



2013

# Tiguan

Quick Reference  
Specification Book



# 2013 Volkswagen Tiguan 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<br>(ft·lb) | Nm  | lb·ft<br>(ft·lb) | Nm  | lb·ft<br>(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<br>(in·lb) | N·cm |  | kg·cm | lb·in<br>(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.

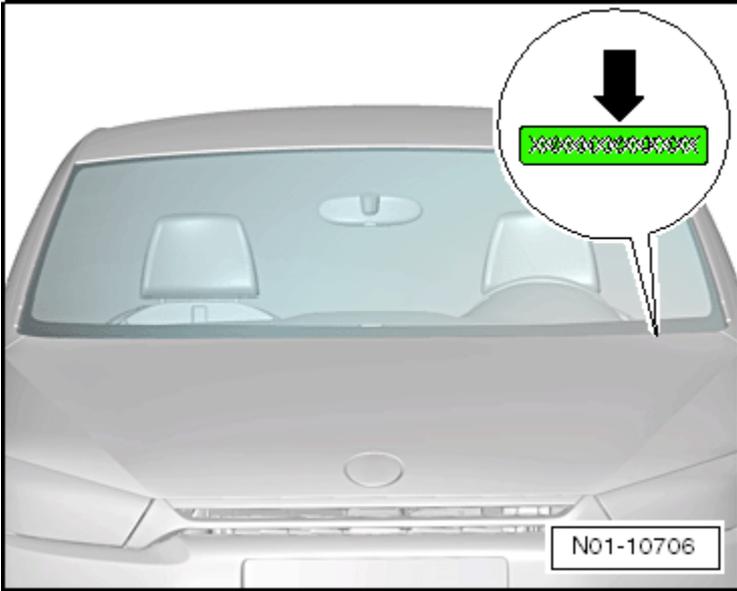
*(CAUTIONS cont'd on next page)*

## **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

## 2013 Volkswagen VIN Decoder (except Routan)

| Series:   | Country of origin   | Manufacturer | Vehicle Type | Series | Engine | Restraint system | Model (7&8) | Check digit | Model year | Assembly plant | Sequential production number (position 12 - 17) |    |    |    |    |    |    |  |  |  |  |  |
|---|---|--------------|--------------|--------|--------|------------------|-------------|-------------|------------|----------------|---|----|----|----|----|----|----|--|--|--|--|--|
|   | 1   | 2            | 3            | 4      | 5      | 6                | 7           | 8           | 9          | 10             | 11  | 12 | 13 | 14 | 15 | 16 | 17 |  |  |  |  |  |
| <b>A=</b> CC Sport w/Man Trans, Golf Zdr w/5 Spd Manual, Passat S, Tiguan w/Auto Trans<br><b>B=</b> CC Sport/Sport w/Auto Trans, Eos Kombi/Sport w/Auto Trans, Golf Zdr w/Auto Trans, Jetta SE w/5 Spd Man, Passat SE, Tiguan w/Auto Trans and 4-Motion<br><b>C=</b> Golf 4dr w/5 Spd Manual, Passat SEL, Tiguan w/Man Trans<br><b>D=</b> Golf 4dr w/Auto Trans, Jetta SE w/Auto Trans<br><b>E=</b> GTI Zdr w/Man Trans, Touareg V6 FSI/TDI /Hybrid<br><b>F=</b> Beetle w/6 Spd Auto Trans, Eos Lux/Exec w/Auto Trans, GTI Zdr w/Auto Trans<br><b>G=</b> CC V6 Exec w/Auto Trans and 4Motion, GTI 4dr w/Man Trans, Jetta SEL w/5 Spd Man Trans  | W   | V            | V            | B      | P      | 7                | A           | N           | 8          | D              | E   | 5  | 0  | 2  | 0  | 1  | 3  |  |  |  |  |  |
| <b>H=</b> CC V6 Lux w/Auto Trans, Beetle 2.5L TDI w/5 Spd Manual, GTI 4dr w/Auto Trans<br><b>J=</b> Beetle 2.5L TDI w/5 Spd Auto Trans<br><b>K=</b> Jetta SportWagen w/5 Spd Man Trans<br><b>L=</b> Jetta SEL/TDI w/Auto Trans<br><b>M=</b> Golf Zdr w/6 Spd Manual, Jetta SportWagen w/5 Spd Manual<br><b>N=</b> Golf 4dr w/6 Spd Manual<br><b>P=</b> Golf R 4dr w/Man Trans, Jetta SportWagen w/6 Spd Auto Trans<br><b>R=</b> Beetle TDI w/6 Spd Man, CC Lux w/Auto Trans, Golf R Zdr w/Man Trans<br><b>V=</b> Beetle Turbo w/6 Spd Auto Trans<br><b>H=</b> Jetta /S w/5 Spd Manual<br><b>Z=</b> Jetta /S w/Auto Trans<br><b>3=</b> Jetta TDI w/6 Spd Man<br><b>4=</b> Beetle Turbo w/6 Spd Manual, Jetta GLI w/Auto Trans<br><b>5=</b> Jetta GLI w/6 Spd Manual<br><b>6=</b> Jetta Hybrid w/Auto Trans | <div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center; margin: 0 auto;"> <span style="font-size: 24px; font-weight: bold;">D = 2013</span> </div> <p style="text-align: center; margin-top: 10px;"><b>Sequential production number (position 12 - 17)</b></p>   |              |              |        |        |                  |             |             |            |                |   |    |    |    |    |    |    |  |  |  |  |  |
|   | <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">             Calculate per NHTSA Code 2013           </div>   |              |              |        |        |                  |             |             |            |                |   |    |    |    |    |    |    |  |  |  |  |  |
|   | <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">             See black           </div>   |              |              |        |        |                  |             |             |            |                |   |    |    |    |    |    |    |  |  |  |  |  |
|   | <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">             A3*** = Passat<br/>             AH (1F) = Eos<br/>             AJ (16)*** = Golf, Golf R, GTI, Jetta, Jetta SportWagen<br/>             AN (3C) = CC<br/>             AT = Beetle, Beetle Conv.<br/>             AX (5N) = Tiguan<br/>             BP (7P) = Touareg           </div>  |              |              |        |        |                  |             |             |            |                |   |    |    |    |    |    |    |  |  |  |  |  |
|   | <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">             C = Chattanooga<br/>             D = Slovakia<br/>             E = Emden<br/>             M = Mexico<br/>             P = Mosel<br/>             V = Portugal<br/>             W = Wolfsburg           </div>  |              |              |        |        |                  |             |             |            |                |   |    |    |    |    |    |    |  |  |  |  |  |
|   | <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">             A= 4 cyl 2.0L 200hp (CBFA-PZEV*) Beetle, Beetle Convertible, Jetta, Jetta GLI<br/>             B= 5 cyl 2.5L 170hp (CBTA-M) Golf<br/>             D= 4 cyl 2.0L 200hp (CBFA-M-PZEV*) Golf<br/>             E= 4 cyl 2.0L 200hp (CCTA) Eos<br/>             F= 4 cyl 2.0L 256hp (CRZA) Golf R<br/>             F= VR6 3.6L 280hp (CGRK) Touareg<br/>             G= 6 cyl 3.0L 330hp + 34 Kw (CGFA) Touareg Hybrid<br/>             H= 5 cyl 2.5L 170hp (CBTA-M) Passat<br/>             K= 4 cyl 2.0L 150hp (CBFA) Jetta<br/>             L= 4 cyl 2.0L TDI 140hp (CJAA) Jetta, Jetta SportWagen, Beetle, Beetle Convertible<br/>             M= 4 cyl 2.0L TDI 140hp (CJAA) Golf<br/>             M= VR6 3.6L 280hp (CQVB) Passat<br/>             N= 4 cyl 2.0L 200hp (CCTA) CC<br/>             N= 4 cyl 2.0L TDI 140hp (CKRA) Passat<br/>             P= 4 cyl 2.0L 200hp (CBFA-PZEV*) CC<br/>             P= 5 cyl 2.5L 170hp (CBFA-M-PZEV*) Beetle, Beetle Convertible, Jetta, Jetta SportWagen, Passat<br/>             P= VR6 3.0L TDI 240hp (CNRB) Touareg<br/>             U= VR6 3.6L 280hp (CNNA) CC<br/>             V= 4 cyl 2.0L 200hp (CCTA) GTI, Tiguan<br/>             W= 4 cyl 2.0L 200hp (CBFA-SULEV) Eos<br/>             X= 5 cyl 2.5L 170hp (CBTA-M) Beetle, Beetle Convertible, Jetta, Jetta SportWagen<br/>             Z= 4 cyl 1.4L 150hp + 28 Kw (CNLA) Jetta Hybrid<br/>             3= 4 cyl 2.0L 200hp (CCTA) Beetle, Beetle Convertible, Jetta GLI           </div> |              |              |        |        |                  |             |             |            |                |   |    |    |    |    |    |    |  |  |  |  |  |
|   | <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">             ** PZEV = Partial Zero Emissions Vehicle<br/>             *** SULEV = Super Low Emissions Vehicle<br/>             **** 7 position US model characters are alphabetic beginning with 2010 MY. ROW model characters, where different, are listed in parenthesis ( ), for reference only.<br/>             ***** Jetta and Jetta SportWagen models are identified by WMI code of <b>3VV</b>, GTI and Golf models are identified by WMI code of <b>WVV</b>.           </div>  |              |              |        |        |                  |             |             |            |                |   |    |    |    |    |    |    |  |  |  |  |  |

August 14, 2012 (Rev 3)

### 2013 Restraint System:

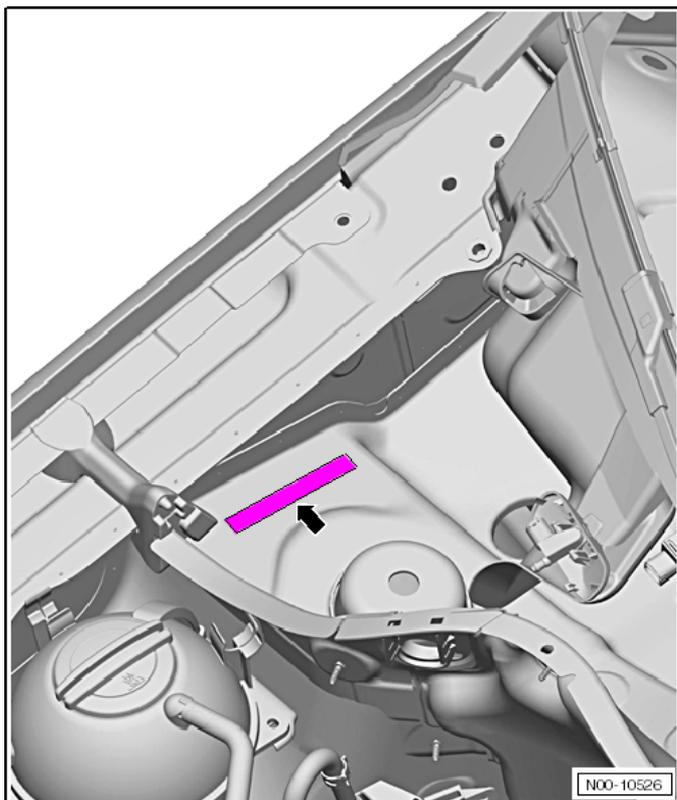
All = Active-Dir/Pass - Front Air Bag - Dir/Pass  
 7 = Advanced Front Air Bags + Side Impact Air Bags - Front + Side Curtain Air Bags  
 8 (Eos Only) = Advanced Front Air Bags + Side Impact Air Bags - Front + Knee Air Bags - Front + Side Curtain Air Bags  
 8 (Jetta Only) or 9 (All Others) = Advanced Front Air Bags + Side Impact Air Bags - Fr.Rr. + Side Curtain Air Bags  
 9 (Tiguan) = Advanced Front Air Bags + Side Impact Air Bags - Fr. Rr. + Side Curtain Air Bags  
 9 (Touareg) = Advanced Front Air Bags + Side Impact Air Bags - Front + Side Curtain Air Bags

Calculate per NHTSA Code

Sequential Product Number

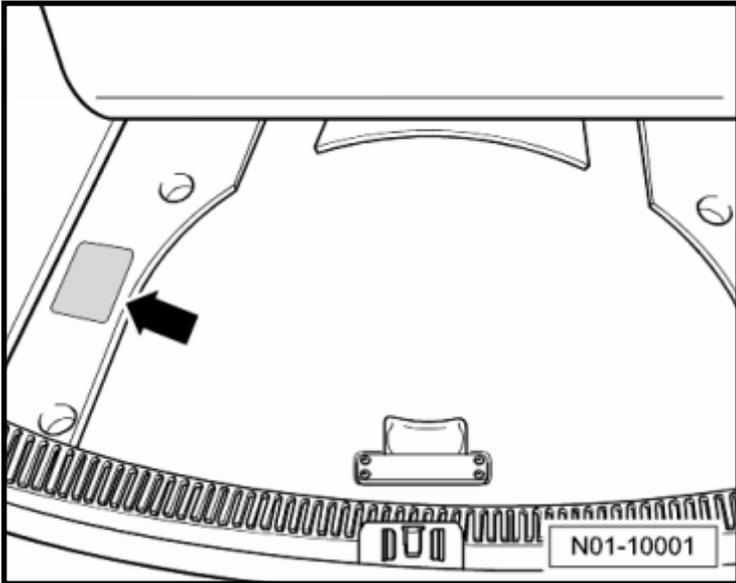
| Country of origin  | Manufacturer | Vehicle Type | Series | Engine | Restraint system | Model | (position 7 & 8) | Check digit | Model year | Assembly plant | Sequential production number (position 12 - 17) |
|--|--------------|--------------|--------|--------|------------------|-------|------------------|-------------|------------|----------------|---|
| M = 1991<br>N = 1992<br>P = 1993<br>R = 1994<br>S = 1995<br>T = 1996<br>V = 1997<br>W = 1998<br>X = 1999<br>Y = 2000<br>1 = 2001<br>2 = 2002<br>3 = 2003<br>4 = 2004<br>5 = 2005<br>6 = 2006<br>7 = 2007<br>8 = 2008<br>9 = 2009<br>A = 2010<br>B = 2011<br>C = 2012<br>D = 2013 |              |              |        |        |                  |       |                  |             |            |                |   |

## Vehicle Identification Number (VIN)



The Vehicle Identification Number (VIN) (➡) is located on the right side of the vehicle near the suspension strut mounting in the plenum chamber.

## Vehicle Data Label



The vehicle data label (➡) is under the luggage compartment floor panel cover.

# SALES CODES

## Engine Codes

|             |                 |
|-------------|-----------------|
| <b>CCTA</b> | 2.0L 4-cylinder |
|-------------|-----------------|

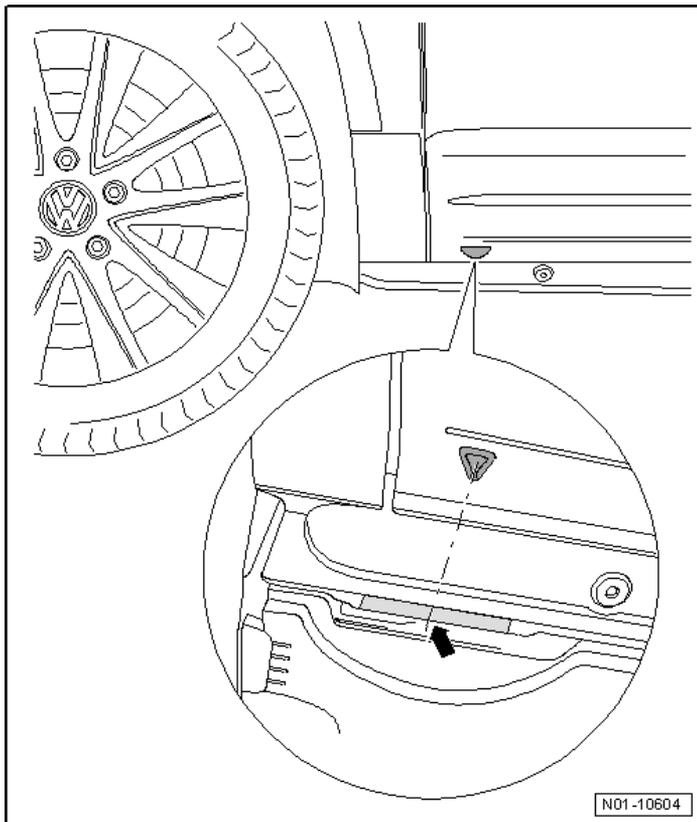
## Transmission Codes

|            |                   |
|------------|-------------------|
| <b>0A6</b> | 6-speed manual    |
| <b>09M</b> | 6-speed automatic |

# VEHICLE LIFTING

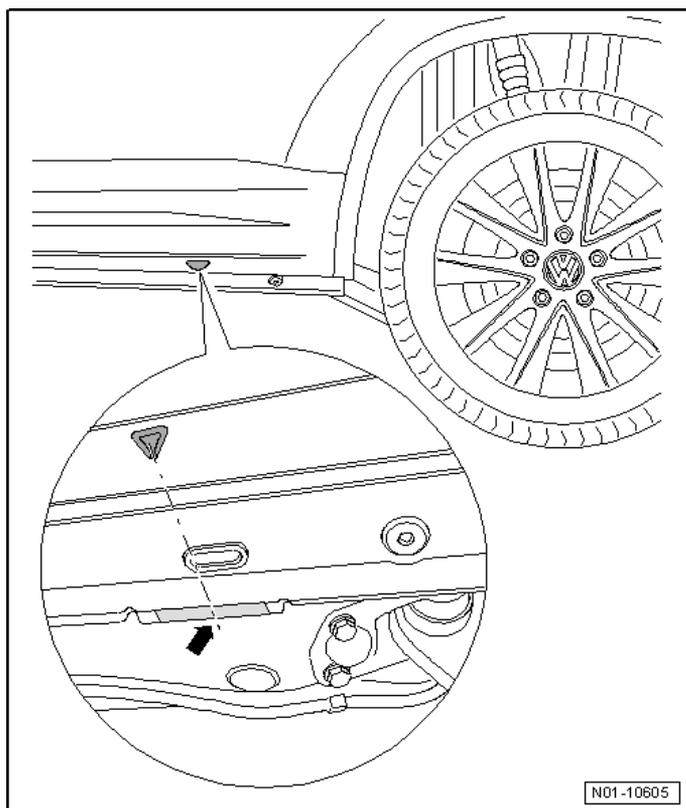
## *Hoist and Jack Mounting Points*

Front



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

## Rear

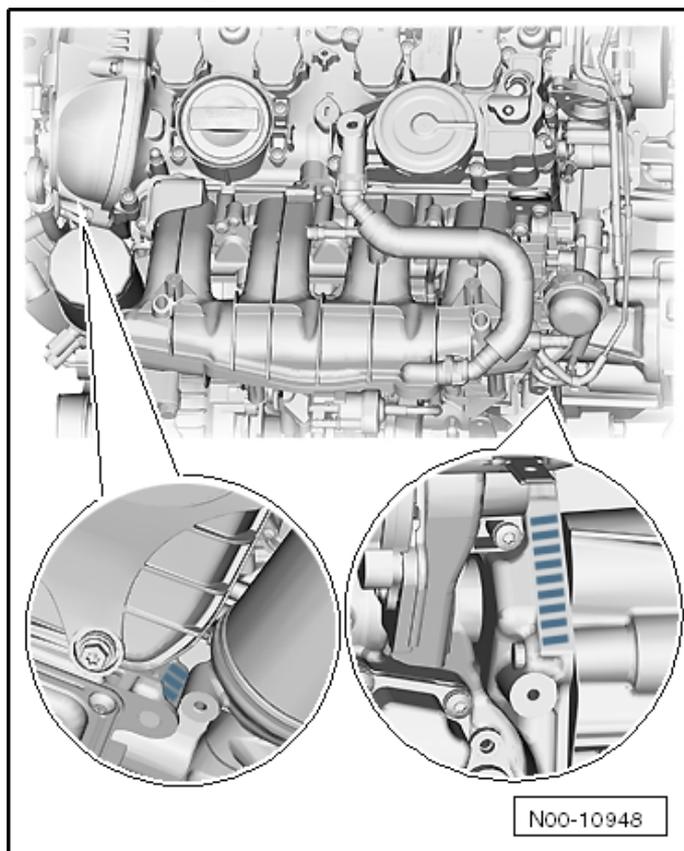


Position the support plate in the side member vertical reinforcement area (➡).

# ENGINE MECHANICAL – 2.0L CCTA

## *General, Technical Data*

### Engine Number Location



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

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

## Engine Data

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

<sup>1)</sup> ULEV = Ultra Low Emissions Vehicle

# Engine Assembly – 2.0L CCTA

## Fastener Tightening Specifications

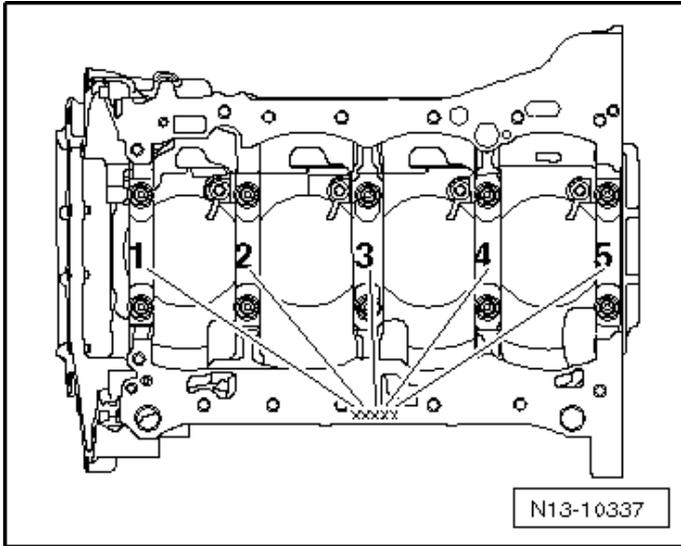
| Component   | Fastener size | Nm                                  |
|---|---------------|-------------------------------------|
| Bolts and nuts  | M6            | 10                                  |
|   | M7            | 15                                  |
|   | M8            | 25                                  |
|   | M10           | 40                                  |
|   | M12           | 60                                  |
| Engine mount-to-body bolt <sup>1)</sup>                 | -             | 40 plus an additional 90° (¼ turn)  |
| Engine mount bracket-to-engine bolt <sup>1)</sup>       | -             | 40 plus an additional 180° (½ turn) |
| Engine mount-to-engine mount bracket bolt <sup>1)</sup> | -             | 60 plus an additional 90° (¼ turn)  |
| Engine mount support bolt                               | -             | 20 plus an additional 90° (¼ turn)  |
| Pendulum support-to-subframe bolt <sup>1), 2)</sup>     | -             | 100 plus an additional 90° (¼ turn) |
| Support-to-body bolt <sup>1)</sup>                      | -             | 20 plus an additional 90° (¼ turn)  |
| Support-to-engine mount bolt <sup>1)</sup>              | -             | 20 plus an additional 90° (¼ turn)  |
| Transmission mount-to-body bolt <sup>1)</sup>           | -             | 40 plus an additional 90° (¼ turn)  |
| Transmission mount-to-transmission bolt <sup>1)</sup>   | -             | 60 plus an additional 90° (¼ turn)  |

<sup>1)</sup> Replace fastener(s).

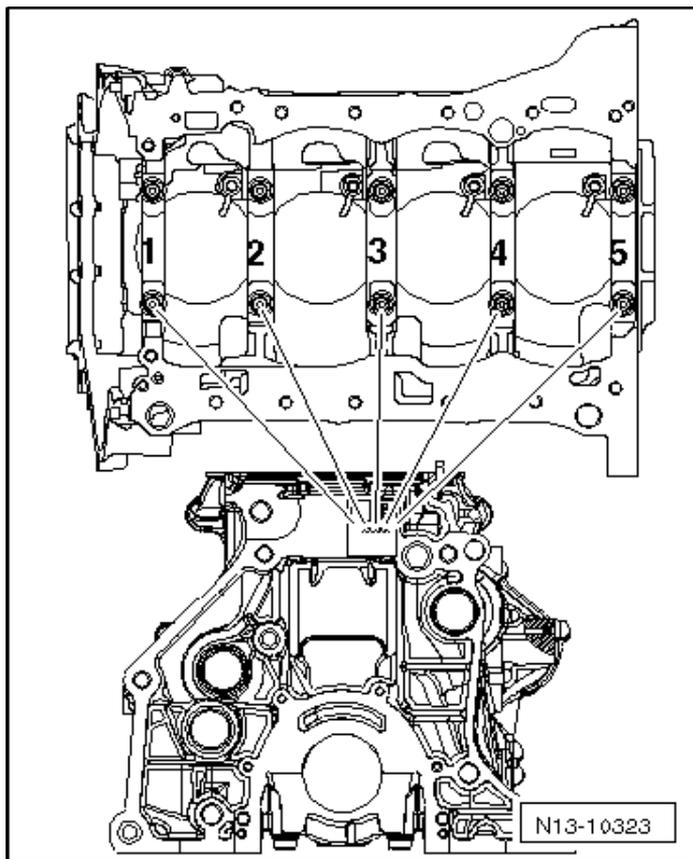
<sup>2)</sup> Install the pendulum support to the transmission bolts first, then install the pendulum support to subframe bolt.

# Crankshaft, Cylinder Block – 2.0L CCTA

## Cylinder Block Bearing Shell Identification



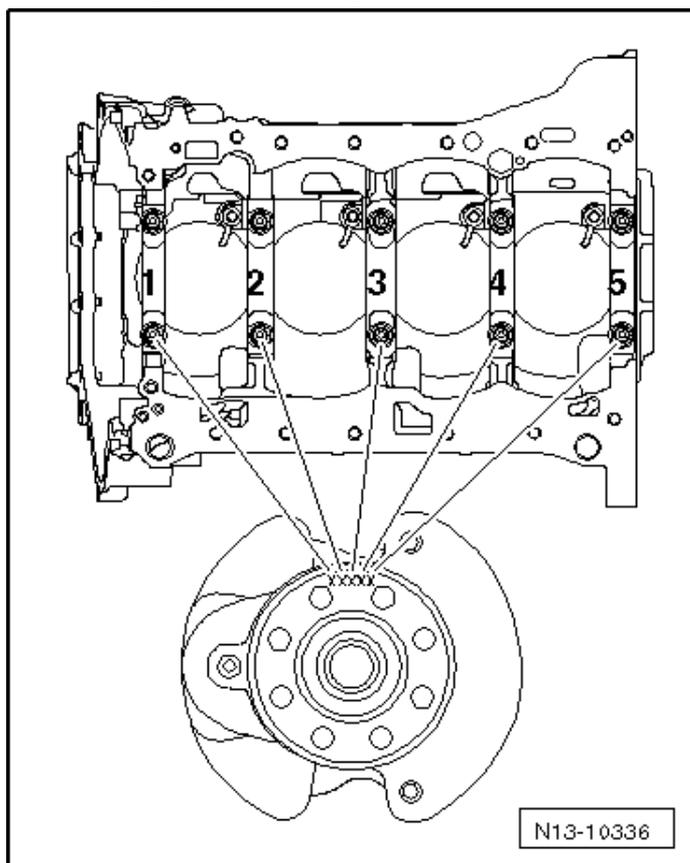
The cylinder block bearing shell identification is located either on the oil pan sealing surface or on the top (transmission side) of the cylinder block.



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   | Fastener size | Nm                                  |
|---|---------------|-------------------------------------|
| Air conditioning compressor-to-accessory bracket bolt           | -             | 25                                  |
| Connecting rod bearing cap-to-connecting rod bolt <sup>1)</sup> | -             | 45 plus an additional 90° (¼ turn)  |
| Dual mass flywheel/drive plate-to-crankshaft bolt <sup>1)</sup> | -             | 60 plus an additional 90° (¼ turn)  |
| Generator-to-accessory bracket bolt                             | -             | 23                                  |
| Pressure relief valve   | -             | 27                                  |
| Ribbed belt tensioner-to-accessory bracket bolt                 | -             | 10                                  |
| Sensor wheel-to-crankshaft screw <sup>1)</sup>                  | -             | 10 plus an additional 90° (¼ turn)  |
| Vibration damper-to-crankshaft bolt <sup>1)</sup>               | -             | 150 plus an additional 90° (¼ turn) |

<sup>1)</sup> Replace fastener(s).

## Crankshaft Dimensions

| Reconditioning dimension in mm <sup>1)</sup> | Crankshaft bearing pin diameter | Connecting rod bearing pin diameter |
|--|---------------------------------|-------------------------------------|
| Basic dimension                              | 58.00                           | 47.80                               |

<sup>1)</sup> The preparation of worn crankshafts is not provided.

## Piston Ring End Gaps

| Piston ring dimensions in mm | New          | Wear limit |
|------------------------------|--------------|------------|
| Compression ring             | 0.20 to 0.40 | 0.8        |
| Oil scraping ring            | 0.25 to 0.50 | 0.8        |

## Piston Ring Clearance

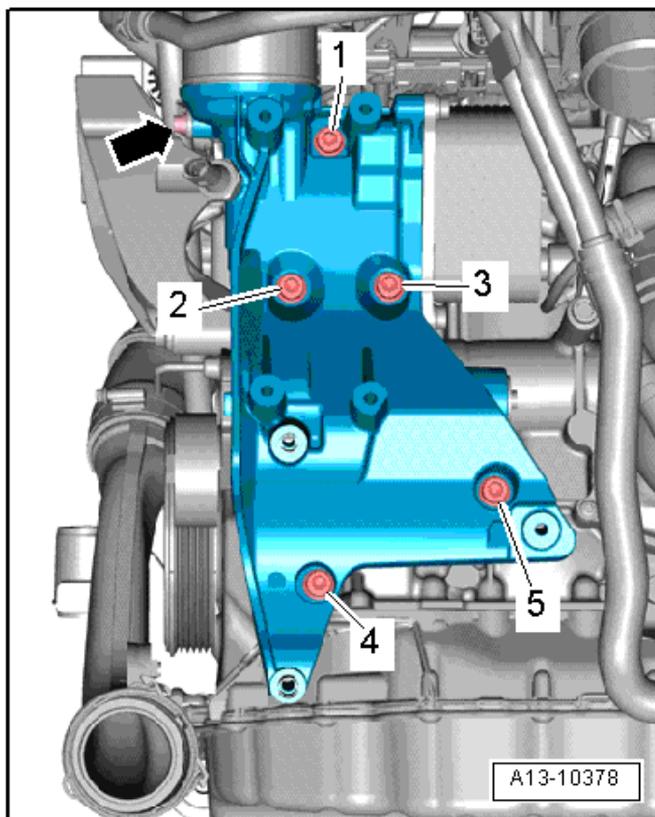
| Piston ring dimensions in mm     | New                | Wear limit |
|----------------------------------|--------------------|------------|
| 1 <sup>st</sup> compression ring | 0.06 to 0.09       | 0.20       |
| 2 <sup>nd</sup> compression ring | 0.03 to 0.06       | 0.15       |
| Oil scraping rings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

## Piston and Cylinder Dimensions

| Honing dimension in mm | Piston diameter      | Cylinder bore diameter |
|------------------------|----------------------|------------------------|
| Basic dimension        | 82.465 <sup>1)</sup> | 82.51                  |

<sup>1)</sup> Measurements without graphite coating (thickness = 0.02 mm). The graphite coating wears off.

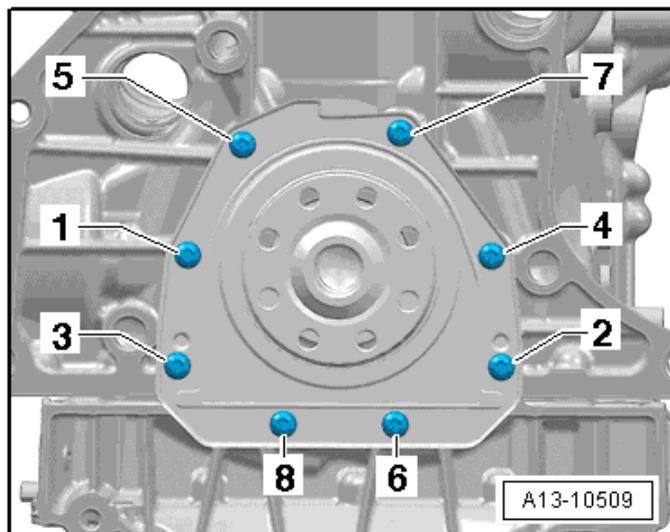
## Accessory Assembly Bracket Tightening Specifications



| 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) |

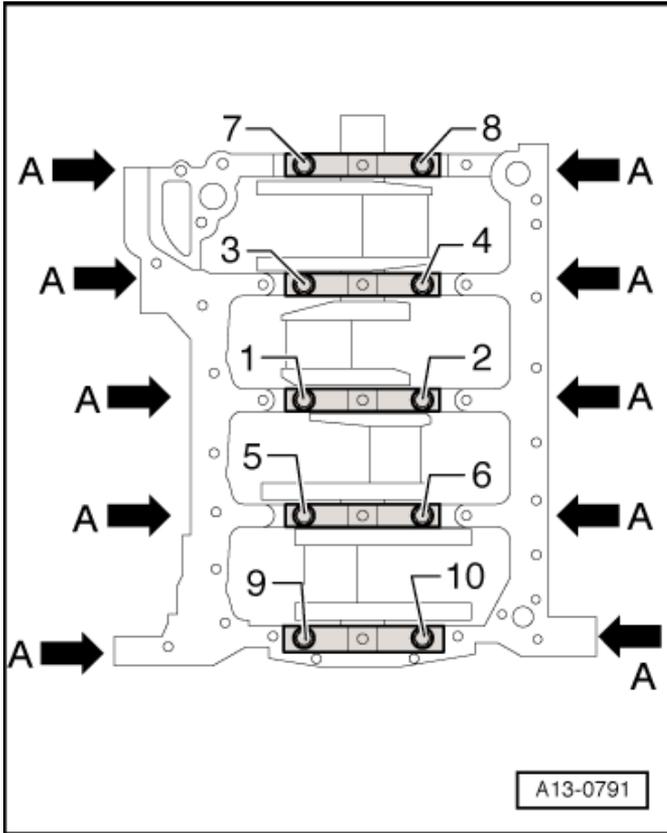
Engine –  
2.0L CCTA

## 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 CCTA

## Fastener Tightening Specifications

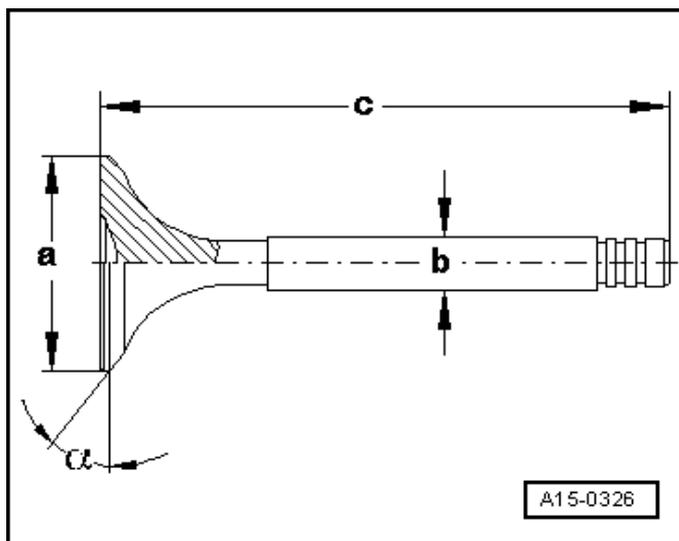
| Component  | Fastener size | Nm                                 |
|--|---------------|------------------------------------|
| Balance shaft-to-cylinder block bolt   | -             | 9                                  |
| Balance shaft timing chain guide rail-to-cylinder block guide pin                    | -             | 20                                 |
| Balance shaft timing chain tensioner-to-cylinder block <sup>2)</sup>                 | -             | 65                                 |
| Balance shaft timing chain tensioning rail-to-cylinder block guide pin               | -             | 20                                 |
| Ball stud-to-cylinder head cover   | -             | 5                                  |
| Bearing bracket-to-cylinder head bolt  | -             | 9                                  |
| Bearing bracket-to-exhaust camshaft bolt <sup>1)</sup>                               | M6            | 8 plus an additional 90° (¼ turn)  |
|  | M8            | 20 plus an additional 90° (¼ turn) |
| Camshaft adjustment valve-to-upper timing chain cover bolt                           | -             | 9                                  |
| Camshaft Position (CMP) sensor-to-cylinder block bolt                                | -             | 9                                  |
| Camshaft timing chain tensioner-to-cylinder block bolt                               | -             | 9                                  |
| Camshaft timing chain guide rail-to-cylinder block guide pin                         | -             | 20                                 |
| Camshaft timing chain tensioning rail-to-cylinder block guide pin                    | -             | 20                                 |
| Control valve-to-intake camshaft <sup>3)</sup>                                       | -             | 35                                 |
| Heat shield-to-bracket bolt  | -             | 9                                  |
| Heat shield-to-cylinder head bolt  | -             | 20                                 |
| Cylinder head mounting plate/connecting piece bolt                                   | -             | 9                                  |
| Oil dipstick guide tube/camshaft adjustment valve 1-to-upper timing chain cover bolt | -             | 9                                  |
| Oil dipstick guide tube-to-cylinder head bolt  | -             | 9                                  |
| Transport strap-to-cylinder head bolt  | -             | 25                                 |
| Vacuum pump-to-cylinder head bolt  | -             | 9                                  |

<sup>1)</sup> Replace fastener(s).

<sup>2)</sup> Install with locking compound, refer to the Electronic Parts Catalog (ETKA).

<sup>3)</sup> Left hand threads.

## Valve Dimensions



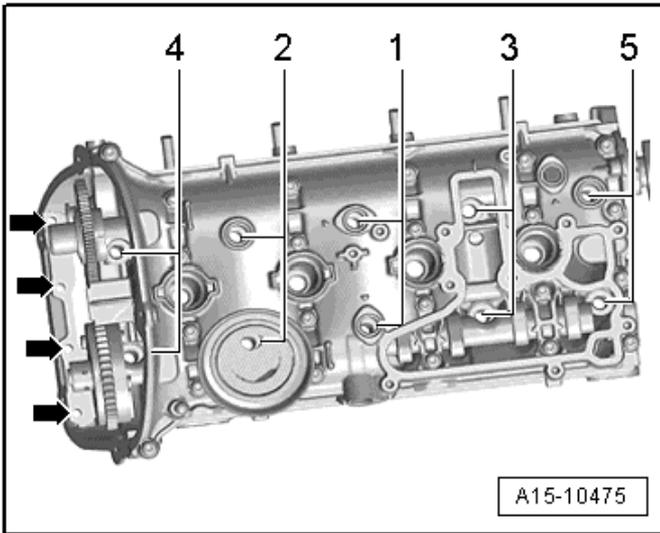
| Dimension  |    | Intake valve | Exhaust valve |
|------------|----|--------------|---------------|
| Diameter a | mm | 33.85 ± 0.10 | 28.0 ± 0.1    |
| Diameter b | mm | 5.98 ± 0.007 | 5.955 ± 0.007 |
| c          | mm | 103.97       | 101.87        |
| α          | ∠° | 45           | 45        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

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

## Compression Pressures

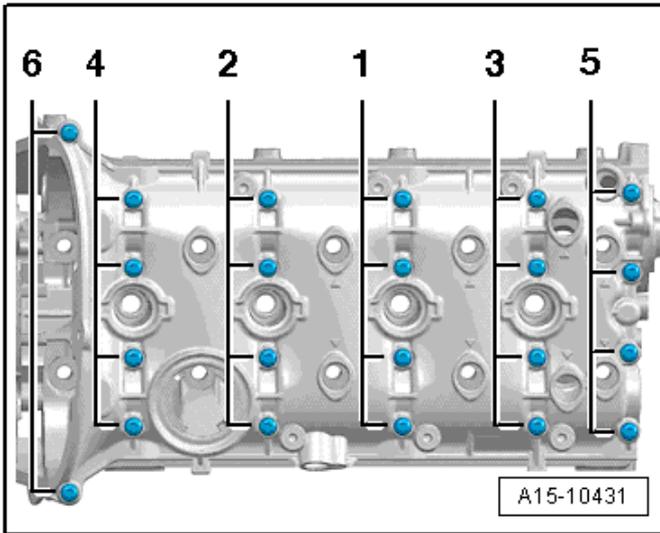
| New Bar positive pressure | Wear limit Bar positive pressure | Difference between cylinders Bar positive pressure |
|---------------------------|----------------------------------|--|
| 11.0 to 14.0              | 7.0                              | Max. 3.0   |

## Cylinder Head Tightening Specifications



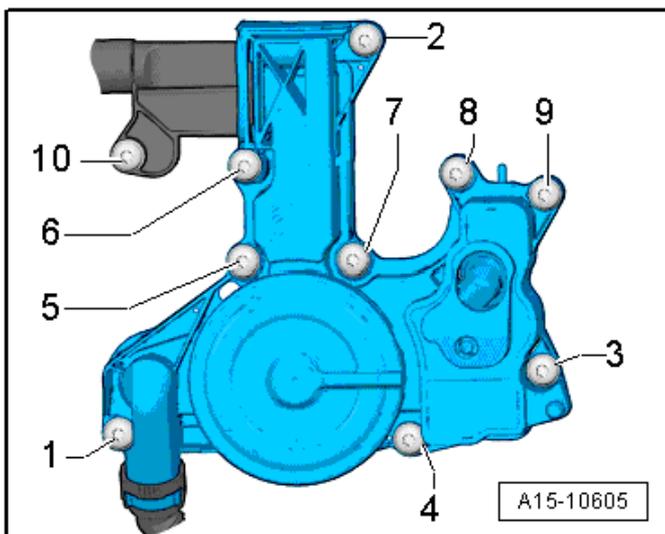
| Step | Component                             | Nm                         |
|------|---------------------------------------|----------------------------|
| 1    | Tighten bolts 1 through 5 in sequence | 40                         |
| 2    | Tighten bolts 1 through 5 in sequence | an additional 90°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

## Cylinder Head Cover Tightening Specifications



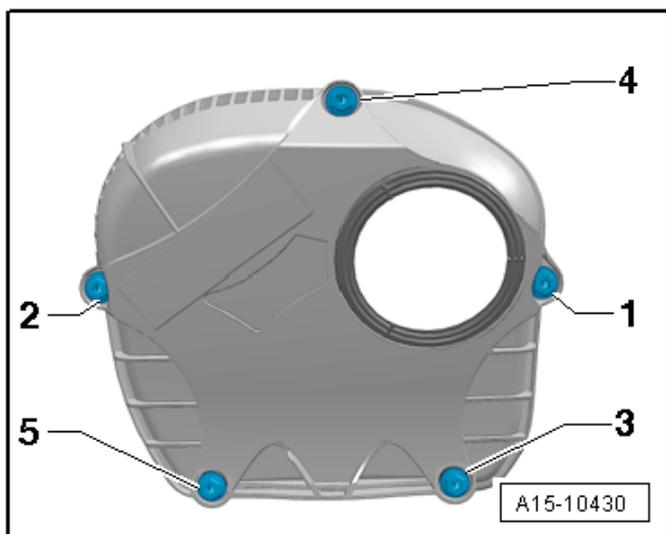
| Step | Component   | Nm                         |
|------|---|----------------------------|
| 1    | Tighten bolts 1 through 6 in sequence in several stages | Hand-tighten               |
| 2    | Tighten bolts 1 through 6 in sequence                   | 8                          |
| 3    | Tighten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

## Crankcase Ventilation Tightening Specification



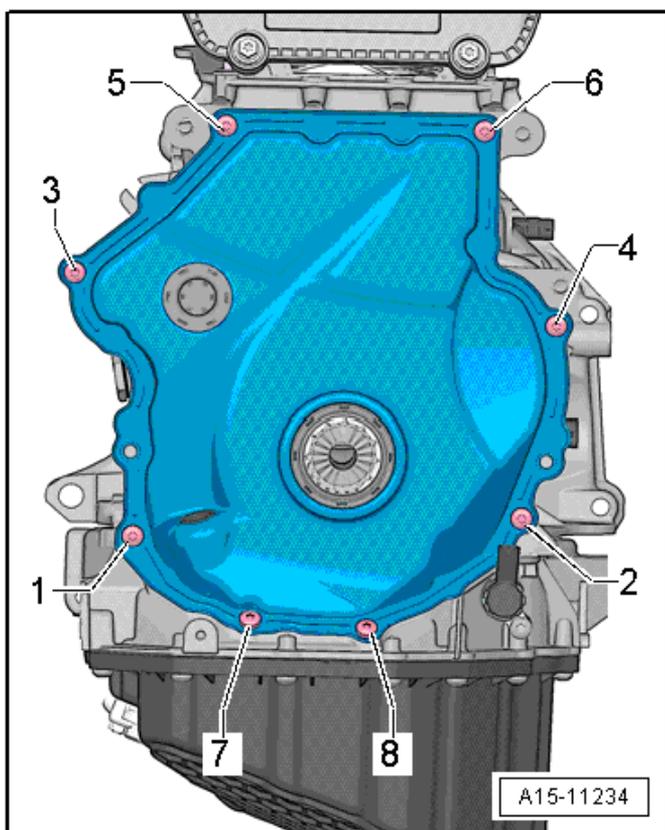
| Step | Component                              | Nm |
|------|--|----|
| 1    | Tighten bolts 1 through 10 in sequence | 11 |

## Upper Timing Chain Cover Tightening Specifications



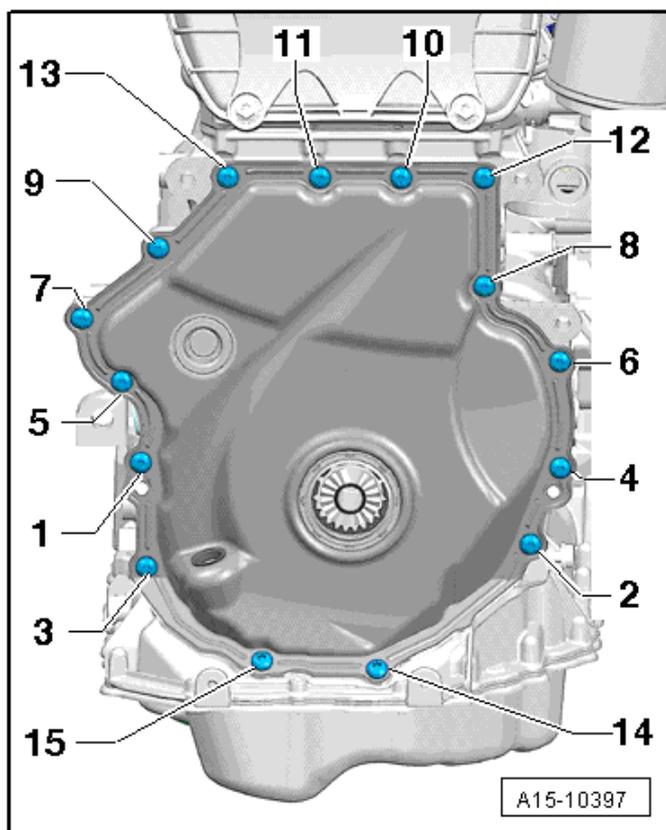
| Step | Component   | Nm           |
|------|---|--------------|
| 1    | Tighten bolts 1 through 5 in sequence in several stages | Hand-tighten |
| 1    | Tighten bolts 1 through 5 in sequence                   | 9            |

## Lower Timing Chain Cover with 8 Bolts Tightening Specifications



| Step | Component                              | Nm                              |
|------|--|---------------------------------|
| 1    | Tighten bolts 1 through 8 in sequence  | 4                               |
| 2    | Tighten bolts 1 through 15 in sequence | an additional<br>45° (1/8 turn) |

## Lower Timing Chain Cover with 15 Bolts Tightening Specifications



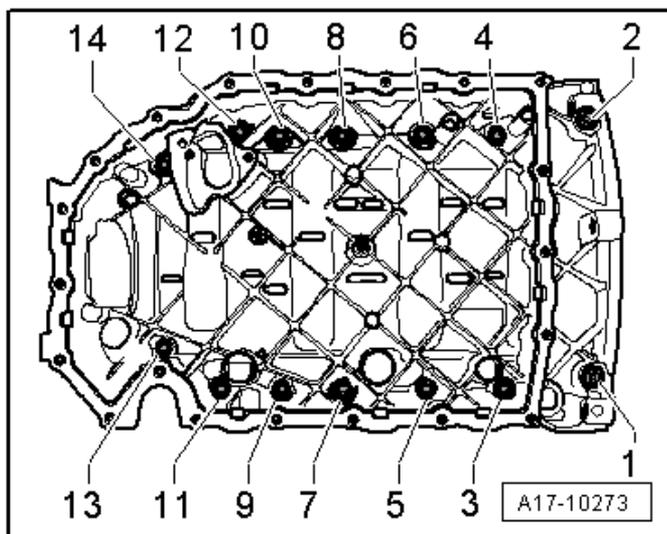
| Step | Component                              | Nm                           |
|------|--|------------------------------|
| 1    | Tighten bolts 1 through 15 in sequence | 8                            |
| 2    | Tighten bolts 1 through 15 in sequence | an additional 45° (1/8 turn) |

## Lubrication – 2.0L CCTA

### Fastener Tightening Specifications

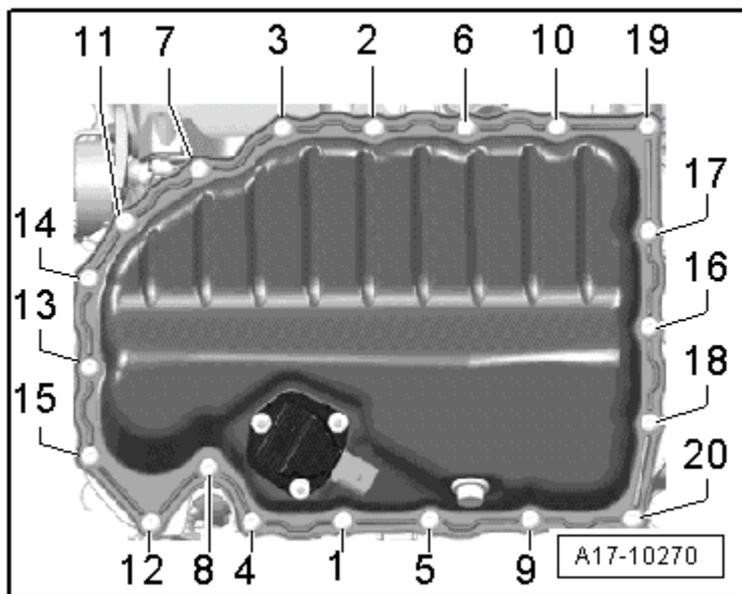
| Component   | Fastener size | Nm |
|---|---------------|----|
| Oil baffle-to-upper oil pan bolt                                | -             | 9  |
| Oil cooler-to-accessory bracket bolt                            | -             | 15 |
| Oil drain plug-to-lower oil pan                                 | -             | 30 |
| Oil filter element-to-accessory bracket                         | -             | 22 |
| Oil pressure switch-to-accessory bracket                        | -             | 20 |
| Oil pump drive chain tensioner guide pin-to-cylinder block bolt | -             | 9  |
| Oil pump-to-upper oil pan bolt                                  | M6            | 9  |
|   | M8            | 20 |
| Oil suction pipe-to-oil pump bolt                               | -             | 9  |

### Upper Oil Pan Tightening Specifications



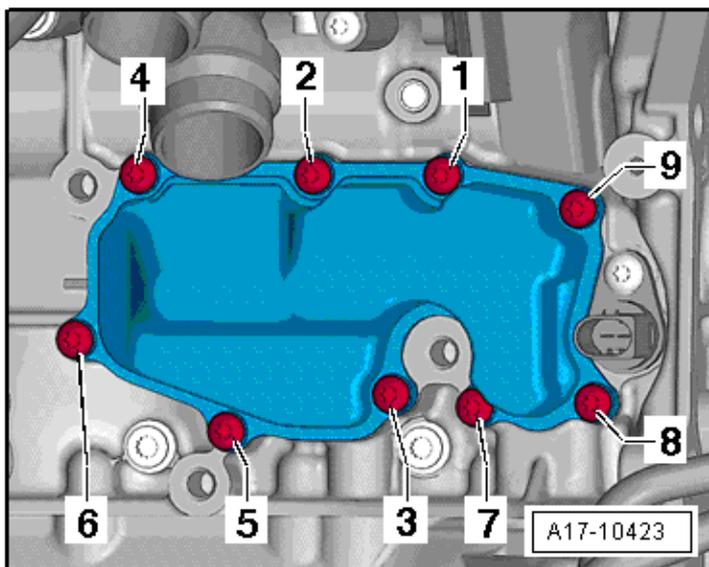
| Step | Component                              | Nm                         |
|------|--|----------------------------|
| 1    | Tighten bolts 1 through 14 in sequence | Hand-tighten               |
| 2    | Tighten bolts 1 through 14 in sequence | 15                         |
| 3    | Tighten bolts 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 CCTA

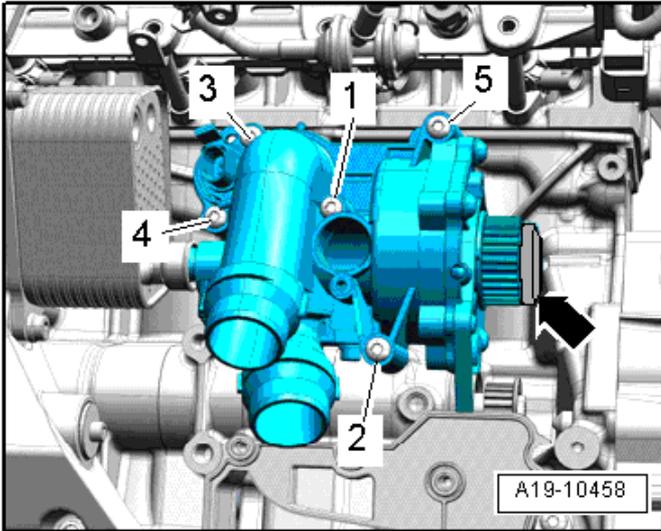
### Fastener Tightening Specifications

| Component  | Nm                                 |
|--|------------------------------------|
| After run coolant pump bracket bolt                                    | 8                                  |
| After run coolant pump bracket-to-upper oil pan bolt                   | 40                                 |
| Coolant expansion tank bolt  | 5                                  |
| Coolant fan shroud nut   | 10                                 |
| Coolant pump connecting piece bolt                                     | 9                                  |
| Coolant pump toothed belt guard bolt                                   | 9                                  |
| Cover for thermostat-to-coolant pump bolt                              | 9                                  |
| Engine coolant temperature sensor retaining plate-to-coolant pump bolt | 4                                  |
| Front coolant pipe bolt  | 3.5                                |
| Radiator fan shroud bolt   | 5                                  |
| Small coolant pipe bolt  | 9                                  |
| Toothed belt drive gear-to-balance shaft bolt <sup>1) 2)</sup>         | 10 plus an additional 90° (¼ turn) |

<sup>1)</sup> Replace fastener(s).

<sup>2)</sup> Has left hand threads.

## Coolant Pump Tightening Specification



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

## Fuel Supply – 2.0L CCTA

### Fastener Tightening Specifications

| Component  | Fastener size | Nm                                |
|--|---------------|-----------------------------------|
| Accelerator Pedal Position (APP) sensor with Accelerator Pedal Position 2 (APP2) sensor-to-body bolt | -             | 10                                |
| Evaporative Emission (EVAP) canister nut   | -             | 10                                |
| Fuel filler tube-to-body bolt <sup>1)</sup>  | -             | 8 plus an additional 90° (¼ turn) |
| Fuel pump control module bracket-to-fuel tank nut  | -             | 3.5                               |
| Fuel tank/heat shield-to-underbody bolt <sup>1)</sup>  | -             | 25                                |
| Fuel tank locking ring   | -             | 110                               |
| Fuel tank securing strap-to-underbody bolt <sup>1)</sup>   | -             | 25                                |

<sup>1)</sup> Replace fastener(s).

Engine –  
2.0L CCTA

# Turbocharger – 2.0L CCTA

## Fastener Tightening Specifications

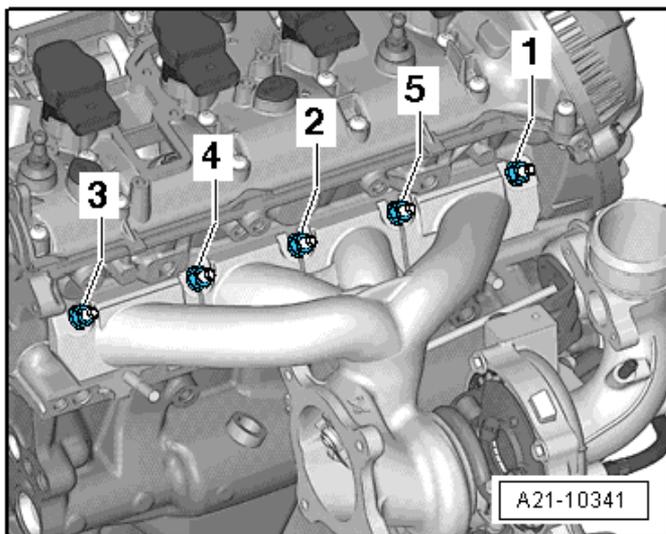
| Component   | Nm  |
|---|-----|
| Charge Air Cooler (CAC) mounting bolt                 | 5   |
| Charge air pipe bolt                                  | 10  |
| Charge air pipe clamp                                 | 5.5 |
| Charge air pressure sensor-to-charge air pipe bolt    | 5   |
| Coolant return pipe-to-turbocharger banjo bolt        | 38  |
| Coolant return pipe-to-turbocharger bolt              | 9   |
| Coolant supply pipe-to-cylinder block banjo bolt      | 38  |
| Coolant supply pipe-to-cylinder block bolt            | 9   |
| Coolant supply pipe-to-turbocharger banjo bolt        | 38  |
| Cylinder block bracket bolt <sup>2)</sup>             | 30  |
| Cylinder head fastening strip nut <sup>1) 3)</sup>    | 30  |
| Cylinder head heat shield bolt                        | 20  |
| Drive axle heat shield bolt                           | 20  |
| Oil return pipe-to-cylinder block bolt                | 9   |
| Oil return pipe-to-turbocharger bolt                  | 9   |
| Oil supply pipe-to-cylinder block bolt                | 9   |
| Oil supply pipe-to-turbocharger banjo bolt            | 33  |
| Oil supply pipe-to-turbocharger bolt                  | 9   |
| Turbocharger bracket bolt <sup>2)</sup>               | 30  |
| Turbocharger connection bolt                          | 9   |
| Turbocharger recirculation valve-to-turbocharger bolt | 7   |
| Vacuum diaphragm-to-turbocharger bolt                 | 10  |
| Wastegate bypass regulator valve-to-turbocharger bolt | 3   |

<sup>1)</sup> Replace fastener(s).

<sup>2)</sup> Lubricate the bolt with hot bolt paste. Refer to the Electronic Parts Catalog (ETKA).

<sup>3)</sup> Lubricate the studs of the exhaust manifold with hot bolt paste. Refer to the Electronic Parts Catalog (ETKA).

## 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 CCTA

## Fastener Tightening Specifications

| Component   | Nm |
|---|----|
| <b>Clamping sleeve nut</b>  |    |
| - Individual clamp  | 25 |
| - Continuous clamp  | 35 |
| Front exhaust pipe with catalytic converter-to-exhaust manifold/turbocharger nut <sup>1) 2)</sup> | 40 |
| Oxygen Sensor (O2S)   | 55 |
| Suspended mount bracket bolt  | 20 |
| Suspended mount-to-subframe bolt  | 25 |
| Suspended mount-to-underbody bolt   | 25 |
| Tunnel bridge-to-underbody bolt   | 25 |

<sup>1)</sup> Replace fastener(s).

<sup>2)</sup> Lubricate the stud bolts on the exhaust manifold/turbocharger with hot bolt paste (G 052 112 A3).

# Multiport Fuel Injection – 2.0L CCTA

## Technical Data

| Engine codes                   | CBFA and CCTA      |
|--------------------------------|--------------------|
| Idle check                     |                    |
| Idle speed (RPM) <sup>1)</sup> | 640 to 800         |
| Engine speed (RPM) limitation  | approximately 6500 |

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

## Fastener Tightening Specifications

| Component   | Fastener size | Nm                                |
|---|---------------|-----------------------------------|
| Engine control module bracket bolt  |               | 7                                 |
| Engine control module mounting frame to bracket nut                           |               | 6                                 |
| Fuel pressure sensor-to-pressure sensor tester (VAS 6394/1)                   | -             | 27                                |
| Fuel pressure sensor-to-fuel rail <sup>2)</sup>                               | -             | 27                                |
| Fuel rail adapter (VAS 6394/2)  | -             | 27                                |
| Fuel supply line connection-to-fuel rail <sup>1)</sup>                        | -             | 22                                |
| Fuel supply line union nut-to-high pressure pump                              | -             | 18                                |
| Fuel supply line union nut-to-fuel rail                                       | -             | 18                                |
| <b>High pressure fuel line connection-to-high pressure pump <sup>1)</sup></b> |               |                                   |
| - With inner threads  | -             | 40                                |
| - With outer threads  | -             | 25                                |
| High pressure pump-to-cylinder head bolt <sup>1)</sup>                        | M6            | 8 plus an additional 90° (¼ turn) |
|   | M8            | 20                                |
| Intake Air Temperature (IAT) sensor-to-intake manifold bolt                   | -             | 5                                 |
| <b>Intake manifold-to-cylinder head bolt</b>                                  |               |                                   |
| - First pass, tighten to  | -             | 3                                 |
| - Final pass, tighten to  | -             | 9                                 |
| Intake manifold support-to-cylinder block bolt                                | -             | 23                                |
| Intake manifold support-to-intake manifold nut                                | -             | 10                                |
| Knock Sensor (KS) bolt  | -             | 20                                |
| Lower air filter housing-to-body bolt   | -             | 8                                 |
| Throttle valve control module-to-intake manifold bolt                         | -             | 5                                 |
| Upper air filter housing-to-lower air filter housing bolt                     | -             | 1.5                               |

<sup>1)</sup> Replace fastener(s).

<sup>2)</sup> Coat the threads with clean engine oil.

## Ignition – 2.0L CCTA

### Technical Data

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

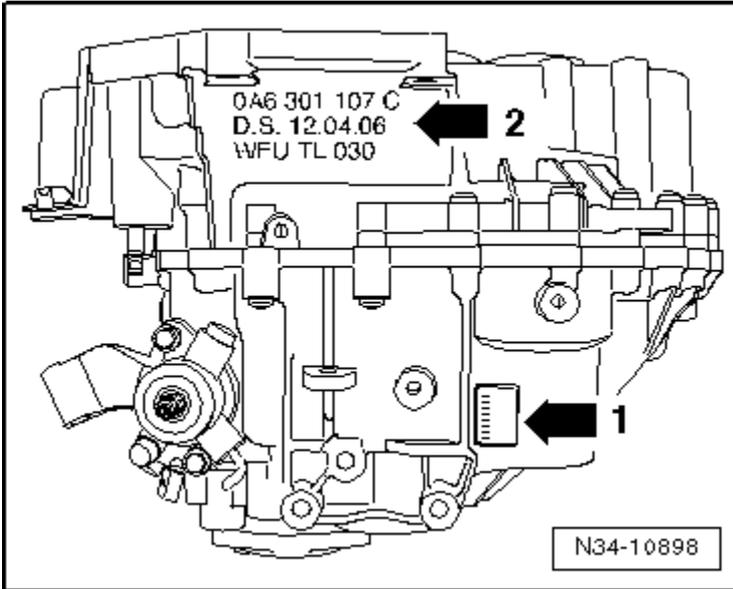
### Fastener Tightening Specifications

| <b>Component</b>                    | <b>Nm</b> |
|-------------------------------------|-----------|
| Camshaft Position (CMP) sensor bolt | 10        |
| Engine Speed (RPM) sensor bolt      | 10        |
| Knock Sensor (KS) bolt              | 20        |
| Spark plug                          | 25        |

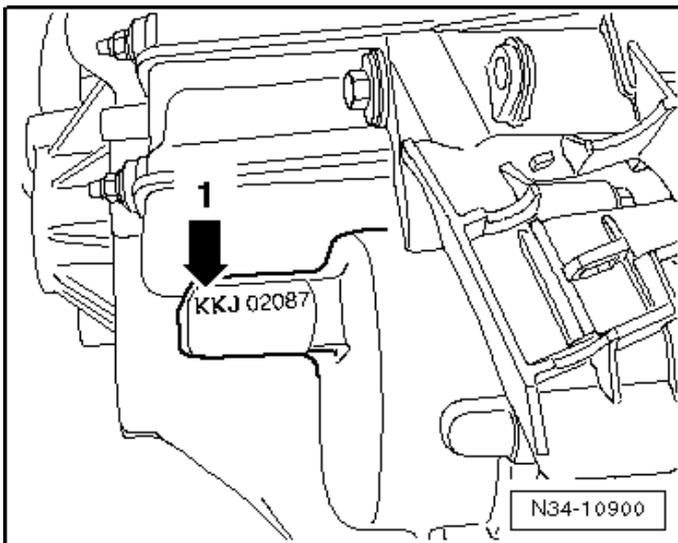
# MANUAL TRANSMISSION – 0A6

## General, Technical Data

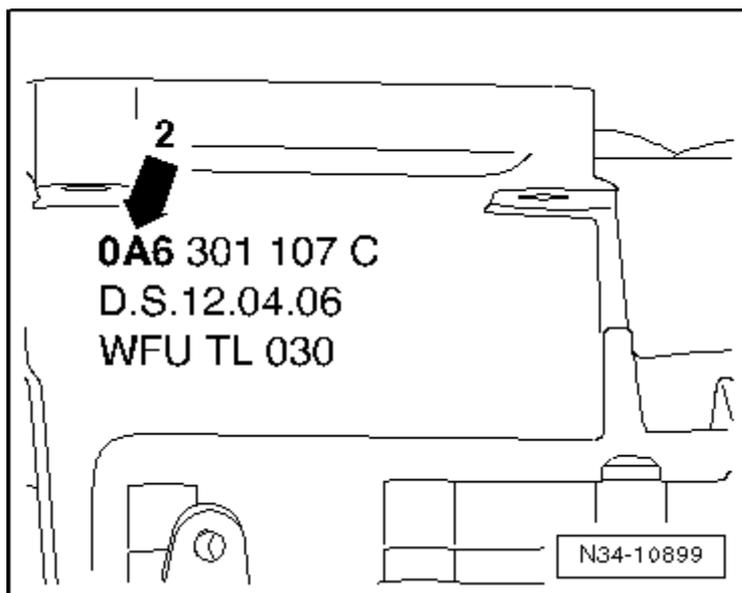
### Transmission Identification



Location on the manual transmission (1) and (2).



Transmission Code Letters and Date of Manufacture (1).



Manual transmission 0A6 (2).

**Example:**

|                      |           |           |                               |
|----------------------|-----------|-----------|-------------------------------|
| <b>KKJ</b>           | <b>02</b> | <b>08</b> | <b>7</b>                      |
| Identification codes | Day       | Month     | Year (2007)<br>of manufacture |

## Engine Codes, Transmission Allocation, Ratios and Capacities

| Manual transmission  |                 | 6-Speed 0A6        |                    |
|----------------------|-----------------|--------------------|--------------------|
| Identification codes |                 | KHL                | KLX                |
| Manufactured         | from<br>through | 10.2007<br>12.2007 | 12.2007<br>07.2008 |
| Allocation           | Engine          | 2.0L -147 kW       | 2.0L -147 kW       |
| Ratio: $Z_2 : Z_1$   | Final drive I   | 66:15 = 4.400      | 66:15 = 4.400      |
|                      | Final drive II  | 66:20 = 3.300      | 66:20 = 3.300      |
|                      | Final drive III | 66:18 = 3.667      | 66:18 = 3.667      |

| Manual transmission  |                 | 6-Speed 0A6        |               |
|----------------------|-----------------|--------------------|---------------|
| Identification codes |                 | LJU                | LMW           |
| Manufactured         | from<br>through | 12.2007<br>07.2008 | 06.2008       |
| Allocation           | Engine          | 2.0L -147 kW       | 2.0L - 147 kW |
| Ratio: $Z_2 : Z_1$   | Final drive I   | 66:15 = 4.400      | 66:15 = 4.400 |
|                      | Final drive II  | 66:20 = 3.300      | 66:20 = 3.300 |
|                      | Final drive III | 66:18 = 3.667      | 66:18 = 3.667 |

- Final drive I for 1<sup>st</sup> and 2<sup>nd</sup> gear
- Final drive II for 3<sup>rd</sup> and 4<sup>th</sup> gear
- Final drive III for reverse gear
- 5<sup>th</sup> gear and 6<sup>th</sup> gear are located on the input shaft

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

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

# Clutch – 0A6

## Fastener Tightening Specifications

| Component  | Fastener size | Nm |
|--|---------------|----|
| Clutch pedal nut <sup>1)</sup>   | -             | 25 |
| Dual mass flywheel pressure plate bolt <sup>3)</sup>                   | M6            | 13 |
|  | M7            | 20 |
| Impact bolster support-to-steering column bracket bolt <sup>1)</sup>   | -             | 20 |
| Mounting bracket-to-bulkhead nut <sup>1)2)</sup>                       | -             | 25 |
| Slave cylinder with release bearing-to-transmission bolt <sup>1)</sup> | -             | 15 |

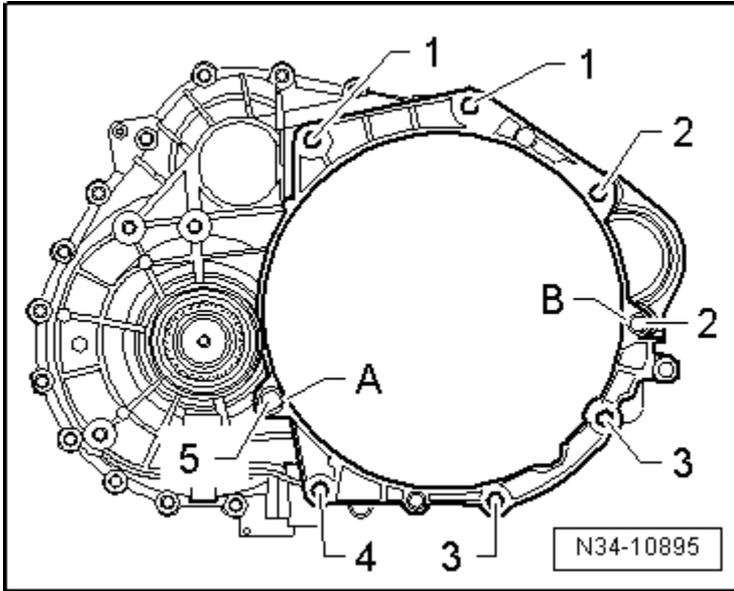
<sup>1)</sup> Replace fastener(s).

<sup>2)</sup> Self-locking.

<sup>3)</sup> Tighten in small steps and in a diagonal sequence.

# Controls, Housing – 0A6

## Transmission to Engine Tightening Specifications



| Item    | Fastener size            | Quantity | Nm |
|---------|--------------------------|----------|----|
| 1       | M12 x 50                 | 2        | 80 |
| 2       | M12 x 165                | 2        | 80 |
| 3       | M10 x 50                 | 2        | 40 |
| 4       | M10 x 68                 | 1        | 40 |
| 5       | M12 x 65                 | 1        | 80 |
| A and B | Centering alignment pins |          |    |

## Fastener Tightening Specifications

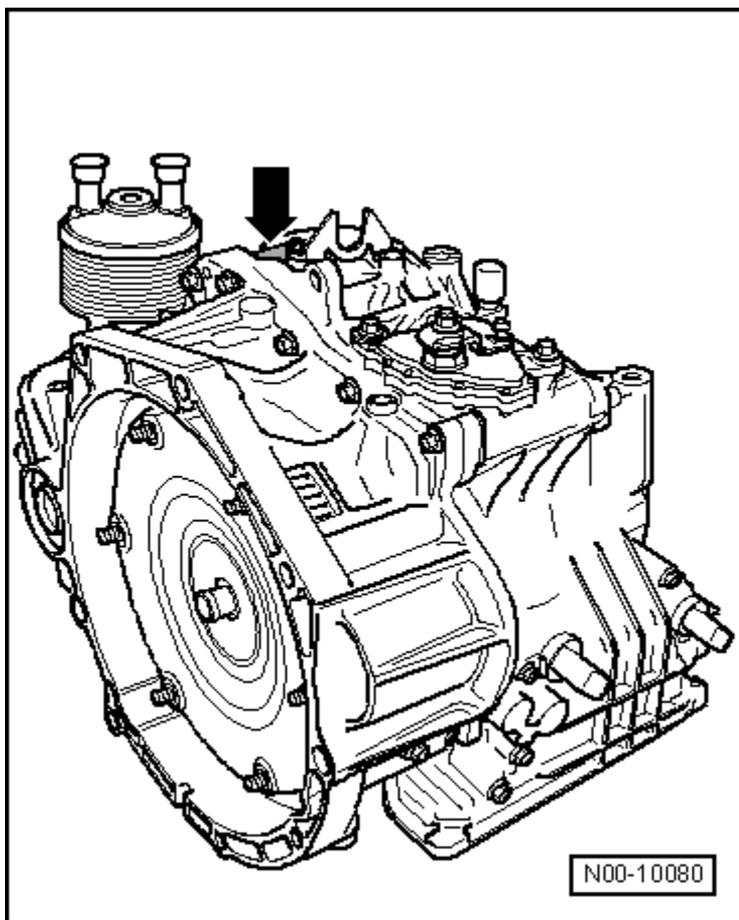
| Component  | Fastener size | Nm                                 |
|--|---------------|------------------------------------|
| Backup lamp switch-to-transmission housing                       | -             | 20                                 |
| Cable bracket-to-transmission bolt                               | -             | 20                                 |
| Ground Cable to Transmission Bolt/Nut                            | -             | 60 plus an additional 90° (¼ turn) |
| Retainer plate-to-transmission housing screw                     | -             | 5                                  |
| Retaining bracket-to-transmission housing stud bolt              | -             | 20                                 |
| Reverse gear selector fork-to-transmission housing nut           | -             | 20 plus an additional 90° (¼ turn) |
| Shift housing-to-body nut  | -             | 8                                  |
| Shift unit-to-transmission housing bolt <sup>1)</sup>            | -             | 25                                 |
| Stub shaft bolt <sup>1)</sup>                                    | -             | 35                                 |
| Transmission housing drain plug                                  | -             | 45                                 |
| Transmission housing fill plug                                   | -             | 45                                 |
| <b>Transmission housing-to-clutch housing bolt <sup>1)</sup></b> |               |                                    |
| - Outer hex head, steel bolt                                     | -             | 15 plus an additional 90° (¼ turn) |
| Transmission Mount to Transmission Bolt                          | -             | 60 plus an additional 90° (¼ turn) |
| Transmission shift lever-to-selector lever nut <sup>1)</sup>     | -             | 23                                 |
| Trip recorder sensor-to-clutch housing bolt                      | -             | 12                                 |

<sup>1)</sup> Replace fastener(s).

# AUTOMATIC TRANSMISSION – 09M

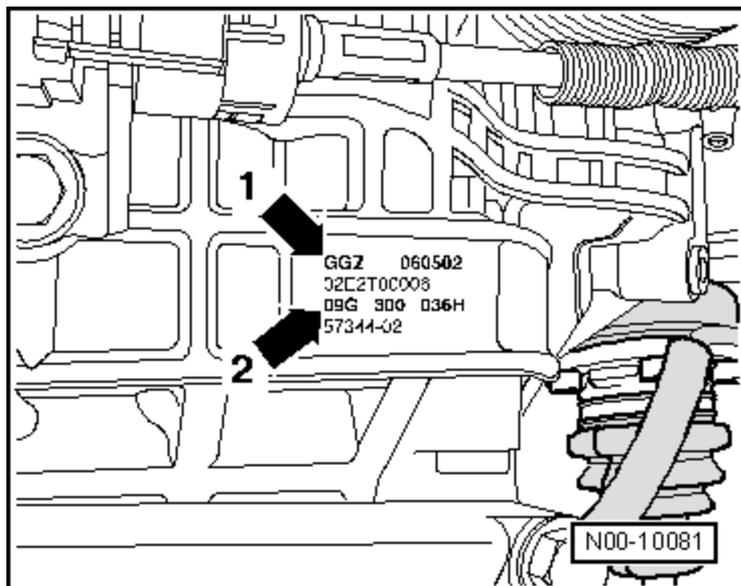
## *General, Technical Data*

### Identification on Transmission



Automatic Trans. –  
09M

Code letters (➡).



(Identification of a 09G transmission shown – 09M similar)

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

(2) 09G.

### Example:

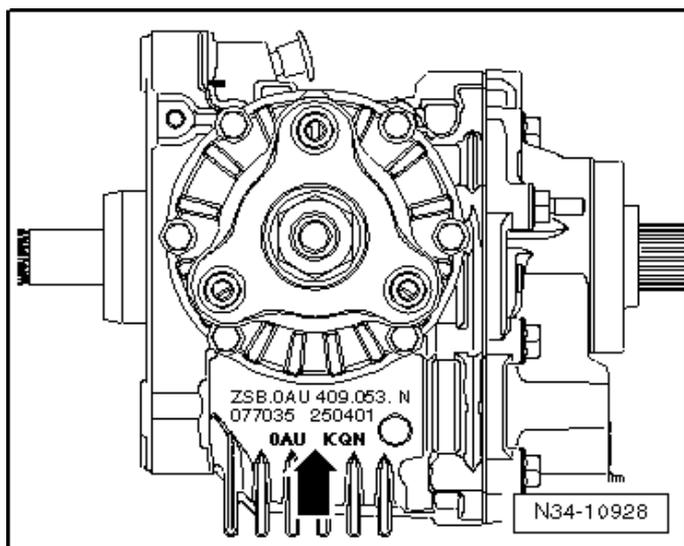
|                      |           |           |                        |
|----------------------|-----------|-----------|------------------------|
| <b>GGZ</b>           | <b>06</b> | <b>05</b> | <b>02</b>              |
| Identification codes | Day       | Month     | Production year (2002) |

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

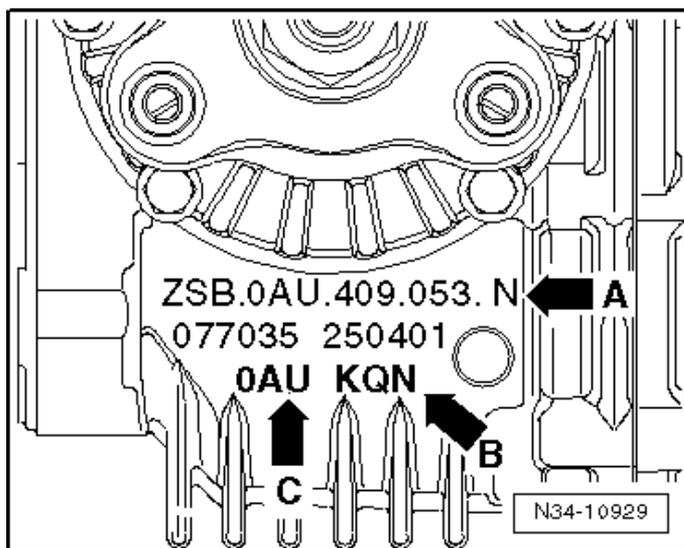
## Engine and Transmission Code Allocation

| Engine             | 6 Speed Automatic Transmission (09M) Code | Bevel Box Code        |
|--------------------|---|-----------------------|
| 2.0L - 147 kW TSFI | JVZ                                       | KQP, KUJ, LGR and LGY |
|                    | MYZ                                       | LGY                   |

## Bevel Box Identification



The identification (➔) is located under the output flange.



A- Bevel box part number

B- Bevel box code letters

C- Bevel box 0AU

# Controls, Housing – 09M

## Fastener Tightening Specifications

| Component  | Nm                                 |
|--|------------------------------------|
| Automatic transmission fluid cooler-to-transmission bolt <sup>3)</sup> | 9                                  |
|  | 20                                 |
| Automatic transmission fluid cooler-to-lock carrier bolt               | 5                                  |
| Automatic transmission fluid cooler line-to-thermostat bolt            | 9                                  |
| Automatic transmission fluid plug-to-transmission pan <sup>4)</sup>    | 27                                 |
| Ground cable-to-bracket bolt   | 25                                 |
| Multifunction transmission range switch-to-shift rod nut               | 7                                  |
| Multifunction transmission range switch-to-transmission bolt           | 6                                  |
| Selector housing-to-body nut <sup>2)</sup>                             | 8                                  |
| Selector housing-to-selector mechanism/underbody nut                   | 9                                  |
| Selector lever cable adjustment bolt                                   | 15                                 |
| Selector lever cable bracket-to-transmission nut                       | 8                                  |
| Selector lever, mechanism and cable-to-body bolt <sup>2)</sup>         | 8                                  |
| Selector lever-to-shift rod nut  | 13                                 |
| Selector mechanism-to-body bolt  | 8                                  |
| Spring-to-selector mechanism bolt                                      | 3                                  |
| Transmission mount bracket-to-transmission bolt <sup>1)</sup>          | 40 plus an additional 90° (¼ turn) |
| Transmission mount-to-transmission mount bracket bolt <sup>1)</sup>    | 60 plus an additional 90° (¼ turn) |

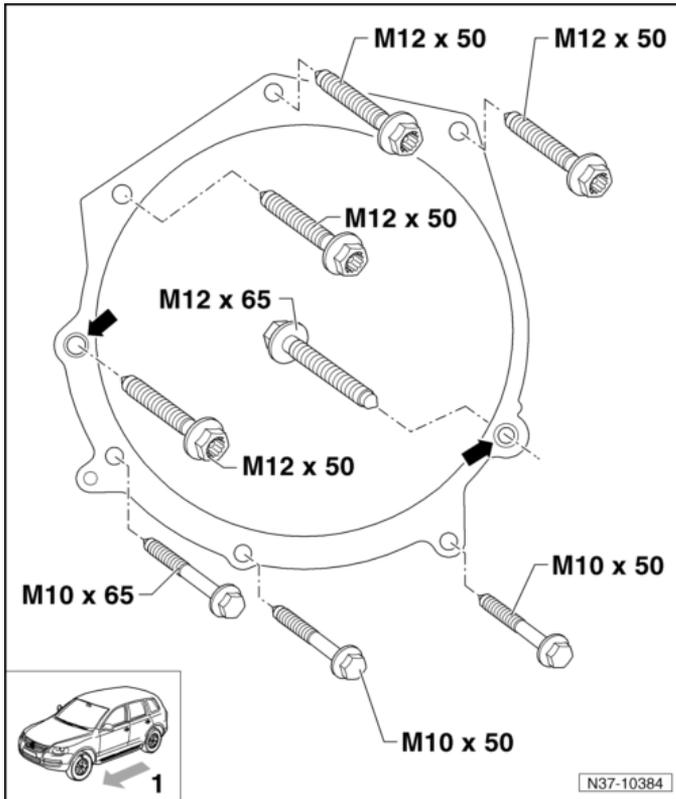
<sup>1)</sup> Replace fastener(s).

<sup>2)</sup> From 11 September 2009.

<sup>3)</sup> For bolt tightening clarification, refer to ElsaWeb, *Transmission Fluid Cooler Overview*.

<sup>4)</sup> Install with a new seal.

## Transmission to Engine Tightening Specifications

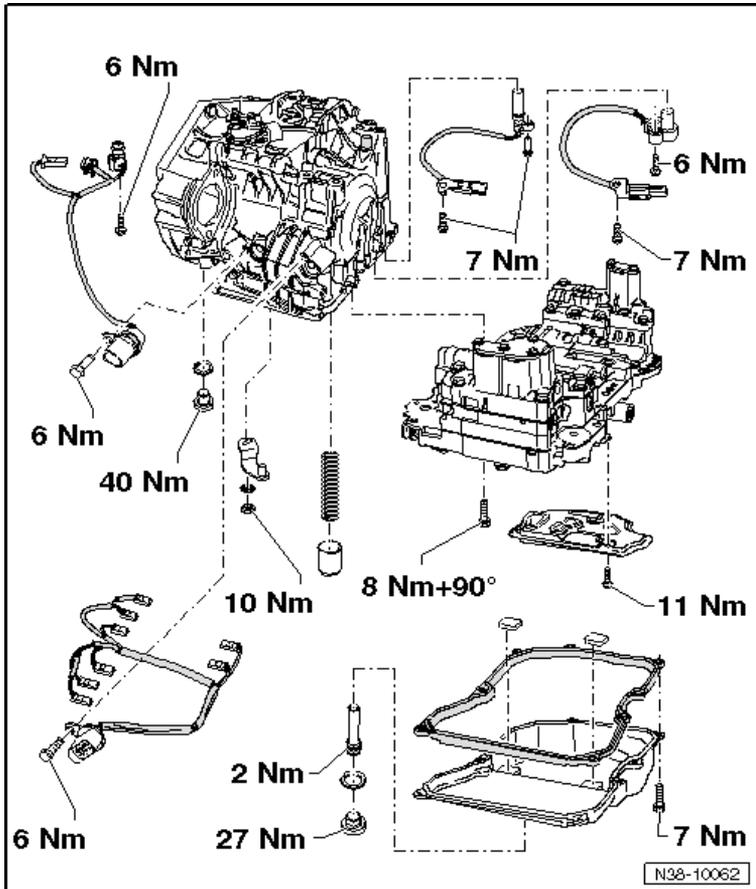


Automatic Trans. –  
09M

| Component                         | Fastener size | Nm |
|-----------------------------------|---------------|----|
| Drive plate-to-converter          | -             | 60 |
| Bolts                             | M12           | 80 |
| Bolts located in the lower flange | M10           | 40 |
| ➡ Alignment pins for centering    |               |    |

# Gears, Hydraulic Controls – 09M

## Fastener Tightening Specifications



# Rear Final Drive, Differential – 0A6

## Fastener Tightening Specifications

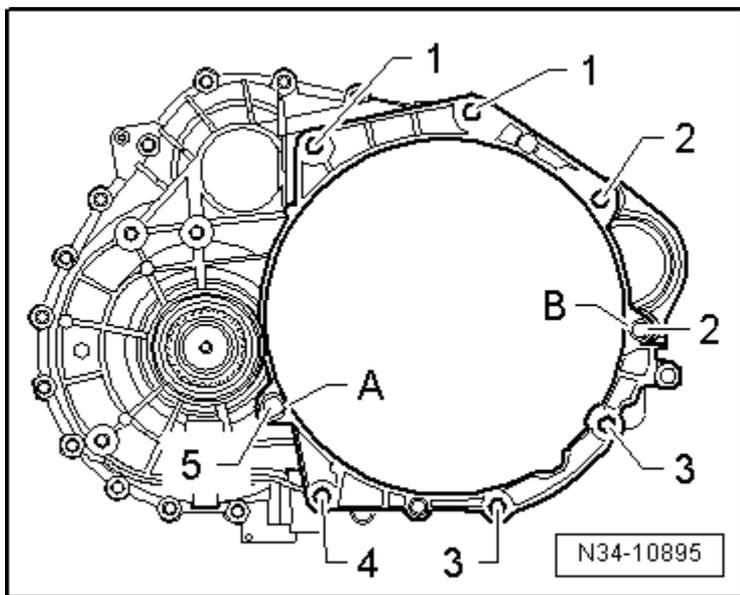
| Component  | Fastener size | Nm  |
|--|---------------|-----|
| Bevel box oil fill plug <sup>1)</sup>                | -             | 27  |
| Bevel box to transmission bolt <sup>1)</sup>         | -             |     |
| Drive pinion housing to bevel box bolt <sup>3)</sup> | -             | 25  |
| Output flange to output shaft nut <sup>2)</sup>      | -             | 480 |

<sup>1)</sup> Replace fastener(s).

<sup>2)</sup> Rear Final Drive, Differential

<sup>3)</sup> Tighten in a diagonal sequence.

## Bevel Box to Transmission Bracket Stud/Nut Tightening Sequence and Specifications



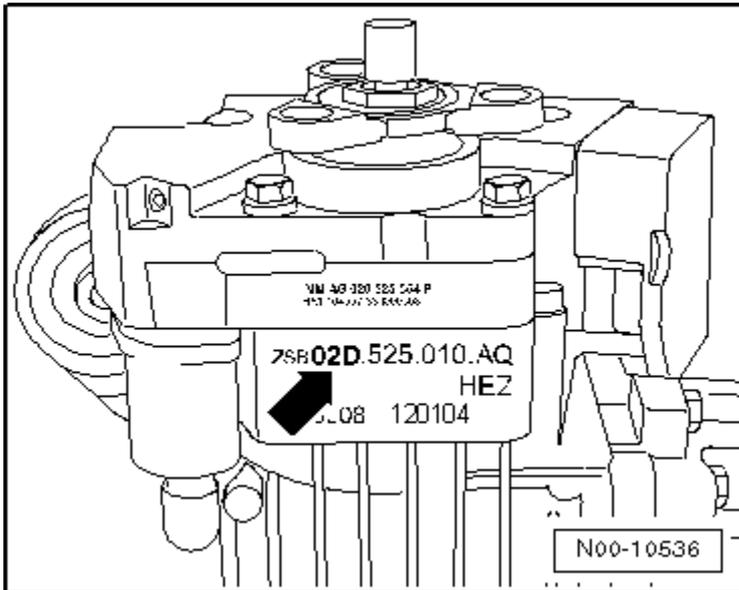
Automatic Trans. -  
09M

| Sequence | Bolt/Stud Bolt/Nut        | Tightening Specifications |
|----------|---------------------------|---------------------------|
| 1        |                           | Counter turn by hand      |
| 2        |                           | 40                        |
| 3        | Tighten -1 and 2-         | 40                        |
|          | Drive axle heat shield    | 20                        |
|          | Flexible disc heat shield | 9                         |

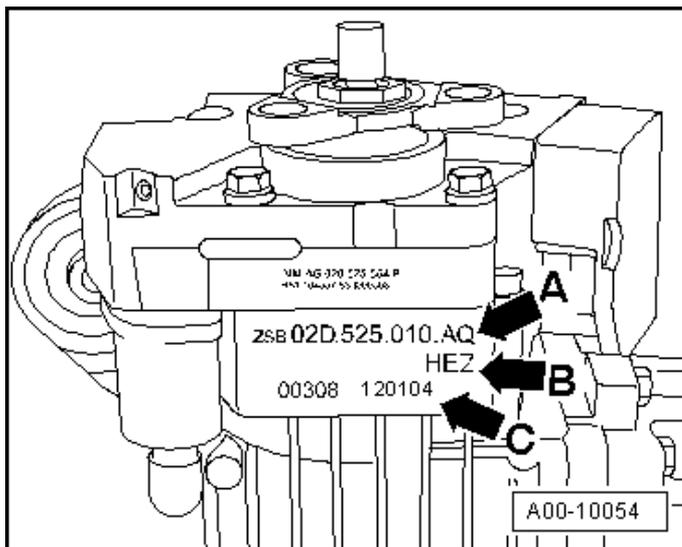
# REAR FINAL DRIVE

## *General, Technical Data*

### Rear Final Drive Identification



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



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

**Example:**

|                      |           |           |                               |
|----------------------|-----------|-----------|-------------------------------|
| <b>HEZ</b>           | <b>12</b> | <b>01</b> | <b>04</b>                     |
| Identification codes | Day       | Month     | Year (2004)<br>of manufacture |

**Rear Final Drive**

**Code Letters and Transmission Allocation**

| <b>Rear Final Drive - 0AY</b><br>Generation IV Haldex Clutch)  |  |
|--|--|
| Transmission type  | Automatic Transmission - 09M                       |
| Code letters   | HPU, LGX, MBC and NWU                              |
| Engine   | 2.0L - 147 kW TFSI                                 |
| Final drive capacity   | Refer to the Fluid Capacity Tables,<br>Rep. Gr. 03 |
| Haldex clutch capacity   | Refer to the Fluid Capacity Tables,<br>Rep. Gr. 03 |
| Replacement capacity in Haldex clutch. Change intervals, refer to Maintenance Intervals, Rep. Gr. 03 | Refer to the Fluid Capacity Tables,<br>Rep. Gr. 03 |
| Driveshaft flange diameter   | 100 mm   |

## Fastener Tightening Specifications

| Component  | Fastener size | Nm                                 |
|--|---------------|------------------------------------|
| All Wheel Drive Control Module to Haldex Clutch Housing Bolt           | -             | 6                                  |
| Front Flexible Disc to Bevel Box Input Flange bolt <sup>1)</sup>       | M10 x 30      | 50 plus an additional 90° (¼ turn) |
| Haldex Clutch Drain Plug   | -             | 30                                 |
| Haldex Clutch Fill Plug  | -             | 15                                 |
| Haldex Clutch Pump to Haldex Clutch Bolt                               | -             | 6                                  |
| Haldex Clutch to Rear Final Drive Bolt                                 | -             | 50                                 |
| Input Flange to Rear Final Drive Nut <sup>2)</sup>                     | -             | 210                                |
| Intermediate Bearing to Underbody Bolt                                 | -             | 25                                 |
| Rear Final Drive Plug  |               | 15                                 |
| Rear Flexible Disc to Driveshaft Bolt <sup>1)</sup>                    | -             | 50 plus an additional 90° (¼ turn) |
| Rear Flexible Disc to Rear Final Drive Input Flange Bolt <sup>1)</sup> | -             | 50 plus an additional 90° (¼ turn) |

<sup>1)</sup> Replace fastener(s).

<sup>2)</sup> Install using liquid locking fluid -D 000 600 A2-.

# SUSPENSION, WHEELS, STEERING

## Front Suspension

### Fastener Tightening Specifications

| Component  | Fastener size   | Nm  |
|--|-----------------|---|
| ABS wheel speed sensor bolt  | M6 x 16         | 8   |
| <b>Ball joint-to-control arm nut <sup>1)</sup></b>   |                 |   |
| - With aluminum control arm  | -               | 60  |
| - With steel control arm   | -               | 100   |
| Ball joint-to-wheel bearing housing nut <sup>1)</sup>  | M12 x 1.5       | 60  |
| Constant Velocity (CV) joint boot clamp  | -               | 25  |
| Control arm-to-subframe bolt <sup>1), 2)</sup>   | M12 x 1.5 x 110 | 70 plus an additional 180° ( $\frac{1}{2}$ turn)  |
| Coupling rod-to-stabilizer bar nut <sup>1)</sup>   | -               | 65  |
| Coupling rod-to-strut nut <sup>1)</sup>  | -               | 65  |
| Cover plate-to-wheel bearing housing bolt  | M6 x 12         | 12  |
| Drive axle heat shield-to-transmission   |                 |   |
| - Bolt (FWD)   | -               | 25  |
| - Nut (AWD)  | -               | 20  |
| Drive axle-to-transmission bolt (with bolted Constant Velocity (CV) joint V107) <sup>1) 3)</sup> | M10 x 52        | 70  |
| <b>Drive axle-to-wheel hub bolt <sup>1) 2)</sup></b>   |                 |   |
| - Twelve-point bolt with ribs  | -               | 70 plus an additional 90° ( $\frac{1}{4}$ turn)   |
| - Twelve-point bolt without ribs   | -               | 200 plus an additional 180° ( $\frac{1}{2}$ turn) |
| Mounting bracket bolt <sup>1)</sup>  | M12 x 1.5 x 100 | 70 plus an additional 90° ( $\frac{1}{4}$ turn)   |
| Mounting bracket-to-subframe bolt <sup>1)</sup>  | M10 x 70        | 50 plus an additional 90° ( $\frac{1}{4}$ turn)   |
| Pendulum support-to-subframe bolt <sup>1) 4)</sup>   | M14 x 1.5 x 70  | 100 plus an additional 90° ( $\frac{1}{4}$ turn)  |

## Fastener Tightening Specifications (cont'd)

| Component  | Fastener size   | Nm                                  |
|--|-----------------|-------------------------------------|
| Pendulum support-to-transmission bolt <sup>1)</sup>    | M10 x 35        | 50 plus an additional 90° (¼ turn)  |
|  | M10 x 75        | 50 plus an additional 90° (¼ turn)  |
|  | M12 x 1.5 x 50  | 60 plus an additional 90° (¼ turn)  |
|  | M12 x 1.5 x 85  | 60 plus an additional 90° (¼ turn)  |
| Shield-to-subframe bolt (FWD)                          | -               | 6                                   |
| Shock absorber-to-strut bearing nut <sup>1)</sup>      | M14 x 1.5       | 60                                  |
| Stabilizer bar-to-subframe bolt <sup>1)</sup>          | M8 x 55         | 20 plus an additional 90° (¼ turn)  |
| Strut-to-body bolt <sup>1)</sup>                       | M8 x 26         | 15 plus an additional 90° (¼ turn)  |
| Strut-to-wheel bearing housing nut <sup>1)</sup>       | M12 x 1.5 x 80  | 70 plus an additional 90° (¼ turn)  |
| Subframe-to-body bolt <sup>1)</sup>                    | M12 x 1.5 x 100 | 70 plus an additional 180° (½ turn) |
|  | M12 x 1.5 x 110 | 70 plus an additional 90° (¼ turn)  |
| Tie rod end-to-wheel bearing housing nut <sup>1)</sup> | M12 x 1.5       | 50                                  |
| Wheel hub-to-wheel bearing housing <sup>1)</sup>       | M12 x 1.5 x 45  | 70 plus an additional 90° (¼ turn)  |

<sup>1)</sup> Replace fastener(s).

<sup>2)</sup> Vehicle must not be standing on its wheels when loosening or tightening.

<sup>3)</sup> Pre-tighten to 10 Nm in a diagonal sequence, and then tighten in a diagonal sequence.

<sup>4)</sup> Only tighten when pendulum support is bolted to transmission.

# Rear Suspension

## Fastener Tightening Specifications

| Component  | Fastener size | Nm                                      |
|--|---------------|---|
| ABS wheel speed sensor bolt  | M6 x 16       | 8                                       |
| Brake disc-to-wheel hub bolt                                       | -             | 4                                       |
| Coupling rod-to-stabilizer bar nut <sup>1)</sup>                   | -             | 40                                      |
| Coupling rod-to-wheel bearing housing nut <sup>1)</sup>            | -             | 40                                      |
| Cover plate-to-wheel bearing housing bolt                          | -             | 12                                      |
| Constant Velocity (CV) joint boot clamp                            | -             | 25                                      |
| Drive axle-to-final drive bolt (AWD) <sup>1)3)</sup>               | M8 x 48       | 40                                      |
| <b>Drive axle-to-wheel hub bolt (AWD) <sup>1)</sup></b>            |               |   |
| - Twelve-point bolt with ribs                                      | -             | 70 plus an additional 90°<br>(¼ turn)   |
| - Twelve-point bolt without ribs                                   | -             | 200 plus an additional 180°<br>(½ turn) |
| Final drive-to-subframe bolt (AWD)                                 | M12 x 105     | 60 plus an additional 90°<br>(¼ turn)   |
| Level control system sensor bolt                                   | M5 x 20       | 5                                       |
| Lower transverse link-to-subframe nut <sup>1)2)</sup>              | M12 x 1.5     | 95                                      |
| Lower transverse link-to-wheel bearing housing nut <sup>1)2)</sup> | -             | 90 plus an additional 90°<br>(¼ turn)   |
| Shock absorber-to-body bolt <sup>1)</sup>                          | -             | 50 plus an additional 90°<br>(¼ turn)   |
| Shock absorber-to-shock absorber mounting nut <sup>1)</sup>        | -             | 25                                      |
| Shock absorber-to-wheel bearing housing bolt <sup>1)</sup>         | -             | 180                                     |
| Stabilizer bar-to-subframe bolt <sup>1)5)</sup>                    | -             | 25 plus an additional 90°<br>(¼ turn)   |
| Stone protection plate-to-lower transverse link bolt               | -             | 8                                       |
| Subframe-to-body bolt <sup>1)</sup>                                | -             | 90 plus an additional 90°<br>(¼ turn)   |
| Tie rod-to-subframe nut <sup>1)2)</sup>                            | -             | 90 plus an additional 90°<br>(¼ turn)   |

## Fastener Tightening Specifications (cont'd)

| Component   | Fastener size   | Nm                                  |
|---|-----------------|-------------------------------------|
| <b>Tie rod-to-wheel bearing housing bolt <sup>1) 2)</sup></b>               |                 |                                     |
| - FWD   | -               | 130 plus an additional 90° (¼ turn) |
| - AWD   | M14 x 1.5 x 115 | 150 plus an additional 90° (¼ turn) |
| Trailing arm-to-mounting bracket bolt <sup>1)</sup>                         | M12 x 1.5 x 80  | 90 plus an additional 90° (¼ turn)  |
| Trailing arm-to-wheel bearing housing bolt <sup>1) 4)</sup>                 | -               | 90 plus an additional 90° (¼ turn)  |
| Trailing arm mounting bracket-to-body bolt <sup>1)</sup>                    | M10 x 35        | 50 plus an additional 90° (¼ turn)  |
| Upper transverse link-to-subframe nut <sup>1) 2)</sup>                      | M12 x 1.5       | 95                                  |
| <b>Upper transverse link-to-wheel bearing housing bolt <sup>1) 2)</sup></b> |                 |                                     |
| - FWD   | M14 x 1.5 x 115 | 130 plus an additional 90° (¼ turn) |
| - AWD   | M14 x 1.5 x 115 | 150 plus an additional 90° (¼ turn) |
| <b>Wheel hub-to-wheel bearing housing bolt <sup>1)</sup></b>                |                 |                                     |
| - FWD   | M16 x 1.5 x 70  | 200 plus an additional 90° (¼ turn) |
| - AWD   | M14 x 1.5 x 45  | 70 plus an additional 90° (¼ turn)  |

<sup>1)</sup> Replace fastener(s).

<sup>2)</sup> Always tighten the threaded connection in curb weight position.

<sup>3)</sup> Pre-tighten to 10 Nm in a diagonal sequence, and then tighten in a diagonal sequence.

<sup>4)</sup> Observe tightening sequence.

<sup>5)</sup> Tighten uniformly.

# Self-Leveling Suspension

## Fastener Tightening Specifications

| Component  | Fastener size | Nm                                 |
|--|---------------|------------------------------------|
| Front body acceleration sensor-to-retainer bolt/nut                | -             | 5                                  |
| Front control system sensor-to-subframe bolt                       | -             | 9                                  |
| Front control system sensor-to-control arm nut <sup>1)</sup>       | -             | 9                                  |
| Front level control system sensor-to-subframe bolt                 | M6 x 16       | 9                                  |
| Front level control system sensor-to-control arm nut <sup>1)</sup> | -             | 9                                  |
| Front shock absorber-to-suspension strut bearing nut               | M14 x 1.5     | 60                                 |
| Rear body acceleration sensor-to-retainer bolt                     | -             | 5                                  |
| Rear level control system sensor bolt                              | M5 x 20       | 5                                  |
| Rear shock absorber-to-body bolt <sup>1)</sup>                     | M10 x 35      | 50 plus an additional 90° (¼ turn) |
| Rear shock absorber-to-mount nut <sup>1)</sup>                     | M10 x 1.0     | 25                                 |
| Rear shock absorber-to-wheel bearing housing bolt                  | -             | 180                                |
| Strut to body bolt <sup>1)</sup>                                   | M8 x 26       | 15 plus an additional 90° (¼ turn) |

<sup>1)</sup> Replace fastener(s).

# Wheels, Tires, Wheel Alignment

## Fastener Tightening Specifications

| Component   | Nm                                  |
|---|-------------------------------------|
| Control arm mounting bracket-to-body mounting bolt <sup>1)</sup>          | 70 plus an additional 180° (½ turn) |
| Front mounting bracket-to-body bolt <sup>1)</sup>                         | 70 plus an additional 180° (½ turn) |
| Front subframe-to-body mounting bolt <sup>1)</sup>                        | 70 plus an additional 180° (½ turn) |
| Tie rod end-to-tie rod lock nut   | 70                                  |
| Tire pressure sensor to metal valve bolt, with autolocation               | 4                                   |
| Tire pressure sensor union nut  | 8                                   |
| Rear lower transverse link-to-subframe nut <sup>1)2)</sup>                | 95                                  |
| Rear upper transverse link-to-subframe mounting nut (AWD) <sup>1)2)</sup> | 95                                  |
| Wheel hub bolt (FWD)  | 140                                 |
| Wheel hub bolt (AWD)  | 120                                 |

<sup>1)</sup> Replace fastener(s).

<sup>2)</sup> Always tighten in curb weight position.

## Wheel Alignment Data

### Wheel Alignment Specified Values

| Front suspension   | Basic suspension | Sport suspension |
|--|------------------|------------------|
| Production Relevant No. (PR. No.)  | G02              | G03              |
| Total toe (wheels not pressed)   | 10' ± 10'        | 10' ± 10'        |
| Camber (wheels in straight ahead position)                                   | -27' ± 30'       | -27' ± 30'       |
| Maximum permissible difference between both sides                            | 30'              | 30'              |
| Toe-out angle <sup>1)</sup> with steering wheel turned 20° to left and right | 1°36' ± 20'      | 1°36' ± 20'      |
| Caster   | 7° 34' ± 30'     | 7° 34' ± 30'     |
| Maximum permissible difference between both sides                            | 30'              | 30'              |
| Standing height (mm)   | 430 ± 10         | 430 ± 10         |

| <b>Front suspension</b>  | <b>Basic suspension with adaptive chassis DCC</b> | <b>Basic suspension US version</b> |
|--|---|------------------------------------|
| PR numbers   | G40   | G34                                |
| Total toe (wheels not pressed)   | 10' ± 10'   | 10' ± 10'                          |
| Camber (wheels in straight ahead position)                                   | -27' ± 30'  | -27' ± 30'                         |
| Maximum permissible difference between both sides                            | 30'   | 30'                                |
| Toe-out angle <sup>1)</sup> with steering wheel turned 20° to left and right | 1°36' ± 20'                                       | 1°36' ± 20'                        |
| Caster   | 7° 34' ± 30'                                      | 7° 34' ± 30'                       |
| Maximum permissible difference between both sides                            | 30'   | 30'                                |
| Standing height (mm)   | 430 ± 10  | 430 ± 10                           |

<sup>1)</sup> Depending on the manufacturer, the toe out angle difference can also be indicated negatively in the alignment computer.

| <b>AWD rear suspension</b>                               | <b>Basic suspension</b> | <b>Sport suspension</b> |
|--|-------------------------|-------------------------|
| Camber   | -1° 20' ± 30'           | -1° 20' ± 30'           |
| Maximum permissible difference between both sides        | 30'                     | 30'                     |
| Total toe (at prescribed camber)                         | +10' ± 10'              | +10' ± 10'              |
| Maximum permissible deviation from direction of rotation | 20'                     | 20'                     |
| Standing height (mm)                                     | 440 ± 10                | 440 ± 10                |

| <b>AWD rear suspension</b>                               | <b>Basic suspension with adaptive chassis DCC</b> | <b>Basic suspension US version</b> |
|--|---|------------------------------------|
| Camber   | -1° 20' ± 30'                                     | -1° 20' ± 30'                      |
| Maximum permissible difference between both sides        | 30'   | 30'                                |
| Total toe (at prescribed camber)                         | +10' ± 10'  | +10' ± 10'                         |
| Maximum permissible deviation from direction of rotation | 20'   | 20'                                |
| Standing height (mm)                                     | 440 ± 10  | 440 ± 10                           |

# Steering

## Fastener Tightening Specifications

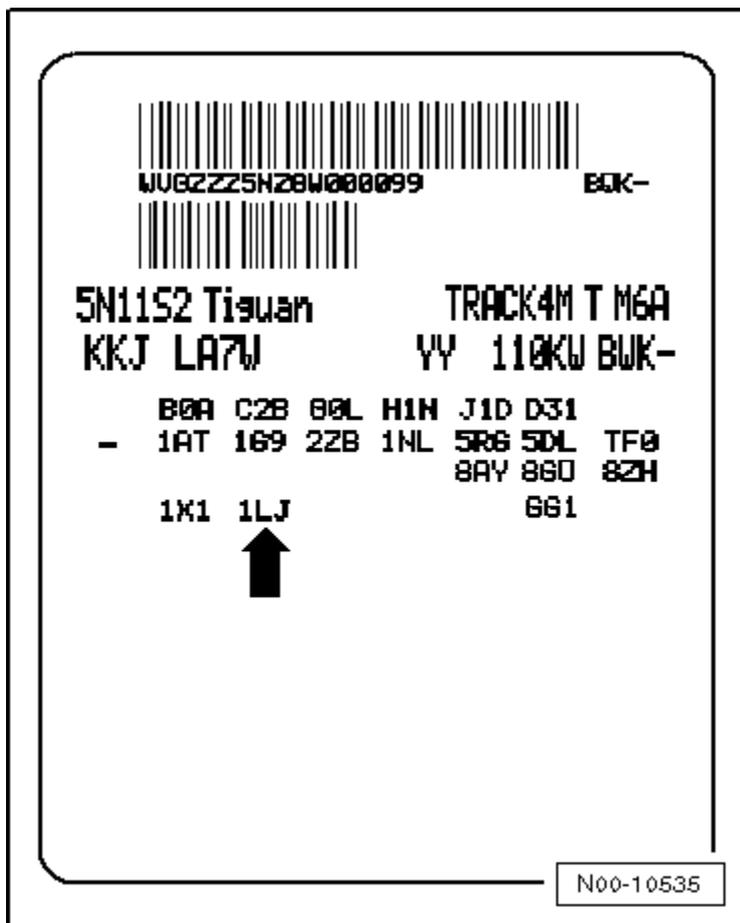
| Component   | Fastener size                   | Nm                                  |
|---|---------------------------------|-------------------------------------|
| <b>Ball joint-to-control arm nut <sup>1)</sup></b>                  |                                 |                                     |
| - To aluminum control arm   | -                               | 60                                  |
| - To steel control arm  | -                               | 100                                 |
| Mounting bracket-to-body bolt <sup>1)</sup>                         | -                               | 70 plus an additional 90° (¼ turn)  |
| Pendulum support-to-transmission bolt <sup>1)</sup>                 | M10 x 35                        | 50 plus an additional 90° (¼ turn)  |
|   | M10 x 75                        | 50 plus an additional 90° (¼ turn)  |
|   | M12 x 1.5 x 85                  | 60 plus an additional 90° (¼ turn)  |
| Stabilizer bar-to-subframe bolt <sup>1)</sup>                       | -                               | 20 plus an additional 90° (¼ turn)  |
| Steering column-to-lateral control arm bolt <sup>1)</sup>           | -                               | 20                                  |
| Steering column universal joint-to-steering gear bolt <sup>1)</sup> | M8 x 35                         | 30                                  |
| Steering gear-to-subframe bolt <sup>1)</sup>                        | M10 x 70                        | 50 plus an additional 90° (¼ turn)  |
| Steering gear heat shield bolt                                      | -                               | 6                                   |
| Steering wheel-to-steering column bolt <sup>1)</sup>                | -                               | 30 plus an additional 90° (¼ turn)  |
| Subframe-to-body bolt <sup>1)</sup>                                 | M12 x 1.5 x 110-                | 70 plus an additional 90° (¼ turn)  |
|   | M12 x 1.5 x 90, M12 x 1.5 x 100 | 70 plus an additional 180° (½ turn) |
| Subframe shield bolt  | M6                              | 6                                   |
| Tie rod-to-steering gear  | -                               | 100                                 |
| Tie rod end-to-tie rod lock nut                                     | -                               | 70                                  |
| Tie rod end-to-wheel bearing housing nut <sup>1)</sup>              | M12 x 1.5                       | 50                                  |

<sup>1)</sup> Replace fastener(s).

# BRAKE SYSTEM

## General, Technical Data

### Vehicle Data Sticker PR Number Allocation



The Production Relevant No. (PR. No.) on the vehicle data label describes which brake system is installed in the vehicle.

Example: (➡) - Front brakes - 1LJ

The vehicle data label can be found in the spare wheel well and the maintenance booklet.

Allocation, refer to the Electronic Parts Catalog (ETKA).

NOTE: The vehicle's rear brake system information is not currently available on the vehicle data plate.

The following tables explain the PR numbers. This is important in order to know the brake caliper/ brake disc and brake pad combination.

### Front Brakes

| Engine Version    | PR Number | Front Wheel Brake |
|-------------------|-----------|-------------------|
| 2.0L - 147 kW FSI | 1ZD       | FN 3 (16")        |

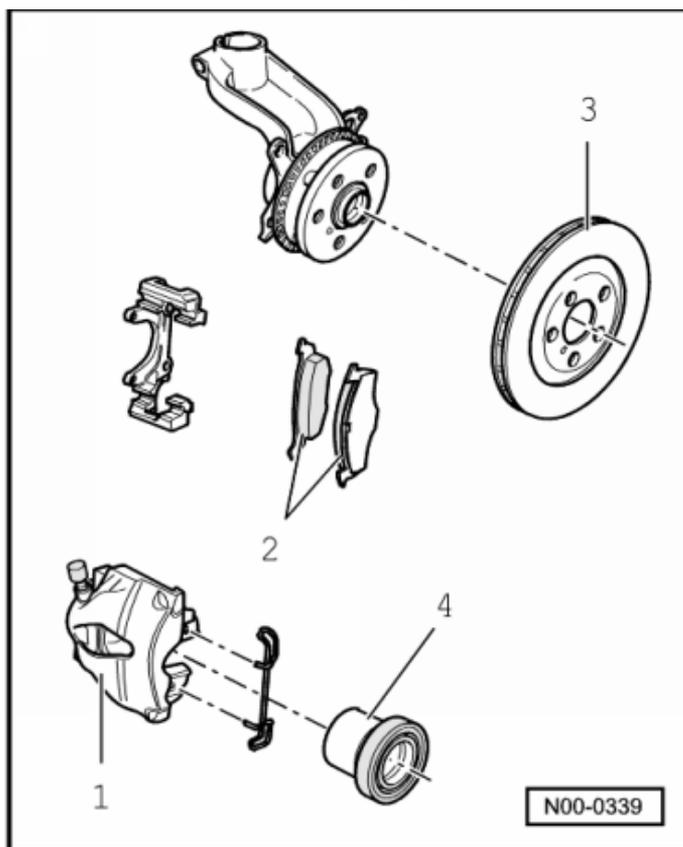
### Rear Brakes

| Engine Version    | PR Number | Rear Wheel Brake |
|-------------------|-----------|------------------|
| 2.0L - 147 kW FSI | 1KU       | CII 41 (16")     |

### Brake Master Cylinder and Brake Booster

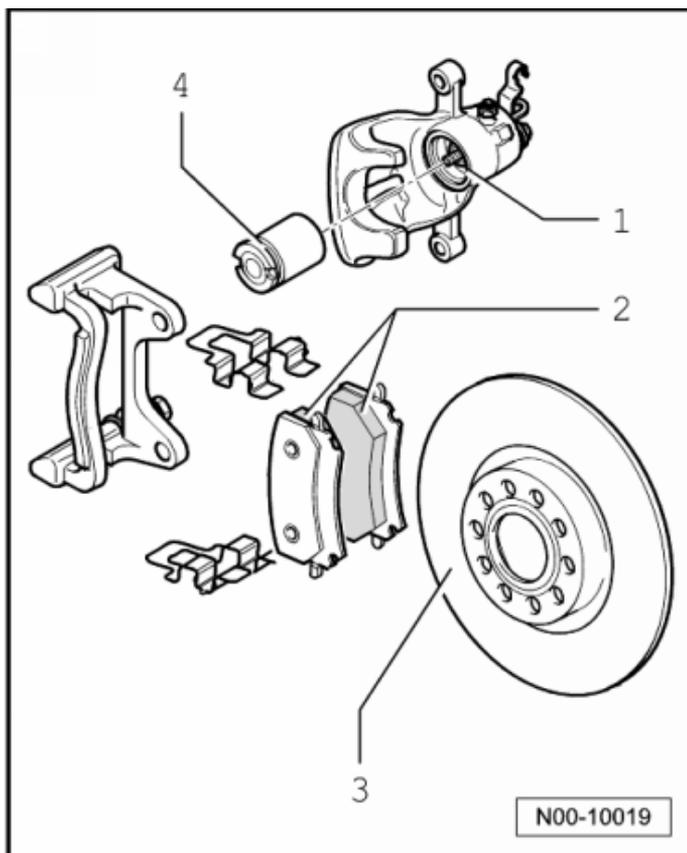
| Component                       | Diameter in mm |
|---------------------------------|----------------|
| Brake master cylinder           | 23.8           |
| Brake booster (left hand drive) | 11             |

## Front Brakes, FN 3



| Item | PR Number            | 1LJ / 1ZD      |     |
|------|----------------------|----------------|-----|
| 1    | Brake caliper        | FN 3 (16")     |     |
| 2    | Brake pad thickness  | mm             | 14  |
| 3    | Brake disc           | Diameter in mm | 312 |
|      | Brake disc thickness | mm             | 25  |
| 4    | Brake caliper piston | Diameter in mm | 54  |

## Rear Brakes, CII 41



| Item | PR Number            |                | 1KU          |
|------|----------------------|----------------|--------------|
| 1    | Brake caliper        |                | CII 41 (16") |
| 2    | Brake pad thickness  | mm             | 11           |
| 3    | Brake disc           | Diameter in mm | 286          |
|      | Brake disc thickness | mm             | 12           |
| 4    | Brake caliper piston | Diameter in mm | 41           |

# Anti-lock Brake System (ABS)

## Fastener Tightening Specifications

| Component                                   | Nm |
|---|----|
| ABS hydraulic unit-to-mounting bracket bolt | 8  |
| ABS wheel speed sensor mounting bolt        | 8  |
| <b>Brake lines-to-ABS unit</b>              |    |
| - Thread M10 x 1                            | 14 |
| - Thread M12 x 1                            | 14 |
| ESP sensor unit nuts                        | 9  |

# Mechanical Components

## Fastener Tightening Specifications

| Component  | Nm                                 |
|--|------------------------------------|
| Brake disc mounting bolt   | 4                                  |
| Brake hose-to-front brake caliper  | 35                                 |
| Brake hose-to-rear brake caliper   | 35                                 |
| Brake hose-to-rear brake line  | 14                                 |
| Brake pedal mounting bracket nut <sup>1)</sup>                           | 25                                 |
| Brake pedal-to-brake pedal mounting bracket mounting nut                 | 25                                 |
| Cover plate mounting bolt  | 12                                 |
| Front brake carrier guide pin  | 30                                 |
| Front brake carrier-to-wheel bearing housing mounting bolt <sup>2)</sup> | 200                                |
| Front wheel speed sensor mounting bolt                                   | 8                                  |
| Parking brake motor-to-rear brake caliper mounting bolt                  | 12                                 |
| Rear brake caliper-to-brake carrier mounting bolt <sup>1)</sup>          | 35                                 |
| Rear brake carrier mounting bolt <sup>1)</sup>                           | 90 plus an additional 90° (¼ turn) |

<sup>1)</sup> Replace fastener(s).

<sup>2)</sup> Clean if re-using.

# Hydraulic Components

## Fastener Tightening Specifications

| Component  | Nm                                 |
|--|------------------------------------|
| Brake Disk Mounting Bolt   | 4                                  |
| Brake Hose to Front Brake Caliper  | 35                                 |
| Brake Hose to Rear Brake Caliper   | 35                                 |
| Brake Hose to Rear Brake Line  | 14                                 |
| Brake Pedal Mounting Bracket Nut <sup>1)</sup>                           | 25                                 |
| Brake Pedal to Brake Pedal Mounting bracket Mounting Nut                 | 25                                 |
| Cover Plate Mounting Bolt  | 12                                 |
| Front Brake Carrier to Wheel Bearing Housing Mounting Bolt <sup>2)</sup> | 2008                               |
| Front Wheel Speed Sensor Mounting Bolt                                   | 30                                 |
| Guide Pin to Front Brake Carrier   |                                    |
| Parking brake motor-to-rear brake caliper mounting bolt                  | 12                                 |
| Rear Brake Caliper to Brake Carrier Mounting Bolt <sup>1)</sup>          | 35                                 |
| Rear Brake Carrier Mounting Bolt <sup>1)</sup>                           | 90 plus an additional 90° (¼ turn) |

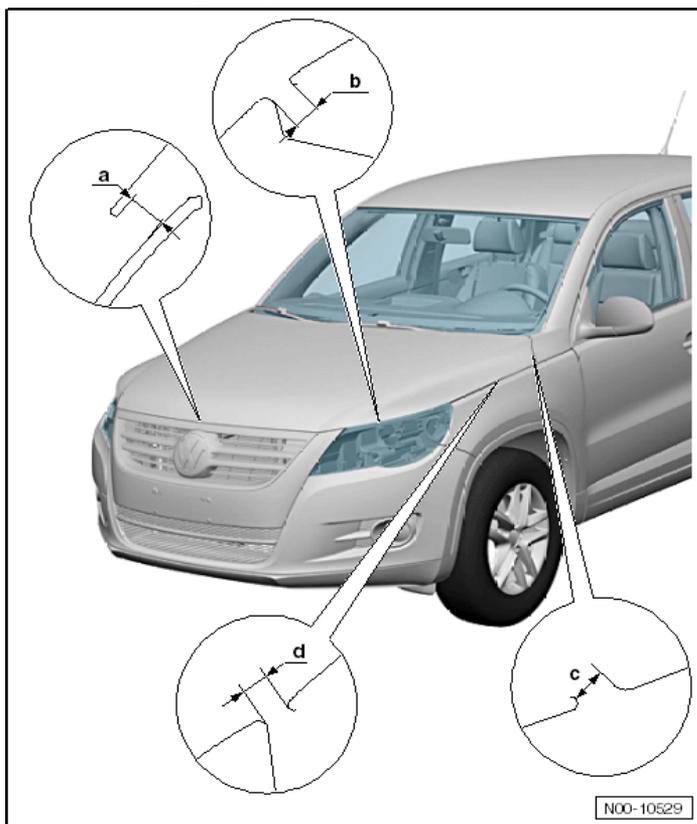
<sup>1)</sup> Replace fastener(s).

<sup>2)</sup> Clean if re-using.

# BODY

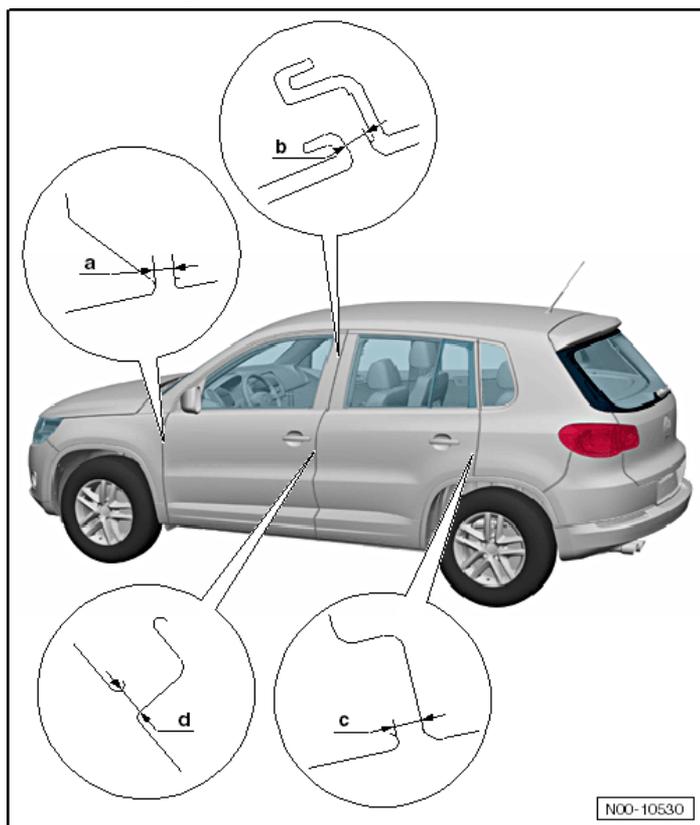
## Body Exterior

### Body Gap Dimensions, Front



| Component | mm            |
|-----------|---------------|
| a         | $7.5 \pm 1.0$ |
| b         | $5.5 \pm 1.0$ |
| c         | $5.5 \pm 1.0$ |
| d         | $5.0 \pm 1.0$ |

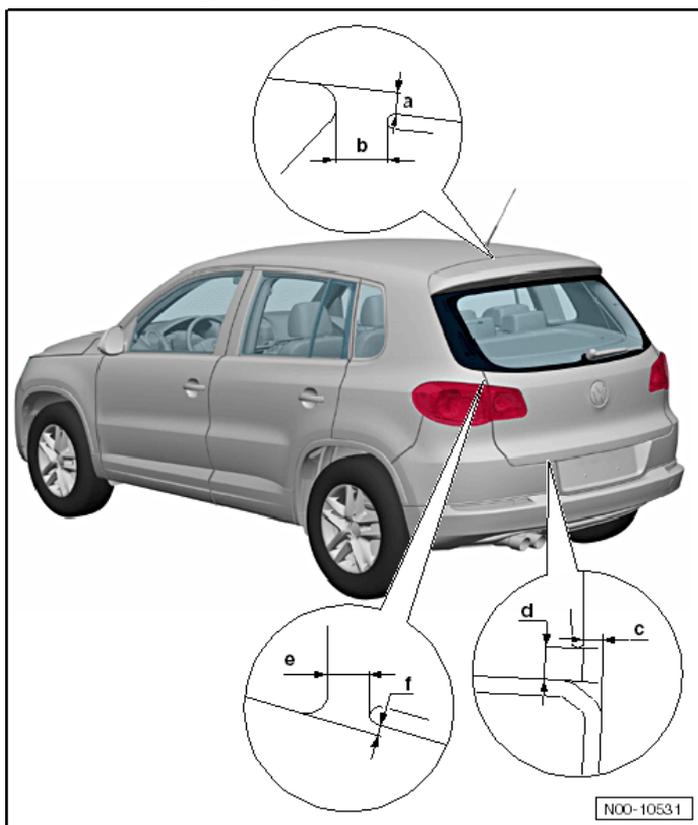
## Body Gap Dimensions, Center



N00-10530

| Component | mm            |
|-----------|---------------|
| a         | $4.0 \pm 1.0$ |
| b         | $4.5 \pm 1.0$ |
| c         | $4.0 \pm 1.0$ |
| d         | $4.5 \pm 1.0$ |

## Body Gap Dimensions, Rear



| Component | mm            |
|-----------|---------------|
| a         | $3.0 \pm 1.0$ |
| b         | $6.0 \pm 0.5$ |
| c         | $3.5 \pm 0.5$ |
| d         | $6.0 \pm 1.0$ |
| e         | $5.0 \pm 1.0$ |
| f         | $1.0 \pm 1.0$ |

## Lock Carrier Tightening Specifications

| Component                        | Nm |
|----------------------------------|----|
| Bumper angle bracket bolts       | 55 |
| Lock carrier bolts <sup>1)</sup> | 2  |
|                                  | 6  |
|                                  | 8  |
|                                  | 12 |

<sup>1)</sup> For bolt tightening clarification, refer to ElsaWeb, *Lock Carrier, Assembly Overview*.

## Front Fender and Noise Insulation Tightening Specifications

| Component                                  | Nm  |
|--|-----|
| Front fender bolts                         | 7.5 |
| Noise insulation bolts <sup>1)</sup>       | 2   |
|  | 6   |
| Underbody impact guard bolts <sup>2)</sup> | 2   |
|  | 20  |
|  | 35  |

<sup>1)</sup> For bolt tightening clarification, refer to ElsaWeb, *Noise Insulation, Long Version or Short Version, Assembly Overview*.

<sup>2)</sup> For bolt tightening clarification, refer to ElsaWeb, *Noise Insulation, Long Version or Short Version, Assembly Overview*.

## Underbody Trim Tightening Specification

| Component           | Nm |
|---------------------|----|
| Underbody trim nuts | 2  |

## Tunnel Brace and Cross Panel Tightening Specifications

| Component           | Nm |
|---------------------|----|
| Crossbrace nut      | 20 |
| Underbody trim nuts | 2  |
| Tunnel brace nuts   | 20 |

## Front Hood Tightening Specifications

| Component                | Nm  |
|--------------------------|-----|
| Hood catch bolts         | 10  |
| Hood hinge bolts         | 21  |
| Hood latch bolts         | 12  |
| Hood release lever bolts | 1.5 |

## Rear Lid, Fuel Filler Door Tightening Specifications

| Component                    | Nm  |
|------------------------------|-----|
| Angle bracket with ball stud | 10  |
| Button                       | 4   |
| Gas strut ball head pin      | 20  |
| Fuel filler door unit        | 1.5 |
| Grip with button screw       | 2   |
| License plate lamp screw     | 1   |
| Rear lid angle bracket bolts | 10  |
| Rear lid ball head pin       | 20  |
| Rear lid grip bolts          | 2   |
| Rear lid grip nuts           | 4   |
| Rear lid hinge bolts         | 10  |
| Rear lid hinge nuts          | 24  |
| Rear lid lock bolts          | 23  |
| Rear lid stop bolts          | 10  |
| Rear lid striker pin bolts   | 18  |

## Front and Rear Door Tightening Specifications

| Component                               | Nm               |
|---|------------------|
| Door handle bracket bolts               | 4.5              |
| Door hinge bolts <sup>2)</sup>          | 9                |
|   | 20               |
|   | 30               |
|   | 32 <sup>1)</sup> |
| Door limiting strap bolts <sup>4)</sup> | 9                |
|   | 30               |
| Door lock bolts                         | 20               |
| Door striker pin bolts                  | 20               |
| Door subframe bolts <sup>3)</sup>       | 8                |
|   | 20               |

<sup>1)</sup> Replace fastener(s).

<sup>2)</sup> For bolt tightening clarification, refer to ElsaWeb, *Front Door, or Rear Door, Assembly Overview*.

<sup>3)</sup> For bolt tightening clarification, refer to ElsaWeb, *Subframe, Assembly Overview*.

<sup>4)</sup> For bolt tightening clarification, refer to ElsaWeb, *Door Limiting Strap, Assembly Overview*.

## Sunroof Tightening Specifications

| Component                          | Nm  |
|------------------------------------|-----|
| Assembly frame bolts <sup>1)</sup> | 4.5 |
|                                    | 8   |
| Cable cover screws                 | 2   |
| Glass panel screws                 | 5   |

## Sunroof Tightening Specifications (*cont'd*)

|                             |     |
|-----------------------------|-----|
| Sunroof motor screws        | 3.5 |
| Shade motor screws          | 3.5 |
| Rear part guide rail screws | 2   |
| Wind deflector screws       | 2   |

<sup>1)</sup> For bolt tightening clarification, refer to ElsaWeb, *Assembly Frame*.

## Front Bumper Tightening Specifications

| Component                          | Nm  |
|------------------------------------|-----|
| Bumper carrier bolts <sup>1)</sup> | 3.5 |
|                                    | 8   |
|                                    | 60  |
| Bumper cover bolts <sup>1)</sup>   | 2   |
|                                    | 6   |

<sup>1)</sup> For bolt tightening clarification, refer to ElsaWeb, *Front Bumper Cover Assembly Overview*, items.

## Rear Bumper Tightening Specifications

| Component                             | Nm  |
|---------------------------------------|-----|
| Rear bumper carrier bolts             | 20  |
| Rear bumper cover bolts <sup>1)</sup> | 2   |
|                                       | 3.5 |
|                                       | 6   |

<sup>1)</sup> For bolt tightening clarification, refer to ElsaWeb, *Rear Bumper Cover Assembly Overview*.

## Door Window Tightening Specifications

| Component                             | Nm |
|---------------------------------------|----|
| Front door window bolts <sup>1)</sup> | 2  |
|                                       | 8  |
|                                       | 20 |
| Rear door window bolts <sup>2)</sup>  | 2  |
|                                       | 8  |
|                                       | 20 |

<sup>1)</sup> For bolt tightening clarification, refer to ElsaWeb, *Front Door Window Assembly Overview*.

<sup>2)</sup> For bolt tightening clarification, refer to ElsaWeb, *Rear Door Window Assembly Overview*.

## Wheel Housing Liner, Roof Rail Tightening Specifications

| Component                          | Nm |
|------------------------------------|----|
| Front wheel housing liner bolts    | 2  |
| Rear wheel housing liner bolts     | 2  |
| Roof rail angle bracket bolts/nuts | 10 |

## Exterior Mirror Tightening Specifications

| Component                  | Nm |
|----------------------------|----|
| Mirror base bolts          | 8  |
| Mirror frame housing bolts | 1  |

## Moldings and Trim Tightening Specification

| Component                       | Nm |
|---------------------------------|----|
| Front and rear door cover bolts | 2  |

## Body Interior

### Storage Compartments, Covers and Trim Tightening Specifications

| Component   | Nm  |
|---|-----|
| A/C and heater control trim screws                            | 1.5 |
| Center console bolts  | 1.5 |
| Center console mounting bracket bolts                         | 8   |
| Driver side left trim panel screws                            | 1.5 |
| Footwell trim screws  | 1.5 |
| Glove compartment screws                                      | 1.5 |
| Headliner console bolts                                       | 3   |
| Instrument panel trim screws                                  | 1.5 |
| Lower instrument panel trim screws                            | 1.5 |
| Lower rear center console screws to mount <sup>1)</sup>       | 6   |
| Rear wheel housing trim (with rear side airbag) <sup>2)</sup> | 4.5 |
| Roof grab handle bracket bolts                                | 2   |
| Steering column trim screws                                   | 1.5 |
| Storage compartment /ashtray screws                           | 1.5 |

<sup>1)</sup> For bolt tightening clarification, refer to ElsaWeb, *Center Console without Armrest*

<sup>2)</sup> For bolt tightening clarification, refer to ElsaWeb, *Rear Wheel Housing Trim with Rear Side Airbag*.

### Instrument Panel Tightening Specifications

| Component   | Nm  |
|---|-----|
| Instrument panel assembly carrier bolts <sup>2)</sup> | 4.5 |
|   | 8   |
|   | 20  |
| Instrument panel bolts <sup>1)</sup>                  | 1.5 |
|   | 9   |

<sup>1)</sup> For bolt tightening clarification, refer to ElsaWeb, *Instrument Panel*.

<sup>2)</sup> For bolt tightening clarification, refer to ElsaWeb, *Assembly Carrier*.

## Interior Trim Tightening Specifications

| Component                                 | Nm        |
|---|-----------|
| Assembly carrier to tunnel bolts          | 20        |
| B-pillar upper trim                       | 4         |
| Door trim bolts                           | 4.5       |
| Instrument cluster bolt                   | 2.5 ± 0.5 |
| Left and right instrument panel vent bolt | 2.5 ± 0.5 |
| Lower instrument panel to tunnel bolts    | 2.5 ± 0.5 |
| Plenum chamber bolt                       | 20        |
| Rear lid handle recess screw              | 1.5       |
| Relay carrier nuts                        | 4.5       |
| Screen separator bolt                     | 8         |
| Side assembly carrier nuts                | 20        |
| Side luggage compartment trim screw       | 1.5       |
| Upper assembly carrier nuts               | 8         |

## Passenger Protection, Airbags, Seat Belts Tightening Specifications

| Component  | Nm  |
|--|-----|
| Airbag control module bracket nuts to body                       | 2   |
| Airbag control module nuts to body                               | 9   |
| Driver and passenger front airbag crash sensor bolt              | 6   |
| Driver and passenger seat side airbag bolt to seat frame         | 9   |
| Outer rear seat belt automatic belt retractors bolt to mount     | 40  |
| Passenger airbag unit bolts to instrument panel                  | 9   |
| Rear center 3-point seat belt retractor to rear seat console nut | 40  |
| Rear seat belt latch seat frame                                  | 40  |
| Rear side airbag crash sensor bolt                               | 6   |
| Seat belt anchor bolt  | 40  |
| Seat belt anchor bolt to body                                    | 40  |
| Seat belt guide bolts  | 4.5 |
| Seat belt height adjuster to mounting plate                      | 20  |
| Seat belt latch to seat frame mount                              | 40  |
| Seat belt relay bolt to seat belt height adjuster                | 40  |
| Seat position sensor screw                                       | 0.3 |
| Side curtain airbags gas generator retaining plate bolts         | 9   |

## Seat Frame Tightening Specifications

| Component                                      | Nm    |
|--|-------|
| Backrest folding table screws                  | 2.5   |
| Backrest to seat bolts                         | 34.5  |
| Door sill side trim screws                     | 2     |
| Door sill side trim bracket bolts              | 8     |
| Height adjustment drive motor                  | 6 ± 2 |
| Height adjustment element bolts                | 6 ± 2 |
| Height adjustment lever to seat bolt           | 19.5  |
| Lower door sill side trim bracket bolt         | 8     |
| Lumbar adjustment switch screws                | 1     |
| Rear bench seat bolts                          | 60    |
| Rear bench seat backrest adjustment trim screw | 2.5   |
| Rear seat bench rails to floor nuts            | 48    |
| Rear seat bench rails to seat frame nuts       | 24    |
| Rear seat center armrest to seat bolt          | 20    |
| Rear seat cushion release spring bolt          | 6     |
| Rear seat storage compartment bolts            | 2.5   |
| Seat adjustment control head screws            | 1     |
| Seat drawer mount bolt                         | 8     |
| Seat forward/backward adjuster drive bolts     | 22    |
| Seat to floor bolts                            | 40    |
| Upper door sill side trim bracket bolt         | 2     |

# HEATING, VENTILATION and 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<br>(positive pressure) of R134a |
|-------------------|---|
| -45               | -0.61   |
| -40               | -0.49   |
| -35               | -0.34   |
| -30               | -0.16   |
| -25               | 0.06  |
| -20               | 0.32  |
| -15               | 0.63  |
| -10               | 1.00  |
| -5                | 1.43  |
| 0                 | 1.92  |
| 5                 | 2.49  |
| 10                | 3.13  |
| 15                | 3.90  |
| 20                | 4.70  |
| 25                | 5.63  |
| 30                | 6.70  |
| 35                | 7.83  |
| 40                | 9.10  |
| 45                | 10.54   |
| 50                | 12.11   |
| 55                | 13.83   |
| 60                | 15.72   |
| 65                | 17.79   |
| 70                | 20.05   |
| 75                | 22.52   |
| 80                | 25.21   |
| 85                | 28.14   |
| 90                | 31.34   |

# Heating, Ventilation

## Fastener Tightening Specifications

| Component                             | Nm        |
|---------------------------------------|-----------|
| Air distribution housing bolts        | 1.4       |
| Air grille                            | 2.5 ± 0.4 |
| Footwell vents                        | 1.5 ± 0.2 |
| Fresh air blower bolts                | 1         |
| Heater control bolts                  | 1.5 ± 0.2 |
| Heater core connection flange bolt    | 2         |
| Heater core pipe clamps               | 2         |
| Heater unit screws <sup>1)</sup>      | 4.5 ± 0.7 |
| Heater unit screws <sup>2)</sup>      | 8         |
| Heater unit screws/nuts <sup>3)</sup> | 9 ± 1.3   |

<sup>1)</sup> For bolt tightening clarification, refer to ElsaWeb, *Heater Unit*, items 1 and 2.

<sup>2)</sup> For bolt tightening clarification, refer to ElsaWeb, *Heater Unit*, item 6.

<sup>3)</sup> For bolt tightening clarification, refer to ElsaWeb, *Heater Unit*, items 10 and 12.

# Air Conditioning

## Fastener Tightening Specifications

| Component  | Nm        |
|--|-----------|
| A/C compressor bolts                                 | 25        |
| Air distribution door motor                          | 1.5       |
| Condenser-to-radiator                                | 5 ± 0.5   |
| Defroster door motor                                 | 1.4       |
| Evacuating and charging valve insert                 | 2.4 ± 0.2 |
| Expansion valve                                      | 5         |
| Expansion valve heat shield                          | 6         |
| Fluid reservoir with dryer                           | 4.2 ± 0.7 |
| Fluid reservoir with dryer clamp bolt                | 7         |
| Fresh air/recirculating air/back pressure door motor | 1.4       |
| Front air distribution door motor                    | 1.4       |
| Heater and A/C control bolts                         | 1.5 ± 0.2 |
| Heating and A/C housing bracket bolts                | 9         |
| Heater unit screws <sup>1)</sup>                     | 4.5 ± 0.7 |
| Heater unit screws <sup>2)</sup>                     | 8         |
| Heater unit screws/nuts <sup>3)</sup>                | 9 ± 1.3   |
| High pressure sensor                                 | 8 ± 1     |
| Left temperature door motor                          | 1.4       |
| Refrigerant lines-to-A/C compressor                  | 22        |
| Refrigerant lines-to-condenser                       | 12 ± 1    |
| Refrigerant lines-to-expansion valve                 | 10 ± 1    |
| Ribbed belt pulley                                   | 35 ± 5    |
| Right temperature door motor                         | 1.4       |
| Temperature regulator door motor                     | 1.4       |

<sup>1)</sup> For bolt tightening clarification, refer to ElsaWeb, *Heating and A/C Unit*, item 1.

<sup>2)</sup> For bolt tightening clarification, refer to ElsaWeb, *Heating and A/C Unit*, item 6.

<sup>3)</sup> For bolt tightening clarification, refer to ElsaWeb, *Heating and A/C Unit*, items 10 and 12.

# ELECTRICAL SYSTEM

## *Electrical Equipment*

### **Battery, Starter, Generator, Cruise Control Tightening Specifications**

| <b>Component</b>  | <b>Fastener size</b> | <b>Nm</b> |
|---|----------------------|-----------|
| Battery terminal clamp nut  | M6                   | 6         |
| Battery clamping plate mounting bolt                                    | M8 x 35              | 20        |
| Generator B+ nut  | -                    | 15        |
| Generator bolts   | M8 x 110             | 20        |
| Generator cap nut   | M8                   | 15        |
| Generator cap screw   | M5 x 21              | 4.5       |
| Ribbed belt pulley-to-generator threaded connection (without freewheel) | -                    | 65        |
| Ribbed belt pulley-to-generator threaded connection (with freewheel)    | -                    | 80        |
| Starter B+ nut  | M8                   | 15        |
| Starter bolts   | M12                  | 75        |
| Starter wiring harness  | M8                   | 15        |
| Voltage regulator   | M4 x 19              | 2         |
|   | M4 x 13              | 2         |

### **Windshield Wiper/Washer System Tightening Specifications**

| <b>Component</b>                            | <b>Fastener size</b> | <b>Nm</b> |
|---|----------------------|-----------|
| Front wiper arm nut                         | -                    | 20        |
| Front wiper frame-to-body                   | -                    | 8         |
| Front wiper motor-to-wiper frame            | -                    | 8         |
| Horn retaining plate-to-longitudinal member | -                    | 20        |
| Rear wiper arm nut                          | -                    | 12        |
| Rear wiper motor nut                        | M6                   | 8         |
| Washer fluid reservoir-to-body              | -                    | 8         |

## Exterior Lights, Switches Tightening Specifications

| Component                                  | Fastener size | Nm  |
|--|---------------|-----|
| Back-up lamp                               | -             | 3   |
| Headlamp-to-body                           | M6 x 40       | 4   |
| Headlamp-to-carrier                        | M6 x 14       | 4   |
| HID headlamp control module                | -             | 3   |
| HID headlamp power output stage            | -             | 3   |
| Left rear level control system sensor      | -             | 5   |
| License plate lamp                         | -             | 1.2 |
| Rear lid tail lamp housing nuts            | -             | 3   |
| Rear view camera nuts                      | -             | 6   |
| Side panel tail lamp bulb holder           | -             | 1.5 |
| Side panel tail lamp housing               | -             | 3   |
| Steering column electronics control module | -             | 1.5 |
| Steering column switch mount shear bolts   | M8 x 20       | 15  |

## Interior Lights, Switches Tightening Specification

| Component | Nm |
|-----------|----|
| Horns     | 20 |

## Wiring Tightening Specifications

| Component                              | Fastener size | Nm  |
|--|---------------|-----|
| Engine compartment E-box               | M5            | 4   |
|  | M6            | 6   |
| Engine compartment E-box central bolt  |               | 9   |
| Instrument panel fuse panel            |               | 4   |
| Towing recognition control module bolt |               | 3.5 |

# DTC CHART

## Fuel and Air Mixture, Additional Emissions Regulations

| DTC   | Error Message  | Malfunction Criteria and Threshold Value  |
|-------|--|---|
| P000A | "A" Camshaft Position Slow Response (Bank 1)                           | <ul style="list-style-type: none"> <li>• Difference between target position vs. actual position &gt; <math> 8.00 ^\circ\text{CRK}</math></li> <li>• For time &gt; 1.3 - 2.9 and</li> <li>• Adjustment angle &lt; <math> 2.50 ^\circ\text{CRK}</math></li> </ul> |
| P0010 | "A" Camshaft Position Actuator Circuit/Open (Bank 1)                   | Signal voltage > 4.70 - 5.40 V  |
| P0011 | A Camshaft Position (Bank1) Timing over-advanced or System Performance | <ul style="list-style-type: none"> <li>• Difference between target position vs. actual position &gt; <math> 8.00 ^\circ\text{CRK}</math></li> <li>• For time &gt; 1.3 - 2.9 and</li> <li>• Adjustment angle &lt; <math> 2.50 ^\circ\text{CRK}</math></li> </ul> |
| P0016 | Crankshaft Position - Camshaft Position Correlation (Bank 1, Sensor A) | <ul style="list-style-type: none"> <li>• Permissible deviation &lt; <math>-11^\circ\text{ Rev}</math></li> <li>or</li> <li>• Permissible deviation &gt; <math>11^\circ\text{ Rev}</math></li> </ul>   |
| P025A | Fuel Pump Module Control Circuit/Open                                  | Signal voltage > 4.8 - 5.3 V  |
| P025C | Fuel Pump Module Control Circuit Low                                   | Signal voltage < 2.7 - 3.25 V   |
| P025D | Fuel Pump Module Control Circuit High                                  | Signal current > 0.6 mA   |
| P0030 | O2 Sensor Heater Control Circuit (Bank1 Sensor 1)                      | Heater voltage 4.70 - 5.40 V  |
| P0031 | O2 Sensor Heater Control Circuit (Bank1 Sensor 1) Low                  | Heater voltage 0.0 - 3.26 V   |
| P0032 | O2 Sensor Heater Control Circuit (Bank1 Sensor 1) High                 | Signal current > 5.50 A   |
| P0036 | O2 Sensor Heater Control Circuit (Bank 1 Sensor 2)                     | Heater voltage 2.34 - 3.59 V  |

| <b>DTC</b> | <b>Error Message</b>                                    | <b>Malfunction Criteria and Threshold Value</b>  |
|------------|---|--|
| P0037      | O2 Sensor Heater Control Circuit (Bank 1 Sensor 2) Low  | Heater voltage < 2.34 V  |
| P0038      | O2 Sensor Heater Control Circuit (Bank 1 Sensor 2) High | Heater voltage > 3.59 V  |
| P050A      | Cold Start Idle Air Control System Performance          | <p>Out of range - Low</p> <ul style="list-style-type: none"> <li>• Engine speed deviation &gt; 80 RPM</li> </ul> <p>and</p> <ul style="list-style-type: none"> <li>• RPM controller torque value ≥ calculated max. value</li> </ul> <p>Out of range - High</p> <ul style="list-style-type: none"> <li>• Engine speed deviation &lt; -80 RPM</li> </ul> <p>and</p> <ul style="list-style-type: none"> <li>• RPM controller torque value ≤ calculated min. value</li> </ul> <p>Plausibility check</p> <ul style="list-style-type: none"> <li>• Integrated deviation of engine speed low and integrated deviation of engine speed high &gt; 2000 RPM</li> </ul> |
| P052A      | Cold Start "A" Camshaft Position Timing Over-Advanced   | Difference between target position vs. actual position >  6.00  °CRK   |
| P053F      | Cold Start Fuel Pressure Performance                    | <ul style="list-style-type: none"> <li>• Difference between target pressure vs. actual pressure: &lt; -1.50 MPa</li> <li>• Difference between target pressure vs. actual pressure: &gt; 1.50 MPa</li> </ul>  |
| P0068      | MAP/MAF – Throttle Position Correlation                 | <ul style="list-style-type: none"> <li>• Plausibility with fuel system load calculation &lt; -22.00%</li> <li>• Plausibility with fuel system load calculation &gt; 22.00%</li> </ul>  |
| P0070      | Ambient Air Temperature Sensor Circuit                  | ambient air temperature signal: short to battery / open circuit  |

| DTC   | Error Message   | Malfunction Criteria and Threshold Value   |
|-------|---|--|
| P0071 | Ambient Air Temperature Sensor Circuit Range/Performance  | <ul style="list-style-type: none"> <li>• Difference ECT vs IAT at engine start (depending on engine off time) &lt; 24.8 K and</li> <li>• Difference in value between IAT vs AAT at engine start (depending on engine off time) &gt; 24.8 K and</li> <li>• Difference in value between AAT vs ECT at engine start (depending on engine off time) &gt; 24.8 K</li> </ul> |
| P0072 | Ambient Air Temperature Sensor Circuit Low                | ambient air temperature signal: short to ground failure  |
| P0087 | Fuel Rail/System Pressure - Too Low                       | <ul style="list-style-type: none"> <li>• Pressure control activity &gt; 2.00 mPa and</li> <li>• Fuel trim activity 0.90 - 1.15 and</li> <li>• Difference between target pressure vs. actual pressure: &gt; -16.38 mPa</li> </ul>   |
| P0100 | Mass or Volume Air Flow Circuit                           | MAF sensor signal 0 $\mu$ s  |
| P0101 | Mass or Volume Air Flow Circuit Range/Performance         | Rationality check mass air flow <ul style="list-style-type: none"> <li>• Mass air flow vs. upper threshold model &gt; 60 - 800 kg/h</li> <li>• Load calculation &gt; 18.00% and</li> <li>• Fuel system (mult.) &lt; -17.00%</li> <li>• Load calculation &lt; -18.00% and</li> <li>• Fuel system (mult.) &gt; 17.00%</li> <li>• Lo &lt; -19%</li> </ul>                 |
| P0102 | Mass or Volume Air Flow Circuit Low Input                 | MAF sensor signal < 66 $\mu$ s   |
| P0103 | Mass or Volume Air Flow Circuit High Input                | MAF sensor signal > 4500 $\mu$ s   |
| P0106 | Manifold Absolute Pressure/ BARO Sensor Range/Performance | Boost pressure signal <ul style="list-style-type: none"> <li>• Altitude sensor &lt; -210 hPa</li> <li>• Altitude sensor &gt; 230 hPa</li> </ul>  |

| DTC   | Error Message  | Malfunction Criteria and Threshold Value   |
|-------|--|--|
| P0111 | Intake Air Temperature (Sensor 1 Bank 1) Circuit Range/Performance | <ul style="list-style-type: none"> <li>• Difference ECT vs IAT at engine start (depending on engine off time) &gt; 24.8 K</li> <li>and</li> <li>• Difference in value between IAT vs AAT at engine start (depending on engine off time) &gt; 24.8 K</li> <li>and</li> <li>• Difference in value between AAT vs ECT at engine start (depending on engine off time) &lt; 24.8 K</li> </ul>   |
| P0112 | Intake Air Temperature (Sensor 1 Bank 1) Circuit Low               | Intake air temperature > 141°C   |
| P0113 | Intake Air Temperature (Sensor 1 Bank 1) Circuit High              | Intake air temperature < -46°C   |
| P0116 | Engine Coolant Temperature Sensor 1 Circuit Range/Performance      | <p>Stuck high / low - no change on signal</p> <ul style="list-style-type: none"> <li>• Difference max ECT vs min ECT &lt; 1.5 K</li> <li>and</li> <li>• ECT start @ ≥ 89°C</li> <li>and</li> <li>• ECT start @ ≤ 110°C</li> </ul> <p>Cross check:</p> <ul style="list-style-type: none"> <li>• Difference ECT vs IAT at engine start (depending on engine off time) &gt; 24.8 K</li> <li>and</li> <li>• Difference in value between IAT vs AAT at engine start (depending on engine off time) &lt; 24.8 K</li> <li>and</li> <li>• Difference in value between AAT vs ECT at engine start (depending on engine off time) &gt; 24.8 K</li> </ul> |
| 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°C   |

| DTC   | Error Message  | Malfunction Criteria and Threshold Value   |
|-------|--|--|
| P0121 | Throttle/Pedal Position Sensor A Circuit Range/Performance | <ul style="list-style-type: none"> <li>• TPS 1 - TPS 2 &gt; 5.10 - 6.30% and</li> <li>• Actual TPS 1 calculated value &gt; actual TPS 2 calculated value</li> </ul> or <ul style="list-style-type: none"> <li>• TPS 1 calculated value &gt; 9.00%</li> </ul> |
| P0122 | Throttle/Pedal Position Sensor A Circuit Low Input         | Signal voltage < 0.20 V  |
| P0123 | Throttle/Pedal Position Sensor A Circuit High Input        | Signal voltage > 4.81 V  |
| P013A | O2 Sensor (Bank 1 Sensor 2) Slow Response - Rich to Lean   | <ul style="list-style-type: none"> <li>• Arithmetic filtered max differential transient time at fuel cut off <math>\geq 0.50</math></li> </ul> and <ul style="list-style-type: none"> <li>• Number of checks <math>\geq 1.00</math></li> </ul>               |
| P0130 | O2 Sensor Circuit (Bank 1-Sensor 1) Malfunction            | O2S ceramic temperature < 640°C  |
| P0131 | O2 Sensor Circuit (Bank 1, Sensor 1) Low Voltage           | Virtual mass < 1.75 V  |
|       |  | Nernst voltage < 1.50 V  |
|       |  | Adjustment voltage < 0.30 V  |
| P0132 | O2 Sensor Circuit (Bank 1, Sensor 1) High Voltage          | Virtual mass > 3.25 V  |
|       |  | Nernst voltage > 4.40 V  |
|       |  | Adjustment voltage > 7.00 V  |

| DTC   | Error Message  | Malfunction Criteria and Threshold Value  |
|-------|--|---|
| P0133 | O2 Sensor Circuit (Bank 1 -Sensor 1) Slow Response     | <p>Symmetric fault:</p> <ul style="list-style-type: none"> <li>• Difference of R2L area ratio vs. L2R area ratio <math>-0.40</math> to <math>0.40</math></li> <li>• Max value of both counters for area ratio R2L and L2R <math>\geq 5</math> times</li> </ul> <p>Delay time:</p> <ul style="list-style-type: none"> <li>• Gradient ratio <math>\geq 0.20</math></li> <li>• Lower value of both area ratios R2L and L2R <math>&lt; 0.15</math></li> </ul> <p>Transient Time:</p> <ul style="list-style-type: none"> <li>• Gradient ratio <math>\geq 0.20</math></li> <li>• Gradient ratio <math>\leq 0.55</math></li> <li>• Lower value of both area ratios R2L and L2R <math>&lt; 0.15</math></li> </ul> <p>or</p> <ul style="list-style-type: none"> <li>• Lower value of both area ratios R2L and L2R <math>&lt; 0.20</math></li> </ul> <p>Asymmetric fault:</p> <ul style="list-style-type: none"> <li>• Difference of R2L area ratio vs. L2R area ratio <math>&lt; -0.40</math>; <math>&gt; 0.40</math></li> <li>• Values of both counters for area ratio R2L and L2R <math>\geq 5</math> times</li> </ul> <p>Delay time:</p> <ul style="list-style-type: none"> <li>• Gradient ratio <math>\geq 0.20</math></li> <li>• Lower value of both area ratios R2L and L2R <math>&lt; 0.30</math></li> </ul> <p>Transient Time:</p> <ul style="list-style-type: none"> <li>• Gradient ratio <math>\geq 0.20</math></li> <li>• Gradient ratio <math>\leq 0.55</math></li> <li>• Lower value of both area ratios R2L and L2R <math>&lt; 0.30</math></li> </ul> <p>or</p> <ul style="list-style-type: none"> <li>• Lower value of both area ratios R2L and L2R <math>&lt; 0.20</math></li> </ul> |
| P0135 | O2 Sensor Heater Circuit (Bank 1-Sensor 1) Malfunction | <ul style="list-style-type: none"> <li>• O2S ceramic temperature <math>&lt; 720^{\circ}\text{C}</math></li> </ul> <p>and</p> <ul style="list-style-type: none"> <li>• Heater duty cycle 100%</li> </ul> <ul style="list-style-type: none"> <li>• O2S ceramic temperature <math>&lt; 720^{\circ}\text{C}</math></li> </ul> <p>and</p> <ul style="list-style-type: none"> <li>• Time after O2S heater on 40 Sec.</li> </ul>   |

| DTC   | Error Message  | Malfunction Criteria and Threshold Value   |
|-------|--|--|
| P0137 | O2 Sensor Circuit (Bank 1-Sensor 2) Low Voltage          | <ul style="list-style-type: none"> <li>• Signal voltage &lt; 0.06 V for time &gt; 3 Sec.</li> </ul> and <ul style="list-style-type: none"> <li>• Difference of sensor voltage with load pulse and voltage without load pulse (mean value of 3 measurements) &lt; 0.01 V</li> </ul>   |
| P0138 | O2 Sensor Circuit (Bank 1-Sensor 2) High Voltage         | Signal voltage > 1.08 V for > 5 Sec.   |
| P0140 | O2 Sensor Circuit (Bank 1-Sensor 2) No Activity Detected | <ul style="list-style-type: none"> <li>• Signal voltage .40 - .60 V for &gt; 3 Sec</li> </ul> and <ul style="list-style-type: none"> <li>• Difference in sensor voltage with load pulse and voltage without load pulse (mean value of 3 measurements) <math>\geq</math> 2.80 V</li> <li>• Internal resistance &gt; 40000 Ohm</li> </ul> and <ul style="list-style-type: none"> <li>• Exhaust temperature &gt; 600°C</li> </ul> |
| P0141 | O2 Sensor Heater Circ.,Bank1-Sensor2 Malfunction         | Heater resistance > 792.00 - 4560.00 $\Omega$  |
| P0169 | Incorrect Fuel Composition                               | <ul style="list-style-type: none"> <li>• Comparison with fuel quantity incorrect</li> <li>• ABS difference between predicted and real air mass &gt; 10.50%</li> </ul>  |
| P0190 | Fuel Rail Pressure Sensor "A" Circuit                    | Signal voltage > 4.8 V   |
| P0191 | Fuel Rail Pressure Sensor "A" Circuit Range/Performance  | Actual pressure > 20.6 MPa   |
| P0192 | Fuel Rail Pressure Sensor "A" Circuit Low Input          | Signal voltage < 0.2 V   |
| P0201 | Injector Circuit/Open - Cylinder 1                       | <ul style="list-style-type: none"> <li>• Signal current &lt; 2.1 A</li> <li>• Internal logic failure</li> </ul>  |
| P0202 | Injector Circuit/Open - Cylinder 2                       | <ul style="list-style-type: none"> <li>• Signal current &lt; 2.1 A</li> <li>• Internal logic failure</li> </ul>  |
| P0203 | Injector Circuit/Open - Cylinder 3                       | <ul style="list-style-type: none"> <li>• Signal current &lt; 2.1 A</li> <li>• Internal logic failure</li> </ul>  |
| P0204 | Injector Circuit/Open - Cylinder 4                       | <ul style="list-style-type: none"> <li>• Signal current &lt; 2.1 A</li> <li>• Internal logic failure</li> </ul>  |

| <b>DTC</b> | <b>Error Message</b>  | <b>Malfunction Criteria and Threshold Value</b>   |
|------------|---|---|
| P0221      | Throttle/Pedal Position Sensor/Switch B Circuit Range/Performance | <ul style="list-style-type: none"> <li>• TPS 1 - TPS 2 &gt; 6.30% and</li> <li>• Actual TPS 2 calculated value &gt; actual TPS 1 calculated value</li> </ul> or <ul style="list-style-type: none"> <li>• TPS 2 calculated value &gt; 9.00%</li> </ul> |
| 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 Overboost Condition                     | Difference of set value boost pressure vs. actual boost pressure value (filtered) > 26.00 - 127.50 kPa  |
| P0236      | Turbocharger Boost Sensor (A) Circuit Range/Performance           | Difference boost pressure signal vs. barometric sensor signal > 23.00 kPa<br>or<br>< -13.00 kPa   |
| P0237      | Turbocharger Boost Sensor (A) Circuit Low Input                   | Signal voltage < 0.20 V   |
| P0238      | Turbocharger Boost Sensor (A) Circuit High Input                  | Signal voltage > 4.88 V   |
| P0243      | Turbocharger/Supercharger Wastegate Solenoid A                    | Signal voltage > 4.40 - 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 > 2.2 0 - 4.0 A  |
| P0261      | Cylinder 1 Injector Circuit Low                                   | Signal current < 2.1 A  |
| P0262      | Cylinder 1 Injector Circuit High                                  | Signal current > 14.70 A  |
| P0264      | Cylinder 2 Injector Circuit Low                                   | Signal current < 2.1 A  |
| P0265      | Cylinder 2 Injector Circuit High                                  | Signal current > 14.70 A  |
| P0267      | Cylinder 3 Injector Circuit Low                                   | Signal current < 2.1 A  |
| P0268      | Cylinder 3 Injector Circuit High                                  | Signal current > 14.70 A  |
| P0270      | Cylinder 4 Injector Circuit Low                                   | Signal current < 2.1 A  |
| P0271      | Cylinder 4 Injector Circuit High                                  | Signal current > 14.70 A  |

| DTC   | Error Message   | Malfunction Criteria and Threshold Value   |
|-------|---|--|
| P0289 | "A" Camshaft Position Actuator Control Circuit High - (Bank 1)            | Signal current > 2.20 A  |
| P0299 | Turbocharger/Supercharger Underboost Rationality Check Low                | Difference of set boost pressure vs. actual boost pressure value > 150 kPa   |
| P2004 | Intake Manifold Runner Control Stuck Open Bank 1                          | <ul style="list-style-type: none"> <li>• Normal closed position, unable to reach signal voltage &lt; 2.62 or &gt; 4.65 V</li> <li>or</li> <li>• Normal open position, unable to reach signal voltage &lt; 0.35 or &gt; 2.38 V</li> </ul> |
| P2008 | Intake Manifold Runner Bank 1 Control Circuit/Open                        | Signal voltage 4.70 - 5.40 V   |
| P2009 | Intake Manifold Runner (Bank 1) Control Circuit Low                       | Signal voltage 0.0 - 3.26 V  |
| P2010 | Intake Manifold Runner (Bank 1) Control Circuit High                      | Signal current > 2.20 A  |
| P2014 | Intake Manifold Runner Position Sensor/Switch Circuit                     | Signal voltage > 4.75 V  |
| P2015 | Intake Manifold Runner Position Sensor/Switch Circuit Range/Performance   | <ul style="list-style-type: none"> <li>• Difference between target position vs. actual position &gt;   25.00  %</li> <li>and</li> <li>• Actual position 0 to 100%</li> </ul>   |
| P2016 | Intake Manifold Runner Position Sensor/Switch Circuit Low                 | Signal voltage < 0.25 V  |
| P2088 | Camshaft Position A Actuator Control Circuit Low (Bank 1) Short to Ground | Signal voltage 0.0 - 3.25 V  |
| P2089 | Camshaft Position A Actuator Control Circuit High (Bank 1) Short to B+    | Signal current > 2.2 A   |
| P2096 | Post Catalyst Fuel Trim System (Bank 1) Too Lean                          | l-portion of 2nd lambda control loop < 0.040   |
| P2097 | Post Catalyst Fuel Trim System (Bank 1) Too Rich                          | l-portion of 2nd lambda control loop > 0.040   |
| P3081 | Engine Temperature Too Low  | Difference reference model temperature vs 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"> <li>• Emission threshold misfire rate (MR) &gt; 3.0%</li> <li>• Catalyst damage misfire rate (MR) &gt; 2.0 - 15.0%</li> </ul>   |
| P0301 | Cylinder 1 Misfire Detected                                       | <ul style="list-style-type: none"> <li>• Emission threshold misfire rate (MR) &gt; 3.0%</li> <li>• Catalyst damage misfire rate (MR) &gt; 2.0 - 15.0%</li> </ul>   |
| P0302 | Cylinder 2 Misfire Detected                                       | <ul style="list-style-type: none"> <li>• Emission threshold misfire rate (MR) &gt; 3.0%</li> <li>• Catalyst damage misfire rate (MR) &gt; 2.0 - 15.0%</li> </ul>   |
| P0303 | Cylinder 3 Misfire Detected                                       | <ul style="list-style-type: none"> <li>• Emission threshold misfire rate (MR) &gt; 3.0%</li> <li>• Catalyst damage misfire rate (MR) &gt; 2.0 - 15.0%</li> </ul>   |
| P0304 | Cylinder 4 Misfire Detected                                       | <ul style="list-style-type: none"> <li>• Emission threshold misfire rate (MR) &gt; 3.0%</li> <li>• Catalyst damage misfire rate (MR) &gt; 2.0 - 15.0%</li> </ul>   |
| P0321 | Ignition/Distributor Engine Speed Input Circuit Range/Performance | <ul style="list-style-type: none"> <li>• Comparison of counted teeth vs. reference = incorrect</li> <li>• Monitoring reference gap failure</li> </ul>  |
| P0322 | Ignition/Distributor Engine Speed Input Circuit No Signal         | <ul style="list-style-type: none"> <li>• Camshaft signal &gt; 3</li> <li>• Engine speed = no signal</li> </ul>   |
| P0324 | Knock Control System Error  | <ul style="list-style-type: none"> <li>• Signal fault counter (combustion) &gt; 24.00</li> <li>or</li> <li>• Signal fault counter (measuring window) &gt; 2.00</li> </ul>  |
| P0327 | Knock (Sensor 1) Circuit Low Input                                | <ul style="list-style-type: none"> <li>Short to ground Port B</li> <li>• Lower threshold &lt; -70 V</li> <li>Short to ground Port A</li> <li>• Lower threshold &lt; -70 V</li> <li>Signal range check</li> <li>• Lower threshold &lt; 0.60 - 1.60 V</li> </ul> |

| DTC   | Error Message                                 | Malfunction Criteria and Threshold Value   |
|-------|---|--|
| P0328 | Knock (Sensor 1) Circuit High Input           | Short to battery plus Port B<br>• Upper threshold > 1.00 V<br>Short to battery plus Port A<br>• Upper threshold > 1.00 V<br>Signal range check<br>• Upper threshold > 21.75 115.87 V |
| P0341 | Camshaft Pos.Sensor Circuit Range/Performance | Signal pattern incorrect defect counter 12.00  |
| P0342 | Camshaft Pos.Sensor Circuit Low Input         | • Signal voltage low<br>• Crankshaft signals = 8   |
| P0343 | Camshaft Position Sensor Circuit High Input   | • Signal voltage high<br>• Crankshaft signals = 8  |
| P0351 | Ignition Coil A Primary/ Secondary Circuit    | • Signal current 0.25 to 2.0 mA<br>• Internal check failed   |
| P0352 | Ignition Coil B Primary/ Secondary Circuit    | • Signal current 0.25 to -2.0 mA<br>• Internal check failed  |
| P0353 | Ignition Coil C Primary/ Secondary Circuit    | • Signal current 0.25 to -2.0 mA<br>• Internal check failed  |
| P0354 | Ignition Coil D Primary/ Secondary Circuit    | • Signal current 0.25 to -2.0 mA<br>• Internal check failed  |

### Additional Exhaust Regulation

| DTC   | Error Message  | Malfunction Criteria and Threshold Value   |
|-------|--|--|
| P0420 | Catalyst System, (Bank1) Efficiency Below Threshold          | Measured OSC/OSC of borderline catalyst. Measured OSC arithmetic average value for catalyst < 1.00 |
| P0441 | Evaporative Emission Control System Incorrect Purge Flow     | Deviation lambda control <  8.00  and 35% idle controller  |
| P0442 | Evaporative Emission System Leak Detected (Small Leak)       | Time for pressure drop < 1.55 - 1.75 Sec.  |
| P0444 | Evaporative Emission System Purge Control Valve Circuit Open | Signal voltage > 4.70 - 5.40 V   |
| P0455 | EVAP Emission Control System (Gross Leak) Leak Detected      | Time for pressure drop < 1.0 Sec.  |

| <b>DTC</b> | <b>Error Message</b>   | <b>Malfunction Criteria and Threshold Value</b> |
|------------|--|---|
| P0456      | EVAP Emission Control System (very small Leak) Leak Detected | Time for pressure drop < 4.5 - 6.0 Sec.         |
| P0458      | Evaporative Emission System Purge Control Valve Circuit Low  | Signal voltage 0.0 - 3.26 V                     |
| P0459      | Evaporative Emission System Purge Control Valve Circuit High | Signal current > 2.20 A                         |

### **Speed and Idle Control**

| <b>DTC</b> | <b>Error Message</b>                               | <b>Malfunction Criteria and Threshold Value</b>   |
|------------|--|---|
| P0506      | Idle Air Control System - RPM Lower Than Expected  | <ul style="list-style-type: none"> <li>• Engine speed deviation &gt; 80 RPM</li> <li>and</li> <li>• RPM controller torque value <math>\geq</math> calculated max value</li> <li>• Integrated deviation of engine speed low and integrated deviation of engine speed high &gt; 2000 RPM</li> </ul> |
| P0507      | Idle Air Control System - RPM Higher Than Expected | <ul style="list-style-type: none"> <li>• Engine speed deviation &lt; -80 RPM</li> <li>and</li> <li>• RPM controller torque value <math>\leq</math> calculated min. value</li> </ul>   |
| P050B      | Cold Start Ignition Timing Performance             | Difference between commanded spark timing vs. actual value > 20.00 - 50.00%   |
| P052A      | VVT Actuator Intake                                | Difference between target position and actual position > 12.0°CRK   |

## Control Module and Output Signals

| DTC   | Error Message   | Malfunction Criteria and Threshold Value   |
|-------|---|--|
| P0606 | ECM/PCM Processor   | Plausibility check<br>• Difference barometric sensor signal vs. boost pressure signal > 9.00 kPa<br>and<br>• Difference barometric sensor vs. last driving cycle > 15.00 kPa<br>Short to battery / open circuit<br>• Diff. barometric sensor signal vs. boost pressure signal < -9.00 kPa<br>and<br>• Difference barometric sensor vs. last driving cycle > 15.00 kPa<br>Short to battery / open circuit<br>• Signal voltage > 4.88 V short to ground<br>• Signal voltage < 0.20 V<br>Out of range high<br>• Measured ambient pressure > 115.00 kPa<br>Out of range low<br>• Measured ambient pressure < 45.00 kPa<br>• Internal check failure<br>• SPI communications check Identifier failure<br>• RAM error memory checksum error |
| P062B | Internal Control Module Fuel Injector Control Performance | SPI communications check Identifier failure  |
| P0627 | Fuel Pump A Control Circuit/ Open                         | • Internal error fuel pump control unit<br>• Feedback from fuel pump control unit pump blocked short circuit to battery +, ground or open circuit  |
| P0634 | PCM/ECM/TCM Internal Temperature Too High                 | Power stage temperature > 150°C  |

DTC Chart

| <b>DTC</b> | <b>Error Message</b>                                 | <b>Malfunction Criteria and Threshold Value</b>  |
|------------|--|--|
| P0638      | Throttle Actuator Control (Bank 1) Range/Performance | Rationality check close movement:<br><ul style="list-style-type: none"> <li>• Time to close to reference point &gt; 0.6 Sec.</li> </ul> and<br><ul style="list-style-type: none"> <li>• Reference point 2.88%</li> </ul> Signal range check at mechanical stop low<br><ul style="list-style-type: none"> <li>• TPS 1 signal voltage &lt; 0.40; &gt; 0.80 V</li> </ul> or<br><ul style="list-style-type: none"> <li>• TPS 2 signal voltage &lt; 4.20; &gt; 4.60 V</li> </ul> or<br><ul style="list-style-type: none"> <li>• TPS 1 + TPS 2 &lt; 4.82; &gt; 5.18 V</li> </ul> |
| P0641      | Sensor Reference Voltage A Circuit/Open              | Signal voltage deviation > $\pm 0.3$ V   |
| P0642      | Sensor Reference Voltage A Circuit Low               | Signal voltage < 4.6 - 5.0 V   |
| P0643      | Sensor Reference Voltage A Circuit High              | 5V supply voltage > 4.99 - 5.41 V  |
| P0651      | Sensor Reference Voltage B Circuit/Open              | Signal voltage deviation > $\pm 0.3$ 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  |
| P0697      | Sensor Reference Voltage C Circuit/Open              | Signal voltage deviation > $\pm 0.3$ V   |
| P062B      | Injection Valves Communication                       | Internal logic failure   |
| P169A      | Loading mode active                                  | Transport mode active  |
| U0001      | High Speed CAN Communication Bus                     | CAN message, no feedback   |
| U0002      | High Speed CAN Communication Bus Performance         | Global time out receiving no message   |
| U0101      | Lost Communication with TCM                          | Received CAN message no message  |

| DTC   | Error Message   | Malfunction Criteria and Threshold Value   |
|-------|---|--|
| U0121 | Lost Communication With Anti-Lock Brake System (ABS) Control Module   | Received CAN message no message  |
| U0140 | CAN communication with Body Control Module                            | Received CAN message - no message  |
| U0146 | Lost Communication With Gateway "A"                                   | Received CAN message no message  |
| U0155 | Lost Communication With Instrument Panel Cluster (IPC) Control Module | Received CAN message - no message  |
| U0302 | Software Incompatibility with Transmission Control Module             | Received AT vehicle data TCM signal  |
| U0402 | CAN Communication with TCM  | Received data implausible message  |
| U0415 | Invalid Data Received From Anti-Lock Brake System Control Module      | <ul style="list-style-type: none"> <li>• Speed sensor signal: out of range 326.39 km/h</li> <li>• Speed sensor signal: initialisation error 327.08 km/h</li> <li>• Speed sensor signal: low voltage error 327.25 km/h</li> <li>• Speed sensor signal: sensor error 327.42 km/h</li> <li>• Received data implausible message</li> </ul> |
| U0422 | CAN: Instrument cluster   | Ambient temperature value initialization, Audi 01 h  |
| U0423 | Invalid Data Received From Instrument Panel Cluster Control Module    | <ul style="list-style-type: none"> <li>• Received data implausible message</li> <li>• Ambient temperature value (initialization) 00h</li> </ul>  |
| U0447 | CAN Gateway   | CAN message incorrect  |

## Fuel and Air Ratios Control Module

| DTC   | Error Message  | Malfunction Criteria and Threshold Value  |
|-------|--|---|
| P12A1 | Fuel Rail Pressure Sensor Inappropriately Low                | <ul style="list-style-type: none"> <li>• Pressure control activity &gt; 0.20 MPa</li> <li>and</li> <li>• Fuel trim activity &lt; 0.80</li> <li>and</li> <li>• Difference between target pressure vs. actual pressure -16.38 to 16.38 MPa</li> </ul>   |
| P12A2 | Fuel Rail Pressure Sensor Inappropriately High               | <ul style="list-style-type: none"> <li>• Pressure control activity &gt; -0.05 mPa</li> <li>and</li> <li>• Fuel trim activity &gt; 1.65</li> <li>and</li> <li>• Difference between target pressure vs. actual pressure -16.38 to 16.38 mPa</li> </ul>  |
| P12A4 | Fuel Rail Pump Control Valve Stuck Closed                    | <ul style="list-style-type: none"> <li>• Pressure control activity &lt; -6.0 mPa</li> <li>and</li> <li>• Fuel trim activity 0.90 to 1.15</li> <li>and</li> <li>• Difference between target pressure vs. actual pressure &lt; 16.38 mPa</li> </ul>   |
| P150A | Engine Off Timer Performance                                 | <p>Comparison of engine off time from instrument cluster control unit with engine after run time.</p> <ul style="list-style-type: none"> <li>• Difference between engine off time and ECM after run time &lt; -12.0 Sec.</li> </ul> <p>Comparison of engine off time from instrument cluster control unit with engine after run time</p> <ul style="list-style-type: none"> <li>• Difference between engine off time and ECM after run time &gt; 12.0 Sec.</li> </ul> |
| P1609 | Crash shut-off was triggered                                 | Airbag(s) activated   |
| P2101 | Throttle Actuator A Control Motor Circuit Range/ Performance | <ul style="list-style-type: none"> <li>• Duty cycle &gt; 80%</li> <li>and</li> <li>• ECM power stage, no failure</li> <li>• Deviation throttle valve angles vs. calculated value &gt; 4.00 - 50.0%</li> </ul>   |

| DTC   | Error Message   | Malfunction Criteria and Threshold Value   |
|-------|---|--|
| P2106 | Throttle Actuator Control System Forced Limited Power         | Internal check failed  |
| P2122 | Throttle/Pedal Position Sensor/Switch D Circuit Low Input     | Signal voltage < 0.61 V  |
| P2123 | Throttle/Pedal Position Sensor/Switch D Circuit High Input    | Signal voltage > 4.79 V  |
| P2127 | Throttle/Pedal Position Sensor/Switch E Circuit Low Input     | Signal voltage < 0.27 V  |
| P2128 | Throttle/Pedal Position Sensor/Switch E Circuit High Input    | Signal voltage > 2.43 V  |
| P2138 | Throttle/Pedal Position Sensor/Switch D/E Voltage Correlation | Signal voltage: Difference between signal sensor 1 vs 2 > 0.17 - 0.70 V  |
| P2146 | Fuel Injector Group A Supply Voltage Circuit/Open             | Short to ground (high side)<br>• Signal current > 14.90 A<br>Short to battery plus (high side)<br>• Signal current < 2.60 A<br>Core connection (high side - low side)<br>• Signal current < 2.60 A |
| P2149 | Fuel Injector Group B Supply Voltage Circuit/Open             | Short to ground (high side)<br>• Signal current > 14.90 A<br>Short to battery plus (high side)<br>• Signal current < 2.60 A<br>Core connection (high side - low side)<br>• Signal current < 2.60 A |
| P2177 | System Too Lean Off Idle, (Bank 1)                            | • Adaptive value > 28%   |
| P2178 | System Too Rich Off Idle, (Bank 1)                            | • Adaptive value < -21%  |
| P2181 | Cooling System Performance                                    | Cooling system temperature too low after a sufficient air mass flow integral < 74 - 84°C   |
| P2184 | Engine Coolant Temperature Sensor 2 Circuit Low               | Engine Coolant Temperature > 141°C   |
| P2185 | Engine Coolant Temperature Sensor 2 Circuit High              | Engine Coolant Temperature < - 43°C  |

| <b>DTC</b> | <b>Error Message</b>   | <b>Malfunction Criteria and Threshold Value</b>   |
|------------|--|---|
| P2187      | System Too Lean At Idle, (Bank 1)                                  | • Adaptive value > 5.02%  |
| P2188      | System Too Rich At Idle, (Bank 1)                                  | • Adaptive value < -5.02%   |
| P2195      | O2 Sensor Signal Stuck Lean (Bank 1 Sensor 1)                      | Delta lambda of 2nd lambda control loop > 0.080   |
| P2196      | O2 Sensor Signal Stuck Rich (Bank 1 Sensor 1)                      | Delta lambda of 2nd lambda control loop < -0.080  |
| P2231      | O2 Sensor Signal Circuit Shorted to Heater Circuit                 | Delta O2S signal front > 190 uA   |
| P2237      | O2 Sensor Positive Current Control Circuit/Open (Bank 1, Sensor 1) | • O2S signal front 1.49 - 1.51 V and<br>• Delta lambda controller >   0.10  |
| P2243      | O2 Sensor Reference Voltage Circuit (Bank 1 Sensor 1) Open         | • O2S signal front < 0.30 V and internal resistance > 1000 Ohms<br>• O2S signal front > 3.25 V and internal resistance > 1000 Ohms            |
| P2251      | O2 Sensor Negative Current Control Circuit (Bank 1 Sensor 1) Open  | • O2S signal front < 1.47 to 1.53 V and internal resistance > 1000 Ohms   |
| P2257      | Air Pump Relay Short to Ground (PZEV)                              | Signal voltage < 3.00 V   |
| P2270      | O2 Sensor Signal Stuck Lean; (Bank 1 Sensor 2)                     | Sensor voltage ≤ 0.70 V   |
| P2271      | O2 Sensor Signal Stuck Rich (Bank 1, Sensor 2)                     | Sensor voltage ≥ 0.15 V   |
| P2293      | Fuel Pressure Regulator 2 Performance                              | • Difference between target pressure vs. actual pressure: < -1.50 MPa<br>• Difference between target pressure vs. actual pressure: > 1.50 MPa |
| P2294      | Fuel Pressure Regulator 2 Control Circuit                          | • Signal voltage 1.40 - 3.20 V  |
| P2295      | Fuel Pressure Regulator 2 Control Circuit Low                      | Signal voltage < 1.40 - 3.20 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 current > 5.1 - 7.0 mA            |
| P2303 | Ignition Coil B Primary Control Circuit Low  | Signal current > 24.0 mA                 |
| P2304 | Ignition Coil B Primary Control Circuit High | Signal current > 5.1 - 7.0 mA            |
| P2306 | Ignition Coil C Primary Control Circuit Low  | Signal current > 24.0 mA                 |
| P2307 | Ignition Coil C Primary Control Circuit High | Signal voltage > 5.1 - 7.0 mA            |
| P2309 | Ignition Coil D Primary Control Circuit Low  | Signal current > 24.0 mA                 |
| P2310 | Ignition Coil D Primary Control Circuit High | Signal voltage > 5.1 - 7.0 mA            |

## Additional Emissions Regulations

| DTC   | Error Message   | Malfunction Criteria and Threshold Value  |
|-------|---|---|
| P2400 | Evaporative Emission System Leak Detection Pump Control Circuit/Open            | Signal voltage > 4.4 - 5.6 V  |
| P2401 | Evaporative Emission System Leak Detection Pump Control Circuit Low             | Signal voltage < 2.15 to 3.25 V   |
| P2402 | Evaporative Emission System Leak Detection Pump Control Circuit High            | Signal current > 3.0 A  |
| P2403 | Evaporative Emission System Leak Detection Pump Sense Circuit/Open              | Low signal voltage > 0.5 Sec.   |
| P2404 | Evaporative Emission System Leak Detection Pump Sense Circuit Range/Performance | <ul style="list-style-type: none"> <li>• High signal voltage &gt; 12 Sec.</li> <li>• Number of checks = 30</li> <li>• Cumulative time of high signal voltage during pumping &gt; 10 Sec.</li> </ul> |

| <b>DTC</b> | <b>Error Message</b>  | <b>Malfunction Criteria and Threshold Value</b>  |
|------------|---|--|
| P2414      | O2 Sensor Exhaust Sample Error, (Bank 1 Sensor 1)             | Threshold 1:<br>• Signal voltage 3.10 to 4.81 V<br>Threshold 2:<br>• Signal voltage. Depending on gain factor, that actual is used for sensor characteristic, the threshold is switched 2.50 to 3.20 V |
| P2626      | O2 Sensor Pumping Current Trim Circuit/Open (Bank 1 Sensor 1) | O2S voltage signal front > 4.81 V  |

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