	3.90
20	4.70
25	5.63
30	6.70
35	7.83
40	9.10
45	10.54
50	12.11
55	13.83
60	15.72
65	17.79
70	20.05
75	22.52
80	25.21
85	28.14
90	31.34

Heating and A/C Components – Tightening Torques

Component	Nm
Fresh air intake cover to plenum chamber bolts	2.5
Fresh air intake grille to plenum chamber nuts	3.5
Coolant pipes to heat exchanger bolts	2.5
Expansion valve to heating and A/C unit bolt	10
Fresh air blower V2 bolt	1
Coolant pipe clamps	2
Connecting flange between heater core connections	2
Auxiliary heater heating element Z35 voltage supply and ground connection mounting nut	6
Heating and ventilation unit cable bracket bolts	5
Assembly carrier bracket bolts	8
Heating and ventilation unit bracket bolts	10

A/C System – Tightening Torques

Component	Nm
Shielding plate nut	6
Refrigerant lines to engine compartment bolts	12
Assembly carrier bracket bolts	8
Climatronic control module J255 with A/C control head E87 to center instrument control panel bolts	2

A/C Refrigerant System – Tightening Torques

Component	Nm
High pressure sensor to refrigerant line	8
A/C compressor to engine bolts	25
Refrigerant lines to A/C compressor bolts	25
Drive plate to A/C compressor, version 1	35
Drive plate to A/C compressor, version 2	30
Refrigerant lines to condenser bolts	12
Condenser to charge air cooler bolts	5
Fluid reservoir to condenser bolts	10
Refrigerant lines to expansion valve bolts	10

ELECTRICAL EQUIPMENT

Battery – Tightening Torques

Location/Fastener		Nm
Battery post terminals/nuts	M6	6
Battery post terminals/additional terminal nuts	M6	6
Battery hold-down bracket bolt	M8 x 35	22

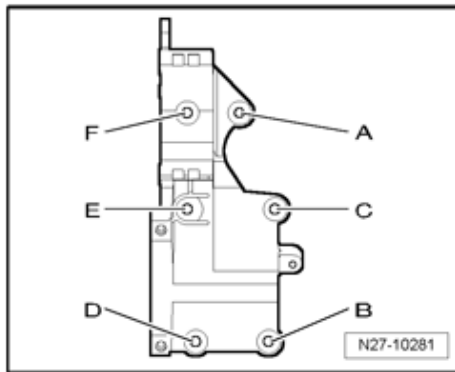
Generator – Tightening Torques

Component		Nm
B+-wire to generator nut	M8	15
Harness retainer to generator	M5	3
Voltage regulator to generator screw	M4	2
Protective cap to generator	M5	4
Ribbed belt pulley with freewheel to generator nut	M10	80
Ribbed belt pulley without freewheel to generator nut	M10	65

Generator 2.0LTFSI – Tightening Torques

Component		Nm
Generator to mounting bracket bolts	M8 x 90	23
Tensioner to mounting bracket bolts	M8 x 90	23
Mounting bracket to engine block bolts	M10 x 45	40
A/C compressor to mounting bracket	M8 x 100	23

2.0L TFSI Generator Mounting Bracket Bolts – Tightening Sequence



Component	Nm
A – B – C – D – E – F	40

Generator 3.2L – Tightening Torques

Component	Nm
Generator to engine accessories bracket bolts	23
Terminal 30/B+ wire to generator nut	15

Starter – Tightening Torques

Component	Nm
Starter to transmission combination bolt	40
Ground cable to starter nut	23
B+ terminal wire to starter nut	15
Wiring harness bracket to starter nut	23

Front Wiper Motor – Tightening Torques

Component	Nm
Wiper arm to wiper frame shaft nuts	17
Wiper frame with linkage and wiper motor to plenum panel bolts	8
Headlamp washer system spray nozzle to front bumper screws	2.5

Washer Reservoir – Tightening Torques

Component	Nm
Washer fluid reservoir (top)	2
to longitudinal member (bottom)	7
Filler neck for washer fluid reservoir to wheel housing	2

Rear Wiper/Washer – Tightening Torques

Component	Nm
Wiper motor to rear lid screw	8
Wiper arm nut	12

Headlamp Washer Spray Jets – Tightening Torques

Component	Nm
Washer jet to bumper screw	2

Front and Rear Lamp – Tightening Torques

Component	Nm
Headlamp to lock carrier screws	4.5
Halogen headlamp beam adjustment motor to headlamp screws	2
HiD lamp control module to headlamp screws	2
Automatic headlamp range control adjusting motor to headlamp screws	2
Headlamp housing repair set to headlamp screws	4.5
Headlamp range control module to instrument panel screws	3
Fog lamp to front bumper screws	5
Side turn signal lamp to side mirror housing screws	0.4
Mirror mount to side mirror housing screws	2.0
Side mirror housing to door screw	6.5
Rear lamp to body bolt	3.5
Rear lamp bulb carrier to rear lamp screws	1.7
Rear fog lamp to rear bumper screws	1.2
High mount brake lamp to rear lid nuts	1.2
License plate lamp to rear lid screws	0.8
Steering column electronic systems control module to mount screw	0.4

Horn – Tightening Torques

Component	Nm
Horns to horn bracket nuts	9
Alarm horn to front fender nut	9

Instruments – Tightening Torques

Component	Fastener Size	Nm
Instrument cluster to instrument panel screws	NA	2.5
Radio frequency controlled clock receiver to rear bumper screws	NA	2.5

Vehicle Level Sensors – Tightening Torques

Component		Nm
Left front level control system sensor G78 bolts	M6	9
Left rear level control system sensor G76 bolts	M5	5

