

2014

TT

Quick Reference
Specification Book

2014 Audi TT

Quick Reference Specification Book

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GENERAL INFORMATION

Decimal and Metric Equivalents

Distance/Length

To calculate: mm x 0.03937 = in.

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

Tightening Torque

Nm-to-lb·ft (ft·lb)

To calculate: Nm x 0.738 = lb·ft

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

Nm-to-lb-in (in·lb), kg·cm

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

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

N·cm-to-lb-in (in·lb), kg·cm

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

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

kg·cm-to-lb·in (in·lb), N·cm

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

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

Warnings and Cautions

WARNINGS

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

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

(WARNINGS cont'd on next page)

WARNINGS *(cont'd)*

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

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

CAUTIONS

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

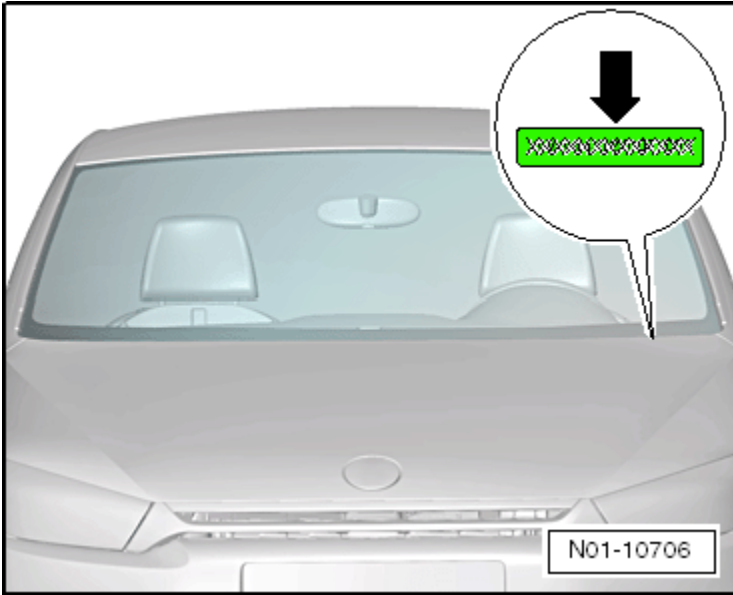
(CAUTIONS cont'd on next page)

CAUTIONS *(cont'd)*

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

VEHICLE IDENTIFICATION

Vehicle Identification Number (VIN) Location



Vehicle
Identification

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

VIN Decoder

Series:

A= A4 Premium
AS Cab Premium
A8 Sedan
RB V8 4.2 Coupé***
RB V10 5.2 Coupé***

B= A4 Premium q
S4 Premium q
TT/TTTS TRS Cpe
Prem = quattro

C= AS Premium q
AS Cab Premium q
A6 2.0T Premium
S5 Premium q
S5 Cab Premium q
Q5 2.0T Premium
Q5 Hybrid Prestige
Q5 TDI Premium**
SQ5 Premium**
Q7 3.0T TDI Prem
R8S Cpe & Cab***

D= A4 Manual Prem q
S4 Manual Prem
A6 2.0T Premium**
S8 Sedan
Q5 3.0T Premium**
Q5 TDI Prem S-Line
Q7 3.0T Prest. S-Line
RB V8 4.2 Coupé
Manual

E= A4 Premium
RB V10 5.2 Coupé***
A6 2.0T Premium q
A6 Premium q
S6
RB V8 4.2 Coupé***

G= AS Manual Prem q
S5 Manual Prem q
A6 2.0T Premium q
RB V10 5.2 Coupé
Manual

H= A4 Manual Prem q
A5 Prestige q
A5 Cab Premium
A5 Cab Premium q

K= A4 Cab Premium
RB V10 5.2 Coupé

L= A5 Premium** q
AS Cab Premium** q
Q5 2.0T Premium**
Q7 3.0T TDI Prem**
Manual

M= A4S4 Man Prestige q
AS Premium q S-Line
A8 S Sedan

S= TT/TTTS TRS R8dr
Prem = q
AS Manual Prem + q
S-Line
RB V8 4.2 Spyder***
RB V10 5.2 Spyder***
Manual

T= allroad Premium q
RB V10 5.2
Manual

U= allroad Premium q
AS Cab Prestige
RB V8 4.2 Spyder
Manual

V= allroad Prestige q
S5 Prestige q
S5 Cab Prestige q
Q5 TDI Prestige
SQ5 Prestige
Q7 TDI Prestige

W= AS Prestige q S-Line
AS Cab Prestige q
A7 Premium q
S7
RS**
Q5 3.0T Prestige S-Line
Q5 TDI Prestige S-Line
Q7 TDI Prestige S-Line
RB V10 5.2 Plus Coupé***
Manual

X= AS Prestige q S-Line
AS Cab Prestige q
A7 Premium q
S7

Z= A7 Prestige q
RB V10 5.2 Plus Coupé
Manual

AA= allroad Premium q
Manual

AA= allroad Premium q
Manual

AA= allroad Premium q
Manual

2014 Audi VIN Decoder

| Mfg. Make (1-3) | | | | | | | | | | | Sequential production number (position 12 - 17) | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|----|----|---|----|----|----|----|----|--|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | |
| W | U | A | B | F | A | F | L | 3 | E | 1 | 0 | 0 | 2 | 0 | 1 | 7 | |

W U A B F A F L 3 E 1

W = Austria
U = Austria
A = Germany
B = Germany
F = France
A = France
F = France
L = France
3 = France
E = France
1 = France

0 0 2 0 1 7

0 = 0
0 = 0
2 = 2
0 = 0
1 = 1
7 = 7

Calculate per NHTSA Code

FC (4G) = AG / S6 / A7 / S7
RS†
FD (4H) = A8 / S8
FE (4J) = A8 / S8
FG (4Z) = R8
FH (8P) = A4 / S4 / S5 / S6 Cab
FK (8J) = TT / TTTS
FL (8K) = A4 / S4
FR (8T) = A6 / S6 /

**A= Ingolstadt
D= Bratislava
N= Neckarsulm
E= Győr**

***7th VIN character is alphabetic for CDN, Mex. and US 2010 and later vehicles. ROW model characters are listed in parenthesis. () for reference only.**

**** A4 allroad models are identified by WMI code of 'WAU'. All other A4 models are identified by WMI code of 'WAU'.**

***** RS† Cabriolet, RS† Coupé, RS† and RB models are identified by WMI code of 'WAU'.**

****** RB Coupé 4.2 and 5.2 models and RB Spyder 4.2 and 5.2 models may use**

Sequential production number (position 12 - 17)

F = 4 cyl 2.0L 220hp (CAED) A4 CVT / A4 q / AS Cpe q / A5 Cab / A6 CVT (CT) / A6 q
G = 4 cyl 2.0L 211hp (CEA) TT Cpe q / TT R8dr q
H = 4 cyl 2.0L 220hp (CPNB) A4 q / A5 Cpe q / A5 Cab q / Allroad / Q5 †
J = V6 3.0L 310hp (CTUA) A6 q (CT) / A7 q
K = V6 3.0L 333hp (CTUB) S4 / S5 / S6 Cab / A8 / A8L
L = V6 3.0L 272hp (CTUC) Q5
M = V6 3.0L 354hp (CTUD) SQ5
N = V6 3.0L 333hp (CTVA) Q7
O = V6 3.0L 280hp (CTWB) Q7
P = V6 3.0L TDI 240hp (CPNB) Q7
R = V6 3.0L TDI 240hp (CPNA) A8
S = V6 3.0L TDI 240hp (CPNB) A6 / A7 Sportback, Q5
T = V10 5.2L 550hp (CTPA) R8 Coupé
U = V10 5.2L 550hp (CTPA) R8 / RB Spyder ††
V = V8 4.2L 430hp (CNDA) RB / RB Spyder
W = V10 5.2L 550hp (CTVA) R8
X = 4 cyl 2.0L 260hp (CDMA) TT S Cpe/R8dr
Y = V8 4.0L 420hp (CCJA) A6 / A8L
Z = V8 4.0L 420hp (CELC) S6 / S7 Sportback (CT)
AA = V8 4.0L 520hp (CGTA) S8
AB = V8 4.0L 460hp (CRS) RS† Sportback (CT)
AC = V12 3L 500hp (CEJA) A8L (D4)
AD = V8 4.2L 450hp (CRS) RS† Cpe/Cab
AE or C = 4 cyl 2.0L 211hp + 45 kW (CHJA) Q5

July 15, 2013 (Rev 2)

2014 Restraint System:

All = Active - Dr. Pass, AirBag - Dr/Pass, Advanced Front AirBag

A (A5 / S5 / R55 Cab, TT / TTTS, R8) = Side AirBags Front, Knee AirBags Front

A (A5 / S5, R55 Coupé) = Side AirBags Front, Side Guard Air Curtain, Knee AirBag Front

A (A4 / S4, A6 / S6, Q5, Q7) = Side AirBags Front, Side Guard Air Curtain

A (A8 / S8) = Side AirBags Frit. & Rear, Side Guard Air Curtain, Knee AirBag

A (R8) = Side AirBags Front, Knee AirBags Front

A (A4 / S4 / A6 / S6, A7 / S7 / RS†) = Side AirBags Front, Side Guard Air Curtain, Knee AirBag

B (A4 / S4, A6 / S6, A7 / S7 / RS†) = Side AirBags Front & Rear, Side Guard Air Curtain, Knee AirBag

B (Q5, Q7) = Side AirBags Front & Rear, Side Guard Air Curtain

2014 Audi VIN Decoder

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

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

Calculate per NHTSA Code

Sequential Product Number

2014 Audi VIN Decoder

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

Calculate per NHTSA Code

Sequential Product Number

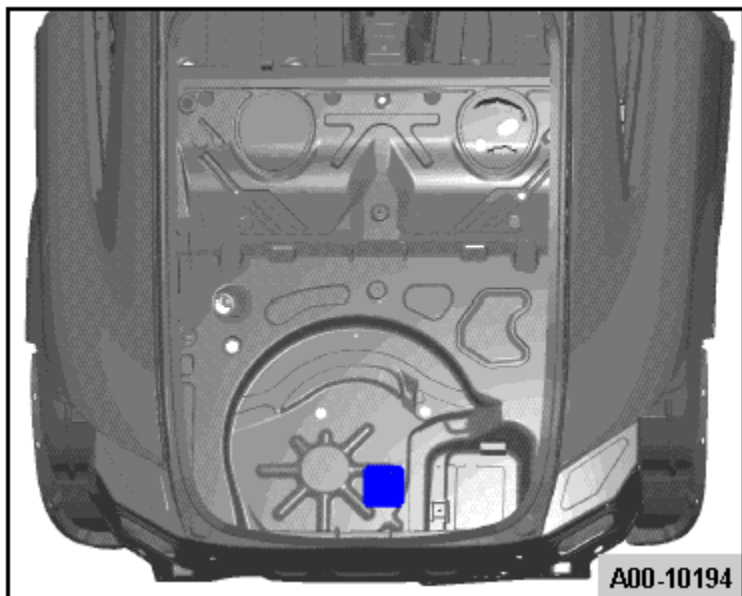
2014 Audi VIN Decoder

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

Calculate per NHTSA Code

Sequential Product Number

Vehicle Data Label



The vehicle data label is located in the spare wheel well.

Vehicle
Identification

SALES CODES

Engine Codes

| | |
|-------------|-----------------|
| CETA | 2.0L 4-cylinder |
| CDMA | 2.0L 4-cylinder |

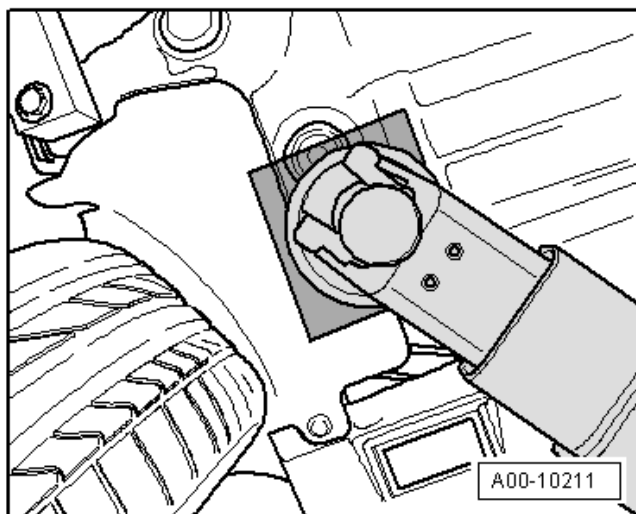
Transmission Codes

| | |
|------------|---|
| 02E | Direct Shift Gearbox (DSG) transmission |
|------------|---|

VEHICLE LIFTING

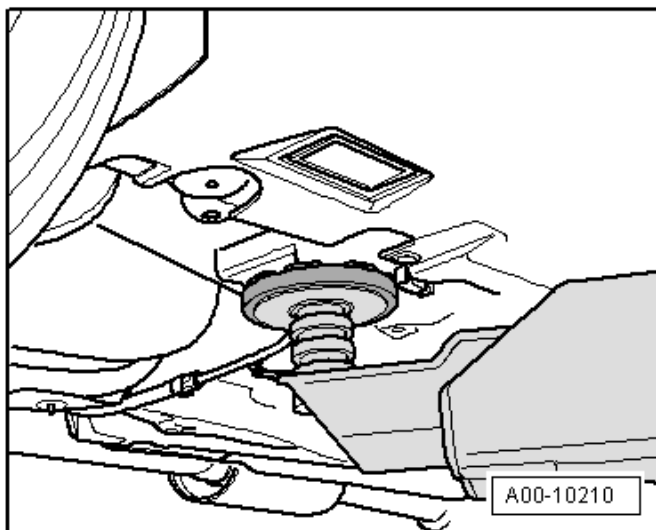
Hoist and Floor Jack Lifting Points

Front



The lift points are located on the floor longitudinal reinforcement, in the area of the marking.

Rear



The lift points are located on the aluminum case part in front of the rear axle mounting point.

ENGINE MECHANICAL – 2.0L CETA

General, Technical Data

Engine Number Location

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

The engine code and serial number is also on a label found on the toothed belt guard and data plates.

Engine Data

| Code letters | | CETA |
|----------------------------------|----------------|------------------|
| Displacement | liter | 1.984 |
| Output | kW at RPM | 155 @ 6000 |
| Torque | Nm at RPM | 350 @ 1500 |
| Bore | Diameter in mm | 82.5 |
| Stroke | mm | 92.8 |
| Compression ratio | | 9.6 |
| RON | | 95 ¹⁾ |
| Injection system/ignition system | | FSI |
| Ignition sequence | | 1-3-4-2 |
| Knock control | | Yes |
| Turbocharger, Supercharger | | Yes |
| Exhaust Gas Recirculation (EGR) | | No |
| Variable intake manifold | | No |
| Variable valve timing | | Yes |
| Secondary Air Injection (AIR) | | No |

¹⁾ Unleaded RON 91 is also permitted but performance is reduced.

Engine Assembly – 2.0L CETA

Fastener Tightening Specifications

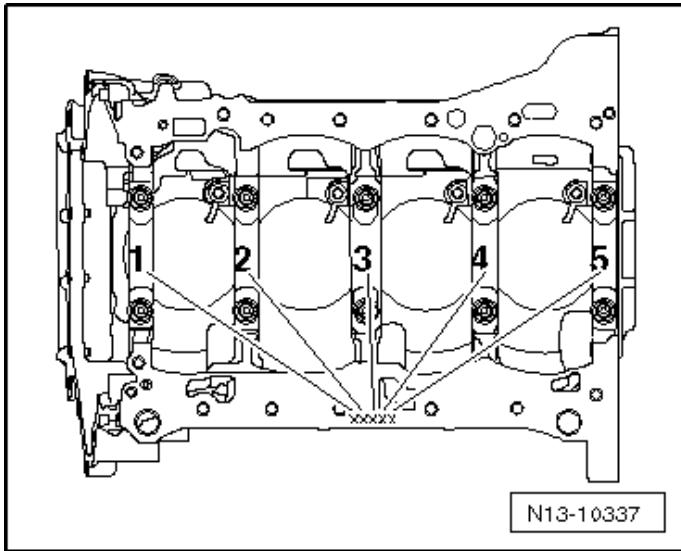
| Component | Fastener size | Nm |
|--|---------------|-------------------------------------|
| Bolts/nuts | M6 | 10 |
| | M7 | 15 |
| | M8 | 22 |
| | M10 | 40 |
| | M12 | 65 |
| Bracket-to-body ¹⁾ | - | 20 plus an additional 90° (¼ turn) |
| Bracket-to-engine mount ¹⁾ | - | 20 plus an additional 90° (¼ turn) |
| Engine mount with support arm ^{1) 2)} | - | 40 plus an additional 90° (¼ turn) |
| | - | 60 plus an additional 90° (¼ turn) |
| Engine support with support arm ¹⁾ | - | 40 plus an additional 180° (½ turn) |

¹⁾ Replace fastener(s).

²⁾ For bolt tightening clarification, refer to ElsaWeb, *Subframe Assembly Overview*, items 6, 10 and 11.

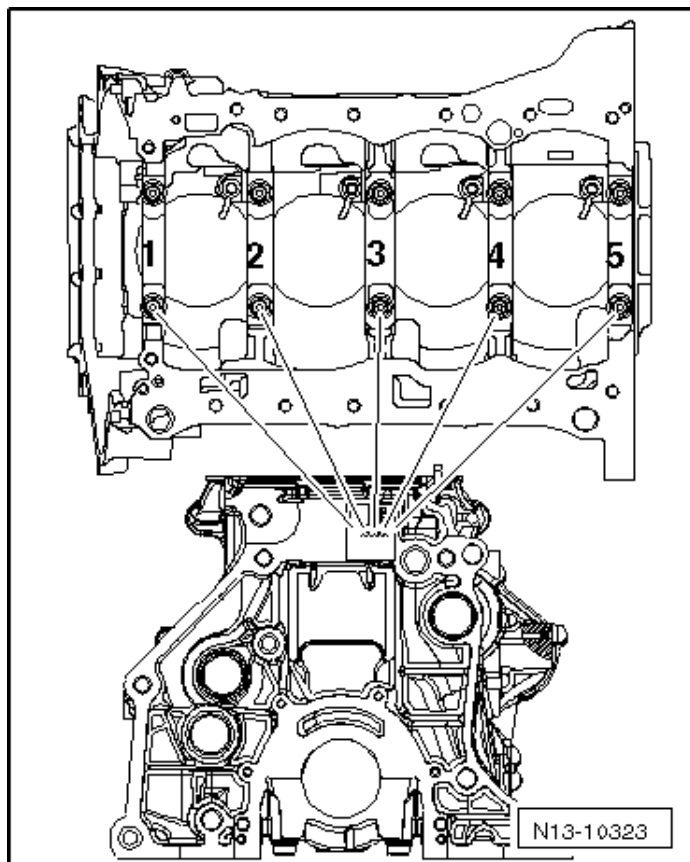
Crankshaft, Cylinder Block – 2.0L CETA

Cylinder Block Bearing Shell Identification



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

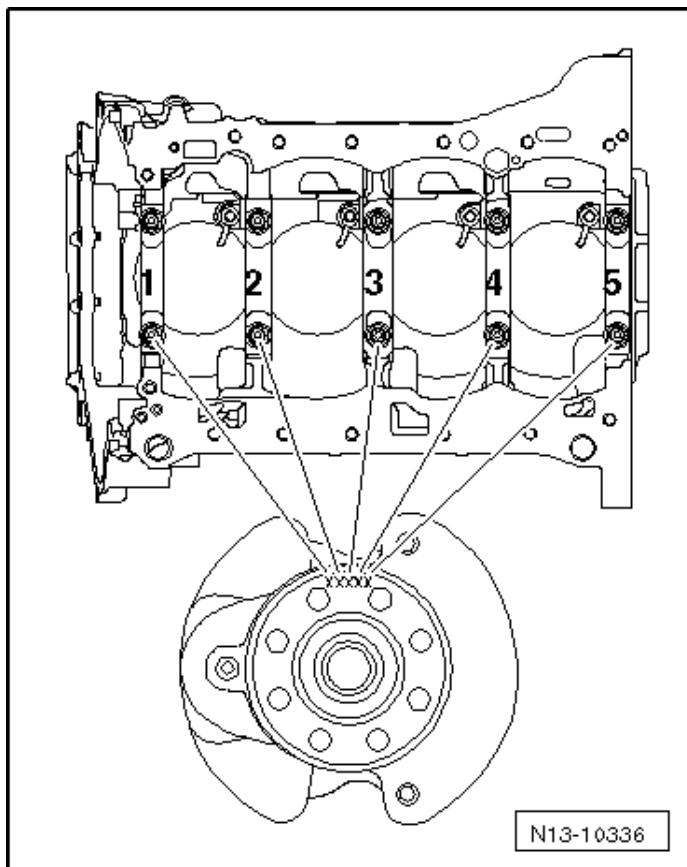
Cylinder Block Bearing Shell Identification



The identification on the cylinder block is for the upper bearing shell. Note the letter and match it to the color identification in the table.

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

Bearing Cap Bearing Shell Identification



The identification on the crankshaft is for the lower bearing shell. Note the letter and match it to the color identification in the table.

| Letter on crankshaft | Color of bearing |
|----------------------|------------------|
| S | Black |
| R | Red |
| G | Yellow |
| B | Blue |
| W | White |

Fastener Tightening Specifications

| Component | Nm |
|-----------------------------------|--|
| A/C compressor | 25 |
| Accessory bracket ³⁾ | 10 |
| Connecting rod bolt ¹⁾ | 45 plus an additional 90° (¼ turn) |
| Dual mass flywheel ¹⁾ | 60 plus an additional 90° (¼ turn) |
| Pressure relief valve | 27 |
| Sensor wheel ¹⁾ | 10 plus an additional 90° (¼ turn) |
| Vibration damper ^{1) 2)} | 150 plus an additional 90° (¼ turn) |

¹⁾ Replace fastener(s).

²⁾ Coat the O-ring with oil.

³⁾ For bolt tightening clarification, refer to ElsaWeb, *Ribbed Belt Drive Overview*, items 7 and 10.

Crankshaft Dimensions

| Reconditioning Dimension in mm ¹⁾ | Crankshaft bearing pin diameter | Connecting rod bearing pin diameter |
|--|---------------------------------|-------------------------------------|
| Basic dimension | 58.00 | 47.80 |

¹⁾ The preparation of worn crankshafts is not provided.

Piston Ring End Gaps

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

Piston Ring Clearance

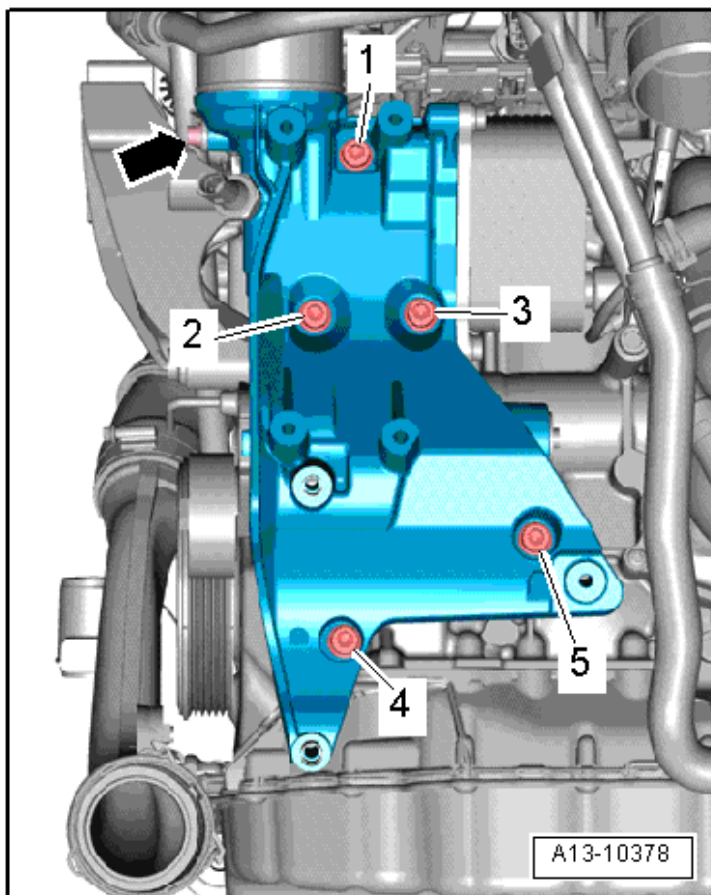
| Piston ring dimensions in mm | New | Wear limit |
|----------------------------------|--------------------|------------|
| 1 st compression ring | 0.06 to 0.09 | 0.20 |
| 2 nd compression ring | 0.03 to 0.06 | 0.15 |
| Oil scraping rings | Cannot be measured | |

Piston and Cylinder Dimensions

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

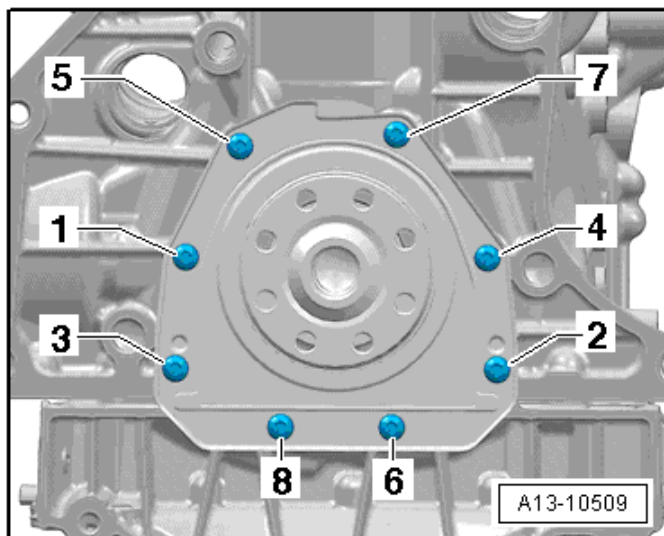
¹⁾ Measurements without graphite coating (thickness = 0.02 mm). The graphite coating wears off.

Accessory Assembly Bracket Tightening Specifications



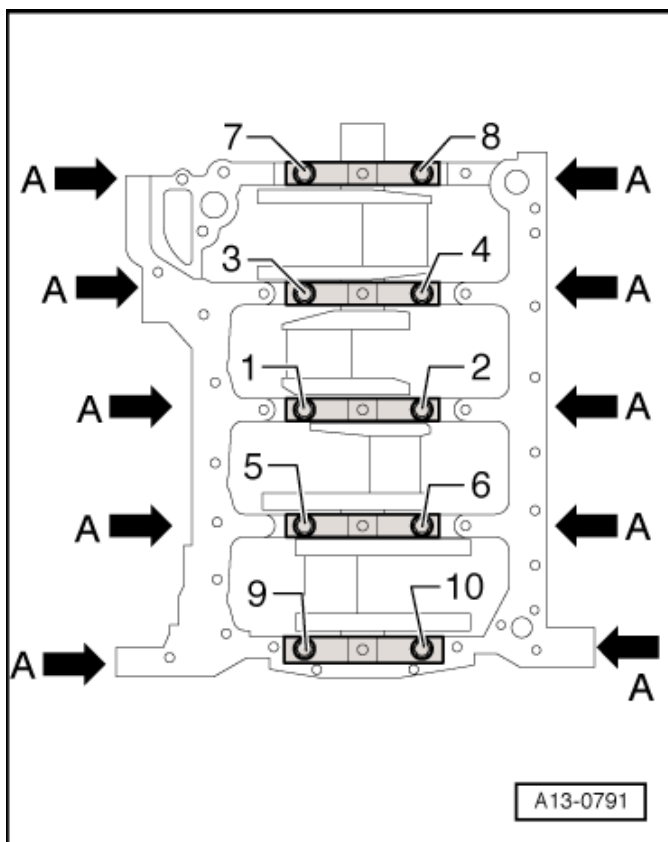
| Step | Component | Nm |
|------|---------------------------------------|----------------------------|
| 1 | Tighten bolts 1 through 5 in sequence | Hand-tighten |
| 2 | Tighten bolts 1 through 5 in sequence | 20 |
| 3 | Tighten bolts 1 through 5 in sequence | an additional 90° (¼ turn) |

Sealing Flange Tightening Specifications



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

Crankshaft Assembly Tightening Specifications



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

Cylinder Head, Valvetrain – 2.0L CETA

Fastener Tightening Specifications

| Component | Fastener size | Nm |
|---|---------------|------------------------------------|
| Balance shaft ¹⁾ | - | 9 |
| Bearing bracket ^{1) 2)} | - | 9 |
| | M6 | 8 plus an additional 90° (¼ turn) |
| | M8 | 20 plus an additional 90° (¼ turn) |
| Camshaft adjuster actuator | - | 5 |
| Camshaft Position (CMP) sensor | - | 9 |
| Camshaft timing chain guide rail guide pins | - | 20 |
| Chain tensioner ⁴⁾ | - | 9 |
| Chain tensioner ³⁾ | - | 65 |
| Control valve | - | 35 |
| Engine lifting eye | - | 25 |
| Guide rail for timing chain, guide bolts | - | 20 |
| Heat shield ^{5) 6)} | - | 9 |
| | - | 20 |
| Mounting plate | - | 9 |
| Oil dipstick guide tube | - | 9 |
| Retaining plate | - | 9 |
| Sealing plugs | - | 5 |
| Tensioning rail for timing chain, guide bolts | - | 20 |
| Timing chain tensioning rail guide bolts | - | 20 |

¹⁾ Replace fastener(s).

²⁾ For bolt tightening clarification, refer to ElsaWeb, *Camshaft Timing Chain Overview*, items 5 and 7.

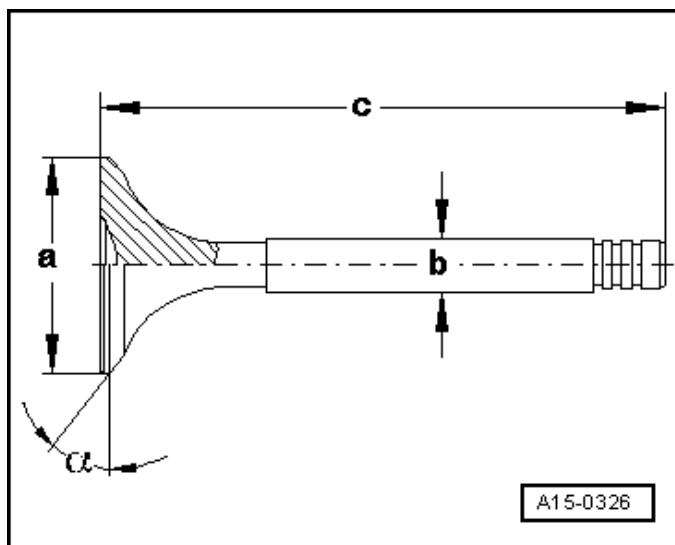
³⁾ For bolt tightening clarification, refer to ElsaWeb, *Balance Shaft Timing Chain Overview*, item 4.

⁴⁾ For bolt tightening clarification, refer to ElsaWeb, *Camshaft Timing Chain Overview*, item 2.

⁵⁾ For bolt tightening clarification, refer to ElsaWeb, *Cylinder Head Overview*, items 13, 15 and 16.

⁶⁾ For bolt tightening clarification, refer to ElsaWeb, *Cylinder Head Overview with AVS*, items 16, 18 and 19.

Valve Dimensions



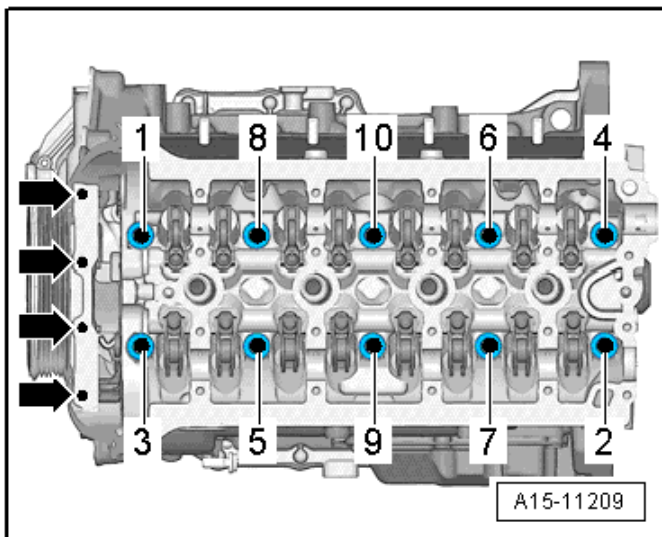
| Dimension | | Intake valve | Exhaust valve |
|------------|----|--------------|---------------|
| Diameter a | mm | 33.85 ± 0.10 | 28.0 ± 0.1 |
| Diameter b | mm | 5.98 ± 0.01 | 5.96 ± 0.01 |
| c | mm | 104.0 ± 0.2 | 101.9 ± 0.2 |
| α | ∠° | 45 | 45 |

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

Compression Pressures

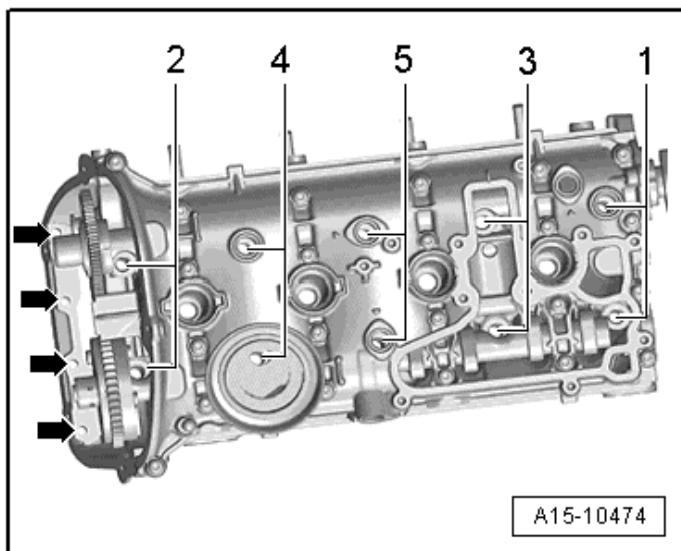
| New Bar positive pressure | Wear limit Bar positive pressure | Difference between cylinders Bar positive pressure |
|---------------------------|----------------------------------|--|
| 11.0 to 14.0 | 7.0 | Maximum 3.0 |

Cylinder Head Removal Specifications (with AVS)



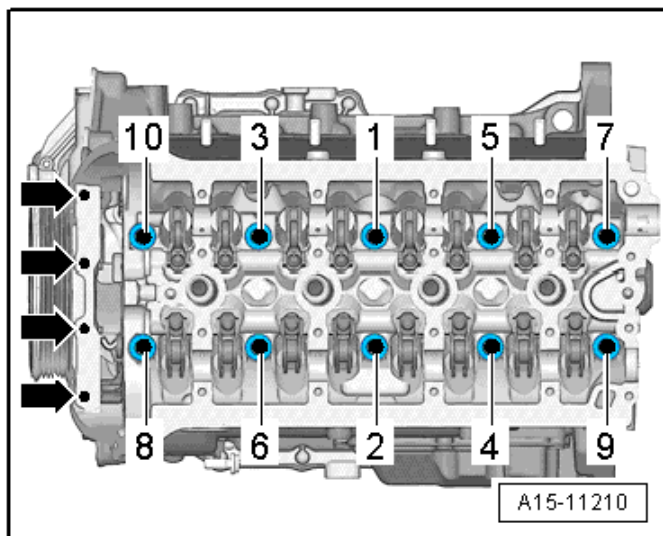
Remove cylinder head bolts (➡) and 1 through 10 in sequence.

Cylinder Head Removal Specifications (without AVS)



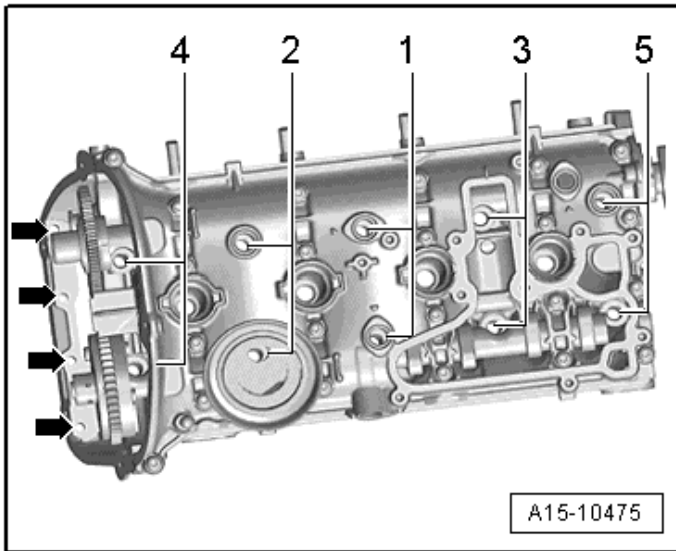
Remove cylinder head bolts (➡) and 1 through 5 in sequence.

Cylinder Head Tightening Specifications (with AVS)



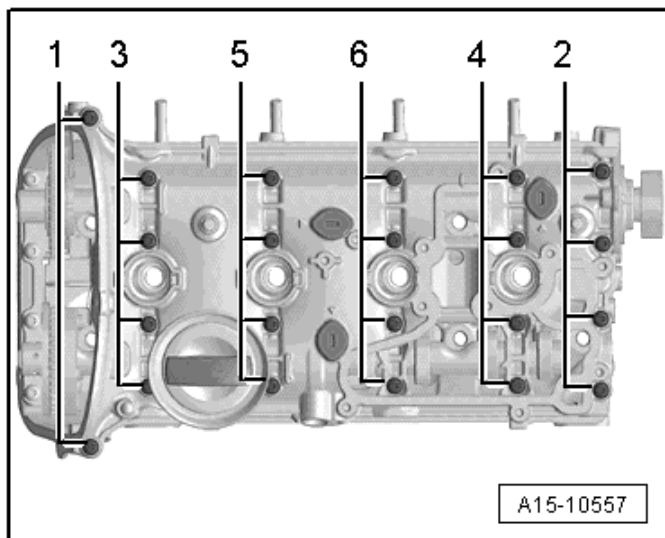
| Step | Component | Nm |
|------|--|----------------------------|
| 1 | Tighten bolts 1 through 10 in sequence | 40 |
| 2 | Tighten bolts 1 through 10 in sequence | an additional 90° (¼ turn) |
| 3 | Tighten bolts 1 through 10 in sequence | an additional 90° (¼ turn) |
| 4 | Tighten bolts (➔) | 8 |
| 5 | Tighten bolts (➔) | an additional 90° (¼ turn) |

Cylinder Head Tightening Specifications (without AVS)



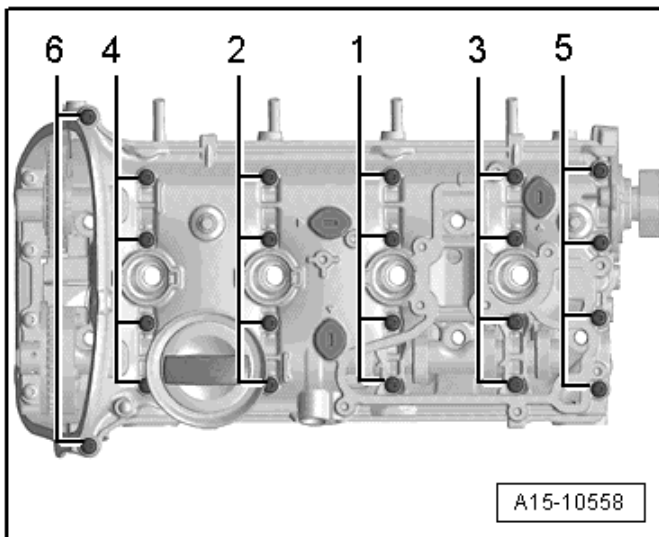
| Step | Component | Nm |
|------|---------------------------------------|----------------------------|
| 1 | Tighten bolts 1 through 5 in sequence | 40 |
| 2 | Tighten bolts 1 through 5 in sequence | an additional 90° (¼ turn) |
| 3 | Tighten bolts 1 through 5 in sequence | an additional 90° (¼ turn) |
| 4 | Tighten bolts (➡) | 8 |
| 5 | Tighten bolts (➡) | an additional 90° (¼ turn) |

Cylinder Head Cover Removal Specifications



Loosen cylinder head cover bolts 1 through 6 in sequence.

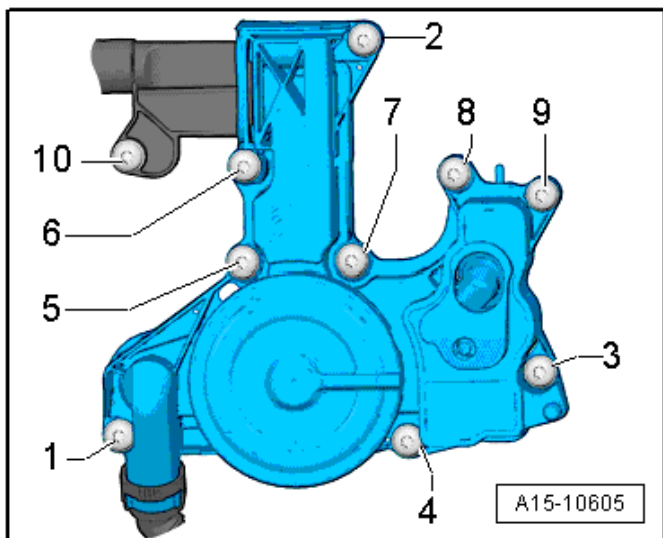
Cylinder Head Cover Tightening Specifications



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

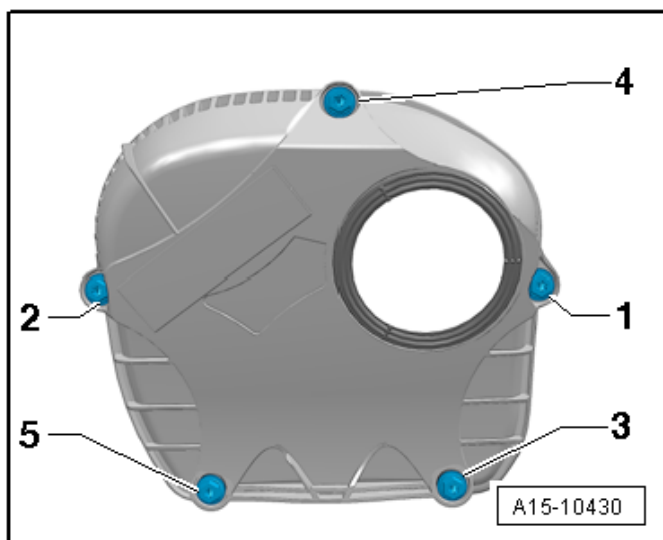
¹⁾ Replace fastener(s).

Crankcase Ventilation Tightening Specification



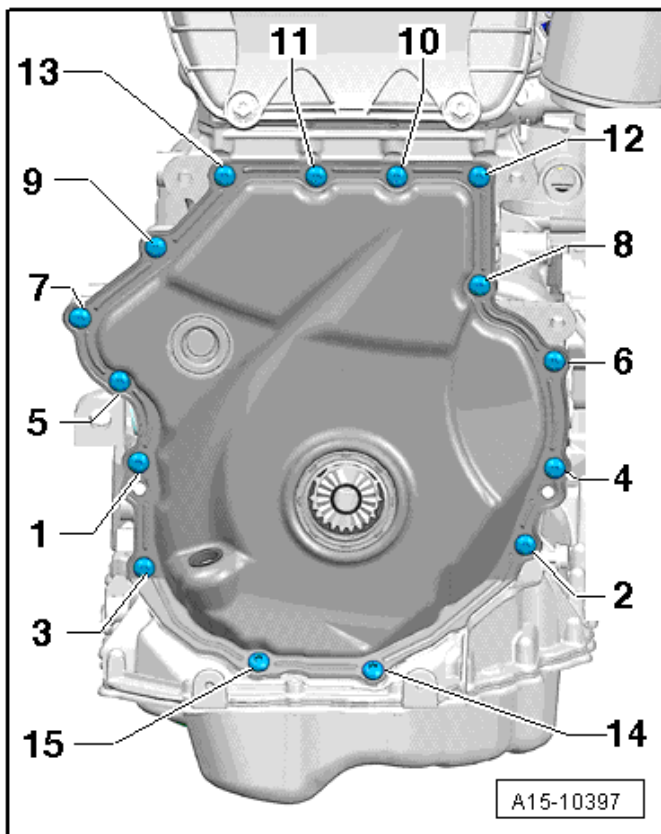
| Step | Component | Nm |
|------|--|----|
| 1 | Tighten bolts 1 through 10 in sequence | 11 |

Upper Timing Chain Cover Tightening Specification



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

Lower Timing Chain Cover Tightening Specifications



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

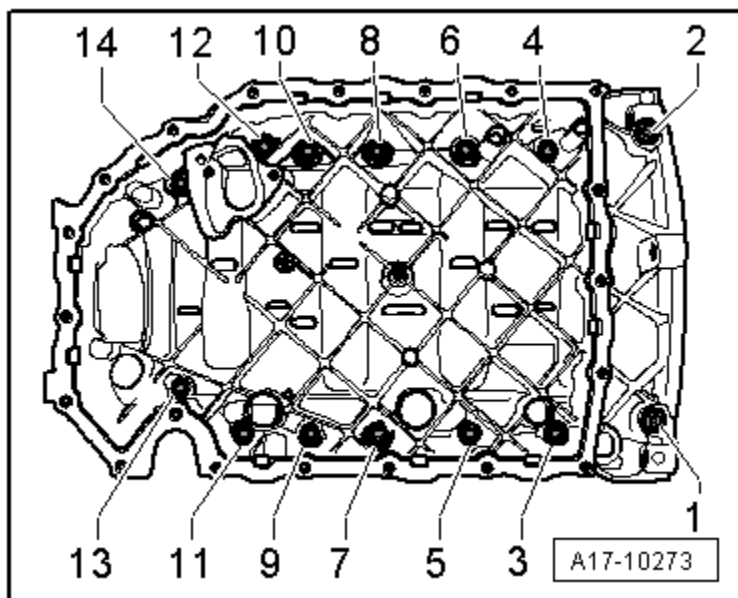
Lubrication – 2.0L CETA

Fastener Tightening Specifications

| Component | Bolt Size | Nm |
|-------------------------------|-----------|----|
| Chain tensioner | - | 9 |
| Engine oil cooler | - | 23 |
| Oil baffle | - | 9 |
| Oil drain plug ¹⁾ | - | 30 |
| Oil level thermal sensor nut | - | 9 |
| Oil pressure regulation valve | - | 9 |
| Oil pressure switch | - | 20 |
| Oil pump | | |
| | M6 | 9 |
| | M8 | 20 |
| Reduced oil pressure switch | - | 20 |
| Suction line | - | 9 |

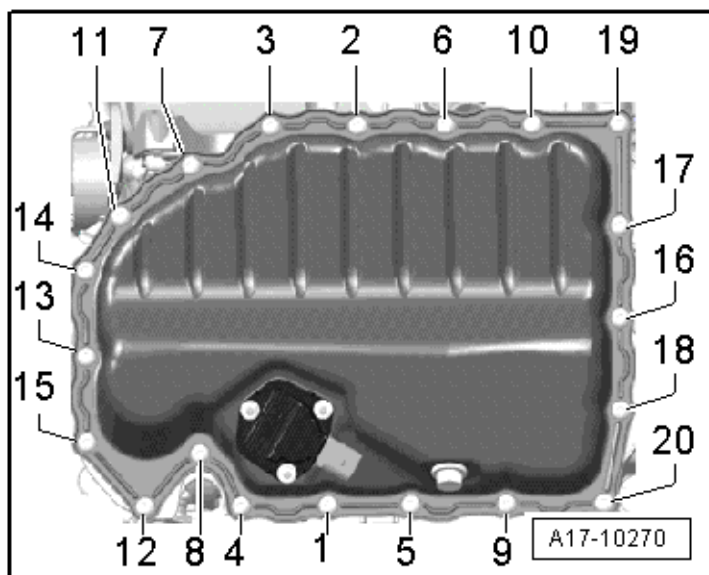
¹⁾ Replace fastener(s).

Upper Oil Pan Tightening Specifications



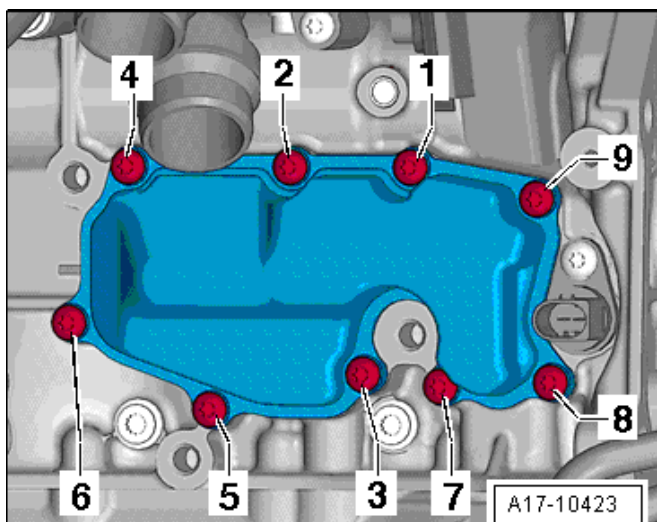
| Step | Component | Nm |
|------|--|----------------------------|
| 1 | Tighten bolts 1 through 14 in sequence | Hand-tighten |
| 2 | Tighten bolts 1 through 14 in sequence | 15 |
| 3 | Tighten bolts 1 through 14 in sequence | an additional 90° (¼ turn) |

Oil Pan Tightening Specifications



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

Oil Separator Tightening Specification



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

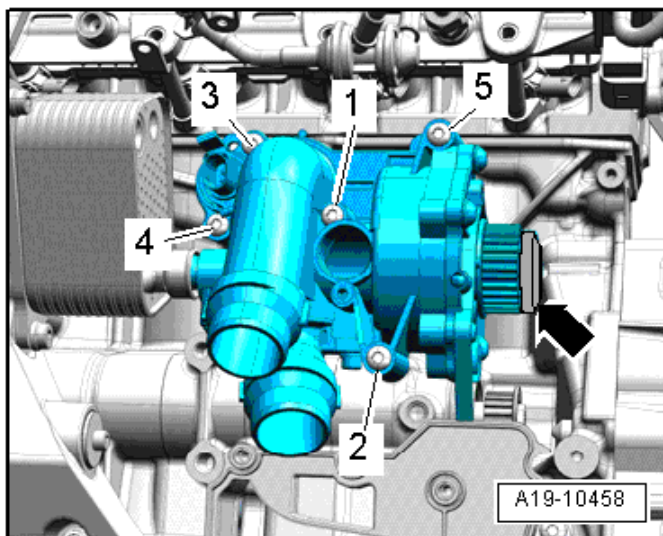
Cooling System – 2.0L CETA

Fastener Tightening Specifications

| Component | Nm |
|--|------------------------------------|
| After run coolant pump bracket-to-mounting bracket bolt | 4 |
| After run coolant pump mounting bracket-to-cylinder block bolt | 5 |
| Connecting piece | 9 |
| Coolant fan nut | 10 |
| Fan shroud nut/bolt | 5 |
| Front coolant pipes | 5 |
| Radiator | 5 |
| Small coolant pipe | 9 |
| Toothed belt drive gear ¹⁾ | 10 plus an additional 90° (¼ turn) |
| Toothed belt guard | 9 |

¹⁾ Replace fastener(s).

Coolant Pump Tightening Specification



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

Fuel Supply – 2.0L CETA

Fastener Tightening Specifications

| Component | Nm |
|--|-----|
| Accelerator pedal module-to-body bolt | 9 |
| Air filter housing-to-bracket bolt | 4 |
| Bracket-to-body nut | 4 |
| Evaporative Emission (EVAP) canister to underbody bolt | 8 |
| Fuel filter bracket bolt | 1 |
| Leak Detection Pump (LDP) bracket bolt | 4 |
| Front Wheel Drive (FWD) | |
| Fuel tank filler tube-to-underbody bolt | 11 |
| Fuel tank locking ring | 110 |
| Fuel tank-to-underbody nut | 20 |
| Heat shield-to-fuel tank lock washer | 3 |
| Securing strap-to-underbody nut | 20 |
| All Wheel Drive (AWD) | |
| Fuel tank filler tube-to-underbody bolt | 11 |
| Fuel tank locking ring | 110 |
| Heat shield-to-underbody nut | 23 |
| Securing strap-to-underbody nut | 23 |

Turbocharger, G-Charger – 2.0L CETA

Fastener Tightening Specifications

| Component | Nm |
|---|------------------|
| Air guide pipe-to-bracket | 10 |
| Charge Air Cooler (CAC) mount | 5 |
| Charge air pipe | 10 |
| Charge air pressure sensor | 5 |
| Connection | 9 |
| Coolant return line ⁴⁾ | 9 |
| | 35 |
| Coolant supply line ³⁾ | 9 |
| | 35 |
| Fastening strip nut ^{1) 5)} | 30 |
| Oil return line | 9 |
| Oil supply line ²⁾ | 30 ⁵⁾ |
| | 9 |
| Right air guide pipe-to-oil pan | 10 |
| Turbocharger bracket ⁵⁾ | 30 |
| Turbocharger recirculating valve | 7 |
| Turbocharger vacuum diaphragm bolt | 10 |
| Turbocharger vacuum diaphragm nut ⁶⁾ | 9 |
| Wastegate bypass regulator valve | 3 |

¹⁾ Replace fastener(s).

²⁾ For bolt tightening clarification, refer to ElsaWeb, *Turbocharger Overview Part II*, items 2, 5 and 6.

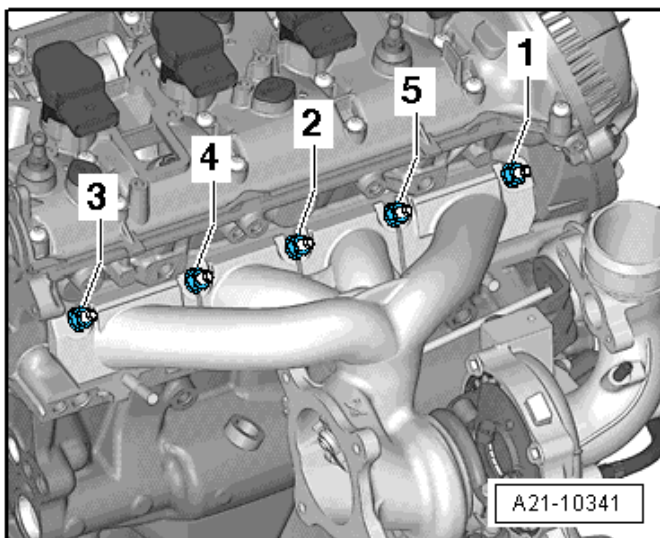
³⁾ For bolt tightening clarification, refer to ElsaWeb, *Turbocharger Overview Part II*, items 8, 9 and 10.

⁴⁾ For bolt tightening clarification, refer to ElsaWeb, *Turbocharger Overview Part III*, items 3 and 6.

⁵⁾ Coat the bolt with hot bolt paste.

⁶⁾ Secure with sealing wax.

Turbocharger Tightening Specifications



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

Exhaust System – 2.0L CETA

Fastener Tightening Specifications

| Component | Nm |
|--|----|
| Exhaust system bracket nut/bolt | 23 |
| Front exhaust pipe with catalytic converter and front muffler nut ^{1) 2)} | 40 |
| Oxygen Sensors (O2S) ³⁾ | 55 |
| Suspended mount | 23 |
| Transverse beam | 23 |

¹⁾ Replace fastener(s).

²⁾ Coat turbocharger stud bolts with hot bolt paste.

³⁾ Only use hot bolt paste to grease the threads.

Multiport Fuel Injection – 2.0L CETA

Technical Data

| 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 (is 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. |

Fastener Tightening Specifications

| Component | Nm |
|---|-----|
| Air filter upper section | 1.5 |
| Engine Speed (RPM) sensor | 4.5 |
| Fuel pressure sensor | 27 |
| Fuel rail | 8 |
| Fuel supply line connectors ¹⁾ | 25 |
| Fuel supply line-to-fuel rail connections ¹⁾ | 25 |
| Fuel supply line union nut | 20 |
| High pressure fuel line | 20 |
| High pressure pump | 20 |
| Intake Air Temperature (IAT) sensor | 9 |
| Intake manifold | 9 |
| Intake manifold support bolt | 20 |
| Intake manifold support nut | 10 |
| Knock Sensor (KS) 1 | 20 |
| Oxygen Sensor (O2S) | 55 |
| Throttle valve control module | 9 |

¹⁾ Replace fastener(s).

Ignition/Glow Plug System – 2.0L CETA

Technical Data

| Engine data | 2.0L Turbo FSI Engine |
|---|---|
| Idle speed cannot be adjusted, it is regulated by idle stabilization | 640 to 800 RPM |
| RPM limited by switching off the fuel injectors and closing the throttle valve. | 6500 RPM |
| Ignition timing is regulated by the control module. It is not possible to adjust the ignition timing. | |
| Ignition System | Single coil ignition system with 4 ignition coils (output stages integrated), that are connected directly to the spark plugs via the ignition cables; The ignition coils can be pulled out of the cylinder head using ignition coil puller -T40039- |
| Ignition sequence | 1-3-4-2 |

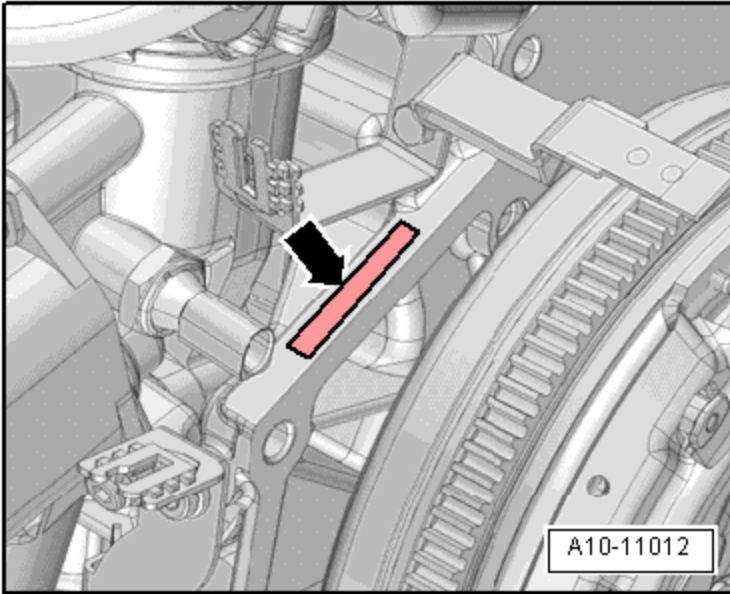
Fastener Tightening Specifications

| Component | Nm |
|--------------------------|----|
| Camshaft position sensor | 10 |
| Knock sensor | 20 |
| Spark plug | 30 |

ENGINE MECHANICAL – 2.0L CDMA

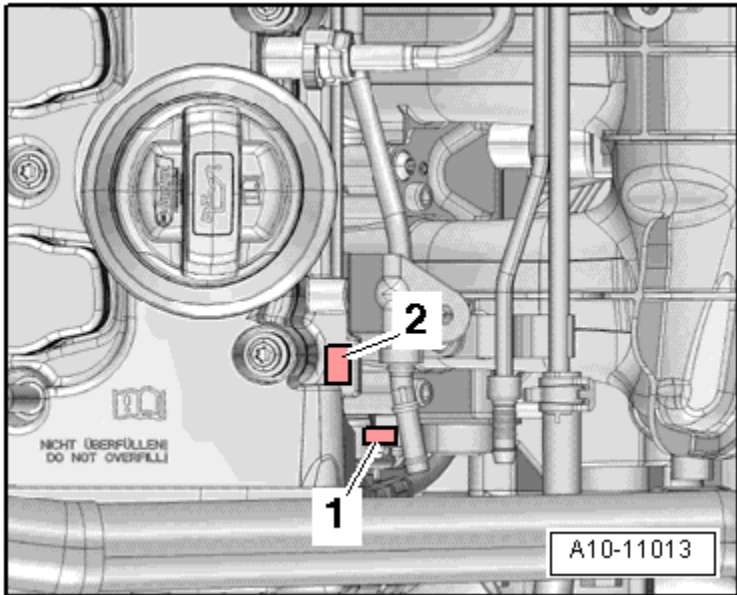
General, Technical Data

Engine Number Location



The engine number (engine code and serial number) (➡) is located where the engine/transmission are joined.

Engine Number Location (*cont'd*)



The engine codes are also stamped on the right side of the cylinder head (2) and on the cylinder block (1).

In addition, a sticker with the engine codes and serial number is affixed to the toothed belt guard.

Engine Data

| Identification codes | | CDMA |
|--------------------------------------|-------------|--------------------|
| Displacement | liter | 1.984 |
| Output | kW at RPM | 195 @ 6000 |
| Torque | Nm at RPM | 350 @ 2500 to 5250 |
| Bore | diameter mm | 82.5 |
| Stroke | mm | 92.8 |
| Compression ratio | | 9.8 |
| RON | at least | 98 ¹⁾ |
| Ignition sequence | | 1-3-4-2 |
| Emissions values | | EU4 |
| Exhaust Gas Recirculation (EGR) | | No |
| Turbocharger | | Turbocharger |
| Knock control | | Yes |
| Charge Air Cooler (CAC) | | Yes |
| Oxygen Sensor (O2S) regulation | | 2 sensors |
| Variable valve timing | | Intake |
| Variable intake manifold | | No |
| Secondary Air Injection (AIR) system | | No |
| Valve per cylinder | | 4 |

¹⁾ Super unleaded RON 95 is also permitted but performance is reduced.

Engine Assembly – 2.0L CDMA

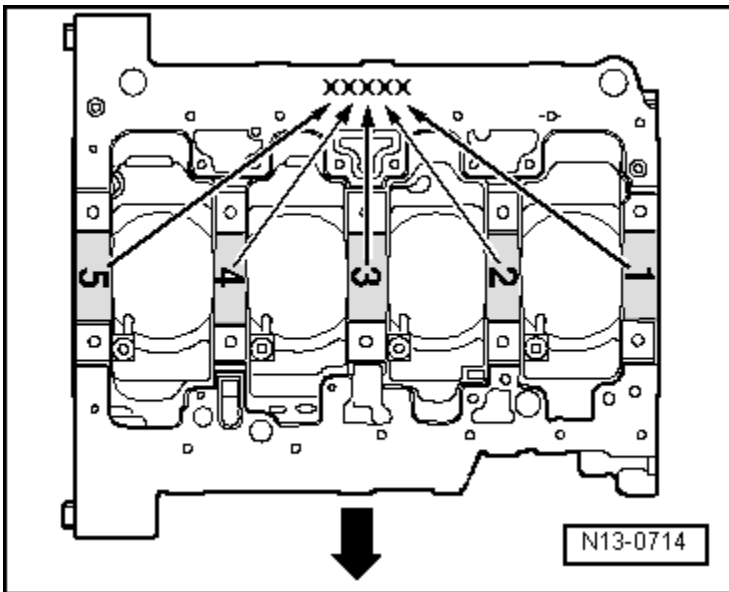
Fastener Tightening Specifications

| Component | Fastener size | Nm |
|--------------------------------|---------------|------------------------------------|
| Bolts/nuts | M6 | 10 |
| | M7 | 15 |
| | M8 | 22 |
| | M10 | 40 |
| | M12 | 65 |
| Exceptions: | | |
| Bracket-to-body | - | 20 plus an additional 90° (¼ turn) |
| Bracket-to-engine mount | - | 20 plus an additional 90° (¼ turn) |
| Engine mount-to-body | - | 40 plus an additional 90° (¼ turn) |
| Engine mount-to-engine support | - | 60 plus an additional 90° (¼ turn) |
| Engine support-to-engine | - | 45 |
| Ground (GND) wire | - | 22 |

¹⁾ Replace fastener(s).

Crankshaft, Cylinder Block – 2.0L CDMA

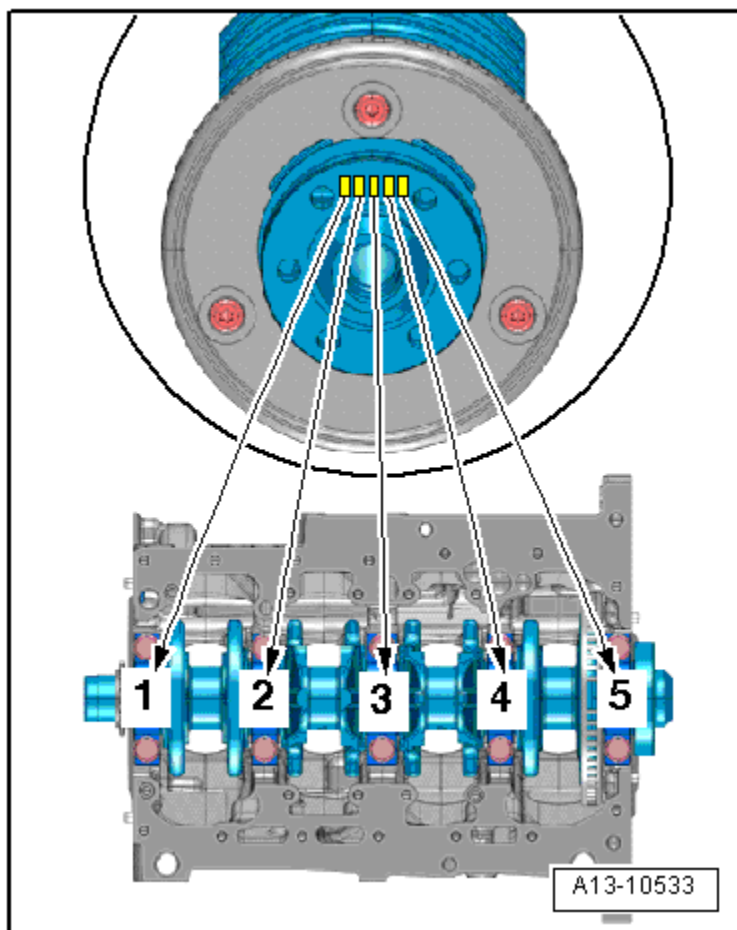
Cylinder Block Bearing Shell Identification



The upper bearing shells with the correct thickness are allocated to the cylinder block in the factory. Colored dots on the sides of the bearing shells identify the bearing shell thickness. The letters marked on the lower sealing surface of the cylinder block identify which bearing thickness must be installed in which location.

| Letter on cylinder block | Color of bearing |
|--------------------------|------------------|
| S | Black |
| R | Red |
| G | Yellow |

Bearing Cover Bearing Shell Identification



The bearing shells with correct thickness are allocated to the bearing cap at the factory. Colored dots on the sides of bearing shells identify bearing shell thickness.

The allocation of the bearing shells for the bearing cover is identified by a series of letters on the crankshaft ribbed belt sprocket flange. The first letter of the row of letters represents bearing 1, the second letter is for bearing 2, and so forth.

| Letter on crankshaft | Color of bearing |
|----------------------|------------------|
| R | Red |
| G | Yellow |
| B | Blue |
| W | White |

Fastener Tightening Specifications

| Component | Nm |
|--|------------------------------------|
| Bearing cap ¹⁾ | 65 plus an additional 90° (¼ turn) |
| Connecting rod bearing cap ¹⁾²⁾ | 45 plus an additional 90° (¼ turn) |
| Dual mass flywheel ¹⁾ | 60 plus an additional 90° (¼ turn) |
| Oil spray jet and pressure relief valve | 27 |
| Ribbed belt tensioning damper | 23 |
| Sensor wheel | 10 plus an additional 90° (¼ turn) |
| Vibration damper ¹⁾ | 10 plus an additional 90° (¼ turn) |

¹⁾ Replace fastener(s).

²⁾ Lubricate threads.

Crankshaft Dimensions

| Reconditioning dimension in mm | Crankshaft bearing pin diameter | | Crankshaft bearing pin diameter | |
|--------------------------------|---------------------------------|------------------|---------------------------------|------------------|
| | | | | |
| Basic dimension | 54.000 | -0.017 -0.037 | 47.800 | -0.022 -0.042 |

Piston Ring End Gaps

| Piston ring dimensions in mm | New | Wear limit |
|------------------------------|--------------|------------|
| Compression ring | 0.20 to 0.40 | 0.80 |
| Oil scraping ring | 0.25 to 0.55 | 0.80 |

Piston Ring Clearance

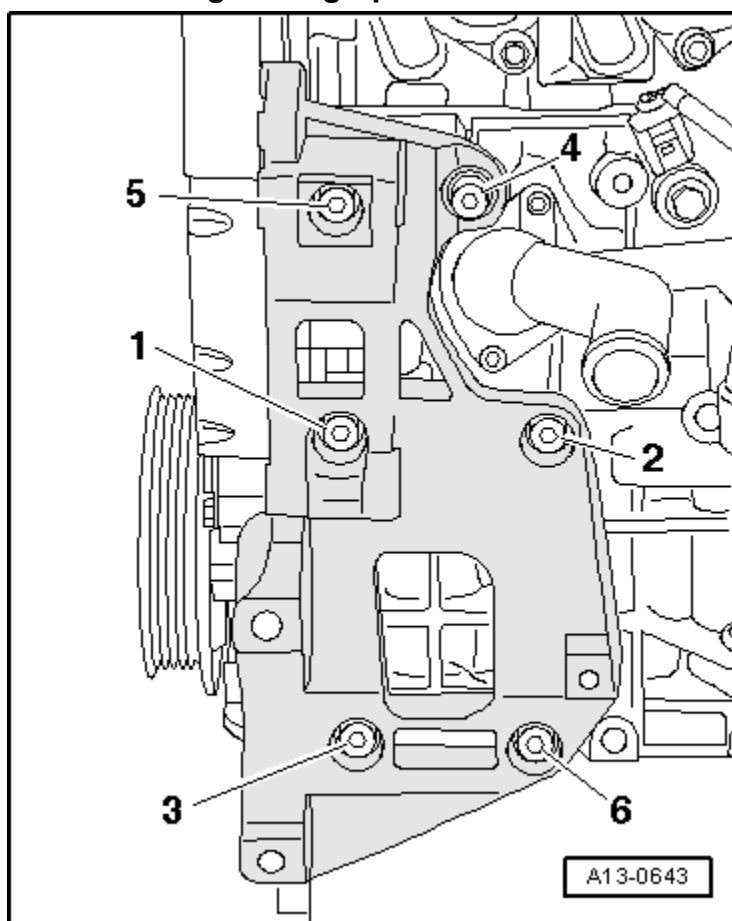
| Piston ring dimensions in mm | New | Wear limit |
|------------------------------|----------------|------------|
| Compression ring | 0.035 to 0.075 | 0.015 |
| Oil scraping ring | 0.03 to 0.06 | 0.15 |

Piston and Cylinder Dimensions

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

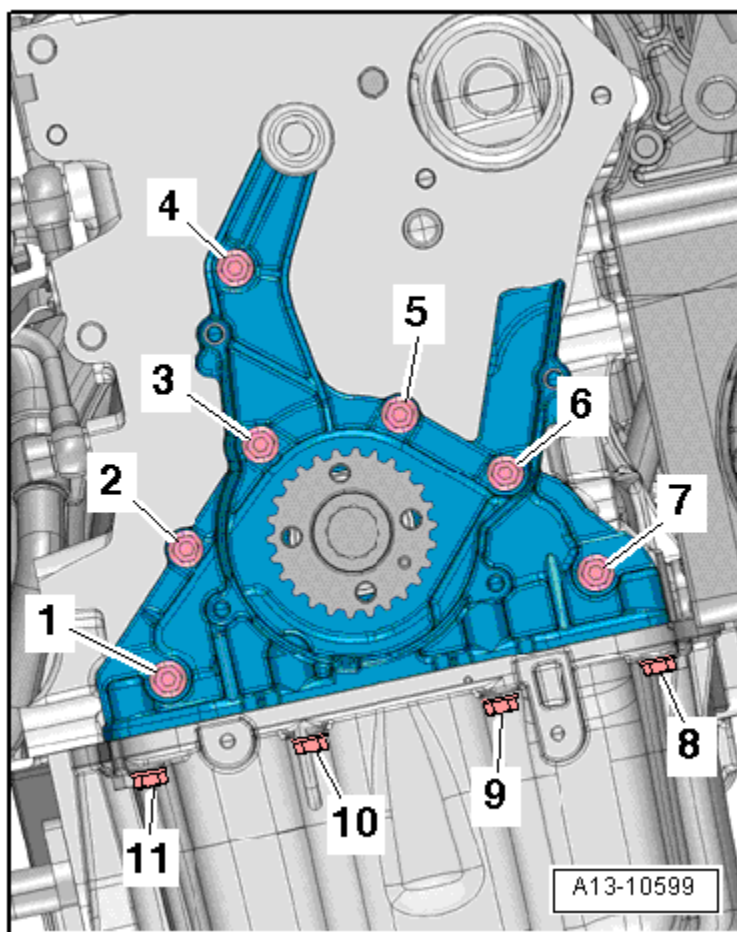
¹⁾ Measurements without graphite coating (thickness = 0.02 mm). The graphite coating wears off.

Accessory Assembly Bracket Tightening Specifications



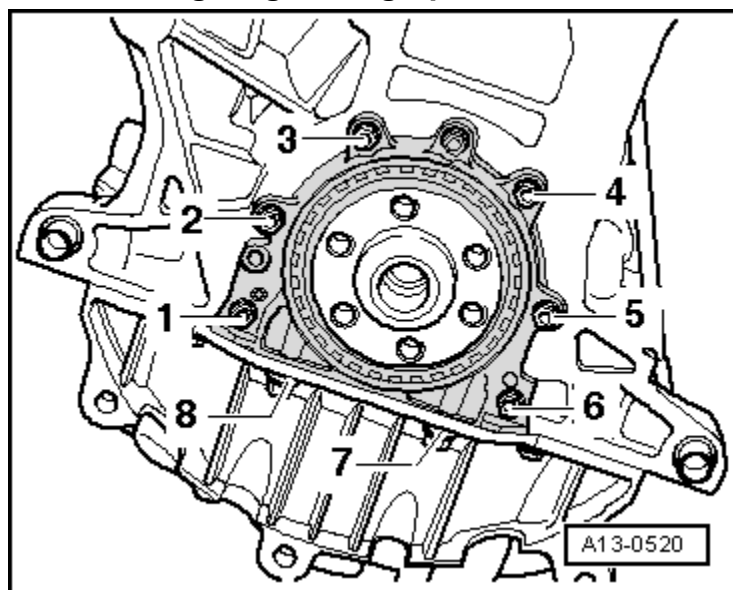
| Step | Component | Nm |
|------|---------------------------------------|--------------|
| 1 | Tighten bolts 1 through 6 in sequence | Hand-tighten |
| 2 | Tighten bolts 1 through 6 in sequence | 40 |

Ribbed Belt Pulley Side Sealing Flange Tightening Specifications



| Step | Component | Nm |
|------|---|--------------|
| 1 | Tighten bolts 1 through 11 in sequence | Hand-tighten |
| 2 | Tighten bolts 1 through 7 in stages and in sequence | 15 |
| 3 | Tighten bolts 8 through 11 in sequence | 15 |

Ribbed Belt Transmission Side Sealing Flange Tightening Specifications



| Step | Component | Nm |
|------|---|--------------|
| 1 | Tighten bolts 1 through 8 in sequence | Hand-tighten |
| 2 | Tighten bolts 1 through 6 in stages and in sequence | 15 |
| 3 | Tighten bolts 7 and 8 in sequence | 15 |

Cylinder Head, Valvetrain – 2.0L CDMA

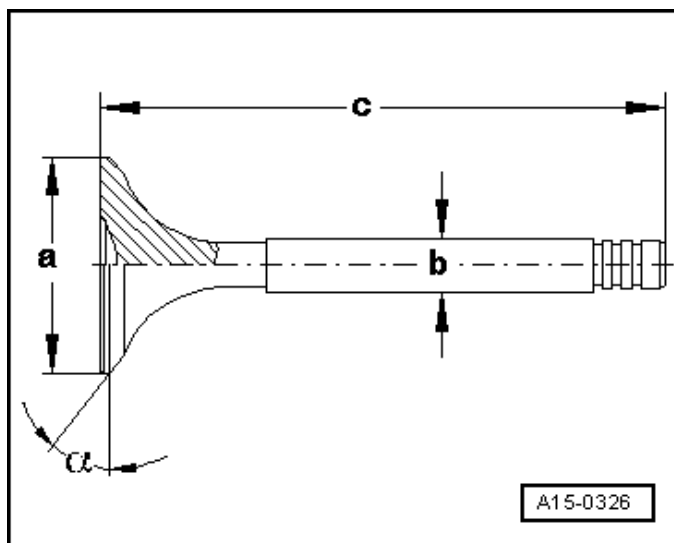
Fastener Tightening Specifications

| Component | Nm |
|--|---|
| Camshaft adjuster ¹⁾ | 20 plus an additional 45° ($\frac{1}{8}$ turn) |
| Camshaft adjustment valve 1 | 4 |
| Camshaft Position (CMP) sensor | 9 |
| Camshaft sprocket ¹⁾ | 50 plus an additional 180° ($\frac{1}{2}$ turn) |
| Chain tensioner ¹⁾ | 9 |
| Coolant pump | 15 |
| Crankshaft toothed belt sprocket ¹⁾ | 90 plus an additional 90° ($\frac{1}{4}$ turn) |
| Damper roller | 23 |
| Drive chain housing | 9 |
| Engine lifting eye | 23 |
| Exhaust manifold threaded pin | 17 |
| Harness mount | 9 |
| Intake manifold threaded pin | 9 |
| Lower toothed belt guard | 9 |
| Pressure regulator valve | 4 |
| Rear toothed belt guard ²⁾ | 9 |
| Tensioning roller nut | 23 |
| Tensioning roller threaded pin | 15 |
| Toothed belt camshaft gear ¹⁾ | 50 plus an additional 180° ($\frac{1}{2}$ turn) |
| Upper toothed belt guard | 9 |

¹⁾ Replace fastener(s).

²⁾ Insert using locking compound, refer to the Electronic Parts Catalog (ETKA).

Valve Dimensions



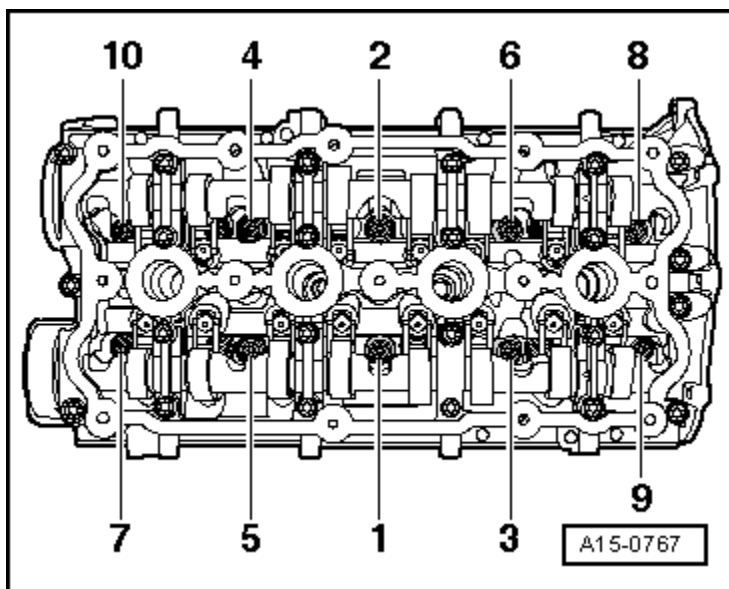
| Dimension | | Intake valve | Exhaust valve |
|------------|----|--------------|---------------|
| Diameter a | mm | 33.85 ± 0.10 | 28.0 ± 0.1 |
| Diameter b | mm | 5.98 ± 0.01 | 5.96 ± 0.01 |
| c | mm | 104.0 ± 0.2 | 101.9 ± 0.2 |
| α | ° | 45 | 45 |

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

Compression Pressures

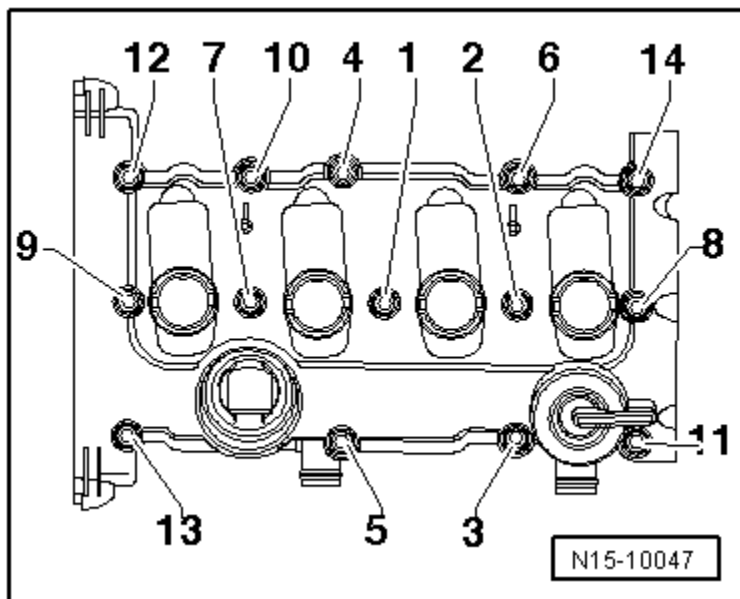
| New Bar positive pressure | Wear limit Bar positive pressure | Difference between cylinders Bar positive pressure |
|---------------------------|----------------------------------|--|
| 10.0 to 14.0 | 7.0 | Maximum 3.0 |

Cylinder Head Tightening Specifications



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

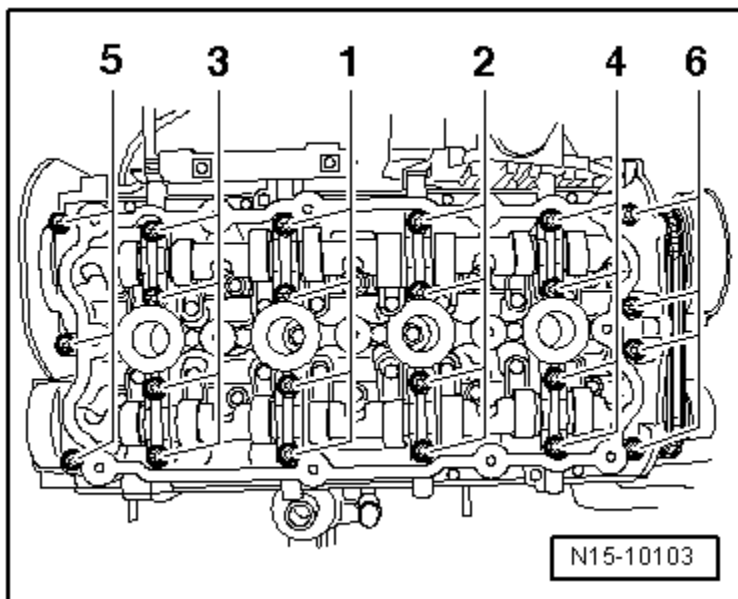
Cylinder Head Cover Tightening Specifications



| Step | Component | Nm |
|------|--|--------------|
| 1 | Tighten bolts 1 through 14 in sequence | Hand-tighten |
| 2 | Tighten bolts 1 through 14 in sequence | 10 |

¹⁾ Replace fastener(s).

Guide Frame Tightening Specifications



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

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

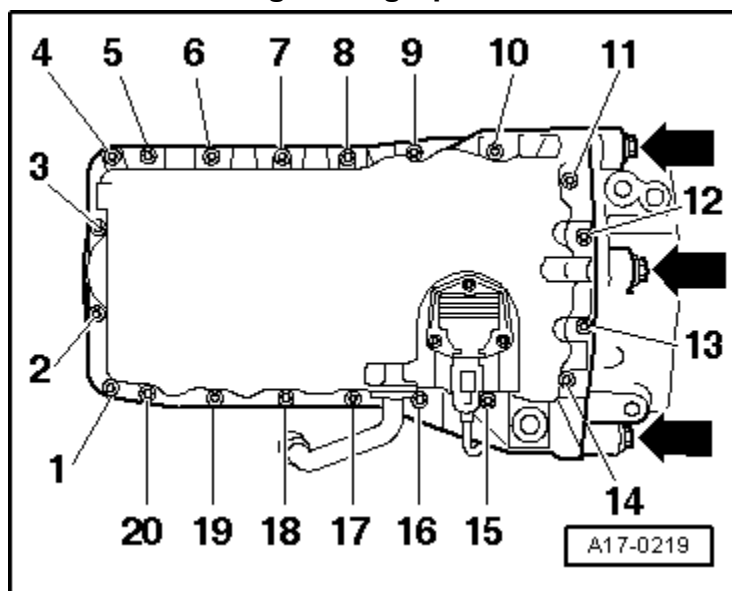
Lubrication – 2.0L CDMA

Fastener Tightening Specifications

| Component | Nm |
|--------------------------------------|------------------------------------|
| Chain sprocket ¹⁾ | 20 plus an additional 90° (¼ turn) |
| Chain tensioner with tensioning rail | 15 |
| Oil baffle | 9 |
| Oil cooler bracket | 15 |
| Oil dipstick guide tube double bolt | 6 |
| Oil drain plug | 30 |
| Oil filter bracket | 15 |
| Oil intake pipe | 8 |
| Oil level thermal sensor | 9 |
| Oil pressure switch | 21 |
| Oil pump cover | 8 |
| Oil return pipe | 9 |

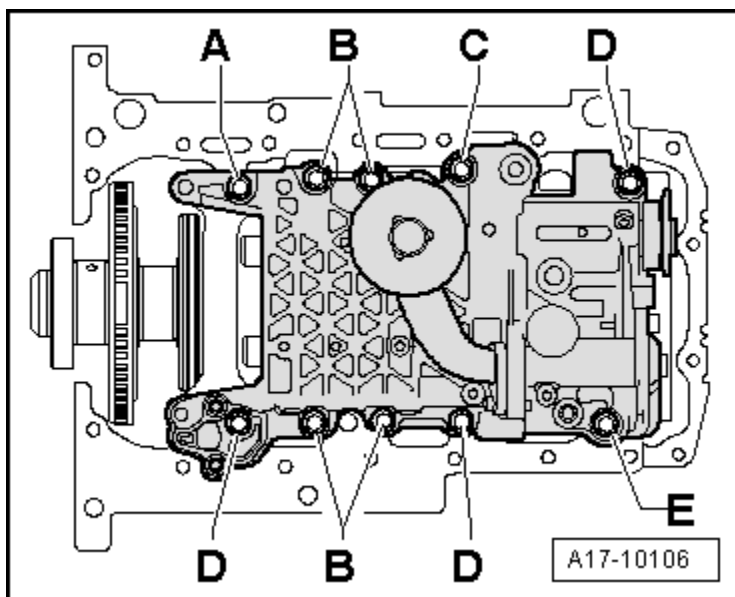
¹⁾ Replace fastener(s).

Oil Pan Tightening Specifications



| Step | Component | Nm |
|------|--|----|
| 1 | Tighten bolts 1 through 20 in sequence | 5 |
| 2 | Tighten bolts (➔) | 40 |
| 3 | Tighten bolts 1 through 20 in sequence | 15 |

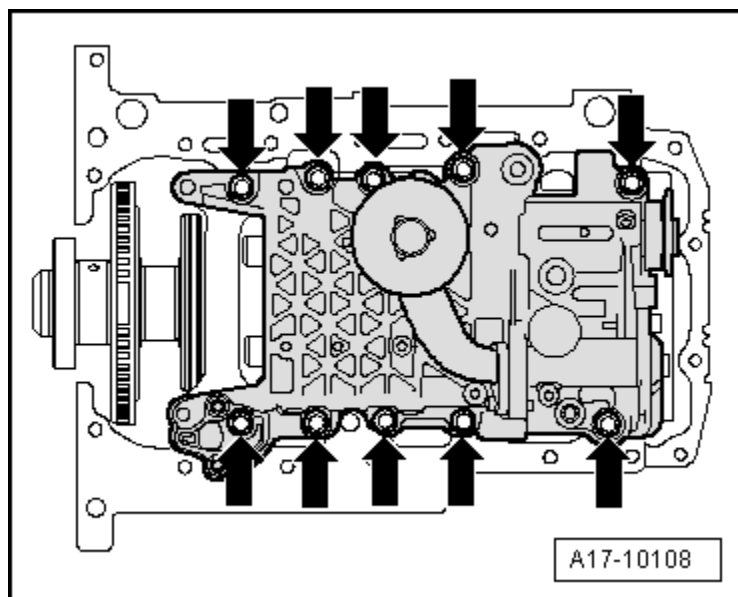
Balance Shaft Housing Bolts



Engine –
2.0L CDMA

| Item | Component | Fastener size |
|------|--------------------------|---------------|
| A | Collar bolt | M7 x 40 |
| B | Collar bolt | M7 x 70 |
| C | Collar bolt | M7 x 90 |
| D | Collar bolt | M7 x 55 |
| E | Sealing plug with O-ring | |

Balance Shaft Housing Tightening Specifications



| Step | Component | Nm |
|------|--|----------------------------|
| 1 | Tighten bolts (➡) in a diagonal sequence | Hand-tighten |
| 2 | Tighten bolts (➡) in a diagonal sequence | 15 |
| 3 | Tighten bolts (➡) in a diagonal sequence | an additional 90° (¼ turn) |

Cooling System – 2.0L CDMA

Fastener Tightening Specifications

| Component | Nm |
|--|----|
| After run coolant pump bracket | 9 |
| After run coolant pump-to-bracket | 4 |
| Coolant connection | 9 |
| Coolant fan nut | 10 |
| Coolant pump | 15 |
| Coolant thermostat with housing | 9 |
| Coolant ventilation line ¹⁾ | 9 |
| | 23 |
| | 40 |
| Fan rib | 5 |
| Front coolant pipe 1 | 9 |
| Front coolant pipe 2 | 9 |
| Radiator | 5 |
| Right front coolant pipe bolt | 6 |
| Right front coolant pipe nut | 9 |

¹⁾ For bolt tightening clarification, refer to ElsaWeb, *Coolant Pipes Overview*, items 3, 4, and 6.

Fuel Supply – 2.0L CDMA

Fastener Tightening Specifications

| Component | Nm |
|--|-----|
| Accelerator pedal module-to-body bolt | 9 |
| Air filter housing-to-bracket bolt | 4 |
| Bracket-to-body nut | 4 |
| Leak Detection Pump (LDP) bracket bolt | 4 |
| Evaporative Emission (EVAP) canister-to-underbody bolt | 8 |
| Fuel filter bracket bolt | 1 |
| Front Wheel Drive (FWD) | |
| Fuel tank filler tube-to-underbody bolt | 11 |
| Fuel tank locking ring | 110 |
| Fuel tank-to-underbody nut | 20 |
| Heat shield-to-fuel tank lock washer | 3 |
| Securing strap-to-underbody nut | 20 |
| All Wheel Drive (AWD) | |
| Fuel tank filler tube-to-underbody bolt | 11 |
| Fuel tank locking ring | 110 |
| Heat shield-to-underbody nut | 23 |
| Securing strap-to-underbody nut | 23 |

Turbocharger, G-Charger – 2.0L CDMA

Fastener Tightening Specifications

| Component | Nm |
|--|----|
| Air guide pipe nut/bolt | 10 |
| Bracket-to-turbocharger ^{5) 6)} | 30 |
| Bracket-to-turbocharger ⁷⁾ | 23 |
| Charge Air Cooler (CAC) bearings | 5 |
| Charge air pressure sensor | 5 |
| Connection | 7 |
| Coolant supply pipe bolt | 23 |
| Coolant supply pipe banjo bolt | 35 |
| Fastening strip ^{1) 2)} | 30 |
| Heat shield | 9 |
| Oil return pipe ³⁾ | 9 |
| Oil return pipe banjo bolt ⁴⁾ | 35 |
| Oil return pipe bolt ⁴⁾ | 9 |
| Oil supply pipe banjo bolt | 30 |
| Oil supply pipe bolt | 9 |
| Ring connection banjo bolt | 8 |
| Turbocharger nut ^{1) 2)} | 21 |
| Turbocharger recirculating valve | 7 |
| Turbocharger vacuum diaphragm bolts ¹⁾ | 9 |
| Turbocharger vacuum diaphragm lock nut ⁸⁾ | 9 |
| Wastegate bypass regulator valve | 3 |

¹⁾ Replace fastener(s).

²⁾ Coat the exhaust manifold threaded pins with hot bolt paste.

³⁾ For bolt tightening clarification, refer to ElsaWeb, *Turbocharger Overview Part II*, items 13, 16 and 18.

⁴⁾ For bolt tightening clarification, refer to ElsaWeb, *Turbocharger Overview Part III*, items 3, 5 and 6.

⁵⁾ For bolt tightening clarification, refer to ElsaWeb, *Turbocharger Overview Part III*, items 8 and 9.

⁶⁾ Insert with hot bolt paste.

⁷⁾ For bolt tightening clarification, refer to ElsaWeb, *Turbocharger Overview Part III*, items 11 and 12.

⁸⁾ Secure with sealing wax after tightening.

Exhaust System – 2.0L CDMA

Fastener Tightening Specifications

| Component | Nm |
|--|----|
| Clamping sleeve nut | 23 |
| Exhaust door valve bolt/nut | 23 |
| Exhaust system bracket nut | 23 |
| Front exhaust pipe with catalytic converter and front muffler ^{1) 2)} | 40 |
| Rear muffler bracket bolt/nut | 23 |
| Suspended mount | 23 |
| Tunnel brace | 23 |

¹⁾ Replace fastener(s).

²⁾ Coat the threaded pin with hot bolt paste.

Fuel Injection and Ignition – 2.0L CDMA

Technical Data

| 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, (is produced by an electric fuel pump in the fuel tank) | Approximately 6.0 Bar positive pressure (same under all operating conditions) |
| | Fuel high pressure (produced by a mechanical single-piston pump) at approximately 85 degree coolant temperature | Approximately 50 Bar positive pressure at idle Approximately 110 Bar positive pressure at certain operating points. |

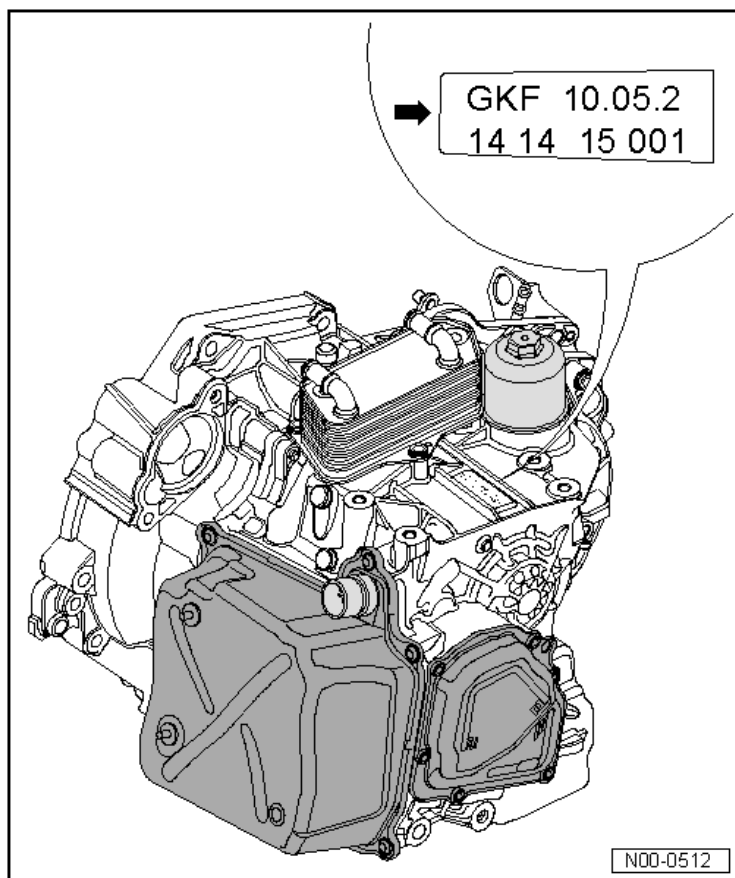
Fastener Tightening Specifications

| Component | Nm |
|--|-----------|
| Air filter housing bracket bolts | 10 |
| Air filter housing bolts | 5 |
| Camshaft Position (CMP) sensor | 10 |
| Front air guide bolt | 2 |
| Fuel pressure sensor | 20 |
| Fuel supply line connection on the fuel rail | 27 |
| Fuel supply line connectors | 30 |
| High pressure pump bolts | 10 |
| Intake Air Temperature (IAT) sensor | 5 |
| Intake Air Temperature (IAT) sensor 2 | 5 |
| Intake flap motor bolts | 7 |
| Intake manifold bolts | 9 |
| Intake manifold support bolt | 23 |
| Knock Sensor (KS) bolts | 20 |
| Low fuel pressure sensor | 15 |
| Mass Air Flow (MAF) sensor | 3 |
| Oxygen Sensors (O2S) | 55 |
| Retaining pin | 10 |
| Spark plug | 30 |
| Throttle valve control module | 7 |

S TRONIC TRANSMISSION – 02E

General, Technical Data

Transmission Identification



The transmission code letters are on top of the transmission near the transmission oil cooler.

Example for above transmission:

- GKF = Transmission code
- 10.05.2 = Production date May 10th, 2002.

The transmission code is also listed on the vehicle data plate.

Code Letters, Transmission Allocations, Ratios and Equipment

| DSG transmission | | 02E AWD | |
|--|--|------------------------------|--------------------------|
| Transmission | Identification codes | KNN | KRF |
| | Month of production | from 06.2008 to 10.2008 | 05.2008 05.2008 |
| Allocation | Model | Audi A4 from MY 2007 | Audi A4 from MY 2007 |
| | Engine | 2.0L TFSI 195 kW | 2.0L TFSI 195 kW |
| Gear Ratios | Final drive I for 1st to 4th gear | 62:13 = 4.769 | 62:13 = 4.769 |
| Z2: Z1 | Final drive II for 5th/6th gear and reverse gear | 62:8 = 3.444 | 62:8 = 3.444 |
| Gear Ratios | 1 st gear | 38:13 = 2.923 | 38:13 = 2.923 |
| | 2 nd gear | 45:23 = 1.957 | 45:23 = 1.957 |
| | 3 rd gear | 35:25 = 1.400 | 35:25 = 1.400 |
| | 4 th gear | 32:31 = 1.032 | 32:31 = 1.032 |
| | 5 th gear | 28:26 = 1.077 | 28:26 = 1.077 |
| | 6 th gear | 27:31 = 0.871 | 27:31 = 0.871 |
| | Reverse gear | 22:14 x 27 13 = 3.264 | 22:14 x 27 13 = 3.264 |
| i total in highest gear | | 3.000 | 3.000 |
| Allocation: rear final drive designation | | Rear final drive 0AV and 0BR | |

Code Letters, Transmission Allocations, Ratios and Equipment (*cont'd*)

| DSG transmission | | | 02E AWD | |
|--|--|---------|------------------------------|--------------------------|
| Transmission | Identification codes | | LRK | LTY |
| | Month of production | from to | 10.2008 11.2009 | 11.2009 06.2010 |
| Allocation | Model | | Audi A4 from MY 2007 | Audi A4 from MY 2007 |
| | Engine | | 2.0L TFSI 195 kW | 2.0L TFSI 195 kW |
| Gear Ratios | Final drive I for 1st to 4th gear | | 62:13 = 4.769 | 62:13 = 4.769 |
| Z2: Z1 | Final drive II for 5th/6th gear and reverse gear | | 62:8 = 3.444 | 62:8 = 3.444 |
| Gear Ratios | 1 st gear | | 38:13 = 2.923 | 38:13 = 2.923 |
| | 2 nd gear | | 45:23 = 1.957 | 45:23 = 1.957 |
| | 3 rd gear | | 35:25 = 1.400 | 35:25 = 1.400 |
| | 4 th gear | | 32:31 = 1.032 | 32:31 = 1.032 |
| | 5 th gear | | 28:26 = 1.077 | 28:26 = 1.077 |
| | 6 th gear | | 27:31 = 0.871 | 27:31 = 0.871 |
| | Reverse gear | | 22:14 x 27 13 = 3.264 | 22:14 x 27 13 = 3.264 |
| i total in highest gear | | | 3.000 | 3.000 |
| Allocation: rear final drive designation | | | Rear final drive 0AV and 0BR | |

Code Letters, Transmission Allocations, Ratios and Equipment (cont'd)

| DSG transmission | | 02E AWD | | |
|--|--|---------|------------------------------|--------------------------|
| Transmission | Identification codes | | MMF | MTY |
| | Month of production | from to | 05.2010 11.2010 | 11.2010 05.2011 |
| Allocation | Model | | Audi A4 from MY 2007 | Audi A4 from MY 2007 |
| | Engine | | 2.0L TFSI 195 kW | 2.0L TFSI 155 kW |
| Gear Ratios | Final drive I for 1st to 4th gear | | 62:13 = 4.769 | 62:13 = 4.769 |
| Z2: Z1 | Final drive II for 5th/6th gear and reverse gear | | 62:8 = 3.444 | 62:8 = 3.444 |
| Gear Ratios | 1 st gear | | 38:13 = 2.923 | 38:13 = 2.923 |
| | 2 nd gear | | 45:23 = 1.957 | 43:24 = 1.792 |
| | 3 rd gear | | 35:25 = 1.400 | 32:27 = 1.185 |
| | 4 th gear | | 32:31 = 1.032 | 29:35 = 0.829 |
| | 5 th gear | | 28:26 = 1.077 | 25:29 = 0.862 |
| | 6 th gear | | 27:31 = 0.871 | 24:35 = 0.686 |
| | Reverse gear | | 22:14 x 27 13 = 3.264 | 22:14 x 27 13 = 3.264 |
| i total in highest gear | | | 3.000 | 3.000 |
| Allocation: rear final drive designation | | | Rear final drive 0AV and 0BR | |

S tronic Trans. – 02E

Code Letters, Transmission Allocations, Ratios and Equipment (*cont'd*)

| DSG transmission | | | 02E AWD | |
|--|--|---------|------------------------------|--------------------------|
| Transmission | Identification codes | | NJB | NJE |
| | Month of production | from to | 05.2011 11.2011 | 05.2011 11.2011 |
| Allocation | Model | | Audi A4 from MY 2007 | Audi A4 from MY 2007 |
| | Engine | | 2.0L TFSI 155 kW | 2.0L TFSI 195 kW |
| Gear Ratios | Final drive I for 1st to 4th gear | | 62:13 = 4.769 | 62:13 = 4.769 |
| Z2: Z1 | Final drive II for 5th/6th gear and reverse gear | | 62:8 = 3.444 | 62:8 = 3.444 |
| Gear Ratios | 1 st gear | | 38:13 = 2.923 | 38:13 = 2.923 |
| | 2 nd gear | | 43:24 = 1.792 | 45:23 = 1.957 |
| | 3 rd gear | | 32:27 = 1.185 | 35:25 = 1.400 |
| | 4 th gear | | 29:35 = 0.829 | 32:31 = 1.032 |
| | 5 th gear | | 25:29 = 0.862 | 28:26 = 1.077 |
| | 6 th gear | | 24:35 = 0.686 | 27:31 = 0.871 |
| | Reverse gear | | 22:14 x 27 13 = 3.264 | 22:14 x 27 13 = 3.264 |
| i total in highest gear | | | 3.000 | 3.000 |
| Allocation: rear final drive designation | | | Rear final drive 0AV and 0BR | |

Code Letters, Transmission Allocations, Ratios and Equipment (cont'd)

| DSG transmission | | | 02E AWD | |
|--|--|---------|------------------------------|--------------------------|
| Transmission | Identification codes | | NMA | NMB |
| | Month of production | from to | 11.2011 05.2012 | 11.2011 05.2012 |
| Allocation | Model | | Audi A4 from MY 2007 | Audi A4 from MY 2007 |
| | Engine | | 2.0L TFSI 195 kW | 2.0L TFSI 195 kW |
| Gear Ratios | Final drive I for 1st to 4th gear | | 62:13 = 4.769 | 62:13 = 4.769 |
| Z2: Z1 | Final drive II for 5th/6th gear and reverse gear | | 62:8 = 3.444 | 62:8 = 3.444 |
| Gear Ratios | 1 st gear | | 38:13 = 2.923 | 38:13 = 2.923 |
| | 2 nd gear | | 45:23 = 1.957 | 43:24 = 1.792 |
| | 3 rd gear | | 35:25 = 1.400 | 32:27 = 1.185 |
| | 4 th gear | | 32:31 = 1.032 | 29:35 = 0.829 |
| | 5 th gear | | 28:26 = 1.077 | 25:29 = 0.862 |
| | 6 th gear | | 27:31 = 0.871 | 24:35 = 0.686 |
| | Reverse gear | | 22:14 x 27 13 = 3.264 | 22:14 x 27 13 = 3.264 |
| i total in highest gear | | | 3.000 | 3.000 |
| Allocation: rear final drive designation | | | Rear final drive 0AV and 0BR | |

S tronic Trans. – 02E

Code Letters, Transmission Allocations, Ratios and Equipment (*cont'd*)

| DSG transmission | | 02E AWD | | |
|--|--|------------------------------|-----------------------|-----------------------|
| Transmission | Identification codes | | PBU | PBV |
| | Month of production | from to | 05.2012 | 05.2012 |
| Allocation | Model | | Audi A4 from MY 2007 | Audi A4 from MY 2007 |
| | Engine | | 2.0L TFSI 195 kW | 2.0L TFSI 155 kW |
| Gear Ratios | Final drive I for 1st to 4th gear | | 62:13 = 4.769 | 62:13 = 4.769 |
| Z2: Z1 | Final drive II for 5th/6th gear and reverse gear | | 62:8 = 3.444 | 62:8 = 3.444 |
| Gear Ratios | 1 st gear | | 38:13 = 2.923 | 38:13 = 2.923 |
| | 2 nd gear | | 45:23 = 1.957 | 43:24 = 1.792 |
| | 3 rd gear | | 35:25 = 1.400 | 32:27 = 1.185 |
| | 4 th gear | | 32:31 = 1.032 | 29:35 = 0.829 |
| | 5 th gear | | 28:26 = 1.077 | 25:29 = 0.862 |
| | 6 th gear | | 27:31 = 0.871 | 24:35 = 0.686 |
| | Reverse gear | | 22:14 x 27 13 = 3.264 | 22:14 x 27 13 = 3.264 |
| i total in highest gear | | 3.000 | 3.000 | |
| Allocation: rear final drive designation | | Rear final drive 0AV and 0BR | | |

Controls, Housing – 02E

Fastener Tightening Specifications

| Component | Nm |
|--|------------------------------------|
| Bracket or selector lever cable ¹⁾²⁾ | 20 plus an additional 90° (¼ turn) |
| Disengaging spring ²⁾ | 3.5 |
| Locking plate ²⁾ | 3.5 |
| Overflow tube | 3 |
| Selector lever boot trim with selector lever scale illumination bulb ²⁾ | 1 |
| Selector lever cable ²⁾ | 13 |
| Selector lever cable adjusting screw ³⁾ | 15 |
| Selector mechanism function unit nut ²⁾ | 8 |
| Selector mechanism shift unit nut ¹⁾²⁾ | 9 |

| Component | Nm |
|--|--|
| Selector mechanism-to-body nut ³⁾ | 8 |
| Transmission oil filter housing | 20 |
| Pendulum support ^{1) 4)} | |
| -To transmission | 50 plus an additional 90° (¼ turn) |
| -To subframe | 100 plus an additional 90° (¼ turn) |
| Transmission fluid check plug | 45 |
| Transmission fluid drain plug | 45 |
| Transmission input speed sensor and clutch oil temperature sensor bolt | 10 |
| Transmission mount with support arm ¹⁾ | |
| -Transmission mount-to-chassis | 40 plus an additional 90° (¼ turn) |
| -Transmission mount-to-transmission support | 60 plus an additional 90° (¼ turn) |
| Transmission oil cooler ¹⁾ | 20 plus an additional 45° (½ turn) |
| Transmission oil pump cover | 8 |
| Transmission support-to-transmission ¹⁾ | 40 plus an additional 90° (¼ turn) |

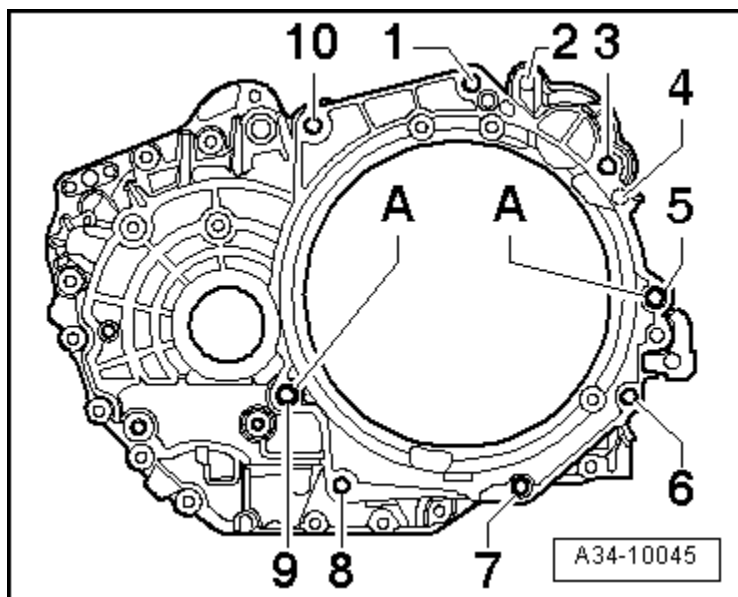
¹⁾ Replace fastener(s).

²⁾ Through 11.2009.

³⁾ From 11.2009.

⁴⁾ For bolt tightening clarification, refer to ElsaWeb, *Subframe Mount Overview*, items 2 and 13.

Transmission to Engine Tightening Specifications



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

¹⁾ The bolt is only accessible through the starter opening with the starter removed.

²⁾ Starter mount.

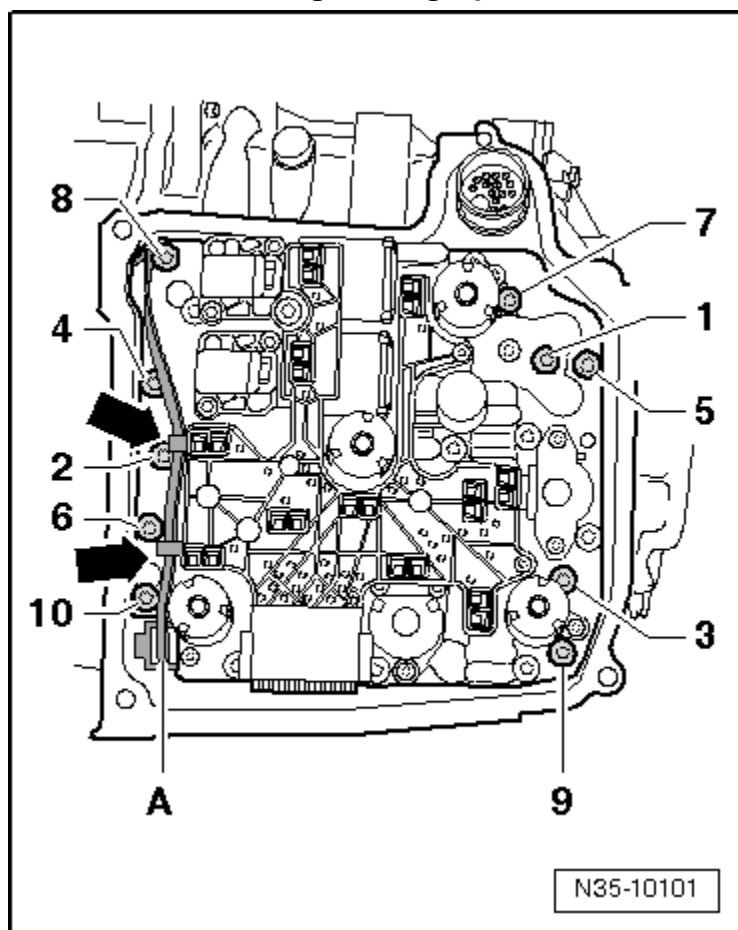
Gears, Shafts – 02E

Fastener Tightening Specifications

| Component | Nm |
|---|-----------------------------------|
| Guard plate | 32 |
| Transmission input speed sensor | 10 |
| Oil pan ¹⁾ | 16 |
| Transmission oil pump | |
| - Countersunk bolts | 8 |
| - Flat head bolts | 8 plus an additional 90° (¼ turn) |
| Transmission oil pump cover ¹⁾ | 8 |

¹⁾ Tighten the bolts diagonally

Mechatronic Tightening Specifications



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

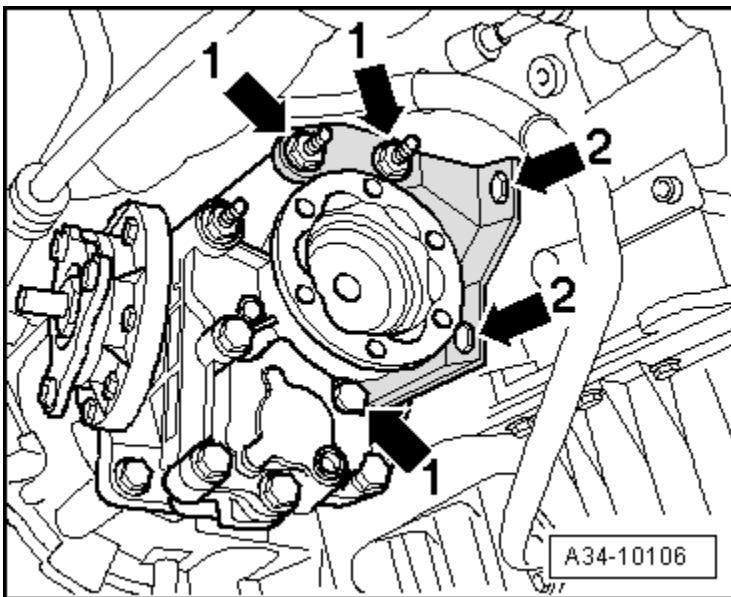
Rear Final Drive, Differential – 02E

Fastener Tightening Specifications

| Component | Nm |
|--|--|
| Bevel box output flange ¹⁾ | 480 |
| Bevel box to transmission ¹⁾ | 40 plus an additional 90° ($\frac{1}{8}$ turn) |
| Drain plug for bevel box oil filler hole ¹⁾ | 15 |
| Gearshift lever, nut | 20 |
| Left flange shaft ¹⁾ | 30 |
| Oil drain plug for bevel box | 60 |
| Right drive axle heat shield | 25 |
| Right flange shaft ¹⁾ | 30 |

¹⁾ Replace

Bevel Box Bracket for Vehicles with 2.0L TFSI Tightening Specifications

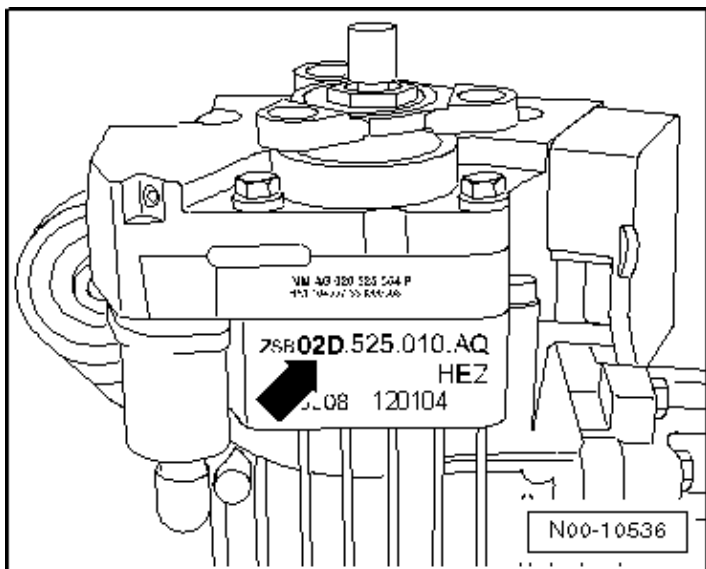


| Step | Component | Nm |
|------|-----------------|--------------|
| 1 | Tighten bolts 1 | Hand-tighten |
| 2 | Tighten bolts 2 | 40 |
| 3 | Tighten bolts 1 | 40 |

REAR FINAL DRIVE – 02D, 0AV, 0BR, 0BS, 0BY

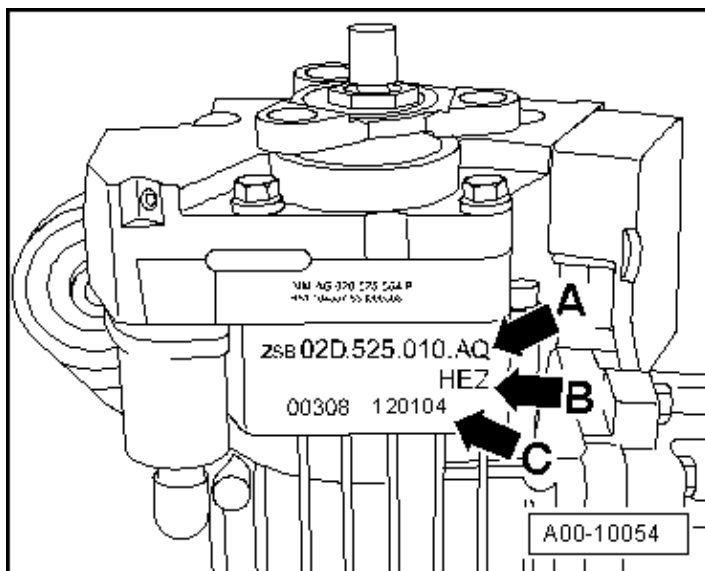
General, Technical Data

Rear Final Drive 02D Identification



The identification (➡) on the bottom side of the final drive identifies which final drive is installed.

Example of Identifications on A Rear Final Drive "02D"



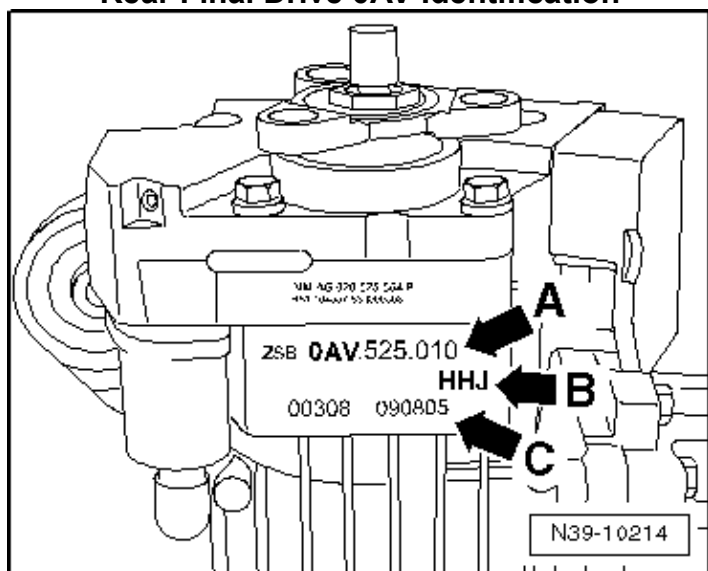
Rear final drive 0BR or 0BY

- Arrow A- final drive part number
- Arrow B- final drive code letters
- Arrow C- Final drive build date

| | | | | |
|-----------------------|--------------|-----------|-----------|-------------------------|
| 02D.525.010.AQ | HEZ | 12 | 01 | 04 |
| Part Number | Code Letters | Day | Month | Production Year 2004 |

**Rear Final Drive 02D
0AV, 0BR, 0BS, 0BY**

Rear Final Drive 0AV Identification

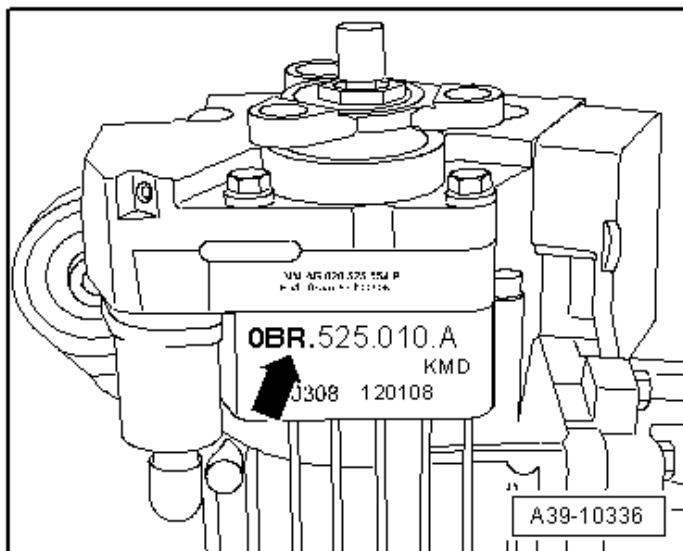


If there are no code letters present, then use the part number for the allocation. Refer to the Parts Catalog.

- Arrow A- final drive part number
- Arrow B- final drive code letters
- Arrow C- Final drive build date

| | | | |
|--------------|-----------|-----------|----------------------|
| HHJ | 09 | 08 | 05 |
| Code Letters | Day | Month | Production Year 2005 |

Rear Final Drive 0BR or 0BY Identification

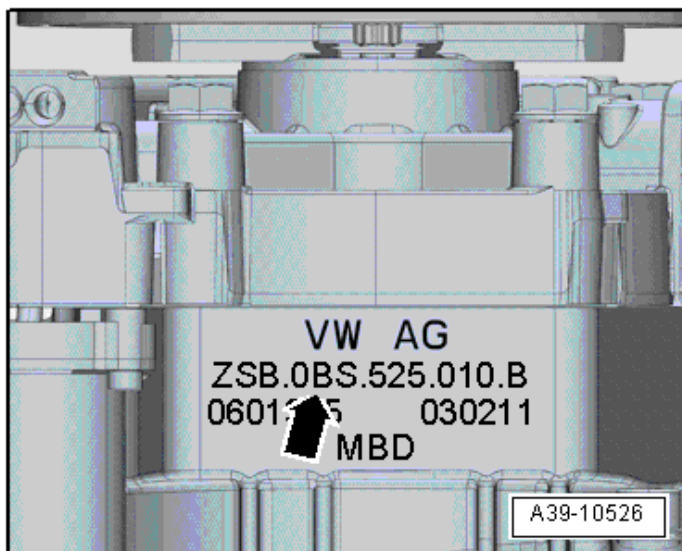


Rear final drive 0BR or 0BY

The identification (➔) on the bottom side of the final drive identifies which final drive is installed.

Rear Final Drive 02D
0AV, 0BR, 0BS, 0BY

Rear Final Drive OBS Identification



The identification (➡) on the bottom side of the final drive identifies which final drive is installed.

Rear Final Drive Transmission Allocations, Ratios, Capacities

| Rear Final Drive 0BR with Haldex Clutch Generation IV | | | |
|--|------------------|-----------------------------------|----------------------|
| Part number | | 0BR.525.010 | 0BR.525.010.A |
| Identification codes | | KMC | KMD |
| Manufactured | from | 01.2008 | 01.2008 |
| | through | | - |
| Allocation | Type | Audi TT from MY 2007 | Audi TT from MY 2007 |
| | Engine | 2.0L - 195 kW TFSI | 2.0L - 195 kW TFSI |
| Ratio: $Z_2 : Z_1$ | Rear final drive | 27:17 = 1.588 | 27:17 = 1.588 |
| Driveshaft flange diameter (mm) | | 100 | 100 |
| Final drive capacity | | Fluid Capacity Tables; Rep. Gr.03 | |
| Haldex clutch capacity | | Fluid Capacity Tables; Rep. Gr.03 | |

| Rear Final Drive 0BR with Haldex Clutch Generation IV | | | |
|--|------------------|--|--|
| Part number | | 0BR.525.010.B | 0BR.525.010.C |
| Identification codes | | MMK | MML |
| Manufactured | from | 11.2009 | 10.2009 |
| | through | | |
| Allocation | Type | Audi TT from MY 2007 | Audi TT from MY 2007 |
| | Engine | 2.0L - 155 kW TFSI 2.0L - 195 kW TFSI | 2.0L - 155 kW TFSI 2.0L - 195 kW TFSI |
| Ratio: $Z_2: Z_1$ | Rear final drive | 27:17 = 1.588 | 27:17 = 1.588 |
| Driveshaft flange diameter (mm) | | 100 | 100 |
| Final drive capacity | | Fluid Capacity Tables; Rep. Gr.03 | |
| Haldex clutch capacity | | Fluid Capacity Tables; Rep. Gr.03 | |
| Replacement capacity in Haldex clutch | | Fluid Capacity Tables; Rep. Gr.03 | |

| Rear Final Drive 0BY With Haldex Clutch Generation IV | | | |
|--|------------------|-----------------------------------|----------------------|
| Part number | | 0BY.525.010 | 0BY.525.010.A |
| Identification codes | | LEK | MBE |
| Manufactured | from | 01.2009 | 09.2009 |
| | through | | |
| Allocation | Type | Audi TT RS from 2007 | Audi TT RS from 2011 |
| | Engine | 2.5L - 250 kW TFSI | 2.5L - 250 kW TFSI |
| Ratio: $Z_2: Z_1$ | Rear final drive | 27:17 = 1.588 | 27:17 = 1.588 |
| Driveshaft flange diameter (mm) | | 100 | 100 |
| Final drive capacity | | Fluid Capacity Tables; Rep. Gr.03 | |
| Haldex clutch capacity | | Fluid Capacity Tables; Rep. Gr.03 | |
| Replacement capacity in Haldex clutch | | Fluid Capacity Tables; Rep. Gr.03 | |

The following information can be found in the Parts Catalog

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

**Rear Final Drive 02D
0AV, 0BR, 0BS, 0BY**

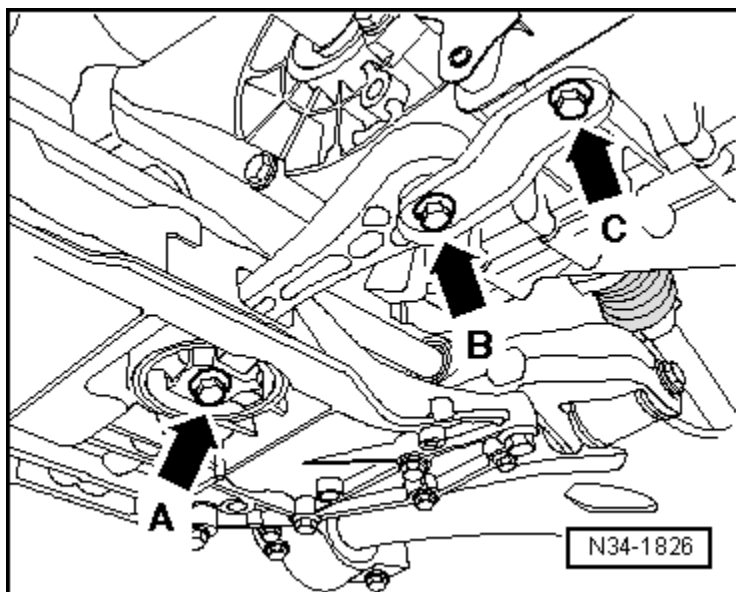
Fastener Tightening Specifications

| Component | Fastener size | Nm |
|--|---------------|------------------------------------|
| All wheel drive control module-to-rear final drive | - | 6 |
| Buffer-to-rear final drive ¹⁾ | - | 60 plus an additional 90° (¼ turn) |
| Cover for oil filter housing | - | 50 |
| Cover to Haldex clutch housing | - | 35 |
| Cross member-to-underbody | - | 23 |
| Drain plug for Haldex clutch pump | | 30 |
| Driveshaft-to-bevel box | - | 60 |
| Flange-to-driveshaft nut ²⁾ | - | 210 |
| Flange-to-rear driveshaft tube | - | 45 |
| Flexible disc with a heat shield-to-front driveshaft tube ¹⁾ | - | 50 plus an additional 90° (¼ turn) |
| Flexible disc with a heat shield-to-manual transmission with bevel box | - | 60 |
| Flexible disc with vibration damper to rear driveshaft | - | 60 |
| Flexible disc with vibration damper-to-rear driveshaft tube balance nut | - | 10 |
| Flexible disc with vibration damper-to-rear driveshaft tube bolt ¹⁾ | - | 50 plus an additional 90° (¼ turn) |
| Flexible disc with vibration damper-to-rear final drive | - | 60 |
| Front flexible disc ¹⁾ | - | 50 plus an additional 90° (¼ turn) |
| Haldex clutch housing | - | 50 |
| Haldex clutch pump-to-Haldex clutch housing | - | 6 |
| Haldex clutch-to-rear final drive | - | 50 |
| Intermediate bearing heat shield | - | 25 |
| Lock plate-to-Constant Velocity (CV) joint protective boot | - | 40 |
| Manual transmission with bevel gear transfer case ¹⁾ | - | 50 plus an additional 90° (¼ turn) |
| Oil filler plug (Haldex Clutch) | - | 15 |
| Oil filler plug | M10 x 1 | 15 |
| Oil filler plug | M20 x 1 | 40 |

¹⁾ Replace fastener(s).

²⁾ Secure with locking fluid -D 000 600-.

Pendulum Support First to Transmission Tightening Specifications



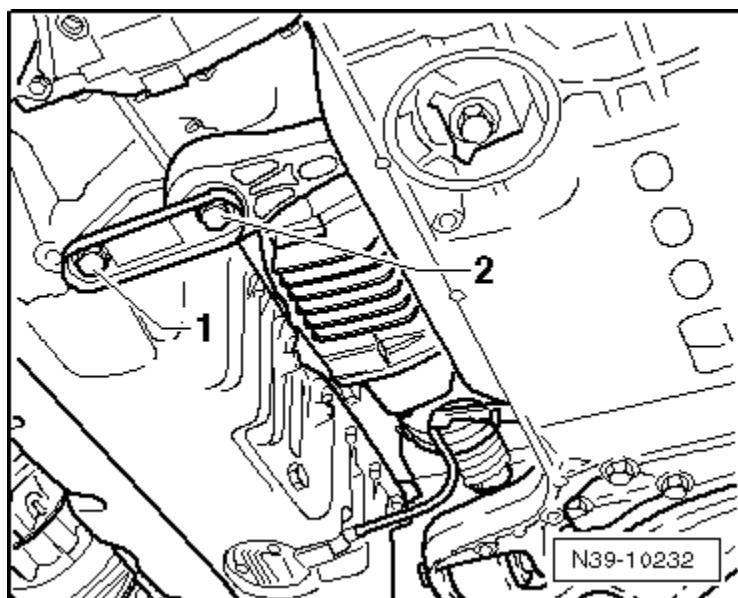
Tighten pendulum support first to transmission -arrows B and C- and then to subframe -arrow A-.

| Step | Component | Nm |
|---------------------|-------------------------------|-------------------------------------|
| Pendulum support to | Transmission -arrows B and C- | 40 plus an additional 90° (¼ turn) |
| | Subframe -arrow A- | 100 plus an additional 90° (¼ turn) |

¹⁾ Replace fastener(s).

Rear Final Drive 02D
0AV, 0BR, 0BS, 0BY

Pendulum Support to Transmission Tightening Specifications



| Step | Component | Nm |
|---------------------|------------------|------------------------------------|
| Pendulum support to | Transmission -1- | 40 plus an additional 90° (¼ turn) |
| | Transmission -2- | 40 plus an additional 90° (¼ turn) |

¹⁾ Replace fastener(s).

SUSPENSION, WHEELS, STEERING

General, Technical data

Chassis

| Front and All Wheel Drive | | |
|--------------------------------------|----|--|
| Front suspension | - | McPherson struts with lower transverse link subframe stabilizer bar. |
| Rear suspension | - | Four-link suspension with separate spring-shock absorber configuration tubular stabilizer. |
| Wheelbase | mm | 2467 |
| Front/rear track width ¹⁾ | mm | 1572/1558 |

¹⁾ Front/rear track width only applicable with 225/55/R16 tires on 7.5Jx16 ET 45 rims.

Steering

| 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 meters |

Front Suspension

Fastener Tightening Specifications

| Component | Fastener size | Nm |
|---|---------------|--------------------------------------|
| ABS wheel speed sensor-to-wheel bearing housing bolt | - | 8 |
| Ball joint-to-transverse link nut ¹⁾ | - | 40 plus an additional 45° (1/8 turn) |
| Ball joint-to-wheel bearing housing nut ¹⁾ | - | 20 plus an additional 90° (1/4 turn) |
| Brake disc-to-wheel hub bolt | - | 4 |
| Coupling rod-to-stabilizer bar nut ¹⁾ | - | 65 |
| Coupling rod-to-suspension strut nut ¹⁾ | - | 65 |
| Cover plate-to-wheel bearing housing bolt | - | 10 |

Suspension,
Wheels, Steering

Fastener Tightening Specifications (cont'd)

| Component | Fastener size | Nm |
|---|---------------|--------------------------------------|
| Drive axle-to-transmission bolt ¹⁾⁵⁾⁶⁾ | M8 | 40 |
| | M10 | 70 |
| Drive axle to wheel hub bolt ¹⁾ | | |
| - Hex bolt | - | 200 plus an additional 180° (½ turn) |
| - 12-point bolt with ribs | - | 70 plus an additional 90° (¼ turn) |
| - 12-point bolt without ribs | - | 200 plus an additional 180° (½ turn) |
| Level control system sensor-to-subframe bolt | - | 9 |
| Level control system sensor-to-transverse link nut | - | 9 |
| Lower bonded rubber bushing for pendulum support-to-subframe bolt ¹⁾³⁾ | - | 100 plus an additional 90° (¼ turn) |
| Shock absorber-to-suspension strut bearing nut ¹⁾ | - | 60 |
| Stabilizer bar-to-subframe bolt ¹⁾ | - | 20 plus an additional 90° (¼ turn) |
| Subframe-to-body bolt ¹⁾ | - | 70 plus an additional 90° (¼ turn) |
| Suspension strut-to-suspension strut dome bolt ¹⁾ | - | 15 plus an additional 90° (¼ turn) |
| Suspension strut-to-wheel bearing housing bolt ¹⁾⁴⁾ | - | 70 plus an additional 90° (¼ turn) |
| Tie rod end-to-wheel bearing housing nut ¹⁾ | - | 20 plus an additional 90° (¼ turn) |
| Transverse link mounting bracket-to-body bolt ¹⁾ | - | 70 plus an additional 90° (¼ turn) |
| Transverse link mounting bracket-to-subframe bolt ¹⁾ | - | 50 plus an additional 90° (¼ turn) |

| Component | Fastener size | Nm |
|---|---------------|-------------------------------------|
| Transverse link-to-subframe bolt ^{1) 2)} | - | 70 plus an additional 180° (½ turn) |
| Wheel hub-to-wheel bearing housing bolt ¹⁾ | - | 70 plus an additional 90° (¼ turn) |

¹⁾ Replace fastener(s).

²⁾ Tighten in the curb weight position.

³⁾ Only tighten when pendulum support is bolted to transmission.

⁴⁾ Bolt point must face in direction of travel.

⁵⁾ Pre-tighten diagonally to 10 Nm.

⁶⁾ Tighten diagonally.

Rear Suspension

Fastener Tightening Specifications

| Component | Fastener size | Nm |
|---|---------------|--------------------------------------|
| Brake disc-to-wheel hub bolt | - | 4 |
| Coupling rod-to-stabilizer bar nut | - | 40 |
| Coupling rod-to-wheel bearing housing nut | - | 25 |
| Cover plate-to-wheel bearing housing bolt | - | 10 |
| Cross member brace bolt (Roadster, AWD) | - | 40 |
| Cross member -to-subframe nut (Coupe, AWD) | - | 50 plus an additional 180° (½ turn) |
| Drive axle-to-rear final drive bolt ^{1) 3)} | M8 | 40 |
| | M10 | 70 |
| Drive axle to wheel hub bolt (AWD) ¹⁾ | | |
| - Hex bolt | - | 200 plus an additional 180° (½ turn) |
| - 12-point bolt with ribs | - | 70 plus an additional 90° (¼ turn) |
| - 12-point bolt without ribs | - | 200 plus an additional 180° (½ turn) |
| Diagonal brace bolt (Roadster, AWD) ¹⁾ | - | 40 plus an additional 45° (⅛ turn) |

Fastener Tightening Specifications (cont'd)

| Component | Fastener size | Nm |
|---|---------------|---|
| Diagonal brace bolt (Roadster, FWD) ¹⁾ | - | 40 plus an additional 45° ($\frac{1}{8}$ turn) |
| | - | 90 plus an additional 45° ($\frac{1}{8}$ turn) |
| Level control system sensor bolt | - | 5 |
| Lower transverse link-to-subframe nut ¹⁾²⁾ | - | 95 |
| Lower transverse link-to-wheel bearing housing nut ¹⁾²⁾ | - | 90 plus an additional 90° ($\frac{1}{4}$ turn) |
| Shock absorber-to-body bolt ¹⁾ | - | 50 plus an additional 45° ($\frac{1}{8}$ turn) |
| Shock absorber-to-shock absorber mounting nut ¹⁾ | - | 25 |
| Shock absorber-to-wheel bearing housing bolt | - | 180 |
| Stabilizer bar-to-body bolt ¹⁾ | - | 25 plus an additional 90° ($\frac{1}{4}$ turn) |
| Subframe-to-body bolt ¹⁾ | - | 90 plus an additional 90° ($\frac{1}{4}$ turn) |
| Tie rod-to-subframe nut ¹⁾²⁾ | - | 90 plus an additional 90° ($\frac{1}{4}$ turn) |
| Tie rod-to-wheel bearing housing bolt ¹⁾²⁾ | - | 130 plus an additional 90° ($\frac{1}{4}$ turn) |
| Trailing arm mounting bracket-to-body bolt ¹⁾ | - | 50 plus an additional 45° ($\frac{1}{8}$ turn) |
| Trailing arm-to-mounting bracket bolt ¹⁾ | - | 90 plus an additional 90° ($\frac{1}{4}$ turn) |
| Trailing arm-to-wheel bearing housing bolt ¹⁾ | - | 90 plus an additional 45° ($\frac{1}{8}$ turn) |
| Upper transverse link-to-subframe nut ¹⁾²⁾ | - | 95 |
| Upper transverse link-to-wheel bearing housing bolt ¹⁾²⁾ | - | 130 plus an additional 90° ($\frac{1}{4}$ turn) |

| Component | Fastener size | Nm |
|--|---------------|--------------------------------------|
| Wheel bearing unit-to-wheel bearing housing bolt ¹⁾ | - | 70 plus an additional 90° (¼ turn) |
| Wheel hub-to-wheel bearing housing bolt (FWD) ¹⁾ | - | 200 plus an additional 180° (½ turn) |
| Wheel speed sensor-to-wheel bearing housing bolt | - | 8 |

¹⁾ Replace fastener(s).

²⁾ Tighten in the curb weight or control position.

³⁾ Pre-tighten diagonally to 10 Nm.

Wheels, Tires

Fastener Tightening Specifications

| Component | Nm |
|---|-----|
| Decorative trim-to-wheel rim bolt | 5 |
| Tire pressure monitoring sensor union nut | 8 |
| Wheel bolt-to-hub | 120 |
| Wheel electronics-to-metal valve microencapsulated bolt (Beru system) | 4 |

Wheel Alignment Data

Wheel Alignment Specified Values

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

Wheel Alignment Specified Values (cont'd)

| Front suspension | Sport suspension (1BV/1BD) | Sport suspension Audi Magnetic Ride (AMR) (1BQ) |
|--|----------------------------|---|
| Individual toe | 5' ± 5' | 5' ± 5' |
| Total toe | 10' ± 10' | 10' ± 10' |
| Camber | -41' ± 30' | -41' ± 30' |
| Maximum permissible difference between both sides | 30' | 30' |
| Toe differential angle at 20° steering angle ¹⁾ | 1° 20' ± 20' | 1° 20' ± 20' |
| Maximum steering angle at inner wheel | 36° 48' | 36° 48' |

¹⁾ The wheel stop on the outer wheel is reduced by this amount. Depending on the computer manufacturer, the toe-out angle difference can be indicated negatively in the alignment computer.

| Rear suspension | Standard suspension (1BA) | Sport suspension Audi Magnetic Ride (AMR) (1BL) |
|--|---------------------------|---|
| Total toe | 25' ± 10' | 25' ± 10' |
| Individual toe | 12.5' ± 5' | 12.5' ± 5' |
| Maximum permissible deviation from direction of rotation | 10' | 10' |
| Camber | -1° 20' ± 30' | -1° 20' ± 30' |
| Maximum permissible difference between both sides | 30' | 30' |

| Rear suspension | Sport suspension (1BV/1BD) | Sport suspension Audi Magnetic Ride (AMR) (1BQ) |
|--|----------------------------|---|
| Total toe | 25' ± 10' | 25' ± 10' |
| Individual toe | 12.5' ± 5' | 12.5' ± 5' |
| Maximum permissible deviation from direction of rotation | 10' | 10' |
| Camber | -1° 20' ± 30' | -1° 20' ± 30' |
| Maximum permissible difference between both sides | 30' | 30' |

Steering

Fastener Tightening Specifications

| Component | Nm |
|--|------------------------------------|
| Shield-to-steering gear bolt | 6 |
| Steering column-to-mounting bracket bolt | 20 |
| Steering column-to-steering gear bolt ¹⁾ | 20 plus an additional 90° (¼ turn) |
| Steering gear-to-subframe bolt ¹⁾ | 50 plus an additional 90° (¼ turn) |
| Steering wheel-to-steering column bolt ¹⁾ | 50 |
| Strut-to-steering column bolt | 9 |
| Tie rod-to-steering gear | 100 |
| Tie rod end-to-tie rod nut | 50 |
| Tie rod end-to-wheel bearing housing nut ¹⁾ | 20 plus an additional 90° (¼ turn) |

¹⁾ Replace fastener(s).

BRAKE SYSTEM

General, Technical Data

Brakes

| |
|---|
| Brake System |
| Dual-circuit brake system with diagonal distribution, Anti-lock Brake System (ABS) with Electronic Brake Distribution (EBD). Depending on equipment and construction, may also be equipped with Electronic Differential Lock (EDL), Anti-Slip Regulation (ASR), Electronic Stability Program (ESP). |

Front Wheel Brakes – Technical Data

| | | | | |
|--|----------------|-----------|-----------|-----------|
| Front wheel brakes | | | | |
| Production Relevant No. (PR. No.) | | 1LJ | 1LL | 1LK |
| Front brake caliper | | FN3 | FN3 | FNR-G-57 |
| Pistons | Diameter mm | 54 | 54 | 57 |
| Production Relevant No. (PR. No.) | | 1LJ | 1LL | 1LK |
| Front brake disc | Diameter mm | 312 (16") | 312 (16") | 340 (17") |
| Brake disc thickness (ventilated) | mm | 25 | 25 | 30 |
| Brake pad wear limit | mm | 21 | 21 | 28 |
| Brake pads | | | | |
| Pad thickness, new (not including backing plate) | mm | 14 | 14 | 14 |
| Brake pad wear limit (not including backing plate) | mm | 2 | 2 | 2 |

| Front wheel brakes | | | |
|---|----------------|-----------|-----------|
| Production Relevant No. (PR. No.) | | 1LM | 1LN |
| Front brake caliper | | FNR-G-57 | FNR-G-57 |
| Pistons | Diameter mm | 57 | 57 |
| Production Relevant No. (PR. No.) | | 1LK | 1LK |
| Front brake disc | Diameter mm | 340 (17") | 340 (17") |
| Brake disc thickness (ventilated) | mm | 30 | 30 |
| Brake pad wear limit | mm | 28 | 28 |
| Brake pads | | | |
| Pad thickness, new (not including backing plate) | mm | 14 | 14 |
| Brake pad wear limit (not including backing plate) | mm | 2 | 2 |

TT RS Front Wheel Brakes

| Front wheel brakes | |
|---|-------------------|
| Brakes PR number | 1LA |
| Front Brake Caliper | Brembo M4 |
| Pistons | 40/40 mm diameter |
| Brake disc PR number | 1LK |
| Front brake disc | 370 mm |
| Brake disc thickness, ventilated | 32 mm |
| Brake disc wear limit | 30 mm |
| Brake pad wear limit (not including backing plate) | 2 mm |

Wheel Brakes – Technical Data

| Rear wheel brakes (FWD) | | | |
|--|----------------|-----------|-----------|
| Production Relevant No. (PR. No.) | | 2ED | 1KZ |
| Rear brake caliper | | CII 38HR | CII 38HR |
| Pistons | Diameter mm | 38 | 38 |
| Production Relevant No. (PR. No.) | | 2ED, 2EE | 1KZ, 1KJ |
| Rear brake disc | Diameter 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 brakes, AWD | | | | |
|--|----------------|-----------|-----------|-----------|
| Production Relevant No. (PR. No.) | | 1KJ | 2EE | 2EA |
| Rear brake caliper | | CII 41HR | CII 41HR | CII 41HR |
| Pistons | Diameter mm | 41 | 41 | 41 |
| Production Relevant No. (PR. No.) | | 1KJ,1KZ | 2EE,2ED | 2EA |
| Rear brake disc | Diameter mm | 286 (16") | 286 (16") | 310 (17") |
| Brake disc thickness (not ventilated) | mm | 12 | 12 | - |
| Brake disc thickness (ventilated) | mm | - | - | 22 |
| Brake disc wear limit | mm | 9 | 9 | 19 |
| Brake pad wear limit (not including backing plate) | mm | 2 | 2 | 2 |

| Rear wheel brakes, AWD | | | |
|--|----------------|-----------|-----------|
| Production Relevant No. (PR. No.) | | 2EF | 2EG |
| Rear brake caliper | | CII 41HR | CII 41HR |
| Pistons | Diameter mm | 41 | 41 |
| Production Relevant No. (PR. No.) | | 2EF | 2EG |
| Rear brake disc | Diameter mm | 310 (17") | 310 (17") |
| Brake disc thickness (not ventilated) | mm | - | - |
| Brake disc thickness, ventilated | mm | 22 | 22 |
| Brake disc wear limit | mm | 19 | 19 |
| Brake pad wear limit (not including backing plate) | mm | 2 | 2 |

TT RS Rear Wheel Brakes

| Rear wheel brakes | |
|--|-----------------|
| Brakes PR number | CII 41 HR |
| Pistons | 41 mm diameter |
| Rear brake disc | 370 mm diameter |
| Brake disc thickness, ventilated | 22 mm |
| Brake disc wear limit | 19 mm |
| Brake pad wear limit (not including backing plate) | 2 mm |

Anti-lock Brake System (ABS)

Fastener Tightening Specifications

| Component | Nm |
|---|-----------|
| ABS control module and ABS hydraulic unit brake lines | 14 |
| ABS hydraulic unit-to-bracket bolt | 8 |
| ABS wheel speed sensor bolt | 8 |
| Brake light switch-to-brake master cylinder bolt | 5 |
| ESP sensor unit bolt | 9 |

Mechanical Components

Fastener Tightening Specifications

| Component | Nm |
|---|------------------------------------|
| Brake disc-to-wheel hub bolt | 4 |
| Brake hose connection with anti-rotation device-to-caliper bolt (16" FN3) | 35 |
| Brake line bracket-to-front brake caliper bolt | 15 |
| Front brake carrier-to-wheel bearing housing bolt ¹⁾ | 200 |
| Rear brake carrier-to-wheel bearing housing bolt ¹⁾ | 90 plus an additional 90° (¼ turn) |
| Brake line connection to front brake caliper | |
| - 17" FNR G57 | 14 |
| - 16" FN3 | 19 |
| Brake line connection to front brake hose | |
| - 17" FNR G57 | 14 |
| - 16" FN3 | 12 |
| Brake pedal to mounting bracket nut | 25 |
| Brake pedal mounting bracket nut | 25 |
| Cover plate-to-front wheel bearing housing bolt | 10 |
| Damper-to-front brake caliper bolt | 10 |
| Front brake caliper guide pin ¹⁾ | 30 |
| Parking brake cable left and right bolt | 4 |
| Parking brake cable lower right clip nut | 12 |
| Parking brake lever nut | 15 |
| Parking brake lever trim bolt | 0.7 |
| Rear brake caliper bleeder screw | 10 |
| Rear brake caliper bolt ¹⁾ | 35 |
| Rear brake line and brake hose | 14 |
| Wear indicator wiring bracket-to-front brake caliper bolt | 25 |
| Wheel speed sensor bolt | 8 |

¹⁾ Replace fastener(s).

Hydraulic Components

Hydraulic Tightening Specifications

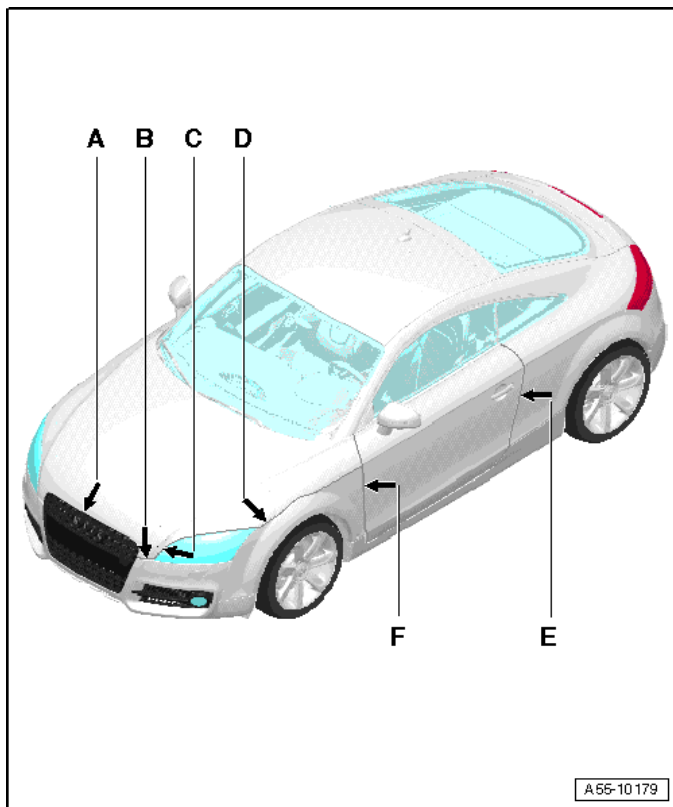
| Component | Nm |
|---|----|
| Brake booster nut ¹⁾ | 25 |
| Brake hose connection with anti-rotation device to front brake caliper | |
| - 16" FN-3 | 35 |
| - 17" FNR-G-57 | 14 |
| Brake line | |
| - to brake master cylinder | 14 |
| - to hydraulic unit | 14 |
| - to front brake hose | 14 |
| - to rear brake caliper | 14 |
| - at rear axle | 14 |
| - at underbody | 14 |
| Brake master cylinder-to-brake booster nut ¹⁾ | 20 |
| Front brake caliper bleeder screw (FN3) | 10 |
| Front brake caliper bleeder valve (FNR-G-57) | 15 |
| Front brake caliper guide pin | 30 |
| Rear brake caliper bleeder screw | 10 |
| Rear brake caliper-to-guide pin bolt ¹⁾ | 35 |

¹⁾ Replace fastener(s).

BODY

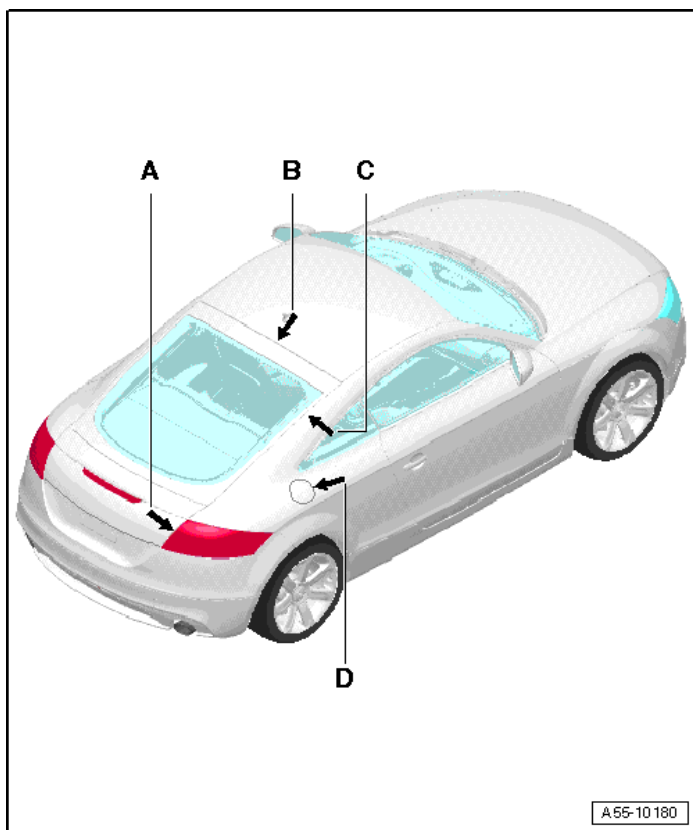
Air Gap Body Dimensions

Front Gap Dimensions



| Component | mm |
|-----------|---------------|
| A | 4.5 ± 0.5 |
| B | 4.5 ± 0.5 |
| C | 3.5 ± 0.5 |
| D | 3.5 ± 0.5 |
| E | 3.5 ± 0.5 |
| F | 3.5 ± 0.5 |

Rear Gap Dimensions



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

Body Exterior

Body Front Tightening Specifications

| Component | Nm |
|---|----|
| Brace for fender to frame bolts | 23 |
| Bumper bracket to lock carrier bolt | 5 |
| End plate to frame bolts | 11 |
| Engine mount brace to bracket bolt (Roadster) | 23 |
| Engine mount brace to engine mount nut (Roadster) | 10 |
| Engine mount brace to frame bolt (Roadster) | 23 |
| Fender to frame bolts | 11 |
| Impact member to lock carrier bolt | 30 |
| Lock carrier bolts ¹⁾ | 6 |
| | 23 |
| Noise insulation frame bolts | 30 |

¹⁾ For bolt tightening clarification, refer to ElsaWeb, *Lock Carrier with Attachments Assembly Overview*, items 4 and 6.

Hood, Lids Tightening Specifications

| Component | Nm |
|---|----|
| All models | |
| Fuel filler door to body bolts | 4 |
| TT | |
| Gas-filled strut ball stud | 21 |
| Hood release lever bracket to hood bolts | 12 |
| Coupe | |
| Gas-filled strut ball stud | 21 |
| Rear lid hinge to hood bolts/nut | 21 |
| Rear lid lock to rear lid nuts | 21 |
| Striker to body nuts | 21 |
| Roadster | |
| Gas-filled strut ball stud | 21 |
| Rear lid hinge bolts/nut | 21 |
| Rear lid lock to rear lid nuts | 21 |
| TT RS | |
| Anti-theft protection to center hood latch bolt | 11 |
| Anti-rotation protection to hood bolt | 2 |
| Brace nut | 9 |
| Brace to anti-theft protection bolt | 11 |
| Center hood latch bolt | 11 |
| Left hood latch mount bolt | 10 |
| Right hood latch mount bolt | 3 |

| Component | Nm |
|---|-----------|
| Rear lid hinge to hood and body bolt/bolt | 34 |
| Striker pin with catch to hood nuts | 9 |

Front Doors, Central Locking System Tightening Specifications

| Component | Nm |
|---|-----------|
| Anti-theft cover to door lock bolt | 20 |
| Bottom door hinge, lower part bottom door hinge, upper part combination screw | 32 |
| Bracket to door bolt | 2.5 |
| Door lock bolt | 20 |
| Fuel filler door unlock motor to fender | |
| - Bolt | 9 |
| - Nut | 1.5 |
| Window regulator to door nut | 8 |
| Window regulator motor to door nut | 3.5 |

Convertible Top Tightening Specifications

| Component | Nm |
|--|-----------|
| Convertible top to body bolts | 36 |
| Convertible top control module bolts | 6 |
| Convertible top frame cover bolt | 5 |
| Convertible top lock nut | 9 |
| Emergency operation valve | 4 |
| End plate cover bolt | 15 |
| Front cover bolt | 2.5 |
| Front rail bolt | 3 |
| Housing cover to convertible top control module bolts | 4 |
| Hydraulic cylinder bolts | 10 |
| Hydraulic filler plug | 5 |
| Left roof guide front trim bolt | 2.5 |
| Oil reservoir clamp bolt | 4 |
| Oil reservoir filler screw | 5 |
| Rear guide hinge bolt | 3 |
| Rail tensioning strap ¹⁾ | |
| - Bolt | 1.5 |
| - Bolt | 2.5 |
| Retaining strip to convertible top headliner ²⁾ | |
| - Bolt | 2.5 |
| - Bolt | 3 |

Convertible Top Tightening Specifications (*cont'd*)

| Component | Nm |
|---------------------------------|-----|
| Right roof guide rear trim bolt | 2.5 |
| Water tray bolt | 2 |

- ¹⁾ For bolt tightening clarification, refer to ElsaWeb, *Convertible Top Cover*, items 3 and 8..
- ²⁾ For bolt tightening clarification, refer to ElsaWeb, *Convertible Top Cover*, items 4 and 7.

Bumpers Tightening Specifications

| Component | Nm |
|----------------------------------|-----|
| TT Front | |
| Bumper | |
| - Bolt | 5 |
| - Nut | 6.5 |
| Bumper guide piece ¹⁾ | |
| - Bolt | 1.5 |
| - Bolt | 2.5 |
| Guide piece (left/right) bolt | 1.5 |
| Impact member | 30 |
| Lower bumper ²⁾ | |
| - Bolt | 1.5 |
| - Bolt | 2 |
| Right guide piece bolt | 1.5 |
| Spoiler bolt | 2 |
| TT Rear | |
| Bracket to body nut | 4 |
| Bumper ³⁾ | |
| - Bolt | 15 |
| - Bolt | 2.5 |
| Guide piece bolt | 2.5 |
| Impact member bolt | 23 |
| Inner guide piece bolt | 2.5 |
| Left cover strip bolt | 2.5 |
| Left inner guide piece bolt | 2.5 |
| Left outer guide piece bolt | 2.5 |
| Right cover strip bolt | 2.5 |
| Right inner guide piece bolt | 2.5 |
| Right outer guide piece bolt | 2.5 |
| TT RS Front | |
| Impact member bolt | 30 |
| Lower part of spoiler bolt | 2 |
| Upper part of spoiler bolt | 2 |

| Component | Nm |
|-----------------------------|-----|
| TT RS Rear | |
| Bumper spoiler bolt | 2 |
| Bumper bolt | 2.5 |
| Left exhaust pipe trim bolt | 2 |
| Diffuser trim bolt | 2 |
| Impact member | 23 |
| Left holder for bumper | 2.5 |

¹⁾ For bolt tightening clarification, refer to ElsaWeb, *Front Bumper*, items 4 and 6.

²⁾ For bolt tightening clarification, refer to ElsaWeb, *Bumper Guide Place*, items 1 and 7.

³⁾ For bolt tightening clarification, refer to ElsaWeb, *Rear Bumper*, items 1 and 5.

Glass, Window Regulators Tightening Specifications

| Component | Nm |
|----------------------|----|
| Window regulator nut | 9 |

Exterior Equipment Tightening Specifications

| Component | Nm |
|---|-----|
| Bulkhead heat shield nut | 2 |
| Carrier plate to Mirror housing 4 | |
| - Bolt | 1.5 |
| - Bolt | 6.5 |
| Center bearing heat shield bolt | 8 |
| Center muffler trim bolt/nut | 2 |
| Center tunnel heat shield bolt/nut | 8 |
| End muffler heat shield nut | 4.5 |
| Exterior rearview mirror housing bolt | 2 |
| License plate bracket bolts | 0.9 |
| Mirror adjusting unit to Exterior rearview mirror housing 1 | |
| - Bolt | 1.5 |
| - Bolt | 6.5 |
| Mirror base cover bolts | 6.5 |
| Noise insulation 3 | |
| - Bolt | 2 |
| - Bolt | 6 |
| Radiator grille to front bumper | 1 |
| Sill panel cover trim bolt | 1.5 |
| Spoiler base plate bolts | |
| - Bolt | 3 |
| - Nut | 2 |
| Spoiler center part bolt | 7 |
| Spoiler motor bolt 2 | 6 |
| Upper part of wheel housing liner bolt | 2 |

Exterior Equipment Tightening Specifications (cont'd)

| Component | Nm |
|---------------------|-----|
| Wheel housing liner | |
| - Bolt | 1.5 |
| - Nut | 2 |
| Wheel spoiler | |
| - Bolt | 1.5 |
| - Nut | 2 |

- ¹⁾ For bolt tightening clarification, refer to ElsaWeb, *Exterior Rearview Mirror Overview*, items 12 and 13..
- ²⁾ For bolt tightening clarification, refer to ElsaWeb, *Underbody Trim Panels*, items 1 and 2.
- ³⁾ For bolt tightening clarification, refer to ElsaWeb, *Mirror Housing*, items 6 and 7.

Body Interior

Interior Equipment Tightening Specifications

| Component | Nm |
|--|-----------|
| Center Console | |
| Front | |
| Center console bracket bolt | 3.5 |
| Center console side trim bolt | 2.5 |
| Center console trim bolt | 1 |
| Climatronic control module bolt | 2.5 |
| Decorative frame bolt | 1 |
| Front Center Console bolt | 2.5 |
| Side trim bracket | 3.5 |
| Rear | |
| Blind Cover for AUX socket screw | 1.5 3.5 8 |
| Bracket bolt | |
| Center console bracket nut | |
| Rear center console | |
| - Bolt (Roadster) | 2.5 |
| - Nut | 3.5 |
| Cover to left parking brake trim bolt | 2.5 |
| Upholstery bracket to parking brake lever trim | 2.5 |
| Storage Compartments and Covers | |
| Driver side instrument panel cover bolt | 2.5 |
| Glove compartment bolt | 2.5 |
| Glove compartment cover bolt | 1.6 |
| Lower steering column switch trim bolt | 2.5 |
| Steering column adjustment handle screw | 3 |
| Upper steering column switch trim bolt | 2.5 |

Passenger Protection, Airbags, Seat Belts Tightening Specifications

| Component | Nm |
|-------------------------------|-----|
| Seat Belts, Coupe | |
| Automatic belt retractor bolt | 45 |
| Belt anchor bolt | 55 |
| Belt guide ring bolt | 45 |
| Belt latch bolt (front seat) | |
| Bucket seat only | 22 |
| All others, | 34 |
| Belt latch bolt (rear seat) | 55 |
| Retainer bolt | 4.5 |
| Three-point seat belt bolt | 45 |

Passenger Protection, Airbags, Seat Belts Tightening Specifications (*cont'd*)

| Component | Nm |
|--|-----|
| Seat Belts, Roadster | |
| Belt anchor bolt | 55 |
| Belt guide bolt | 6 |
| Belt latch bolt (front seat) | |
| - Bucket seat only | 22 |
| - All others, | 34 |
| All Vehicles | |
| Airbag unit nut ¹⁾ | 7 |
| Airbag control module nut | 9 |
| Airbag unit bracket ¹⁾ | 7 |
| Angle bracket to central tube bolt | 9 |
| Battery positive terminal nut | 6 |
| Battery interrupt igniter nut | 15 |
| Child seat anchorages, LATCH and top tether | |
| - Backrest frame | 16 |
| - Bracket to seat pan | 12 |
| - Retainer to backrest | 4 |
| Connector on seat occupied recognition control module bolt | 2.5 |
| Driver footwell air guide channel bolt | 2.5 |
| Driver seat position sensor | 1.3 |
| Driver side knee airbag bolt | 9 |
| Glove compartment ²⁾ | |
| - Bolt | 2.5 |
| - Bolt | 3 |
| Knee bar bolt | 2.5 |
| Left support | 9 |
| Lower support nut | 9 |
| Right support | 9 |
| Side airbag bolt | 10 |
| Steering wheel bolt | 7 |
| Switchable belt load limiter connector bolt | 45 |

Interior Trim Tightening Specifications

| Component | Nm |
|---|-----|
| Armrest bolt | 1.3 |
| Center defroster vent bolt | 2.5 |
| Door trim bolt | 2.8 |
| Front passenger airbag unit nut ²⁾ | 7 |

| Component | Nm |
|--|-----------|
| Instrument cluster bolt | 2.5 |
| Instrument cluster cover ¹⁾ | |
| - Bolt | 1 |
| - Bolt | 2.5 |
| Instrument panel bolt | 3.5 |
| Interior door mechanism bolt | 1.3 |
| Pull handle bolt | 3.3 |
| Central Tube Part 1 (Driver Side) | |
| Central tube threaded pin | 23 |
| er side instrument panel cover mounting bracket to left support bolt | 9 |
| Instrument panel bracket to central tube | |
| - Bolt | 9 |
| - Nut | 20 |
| Intermediate plate to left support bolt | 9 |
| Left center section bracket to central tube bolt | 9 |
| Left support to central tube bolt | 9 |
| Lower brace to central tube bolt | 7 |
| Steering column mounting bracket to central tube bolt | 20 |
| Upper brace to central tube bolt | 20 |
| Central Tube Part 2 (Passenger Side) | |
| Cable guide to central tube | 4.5 |
| Centering bracket to central tube bolt | 9 |
| Central tube threaded pin | 23 |
| Glove compartment bracket to right support bolt | 3.5 |
| Instrument panel bracket | |
| - Bolt | 9 |
| - Nut ²⁾ | 20 |
| Instrument panel support to right center section bracket | 3.5 |
| Intermediate plate to right support bolt | 9 |
| Left relay and fuse carrier mounting frame to central tube | 4.5 |
| Right center section bracket to central tube bolt | 9 |
| Right support to central tube bolt | 9 |
| Support for the front passenger airbag unit bolt | 9 |
| Trim, Coupe | |
| Belt extraction panel to rear side trim bolt | 1 |
| C-pillar trim bolt | 3.5 |
| Footrest bracket bolt | 3.5 |
| Footrest cover bolt | 2 |
| Lower bracket bolt | 8 |
| Lower rear lid trim to rear lid bolt | 1.8 |
| Luggage compartment side trim bolt | 4 |

Interior Trim Tightening Specifications (*cont'd*)

| Component | Nm |
|---|-----|
| Mount for operating lever bolt | 12 |
| Sun visor to headliner bolt | 3.5 |
| Upper rear lid trim to rear lid bolt | 1.8 |
| Trim, Roadster | |
| Belt extraction panel to rear bulkhead cover | 0.6 |
| Brace between a-pillar and mounting bracket/steering column | 9 |
| Bracket to center storage compartment bolt | 4 |
| Center storage compartment bolt | 2 |
| Cover for the steering column universal joint to body bolt | 2 |
| Footrest bracket bolt | 3.5 |
| Footrest cover bolt | 2 |
| Lower center storage compartment bolt | 2 |
| Mount for operating lever bolt | 12 |
| Rollover protection bracket to rollover protection trim rear section bolt ²⁾ | 3 |
| Rear lid trim to rear lid bolt | 1.8 |
| Reinforcement, tunnel support | 9 |
| Storage compartment bolt (left/right) | 2 |
| Sun visor to windshield frame trim bolt | 3.5 |
| Wind deflector to body bolt | 7 |
| Wind deflector support to body bolt | 7 |
| Windshield frame trim to windshield frame ³⁾ | |
| - Bolt | 2 |
| - Bolt | 3.5 |

¹⁾ For bolt tightening clarification, refer to ElsaWeb, *InstrumentPanel Overview* items 5 and 26.

²⁾ Replace fastener(s).

³⁾ For bolt tightening clarification, refer to ElsaWeb, *Windshield Frame Trim Overview*, items 2 and 5.

Seat Frames Tightening Specifications

| Component | Nm |
|---|-----|
| Bucket Seat | |
| Backrest frame mount to backrest frame bolt ²⁾ | 22 |
| Release lever cover (left/right) to backrest frame bolt ²⁾ | 2.5 |
| Manual Front Seats | |
| Cable clip to seat pan bolt | 3.5 |
| Front backrest to seat pan self-locking bolt | 36 |
| Front seat to floor bolt | 40 |
| Lumbar support adjustment switch bolt | 0.5 |
| Retaining plate to Seat height adjuster | |

| Component | Nm |
|--|-----------|
| - Bolt | 8 |
| - Nut | 12 |
| Seat height adjuster to seat bolt | 8 |
| Sill side retaining bracket to front seat bolt | 3.5 |
| Sill-side trim bolt | 2.5 |
| Tunnel side trim bolt | 2.5 |
| Wiring harness cable clamp bolt | 3.5 |
| Power Front Seats | |
| Bracket to backrest frame bolt (Coupe only) | 4 |
| Cable clip to seat pan bolt | 3.5 |
| Driver seat angle adjustment motor or front passenger seat angle adjustment motor bolt | 22 |
| Driver seat height adjustment motor or front passenger's seat height adjustment motor bolt ¹⁾ | 27 |
| Driver seat height adjustment motor or front passenger's seat height adjustment motor to lower seat pan frame self-locking screw | 31 |
| Front backrest to seat pan self-locking bolt | 35 |
| Front seat to floor bolt | 40 |
| Lumbar support adjustment switch to sill-side trim bolt | 0.5 |
| Seat angle adjustment motor | |
| - Bolt | 14 |
| - Self-locking screw ¹⁾ | 22 |
| Sill-side trim bolt | 2.5 |
| Storage compartment to seat pan bolt | 3.5 |
| Tunnel side trim bolt | 2.5 |
| Upper seat pan frame self-locking bolt | 29 |
| 1/2 left and right backrest to body | |
| - Bolt | 40 |
| - Nut | 55 |
| Backrest frame bolt | 4 |
| Left/right release bolt | 2 |

¹⁾ Replace fastener(s).

²⁾ Replace with locking compound.

HEATING, VENTILATION & AIR CONDITIONING

General, Technical Data

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 |

Air Conditioning

Fastener Tightening Specifications

| Component | Nm |
|---------------------------------------|------|
| Air intake grille | 3.5 |
| Compressor drive plate | |
| Denso version 1 | 35 |
| Denso version 2 | 30 |
| Compressor mounting bolts | 25 |
| Coolant pipes-to-heater core | 2.5 |
| Expansion valve-to-evaporator bracket | 10 |
| Fluid reservoir on condenser | 10 |
| High pressure sensor | 8 |
| Sanden drive plate | 25 |
| Oil drain plug | |
| Denso | 30 |
| Sanden | 10 |
| Pressure relief valve | |
| Denso | 10 |
| Sanden | 14.5 |
| Refrigerant lines-to-compressor | 25 |
| Refrigerant lines-to-condenser | 12 |
| Refrigerant lines-to-expansion valve | 10 |

ELECTRICAL SYSTEM

Communication Equipment

Communication Tightening Specifications

| Component | Nm |
|--|-----|
| Nut for antenna amplifier 2 ¹⁾ | 6 |
| Nut for center speaker ¹⁾ | 2 |
| Nut for digital sound system control module | 5 |
| Nut for digital sound system control module - Bose® | 5 |
| Nut for mast antenna ²⁾ | 4 |
| Nut for radio, telephone, navigation system antenna ¹⁾ | 6 |
| Nut for satellite antenna | 6 |
| Nut for windshield antenna suppression filter | 6 |
| Screw for antenna amplifier 2 ²⁾ | 2 |
| Screw for antenna amplifier 4 | 2 |
| Screw for antenna selection control module | 2 |
| Screw for center mid/high range loudspeaker | 1 |
| Screw for center speaker | 2 |
| Screw for digital sound system control module | 3 |
| Screw for digital sound system control module - Bose® | 3 |
| Screw for left front bass speaker/right front bass speaker | 3.5 |
| Screw for external audio source connection | 1 |
| Screw for left front midrange speaker/right front midrange speaker | 2 |
| Screw for left rear mid/low range loudspeaker & right rear mid/low range loudspeaker | 2 |
| Screw for navigation system / telephone antenna ²⁾ | 2 |
| Screw for radio antenna ²⁾ | 2 |
| Screws for telephone base plate | 2 |

¹⁾ Coupe

²⁾ Roadster

Electrical Equipment

Battery, Starter, Generator, Cruise Control Tightening Specifications

| Component | Nm |
|------------------------------------|-----------|
| Battery ground cable nut | 6 |
| Battery jump start terminal nut | 5.5 |
| Battery jump start pin | 9 |
| Battery positive cable nut | 15 |
| Battery retaining bracket nut | 20 |
| Generator bolts | 23 |
| Generator terminal 30/B+ | 15 |
| Main fuse box nut | 6 |
| Starter ground wire nut | 23 |
| Starter terminal B+ nut | 15 |
| Starter wiring harness bracket nut | 23 |

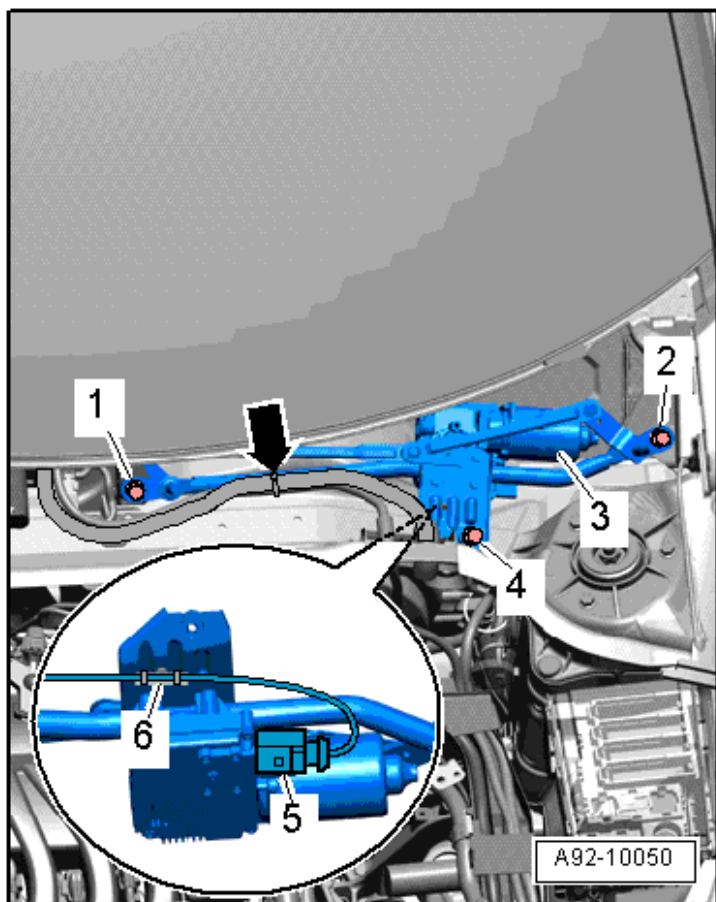
Instruments Tightening Specifications

| Component | Nm |
|---|-----------|
| Horn nut | 9 |
| Instrument cluster | 2.5 |
| Radio frequency controlled clock receiver | 2.5 |

Windshield Wiper/Washer Tightening Specifications

| Component | Nm |
|------------------------------------|-----------|
| Headlamp washer spray nozzle | 2.5 |
| Windshield wiper frame bracket nut | 6 - 8 |
| Wiper arm nut | 17 |

Windshield Wiper Motor Tightening Sequence



Electrical Equip./
Communication

| Step | Component | Nm |
|------|-----------------------------------|--------------|
| 1 | Tighten bolts 1, 2, 4 in sequence | Hand-tighten |
| 2 | Tighten bolts 1, 2, 4 in sequence | 8 |

Exterior Lights, Switches Tightening Specifications

| Component | Nm |
|---|-----|
| Exterior rearview mirror housing-to-base | 9.5 |
| Exterior rearview mirror mount | 2 |
| Exterior rearview mirror turn signal bulb | 0.4 |
| Fog lamp housing | 5 |
| Headlamp beam adjustment motor | 2 |
| Headlamp housing bracket screw | 4.5 |
| Headlamp housing cover | 2 |
| Headlamp range control module | 3 |
| License plate lamp | 0.8 |
| Rear fog lamp | 1.2 |
| Steering column electronic systems control module | 0.4 |
| Tail lamp bulb holder | 1.7 |
| Tail lamp housing | 3.5 |

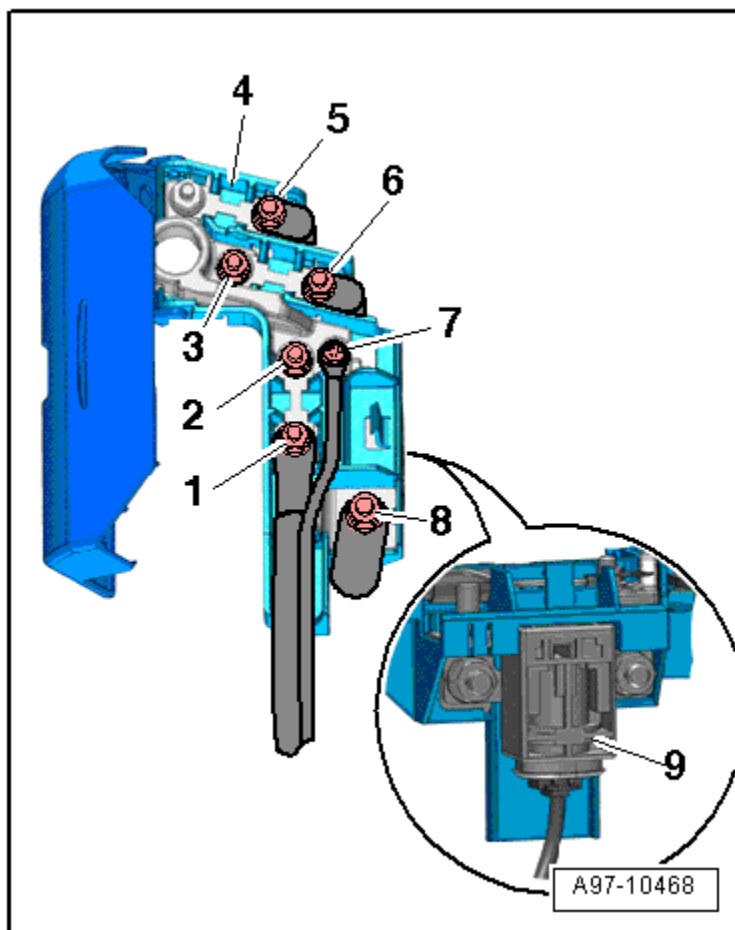
Interior Lights, Switches Tightening Specification

| Component | Nm |
|----------------|----|
| Alarm horn nut | 9 |

Wiring Tightening Specifications

| Component | Nm |
|------------------------------------|-----|
| Engine compartment E-box wire nuts | 7.5 |
| Left instrument panel fuse panel | 3 |

Fuse Panel D Tightening Specification



| Item | Component | Nm |
|------|---|-----|
| 1 | Electrical wire | 7.5 |
| 2 | Nut | 9 |
| 3 | Nut | 9 |
| 4 | Fuse panel D inside the luggage compartment | - |
| 5 | Electrical wire | 7.5 |
| 6 | Electrical wire | 7.5 |
| 7 | Bolt | 3.5 |
| 8 | Electrical wire | 15 |
| 9 | Battery interrupt igniter (N253) | - |

DTC CHART

Engine Code – 2.0L CETA

Fuel and Air Mixture, Additional Emission Regulations

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|---|--|
| P000A | "A" Camshaft Position Slow Response Bank 1 | <ul style="list-style-type: none">• Difference between target position vs. actual position > 8.00° CRK• For time > 1.30 to 2.90 Sec. and• Adjustment angle ≥ 2.50° CRK |
| P0010 | "A" Camshaft Position Actuator Control Circuit/Open Bank 1 | Signal voltage, > 4.70 to 5.40 V |
| P0011 | "A" Camshaft Position - Bank 1 Timing Over-Advanced or System Performance | <ul style="list-style-type: none">• Difference between target position vs. actual position > 8.00° CRK• For time > 1.30 to 2.90 Sec. and• Adjustment angle ≥ 2.50° CRK |
| P0016 | Crankshaft Position - Camshaft Position Correlation Bank 1 Sensor A | <ul style="list-style-type: none">• Permissible deviation < -11.01° CRKor• Permissible deviation > 11.01° CRK |
| P0030 | HO2S Heater Control Circuit Bank 1 Sensor 1 | Heater voltage 4.70 to 5.40 V |
| P0031 | HO2S Heater Control Circuit Low Bank 1 Sensor 1 | Heater voltage 0.00 to 3.26 V |
| P0032 | HO2S Heater Control Circuit High Bank 1 Sensor 1 | Signal current > 5.50 A |
| P0036 | HO2S Heater Control Circuit Bank 1 Sensor 2 | Heater voltage, 2.34 to 3.59 V |
| P0037 | HO2S Heater Control Circuit Low Bank 1 Sensor 2 | Heater voltage < 2.34 V |
| P0038 | HO2S Heater Control Circuit High Bank 1 Sensor 2 | Heater voltage > 3.59 V |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|---|---|
| P0068 | MAP/MAF – Throttle Position Correlation | <ul style="list-style-type: none"> • Plausibility with fuel system load calculation < 50% • Plausibility with fuel system load calculation > 50% |
| P0070 | Ambient Air Temperature Sensor Circuit “A” | AAT signal short to battery/Open circuit, failure |
| P0071 | Ambient Air Temperature Sensor Circuit “A” Range/ Performance | <ul style="list-style-type: none"> • Difference ECT vs. IAT @ manifold @ engine start (depending on engine-off time) < 24.8 to 39.8 K and • Difference value IAT @ manifold vs. AAT @ engine start (depending on engine-off time) > 24.8 to 39.8 K and • Difference AAT vs. ECT at engine start (depending on engine-off time) > 24.8 to 39.8 K |
| P0072 | Ambient Air Temperature Sensor Circuit “A” Low | AAT signal short to ground, failure |
| P0087 | Fuel Rail/System Pressure - Too Low | <ul style="list-style-type: none"> • Pressure control activity, > 5.00 MPa and • Fuel trim activity, 1.05 to 1.50- and • Difference between target pressure vs. actual pressure > -16.38 MPa |
| P0088 | Fuel Rail/System Pressure - Too High | Fuel rail pressure > 13.9 mPa |
| P0089 | Fuel Pressure Regulator 1 Performance | Actual pressure deviation <100 kPa or >100 kPa |
| P008A | Low Pressure Fuel System Pressure - Too Low | Actual pressure < 0.08 MPa |
| P008B | Low Pressure Fuel System Pressure - Too High | Actual pressure > 0.08 MPa |
| P0100 | Mass or Volume Air Flow Sensor “A” Circuit | MAF sensor signal 0 μ s |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|---|--|
| P0101 | Mass or Volume Air Flow Sensor "A" Circuit Range/Performance | <ul style="list-style-type: none"> • Mass air flow vs lower threshold model < 3 to 197kg/h% • Mass air flow vs upper threshold > 60 to 890 kg/h |
| P0102 | Mass or Volume Air Flow Sensor "A" Circuit Low | MAF sensor signal, <66 u Sec. |
| P0103 | Mass or Volume Air Flow Sensor "A" Circuit High | MAF sensor signal, >4.5 m Sec. |
| P0106 | Manifold Absolute Pressure/Barometric Pressure Sensor Circuit Range/Performance | <p>Rationality Check Low:</p> <ul style="list-style-type: none"> • Difference manifold pressure - lower threshold model < 0.0 kPa • Model range 0.0 to 190.0 kPa <p>Rationality Check High:</p> <ul style="list-style-type: none"> • Difference manifold pressure - upper threshold model > 0.0 kPa • Model range 85.0 to 250.0 kPa <p>Rationality Check:</p> <ul style="list-style-type: none"> • Difference barometric sensor signal vs. manifold pressure signal at engine start > 9.00 kPa <p>Adaptation Value Monitoring:</p> <ul style="list-style-type: none"> • Offset value manifold pressure for load calculation in driving condition range 2 > 8.00 kPa <p>Cross Check:</p> <ul style="list-style-type: none"> • Difference manifold pressure to average value of all pressure sensors @ start < -6.50 kPa <p>Cross Check:</p> <ul style="list-style-type: none"> • Difference manifold pressure to average value of all pressure sensors @ start > 6.00 kPa <p>Rationality Check:</p> <ul style="list-style-type: none"> • Manifold pressure signal: variation between state 1 and 2 < 1.00 kPa |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|---|--|
| P0107 | Manifold Absolute Pressure/ Barometric Pressure Sensor Circuit Low | <ul style="list-style-type: none"> • Short to ground signal voltage < 0.20 V • Manifold pressure signal < 8.00 kPa |
| P0108 | Manifold Absolute Pressure/ Barometric Pressure Sensor Circuit High | Range Check: <ul style="list-style-type: none"> • Manifold pressure signal > 300.00 kPa Short to Battery/Open Circuit <ul style="list-style-type: none"> • Signal voltage > 4.80 V |
| P0111 | Intake Air Temperature Sensor 1 Circuit Range/Performance | <ul style="list-style-type: none"> • Difference ECT vs. IAT @ manifold at engine start (depending on engine-off time, > 25 to 39.8 K and • Difference IAT @ manifold vs. AAT @ engine start (depending on engine-off time), > 25 to 39.8 K and • Difference AAT vs. ECT at engine start (depending on engine off time) < 24.8 to 39.8 K |
| P0112 | Intake Air Temperature Sensor 1 Circuit Low | Signal voltage, < 0.16 V |
| P0113 | Intake Air Temperature Sensor 1 Circuit High | Signal voltage, < 4.48 V |
| P0116 | Engine Coolant Temperature Sensor 1 Circuit Range/ Performance | Cross Check: <ul style="list-style-type: none"> • Difference ECT vs. IAT @ manifold at engine start > 24.8 to 39.8K (depending on engine off time) and • Difference IAT@ manifold vs. AAT at engine start < 24.8 to 39.8K (depending on engine off time) and • Difference AAT vs. ECT at engine start > 24.8 to 39.8K (depending on engine off time) |
| P0117 | Engine Coolant Temperature Sensor 1 Circuit Low | Engine coolant temperature > 140° C |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|------------|---|---|
| P0118 | Engine Coolant Temperature Sensor 1 Circuit Open | Engine coolant temperature < -40.0° C |
| P0121 | Throttle/Pedal Position Sensor/Switch "A" Circuit Range/Performance | <ul style="list-style-type: none"> • TPS 1 - TPS 2 > 6.30% and • Actual TPS 1 calculated value > actual TPS 2 calculated value or <ul style="list-style-type: none"> • TPS 1 calculated value > 9.00% |
| P0122 | Throttle/Pedal Position Sensor/Switch "A" Circuit Low | Signal voltage < 0.20 V |
| P0123 | Throttle/Pedal Position Sensor/Switch "A" Circuit High | Signal voltage > 4.81 V |
| P0130 | HO2 Sensor Circuit Bank 1 Sensor 1 | O2S ceramic temperature < 640° C |
| P0131 | OHO2 Sensor Circuit Low Voltage Bank 1 Sensor 1 | Short to Battery: <ul style="list-style-type: none"> • Nernst voltage UN, < 1.50 V or <ul style="list-style-type: none"> • Adjustment voltage IA, < 0.30 V or <ul style="list-style-type: none"> • Adjustment voltage IP < 0.30 V |
| P0132 | HO2 Sensor Circuit High Voltage Bank 1 Sensor 1 | Short to Battery: <ul style="list-style-type: none"> • Nernst voltage UN, > 4.40 V or <ul style="list-style-type: none"> • Adjustment voltage IA, > 7.00 V or <ul style="list-style-type: none"> • Adjustment voltage IP > 7.00 V |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|--|--|
| P0133 | HO2 Sensor Circuit Slow Response Bank 1 Sensor 1 | <p>Symmetric Fault:</p> <ul style="list-style-type: none"> • Difference of R2L area ratio vs. L2R area ratio -0.35 to 0.35- • Max value of both counters for area ratio R2L and L2R ≥ 5 times <p>Delayed Time:</p> <ul style="list-style-type: none"> • Gradient ratio ≥ 0.00- • Lower value of both area ratios R2L and L2R < 0.20- <p>Transient Time:</p> <ul style="list-style-type: none"> • Gradient ratio ≥ 0.00- • Gradient ratio ≤ 0.00- • Lower value of both area ratios R2L and L2R < 0.20 <p>or</p> <ul style="list-style-type: none"> • Lower value of both gradient ratios R2L and L2R < 0.00- <p>Asymmetric Fault:</p> <ul style="list-style-type: none"> • Difference of R2L area ratio vs. L2R area ratio < -0.35, > 0.35- • Values of both counters for area ratio R2L and L2R ≥ 5 times <p>Delayed Time:</p> <ul style="list-style-type: none"> • Gradient ratio ≥ 0.00- • Gradient ratio ≤ 0.00- • Lower value of both area ratios R2L and L2R < 0.35- <p>Transient Time:</p> <ul style="list-style-type: none"> • Gradient ratio ≥ 0.00- • Gradient ratio ≤ 0.00- • Lower value of both area ratios R2L and L2R < 0.35- <p>or</p> <ul style="list-style-type: none"> • Lower value of both area ratios R2L and L2R < 0.00- |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|---|---|
| P0135 | HO2 Sensor Heater Circuit Bank 1 Sensor 1 | Out of range-high • O2S ceramic temperature < 715° C and • Heater duty cycle, 100% Rationality check: • Ceramic temperature, < 715° C and • Time after O2S heater on 40 Sec |
| P0136 | O2 Circuit Bank 1, Sensor 2 | • Delta voltage one step at heater switching > 2.00 V and • Cycles completed ≥ 6 |
| P0137 | HO2 Sensor Circuit Low Voltage Bank 1 Sensor 2 | • Signal voltage < 0.06 V for time > 3 Sec. and • Difference of sensor voltage with load pulse and voltage without load pulse (mean value of 3 measurements) < 0.01 V |
| P0138 | HO2 Sensor Circuit High Voltage Bank 1 Sensor 2 | Signal voltage > 1.26 V for > 5 Sec. |
| P0139 | HO2 Sensor Circuit Slow Response Bank 1 Sensor 2 | • O2S signal rear during fuel cut off > 160 mV • O2S signal rear either < 624 or > 624 mV |
| P013A | HO2 Sensor Slow Response - Rich to Lean Bank 1 Sensor 2 | • EWMA filtered max differential transient time at fuel cut off ≥ 0.7 Sec and • Number of checks ≥ 3.00 (initial phase and step function) |
| P0140 | HO2 Sensor Circuit No Activity Detected Bank 1 Sensor 2 | • Difference of sensor voltage with load pulse and voltage without load pulse (mean value of 3 measurements) ≥ 2.80 V • Internal resistance > 40000.0 Ω and • Exhaust temperature > 600.0 °C |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|---|--|
| P0141 | HO2 Sensor Heater Circuit Bank 1 Sensor 2 | Heater resistance, 792.0 to 4560.0 Ω |
| P0171 | System Too Lean Bank 1 | Adaptive value > 6.0% |
| P0172 | System Too Rich Bank 1 | Adaptive value < 6-.0% |
| P0190 | Fuel Rail Pressure Sensor "A" Circuit | Signal voltage > 4.9 V |
| P0191 | Fuel Rail Pressure Sensor "A" Circuit Range/Performance | Actual pressure > 21.30 MPa |
| P0192 | Fuel Rail Pressure Sensor "A" Circuit Low | Signal voltage < 0.2 V |
| P0201 | Injector Circuit/Open - Cylinder 1 | • Signal current < 2.1 A |
| P0202 | Injector Circuit/Open - Cylinder 2 | • Signal current < 2.1 A |
| P0203 | Injector Circuit/Open - Cylinder 3 | • Signal current < 2.1 A |
| P0204 | Injector Circuit/Open - Cylinder 4 | • Signal current < 2.1 A |
| P0221 | Throttle/Pedal Position Sensor/Switch "B" Circuit Range/Performance | • TPS 1 - TPS 2 > 6.30% and • Actual TPS 2 calculated value > actual TPS 1 calculated value or • TPS 2 calculated value > 9.00% |
| P0222 | Throttle/Pedal Position Sensor/Switch "B" Circuit Low Input | Signal voltage < 0.20 V |
| P0223 | Throttle/Pedal Position Sensor/Switch "B" Circuit High Input | Signal voltage > 4.81 V |
| P0234 | Turbocharger/Supercharger "A" Overboost Condition | Difference set value boost pressure vs. actual boost pressure value > 20.0 to 127.50 kPa |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|--|--|
| P0236 | Turbocharger/Supercharger Boost Sensor "A" Circuit Range/Performance | <ul style="list-style-type: none"> • Difference boost pressure signal vs barometric sensor signal, >26.30 kPa • Difference boost pressure signal vs barometric sensor signal, <-16.30 kPa • Difference pressure in front of throttle to average value of all pressure sensors @ start < -6.00 kPa • Difference pressure in front of throttle to average value of all pressure sensors @ start > 6.00 kPa |
| P0237 | Turbocharger/Supercharger Boost Sensor "A" Circuit Range/Performance | Signal voltage < 0.20 V |
| P0238 | Turbocharger/Supercharger Boost Sensor "A" Circuit High | Signal voltage > 4.88 V |
| P0243 | Turbocharger/Supercharger Wastegate Solenoid "A" | Signal voltage > 4.4 - 5.60 V |
| P0245 | Turbocharger/Supercharger Wastegate Solenoid "A" Low | Signal voltage < 2.15 - 3.25 V |
| P0246 | Turbocharger/Supercharger Wastegate Solenoid "A" High | Signal current, >2.20 to 4.00 A |
| P025A | Fuel Pump Module "A" Control Circuit/Open | Signal voltage > 4.40 - 5.60 V |
| P025C | Fuel Pump Module "A" Control Circuit Low | Signal voltage < 2.15 - 3.25 V |
| P025D | Fuel Pump Module "A" Control Circuit High | Signal current > 1.10 A |
| P0261 | Cylinder 1 Injector Circuit Low | Signal current < 2.10 A |
| P0262 | Cylinder 1 Injector Circuit High | Signal current > 14.70 A |
| P0264 | Cylinder 2 Injector Circuit Low | Signal current < 2.10 A |
| P0265 | Cylinder 2 Injector Circuit High | Signal current > 14.70 A |
| P0267 | Cylinder 3 Injector Circuit Low | Signal current < 2.10 A |
| P0268 | Cylinder 3 Injector Circuit High | Signal current > 14.70 A |
| P0270 | Cylinder 4 Injector Circuit Low | Low side signal current < 2.10 A |
| P0271 | Cylinder 4 Injector Circuit High | Signal current > 14.70 A |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|--|---|
| P0299 | Turbocharger/Supercharger "A" Underboost Condition | Difference set value boost pressure vs actual boost pressure value, > 15 kPa |
| P2004 | Intake Manifold Runner Control Stuck Open Bank 1 | <ul style="list-style-type: none"> • Normal closed position, unable to reach • Signal voltage < 2.62 or > 4.65 V or <ul style="list-style-type: none"> • Normal open position, unable to reach • Signal voltage, < 0.35 or > 2.38 V |
| P2008 | Intake Manifold Runner Control Circuit/Open Bank 1 | Signal voltage 4.70 to 5.40 V |
| P2009 | Intake Manifold Runner Control Circuit Low Bank 1 | Signal voltage 0.00 to 3.26 V |
| P2010 | Intake Manifold Runner Control Circuit High Bank 1 | Signal current > 2.20 A |
| P2014 | Intake Manifold Runner Position Sensor/Switch Circuit Bank 1 | Signal voltage > 4.75 V |
| P2015 | Intake Manifold Runner Position Sensor/Switch Circuit Range/Performance Bank 1 | Rationality Check: <ul style="list-style-type: none"> • Difference between target position vs. actual position > 25.0% and <ul style="list-style-type: none"> • Actual position < 0.0 or > 100% Rationality Check High: <ul style="list-style-type: none"> • Difference between target position vs. actual position > 25.0% and <ul style="list-style-type: none"> • Actual position < 0.0 or > 100% Rationality Check Low: <ul style="list-style-type: none"> • Difference between target position vs. actual position > 25.0% and <ul style="list-style-type: none"> • Actual position < 0.0 or > 100% |
| P2016 | Intake Manifold Runner Position Sensor/Switch Circuit Low Bank 1 | Signal voltage, < 0.25 V |

DTC Chart

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|--|--|
| P2088 | "A" Camshaft Position Actuator Control Circuit Low Bank 1 | Signal voltage, 0.0 to 3.25 V |
| P2089 | "A" Camshaft Position Actuator Control Circuit High Bank 1 | Signal current > 2.20 A |
| P2096 | Post Catalyst Fuel Trim System Too Lean Bank 1 | l-portion of 2nd lambda control loop < -0.045 |
| P2097 | Post Catalyst Fuel Trim System Too Rich Bank 1 | l-portion of 2nd lambda control loop > 0.045 |
| P3081 | Engine Temperature Too Low | Difference between ECT and modeled ECT > 9.8 K |

Ignition System

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|---|--|
| P0300 | Random/Multiple Cylinder Misfire Detected | <ul style="list-style-type: none"> • Emission threshold 1st misfire rate (MR) > 1.7% • Catalyst damage misfire rate (MR) > 2.5 - 20.0% |
| P0301 | Cylinder 1 Misfire Detected | <ul style="list-style-type: none"> • Emission threshold misfire rate (MR) > 1.90% • Catalyst damage misfire rate (MR) > 3.70 to 16.76% |
| P0302 | Cylinder 2 Misfire Detected | <ul style="list-style-type: none"> • Emission threshold misfire rate (MR) > 1.90% • Catalyst damage misfire rate (MR) > 3.70 to 16.76% |
| P0303 | Cylinder 3 Misfire Detected | <ul style="list-style-type: none"> • Emission threshold misfire rate (MR) > 1.90% • Catalyst damage misfire rate (MR) > 3.70 to 16.76% |
| P0304 | Cylinder 4 Misfire Detected | <ul style="list-style-type: none"> • Emission threshold misfire rate (MR) > 1.90% • Catalyst damage misfire rate (MR) > 3.70 to 16.76% |
| P0321 | Ignition/Distributor Engine Speed Input Circuit Range/Performance | Counted teeth versus reference, incorrect > 1 |
| P0322 | Ignition/Distributor Engine Speed Input Circuit No Signal | <ul style="list-style-type: none"> • Camshaft signals > 3.00 and • Engine speed no signal |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|--|--|
| P0324 | Knock Control System Error | <ul style="list-style-type: none"> • Signal fault counter (combustion) > 24.00- or • Signal fault counter (measuring window) > 2.00- |
| P0327 | Knock/Combustion Vibration Sensor 1 Circuit Low | Short to Ground Port B: Short to Ground Port A: <ul style="list-style-type: none"> • Lower threshold < 70 V Signal Range Check: <ul style="list-style-type: none"> • Lower threshold, < 0.00 to 3.10V |
| P0328 | Knock/Combustion Vibration Sensor 1 Circuit High | Short to Battery Plus Port B: Short to Battery Plus Port A: <ul style="list-style-type: none"> • Upper threshold > 1.00 V Signal Range Check: <ul style="list-style-type: none"> • Upper threshold, > 37.50 to 165.00 V |
| P0332 | Knock/Combustion Vibration Sensor 2 Circuit Low | Lower threshold 0.05 - 0.38 V |
| P0333 | Knock/Combustion Vibration Sensor 2 Circuit High | Upper threshold 4.5 - 30.0 V |
| P0340 | Camshaft Position Sensor "A" Circuit | Cam adaptation values out of range <ul style="list-style-type: none"> • > 20° KW • < -20° KW • Difference of adapted and actual values > 9° KW |
| P0341 | Camshaft Position Sensor "A" Circuit Range/Performance | <ul style="list-style-type: none"> • Signal pattern incorrect and • Defect counter = 12 |
| P0342 | Camshaft Position Sensor "A" Circuit Low | <ul style="list-style-type: none"> • Signal voltage permanently low and • Crankshaft signals = 8.0 |
| P0343 | Camshaft Position Sensor "A" Circuit High | <ul style="list-style-type: none"> • Signal voltage permanently high and • Internal check failed |
| P0351 | Ignition Coil "A" Primary Control Circuit/Open | <ul style="list-style-type: none"> • Signal current, < 0.25 to -2.00 mA or • Internal check failed |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|--|--|
| P0352 | Ignition Coil "B" Primary/ Secondary Circuit | <ul style="list-style-type: none"> • Signal current, < 0.25 to -2.00 mA or <ul style="list-style-type: none"> • Internal check failed |
| P0353 | Ignition Coil "C" Primary/ Secondary Circuit | <ul style="list-style-type: none"> • Signal current, < 0.25 to -2.00 mA or <ul style="list-style-type: none"> • Internal check failed |
| P0354 | Ignition Coil "D" Primary/ Secondary Circuit | <ul style="list-style-type: none"> • Signal current, < 0.25 to -2.00 mA <ul style="list-style-type: none"> • Internal check failed |

Additional Exhaust Regulation

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|---|--|
| P0420 | Catalyst System Efficiency Below Threshold Bank 1 | Amplitude ratio O2S < 1 |
| P0441 | EVAP System Incorrect Purge Flow | <ul style="list-style-type: none"> • Deviation Lambda control < 2.00 to 7.00% and <ul style="list-style-type: none"> • Deviation idle control < 30.00% |
| P0442 | EVAP System Leak Detected (small leak) | Time for pressure drop < 1.60 to 1.80 Sec. |
| P0444 | EVAP System Purge Control Valve "A" Circuit Open | Signal voltage > 4.70 to 5.40 V |
| P0455 | EVAP System Leak Detected (large leak) | Time for pressure drop < 1.00 Sec. |
| P0456 | EVAP System Leak Detected (very small leak) | Pressure Check: <ul style="list-style-type: none"> • Time for pressure drop < 5.0 to 6.5 Sec. |
| P0458 | EVAP System Purge Control Valve "A" Circuit Low | Signal voltage, 0.00 to 3.26 V |
| P0459 | EVAP System Purge Control Valve "A" Circuit High | Signal current, > 2.20 A |

Speed and Idle Control

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|---|--|
| P0501 | Vehicle Speed Sensor "A" Circuit Range/Performance | Vehicle speed < 2 MPH |
| P0503 | Vehicle Speed Sensor "A" Circuit Intermittent/Erratic/ High | Vehicle speed > 200 km/h |
| P0506 | Idle Air Control System RPM Lower Than Expected | <ul style="list-style-type: none"> • Engine speed deviation > 80.0 RPM and • RPM controller torque value \geq calculated max. value or • Integrated deviation of engine speed low and integrated deviation of engine speed high > 2000.0 RPM |
| P0507 | Idle Air Control System RPM Higher Than Expected | <ul style="list-style-type: none"> • Engine speed deviation > 80 RPM and • RPM controller torque value \geq calculated min. value or • Integrated number of fuel cut off transitions \geq n.a. |
| P050A | Cold Start Idle Air Control System Performance | <p>Plausibility Check:</p> <ul style="list-style-type: none"> • Integrated deviation of engine speed low and integrated deviation of engine speed high > 2000 RPM <p>Out of Range Low:</p> <ul style="list-style-type: none"> • Engine speed deviation > 80.0 RPM and • RPM controller torque value \geq calculated max. value <p>Out of Range High</p> <ul style="list-style-type: none"> • Engine speed deviation < -80.0 RPM and • RPM controller torque value \leq calculated min. value |
| P050B | Cold Start Idle Air Control System Performance | Difference between commanded spark timing vs. actual value > 18.00% |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|------------|--|---|
| P052A | Cold Start "A" Camshaft Position Timing Over-Advanced Bank 1 | Difference between target position vs. actual position > 6.0° CRK |
| P053F | Cold Start High Fuel Pressure Performance | <ul style="list-style-type: none"> • Difference between target pressure vs. actual pressure < -1.50 MPa • Difference between target pressure vs. actual pressure > 1.50 MPa |

Control Module and Output Signals

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|------------|---|---|
| P0601 | Internal Control Module Memory Check Sum Error | Internal check sum, incorrect |
| P0604 | Internal Control Module Random Access Memory (RAM) Error | Write ability check, failed |
| P0605 | Internal Control Module Read Only Memory (ROM) Error | Check sum incorrect |
| P0606 | Control Module Processor | Module internal check failure. |
| P062B | Internal Control Module Fuel Injector Control Performance | SPI communications check Identifier failure |
| P0638 | Throttle Actuator Control Range/Performance - Bank 1 | Rationality check: <ul style="list-style-type: none"> • Time to close to reference point > 0.56 Sec. and <ul style="list-style-type: none"> • Reference point 2.88% Signal range check: <ul style="list-style-type: none"> • Duty cycle > 80% and <ul style="list-style-type: none"> • ECM power stage, no failure • TPS 1 signal voltage < 0.40; > 0.80 V or <ul style="list-style-type: none"> • TPS 2 signal voltage < 4.20; > 4.60V |
| P0641 | Sensor Reference Voltage "A" Circuit/Open | Signal voltage deviation > +/- 0.30 V |
| P0642 | Sensor Reference Voltage "A" Circuit Low | Signal voltage, < 4.6 to 5 V |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|--|---|
| P0643 | Sensor Reference Voltage "A" Circuit High | 5 V supply voltage > 5 to 5.4 V |
| P0651 | Sensor Reference Voltage "B" Circuit/Open | Signal voltage deviation > +/- 0.30 V |
| P0652 | Sensor Reference Voltage "B" Circuit Low | Signal voltage, < 4.6-5 V |
| P0653 | Sensor Reference Voltage "B" Circuit High | 5 V supply voltage > 5 to 5.4 V |
| P0657 | Actuator Supply Voltage "A" Circuit/Open | Signal voltage, > 4.40 to 5.60 V |
| P0658 | Actuator Supply Voltage "A" Circuit Low | Signal voltage < 2.15 - 3.25 V |
| P0659 | Actuator Supply Voltage "A" Circuit High | Signal current > 1.10 A |
| P0685 | ECM/PCM Power Relay Control Circuit/Open | <ul style="list-style-type: none"> • Signal voltage 2.6 - 3.7 V • Sense circuit voltage > 6 V |
| P0686 | ECM/PCM Power Relay Control Circuit Low | <ul style="list-style-type: none"> • Signal voltage 2.6 - 3.7 V • Sense circuit voltage > 6 V |
| P0687 | ECM/PCM Power Relay Control Circuit High | <ul style="list-style-type: none"> • Signal current > 1.4 - 0.7 A • Sense circuit voltage < 6 V |
| P0688 | ECM/PCM Power Relay Sense Circuit/Open | <ul style="list-style-type: none"> • Sense voltage < 3.0 V • Sense voltage, > 3.0 V |
| P0697 | Sensor Reference Voltage "C" Circuit/Open | Signal voltage deviation > +/- 0.30 V |
| P0698 | Sensor Reference Voltage "C" Circuit Low | Signal voltage, < 4.6 to 5 V |
| P0699 | Sensor Reference Voltage "C" Circuit High | 5 V supply voltage > 5 to 5.4 V |
| U0001 | High Speed CAN Communication Bus | CAN message, no feedback |
| U0002 | High Speed CAN Communication Bus Performance | Global time out-receiving no message |
| U0100 | Lost Communication with ECM/PCM "A" | <ul style="list-style-type: none"> • Failure of all CAN engine messages, time out > 490 mSec. • Failure of all CAN engine messages, but not all CAN messages, time out > 1010 mSec. |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|------------|--|---|
| U0101 | Lost Communication with TCM | Received CAN message No message |
| U0121 | Lost Communication With Anti-Lock Brake System (ABS) Control Module | Received CAN message no message |
| U0146 | Lost Communication With Gateway "A" | CAN communication with gateway, time-out |
| U0155 | Lost Communication With Instrument Panel Cluster (IPC) Control Module | Received CAN message no message |
| U0302 | Software Incompatibility with Transmission Control Module | TCM signal received AT vehicle data |
| U0323 | CAN: Instrument cluster Audi only | Ambient temperature value module not encoded for ambient temp sensor, 00h |
| U0402 | Invalid Data Received From TCM | Received data implausible message |
| U0404 | Invalid Data Received From Gear Shift Control Module "A" | <ul style="list-style-type: none"> • If the value of message counter is permanent, constant, or change exceeds a threshold, increment an event counter • Maximum change of message counter > 5 |
| U0415 | Invalid Data Received From Anti-Lock Brake System (ABS) Control Module | <ul style="list-style-type: none"> • Received data implausible message • Speed sensor signal 203.0 MPH • Speed sensor signal 203.0 MPH • Initialisation error • Vehicle speed 202.00 MPH |
| U0422 | Invalid Data Received From Body Control Module | Ambient temperature value initialization, Audi 01 h |
| U0423 | Invalid Data Received From Instrument Panel Cluster Control Module | <ul style="list-style-type: none"> • AAT value (initialization) 1.0 h • Received data implausible message |
| U0447 | Invalid Data Received From Gateway "A" | CAN message incorrect |
| U102E | LIN Communication | NLIN message, incorrect |
| U102F | LIN Communication | Time out |
| U1030 | LIN Communication | Not active |

Fuel and Air Ratios Control Module

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|--|--|
| P1114 | O2 Sensor Heater Circuit Bank 1 Sensor 2 | Heater resistance, (128-648)*(8-40)1.02-25.9 k Ω (dep. on mod. exhaust temperature and heater power) |
| P12A1 | Fuel Rail Pressure Sensor Inappropriately Low | <ul style="list-style-type: none"> • Pressure control activity, > 0.18 MPa and • Fuel trim activity < 0.80 and • Difference between target pressure vs. actual pressure -16.38 to 16.38 MPa |
| P12A2 | Fuel Rail Pressure Sensor Inappropriately High | <ul style="list-style-type: none"> • Pressure control activity, < -0.05 MPa and • Fuel trim activity > 1.5 |
| P12A4 | Fuel Rail Pump Control Valve Stuck Closed | <ul style="list-style-type: none"> • Pressure control activity, < 6.00 mPa and • Fuel trim activity, < 0.80- and • Difference between target pressure vs. actual pressure -16.38 to 16.38 MPa |
| P13EA | Ignition Timing Monitor | Difference between commanded spark timing and actual value > 22% |
| P150A | Engine Off Time | <ul style="list-style-type: none"> • Difference between engine off time and ECM after run time < -12.0 Sec. • Difference between engine off time and ECM after run time > 12.0 Sec. |
| P2101 | Throttle Actuator "A" Control Motor Circuit Range/ Performance | <ul style="list-style-type: none"> • Duty cycle > 80% and • ECM power stage, no failure • Deviation throttle value angles vs. throttle value setpoint > 4.00 to 50.00% |
| P2106 | Throttle Actuator Control System - Forced Limited Power | Internal check failed |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|------------|--|--|
| P2110 | Throttle Actuator Control System - Forced Limited RPM | Engine load out of range |
| P2122 | Throttle/Pedal Position Sensor/Switch "D" Circuit Low | Signal voltage < 0.61 V |
| P2123 | Throttle/Pedal Position Sensor/Switch "D" Circuit High | Signal voltage > 4.79 V |
| P2127 | Throttle/Pedal Position Sensor/Switch "E" Circuit Low | Signal voltage < 0.27 V |
| P2128 | Throttle/Pedal Position Sensor/Switch "E" Circuit High | Signal voltage > 2.43 V |
| P2138 | Throttle/Pedal Position Sensor/Switch "D"/"E" Voltage Correlation | Signal voltage sensor 1 vs 2, 0.17 to 0.70 V |
| P2146 | Fuel Injector Group "A" Supply Voltage Circuit/Open | <ul style="list-style-type: none"> • Signal current < 2.6 A or • Signal current > 14.90 A |
| P2149 | Fuel Injector Group "B" Supply Voltage Circuit/Open | <ul style="list-style-type: none"> • Signal current < 2.6 A or • Signal current > 14.90 A |
| P2177 | System Too Lean Off Idle Bank 1 | Adaptive value > 26% |
| P2178 | System Too Rich Off Idle Bank 1 | Adaptive value < 26% |
| P2181 | Cooling System Performance | Cooling system temperature too low after a sufficient mass air flow integral < 74.0 to 84.0° C |
| P2184 | Engine Coolant Temperature Sensor 2 Circuit Low | ECT outlet > 141° C |
| P2185 | Engine Coolant Temperature Sensor 2 Circuit High | ECT outlet < -43° C |
| P2187 | System Too Lean at Idle Bank 1 | Adaptive value > 6.00% |
| P2188 | System Too Rich at Idle Bank 1 | Adaptive value < 6.0% |
| P2195 | O2 Sensor Signal Biased/ Stuck Lean Bank 1 Sensor 1 | Delta lambda of 2nd lambda control loop > 0.07- |
| P2196 | O2 Sensor Signal Biased/ Stuck Rich - Bank 1, Sensor 1 | Delta lambda of 2nd lambda control loop < -0.07- |
| P2231 | O2 Sensor Signal Circuit Shorted to Heater Circuit Bank 1 Sensor 1 | Delta O2S signal front > 190 uA |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|--|--|
| P2237 | O2 Sensor Positive Current Control Circuit / Open - Bank 1, Sensor 1 | <ul style="list-style-type: none"> • O2S voltage signal front 1.49 to 1.51 V and • Difference between maximum and minimum value of O2S voltage signal front < 32.00 V and • Delta lambda controller > 0.10- or • Lambda control at min or max limit • O2S voltage signal front 1.49 to 1.51 V and • Difference between maximum and minimum value of O2S voltage signal front < 32.00 V and • No reaction on commanded stepwise change of lambda-setpoint <> 1 |
| P2243 | HO2 Sensor Reference Voltage Circuit / Open - Bank 1 Sensor 1 | <ul style="list-style-type: none"> • O2S signal front < 0.30 V, > 3.25V and • Internal resistance > 1000 O |
| P2270 | HO2 Sensor Signal Biased/ Stuck Lean Bank 1 Sensor 2 | <ul style="list-style-type: none"> • O2S signal rear not oscillating at reference < 0.63 V and • Enrichment after stuck lean 14.99% |
| P2271 | O2 Circuit (Bank 1, Sensor 3) ULEV | <ul style="list-style-type: none"> • O2S signal rear not oscillating at reference < 0.63 V and • Enrichment after stuck lean 14.99% • Sensor voltage ≥ 0.18 V and • Number of checks ≥ 1.0 |
| P2279 | Intake Air System Leak | <ul style="list-style-type: none"> • Offset value throttle mass flow > 8.00 kg/h and • Correction factor > 0.97- |

DTC Chart

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|------------|--|--|
| P2293 | Fuel Pressure Regulator 2 Performance | <ul style="list-style-type: none"> • Difference between target pressure vs. actual pressure, <-2.00 MPa • Difference between target pressure vs. actual pressure, > 2.00 MPa |
| P2294 | Fuel Pressure Regulator 2 Control Circuit/Open | • Signal voltage 1.40 to 3.20 V |
| P2295 | Fuel Pressure Regulator 2 Control Circuit Low | Signal voltage >1.40 V |
| P2296 | Fuel Pressure Regulator 2 Control Circuit High | Signal voltage > 3.9 V |

Ignition System

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|------------|--|---|
| P2300 | Ignition Coil "A" Primary Control Circuit Low | Signal current >24.0 mA |
| P2301 | Ignition Coil "A" Primary Control Circuit High | Signal voltage >5.10 to 7.00 V |
| P2303 | Ignition Coil "B" Primary Control Circuit Low | Signal current >24.0 mA |
| P2304 | Ignition Coil "B" Primary Control Circuit High | Signal voltage >5.10 to 7.00 V |
| P2306 | Ignition Coil "C" Primary Control Circuit Low | Signal current >24.0 mA |
| P2307 | Ignition Coil "C" Primary Control Circuit High | Signal voltage >5.10 to 7.00 V |
| P2309 | Ignition Coil "D" Primary Control Circuit Low | Signal current >24.0 mA |
| P2310 | Ignition Coil "D" Primary Control Circuit High | Signal voltage >5.10 to 7.00 V |

Additional Emissions Regulations

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|------------|--|---|
| P2400 | Evaporative Emission System Leak Detection Pump Control Circuit/Open | Signal voltage > 4.40 to 5.60 V |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|---|---|
| P2401 | EVAP System Leak Detection Pump Control Circuit Low | Signal voltage < 2.15 to 3.25 V |
| P2402 | EVAP System Leak Detection Pump Control Circuit High | Signal current > 3.00 A |
| P2403 | EVAP System Leak Detection Pump Sense Circuit/Open | Low signal voltage > 0.50 Sec. |
| P2404 | EVAP System Leak Detection Pump Sense Circuit Range/Performance | <ul style="list-style-type: none"> • High signal voltage > 12.0 Sec. and • Number of checks 30.00- • Cumulative time of high signal voltage during pumping >50.0 Sec. |
| P2414 | O2 Sensor Exhaust Sample Error Bank 1, Sensor 1 | Threshold 1: <ul style="list-style-type: none"> • Signal voltage 3.10 to 4.81V Threshold 2: <ul style="list-style-type: none"> • Signal voltage 2.50 to 3.10V • Depending on gain factor, that actual is used for sensor characteristic, the threshold is switched |
| P2539 | Low Pressure Fuel System Sensor Circuit | Signal voltage > 4.9 V |
| P2540 | Low Pressure Fuel System Sensor Circuit Range/Performance | Actual pressure deviation < 800 kPa < 80 kPa |
| P2541 | Low Pressure Fuel System Sensor Circuit Low | Signal voltage < 0.2 V |
| P2569 | Direct Ozone Reduction Catalyst Temperature Sensor Circuit Low | Signal voltage < 0.2 V |
| P2570 | Direct Ozone Reduction Catalyst Temperature Sensor Circuit High | Signal voltage > 5.0 V |
| P2626 | O2 Sensor Pumping Current Trim Circuit/Open Bank 1 Sensor 1 | O2S signal front >3.2 V |

DTC CHART

Engine Code – 2.0L CDMA

Fuel and Air Mixture, Additional Emission Regulations

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|---|---|
| P000A | "A" Camshaft Position Slow Response Bank 1 | <ul style="list-style-type: none"> • Difference between target position vs. actual position > 8.00° CRK • For time > 1.30 to 2.90 Sec. and • Adjustment angle ≥ 2.50° CRK |
| P0010 | "A" Camshaft Position Actuator Control Circuit/Open Bank 1 | Signal voltage, > 4.70 to 5.40 V |
| P0011 | "A" Camshaft Position - Bank 1 Timing Over-Advanced or System Performance | <ul style="list-style-type: none"> • Difference between target position vs. actual position > 8.00° CRK • For time > 1.30 to 2.90 Sec. and • Adjustment angle < 2.50° CRK |
| P0016 | Crankshaft Position - Camshaft Position Correlation Bank 1 Sensor A | <ul style="list-style-type: none"> • Permissible deviation < -11.01° CRK or • Permissible deviation > 11.01° CRK |
| P0030 | HO2S Heater Control Circuit Bank 1 Sensor 1 | Heater voltage 4.70 to 5.40 V |
| P0031 | HO2S Heater Control Circuit Low Bank 1 Sensor 1 | Heater voltage 0.00 to 3.26 V |
| P0032 | HO2S Heater Control Circuit High Bank 1 Sensor 1 | Signal current > 5.50 A |
| P0036 | HO2S Heater Control Circuit Bank 1 Sensor 2 | Heater voltage, 2.34 to 3.59 V |
| P0037 | HO2S Heater Control Circuit Low Bank 1 Sensor 2 | Heater voltage < 2.34 V |
| P0038 | HO2S Heater Control Circuit High Bank 1 Sensor 2 | Heater voltage > 3.59 V |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|---|---|
| P0068 | MAP/MAF – Throttle Position Correlation | <ul style="list-style-type: none"> • Plausibility with fuel system, load calculation <50% • Plausibility with fuel system, load calculation >50% |
| P0070 | Ambient Air Temperature Sensor Circuit “A” | AAT signal short to battery/Open circuit, failure |
| P0071 | Ambient Air Temperature Sensor Circuit “A” Range/ Performance | <ul style="list-style-type: none"> • Difference ECT vs. IAT @ manifold @ engine start (depending on engine-off time) < 24.8 to 39.8 K and • Difference value IAT @ manifold vs. AAT @ engine start (depending on engine-off time) > 24.8 to 39.8 K and • Difference AAT vs. ECT at engine start (depending on engine-off time) > 24.8 to 39.8 K |
| P0072 | Ambient Air Temperature Sensor Circuit “A” Low | AAT signal short to ground, failure |
| P0087 | Fuel Rail/System Pressure - Too Low | <ul style="list-style-type: none"> • Pressure control activity, > 5.00 MPaa and • Fuel trim activity, 1.05 to 1.50- and • Difference between target pressure vs. actual pressure > -16.38 MPa |
| P0088 | Fuel Rail/System Pressure - Too High | Fuel rail pressure > 13.9 MPa |
| P0089 | Fuel Pressure Regulator 1 Performance | Actual pressure deviation <100 kPa or >100 kPa |
| P008A | Low Pressure Fuel System Pressure - Too Low | Actual pressure < 0.08 MPa |
| P008B | Low Pressure Fuel System Pressure - Too High | Actual pressure > 0.08 MPa |
| P0100 | Mass or Volume Air Flow Sensor “A” Circuit | MAF sensor signal 0 μ s |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|---|--|
| P0101 | Mass or Volume Air Flow Sensor "A" Circuit Range/Performance | <ul style="list-style-type: none"> • Mass air flow vs lower threshold model < 3 to 197kg/h% • Mass air flow vs upper threshold > 60 to 890 kg/h |
| P0102 | Mass or Volume Air Flow Sensor "A" Circuit Low | MAF sensor signal, <66 u Sec.s |
| P0103 | Mass or Volume Air Flow Sensor "A" Circuit High | MAF sensor signal, >4.5 m Sec. |
| P0106 | Manifold Absolute Pressure/Barometric Pressure Sensor Circuit Range/Performance | <p>Rationality Check Low:</p> <ul style="list-style-type: none"> • Difference manifold pressure - lower threshold model < 0.0 kPa • Model range 0.0 to 190.0 kPa <p>Rationality Check High:</p> <ul style="list-style-type: none"> • Difference manifold pressure - upper threshold model > 0.0 kPa • Model range 85.0 to 250.0 kPa <p>Rationality Check:</p> <ul style="list-style-type: none"> • Difference barometric sensor signal vs. manifold pressure signal at engine start > 9.00 kPa <p>Adaptation Value Monitoring:</p> <ul style="list-style-type: none"> • Offset value manifold pressure for load calculation in driving condition range 2 > 8.00 kPa <p>Adaptation Value Monitoring:</p> <ul style="list-style-type: none"> • Offset value manifold pressure for load calculation in driving condition range 2 <- 8.00 kPa <p>Cross Check:</p> <ul style="list-style-type: none"> • Diff. manifold pressure to average value of all pressure sensors @ start < -6.50 kPa <p>Cross Check:</p> <ul style="list-style-type: none"> • Diff. manifold pressure to average value of all pressure sensors @ start > 6.00 kPa <p>Rationality Check:</p> <ul style="list-style-type: none"> • Manifold pressure signal: variation between state 1 and 2 < 1.00 kPa |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|---|---|
| P0107 | Manifold Absolute Pressure/ Barometric Pressure Sensor Circuit Low | <ul style="list-style-type: none"> • Short to ground signal voltage < 0.20 V • Manifold pressure signal < 8.00 kPa |
| P0108 | Manifold Absolute Pressure/ Barometric Pressure Sensor Circuit High | Range Check: <ul style="list-style-type: none"> • Manifold pressure signal > 300.00 kPa Short to Battery/ Open Circuit: <ul style="list-style-type: none"> • Signal voltage > 4.80 V |
| P0111 | Intake Air Temperature Sensor 1 Circuit Range/Performance | <ul style="list-style-type: none"> • Diff. ECT vs. IAT @ manifold at engine start (depending on engine-off time, > 25 to 39.8 K and • Difference IAT @ manifold vs. AAT @ engine start (depending on engine-off time), > 25 to 39.8 K and • Difference AAT vs. ECT at engine start (depending on engine off time) < 24.8 to 39.8 K |
| P0112 | Intake Air Temperature Sensor 1 Circuit Low | Signal voltage, < 0.16 V |
| P0113 | Intake Air Temperature Sensor 1 Circuit High | Signal voltage, < 4.48 V |
| P0116 | Engine Coolant Temperature Sensor 1 Circuit Range/ Performance | Cross Check: <ul style="list-style-type: none"> • Difference ECT vs. IAT @ manifold at engine start > 24.8 to 39.8K (depending on engine off time) and • Difference IAT@manifold vs. AAT at engine start < 24.8 to 39.8K (depending on engine off time) and • Difference AAT vs. ECT at engine start > 24.8 to 39.8K (depending on engine off time) |
| P0117 | Engine Coolant Temperature Sensor 1 Circuit Low | Engine coolant temperature > 140° C |
| P0118 | Engine Coolant Temperature Sensor 1 Circuit High | Engine coolant temperature < -40.0° C |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|---|---|
| P0121 | Throttle/Pedal Position Sensor/Switch "A" Circuit Range/Performance | <ul style="list-style-type: none"> • TPS 1 - TPS 2 > 6.30% and • Actual TPS 1 calculated value > actual TPS 2 calculated value or <ul style="list-style-type: none"> • TPS 1 calculated value > 9.00% |
| P0122 | Throttle/Pedal Position Sensor/Switch "A" Circuit Low | Signal voltage, < 0.20 V |
| P0123 | Throttle/Pedal Position Sensor/Switch "A" Circuit High | Signal voltage, > 4.81 V |
| P0130 | HO2 Sensor Circuit Bank 1 Sensor 1 | O2S ceramic temperature < 640° C |
| P0131 | HO2 Sensor Circuit Low Voltage Bank 1 Sensor 1 | Short to Battery: <ul style="list-style-type: none"> • Nernst voltage UN, < 1.50 V or <ul style="list-style-type: none"> • Adjustment voltage IA, < 0.30 V or <ul style="list-style-type: none"> • Adjustment voltage IP < 0.30 V |
| P0132 | HO2 Sensor Circuit High Voltage Bank 1 Sensor 1 | Short to Battery: <ul style="list-style-type: none"> • Nernst voltage UN, > 4.40 V or <ul style="list-style-type: none"> • Adjustment voltage IA, > 7.00 V or <ul style="list-style-type: none"> • Adjustment voltage IP > 7.00 V |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|--|--|
| P0133 | HO2 Sensor Circuit Slow Response Bank 1 Sensor 1 | <p>Symmetric Fault:\</p> <ul style="list-style-type: none"> • Difference of R2L area ratio vs. L2R area ratio -0.35 to 0.35- • Max value of both counters for area ratio R2L and L2R ≥ 5 times <p>Delayed Time:</p> <ul style="list-style-type: none"> • Gradient ratio ≥ 0.00- • Lower value of both area ratios R2L and L2R < 0.20- <p>Transient Time:</p> <ul style="list-style-type: none"> • Gradient ratio ≥ 0.00- • Gradient ratio ≤ 0.00- • Lower value of both area ratios R2L and L2R < 0.20- <p>or</p> <ul style="list-style-type: none"> • Lower value of both gradient ratios R2L and L2R < 0.00- <p>Asymmetric Fault:</p> <ul style="list-style-type: none"> • Difference of R2L area ratio vs. L2R area ratio < -0.35, > 0.35- • Values of both counters for area ratio R2L and L2R ≥ 5 times <p>Delay Time:</p> <ul style="list-style-type: none"> • Gradient ratio ≥ 0.00- • Gradient ratio ≤ 0.00- • Lower value of both area ratios R2L and L2R < 0.35- <p>Transient Time:</p> <ul style="list-style-type: none"> • Gradient ratio ≥ 0.00- • Gradient ratio ≤ 0.00- • Lower value of both area ratios R2L and L2R < 0.35- <p>or</p> <ul style="list-style-type: none"> • Lower value of both area ratios R2L and L2R < 0.00- |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|---|---|
| P0135 | O2 Heater Circuit (Bank 1, Sensor 1) | Out of Range-High • O2S ceramic temperature < 715° C and • Heater duty cycle 100% Rationality Check: • O2S ceramic temperature < 715° C and • Time after O2S heater on 40 Sec. |
| P0136 | HO2 Sensor Circuit Bank 1 Sensor 2 | • Delta voltage one step at heater switchin >2.0 V • Cycles completed ≥ 6 |
| P0137 | HO2 Sensor Circuit Low Voltage Bank 1 Sensor 2 | • Signal voltage < 0.06 V for time > 3 Sec. and • Difference of sensor voltage with load pulse and voltage without load pulse (mean value of 3 measurements) < 0.01 V |
| P0138 | HO2 Sensor Circuit High Voltage Bank 1 Sensor 2 | • Signal voltage >1.26 V • For time > 5.0 Sec |
| P0139 | HO2 Sensor Circuit Slow Response Bank 1 Sensor 2 | • O2S signal rear during fuel cut off > 160 mV • O2S signal rear either < 624 or > 624 mV |
| P013A | HO2 Sensor Slow Response - Rich to Lean Bank 1 Sensor 2 | • EWMA filtered max differential transient time at fuel cut off ≥ 0.7 Sec and • Number of checks ≥ 3.00 (initial phase and step function) |
| P0140 | HO2 Sensor Circuit No Activity Detected Bank 1 Sensor 2 | • Difference of sensor voltage with load pulse and voltage without load pulse (mean value of 3 measurements) ≥ 2.80 V • Internal resistance > 40000.0 Ω and • Exhaust temperature > 600.0° C |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|---|--|
| P0141 | HO2 Sensor Heater Circuit Bank 1 Sensor 2 | Heater resistance, 792.0 to 4560.0 Ω |
| P0171 | System Too Lean Bank 1 | Adaptive value > 6.0% |
| P0172 | System Too Rich Bank 1 | Adaptive value < -6.0% |
| P0190 | Fuel Rail Pressure Sensor "A" Circuit | Signal voltage > 4.8 V |
| P0191 | Fuel Rail Pressure Sensor "A" Circuit Range/Performance | Actual pressure > 21.30 MPa |
| P0192 | Fuel Rail Pressure Sensor "A" Circuit Low | Signal voltage < 0.2 V |
| P0201 | Injector Circuit/Open - Cylinder 1 | • Low side signal current < 2.10 A |
| P0202 | Injector Circuit/Open - Cylinder 2 | • Low side signal current < 2.10 A |
| P0203 | Injector Circuit/Open - Cylinder 3 | • Low side signal current < 2.10 A |
| P0204 | Injector Circuit/Open - Cylinder 4 | • Low side signal current < 2.10 A |
| P0221 | Throttle/Pedal Position Sensor/Switch "B" Circuit Range/Performance | • TPS 1 - TPS 2 > 6.30% and • Actual TPS 1 calculated value > actual TPS 2 calculated value or • TPS 1 calculated value > 9.00% |
| P0222 | Throttle/Pedal Position Sensor/Switch "B" Circuit Low | Signal voltage < 0.20 V |
| P0223 | Throttle/Pedal Position Sensor/Switch "B" Circuit High | Signal voltage > 4.81 V |
| P0234 | Turbocharger/Supercharger "A" Overboost Condition | Difference set value boost pressure vs. actual boost pressure value > 20.0 to 127.50 kPa |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|------------|--|--|
| P0236 | Turbocharger/Supercharger Boost Sensor "A" Circuit Range/Performance | <ul style="list-style-type: none"> • Difference boost pressure signal vs barometric sensor signal, >26.30 kPa • Difference boost pressure signal vs barometric sensor signal, <-16.30 kPa • Difference pressure in front of throttle to average value of all pressure sensors @ start < -6.00 kPa • Difference pressure in front of throttle to average value of all pressure sensors @ start > 6.00 kPa |
| P0237 | Turbocharger/Supercharger Boost Sensor "A" Circuit Range/Performance | Signal voltage < 0.2 V |
| P0238 | Turbocharger/Supercharger Boost Sensor "A" Circuit High | Signal voltage, > 4.88 V |
| P0243 | Turbocharger/Supercharger Wastegate Solenoid "A" | Signal voltage, > 4.40 to 5.60 V |
| P0245 | Turbocharger/Supercharger Wastegate Solenoid "A" Low | Signal voltage, < 2.15 to 3.25 V |
| P0246 | Turbocharger/Supercharger Wastegate Solenoid "A" High | Signal current, >2.20 to 4.00 A |
| P025A | Fuel Pump Module "A" Control Circuit/Open | Signal voltage > 4.40 to 5.60 V |
| P025C | Fuel Pump Module "A" Control Circuit Low | Signal voltage< 2.15 to 3.25 V |
| P025D | Fuel Pump Module "A" Control Circuit High | Signal current > 1.10 A |
| P0261 | Cylinder 1 Injector Circuit Low | Signal current < 2.10 A |
| P0262 | Cylinder 1 Injector Circuit High | Signal current > 14.70 A |
| P0264 | Cylinder 2 Injector Circuit Low | Signal current < 2.10 A |
| P0265 | Cylinder 2 Injector Circuit High | Signal current > 14.70 A |
| P0267 | Cylinder 3 Injector Circuit Low | Signal current < 2.10 A |
| P0268 | Cylinder 3 Injector Circuit High | Signal current > 14.70 A |
| P0270 | Cylinder 4 Injector Circuit Low | Low side signal current < 2.10 A |
| P0271 | Cylinder 4 Injector Circuit High | Signal current > 14.70 A |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|--|--|
| P0299 | Turbocharger/Supercharger "A" Underboost Condition | Difference set value boost pressure vs actual boost pressure value, > 15 kPa |
| P2004 | Intake Manifold Runner Control Stuck Open Bank 1 | <ul style="list-style-type: none"> • Normal closed position, unable to reach signal voltage < 2.62 or > 4.65 V or <ul style="list-style-type: none"> • Normal open position, unable to reach signal voltage < 0.35 or > 2.38 V |
| P2008 | Intake Manifold Runner Control Circuit/Open Bank 1 | Signal voltage 4.70 to 5.40 V |
| P2009 | Intake Manifold Runner Control Circuit Low Bank 1 | Signal voltage 0.00 to 3.26 V |
| P2010 | Intake Manifold Runner Control Circuit Shorted to B+ (Bank 1) | Signal current > 2.20 A |
| P2014 | Intake Manifold Runner Position Sensor/Switch Circuit Bank 1 | Signal voltage, > 4.75 V |
| P2015 | Intake Manifold Runner Position Sensor/Switch Circuit Range/Performance Bank 1 | Rationality Check: <ul style="list-style-type: none"> • Difference between target position vs. actual position > 25.0% and <ul style="list-style-type: none"> • Actual position < 0.0 or > 100% Rationality Check High: <ul style="list-style-type: none"> • Difference between target position vs. actual position > 25.0%% and <ul style="list-style-type: none"> • Actual position < 0.0 or > 100% Rationality Check Low: <ul style="list-style-type: none"> • Difference between target position vs. actual position > 25.0% and <ul style="list-style-type: none"> • Actual position < 0.0 or > 100% |
| P2016 | Intake Manifold Runner Position Sensor/Switch Circuit Low Bank 1 | Signal voltage < 0.125 V |
| P2088 | "A" Camshaft Position Actuator Control Circuit Low Bank 1 | Signal voltage, 0.0 to 3.25 V |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|--|--|
| P2089 | "A" Camshaft Position Actuator Control Circuit High Bank 1 | Signal current > 2.20 A |
| P2096 | Post Catalyst Fuel Trim System Too Lean Bank 1 | l-portion of 2nd lambda control loop < -0.045 |
| P2097 | Post Catalyst Fuel Trim System Too Rich Bank 1 | l-portion of 2nd lambda control loop > 0.045 |
| P3081 | Engine Temperature Too Low | Difference between ECT and modeled ECT > 10° K |

Ignition System

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|---|---|
| P0300 | Random/Multiple Cylinder Misfire Detected | <ul style="list-style-type: none"> • Emission threshold 1st interval % misfire rate (MR) > 1.7% • Catalyst damage misfire rate (MR) > 2.5 - 20.0% |
| P0301 | Cylinder 1 Misfire Detected | <ul style="list-style-type: none"> • Emission threshold 1st interval % misfire rate (MR) > 1.90% • Catalyst damage misfire rate (MR) > 3.70 to 16.76% |
| P0302 | Crankshaft Speed Fluctuation (Single or Multiple) | <ul style="list-style-type: none"> • Emission threshold 1st interval % misfire rate (MR) > 1.90% • Catalyst damage misfire rate (MR) > 3.70 to 16.76% |
| P0303 | Crankshaft Speed Fluctuation (Single or Multiple) | <ul style="list-style-type: none"> • Emission threshold 1st interval % misfire rate (MR) > 1.90% • Catalyst damage misfire rate (MR) > 3.70 to 16.76% |
| P0304 | Crankshaft Speed Fluctuation (Single or Multiple) | <ul style="list-style-type: none"> • Emission threshold 1st interval % misfire rate (MR) > 1.90% • Catalyst damage misfire rate (MR) > 3.70 to 16.76% |
| P0321 | Ignition/Distributor Engine Speed Input Circuit Range/Performance | Counted teeth versus reference, incorrect > 1 |
| P0322 | Ignition/Distributor Engine Speed Input Circuit No Signal | <ul style="list-style-type: none"> • Camshaft signals > 3.00l and • Engine speed no signal |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|--|---|
| P0324 | Knock Control System Error | <ul style="list-style-type: none"> • Signal fault counter (combustion) > 24.00-l or <ul style="list-style-type: none"> • Signal fault counter (measuring window) > 2.00- |
| P0327 | Knock/Combustion Vibration Sensor 1 Circuit Low | Short to Ground Port B: Short to Ground Port A: <ul style="list-style-type: none"> • Lower threshold < 0.70 V Signal Range Check: <ul style="list-style-type: none"> • Lower threshold, < 0.00 to 3.10V |
| P0328 | Knock/Combustion Vibration Sensor 1 Circuit High | Short to Battery Plus Port B: Short to Battery Plus Port A <ul style="list-style-type: none"> • Upper threshold > 1.00 V Signal Range Check: <ul style="list-style-type: none"> • Upper threshold, > 37.50 to 165.00 V |
| P0332 | Knock/Combustion Vibration Sensor 2 Circuit Low | Lower threshold 0.05 - 0.38 V |
| P0333 | Knock/Combustion Vibration Sensor 2 Circuit High | Upper threshold 4.5 - 30.0 V |
| P0340 | Camshaft Position Sensor "A" Circuit | Cam Adaption Values Out of Range; <ul style="list-style-type: none"> • > 20° KW • < -20° KW • Difference of adapted and actual values > 9° KW |
| P0341 | Camshaft Position Sensor "A" Circuit Range/Performance | <ul style="list-style-type: none"> • Signal pattern incorrect and • Defect counter = 12.0 |
| P0342 | Camshaft Position Sensor "A" Circuit Low | <ul style="list-style-type: none"> • Signal voltage permanently low and • Crankshaft signals = 8.0 |
| P0343 | Camshaft Position Sensor "A" Circuit High | <ul style="list-style-type: none"> • Signal voltage permanently high and • Crankshaft signals = 8.0 |
| P0351 | Ignition Coil "A" Primary Control Circuit/Open | <ul style="list-style-type: none"> • Signal current, < 0.25 to -2.00 mA or <ul style="list-style-type: none"> • Internal check failed |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|------------|--|--|
| P0352 | Ignition Coil "B" Primary Control Circuit/Open | <ul style="list-style-type: none"> • Signal current, < 0.25 to -2.00 mA or • Internal check failed |
| P0353 | Ignition Coil "C" Primary Control Circuit/Open | <ul style="list-style-type: none"> • Signal current, < 0.25 to -2.00 mA or • Internal check failed |
| P0354 | Ignition Coil "D" Primary Control Circuit/Open | <ul style="list-style-type: none"> • Signal current, < 0.25 to -2.00 mA or • Internal check failed |

Additional Exhaust Regulation

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|------------|---|--|
| P0420 | Catalyst System Efficiency Below Threshold Bank 1 | Amplitude ratio O2S < 1 |
| P0441 | EVAP System Incorrect Purge Flow | <ul style="list-style-type: none"> • Deviation lambda control < 2.00 to 7.00% and • Deviation idle control < 30.00% |
| P0442 | EVAP System Leak Detected (small leak) | Time for pressure drop < 1.60 to 1.80 Sec. |
| P0444 | EVAP System Purge Control Valve "A" Circuit Open | Signal voltage > 4.70 to 5.40 V |
| P0455 | EVAP System Leak Detected (large leak) | Time for pressure drop < 1.00 Sec. |
| P0456 | EVAP System Leak Detected (very small leak) | Pressure Check: <ul style="list-style-type: none"> • Time for pressure drop < 5.0 to 6.5 Sec. |
| P0458 | EVAP System Purge Control Valve "A" Circuit Low | Signal voltage, 0.00 to 3.26 V |
| P0459 | EVAP System Purge Control Valve "A" Circuit High | Signal current, > 2.20 A |

Speed and Idle Control

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|---|--|
| P0501 | Vehicle Speed Sensor "A" Circuit Range/Performance | Vehicle speed < 2 MPH |
| P0503 | Vehicle Speed Sensor "A" Circuit Intermittent/Erratic/ High | Vehicle speed >200.0 km/h |
| P0506 | Idle Air Control System RPM Lower Than Expected | <ul style="list-style-type: none"> • Engine speed deviation < -80 RPM and • RPM controller torque value \geq calculated max. value or • Integrated deviation of engine speed low and integrated deviation of engine speed high > 2000.0 RPM |
| P0507 | Idle Air Control System RPM Higher Than Expected | <ul style="list-style-type: none"> • Engine speed deviation > 80 RPM and • RPM controller torque value \geq calculated min. value or • Integrated number of fuel cut off transitions \geq n.a. |
| P050A | Cold Start Idle Air Control System Performance | <p>Plausibility Check:</p> <ul style="list-style-type: none"> • Integrated deviation of engine speed low and integrated deviation of engine speed high > 2000 RPM <p>Out of Range Low</p> <ul style="list-style-type: none"> • Engine speed deviation > 80 RPM and • RPM controller torque value \geq calculated max. value <p>Out of Range High</p> <ul style="list-style-type: none"> • Engine speed deviation < 80 RPM and • RPM controller torque value \leq calculated min. value |
| P050B | Cold Start Ignition Timing Performance | Difference between commanded spark timing vs. actual value > 18.00% |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|------------|--|---|
| P052A | Cold Start "A" Camshaft Position Timing Over-Advanced Bank 1 | Difference between target position and actual position > 6.0° CRK |
| P053F | Cold Start High Fuel Pressure Performance | <ul style="list-style-type: none"> • Difference between target pressure vs. actual pressure < -1.50 MPa or • Difference between target pressure vs. actual pressure > 1.50 MPa |

Control Module and Output Signals

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|------------|---|---|
| P0601 | Internal Control Module Memory Check Sum Error | Internal check sum, incorrect |
| P0604 | Internal Control Module Random Access Memory (RAM) Error | Write ability check, failed |
| P0605 | Internal Control Module Read Only Memory (ROM) Error | Checksum incorrect |
| P0606 | Control Module Processor | Module internal check failure. |
| P062B | Internal Control Module Fuel Injector Control Performance | SPI communications check Identifier failure |
| P0638 | Throttle Actuator Control Range/Performance Bank 1 | Rationality check: <ul style="list-style-type: none"> • Time to close to reference point > 0.56 Sec. and • Reference point 2.88% Signal range check: <ul style="list-style-type: none"> • Duty cycle > 80% and • ECM power stage, no failure • TPS 1 signal voltage < 0.40; > 0.80 V or • TPS 2 signal voltage < 4.20; > 4.60V |
| P0641 | Sensor Reference Voltage "A" Circuit/Open | Signal voltage deviation > +/- 0.30 V |
| P0642 | Sensor Reference Voltage "A" Circuit Low | Signal voltage, < 4.6 to 5 V |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|--|---|
| P0643 | Sensor Reference Voltage "A" Circuit High | 5 V supply voltage > 5 to 5.4 V |
| P0651 | Sensor Reference Voltage "B" Circuit/Open | Signal voltage deviation > +/- 0.30 V |
| P0652 | Sensor Reference Voltage "B" Circuit Low | Signal voltage, < 4.6-5 V |
| P0653 | Sensor Reference Voltage "B" Circuit High | 5 V supply voltage > 5 to 5.4 V |
| P0657 | Actuator Supply Voltage A Circuit/Open | Signal voltage > 4.4 - 5.6 V |
| P0658 | Actuator Supply Voltage "A" Circuit Low | Signal voltage < 2.15 - 3.25 V |
| P0659 | Actuator Supply Voltage A Circuit High | Signal current > 1.10 A |
| P0685 | ECM/PCM Power Relay Control Circuit/Open | <ul style="list-style-type: none"> • Signal voltage 2.6 - 3.7 V • Sense circuit voltage < 6 V |
| P0686 | ECM/PCM Power Relay Control Circuit Low | <ul style="list-style-type: none"> • Signal voltage 2.6 - 3.7 V • Sense circuit voltage > 6 V |
| P0687 | ECM/PCM Power Relay Control Circuit High | <ul style="list-style-type: none"> • Signal current > 1.4 - 0.7 A • Sense circuit voltage < 6 V |
| P0688 | ECM/PCM Power Relay Sense Circuit | <ul style="list-style-type: none"> • Sense voltage < 3.0 V • Sense voltage > 3.0 V |
| P0697 | Sensor Reference Voltage "C" Circuit/Open | Signal voltage deviation > +/- 0.30 V |
| P0698 | Sensor Reference Voltage "C" Circuit Low | Signal voltage < 4.6 - 5.0 V |
| P0699 | Sensor Reference Voltage "C" Circuit High | 5V supply voltage > 5.0 - 5.4 V |
| U0001 | High Speed CAN Communication Bus | CAN message, no feedback |
| U0002 | High Speed CAN Communication Bus Performance | Global time out-receiving no message |
| U0100 | Lost Communication With ECM/PCM "A" | <ul style="list-style-type: none"> • Failure of all CAN engine messages, time out more than > 490 mSec. • Failure of all CAN engine messages, but not all CAN messages, time out more than > 1010 mSec. |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|------------|--|---|
| U0101 | Lost Communication with TCM | Received CAN message No message |
| U0121 | Lost Communication With Anti-Lock Brake System (ABS) Control Module | Received CAN message no message |
| U0146 | Lost Communication With Gateway "A" | CAN communication with gateway, time-out |
| U0155 | Lost Communication With Instrument Panel Cluster (IPC) Control Module | Received CAN message - no message |
| U0302 | Software Incompatibility with Transmission Control Module | TCM signal received AT vehicle data |
| U0323 | Software Incompatibility With Instrument Panel Control Module | AAT value (module not encoded for AAT sensor) 0.00 h |
| U0402 | Invalid Data Received From TCM | Received data implausible message |
| U0404 | Invalid Data Received From Gear Shift Control Module "A" | <ul style="list-style-type: none"> • If the value of message counter is permanent, constant, or change exceeds a threshold, increment an event counter • Maximum change of message counter > 5 |
| U0415 | Invalid Data Received From Anti-Lock Brake System (ABS) Control Module | <ul style="list-style-type: none"> • Received data implausible message • Speed sensor signal 203.0 MPH • Speed sensor signal 203.0 MPH • Initialisation error • Vehicle speed 202.00 MPH |
| U0422 | Invalid Data Received From Body Control Module | Ambient temp. value (initialization), Audi, 01h |
| U0423 | Invalid Data Received From Instrument Panel Cluster Control Module | <ul style="list-style-type: none"> • AAT value (initialization) 1.0 h • Received data implausible message |
| U0447 | Invalid Data Received From Gateway "A" | CAN message incorrect |
| U1030 | LIN Communication | LIN message, incorrect |
| U102F | LIN Communication | Time out |
| U102E | LIN Communication | Not active |

Fuel and Air Ratios Control Module

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|--|--|
| P1114 | O2 Sensor Heater Circuit Bank 1 Sensor 2 | Heater resistance, $(128-648) \cdot (8-40)1.02-25.9 \text{ k } \Omega$ (dep. on mod. exhaust temp. and heater power) |
| P12A1 | Fuel Rail Pressure Sensor Inappropriately Low | <ul style="list-style-type: none"> • Pressure control activity > 0.18 MPa and • Fuel trim activity < 0.80 and • Difference between target pressure vs. actual pressure -16.38 to 16.38 MPa |
| P12A2 | Fuel Rail Pressure Sensor Inappropriately High | <ul style="list-style-type: none"> • Pressure control activity < -0.05 mPa and • Fuel trim activity > 0.80 and • Difference between target pressure vs. actual pressure -16.38 to 16.38 MPa |
| P12A4 | Fuel Rail Pump Control Valve Stuck Closed | <ul style="list-style-type: none"> • Pressure control activity, <-7.50 MPa and • Fuel trim activity 0.93 to 1.15- and • Difference between target pressure vs. actual pressure, - < 16.38 mPa |
| P13EA | Ignition Timing Monitor | Difference between commanded spark timing vs. actual value > 22% |
| P150A | Engine Off Time Performance | <ul style="list-style-type: none"> • Difference between engine off time and ECM after run time < -12.0 Sec. • Difference between engine off time and ECM after run time > 12.0 Sec. |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|------------|---|---|
| P2101 | Throttle Actuator "A" Control Motor Circuit Range/ Performance | <ul style="list-style-type: none"> • Duty cycle >80% and • ECM power stage, no failure or • Deviation throttle value angles vs. calculated value > 4.00 - 50.00% |
| P2106 | Throttle Actuator Control System - Forced Limited Power | Internal check failed |
| P2110 | Throttle Actuator Control System - Forced Limited RPM | Engine load out of range |
| P2122 | Throttle/Pedal Position Sensor/Switch "D" Circuit Low | Signal voltage < 0.61 V |
| P2123 | Throttle/Pedal Position Sensor/Switch "D" Circuit High | Signal voltage > 4.79 V |
| P2127 | Throttle/Pedal Position Sensor/Switch "E" Circuit Low | Signal voltage < 0.27 V |
| P2128 | Throttle/Pedal Position Sensor/Switch "E" Circuit High | Signal voltage > 2.43 V |
| P2138 | Throttle/Pedal Position Sensor/Switch "D"/"E" Voltage Correlation | Signal voltage sensor 1 vs 2, 0.17 to 0.70 V |
| P2146 | Fuel Injector Group "A" Supply Voltage Circuit/Open | <ul style="list-style-type: none"> • Signal current < 2.6 A or • Signal current > 14.90 A |
| P2149 | Fuel Injector Group "B" Supply Voltage Circuit/Open | <ul style="list-style-type: none"> • Signal current < 2.6 A or • Signal current > 14.90 A |
| P2177 | System Too Lean Off Idle Bank 1 | Adaptive value > 26% |
| P2178 | System Too Rich Off Idle Bank 1 | Adaptive value < 26% |
| P2181 | Cooling System Performance | Cooling system temperature too low after a sufficient mass air flow integral < 74.0 to 84.0° C |
| P2184 | Engine Coolant Temperature Sensor 2 Circuit Low | ECT outlet > 141° C |
| P2185 | Engine Coolant Temperature Sensor 2 Circuit High | ECT outlet < -43° C |
| P2187 | System Too Lean at Idle Bank 1 | Adaptive value > 6.00% |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|--|--|
| P2188 | System Too Rich at Idle Bank 1 | Adaptive value < 6.0% |
| P2195 | O2 Sensor Signal Biased/ Stuck Lean Bank 1 Sensor 1 | Delta lambda of 2nd lambda control loop > 0.07- |
| P2196 | O2 Sensor Signal Biased/ Stuck Rich - Bank 1, Sensor 1 | Delta lambda of 2nd lambda control loop < -0.07- |
| P2231 | O2 Sensor Signal Circuit Shorted to Heater Circuit Bank 1 Sensor 1 | Delta O2S signal front > 190 uA |
| P2237 | O2 Sensor Positive Current Control Circuit / Open - Bank 1, Sensor 1 | <ul style="list-style-type: none"> • O2S voltage signal front 1.49 to 1.51 V and • Difference between maximum and minimum value of O2S voltage signal front < 32.00 V and • Delta lambda controller > 0.10- or • Lambda control at min or max limit • O2S voltage signal front 1.49 to 1.51 V and • Difference between maximum and minimum value of O2S voltage signal front and • No reaction on commanded stepwise change of lambda-setpoint <> 1 |
| P2243 | HO2 Sensor Reference Voltage Circuit / Open - Bank 1 Sensor 1 | <ul style="list-style-type: none"> • O2S signal front < 0.30 V, > 3.25V and • Internal resistance > 1000 O |
| P2270 | HO2 Sensor Signal Biased/ Stuck Lean Bank 1 Sensor 2 | <ul style="list-style-type: none"> • O2S signal rear not oscillating at reference < 0.63 V and • Enrichment after stuck lean 14.99% |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|------------|---|---|
| P2271 | HO2 Sensor Signal Biased/ Stuck Rich Bank 1 Sensor 2 | <ul style="list-style-type: none"> • O2S signal rear not oscillating at reference < 0.63 V and • Enrichment after stuck lean 14.99% • Sensor voltage \geq 0.18 V and • Number of checks \geq 1.0 |
| P2279 | Intake Air System Leak | <ul style="list-style-type: none"> • Offset value throttle mass flow > 8.00 kg/h and • Correction factor > 0.97- |
| P2293 | Fuel Pressure Regulator 2 Performance | <ul style="list-style-type: none"> • Difference between target pressure vs. actual pressure, < -2.00 MPa • Difference between target pressure vs. actual pressure, > 2.00 MPa |
| P2294 | Fuel Pressure Regulator 2 Control Circuit Open Circuit | Signal voltage 1.40 to 3.20 V |
| P2295 | Fuel Pressure Regulator 2 Control Circuit Low | Signal voltage > 1.40 V |
| P2296 | Fuel Pressure Regulator 2 Control Circuit High | Signal voltage > 3.20 V |

Ignition System

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|------------|--|---|
| P2300 | Ignition Coil "A" Primary Control Circuit Low | Signal current > 24.0 mA |
| P2301 | Ignition Coil "A" Primary Control Circuit High | Signal voltage > 5.10 to 7.00 V |
| P2303 | Ignition Coil "B" Primary Control Circuit Low | Signal current > 24.0 mA |
| P2304 | Ignition Coil "B" Primary Control Circuit High | Signal voltage > 5.10 to 7.00 V |
| P2306 | Ignition Coil "C" Primary Control Circuit Low | Signal current > 24.0 mA |
| P2307 | Ignition Coil "C" Primary Control Circuit High | Signal voltage > 5.10 to 7.00 V |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|--|--|
| P2309 | Ignition Coil "D" Primary Control Circuit Low | Signal current > 24.0 mA |
| P2310 | Ignition Coil "D" Primary Control Circuit High | Signal voltage > 5.10 to 7.00 V |

Additional Emissions Regulations

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|-------|---|---|
| P2400 | EVAP System Leak Detection Pump Control Circuit/Open | Signal voltage > 4.40 to 5.60 V |
| P2401 | EVAP System Leak Detection Pump Control Circuit Low | Signal voltage < 2.15 to 3.25 V |
| P2402 | EVAP System Leak Detection Pump Control Circuit High | Signal current > 3.00 A |
| P2403 | EVAP System Leak Detection Pump Sense Circuit/Open | Low signal voltage > 0.50 Sec. |
| P2404 | EVAP System Leak Detection Pump Sense Circuit Range/Performance | <ul style="list-style-type: none"> • High signal voltage > 12..0 Sec. and • Number of checks 30.00- • Cumulative time of high signal voltage during pumping > 50.0 Sec. |
| P2414 | O2 Sensor Exhaust Sample Error Bank 1, Sensor 1 | Threshold 1: <ul style="list-style-type: none"> • Signal voltage 3.10 to 4.81V Threshold 2: <ul style="list-style-type: none"> • Signal voltage 2.50 to 3.10V • Depending on gain factor, that actual is used for sensor characteristic, the threshold is switched |
| P2539 | Low Pressure Fuel System Sensor Circuit | Signal voltage > 4.9 V |
| P2541 | Low Pressure Fuel System Sensor Circuit Low | Signal voltage < 0.2 V |
| P2569 | Direct Ozone Reduction Catalyst Temperature Sensor Circuit Low | Signal voltage < 0.2 V |
| P2570 | Direct Ozone Reduction Catalyst Temperature Sensor Circuit High | Signal voltage > 5.0 V |

| DTC | Error Message | Malfunction Criteria and Threshold Value |
|------------|---|---|
| P2626 | O2 Sensor Pumping Current Trim Circuit/Open Bank 1 Sensor 1 | O2S signal front > 3.2 V |

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