

00 00 Extract from BMW Group Standard GS 90003-2

Tightening Torques

	Type	Thread	Tightening specifications	Torque
If there are no cross-references to tightening torques in the repair instructions, the extracts based on BMW Group Standard GS 90003-2 must be observed.				
A distinction is made between screws / bolts / nuts with surface colour / (surface coating) yellow (ZN) and silver (ZNS) The maximum tightening torques are: Surface colour yellow (ZN): Applicable only to set screws with metric coarse and fine threads to DIN 13-28 and nuts with nut height of 0.8 x d to DIN 934 and exclusively for a total $\mu = 0.125$ (screws/bolts phosphatised, nuts untreated or galvanized. Lubricated condition: both unlubricated and oiled).				
Surface colour silver (ZNS): Applicable only to set screws with metric coarse and fine threads to DIN 13-28 and nuts with nut height of 0.8 x d to DIN 934 and exclusively for a μ range = 0.09 0.15 (screws/bolts cadmium-plated, nuts untreated or galvanized. Lubricated condition: both unlubricated and oiled). The values specified in the table apply to a screw/screw connection in accordance with the above-mentioned conditions. Not applicable when a different thread surface or lubrication status is used or in the case of deviating nut height.				



Also not applicable to screws/bolts reduced shafts, to self-locking screw/bolt connections and to screwing/bolting parts made of different materials. Caution! It is essential to adhere to the prescribed tightening torques in order to carry out a correct and proper repair. This presupposes that the torque wrenches required for this purpose are subject to regular testing. Permitted tolerance of calibrated torque wrenches is $\pm 4\%$ from the scale value. Approved torque wrenches and torque testers are featured in the Workshop Equipment Planning Catalogue.				
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00 00 M10 and M10 x 1 - maximum tightening torques acc. to BMW GS 90003-2

Tightening Torques

	Type	Thread	Tightening specification	Torque
Scope of applicability of tightening torques, refer to excerpt from company standard BMW GS 90003-2	Surface colour / (surface coating)			
M10 thread	yellow (ZN)	M10 8.8		47 Nm
	silver (ZNS)	M10 8.8		38 Nm
	yellow (ZN)	M10 10.9		66 Nm
	silver (ZNS)	M10 10.9		56 Nm
	yellow (ZN)	M10 12.9		79 Nm
	silver (ZNS)	M10 12.9		62 Nm
M10x1 thread	yellow (ZN)	M10 x 1 8.8		54 Nm
	silver (ZNS)	M10 x 1 8.8		41 Nm
	yellow (ZN)	M10 x 1 10.9		75 Nm
	silver (ZNS)	M10 x 1 10.9		60 Nm
	yellow (ZN)	M10 x 1 12.9		91 Nm
	silver (ZNS)	M10 x 1 12.9		67 Nm



00 00 M12 and M12x1.5 - maximum tightening torques acc. to BMW GS 90003-2**Tightening Torques**

	Type	Thread	Tightening specification	Torque
Scope of applicability of tightening torques, refer to excerpt from company standard BMW GS 90003-2	Surface colour / (surface coating)			
M12 thread	yellow (ZN)	M12 8.8		82 Nm
	silver (ZNS)	M12 8.8		66 Nm
	yellow (ZN)	M12 10.9		115 Nm
	silver (ZNS)	M12 10.9		98 Nm
	yellow (ZN)	M12 12.9		140 Nm
	silver (ZNS)	M12 12.9		108 Nm
M12x1.5 thread	yellow (ZN)	M12 x 1.5 8.8		87 Nm
	silver (ZNS)	M12 x 1.5 8.8		68 Nm
	yellow (ZN)	M12 x 1.5 10.9		123 Nm
	silver (ZNS)	M12 x 1.5 10.9		100 Nm
	yellow (ZN)	M12 x 1.5 12.9		147 Nm
	silver (ZNS)	M12 x 1.5 12.9		110 Nm



00 00 M14 and M14x1.5 - maximum tightening torques acc. to BMW GS 90003-2**Tightening Torques**

	Type	Thread	Tightening specification	Torque
Scope of applicability of tightening torques, refer to excerpt from company standard BMW GS 90003-2	Surface colour / (surface coating)			
M14 thread	yellow (ZN)	M14 8.8		130 Nm
	silver (ZNS)	M14 8.8		104 Nm
	yellow (ZN)	M14 10.9		180 Nm
	silver (ZNS)	M14 10.9		155 Nm
	yellow (ZN)	M14 12.9		220 Nm
	silver (ZNS)	M14 12.9		170 Nm
M14x1.5 thread	yellow (ZN)	M14 x 1.5 8.8		143 Nm
	silver (ZNS)	M14 x 1.5 8.8		110 Nm
	yellow (ZN)	M14 x 1.5 10.9		200 Nm
	silver (ZNS)	M14 x 1.5 10.9		165 Nm
	yellow (ZN)	M14 x 1.5 12.9		240 Nm
	silver (ZNS)	M14 x 1.5 12.9		180 Nm



00 00 M16 and M16x1.5 - maximum tightening torques acc. to BMW GS 90003-2**Tightening Torques**

	Type	Thread	Tightening specification	Torque
Scope of applicability of tightening torques, refer to excerpt from company standard BMW GS 90003-2	Surface colour / (surface coating)			
M16 thread	yellow (ZN)	M16 8.8		200 Nm
	silver (ZNS)	M16 8.8		160 Nm
	yellow (ZN)	M16 10.9		280 Nm
	silver (ZNS)	M16 10.9		235 Nm
	yellow (ZN)	M16 12.9		340 Nm
	silver (ZNS)	M16 12.9		260 Nm
M16x1.5 thread	yellow (ZN)	M16 x 1.5 8.8		216 Nm
	silver (ZNS)	M16 x 1.5 8.8		170 Nm
	yellow (ZN)	M16 x 1.5 10.9		303 Nm
	silver (ZNS)	M16 x 1.5 10.9		250 Nm
	yellow (ZN)	M16 x 1.5 12.9		364 Nm
	silver (ZNS)	M16 x 1.5 12.9		275 Nm



00 00 M18 and M18x1.5 - maximum tightening torques acc. to BMW GS 90003-2**Tightening Torques**

	Type	Thread	Tightening specification	Torque
Scope of applicability of tightening torques, refer to excerpt from company standard BMW GS 90003-2	Surface colour / (surface coating)			
M18 thread	yellow (ZN)	M18 8.8		280 Nm
	silver (ZNS)	M18 8.8		225 Nm
	yellow (ZN)	M18 10.9		390 Nm
	silver (ZNS)	M18 10.9		330 Nm
	yellow (ZN)	M18 12.9		470 Nm
	silver (ZNS)	M18 12.9		365 Nm
M18x1.5 thread	yellow (ZN)	M18 x 1.5 8.8		313 Nm
	silver (ZNS)	M18 x 1.5 8.8		245 Nm
	yellow (ZN)	M18 x 1.5 10.9		440 Nm
	silver (ZNS)	M18 x 1.5 10.9		360 Nm
	yellow (ZN)	M18 x 1.5 12.9		527 Nm
	silver (ZNS)	M18 x 1.5 12.9		400 Nm



00 00 M4 and M5 - maximum tightening torques acc. to BMW GS 90003-2

Tightening Torques

	Type	Thread	Tightening specification	Torque
Scope of applicability of tightening torques, refer to excerpt from company standard BMW GS 90003-2	Surface colour / (surface coating)			
M4 thread	yellow (ZN)	M4 8.8		3 Nm
	silver (ZNS)	M4 8.8		2 Nm
	yellow (ZN)	M4 10.9		4 Nm
	silver (ZNS)	M4 10.9		3 Nm
	yellow (ZN)	M4 12.9		5 Nm
M5 thread	yellow (ZN)	M5 8.8		6 Nm
	silver (ZNS)	M5 8.8		5 Nm
	yellow (ZN)	M5 10.9		8 Nm
	silver (ZNS)	M5 10.9		7 Nm
	yellow (ZN)	M5 12.9		10 Nm
	silver (ZNS)	M5 12.9		8 Nm



00 00 M6 and M7 - maximum tightening torques acc. to BMW GS 90003-2

Tightening Torques

	Type	Thread	Tightening specification	Torque
Scope of applicability of tightening torques, refer to excerpt from company standard BMW GS 90003-2	Surface colour / (surface coating)			
M6 thread	yellow (ZN)	M6 8.8		10 Nm
	silver (ZNS)	M6 8.8		8 Nm
	yellow (ZN)	M6 10.9		14 Nm
	silver (ZNS)	M6 10.9		12 Nm
	yellow (ZN)	M6 12.9		17 Nm
	silver (ZNS)	M6 12.9		13 Nm
M7 thread	yellow (ZN)	M7 8.8		15 Nm
	silver (ZNS)	M7 8.8		13 Nm
	yellow (ZN)	M7 10.9		21 Nm
	silver (ZNS)	M7 10.9		19 Nm
	yellow (ZN)	M7 12.9		26 Nm
	silver (ZNS)	M7 12.9		21 Nm



00 00 M8 and M8 x 1 - maximum tightening torques acc. to BMW GS 90003-2

Tightening Torques

	Type	Thread	Tightening specification	Torque
Scope of applicability of tightening torques, refer to excerpt from company standard BMW GS 90003-2	Surface colour / (surface coating)			
M8 thread	yellow (ZN)	M8 8.8		24 Nm
	silver (ZNS)	M8 8.8		19 Nm
	yellow (ZN)	M8 10.9		34 Nm
	silver (ZNS)	M8 10.9		28 Nm
	yellow (ZN)	M8 12.9		40 Nm
	silver (ZNS)	M8 12.9		32 Nm
M8x1 thread	yellow (ZN)	M8 x 1 8.8		26 Nm
	silver (ZNS)	M8 x 1 8.8		21 Nm
	yellow (ZN)	M8 x 1 10.9		36 Nm
	silver (ZNS)	M8 x 1 10.9		30 Nm
	yellow (ZN)	M8 x 1 12.9		44 Nm
	silver (ZNS)	M8 x 1 12.9		33 Nm



0 operating fluid overview

Expendable materials

Fitting aid (Circo Light; lubricant)	250 ml, Bottle	83192405829
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Expendable materials

Lubricating grease Renolit CX-SP 1	100 g, Tube	83192183737
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Expendable materials

Lubricating grease Klübersynth LF 44-22	45 g, Tube	83230396713
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Expendable materials

Ball bearing grease	100 g, Tube	81229407174
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Expendable materials

Lubricating oil 4 UH 1 - 460 N	100 ml, Bottle	83230306232
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Expendable materials

Wheel bearing grease UNIREX N3	400 ml, Cartridge	83192160349
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Expendable materials

Lubricating grease MI-Setral-43 N	50 g, Tube	83232152082
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Expendable materials

Lubricating grease GKY H-15	100 g, Bag	83232179705
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Expendable materials

Lubricating grease One Lube Improved	110 g, Bag	83232179708
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Expendable materials

Silicone spray	400 ml, Spray can	83192208609
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Expendable materials

Universal lubricant spray	250 ml, Spray can	81229407711
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Expendable materials



Adhesive lubricant	250 ml, Spray can	81229407629
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Expendable materials

Door brake lubricating grease	400 ml, Spray can	83230301796
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Expendable materials

Lubricating material Optimoly Paste TA	400 ml, Spray can	83239407817
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Expendable materials

Quietsch-Ex	250 ml, Spray can	83230420633
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Expendable materials

Lubricating grease Klüberplex BE 11-462	400 ml, Spray can	83220397761
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Expendable materials

Fluoropan T20 spray with PTFE	400 ml, Spray can	83230154884
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Expendable materials

Lubricating grease Renolit CX-CVM 1	100 g, Bag	83192286016
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Expendable materials

Lubricating grease Renolit CX-CVL 1	100 g, Bag	83192286017
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Expendable materials

Lubricating grease Renolit CX-TP 1	100 g, Bag	83192286018
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Expendable materials

Paste MP 3	100 g, Tube	07559062476
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Expendable materials

Active rust film remover	500 ml, Spray can	83192211267
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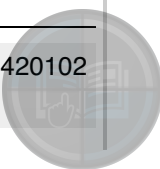
Expendable materials

Contact-protection greaseKF1	50 g, Tube	83192295229
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Expendable materials



Special lubricant KRYTOX	30 ml, Bottle	83199408523
Paints and colours		
BMW sound insulating paint 1	50 g, Spray	83192414997
Paints and colours		
Sound insulating paint Berucoat AK 978	100 ml, Spray can	83192358109
Sealing compound		
Silicone sealant Drei Bond 1207	310 ml, Cartridge	81229407439
Sealing compound		
Surface sealant Loctite 574	50 ml, Bottle	81229407301
Sealing compound		
Surface sealant Loctite 5203	50 ml, Cartridge	83190422969
Sealing compound		
Surface sealant 2054/2	12 g, Cartridge	83190412375
Sealing compound		
Special activator type 5900	10 ml, Bottle	83190412376
Adhesive		
Adhesive anaerobic Drei Bond 1385	50 g, Bottle	83190417376
Adhesive		
Adhesive Loctite 577	50 ml, Bottle	33112328736
Sealing compound		
Surface sealant Loctite 518	50 ml, Cartridge	83190395783
Sealing compound		
Loctite 5460 liquid sealing compound	50 ml, Cartridge	83192420102



Adhesive

Screw lock Loctite Stick 268, high strength	19 g, Pin	83190441108
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Adhesive

Screw lock Loctite 270, high strength	10 ml, Bottle	83192210337
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Adhesive

Screw lock Loctite 243, medium strength	10 ml, Bottle	83192210339
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Adhesive

Screw lock Loctite 277, high strength	250 ml, Bottle	83190142917
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Adhesive

Screw lock Loctite 273, high strength	50 ml, Bottle	83190443083
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Adhesive

Profile rubber adhesive No longer available from BMW.		
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Adhesive

Adhesive Loctite 638	50 ml, Bottle	81229407420
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Adhesive

Adhesive Loctite 2701	10 ml, Bottle	33172331095
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Adhesive

Adhesive 2K Loctite 3450	25 ml, Bottle	51252313730
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Adhesive

BMW Glue Pen	10 g, Pin	81222358167
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Adhesive

SuperglueS1	20 g, Bottle	81222351255
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Adhesive

SuperglueS2	20 g, Bottle	81222351257
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Adhesive

Superglue S3	3 g, Bottle	81222351258
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Expendable materials

Cooling spray	400 ml, Spray can	83199407762
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Expendable materials

Odour remover	100 ml, Spray can	83192233353
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Expendable materials

Rust film remover Professional	5 l, Canister	83192166998
	200 l, Barrel	83120396936
	1000 l, Barrel	83120396937

Expendable materials

Rust film remover Rv26H	500 ml, Spray bottle	83120414441
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Expendable materials

Preservative remover	60 l, Canister	83190422208
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Expendable materials

Universal cleaner exterior	10 l, Canister	83192153221
	25 l, Canister	83192154648

Expendable materials

Stain remover	1 l, Can	83119407816
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Expendable materials

Adhesive remover	1 l, Can	83110009712
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Expendable materials

Universal cleaner interior	20 l, Canister	83192154638
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Care product

Wheel rim brushes	1x , Set	83192298237
Sealing compound		
Loctite 171000 primer	4 ml, Bottle	83197515683
Overview of consumables (Electronic Parts Catalogue)		
Sealing compound		
Loctite 193140 liquid sealing compound	6 ml, Cartridge	83190439030
Overview of consumables (Electronic Parts Catalogue)		
Sealing compound		
Sealant Dow Corning	35 ml, Tube	07580397777
Overview of consumables (Electronic Parts Catalogue)		
Adhesive		
Adhesive Loctite 648	50 ml, Bottle	07589067732
Overview of consumables (Electronic Parts Catalogue)		
Expendable materials		
Engine and cold cleaner	1 l, Spray bottle	83192360950
	10 l, Canister	83192361705
Overview of consumables (Electronic Parts Catalogue)		
Expendable materials		
Leak detection spray	400 ml, Spray can	83199407861
Overview of consumables (Electronic Parts Catalogue)		
Expendable materials		
Contact spray	250 ml, Spray can	83222405599
Overview of consumables (Electronic Parts Catalogue)		
Expendable materials		
Powder spray	300 ml, Spray can	83192358648
Expendable materials		
Vacuum pump oil	1 l, Bottle	83192232502
Expendable materials		



Lubricants PF1	50 g, Pin	83230309627
Expendable materials		
Injector lubricating grease	50 g, Can	83230441070
Adhesive		
Screw lock Loctite Stick 248, medium strength	19 g, Pin	83192359746
Expendable materials		
Universal cleaner	20 l, Canister	83192360981



1100 Overview of tightening torques

Engine fixture to engine support arm		
Hexagon screws from special tool set	Tightening torque	105Nm
Engine support arm on the assembly stand		
M14 x 95	Tightening torque	130Nm
Standard screw connection 4 Nm		
Oval-head screw	Tightening torque	4Nm
Standard screw connection M10		
M10		38Nm
Standard screw connection M5		
M5		5Nm
Standard screw connection M6		
M6		8Nm
Standard screw connection M7		
M7		13Nm
Standard screw connection M8		
M8	Tightening torque	19Nm
Standard screw connection hose clamp 5		
Hose clamp L12 - L15	Tightening torque	1,25Nm



11 11 Crankcase

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Hexagon screws Bedplate to crankcase.	N52K	M10 x 100	Replace screws. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	20 Nm 70 °
2AZ ASA screws Bedplate to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M10 x 27	Replace screws. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	15 Nm 90 °
3AZ ASA screws Bedplate to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M8 x 37	Replace screws. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	8 Nm 90 °
4AZ ASA screws Bedplate to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M10 x 41	Replace screws. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	15 Nm 90 °
5AZ Oil spray nozzles Oil spray nozzles in crankcase.	N52K	M8 x 1		12 Nm
6AZ Plug Coolant drain to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M14 x 1.5	Replace screw and sealing ring. Thread repairs are not permitted!	50 Nm
7AZ Plug Mounting hole to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M22 x 1.5	Replace screw. Thread repairs are not permitted!	50 Nm



8AZ Plug Mounting hole to bedplate. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M16 x 1.5	Replace screw. Thread repairs are not permitted!	27 Nm
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11 12 Cylinder head with cylinder head cover

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ ISA screws (cylinder head bolts) Cylinder head to crankcase.	N52K	M10 x 125	Replace screws. Tighten screws from inside outwards. Joining torque and angle of rotation must be observed without fail. Joining torque 1. Angle of rotation 2. Angle of rotation 3. Angle of rotation	30 Nm 90 ° 90 ° 45 °
2AZ ISA screws (cylinder head bolts) Cylinder head to crankcase.	N52K	M9	Replace screws. Joining torque and angle of rotation must be observed without fail. Joining torque 1. Angle of rotation 2. Angle of rotation 3. Angle of rotation	30 Nm 90 ° omitted 45 °
3AZ Al screw Cylinder head to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M9 x 30	Replace screw. Thread repairs exclusively with aluminium Helicoil threaded insert. Joining torque and angle of rotation must be observed without fail. Joining torque Torque angle	10 Nm 90 °
4AZ ASA screws Cylinder head to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M9 x 70	Replace screws. Thread repairs exclusively with aluminium Helicoil threaded insert. Joining torque and angle of rotation must be observed without fail. Joining torque Torque angle	10 Nm 135 °
5AZ ASA screws Cylinder head cover to cylinder head.	N52K	M7		9 Nm
6AZ Fillister head screws Ignition coil cover to cylinder head cover.	N52K	M6 x 20		4 Nm
7AZ ISA screws Bearing cap of eccentric shaft to cylinder head.	N52K	M6 x 30.5		9 Nm
8AZ Seal plugs Coolant duct in cylinder head.	N52K	M16 x 1.5	Thread must be oiled.	40 Nm



9AZ Towing eye Towing eye to cylinder head.	N52K	M16	Use towing eye exclusively with M16 thread. Use towing eye for engine transportation only.	30 Nm
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1112 Overview of Technical Data

Cross deviation from flatness

max. 0,05 mm

Longitudinal deviation from flatness

max. 0,10 mm



1112 Overview of tightening torques

Flange to assembly stand		
M14X30	Tightening torque	135Nm



11 13 Oil sump

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Plug Oil drain to oil sump.	N52K	M12 x 1.5	Renew the sealing ring.	25 Nm
2AZ ASA screw Oil sump (aluminium) to crankcase lower half. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M8 x 26	Renew screw. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Angle of rotation	8 Nm 90 °
3AZ ASA screw Oil sump (aluminium) to crankcase lower half. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M8 x 112 M8 x 92	Renew screw. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Angle of rotation	8 Nm 180 °
4AZ ASA screw, microencapsulated Oil sump (aluminium) to crankcase lower half. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K 4WD	M8 x 36 M8 x 40	Replace microencapsulated screw. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Angle of rotation	8 Nm 90 °
5AZ ASA screw Oil sump (sheet metal) to crankcase lower half. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M8 x 24	Renew screw. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Angle of rotation	8 Nm 90 °
6AZ ASA screw Oil deflector to crankcase lower half. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M6 x 20	Renew screw. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Angle of rotation	4 Nm 90 °



7AZ	ASA screw Transmission to oil sump.	N52K	M8 x 50		19 Nm
8AZ	Hexagon nut Holder, transmission oil cooler line, to oil sump.	N52K	M6		8 Nm
9AZ	Hexagon nut Holder, coolant hose, to oil sump.	N52K	M6		9 Nm
10AZ	Hexagon screw Holder, coolant hose, to oil sump.	N52K	M10 x 18		21 Nm
11AZ	Hexagon nut Oil level sensor to oil sump.	N52K	M6		8 Nm
12AZ	Hexagon screw Coolant return line to oil sump.	N52K	M10 x 18		41 Nm



11 14 Transmission closing plate

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ ASA screws Transmission cover plate to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M6 x 16	Replace screws. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	4 Nm 45 Å°



11 24 Connecting Rods and Bearings

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ ASA screw (connecting rod bolt) Connecting rod bearing cap to connecting rod.	N52K	M8 x 47	Replace screw. Screw washed and oiled. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	20 Nm 120 °



11 11 Crankcase

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Hexagon screws Bedplate to crankcase.	N52K	M10 x 100	Replace screws. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	20 Nm 70 °
2AZ ASA screws Bedplate to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M10 x 27	Replace screws. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	15 Nm 90 °
3AZ ASA screws Bedplate to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M8 x 37	Replace screws. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	8 Nm 90 °
4AZ ASA screws Bedplate to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M10 x 41	Replace screws. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	15 Nm 90 °
5AZ Oil spray nozzles Oil spray nozzles in crankcase.	N52K	M8 x 1		12 Nm
6AZ Plug Coolant drain to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M14 x 1.5	Replace screw and sealing ring. Thread repairs are not permitted!	50 Nm
7AZ Plug Mounting hole to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M22 x 1.5	Replace screw. Thread repairs are not permitted!	50 Nm



8AZ Plug Mounting hole to bedplate. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M16 x 1.5	Replace screw. Thread repairs are not permitted!	27 Nm
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11 21 Crankshaft and Bearings

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Increment wheel on crankshaft	S54	M5 10.9	Replace screws	5.0 Nm 45 Å°
Increment wheel on crankshaft			Jointing torque Torque angle	
Increment wheel on crankshaft		M5 10.9	Replace screws	13 Nm
Increment wheel on crankshaft		M5 8.8	Replace screws	5.5 Nm



11 21 Crankshaft and Bearings

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Hexagon screw (central screw) Hub of vibration damper to crankshaft.	N52K	M16 x 80	Replace screw. Screw and thread are lightly oiled. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	100 Nm 360 °



11 22 Flywheel

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Hexagon screws Flywheel to crankshaft for automatic transmission.	N52K	M12 x 25.5	Replace screws. Jointing torque and final tightening must be observed without fail. 1. Jointing torque 2. Final tightening	30 Nm 125 Nm
2AZ ISA screws Flywheel to crankshaft for manual gearbox.	N52K	M12 x 25	Replace screws.	120 Nm



11 23 Vibration Damper

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ ASA screws Vibration damper to hub.	N52K	M8 x 16		35 Nm



11 24 Connecting Rods and Bearings

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ ASA screw (connecting rod bolt) Connecting rod bearing cap to connecting rod.	N52K	M8 x 47	Replace screw. Screw washed and oiled. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	20 Nm 120 °



11 11 Crankcase

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Hexagon screws Bedplate to crankcase.	N52K	M10 x 100	Replace screws. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	20 Nm 70 °
2AZ ASA screws Bedplate to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M10 x 27	Replace screws. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	15 Nm 90 °
3AZ ASA screws Bedplate to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M8 x 37	Replace screws. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	8 Nm 90 °
4AZ ASA screws Bedplate to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M10 x 41	Replace screws. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	15 Nm 90 °
5AZ Oil spray nozzles Oil spray nozzles in crankcase.	N52K	M8 x 1		12 Nm
6AZ Plug Coolant drain to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M14 x 1.5	Replace screw and sealing ring. Thread repairs are not permitted!	50 Nm
7AZ Plug Mounting hole to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M22 x 1.5	Replace screw. Thread repairs are not permitted!	50 Nm



8AZ Plug Mounting hole to bedplate. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M16 x 1.5	Replace screw. Thread repairs are not permitted!	27 Nm
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11 28 Ribbed V-belt with tension and deflection system

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ ASA screw Belt tensioner to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K / Not for E70 N52K B30	M11 x 65	Replace screw. Thread repairs are not permitted! Jointing torque and angle of rotation must be observed without fail. Jointing torque Angle of rotation	25 Nm 90 °
2AZ ASA screw Belt tensioner with deflection pulley to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	E70 N52K B30	M11 x 99	Replace screw. Thread repairs are not permitted! Jointing torque and angle of rotation must be observed without fail. Jointing torque Angle of rotation	25 Nm 90 °
3AZ Hexagon screw Deflection pulley to alternator.	N52K	M10 x 45		40 Nm



1130 Overview of tightening torques

SWZ2249117		
Screw M6	Tightening torque	10Nm



11 31 Camshaft

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ ASA screws Upper and lower bearing banks of exhaust camshaft to cylinder head.	N52K	M7 x 70	Insert bolts dry. Tighten screws from inside outwards. Jointing torque and angle of rotation must be observed without fail. Jointing torque Angle of rotation	8 Nm 60 °
2AZ ISA screws Bearing cap of intake camshaft to cylinder head.	N52K	M6 x 30,5		9 Nm
3AZ ASA screws Timing chain module to cylinder head.	N52K	M6 x 35		9 Nm
4AZ Bearing pin Timing chain module to crankcase.	N52K	M8		20 Nm
5AZ Bearing pin Timing chain module to cylinder head.	N52K	M7		14 Nm
6AZ Chain tensioner Chain tensioner to cylinder head.	N52K	M22 x 1.5	Do not retighten the chain tensioner. Replace sealing ring.	55 Nm
7AZ Plug Mounting hole to cylinder head.	N52K	M18 x 1.5		25 Nm



1131 Overview of tightening torques

Preload timing chain	
	Tightening torque0,6Nm



11 36 Variable camshaft control VANOS

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Hexagon screws (central bolts) VANOS with sensor gear to inlet and exhaust camshafts.	N52K	M10 x 94	Replace screws. Grip inlet and exhaust camshafts at dihedron when tightening. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	20 Nm 180 °
2AZ Non-return valve Non-return valve for VANOS to cylinder head	N52K	M14 x 1.5	Replace sealing ring.	13 Nm
3AZ Hexagon screws Inlet and exhaust solenoid valve with holder to cylinder head.	N52K	M6 x 12	Replace support and sealing rings.	9 Nm



11 37 Variable valve gear

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ ASA screws Gate to timing case.	N52K	M6 x 23	Only one screw (inside) plus the oil spray nozzle are fitted on cylinder no. 3.	10 Nm
2AZ ASA screws Torsion spring to cylinder head.	N52K	M6 x 20		10 Nm
3AZ ASA screws Electric servomotor to cylinder head and to cylinder head cover.	N52K	M6 x 16	1. Join screws hand-tight to cylinder head. 2. Join screw hand-tight to cylinder head cover. 3. Jointing torque on cylinder head. 4. Jointing torque on cylinder head cover.	10 Nm
4AZ ASA screw Oil spray nozzle to gate.	N52K	M6 x 30	Oil spray nozzle is fitted on cylinder no. 3 (outside).	10 Nm
5AZ Stop screw Stop screw of eccentric shaft to cylinder head.	N52K	M6		10 Nm
6AZ Eccentric shaft sensor to cylinder head cover	N52K	M6		10 Nm



1140 Overview of technical data

Engine oil	
	Filling capacity, engine oil change with oil filter element 6,5 l



11 41 Oil pump with strainer and motor

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ ASA screws Suction pipe to bedplate. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M6 x 30	Replace screws. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Angle of rotation	4 Nm 100 °
2AZ ASA screw Oil pump to bedplate. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M8 x 123	Replace screw. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Angle of rotation	10 Nm 180 °
3AZ ASA screws Oil pump to bedplate. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M8 x 31	Replace screws. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Angle of rotation	10 Nm 90 °
4AZ ASA screw Chain module to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M6 x 16	Replace screw. Thread repairs are not permitted! Jointing torque and angle of rotation must be observed without fail. Jointing torque Angle of rotation	4 Nm 45 °
5AZ ASA screws Chain module to oil pump. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M6 x 16	Replace screws. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Angle of rotation	4 Nm 45 °
6AZ Fillister head bolt Sprocket to oil pump.	N52K	M8 x 20	Jointing torque and angle of rotation must be observed without fail. Jointing torque Angle of rotation	20 Nm 45 °



7AZ Hydraulic valve of oil pump on crankcase	N52K	M6x16	Replace screws Thread repairs exclusively with Al Helicoil. Jointing torque and angle of rotation must be observed without fail. Jointing torque Angle of rotation	3 Nm 45 °
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11- 42 Oil filter element with connections

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Oil filter cap Oil filter cap to oil-filter housing.	N52K		Replace sealing ring.	25 Nm
2AZ ASA screws Oil filter housing to cylinder head.	N52K	M8	Replace seal.	22 Nm
3AZ Tapping screws Oilâ€¢coolant heat exchanger to oil filter housing.	N52K	M8 x 20	Replace seal.	16 Nm



11 51 Electric water pump with drive

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ ASA screws Electric water pump to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K / Not for E70 N52K B30	M8 x 32	Replace screws. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Angle of rotation	10 Nm 90 °
2AZ ASA screws Electric water pump to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	E70 N52K B30	M8 x 28	Replace screws. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Angle of rotation	10 Nm 90 °



1151 Overview of tightening torques

Coolant hose to electric coolant pump		
Hose clamp		3Nm
Electric coolant pump to crankcase		
External Torx screw M8x32 (aluminium) Renew screws.	Jointing torque	10Nm
Thread repairs exclusively with aluminium Helicoil thread insert	Angle of rotation	90°



11 53 Coolant thermostat with connections

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Hexagon screws Coolant thermostat to electric water pump.	N52K	M6 x 25		9 Nm
2AZ ASA screws Feed line (from electric water pump) to crankcase.	N52K	M6 x 16	Replace sealing ring and seal.	9 Nm
3AZ Hose clamp Feed line (from crankcase) to electric water pump.	N52K	L42-48		3 Nm
4AZ Hose clamps Coolant hose between oil-water heat exchanger and feed line.	N52K	L18-24		3 Nm
5AZ Hose clamps Coolant hose between coolant thermostat and electric water pump.	N52K	L42-48		3 Nm
6AZ Hose clamp Coolant hose (from cylinder head) to coolant thermostat.	N52K	L23-35		3 Nm
7AZ Hexagon screws Coolant hose (from coolant thermostat) to cylinder head.	N52K	M6 x 25		9 Nm
8AZ ASA screw Spacer to cylinder head.	N52K	M6 x 12		8 Nm
9AZ ASA screws Dual bracket to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M6 x 16	Replace screws. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	4 Nm 45 °



1153 Overview of tightening torques

Coolant thermostat to electric coolant pump	
	9Nm
Hose clamp	
	3Nm



11 61 Air intake manifold

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Hexagon screw Air intake manifold to cylinder head.	N52K	M7 x 50		15 Nm
2AZ Hexagon nut Air intake manifold to cylinder head.	N52K	AM7 (to DIN 439)		15 Nm
3AZ Hose clamp Clean-air gaiter to connection, throttle valve assembly.	N52K	L80-100		3 Nm
4AZ Ejet screw Fuel line to intake manifold	N52K	50 x 20		6 Nm
5AZ Oval-head screw Holder, engine wiring harness, to intake manifold.	N52K	M6 x 10		8 Nm



11 61 Intake manifold

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Intake manifold to cylinder head	alle	M8		22 Nm
	alle	M7		15 Nm
	alle	M6		10 Nm
2AZ Sound absorption cover to holder	M60/1 / M60/2 / M62	M6		8 Nm
3AZ Throttle valve to intake manifold	N73	M6x60/ M6x80		8 Nm



11 66 Vacuum pump

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ ISA flat mushroom head screws 10.9 Vacuum pump to crankcase.	N52K	M6 x 40		10 Nm
2AZ ISA screw Sprocket wheel to vacuum pump.	N52K	M10 x 30		66 Nm



11 72 Air pump, lines and control valves

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Secondary air valve to cylinder head	N52K	M6		8 Nm
2AZ Secondary air pump to mounting bracket/pump carrier	N52K	M6		8 Nm
3AZ Intake hose / intake line to body	N52K	M6		8 Nm



11 78 Emissions-control, Lambda oxygen sensor

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Oxygen control sensor; oxygen monitor sensor	All	M18 x 1.5		50 Nm



11 78 Exhaust gas control, lambda control sensor / lambda monitor sensor

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Lambda control sensor LSU 4.9 Lambda monitor sensor LSF 4.2	N52K	M18 x 1.5		50 Nm
2AZ ASA screws Bracket, lambda control sensors, to cylinder head.	N52K	M6 x 12		8 Nm
3AZ Hexagon screw Bracket, lambda monitor sensors, side, to transmission.	N52K / Not for E6x and E85	M8 x 16		19 Nm
4AZ Bracket, plug connection, lambda monitor sensors, bottom, to transmission.	N52K			



11 11 Crankcase

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Hexagon screws Bedplate to crankcase.	N52K	M10 x 100	Replace screws. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	20 Nm 70 °
2AZ ASA screws Bedplate to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M10 x 27	Replace screws. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	15 Nm 90 °
3AZ ASA screws Bedplate to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M8 x 37	Replace screws. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	8 Nm 90 °
4AZ ASA screws Bedplate to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M10 x 41	Replace screws. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	15 Nm 90 °
5AZ Oil spray nozzles Oil spray nozzles in crankcase.	N52K	M8 x 1		12 Nm
6AZ Plug Coolant drain to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M14 x 1.5	Replace screw and sealing ring. Thread repairs are not permitted!	50 Nm
7AZ Plug Mounting hole to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M22 x 1.5	Replace screw. Thread repairs are not permitted!	50 Nm



8AZ Plug Mounting hole to bedplate. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M16 x 1.5	Replace screw. Thread repairs are not permitted!	27 Nm
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11 14 Transmission closing plate

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ ASA screws Transmission cover plate to crankcase. Aluminium screws/bolts are permitted with and without colour coding (blue).	N52K	M6 x 16	Replace screws. Thread repairs exclusively with aluminium Helicoil threaded insert. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	4 Nm 45 Å°



11 operating fluid overview

Testing equipment

Connecting hose Ä = 8 x 13 mm, length = 70 mm	
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Sealing compound

Loctite 5970 liquid sealing compound	50 ml, Cartridge	83190404517
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[Overview of consumables \(Electronic Parts Catalogue\)](#)

Expendable materials

Brake cleaner2.0	500 ml, Spray can	83192365214
	20 , Canister	83192365215

Expendable materials

lubricating grease Longtime PD -1	400 g, Cartridge	83192160340
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[Overview of consumables \(Electronic Parts Catalogue\)](#)

Expendable materials

Copper paste	100 g, Tube	81229400794
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[Overview of consumables \(Electronic Parts Catalogue\)](#)

Expendable materials

Lubricating grease SYNTHESO GLEP 1	100 g, Tube	83299407778
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[Overview of consumables \(Electronic Parts Catalogue\)](#)

Engine oil

Technically suitable engine oils for BMW Group engines	
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[3.0 Technically appropriate engine oils for BMW Group engines](#)

Engine oil

Technically suitable engine oils for BMW Group engines	
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[3.0 Specified engine oils for Toyota J29](#)

Sealing compound

Sealant Drei Bond 1209	30 ml, Tube	07 58 9 062 376
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12 12 Spark Plugs

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Spark plugs (ungreased)	All	M12x1.25		23 ± 3 Nm
	All	M14x1.25		30 ± 3 Nm



1212 Overview of tightening torques

Spark plugs	
M14x1.25	30Nm



12 14 Electronic Shift Units or Control Units

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Knock sensor	N52, N52K, N51, N53	M8x31	Replace screws Jointing torque Torque angle	10 Nm 90 °
2AZ Pulse generator for crankshaft	N52, N52K, N51, N53	M6x16	Replace screws Jointing torque Torque angle	3 Nm 45°
3AZ Pulse generator for inlet camshaft	N52, N52K, N51, N53	M6x16		9 Nm
4AZ Pulse generator for exhaust camshaft	N52, N52K, N51, N53	M6x16		9 Nm



12 31 Alternator with Drive and Mounting Parts

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Wires to alternator				
Terminal D+	M10 / M20			5 Nm
	alle / others	M6		7 Nm
Terminal B+	S38 / B38			8 Nm
	alle / others	M8		13 Nm
2AZ Pulley	alle			45 Nm
3AZ Belt pulley (drive belt)	Alternator with cooling jacket			80 Nm
	All others			70 Nm
	N42, N46 Valeo			75 Nm
	N42, N46 Bosch			65 Nm
4AZ Rear retaining bracket	alle			3,5 Nm
5AZ Cheese head screw for line clip	alle			3,5 Nm
6AZ Alternator to bearing support	M40 / M42 / M43 / M44			43 Nm
7AZ Generator an KGH	N42, N46, N62	M8		21 Nm
8AZ Ina belt pulley (drive belt) with freewheel installed on Bosch and Valeo alternator.				80 Nm
9AZ Alternator and deflecting element to support Alternator to component carrier	M54	M10 x 150		42 Nm
		M10 x 125		42 Nm
10AZ Alternator to holder	M57	M10		38 Nm
11AZ Idler pulley to holder	M57	M8		19 Nm



12 31 Alternator with Drive and Mounting Parts

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Wires to alternator	N52 / N52K / N51 / N53	M8		19 Nm
2AZ Alternator to crankcase	N52 / N52K / N51 / N53	M8x82	Replace screws Jointing torque Torque angle	10 Nm 180 Å°
3AZ Belt pulley (ribbed V-belt) with freewheel (Ina) fitted to Bosch and Valeo alternators	N52,			80 Nm



11 61 Intake manifold

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Elbow fitting to intake system	N52	50x20	Jointing torque	6 Nm



12 41 Starter motor with mounting

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Starter motor mounting to crankcase	N52 / N52K / N51 / N53	M10x85	Replace screw Jointing torque Torque angle	20 Nm 180 °
2AZ Starter motor mounting to crankcase	N52 / N52K / N51 / N53	M10x30	Replace screw Jointing torque Torque angle	20 Nm 90 °
3AZ Battery positive lead to starter	N52 / N52K / N51 / N53	M8		13 Nm



1241 Overview of tightening torques

Starter motor to crankcase		
M10x30 Renew screw.	Jointing torque	20Nm
	Angle of rotation	90°



12 42 Starter line

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Battery positive terminal in/on distribution box	E63 / E65 / E90 / E91 / E87 / E83	M8		21 Nm
	E60 / E61	M8		14 Nm



12 42 Starter line

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Starter line to jump-start connection point	N52, N52K, N51, N53	M8		19 Nm
2AZ Starter line to jump-start connection point	E70 / N52K	M8		13 Nm



12 52 Plug connections, terminals, loose parts

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Holder, wiring harness, to cylinder head	N52 / N52K / N54 / N54T	M6x12		8 Nm
2AZ Cable channel to cylinder head cover	N52 / N52K / N53 / N54 / N54T	M6	Replace screws. Jointing torque Angle of rotation	3 Nm 45 °
3AZ Earth cable to crankcase (electr. coolant pump)	N52 / N54 / N54T / N52K / N51 / N53	M8	Replace screws. Jointing torque Angle of rotation	8 Nm 45 °
4AZ Holder for monitoring sensors	N54 / N54T	M6x12		8 Nm



12 52 Bracket for oil level sensor earth strap

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Earth strap to bracket and cable bracket on transmission	N40 / N42 / N43 / N45 / N45T / N46 / N46T / N51 / N52 / N52K / N53 / N54	M6		8 Nm



12 52 Plug connections, terminals, loose parts

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Holder, wiring harness, to cylinder head	N52 / N52K / N54 / N54T	M6x12		8 Nm
2AZ Cable channel to cylinder head cover	N52 / N52K / N53 / N54 / N54T	M6	Replace screws. Jointing torque Angle of rotation	3 Nm 45 °
3AZ Earth cable to crankcase (electr. coolant pump)	N52 / N54 / N54T / N52K / N51 / N53	M8	Replace screws. Jointing torque Angle of rotation	8 Nm 45 °
4AZ Holder for monitoring sensors	N54 / N54T	M6x12		8 Nm



12 52 Bracket for oil level sensor earth strap

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Earth strap to bracket and cable bracket on transmission	N40 / N42 / N43 / N45 / N45T / N46 / N46T / N51 / N52 / N52K / N53 / N54	M6		8 Nm



12 61 Engine oil pressure, engine oil temperature, oil condition display

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Engine oil pressure switch/engine oil temperature sensor	N51 / N52 / N52K / N53 / N54 / N54T / N55	M12x1.5	Jointing torque Angle of rotation	20 Nm 16 °
2AZ Oil condition sensor for engine oil	N51 / N52 / N52K / N53 / N54 / N54T / N55	M6	Jointing torque 2 Nm	8.5 Nm



12 61 Oil pressure, oil temperature, oil level display

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Oil-pressure switch/oil-temperature switch	All	M12x1.5		27 Nm
2AZ Level switch for engine oil	N62 / N73 / M67TU		Jointing torque 2Â Nm	8.5 Nm
3AZ Oil pressure switch	N46	M12 x 1.5		27 Nm
4AZ Level sensor to oil sump	N46	M6		9 Nm



13 53 Fuel Injector Nozzles and Lines

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Fuel injection pipe	N52,N52K	M6 x 12		9 ± 1 Nm
	N51	M6 x 16		9 ± 1 Nm



1353 Overview of tightening torques

Fuel injection pipe to cylinder head	
M6x16	9Nm



13 54 Throttle and actuator

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Throttle-valve assembly to intake manifold	N52 / N52K / N51 / N53	M6 x 50		9 Nm



13 62 Senders for Control Unit

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Temperature time switch	M21 / M51			18 Nm
2AZ Temperature sensor, water	M60/1 / M60/2 / M21 / M51			18 Nm
	all others			13 Nm
3AZ Temperature switch	All			28 Nm
4AZ Temperature sensor, air	All			13 Nm
5AZ Charge-air pressure sensor to bracket	M51 / M41			4 Nm
Charge-air pressure sensor to intake manifold	M47			5 Nm
6AZ Dual temperature sensor (4-pin plug connection)	M41 / M43 / M44 / S50 / S52 / M52 / M57 / M67 / M62 / M73			13 Nm
7AZ Air-mass sensor on lower section of intake filter housing	M51			3.5 Nm
Air-mass flow sensor to cylinder head cover	M47 / M47TU / M57 / M57TU / M57T2			4.5 Nm
8AZ Pulse generator, camshaft to cylinder head cover	M57			4.5 Nm
	M47TU / M57TU			3.5 Nm
	M57T2			2.3 Nm
9AZ Intake neck on air-mass flow sensor	M47			9 Nm



13 62 Senders for Control Unit

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Camshaft sensor to cylinder head	N52 / N52K / N53	M6x16		8.8 Nm
2AZ Crankshaft sensor to crankcase	N52 / N52K / N53	M6x16		3 Nm
3AZ Knock sensor to crankcase	N52 / N52K / N53	M8x31		10 Nm
4AZ Differential pressure sensor to intake manifold	N52 / N52K / N53	K50x20		6 Nm
5AZ Water temperature sensor, screwed	N52 / N52K / N53	M12x1.5		13.5 Nm
6AZ Magnet wheel to eccentric shaft	N52 / N52K / N53	M6x20		8 Nm
7AZ VVT sensor to bearing bridge	N52 / N52K / N53	M6x14		8 Nm
8AZ Air mass sensor	N52 / N52K / N53			3 Nm



13 operating fluid overview



16 11 Fuel Tank and Mounting Parts

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Fuel tank to body (hexagon nut)	E46 / E83	M8	Replace self-locking nuts	19 Nm
	E24	M8		45 Nm
	E30	M8		25 Nm
Tension strap to body (hexagon screw)	E53 / E46 / E85 / E86 / E83	M8		19 Nm
	E24	M8		8 Nm
	E38 / E65 / E66 / E67	M8		20 Nm
	E60 / E61 / E63 / E64	M8		19 Nm
2AZ Connecting pipe to fuel tank	E30			25 Nm
3AZ Heat shield to fuel tank	E30			8.5 Nm
	E24			1.0 Nm
	E31			3 Nm
4AZ Drain plug to fuel tank	E28 / E30			25 Nm
5AZ Trunk separating wall/retaining bracket to trunk floor	E52	M6		7,8 Nm
6AZ Wheel arch cover to body	E52	M6		3 Nm



16 12 Fuel Delivery

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Pump assembly to metal-bonded mount	E28 / E30			6,5 Nm
2AZ Holder to fuel pump or fuel reservoir	E28 / E30			6,5 Nm
3AZ Electric connections on fuel pump	E28 / E30			2 Nm
4AZ Electric connections on fuel pump	E28 / E30	M4		1,2 Nm
5AZ Electric connections on fuel pump	E28 / E30	M5		1,6 Nm
6AZ Plastic nut on cover for fuel pipes	E30			2 Nm
7AZ Hose clamps 10 - 16 mm dia.	E28 / E30			2 Nm
	E65 / E66			1,5 Nm
8AZ Hose clamps 18 mm dia.	E28 / E30			3 Nm
9AZ Hose clamps 37 - 43 mm dia.	E28 / E30			4 Nm
	E52			3 Nm
10AZ Hose clamps 42 - 48 mm dia.	E65 / E66			2 Nm
	E83			4 Nm
11AZ Fuel filler pipe to body	E46 / E65 / E66 / E67 / E83			4 Nm
	E60 / E61 / E63 / E64	M6		9 Nm
	E85 / E86	M6 8.8		9 Nm
12AZ Feed line to fuel tank	E46 / M56	M14		26±3 Nm
13AZ Vent line from carbon canister to fuel tank	E46 / M56	M24		26±3 Nm
14AZ Fuel tank vent line to fuel filler pipe / purge air line to carbon canister	E46 / M56	M14		26±3 Nm
16AZ Grounding strap, fuel filler pipe to body	E85 / E86	M6 8.8		9 Nm
	E83			8 Nm



16 13 Tank Ventilation

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Fuel vapor venting tank to body	E24			3 Nm
	E30			4,5 Nm
	E39			4,0 Nm
	E38			5,5 Nm
	E53			3,5 Nm
	E65 / E66 / E67			9,0 Nm
2AZ Carbon canister to body	E85 / E86	M8		9 Nm
	E46 / E60 / E61 / E63 / E64 / E83	M6		9 Nm
3AZ DMTL to holder / carbon canister	E83 / E85 / E86 / E60 / E46 / M56			2 Nm
4AZ Dust filter to holder / carbon canister	E60 / E83 / E46 / M56			2 Nm
	E85 / E86			2 Nm



16 14 Fuel pump

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Fuel level sensor to intake unit	E32			8 Nm
2AZ Lock ring for fuel tank (sensor opening, fuel level sensor, pump unit)				
Plastic lock ring 26.5 mm high	E34 / E31			40 Nm
Plastic lock ring 31.5 mm high (new)	E36 / E34 / E31		First manually tighten lock ring by two rotations	55 Nm
Locking ring (metal)	E39 / E46 / E52 / E53			35 Nm
	E60 / E61 / E63 / E64 / E65 / E66 / E67			45 ± 5 Nm
	E85 / E86,			50 ± 10 Nm
	E83			55±5 Nm
3AZ In-tank pump with fuel level sensor on tank	E38	M6	Tighten nuts crosswise	6,5 Nm
4AZ El. fuel pump control unit to body / holder	E60 / E61 / E63 / E64 / E85 / E86	M6		8 Nm



1710 Overview of tightening torques

Front charge-air duct to fan cowl	
	5Nm



17 11 Radiator, expansion tank, lines (N52, N52K, N51, N54, N54T, N45, N45T, N46, N46T)

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Radiator bracket, top	N52 / N52K / N51 / N54 / N54T / N45 / N46 / N53 / N43 / N45T / N46T			3 Nm
2AZ Radiator to cooling module	N52 / N52K / N51 / N54 / N54T / N45 / N46 / N53 / N43 / N45T / N46T	K60 x 20		4,5 Nm
3AZ Expansion tank to body	N52 / N52K / N51 / N54 / N54T / N45 / N46 / N53 / N43 / N45T / N46T	M6 x 20		8 Nm
4AZ Transmission oil heat exchanger to fan cowl	N46T / N54 / N54T			4,5 Nm
5AZ Additional water cooler to radiator mounting	N54T	M8		20 Nm
6AZ Auxiliary radiator holder to side member	N54T	M6		8 Nm
7AZ Coolant hose to radiator	N52 / N52K / N51 / N54 / N54T / N45 / N46 / N53 / N43 / N45T / N46T			3 Nm



17 21 Engine Oil Cooler

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Transmission oil-water heat exchanger to front axle carrier	N52	M6x35		8 Nm
2AZ Engine oil cooler to holder	N52	M8 x 35		12 Nm
3AZ Engine oil cooler to holder	N52	Oval-head screw		3 Nm



17 11 Radiator, expansion tank, lines (N52, N52K, N51, N54, N54T, N45, N45T, N46, N46T)

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Radiator bracket, top	N52 / N52K / N51 / N54 / N54T / N45 / N46 / N53 / N43 / N45T / N46T			3 Nm
2AZ Radiator to cooling module	N52 / N52K / N51 / N54 / N54T / N45 / N46 / N53 / N43 / N45T / N46T	K60 x 20		4,5 Nm
3AZ Expansion tank to body	N52 / N52K / N51 / N54 / N54T / N45 / N46 / N53 / N43 / N45T / N46T	M6 x 20		8 Nm
4AZ Transmission oil heat exchanger to fan cowl	N46T / N54 / N54T			4,5 Nm
5AZ Additional water cooler to radiator mounting	N54T	M8		20 Nm
6AZ Auxiliary radiator holder to side member	N54T	M6		8 Nm
7AZ Coolant hose to radiator	N52 / N52K / N51 / N54 / N54T / N45 / N46 / N53 / N43 / N45T / N46T			3 Nm



17 22 Oil Cooler Pipes

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Transmission oil cooler line to transmission	N52K	M8x28		20 Nm
2AZ Transmission oil cooler line to oil sump	N52K	M6		10 Nm
3AZ Transmission oil cooler line to transmission sump	N52K	M6x35		8 Nm
4AZ Transmission oil cooler line to transmission oil-water heat exchanger	N52K	M6x35		8 Nm
5AZ Engine oil cooler lines to oil module/engine oil cooler	N52K	M8		20 Nm



1722 Overview of tightening torques

Transmission oil cooler line to transmission	
M8	19Nm



17 operating fluid overview

Expendable materials

BMW antifreeze and corrosion inhibitor G30-91 DEU	1500 ml, Can	83192211662
	60 l, Barrel	83192304076

Expendable materials

BMW antifreeze and corrosion inhibitor G30-91 Worldwide (except DEU, JPN, CHN, FIN, NOR, SWE, DNK, FRO, AUS)	1500 ml, Can	83512355294
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Expendable materials

BMW antifreeze and corrosion inhibitor G30-91 Worldwide (except DEU)	60 l, Barrel	83512355295
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Expendable materials

BMW antifreeze and corrosion inhibitor G48 DEU	1500 ml, Can	83192211191
	60 l, Barrel	83192304068
	205 l, Barrel	83192304069

Expendable materials

BMW antifreeze and corrosion inhibitor (i01) Worldwide	1 l, Can	83512355296
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Expendable materials

BMW antifreeze and corrosion inhibitor G48 Worldwide (except DEU, JPN, CHN, FIN, NOR, SWE, DNK, FRO, AUS)	1500 ml, Can	83512355290
	60 l, Barrel	83512355291
	205 l, Barrel	83512355293

Expendable materials

BMW antifreeze and corrosion inhibitor G48 FIN, NOR, SWE, DNK, FRO	1500 ml, Can	83192211914
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Expendable materials

BMW antifreeze and corrosion inhibitor G48 JPN	1500 ml, Can	83192211194
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Expendable materials

BMW antifreeze and corrosion inhibitor G48 OFF	1500 ml, Can	83192211913
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Expendable materials



Expendable materials

BMW antifreeze and corrosion inhibitorG48 CHN	1500 ml, Can	83192211195
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Expendable materials

BMW antifreeze and corrosion inhibitor HT-12 Worldwide	5, Canister	83192466484
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Expendable materials

Technically suitable antifreeze and corrosion inhibitor	
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[Main group 17](#)

18 40 Exhaust manifold

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Exhaust manifold to cylinder head	N51 / N52 / N52K / N53	M7 nut		20 Nm
	N45	M7 nut		20 Nm



18 20 Exhaust system suspension

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Exhaust system to manifold	N52 / N52K / N51	M10 nut		45 Nm
2AZ Preliminary pipe bracket to transmission	N52 / N52K / N51	M8		21 Nm
3AZ Bracket to rear differential	N52 / N46 / M47T2 / M57T2	M12 nut		30 Nm
4AZ Bracket, rear muffler, to support plate	N52 / N52K / N51	M8 nut		21 Nm
5AZ Rear muffler to body	N52 / N52K / N51 / M47T2	M8 nut		21 Nm
6AZ Exhaust system to transmission	M47T2	ASA M8 bolt		21 Nm
	M47T2	M8 nut		21 Nm
7AZ Exhaust system to body	N52 / N52K / N51,	M8		21 Nm
8AZ Clamp	N52 / N52K / N51			45 Nm



17 22 Oil Cooler Pipes

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Transmission oil cooler line to transmission	N52K	M8x28		20 Nm
2AZ Transmission oil cooler line to oil sump	N52K	M6		10 Nm
3AZ Transmission oil cooler line to transmission sump	N52K	M6x35		8 Nm
4AZ Transmission oil cooler line to transmission oil-water heat exchanger	N52K	M6x35		8 Nm
5AZ Engine oil cooler lines to oil module/engine oil cooler	N52K	M8		20 Nm



18 40 Exhaust manifold

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Exhaust manifold to cylinder head	N51 / N52 / N52K / N53	M7 nut		20 Nm
	N45	M7 nut		20 Nm



18 20 Exhaust system suspension

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Exhaust system to manifold	N52 / N52K / N51	M10 nut		45 Nm
2AZ Preliminary pipe bracket to transmission	N52 / N52K / N51	M8		21 Nm
3AZ Bracket to rear differential	N52 / N46 / M47T2 / M57T2	M12 nut		30 Nm
4AZ Bracket, rear muffler, to support plate	N52 / N52K / N51	M8 nut		21 Nm
5AZ Rear muffler to body	N52 / N52K / N51 / M47T2	M8 nut		21 Nm
6AZ Exhaust system to transmission	M47T2	ASA M8 bolt		21 Nm
	M47T2	M8 nut		21 Nm
7AZ Exhaust system to body	N52 / N52K / N51,	M8		21 Nm
8AZ Clamp	N52 / N52K / N51			45 Nm



17 22 Oil Cooler Pipes

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Transmission oil cooler line to transmission	N52K	M8x28		20 Nm
2AZ Transmission oil cooler line to oil sump	N52K	M6		10 Nm
3AZ Transmission oil cooler line to transmission sump	N52K	M6x35		8 Nm
4AZ Transmission oil cooler line to transmission oil-water heat exchanger	N52K	M6x35		8 Nm
5AZ Engine oil cooler lines to oil module/engine oil cooler	N52K	M8		20 Nm



18 40 Exhaust manifold

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Exhaust manifold to cylinder head	N51 / N52 / N52K / N53	M7 nut		20 Nm
	N45	M7 nut		20 Nm



18 operating fluid overview

Expendable materials

Diesel particulate filter cleaner	500 ml	83192211602
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Expendable materials

Starter kit for diesel particulate filter cleaner	500 ml	83192211603
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21 11 Bell housing

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Clutch housing to crankcase	E36 / E38 / E39 / E46 / E52 / E53 / E60 / E61 / E63 / E64 / E83 / E85 / E87 / E90 / E91	M8		28 Nm
	E36 / E38 / E39 / E46 / E52 / E53 / E60 / E61 / E63 / E64 / E83 / E85 / E87 / E90 / E91	M10		56 Nm
	E36 / E38 / E39 / E46 / E52 / E53 / E60 / E61 / E63 / E64 / E83 / E85 / E87 / E90 / E91	M12		98 Nm



21 21 Clutch Disc and Drive Plate

Tightening Torques

	Type	Thread	Work instruction	Torque
1AZ Clutch to flywheel	E36 / E38 / E39 / E46 / E52 / E53 / E60 / E61 / E63 / E64 / E83 / E85 / E86 / E87 / E90 / E91	M8 8.8	Replace screws	25 Nm
	E36 / E38 / E39 / E46 / E52 / E53 / E60 / E61 / E63 / E64 / E83 / E85 / E86 / E87 / E90 / E91	M8 10.9	Replace screws	34 Nm
Clutch to flywheel With ZNS screws			Replace ZNS bolts. Jointing torque and angle of rotation must be observed without fail.	
	S85 / S65		Jointing torque Angle of rotation	15 Nm 25 °
	N52 / N53 / N52K / M47T2 / N45T / N54 / N54T / N46T / N43 / N45K / N47 / M57T2 / N47S / N62TU / N55 / N57 / N20	M8 10.9	Jointing torque Angle of rotation	15 Nm 90° ±5°



2121 Overview of tightening torques

Clutch to flywheel			
M8 8.8 Renew screws.		Tightening torque	25Nm
M8 10.9 Renew screws.		Tightening torque	34Nm
M8 10.9 ZNS screw Renew screws.		Jointing torque	15Nm
		Angle of rotation	90°



21 52 Clutch operation (hydraulic)

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Hydraulic line to clutch slave cylinder or throttle.	E36 / E38 / E39 / E52 / E53 / E60 / E61 / E63 / E64 / E83 / E85 / E86 / E81 / E87 / E90 / E91 / E92			14.5 Nm
	E46			20 + 5 Nm
2AZ Clutch master cylinder to bearing support	E36 / E38 / E39 / E46 / E52 / E53 / E60 / E61 / E63 / E64 / E85 / E84 / E86 / E87 / E89 / E90 / E91 / E92 / E93			22 Nm
	E83			8 Nm
3AZ Fitting screw, clutch master cylinder	E36 / E38 / E39 / E46 / E52 / E53 / E60 / E61 / E63 / E64 / E83 / E85 / E86 / E87 / E90 / E91 / E92 / E93			22 Nm
4AZ Clutch master cylinder to pedal assembly	E36 / E38 / E39 / E46 / E52 / E53 / E60 / E61 / E63 / E64 / E81 / E82 / E83 / E84 / E85 / E86 / E87 / E88 / E89 / E90 / E91 / E92 / E93			9 Nm
5AZ Clutch slave cylinder to clutch housing/transmission case	E36 / E38 / E39 / E46 / E52 / E53 / E60 / E61 / E63 / E64 / E81 / E82 / E83 / E84 / E85 / E86 / E87 / E88 / E89 / E90 / E91 / E92 / E93			22 Nm
	E60 / E63	7-speed SMG		25 Nm
6AZ Pressure accumulator to hydraulic unit	E36 / M3			35 Nm
7AZ Coupling bolts for hydraulic pipes	E46 / M3			14 Nm
8AZ Pressure accumulator for hydraulic unit	E46 / M3			40 Nm



9AZ Clutch position sensor to clutch slave cylinder	E46 / E60 / E61 / E63 / E64 / E85	6-speed SMG		2.5 Nm
	E60 / E61 / E63	7-speed SMG		3.5 Nm
10AZ Banjo bolt, pipe, actuator/pump block	E60 / E61 / E63	7-speed SMG		18 Nm
11AZ Filler plug, expansion tank, pump block	E60 / E61 / E63	7-speed SMG		2.1 Nm
12AZ Throttle valve to clutch slave cylinder	E60, E61			17 Nm



2152 Overview of tightening torques

Clutch slave cylinder to clutch housing/transmission housing

Renew screws.

22Nm



37 11 Control and suspension elements, front

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Vent valve to oscillating motor	E60 / E61 / E63 / E64 / E65 / E66			14 Nm
2AZ Vent hose to vent valve	E60 / E61 / E63 / E64 / E65 / E66			5 Nm



22 11 Engine mounting

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Engine mount to front axle support	E52 / E85 / E86			42 Nm
	E65 / E66 / E67	M8-8		19 Nm
	E60 / E61 / E63 / E64 / E83	M8-8		21 Nm
	E53	M8 -10.9		30 Nm
	E87 / E90 / E91 / E92 / E93 / E70 / E71 / E83 / E81 / E82 / E88 / E89 / E84	M8 10.9		28 Nm
	E70 / E71 / E72 / E83 / E84 / E90 / E91 / E92 / E93	M10		38 Nm
	E92 / E90 / S65	M10		56 Nm
2AZ Engine mount to engine support arm	E60 / E61 / E63 / E64 / E65 / E66 / E67 / E53 / E83 / E87 / E90 / E91 / E92 / E93 / E70 / E71 / E81 / E82 / E88 / E89 / E84	M10 10.9		56 Nm
	E65 / E66 / E67	M12 10.9		100 Nm
	E70 / E71 / E72 / E83 / E84 / E90 / E91 / E92 / E93	M12		68 Nm
	E85 / E86 / E52			42 Nm
3AZ Engine support arm to engine	E60 / E61 / E63 / E64 / E65 / E66 / E67 / E70 / E71 / E72 / E81 / E82 / E83 / E84 / E87 / E88 / E89 / E90 / E91 / E92 / E93	M10 8.8		38 Nm
	N51 / N52 / N52K / N53	M12	Aluminium bolts must be replaced 1. Jointing torque 2. Angle of rotation	25 Nm 105 Å°
	E60 / E61 / E65 / E66 / E67	M8 8.8		19 Nm
	E85 / E83	M8 8.8		21 Nm
	E70 / E71	M10 10.9		56 Nm
	E53 (N62/ M54)			38 Nm
	E53 (M57)			65 Nm
	N54 / N55	M12	Engine N54 / 55 only	66 Nm
	N42	M10 8.8		38 Nm
4AZ Engine mount to console	E65 / E60 / E61 / E63/E64	M8 8.8		21 Nm



5AZ Console to front axle support	E65 / E60 / E61 / E63 / E64	M8-8		21 Nm
6AZ Vibration absorber to engine support	E70 / E71			19 Nm
7AZ Reinforcement plate to front axle support	E90 / E91 / E92	M8		19 Nm
8AZ Support angle to engine mount or front axle support	E90 / E91 / E92	M8		19 Nm



22 32 Transmission mounting

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Bolt to transmission cross member	E60 / E65 / E66 / E67			30 Nm
2AZ Transmission bearing support to transmission	E60 / E61 / E63 / E64 / E65 / E66 / E67 / E81 / E82 / E84 / E85 / E86 / E87 / E88 / E89 / E90 / E91 / E92 / E93	M10x35	ASA screw 1sa flat-head screw	38 Nm
		M10x32.5		48 Nm
3AZ Transmission mount to transmission/transmission cross member	E60 / E61 / E63 / E64 / E67 / E81 / E82 / E84 / E85 / E86 / E87 / E88 / E89 / E90 / E91 / E92 / E93	M8		19 Nm
4AZ Transmission cross member to body	E85 / E86 / E46 / E83	M8		21 Nm
	E60 / E61 / E63 / E64 / E67 / E81 / E82 / E84 / E87 / E88 / E89 / E90 / E91 / E92 / E93			19 Nm
	E53	M10		41 Nm
	E70 / E71 / E72	M10		38 Nm
5AZ Transmission cross member to rubber mounts	E46 / E53 / E83	M12		73 Nm
	E70 / E71 / E72 / E84	M12		68 Nm
6AZ Vibration absorber to transmission cross member	E60 / E61	M10		38 Nm



2211 Overview of tightening torques

Engine support arm to engine

M10	38Nm
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Left/right engine mount to engine support arm

M10	56Nm
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M12	68Nm
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37 11 Control and suspension elements, front

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Vent valve to oscillating motor	E60 / E61 / E63 / E64 / E65 / E66			14 Nm
2AZ Vent hose to vent valve	E60 / E61 / E63 / E64 / E65 / E66			5 Nm



22 32 Transmission mounting

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Bolt to transmission cross member	E60 / E65 / E66 / E67			30 Nm
2AZ Transmission bearing support to transmission	E60 / E61 / E63 / E64 / E65 / E66 / E67 / E81 / E82 / E84 / E85 / E86 / E87 / E88 / E89 / E90 / E91 / E92 / E93	M10x35	ASA screw 1sa flat-head screw	38 Nm
		M10x32.5		48 Nm
3AZ Transmission mount to transmission/transmission cross member	E60 / E61 / E63 / E64 / E67 / E81 / E82 / E84 / E85 / E86 / E87 / E88 / E89 / E90 / E91 / E92 / E93	M8		19 Nm
4AZ Transmission cross member to body	E85 / E86 / E46 / E83	M8		21 Nm
	E60 / E61 / E63 / E64 / E67 / E81 / E82 / E84 / E87 / E88 / E89 / E90 / E91 / E92 / E93			19 Nm
	E53	M10		41 Nm
	E70 / E71 / E72	M10		38 Nm
5AZ Transmission cross member to rubber mounts	E46 / E53 / E83	M12		73 Nm
	E70 / E71 / E72 / E84	M12		68 Nm
6AZ Vibration absorber to transmission cross member	E60 / E61	M10		38 Nm



2232 Overview of tightening torques

Transmission cross member to body		
M8		19Nm
Transmission mount to transmission/transmission cross member		
M8		19Nm



23 14 Electrical fittings

Tightening Torques

Transmission designation	Type	Thread	Tightening specifications	Torque
1AZ Reversing light switch	G / H / I / C / Transmission	M12		16 Nm
2AZ Zero-gear sensor to transmission	G / H / I / C / Transmission			5 Nm



23 00 Transmission in general

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Transmission to engine Transmission designations, see 23...				
Hex screws	B / C / D / E / F / G / H / I / 7- speed SMG	M6		8 Nm
	B / C / D / E / F / G / H / I / 7- speed SMG	M8		25 Nm
	B / C / D / E / F / G / H / I / 7- speed SMG	M10		49 Nm
	B / C / D / E / F / G / H / I / 7- speed SMG	M12		74 Nm
Torx bolt	B / C / D / E / F / G / H / I / 7- speed SMG	M6		9 Nm
	B / C / D / E / F / 7-speed SMG	M8		19 Nm
	B / C / D / E / H / I / 7-speed SMG	M10		43 Nm
	G-transmission	M10		38 Nm
	7-speed SMG	M10x55 8.8		43 Nm
	7-speed SMG	M10x42 8.8		42 Nm
Steel screws with Torx head	I / G / H / K transmission	M8		19 Nm
Steel screws with Torx head	I / G / H / K transmission	M12		66 Nm
2Az Transmission to engine N52/N52K/N53/N54/N55 Aluminium screws/bolts are not magnetic.	I / G / H- transmission		Replace screws Jointing torque and angle of rotation must be observed without fail	
	I / G / H- transmission	M10x30	Jointing torque	20 Nm
			Angle of rotation	90--110°
	I / G / H- transmission	M10x85	Jointing torque	20 Nm
			Angle of rotation	180--200°
	I / G / H / K transmission	M12	Jointing torque	25 Nm
			Angle of rotation	130 ° +20°
3AZ Cover plate, transmission	I / H- transmission	M6		8 Nm



23 00 Transmission in general

Tightening Torques

Transmission designation	Type	Thread	Tightening specifications	Torque
2AZ Gearbox to clutch housing	B / C / D / E / F / G / H / I / 7- speed SMG	M12		76 Nm
3AZ Reinforcement shell to transmission	B / C / D / E / F / G / H / I / 7- speed SMG	M8		23 Nm
4AZ Oil drain plug / oil filler plug	B / C transmission			50 Nm
	D / E- transmission			52 Nm
	G / H- transmission	M18x1.5 hexagon socket		35 Nm
	H / I- transmission	M12x1.5		25 Nm
	C / I- transmission	M18X1.5	Steel screw without gasket	45 Nm
	7-speed SMG			40 Nm
5AZ Transmission extension	G / H- transmission	M10		46 Nm



2300 Overview of Technical Data

Transmission filling capacities	
	Oil capacity
	1,3 l
	Oil capacity for refilling or exchange transmission
	1,4 l



2300 Overview of tightening torques

Clutch slave cylinder to transmission		
		22Nm
Holder for underbody panelling		
		3Nm
Oil drain plug/oil filler plug (GS6-17DG)		
M12x1.5	Tightening torque	25Nm
M18x1.5 steel screw without seal	Tightening torque	45Nm
Oil drain plug/oil filler plug (GS6-37DG)		
M12x1.5	Tightening torque	25Nm
M18x1.5 hexagon socket	Tightening torque	35Nm
Transmission to engine		
M8		19Nm
M12		66Nm



23 11 Case and Cover

Tightening Torques

	Type	Thread	Tightening specification	Torque
6AZ Reverse gear shaft to case	B / C / D / E / F / G / H / I / 7- speed SMG	M8		25 Nm
	S5D 310Z / S5D 320Z	M8		20 Nm
	B / C / D / E / F / G / H / I / 7- speed SMG	M10		45 Nm
7AZ Support for reverse gear shaft	B / C- transmission	M8		25 Nm
8AZ Bearing holder to rear housing section	B / C- transmission	M6		10 Nm
9AZ Retaining tabs for sealing cap	C-transmission	M6		10 Nm
10AZ Bearing on countershaft	B-transmission	M10		90 Nm
	C-transmission	M10		30 Nm
	C-transmission	M10		60 Nm



23 11 Case and Cover

Tightening Torques

	Type	Thread	Tightening specification	Torque
11AZ Screw plug to rear housing section	B / C / D / E / F / G / H / I / 7-speed SMG	M20		60 Nm
	B-transmission	M16		40 Nm
	B / C-transmission	M22		60 Nm
12AZ Sealing caps to rear housing section	B / C-transmission	M6		10 Nm
13AZ Reversing bolt to reversing lever	ZFS-5-16 / C-transmission			43 Nm
14AZ Clamping claw to rear housing section	ZFS-5-16 / C-transmission			33 Nm
15AZ Screws on detent plate	ZFS-5-16 / C-transmission			9 Nm



23 11 Housing with lid

Tightening Torques

Transmission designation	Type	Thread	Tightening specifications	Torque
1AZ Transmission housing, rear section/front section	B / C / D / E / F / G / H / I / 7- speed SMG			22 Nm
2AZ Cover with guide tube/transmission case	B / C / D / E / F / G / H / I / C / 7- speed SMG	M8 x 22		18 Nm
	B / C / D / E / F / G / H / I / C / 7- speed SMG	M8 x 30		25 Nm
	B / C / D / E / F / G / H / I / C / 7- speed SMG	M6		10 Nm
3AZ Bearing cap/sealing flange	B / C / D / E / F / G / H / I / 7- speed SMG			10,5 Nm
4AZ Reverse gear wheel axle to intermediate housing	B / C / D / E / F / G / H / I / 7- speed SMG			49 Nm
5AZ Retaining plate for reverse gear wheel axle to intermediate case	B / C / D / E / F / G / H / I / 7- speed SMG			25 Nm
6AZ Transmission closing plate	B / C / D / E / F / G / H / I / 7- speed SMG	M6		8 Nm
7AZ Transmission oil strainer in transmission	G-transmission	M18		25 Nm



23 11 Housing with lid

Tightening Torques

	Type	Thread	Tightening specifications	Torque
16AZ Retaining plate to intermediate housing	265 / Sport	M6		9 Nm
17AZ Retaining plates of bearings on housing	S5DÂ 310Z / S5D 320Z / S5D 200G / S5D 250G	M6		10 Nm
18AZ Retaining plate to housing	S5D 320Z SMG	M6		5,5 Nm



23 14 Electrical fittings

Tightening Torques

Transmission designation	Type	Thread	Tightening specifications	Torque
1AZ Reversing light switch	G / H / I / C / Transmission	M12		16 Nm
2AZ Zero-gear sensor to transmission	G / H / I / C / Transmission			5 Nm



23 21 Transmission shafts

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Output flange	S5D 200G / S5D 250G / S5D260Z / S5DÂ 310Z / S6S 420G		Collar nut installed with screw locking Pretension Release Tighten down	190 Nm 120 Nm
	S5D 280Z / S5D 320Z		Collar nut installed with screw locking Pretension Release Tighten down	170 Nm 130 Nm
	S5D 390Z		Collar nut installed with screw locking Pretension Release Tighten down	200 Nm 145 Nm
	GS6-17BG / GS6-37BZ		Collar nut installed with screw locking Pretension Release Tighten down	170 Nm 120 Nm
	GS6-45BZ		Collar nut installed with screw locking Pretension Release Tighten down	200 Nm 150 Nm
	GS6-53DZ/BZ		Collar nut installed with screw locking Pretension Release Tighten down	200 Nm 140 Nm
	GS7S47BG		Collar nut installed with screw locking	200 Nm
2AZ Gear to countershaft	265 / Sport	M10		60 Nm
3AZ Adapter shaft to the output	GS6X45BZ			68 Nm



23 31 Interior Shift Components

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Shift arms to transmission case	S5D 310Z			45 Nm
2AZ Sealing cap for locking sleeves of gearshift rods	S6S 420G	M6		10 Nm
3AZ Retaining screw, shift actuator / selector shaft	S5D 320Z / S6S37BZ / S6S53BZ SMG	M6		10 Nm



23 41 External Gearshift Components

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ	Servomotor / actuator to transmission housing Insert screws with screw locking adhesive	S6S 420G / GS6S37BZ / GS7S47BG / GS6S53BZ SMG transmission	M6	10 Nm
2AZ	Switch for gear recognition to servomotor	S6S 420G SMG transmission	M5	6 Nm
3AZ	Hydraulic lines to servomotor	S6S 420G SMG transmission	M12x1	17 Nm
4AZ	Actuator to transmission housing	S6S 420G SMG transmission	M8	25 Nm
5AZ	Reversing light switch	B / C / D / E / F / G / H / I / J / K- gearbox	M12	16 Nm
6AZ	Pressure accumulator to valve block	GS5S31BZ / GS6S53BZ / GS6S37BZ SMG Gearbox		30 Nm
7AZ	Protective plate Expansion tank Shift actuator Hydraulic pump Valve block to transmission housing Ground strap to transmission housing	GS5S31BZ / GS6S53BZ / GS6S37BZ SMG Gearbox	M6	10 Nm
8AZ	Protective plate / valve block to transmission housing /	GS5S31BZ / GS6S53BZ / GS6S37BZ SMG Gearbox	M8	20 Nm
9AZ	Valves to valve block	GS5S31BZ / GS6S53BZ / GS6S37BZ SMG Gearbox	M4	3.5 Nm
10AZ	Pressure sensor to valve block	GS5S31BZ / GS6S53BZ / GS6S37BZ SMG Gearbox		15 Nm
11AZ	Shift/selector sensor to transmission housing	GS5S31BZ / GS6S53BZ / GS6S37BZ SMG Gearbox	M4	2.8 Nm
12AZ	Retaining screw for hydraulic line	GS5S31BZ / GS6S53BZ / GS6S37BZ SMG Gearbox		18 Nm
13AZ	Banjo bolt for hydraulic line	GS5S31BZ SMG Gearbox		16 Nm
14AZ	Heat shield to expansion tank/ pump bracket	GS6S37BZ SMG Gearbox		6 Nm
15AZ	Clutch speed sensor	GS6S53BZ / GS6S37BZ SMG Gearbox		35 Nm



16AZ	Transmission oil cooler to transmission	E60 / E63 / E64 / E61 / GS7S47BG SMG transmission	M6x35		10 Nm
17AZ	Transmission oil strainer in transmission oil cooler	E60 / E63 / E64 / E61 / GS7S47BG SMG transmission / G-transmission	M18		25 Nm
18AZ	Banjo bolt to transmission oil cooler	E60 / E63 / E64 / E61 / GS7S47BG SMG transmission	M16x1.5		40 Nm
19AZ	Union nut to screwed socket	E60 / E63 / E64 / E61 / GS7S47BG SMG transmission			40 Nm
20AZ	Oil cooler connection to transmission oil cooler	E60 / E63 / E64 / E61 / GS7S47BG SMG transmission			40 Nm
21AZ	Oil pump to transmission oil cooler	E60 / E63 / E64 / E61 / GS7S47BG SMG transmission	M6x20		10 Nm
22AZ	Speed sensor to transmission	E60 / E63 / E64 / E61 / GS7S47BG SMG transmission	M6X16		10 Nm
23AZ	Temperature and pressure sensor to hydraulic unit	E60 / E63 / E64 / E61 / GS7S47BG SMG transmission			15 Nm
24AZ	Clamp, pressure accumulator to transmission	E60 / E63 / E64 / E61 / GS7S47BG SMG transmission			22 Nm
25AZ	Pressure accumulator to pump block	E60 / E63 / E64 / E61 / GS7S47BG SMG transmission			29 Nm
26AZ	Pump block to transmission	E60 / E63 / E64 / E61 / GS7S47BG SMG transmission			22 Nm
27AZ	Banjo bolts, pressure lines clutch actuator and pump block	E60 / E63 / E64 / E61 / GS7S47BG SMG transmission			25 Nm
28AZ	Screws, actuator block	E60 / E63 / E64 / E61 / GS7S47BG SMG transmission			22 Nm



29AZ	Union nut, hydraulic line, actuator block	E60 / E63 / E64 / E61 / GS7S47BG SMG transmission			11 Nm
30AZ	Pump to electric motor	E60 / E63 / E64 / E61 / GS7S47BG SMG transmission			5 Nm
31AZ	Electric motor to pump block	E60 / E63 / E64 / E61 / GS7S47BG SMG transmission			5 Nm
32AZ	Screw plug to pump block	E60 / E61 / E63 / E64 / GS7S47BG SMG transmission			24 Nm
33AZ	Switch valve to actuator rack Clutch valve to pump rack	E60 / E61 / E63 / E64 / GS7S47BG SMG transmission			2.9 Nm



23 71 Transmission mounting

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Transmission mount (rubber mount) to cross member	B / C / D / E / F / G / H / I / 7-speed SMG	M10		42 Nm
	B / C / D / E / F / G / H / I / 7-speed SMG	M12		73 Nm
2AZ Transmission cross member to body	B / C / D / E / F / G / H / I / 7-speed SMG	M10		42 Nm
	B / C / D / E / F / G / H / I / 7-speed SMG	M8		19 Nm
	B / C / D / E / F / G / H / I / 7-speed SMG	M8	Only E83,E85,E86,E46	21 Nm
3AZ Bearing support to transmission	B / C / D / E / F / G / H / I / 7-speed SMG	M8		19 Nm
4AZ Transmission mounting bracket to transmission	B / C / D / E / F / G / H / I / 7-speed SMG	M10 ASA screw		38 Nm
	B / C / D / E / F / G / H / I / 7-speed SMG	M10 ISA flat head		48 Nm
5AZ Transmission mount to transmission support bracket/transmission cross-member	B / C / D / E / F / G / H / I / 7-speed SMG	M8		19 Nm



23 operating fluid overview

Brake fluid and hydraulic fluid

Hydraulic fluid CHF 11 S	1 l, Can	83290429576
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Transmission oil

Manual gearbox oil MTF LT-5	1 l, Can	83222156969
	20 l, Barrel	83222167666

Transmission oil

Manual gearbox oil MTF 3	1 l, Bottle	83222455210
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Transmission oil

Manual gearbox oil MTF LT-2 * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	1 l, Can	83222339219
	5 l, Can	83220309031
	1000 ml, TU*	83220396705

Transmission oil

Manual gearbox oil MTF LT-3 * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	1 l, Can	83222339221
	5 l, Can	83227533818
	1000 ml, TU*	83220396706

Transmission oil

Manual gearbox oil MTF LT-4 * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	1 l, Can	83222339223
	5 l, Can	83220421925
	1000 ml, TU*	83220430275

Transmission oil

Manual gearbox oil MTF 2 * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	1 l, Can	83222344589
	20 l, Barrel	83220403247
	1000 ml, TU*	83220403673

Transmission oil

Manual gearbox oil MTF 1	1 l	81222320384
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Manual gearbox oil with 1	1 l, Can	812229401225
* TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	1000 ml, TU*	81229401225

Transmission oil

Technically suitable manual gearbox oil	
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[Main group 23](#)



24 00 Transmission in general

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Transmission to engine				
Hex screws	A4S 200R / A4S 270R / A4S 310R / A5S 300J / A5S 310Z / A5S 325Z / A5S 440Z / A5S 560Z / A5S 360R/A5S 390R / GA6HP19Z / GA6HP26Z / GA6HP32Z	M8		24 Nm
Hex screws	A4S 200R / A4S 270R / A4S 310R / A5S 300J / A5S 310Z / A5S 325Z / A5S 440Z / A5S 560Z / A5S 360R/A5S 390R / GA6HP19Z / GA6HP26Z / GA6HP32Z	M10		45 Nm
Hex screws	A4S 200R / A4S 270R / A4S 310R / A5S 300J / A5S 310Z / A5S 325Z / A5S 440Z / A5S 560Z / A5S 360R/A5S 390R / GA6HP19Z / GA6HP26Z / GA6HP32Z	M12		82 Nm
Torx bolts	A4S 200R / A4S 270R / A4S 310R / A5S 300J / A5S 310Z / A5S 325Z / A5S 440Z / A5S 560Z / A5S 360R/A5S 390R	M8		21 Nm
Torx bolts	A4S 200R / A4S 270R / A4S 310R / A5S 300J / A5S 310Z / A5S 325Z / A5S 440Z / A5S 560Z / A5S 360R/A5S 390R	M10		42 Nm



Torx bolts	A4S 200R / A4S 270R / A4S 310R / A5S 300J / A5S 310Z / A5S 325Z / A5S 440Z / A5S 560Z / A5S 360R/A5S 390R	M12		72 Nm
Torx bolts	GA6HP19Z / GA6HP26Z	M6		9 Nm
Torx bolts	GA6HP26Z	M10		38 Nm
Steel Torx screws	GA6HP19Z / GA6L26Z / GA6L45R	M8		19 Nm
Steel Torx screws	GA6HP19Z / GA6HP26Z / GA6L45R	M12		66 Nm
2AZ Transmission to engine N51/N52/N52K/N53/N54/N55 Aluminium screws are not magnetic	GA6HP19Z / GA6HP26Z / GA6L45R		Replace screws Jointing torque and angle of rotation must be observed without fail	
	GA6HP19Z / GA6L45R	M10x30	Jointing torque	20 Nm
			Angle of rotation	90-110 °
	GA6HP19Z	M10x85	Jointing torque Angle of rotation	20 Nm 180-200 °
	GA6HP19Z / GA6L45R	M12	Jointing torque	25 Nm
			Angle of rotation	130 °
3AZ Reinforcement shell to transmission/extension	A4S 200R / A4S 270R / A4S 310R / A5S 300J / A5S 310Z / A5S 325Z / A5S 440Z / A5S 560Z / A5S 360R/A5S 390R / GA6HP19Z / GA6HP26Z / GA6HP32Z	M8		23 Nm
4AZ Cover plate for transmission	GA6HP19Z / GA6L45R	M6		9 Nm
5AZ Heat shield, oil sump	GA6L45R / GA6HP19Z	M6		8 Nm
6AZ Air duct plate	GA6HP26Z	M6		10 Nm
7AZ Line cover plate	GA6HP26Z	M6		10 Nm



2400 Overview of tightening torques

Transmission to engine	
Torx screwM6	9Nm
Torx screwM8	19Nm
Torx screwM12	66Nm



24 11 Transmission Case, Oil Sump

Tightening Torques

	Type	Thread	Tightening specification	Torque
8AZ Oil filler pipe	3HP-22			105 Nm
	4HP-22 / 4HP-24 / A5S 310Z			98 Nm
9AZ Plug	A4S 200R / A4S 270R / A4S 310R / A5S 300J / A5S 310Z / A5S 325Z / A5S 440Z / A5S 560Z / A5S 360R / A5S 390R / GA6HP19Z / GA6HP26Z / GA6HP32Z	M18		43 Nm
10AZ Oil duct screw plugs	A5S 300J			8 Nm
	A5S 310Z / A5S 560Z			15 Nm
11AZ Damper cover on transmission case	A5S 300J	M6		10 Nm
12AZ Radial shaft seal to converter housing	A4S 270R / A4S 310R / A5S 360R / A4S 360R	M4		3 Nm
13AZ Intermediate plate on intermediate housing	A4S 270R / A4S 310R	5/16 inch		25 Nm



24 11 Transmission housing, transmission oil sump

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Transmission extension	A4s 200R / A5S 300J / A5S 310Z / A5S 325Z / A5S 440Z / A5S 560Z / A5S 390R / GA6HP19Z / GA6HP26Z / GA6HP32Z	M8		25 Nm
	A4S 270R / A4S 310R	5/16 inch		32 Nm
	A5S 360R / A4S 360R	M8		22 Nm
2AZ Guard	A4s 200R / A5S 300J / A5S 310Z / A5S 325Z / A5S 440Z / A5S 560Z / A5S 390R / GA6HP19Z / GA6HP26Z / GA6HP32Z	M6		9 Nm
3AZ Converter housing	A4s 200R / A5S 300J / A5S 310Z / A5S 325Z / A5S 440Z / A5S 560Z / A5S 390R / GA6HP19Z / GA6HP26Z / GA6HP32Z	M8		25 Nm
	4HP-22 / 4HP-24	M10		46 Nm
	A4S 270R / A4S 310R	1/2 inch		42 Nm
4AZ Screw plug to intermediate plate	A4s 200R / A5S 300J / A5S 310Z / A5S 325Z / A5S 440Z / A5S 560Z / A5S 390R / GA6HP19Z / GA6HP26Z / GA6HP32Z	M10		16 Nm
	4HP-22 / 4HP-24	M14		40 Nm
	4HP-22 / 4HP-24	M20		50 Nm
	A5S 440Z	M12		23 Nm



24 11 Transmission housing, transmission oil sump

Tightening Torques

	Type	Thread	Tightening specification	Torque
5AZ Transmission oil sump	4HP-22 / 4HP-24 / A5S 310Z / A5S 325Z	M6		6 Nm
	A5S 560Z / A5S 440Z	M6		10 Nm
	A4S 270R / A4S 310R	M6		12 Nm
	A5S 360R / A4S 360R	M6		10 Nm
	A5S 300J			9 Nm
	GA6HP26Z / GA6HP19Z / GA6L45R / GA6HP32Z	M6		10 Nm
6AZ Oil drain plug	A4S 200R / A5S 310Z /	M10		16 Nm
	A5S 325Z			35 Nm
	A5S 440Z	M16x1.5		30 Nm
	A5S 560Z			50 Nm
	A5S 360R / A5S 390R	M14		18 Nm
	A4S 270R / A4S 310R			25 Nm
	A5S 300J			35 Nm
	GA6L45R	M12x1.75		14 Nm
	GA6HP19Z / GA6HP26Z / GA6HP32Z	M10x1	Metal oil sump	12 Nm
	GA6HP19Z / GA6HP26Z / GA6HP32Z	M16x1.5 M24x1	Plastic oil sump	8 Nm
7AZ Oil filler plug	A5S 325Z			30 Nm
	A5S 310Z / A5S 560Z			100 Nm
	A5S 440Z	M18x1.5		35 Nm
	A4S 270R / A4S 310R			33 Nm
	A5S 360R / A4S 360R	M14		18 Nm
	A5S 300J			40 Nm
	GA6HP26Z / GA6HP32Z	M30x1.5		80 Nm
	GA6HP19Z / GA6HP26Z / GA6HP32Z	M18x1.5		35 Nm
	GA6L45R	M18x1.5		19 Nm



2411 Overview of tightening torques

Oil filler plug (GA6HP and GA8HP)

M18

The torque to be set deviates from the specified tightening torque due to the special tool. The torque to be set must be calculated depending on the used torque.

Tightening torque

35Nm

Torque to be set

Torque to be set = $(35 \text{ Nm} \cdot L1) : L2$

Oil filler plug to transmission

M18x1.5

Tightening torque

35Nm



24 13 Transmission Extension, Bearings, Sealing Ring Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Slotted nut / output flange	A5S 310Z / A5S 440Z / A5S 560Z / A5S 325Z			120 Nm
2AZ Double hexagon nut/output flange	GA6HP26Z		up to 09/02 without sealing ring in output flange	80 Nm
	GA6HP19Z / GA6HP26Z		from 09/02 with sealing ring in output flange	60 Nm
	GA8HP45Z		with sealing ring in output flange	60 Nm
3AZ Output shaft nut to output flange	GA6L45R		Replace nut from 01/11 Nut with screw locking in thread	55 Nm



24 15 Electrical fittings

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Position switch on transmission	A4S 200R / A4S 270R / A4S 310R / A5S 300J / A5S 310Z / A5S 325Z / A5S 440Z / A5S 560Z / A5S 360R / A5S 390R / GA6HP19Z / GA6HP26Z / GA6HP32Z	M6		10 Nm



24 21 Input, Intermediate and Output Shafts

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Flange nut, output flange	A5S 300J			225 Nm
Flange nut, output flange without spring washer	A5S 360R			30 Nm
Flange nut, output flange, with spring washer	A5S 360R / A5S 390R / A4S 200R			60 Nm
	A4S 270R / A4S 310R			100 Nm



24 22 Planetary gear drive

Tightening Torques

	Type	thread	tightening specification	Torque
1AZ Brake coupling D/G on gear box housing	A5S 310Z / A5S 560Z	M10	Insert all screws until contact is made with screw head in each case center bolt both outer screws center bolt both outer screws both outer screws	30 Nm 15 Nm 63 Nm 30 Nm 63 Nm



24 23 Shift Clutches

Tightening Torques

	Type	thread	tightening specification	Torque
1AZ Torx screws for F clutch on transmission case	4HP-22 / 4HP-24	M6		10 Nm
	/ A5SÂ 560Z	M8		23 Nm
2AZ Brake band adjusting screw	A 4 S 270 R / A 4 S 310 R	5/16"		5 Nm
3AZ Lock nut of brake band adjusting screw	A 4 S 270 R / A 4 S 310 R	5/16"		21 Nm



24 30 Hydraulic / electric control parts and controlling elements

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Valve body to transmission	3HP-22	M6		11 Nm
	4HP-22 / 4HP-24 / A5S 310Z / A5S 440Z / A5S 300J / A5S 325Z / GA6HP19Z / GA6HP26Z / GA6HP32Z	M6		8 Nm
	GA6HP19Z TU / GA6HP26TU	M6		8 Nm
	A4S 270R / A4S 310R	5/16 inch		20 Nm
	A5S 360R / A4S 360R	M6		11 Nm
	A5S 560Z	M6 x 12		6 Nm
	A5S 560Z	M6 x 55		8 Nm
	GA6L45R	M5		8 Nm
2AZ Valve housing to valve body	A4S 200R / A4S 270R / A4S 310R / A5S 300J / A5S 310Z / A5S 310Z / A5S 440Z / A5S 560Z / A5S 360R / A5S 390R / GA6HP19Z / GA6HP26Z / GA6HP32Z	M6		5 Nm
3AZ Intermediate plate on shift unit	A4S 270R / A4S 310R			13 Nm
4AZ Input and output speed sensors to mechatronics		M6		12 Nm



24 31 Primary Pump Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Oil pump to case				
	A4S 270R / A4S 310R	5/16 inch	1st pass 2nd pass	10 Nm 20 Nm
	A5S 560Z	M6		10 Nm
	A5S 560Z	M5		5 Nm
	A5S 300J / A5S 440Z / A5S 310Z / A5S 325Z	M6		11 Nm
	GA6HP19Z / GA6HP26Z	M6		10 Nm
2AZ Oil strainer	A5S 440Z / A5S 560Z			5 Nm
	A5S 310Z			6 Nm
	A5S 325Z	M6		6 Nm
	A4S 270R / A4S 310R	5/16 inch		20 Nm
	A5S 300J			8 Nm
3AZ Oil pump body	A4S 270R / A4S 310R	5/16 inch		20 Nm
	A5S 310Z / A5S 560Z	M6		10 Nm
	GA6HP19Z / GA6HP26Z			10 Nm
4AZ Oil cooler pipe adapter to transmission	A5S 300J / A4S 270R / A4S 310R			28 Nm
Hollow bolt	A5S 440Z	M18x1.5		25 Nm
Cap screw	A5S 440Z	M18x1.5		20 Nm



24 32 Controller

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Governor flange to transmission	A4S 200R / A4S 270R / A4S 310R / A5S 300J / A5S 310Z / A5S 325Z / A5S 440Z / A5S 560Z / A5S 360R / A5S 390R / GA6HP19Z / GA6HP26Z / GA6HP32Z	M8		16 Nm
2AZ Threaded bolt to centrifugal governor	A4S 200R / A4S 270R / A4S 310R / A5S 300J / A5S 310Z / A5S 325Z / A5S 440Z / A5S 560Z / A5S 360R / A5S 390R / GA6HP19Z / GA6HP26Z / GA6HP32Z	M6		3 Nm
3AZ Hexagon nut to threaded bolt	A4S 200R / A4S 270R / A4S 310R / A5S 300J / A5S 310Z / A5S 325Z / A5S 440Z / A5S 560Z / A5S 360R / A5S 390R / GA6HP19Z / GA6HP26Z / GA6HP32Z			10 Nm
4AZ Hexagon screw to centrifugal governor	A4S 200R / A4S 270R / A4S 310R / A5S 300J / A5S 310Z / A5S 325Z / A5S 440Z / A5S 560Z / A5S 360R / A5S 390R / GA6HP19Z / GA6HP26Z / GA6HP32Z	M6		11 Nm
5AZ Governor housing to hub	4HP-22H	M6		11 Nm



24 34 Shift travel valves, parking lock

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Pressure regulator to valve housing	4HP-22EH / 4HP-24EH / A5S 310Z	M6		5 Nm
	A4S 270R / A4S 310R			10 Nm
2AZ Solenoid valve to valve housing	4HP-22EH / 4HP-24EH / A5S 310Z	M6		5 Nm
	A4S 270R / A4S 310R			10 Nm
	A5S 560Z			6 Nm
	A5S 300J	M5		3 Nm
	A5S 300J	M6		8 Nm
3AZ Guide Plate / Parking Lock Mechanism	A5S 310Z			10 Nm
	A5S 325Z			10 Nm
	A5S 560Z			23 Nm
	A5S 360R / A4S 360R	M6		21 Nm
	A5S 440Z	M6		10 Nm
4AZ Pulse sender	A5S 310Z / A5S 440Z	M5		5 Nm
	A5S 560Z	M5		6 Nm
		M8		23 Nm
	A5S 360R / A4S 360R	M6		11 Nm
	A5S 300J	M5		6 Nm
5AZ Cover for servo piston on shift unit	A4S 270R / A4S 310R	5/16 inch		25 Nm
6AZ Retaining plate for solenoid valves and pressure regulator on shift unit	A5S 440Z	M5		5 Nm
	A5S 325Z			6 Nm
7AZ Retaining plate for solenoid valves and EDS valves to hydraulic unit	GA6HP19Z / GA6HP26Z			5 Nm
8AZ Electronic module to hydraulic unit	GA6HP19Z / GA6HP26Z			8 Nm



24 34 Shift Valves, Parking Lock

Tightening Torques

	Type	thread	tightening specification	Torque
7AZ Pulse generator, output speed	A5S 325Z			6 Nm
8AZ Pulse generator, turbine speed	A5S 325Z			8 Nm
9AZ Plug	A5S 325Z			20 Nm



24 35 Wire Harness, Shift Elements and Sensor

Tightening Torques

	Type	thread	tightening specification	Torque
1AZ Transmission socket to case	4HP-22 EH / 4 HP-24EH / A5S 310Z	M26		12 Nm
	A4S 270R / A4S 310R	M26		14 Nm



24 40 Torque converter

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Torque converter to flywheel		M8		26 Nm
	A4S 270R / A4S 310R / A5S 310Z / A5S 300J / A5S 440Z / A5S 560Z / A5S 325Z / A4S 200R / GA6HP26Z / GA6HP19Z	M10 8.8		45 Nm
	A5S360/ 390R	M10		45 Nm
	A5S360/ 390R / GA6HP19Z / GA6HP26Z / GA6HP32Z / GA6L45R	M10 10.9		56 Nm



2440 Overview of tightening torques

Torque converter on the drive plate	
M10 Renew screws.	56Nm



24 51 External shift linkage

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Selector lever on transmission	A4S 200R / A4S 270R / A4S 310R / A5S 310Z / A5S 325Z / A5S 440Z / A5S 560Z / A5S 360R / A5S 390R / GA6HP19Z / GA6HP26Z / GA6 HP32Z / GA6L45R	M8x1		10 Nm
	A5S 300J	M8		15 Nm



24 52 Interior Shift Elements

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Shift segment to shaft	A4S 270R / A4S 310R			22 Nm
	A5S 300J	M14x1.5		35 Nm
2AZ Detent spring on shift unit	A4S 270R / A4S 310R	5/16"		25 Nm



24 71 Transmission mounting

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Cross member to body	E36 / E38 / E39 / E46 / E53 / E85 / E86 / E83			21 Nm
	E60 / E61 / E63 / E64 / E66 / E67 / E68 / E65 / E83 / E81 / E87 / E93 / E92 / E91 / E90 / E88 / E82 / E89 / E84	M8		19 Nm
2AZ Rubber mounts to cross member or transmission	E36 / E38 / E39 / E46 / E53			21 Nm
	E81 / E60 / E61 / E63 / E64 / E65 / E66 / E87 / E93 / E92 / E91 / E90 / E87 / E86 / E85 / E68 / E67 / E88 / E82 / E89 / E84			19 Nm
	E83			73 Nm
3AZ Support tube to engine subframe	E36			42 Nm
4AZ Rubber mounts to carrier pipe	E36			21 Nm
5AZ Carrier plate	E36			21 Nm
6AZ Transmission support block to transmission	E60 / E61 / E63 / E64 / E87 / E85 / E86 / E87 / E90 / E91 / E92 / E93 / E81 / E82 / E88 / E84		ASA screw	38 Nm
	E60 / E61 / E63 / E64 / E87 / E85 / E86 / E87 / E90 / E91 / E92 / E93 / E81 / E82 / E88 / E84	M10	M10 ISA pan-head screw	48 Nm
7AZ Transmission mount to transmission support bracket/transmission cross-member	E60 / E61 / E63 / E64 / E87 / E90 / E91 / E92 / E93 / E81 / E82 / E88 / E84			19 Nm



2471 Overview of tightening torques

Transmission cross member	
	19Nm



24 operating fluid overview

Transmission oil

Automatic transmission fluid ATF D II	1 l, Can	81229400272
	60 l, Barrel	81229400275

Transmission oil

Automatic transmission fluid ATF D VI	1 l, Can	83222167718
	5 l, Barrel	83222167720

Transmission oil

Automatic transmission fluid ATF 1	1 l, Can	83222305395
	5 l, Can	83222344588

Transmission oil

Automatic transmission fluid ATF 4	1 l, Bottle	83222344206
	20 l, Barrel	83229407807

Transmission oil

Automatic transmission fluid ATF 5	1 l, Bottle	83222344207
	20 l, Barrel	83220442817

Transmission oil

Automatic transmission fluid ATF 6	1 l, Bottle	83222355599
	20 l, Barrel	83222355601

Transmission oil

Automatic transmission fluid JWS 3309	1 l, Bottle	83227542290
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Transmission oil

Automatic transmission fluid ATF 3+	1 l, Bottle	83222289720
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Transmission oil

Automatic transmission fluid ATF 33 * TU = Trade Unit. TU numbers cannot be ordered!	20 l, Barrel	83220403580
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For invoicing purposes only.	1000 ml, TU*	83220406574
Transmission oil		
Automatic transmission fluid ATF D III * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	1 l, Can	83229407858
	1000 ml, TU*	83229407860
Transmission oil		
Automatic transmission fluid ATF 2 * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	1 l, Can	83222305396
	20 l, Barrel	83220142516
	1000 ml, TU*	83220144137



25 11 Shift Console - Manual Transmission

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Front console to shift console	E36 / E38 / E39 / E46 / E53 / E60 / E61 / E63 / E64 / E83 / E85 / E86 / E87 / E90 / E91 / E92, with sheet metal console			25 Nm
2AZ Shift console to transmission	E36 / E38 / E39 / E46 / E53 / E60 / E61 / E63 / E64 / E83 / E85 / E86 / E87 / E90 / E91 / E92, with sheet metal console			23 Nm
3AZ Rear shift console to body	E36 / E38 / E39 / E46 / E53 / E60 / E61 / E63 / E64 / E83 / E85 / E86 / E87 / E90 / E91 / E92			11 Nm
4AZ Aluminium shift arm console to transmission	E30 / M3			21.5 Nm
5AZ Aluminium shift arm to console	E30 / M3			11 Nm
6AZ Shift arm console to body	E36 / E38 / E39 / E46 / E53 / E60 / E61 / E63 / E64 / E83 / E85 / E86 / E87 / E90 / E91 / E92			21 Nm
	E31			9 Nm
7AZ Adjustable shift rod (clamping sleeve)	E31			23 Nm
8AZ Support bearing to transmission tunnel	E53			21.5 Nm
10AZ Hose clamp, vibration damper	E60 / E61			6 Nm



2511 Overview of tightening torques

Wishbone to body	
M6	10Nm



25 16 Gearshift bracket - Automatic Transmission

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Bowden cable to gearshift bracket/transmission	E36 / E38 / E39 / E46 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E67 / E68 / E83 / E85 / E86 / E87 / E90 / E91 / E92 / E81 / E82 / E88			15 Nm
2AZ Clamping screw on shift lever	E36 / E38 / E39 / E46 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E67 / E68 / E83 / E85 / E86 / E87 / E90 / E91 / E92 / E93 / E81 / E82 / E88 / E89 / E84			10 Nm
3AZ Gearshift bracket to tunnel	E36 / E38 / E39 / E46 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E67 / E68 / E83 / E85 / E86 / E87 / E90 / E91 / E92 / E93 / E81 / E82 / E88 / E89 / E84			7 Nm
4AZ Switch to gearshift bracket	E36 / E38 / E39 / E46 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E67 / E68 / E83 / E85 / E86 / E87 / E90 / E91 / E92			4,5 Nm
5AZ Interlock cable to gearshift bracket	E36 / E38 / E39 / E46 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E67 / E68 / E83 / E85 / E86			7 Nm
6AZ Cable retaining tab to transmission	E91 / E92 4WD / E84 N55	M8X18		19 Nm
7AZ Oval-head screw for emergency release device	E60, E61			1,6 Nm



8AZ Screw for adjusting cable on transmission	E60 / E61 / E81 / E82 / E83 / E84 / E87 / E88 / E90 / E91 / E92 / E93		With ball head	13 Nm
9AZ Vulcanised support angle to transmission	E81 / E82 / E87 / E88 / E90 / E91 / E92 / E93 / E84	M6		9 Nm
10AZ Nut, support angle	E60 / E61 / E81 / E82 / E83 / E84 / E87 / E88 / E90 / E91 / E92 / E93	M8		19 Nm



2516 Overview of tightening torques

Clamping bolt to lever	
	10Nm



26 11 Propeller Shaft. complete

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Flexible disc to propeller shaft and transmission output flange Steel propeller shaft	E36 / E38 / E39 / E46 / E52 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E83 / E85 / E87 / E90 / E91	M10 8.8		48 Nm
	E36 / E38 / E39 / E46 / E52 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E83 / E85 / E87 / E90 / E91	M10 10.9		64 Nm
	E31 / E38 / E39 / E46	M14		140 Nm
	E32 / E34 / E36 / E38 / E39	M12 8.8		81 Nm
	E60 / E61 / E63 / E64	M12 8.8		90 Nm
	E32 / E34 / E36 / E38 / E39 / E46 / E53 / E85	M12 10.9		100 Nm
	E60 / E61 / E63 / E64	M12 10.9	Jointing torque Angle of rotation	55 Nm 90 °
	E39 (M5) / E36 (M3) / E46 (M3), E65	M12 10.9		115 Nm 90 Nm
Flexible disc to transmission output flange	E46 / E39 / E60 / Only M57		Screw with rolled-on washer only Jointing torque Angle of rotation	 50 Nm 90 °
Flexible disc to transmission output flange	E65 / E66 / All except N73, M67		Screw with rolled-on washer only Jointing torque Angle of rotation	 50 Nm 90 °
	E60 / E61 / E63 / E64 / E65 / E66 / E67	M12 10.9	Double-stage flexible disc Jointing torque Angle of rotation	 50 Nm 90°
Flexible disc on propeller shaft	E83	M12 10.9	Tighten via nut	100 Nm
Flexible disc to transmission output flange	E83	M12 10.9		90 Nm
Aluminium propeller shaft: Flexible disc to transmission output flange	E39 / E60	M12 10.9		100 Nm
Aluminium propeller shaft: Flexible disc on propeller shaft	E39 / E60	M12 10.9		90 Nm



	E60 / E61 / E63 / E64	M10 10.9		64 Nm
	E60	M12 8.8		90 Nm
	E63 (N52)	M12		110 Nm
Flexible disc to transmission output flange ZNS screws and nuts Shiny zinc coating All versions			Replace bolts and nuts Jointing torque and angle of rotation must be observed without fail	
	E60 / E61 / E63 / E64 / E85 / E86 / E87 / E90 / E91 / E92 / E93 / E81 / E82 / E83 / E84 / E88 / E89	M10-10.9	Jointing torque	20 Nm
			Angle of rotation	90 °
	E46 / E53 / E60 / E61 / E63 / E64 / E65 / E85 / E86 / E87 / E90 / E91 / E92 / E93 / E70 / E71 / E72 / E81 / E82 / E83 / E84 / E88 / E89	M12-10.9	Jointing torque	55 Nm
			Angle of rotation	90 °
	E60 / E61 / E63 / E64 / E65	M12-8.8	Jointing torque	30 Nm
			Angle of rotation	90 °
2AZ Coupling propeller shaft to transmission	E83	M12- 10.9	Jointing torque Angle of rotation Screw with ribbed teeth + double stage flexible disc	30 Nm 90 °
2AZ Coupling propeller shaft to transmission	E36 / E38 / E39 / E46 / E52 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E83 / E85 / E87 / E90 / E91	M10		60 Nm
	E32 / E31	M12		95 Nm
3AZ Clamping ring for slide after installation in the car	E36 / E38 / E39 / E46 / E52 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E83 / E85 / E87 / E90 / E91			10 Nm
	E30 / All-wheel drive vehicle			22 Nm



26 11 Propeller Shaft. complete

Tightening Torques

	Type	Thread	Tightening specifications	Torque
4AZ Propeller shaft to drive flange (rear axle final drive)				
Version, universal joint: Compression nut	E36 / E38 / E39 / E46 / E52 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E83 / E85	M10	Only finned nuts to higher tightening torque	64 Nm
Version, universal joint: Torx bolt	E36 / E38 / E39 / E46 / E52 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E83 / E85	M10		85 Nm
Version, constant-velocity joint: Torx bolt	E46 (M3) / E38/ E39/ E46 / E60 / E83(M57TU)E63(N52)	M10		70 Nm
Version, constant-velocity joint: Compression nut	E36 / E38 / E39 / E46 / E52 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E83 / E85	M8		32 Nm
Compression nut	E36 / E38 / E39 / E46 / E52 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E83 / E85	M10		64 Nm
Finned nut	E36 / E38 / E39 / E46 / E52 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E83 / E85	M8		43 Nm
Finned nut	E36 / E38 / E39 / E46 / E52 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E83 / E85	M10		70 Nm
ZNS screws and nuts, shiny zinc coating All versions with universal or constant-velocity joint			Replace bolts and nuts Jointing torque and angle of rotation must be observed without fail	
	E83 / E85 / E86 / E87 / E90 / E91 / E92 / E93 / E81 / E82 / E84 / E88	M10-10.9 screw with ribbed teeth	Jointing torque	40 Nm
			Angle of rotation	45 °
	E92 M3 / E82 M Coupé	M10 screw with ribbed teeth	Jointing torque	20 Nm
			Angle of rotation	90 °
	E46 / E60 / E61 / E63 / E64 / E65 / E66 / E83 / E85 / E86 / E81 / E82 / E87 / E90 / E91 / E92 / E93 / E88 / E84	M10-10.9	Jointing torque	20 Nm
			Angle of rotation	90 °
Screw with ribbed teeth	E85 / M, E86 / M	M12x55-10.9	Jointing torque	55 Nm
			Angle of rotation	90 °
Screw with ribbed teeth	E85 / M, E86 / M	M10x46-10.9	Replace screws and washers	70 Nm



5AZ Pivot fork piece to centre propeller shaft bearing journal with Loctite (Version without slide)	E36 / E38 / E39 / E46 / E52 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E83 / E85 / E86 / E87 / E90 / E91 / E92			97 Nm
6AZ Centre mount to body	E36 / E38 / E39 / E46 / E52 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E70 / E71 / E72 / E81 / E83 / E82 / E84 / E85 / E86 / E87 / E88 / E89 / E90 / E91 / E92 / E93			21 Nm
7AZ Flexible disc to front axle differential	E53	M10-10.9		60 Nm
8AZ Flexible disc on propeller shaft	E53	M10-10.9		64 Nm
9AZ Front propeller shaft to transfer box/front differential ZNS screws and nuts, shiny zinc coating			Replace bolts and nuts Jointing torque and angle of rotation must be observed without fail	
	E60 / E61 / E90 / E91 / E92 / E84 / E70 / E71	M8	Jointing torque	20 Nm
			Angle of rotation	45 °
	E46	M10-10.9	Jointing torque	20 Nm
			Angle of rotation	45 °
	E53 / E70 / E71 / E72	M10-12.9	Jointing torque	10 Nm
Universal joint	E70 / E71 / E72 / E83	M10-10.9	Angle of rotation	45 °
			Jointing torque	40 Nm



2611 Overview of tightening torques

Centre mount to body

	21Nm
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Front flexible disc on the transmission

Renew screws and nuts. Tightening via screw.

Jointing torque	55Nm
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Angle of rotation	90°
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Front flexible disc on the transmission

Different screws may be installed. Select the correct torque according to the screw connection. ZNS screw can be recognized by the fact that they are coated with shiny zinc.

M10 8.8	48Nm
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M10 10.9	64Nm
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M12 10.9	90Nm
----------	------

ZNS screw with nut M10 10.9	Jointing torque	20Nm
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Renew screws and nuts.

Angle of rotation	90°
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ZNS screw with nut M12 10.9	Jointing torque	55Nm
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Renew screws and nuts.

Angle of rotation	90°
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Propeller shaft (universal joint) to rear axle differential

Different screws may be installed. Select the correct torque according to the screw connection.

ZNS screw with nut M10 10.9 Ribbed serration	Jointing torque	40Nm
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Renew ZNS screw and nut.

Angle of rotation	45°
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ZNS screw with nut M10 10.9	Jointing torque	20Nm
-----------------------------	-----------------	------

Renew ZNS screw and nut.

Angle of rotation	90°
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ZNS screw with nut M12 10.9	Jointing torque	55Nm
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Renew ZNS screw and nut.

Angle of rotation	90°
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26 operating fluid overview

Expendable materials

Lubricating grease Optitemp HT 1 LF	50 g, Tube	83230417754
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Expendable materials

Lubricating grease Olistamoly 2 LN 584 LO	100 g, Tube	83 19 0 447 919
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27 operating fluid overview

Transmission oil

Transfer box oil DTF 1	1 l, Bottle	83222409710
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Transmission oil

Hypoid Axle Oil G1	3x 500 ml, Bottle	83222295532
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Expendable materials

Mounting grease GE	5 g, Tube	83232357146
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Transmission oil

Technically suitable transfer box and electrical transmission oils	
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[Main group 27](#)

Expendable materials

Solvent cleaner GE	300 ml, Can	83232357553
* TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	50 ml, TU*	83232288661



28 operating fluid overview

Transmission oil

Double-clutch transmission oil DCTF-1+	1 l, Bottle	83222446673
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Expendable materials

Twin-clutch gearbox oil BMW DCTF-2	1 , Bottle	83 22 2 433 157
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31 10 Front Axle Suspension

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Front axle carrier to engine carrier	E30, E31, E32, E34	M10 8.8	Replace screws (E30 AWD insert with Loctite)	42 Nm
	E30, E31, E32, E34	M10 9.8	Replace screws	47 Nm
	E36	M12 12.9	Replace screws	105 Nm
	E36, E46	M12 10.9	Replace screws	110 Nm
	E38, E39	M12 8.8	Replace screws	77 Nm
	E52	M12 front 10.9 middle 8.8 rear 8.8	Replace screws	75 Nm
	E53, E60 / Rear end, E61 / Rear end, E63, E64, E65, E66, E67, E85, E86	M12 10.9	Observe repair instruction.	100 Nm
2AZ Front end of front axle carrier to body	E60 / Four Wheel Drive, E61 / Four Wheel Drive	M12 10.9	Observe repair instruction. Replace screws Jointing torque Torque angle	100 Nm 90 °
	E34 / Four Wheel Drive	M10 8.8		47 Nm
3AZ Front axle subframe rear / middle to body	E83	M12 10.9		113 Nm
	E34 / Four Wheel Drive	(collar screw)		59 Nm
	E83	M10 10.9		50 Nm
4AZ Front axle carrier with reinforcement to engine carrier	E83	M12 10.9		100 Nm
	E31			47 Nm
5AZ Cruciform reinforcement to door sill	E31			42 Nm
6AZ Reinforcement to bracket Bracket to body	E31			42 Nm
7AZ Reinforcement (sleeve) to body	E31			127 Nm
8AZ Front end reinforcement on front axle carrier/engine carrier	E46		Replace screws; first tighten down rear screws Jointing torque Torque angle	59 Nm 90+30 °
9AZ Reinforcement plate to front axle support/engine carrier	E53		Replace screws & nuts Jointing torque Torque angle	56 Nm 90 °



	E60 / Rear end, E61 / Rear end, E63, E64, E65, E66, E67		Replace screws & insertion nuts	56 Nm
			Jointing torque Torque angle	56 Nm 90 °
	E60 / Four Wheel Drive, E61 / Four Wheel Drive		Replace screws	
			Jointing torque Torque angle	56 Nm 90 °
	E83	M10	Replace screws	74 Nm
10AZ Adapter to body	E46 / Four Wheel Drive		Replace screws	59 Nm
11AZ Front axle support to adapter	E46 / Four Wheel Drive		Replace screws	110 Nm
12AZ Heat shield to front axle carrier	E60, E61, E63, E64, E65, E66, E67			8 Nm
13AZ Mounting bracket to front axle carrier / engine carrier	E60 / Four Wheel Drive, E61 / Four Wheel Drive	M8 x 26		19 Nm



31 12 Axle guide and axle strut

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Tension strut to front axle support	E12, E24 / to 5.82		Tighten in normal position.	80 Nm
	E23		Tighten in normal position.	135 Nm
	E39, E52		Tighten in normal position.	110 Nm
	E53		Replace screw. Tighten in normal position.	165 Nm
	E60, E61, E63, E64, E65, E66, E67	M12 10.9	Replace bolt and nut. Tighten in normal position. Jointing torque Angle of rotation	100 Nm 90 °
	E83		Replace screw. Tighten in normal position. Jointing torque Angle of rotation	165 Nm 90 °
2AZ Wishbone to front axle support	E24 / from 5.82, E28, E31, E32, E34, E38, E39 / 8 Cylinder		tighten in normal position	77,5 Nm
	E39 / 6 Cylinder, E52		Tighten in normal position.	110 Nm
	E12, E21, E23, E24 / to 5.82		Tighten in normal position.	85 Nm
	E53, E60, E61, E63, E64, E65, E66, E67, E83	M12 10.9	Replace bolt and nut. Tighten in normal position. Jointing torque Angle of rotation	100 Nm 90±15 °
3AZ Wishbone (ball joint) to front axle support	E30		Replace nut.	85 Nm
	E36, E46		Replace nut.	90 Nm
	E30 / 4WD		Replace nut.	100 Nm
	E85, E86	M14x1,5	Replace nut.	80 Nm
4AZ Wishbone to spring strut	E21, E30			65 Nm
5AZ Wishbone to swivel bearing/spring strut	E30 / 4WD			85 Nm
	E30 / 4WD	Polystop nut		93 Nm
	E34 / 4WD			80 Nm
6AZ Wishbone to swivel bearing/steering knuckle	E36, E46, E85, E86		Use of impact wrench not permitted! Replace nut.	65 Nm
	E38		Replace nut.	93 Nm
	E39, E53, E52, E83, E60 / 4WD, E61 / 4WD, E67		Replace nut.	80 Nm



	E60 / Rear end, E61 / Rear end, E63, E64, E65, E66		Replace nut.	165 Nm
7AZ Bracket for wishbone to engine support	E30			42 Nm
	E36			47 Nm
	E46		Replace screws.	59 Nm
	E85, E86	M10 10.9	Replace screws.	56 Nm
8AZ Ball joint for wishbone to front axle support	E34 / 4WD, E46 / 4WD			77 Nm
9AZ Wishbone to ball joint	E34 / 4WD, E46 / 4WD			80 Nm
10AZ Wishbone mount to front axle support	E34 / 4WD			47 Nm
	E46 / 4WD		Replace screws.	59 Nm
11AZ Compression strut to body	E24 / from 5.82, E28		Tighten in normal position.	130 Nm
12AZ Compression strut to track-rod arm/steering knuckle/swivel bearing	E24, E28 / from 5.82, E31, E32, E34, E38			93 Nm
	E39			80 Nm
13AZ Compression strut to connecting pipe/front axle support	E31, E32, E34, E38, E39		Tighten in normal position.	127 Nm
14AZ Compression strut to cross reinforcement	E31		Tighten in normal position.	127 Nm
15AZ Connecting pipe to body	E31, E32, E34			127 Nm
16AZ Support for connecting pipe to body	E31, E32, E34			59 Nm
17AZ Connecting pipe to compression strut bearing	E24 / from 5.82, E28			60 Nm
18AZ Tension strut on the track-rod arm	E23			85 Nm
19AZ Tension strut to steering knuckle/swivel bearing	E39, E52, E67			80 Nm
	E60 / Rear end, E61 / Rear end, E63, E64, E65, E66			165 Nm
20AZ Tension strut to guide joint	E53, E83		Replace nut.	80 Nm
	E60 / 4WD, E61 / 4WD		Replace nut.	165 Nm
21AZ Guide joint to swivel bearing	E53, E60 / 4WD, E61 / 4WD, E83		Replace screws.	60 Nm



31 21 Wheel Bearings and Steering Knuckle

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Collar nut (bearing unit)	E24 / from 5.82, E28, E30, E31, E32, E34, E36, E38, E46, E85, E86			290 Nm
	E67			420 Nm
2AZ Drive flange to axle shaft	E30 / 4WD, E34 / 4WD		Replace collar nut.	250 Nm
	E46 / 4WD, E53, E60 / 4WD, E61 / 4WD, E67, E83		Replace collar nut.	420 Nm
3AZ Castle nut adjusting instructions	E12, E21, E23, E24 / from 5.82		Observe repair instructions.	
4AZ Steering stub on spring strut	E36	M12x20	Replace screws.	107 Nm
	E36	Shoulder screw M12x42		107 Nm
	E39	Bolt with flange M12x1.5x95		81 Nm
	E38, E46, E85, E86, E60, E61, E63, E64	M12	Replace screw.	81 Nm
5AZ Bearing unit on swivel bearing	E39, E52, E60 / Rear end, E61 / Rear end, E63, E64, E65, E66		Replace screws.	110 Nm



3121 Overview of tightening torques

Drive flange to front axle shaft	
Collar nut	420Nm
Replace collar nut.	



31 31 Spring Struts

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Spring strut support bearing / adapter for rough road package to wheel arch / adapter for rough road package	E60, E61, E63, E64, E65, E66, E67, E83, E85, E86	Flanged hexagon nut	Replace nuts	34 Nm
	E28, E30, E31, E32, E34, E36 / S50 / S52, E38, E39	Hexagon flange nut dia. 18 mm	Replace nuts	24 Nm
	E36 / S50 / S52	Flanged hexagon nut dia. 21 mm	Replace nuts and secure with Loctite 242	27 Nm
	E32, E34, E36, E46, E53	Flanged hexagon nut dia. 21 mm	Replace nuts	34 Nm
	E52	Hexagon flange nut dia. 18 mm	Replace nuts	28 Nm
2AZ Shock absorber piston rod on thrust bearing	E12, E21, E23, E24 / until 5.82			80 Nm
	E24 / from 5.82, E30, E31, E32, E34	M12 (with external hexagon piston rod)		64 Nm
	E24 / from 5.82, E30, E31, E32, E34	M12 (with internal hexagon piston rod)		44 Nm
	E36, E38, E39, E46, E52, E53, E60, E61, E63, E64, E65, E66, E67, E83, E85, E86		Replace nut	64 Nm
3AZ Spring strut shock absorber to pivot mount	E34 / Four Wheel Drive			80 Nm
	E53		Replace screw & nut	250 Nm
	E52, E60 / except AWD, E61 / except AWD, E63, E64, E65, E66		Replace screw & nut	81 Nm
	E60 / Four Wheel Drive, E61 / Four Wheel Drive, E67, E83		Replace screw & nut	100 Nm



31 35 Stabilizer Bar

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Retaining bar for stabilizer to front axle carrier / body	E21			50 Nm
	E12, E24 / until 5.82			45 Nm
	E36, E46, E39, E52, E85, E86	M8	tighten in normal position	21 Nm
	E65, E66, E67		Replace nuts	28 Nm
	E60, E61, E63, E64		Replace nuts	30.5 Nm
	E83	M10 10.9		56 Nm
2AZ Stabilizer to control arm	E21		tighten in normal position	130 Nm
3AZ Stabilizer link to control arm and stabilizer	E23	M8	tighten in normal position	25 Nm
	E23	M10	tighten in normal position	50 Nm
4AZ Stabilizer link to control arm	E34 / Four Wheel Drive			22 Nm
5AZ Stabilizer link to stabilizer	E34 / Four Wheel Drive			78 Nm
	E38, E46, E83			65 Nm
	E85, E86	M10		58 Nm
6AZ Stabilizer link on spring strut shock absorber and stabilizer	E28	(yellow chrome-plated)		30 Nm
	E24 / from 5.82, E28 / from 5.82	(white chrome-plated)		33 Nm
	E24 / from 5.82, E28, E31, E32, E34	(yellow)	(wrench surface on ball head must be parallel to absorber axle)	59 Nm
7AZ Stabilizer link on spring strut shock absorber and stabilizer (wrench surface on ball head must be parallel to absorber axle)	E36			59 Nm
	E30 / Four Wheel Drive			47 Nm
	E52			65 Nm
	E53			100 Nm
8AZ Stabilizer link (with bracket) on stabilizer	E30 / Four Wheel Drive			47 Nm
9AZ Bracket for stabilizer link on control arm	E30, E36			42 Nm
10AZ Bracket for stabilizer link on swivel bearing	E39, E60, E61, E63, E64			59 Nm
11AZ Stabilizer link on stabilizer/bracket	E39, E60, E61, E63, E64		Replace nut	65 Nm
12AZ Stabilizer link to stabilizer	E65, E66, E67		Replace nut	58 Nm
13AZ Stabilizer link to spring strut	E65, E66, E67		Replace nut	



			Jointing torque	20 Nm
			Torque angle	90 Å°



31 operating fluid overview

Transmission oil

Technically suitable front axle transmission oils

[Main group 31](#)



32 00 Steering

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Steering gear to front axle carrier	E21			50 Nm
	E21 (power steering)			41 Nm
	E12, E23, E24			42 Nm
	E24 / from 5.82, E28, E31, E32, E34	M12		80 Nm
	E28, E30, E36, E46	M10		42 Nm
	E32/3 / 750iLs	M10 10.9		110 Nm
	E38	M10 8.8	Press steering gear outwards to stop on front axle support and first tighten both front screws.	42 Nm
	E38 / Ball-and-nut steering, E39 / Ball-and-nut steering	M10 10.9		62 Nm
	E39 / Rack-and-pinion steering gear, E52	M10	Replace screws	42 Nm
	E53	M12 10.9	Jointing torque Torque angle	50 Nm 90 °
	E60 / REAR END, E61 / REAR END, E63, E64, E65, E66, E67		Replace screws & nuts Jointing torque Torque angle	 56 Nm 90 °
	E61 / Four Wheel Drive, E60 / Four Wheel Drive	M12	Replace screws & nuts	120 Nm
	E83	M12	Replace screws & nuts	100 Nm
	E85, E86	M10	Replace screws & nuts	42 Nm
2AZ Heat shield to steering gear	E60, E61, E63, E64	M6		7.5 Nm



3200 Overview of Technical Data

Ride height with vehicle load tolerance	
	Minimum value
	min. - 20 mm
	Maximum value
	max. + 40 mm

Tolerance for ride height at design level	
	Tolerance for setpoint value
	max. 2 mm
	Difference between left and right
	max. 2 mm

Tolerance for ride height in normal position	
	Tolerance for setpoint value
	max. 10 mm
	Difference between left and right
	max. 10 mm







32 00 Steering

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Steering gear to front axle carrier	E21			50 Nm
	E21 (power steering)			41 Nm
	E12, E23, E24			42 Nm
	E24 / from 5.82, E28, E31, E32, E34	M12		80 Nm
	E28, E30, E36, E46	M10		42 Nm
	E32/3 / 750iLs	M10 10.9		110 Nm
	E38	M10 8.8	Press steering gear outwards to stop on front axle support and first tighten both front screws.	42 Nm
	E38 / Ball-and-nut steering, E39 / Ball-and-nut steering	M10 10.9		62 Nm
	E39 / Rack-and-pinion steering gear, E52	M10	Replace screws	42 Nm
	E53	M12 10.9	Jointing torque Torque angle	50 Nm 90 °
	E60 / REAR END, E61 / REAR END, E63, E64, E65, E66, E67		Replace screws & nuts Jointing torque Torque angle	 56 Nm 90 °
	E61 / Four Wheel Drive, E60 / Four Wheel Drive	M12	Replace screws & nuts	120 Nm
	E83	M12	Replace screws & nuts	100 Nm
	E85, E86	M10	Replace screws & nuts	42 Nm
2AZ Heat shield to steering gear	E60, E61, E63, E64	M6		7.5 Nm



32 13 Power Steering Gear

Tightening Torques

	Type	Thread	Tightening specification	Torque
6AZ Ring nut	E30	with 2.5 mm dia. wire		120 Nm
	E30	with 3.5 mm dia. wire		150 Nm
7AZ Valve housing to case	E30			18 Nm
8AZ Pressure piece cover	E30			18 Nm
9AZ Internal lines to steering gear	E30	M10		10 Nm
	E30 / E60 / E61 / E63 / E64 / E67	M12		20 Nm
	E65 / E66	M12		30 Nm
	E60 / E61 / E63 / E64	M18		25 Nm
	E65 / E66	M18		60 Nm
10AZ Coupling bolt with hexagon socket	E34 (AWD)			20 Nm
11AZ Pipe (pipe cringe) to steering gear	E30 / E36			8 Nm
12AZ Servotronic converter to power steering gear	E60 / E61 / E63 / E64 / E65 / E66 / E67 / E83			3 Nm



32 00 Steering

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Steering gear to front axle carrier	E21			50 Nm
	E21 (power steering)			41 Nm
	E12, E23, E24			42 Nm
	E24 / from 5.82, E28, E31, E32, E34	M12		80 Nm
	E28, E30, E36, E46	M10		42 Nm
	E32/3 / 750iLs	M10 10.9		110 Nm
	E38	M10 8.8	Press steering gear outwards to stop on front axle support and first tighten both front screws.	42 Nm
	E38 / Ball-and-nut steering, E39 / Ball-and-nut steering	M10 10.9		62 Nm
	E39 / Rack-and-pinion steering gear, E52	M10	Replace screws	42 Nm
	E53	M12 10.9	Jointing torque Torque angle	50 Nm 90 °
	E60 / REAR END, E61 / REAR END, E63, E64, E65, E66, E67		Replace screws & nuts Jointing torque Torque angle	 56 Nm 90 °
	E61 / Four Wheel Drive, E60 / Four Wheel Drive	M12	Replace screws & nuts	120 Nm
	E83	M12	Replace screws & nuts	100 Nm
	E85, E86	M10	Replace screws & nuts	42 Nm
2AZ Heat shield to steering gear	E60, E61, E63, E64	M6		7.5 Nm



3213 Overview of tightening torques

Steering shaft to steering gear

Recut thread.

Renew clamping bolt.

Do not retorque with torque wrench.

22Nm



32 21 Steering Arms

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Tie rod to ball joint (castle nut)	E21			60 Nm
2AZ Tie rod/axial joint to rack	E21, E30		Replace retaining plate	75 Nm
	E34, E36		Replace retaining plate	71 Nm
	E39, E52			71 Nm
	E46, E85 / except S54, E86 /except S54			100 +10 Nm
	E53, E60, E61, E63, E64, E65, E66, E67, E83, E85 / S54, E86 / S54			110 Nm
3AZ Tie rod end to steering knuckle / swivel bearing	E34 / Four Wheel Drive		Replace nut	50 Nm
	E36		Replace nut	36 Nm
	E38, E39, E52		Replace nut	65 Nm
	E46, E85, E86		Use of impact screwdriver not permitted! Replace nut	65 Nm
	E53, E60 / Four Wheel Drive, E61 / Four Wheel Drive, E67, E83		Replace nut	80 Nm
	E60 / REAR END, E61 / REAR END, E63, E64, E65, E66		Replace nut	165 Nm
4AZ Tie rod clamping screw	E38, E39			27 Nm
	E12, E23, E24, E28, E30, E31, E32, E34			14 Nm
5AZ Tie rod end to tie rod (clamping nut)	E34 / Four Wheel Drive, E36, E46, E85, E86			45 Nm
	E39, E52, E53, E60, E61, E63, E64, E65, E66, E67, E83			51 Nm
6AZ Steering drop arm to steering gear	E32, E34 / Four Wheel Drive			59 Nm
	E23	M26	Tightening value may be exceeded up to correct position to locking plate	at least 180 Nm
	E12, E23, E24, E28	M22	Tightening value may be exceeded up to correct position to locking plate	at least 140 Nm
	E31			70 Nm



	E38, E39		Note direction of screw thread. In direction of travel: from left on LHD or from right on RHD vehicle	61 Nm
7AZ Steering guide arm to front axle carrier	E39			62 Nm
	E23, E24, E28, E31, E32, E34, E38	M10		42 Nm
	E12, E23, E24	M12		85 Nm
8AZ Track rod arm to strut	E12, E24 (up to 5.82)		Bolts secured with: Wire	55 Nm
	E23, E24 (from 5.82), E28		Bolts secured with: Loctite No. 270 Clean threads of tapped bores and bolts.	62 Nm
	E31, E32, E34		Bolts secured with: Loctite No. 270 Clean threads of tapped bores and bolts.	110 Nm
	E30 / M3		Bolts secured with: Loctite No. 270 Clean threads of tapped bores and bolts.	30 Nm
9AZ Tie rod arm to control arm	E12, E23, E24 (up to 5.82)			66 Nm
	E30 / M3			66 Nm
	E24 (from 5.82), E28, E31, E32, E34			93 Nm
10AZ Leading strut to tie rod arm	E23			93 Nm
11AZ Trailing strut to tie rod arm	E31, E32, E34			93 Nm



3221 Overview of Technical Data

Ear hose clamp gap dimension	
	Dimension [A]
	max. 1 mm



3221 Overview of tightening torques

Track rod end to swivel bearing	
Renew nut.	80Nm



32 31 Steering Column

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Universal joint/coupling to steering gear/steering spindle	E12, E24 / until 5.82		Replace clamping screw	25 Nm
	E21, E23, E24 / from 5.82, E28, E30, E31, E32, E34, E46, E52, E60, E61, E63, E64, E65, E66, E67, E83		Recut thread Replace clamping screw	22 Nm
	E36, E38, E39		Recut thread Replace clamping screw	19 Nm
	E53 / Steel joint	M8 10.9	Recut thread Replace clamping screw	24 Nm
	E53 / Aluminium joint	M8 10.9	Recut thread Replace clamping screw	28 Nm
	E85, E86	M8	Recut thread Replace clamping screw	30 Nm
2AZ Bearing block for steering column adjustment to instrument panel carrier and pedal bearing block	E31, E32, E34	M8		22 Nm
3AZ Hexagon screw to bearing block for steering column adjustment	E12, E24 / until 5.82	M10 x 115		25 Nm
	E28, E24 / from 5.82	M8 x 110		22 Nm
	E23	M10 x 170		27 Nm
	E31, E32, E34		Observe repair instruction.	
	E38, E39, E53	M8	Adjustment lever in clamped position	3.0 Nm
	E46, E83	M8	Value 1 Value 2	4.0 Nm 4.8 Nm
	E85, E86	M8	Adjusting lever without needle bearing Adjusting lever with needle bearing	6 Nm 3.2 Nm
4AZ Clamp/shackle for outer steering tube	E12, E21, E24, E28			22 Nm
	E23			10 Nm
5AZ Airbag: Steering column to holder	E23, E24, E28			18 Nm
6AZ Steering column to instrument panel / support tube	E60, E61, E63, E64, E65, E66, E67, E83, E85, E86			21 Nm
7AZ Steering column to dashboard	E12, E23, E24, E28			14 Nm
8AZ Sliding piece (screw/nut)	E46			9.5 Nm



9AZ Control unit, steering column (CIM) to steering column	E65, E66, E67			2.5 Nm
10AZ Bracket for sleeve to body	E85, E86	M6		2.4 Nm
	E83	M6		2.8 Nm
11AZ Cable holder to steering column	E46	M5 (silver)		8.8 Nm
	E46	M5 (black)		4 Nm
12AZ Electric drive to steering column	E65, E66	M6		8 Nm
	E60, E61, E63, E64			6 Nm
13AZ Steering spindle to double universal joint / universal joint	E53, E65, E66, E67, E83		Recut thread Replace clamping screw	28 Nm
14AZ Universal joint with corrugated tube to steering gear	E65, E66, E67		Recut thread Replace clamping screw	22 Nm
15AZ Bearing block of steering column to bulkhead	E83	M8	Replace nuts	21.4 Nm
16AZ Steering column to bearing block	E83	M6	Stick in nut again	8.8 Nm
17AZ Steering spindle middle section to assembly partition wall	E60 / Four Wheel Drive, E61 / Four Wheel Drive			6 Nm



3231 Overview of tightening torques

Universal joint	
Recut thread.	22Nm
Renew clamping bolt.	



32 33 Steering Wheel

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Steering wheel to steering column	E12, E21, E24, E23, E28, E30	Nut		80 Nm
	E31, E32, E34, E36, E38, E39, E46, E52, E53, E60, E61, E63, E64, E65, E66, E67, E83, E85, E86	Screw		62.5 Nm
2AZ Retaining plate to steering wheel	E60, E61, E63, E64	M5		6 Nm
3AZ Voltage regulator to steering wheel	E60, E61	M5x12	Replace screws	3 Nm
4AZ Engine electrics, Lane Departure Warning, to steering wheel	E60, E61	M5x12	Replace screws	4 Nm



32 41 Pump and Oil Supply

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Power steering pump / bearing block of power steering pump to crankcase / oil sump / oil filter unit carrier / A/C compressor carrier	E39 / M5		Observe tightening sequence	25 Nm
	E36, E38, E39, E46, E52, E53		Note shims, refer also to Service Information Gr. 32	21 Nm
	M47T2 / M57TU / M57T2	M6		8 Nm
	N62 / N62TU / N73	M8	Replace nuts	21 Nm
	N52 / N52K / N53	M10 x 33	Replace aluminium screws/bolts Follow repair instruction . Jointing torque Torque angle	20 Nm 90 ㄴ
	N54	M10	Follow repair instruction .	38 Nm
	E60, E61, E63, E64, E65, E66, E67, E83, E85 / S54, E86 / S54	M8		21 Nm
2AZ Pump bracket on engine support	E38 / M60/1 / M60/2 / M62, E39 / M62			22 Nm
3AZ Hydraulic line connections to vane pump/power steering pump and steering gear/banjo bolts, steering hydraulics	E38	Banjo bolt M12	Replace sealing rings	33 Nm
	E36, E39, E46, E52	Banjo bolt M14	Replace sealing rings	35 Nm
	E38	Banjo bolt M14	Replace sealing rings	39 Nm
	E60, E61, E63, E64	M14 non-return valve	Replace sealing rings	35 Nm
	E53, E60, E61, E63, E64, E65, E66, E85 / S54, E86 / S54	Banjo bolt M14	Replace sealing rings	33 Nm
	E36, E38, E39, E46, E52, E53	Banjo bolt M16	Replace sealing rings	40 Nm
	E60, E61, E63, E64, E65, E66, E83, E85 / S54, E86 / S54	Banjo bolt M16	Replace sealing rings	35 Nm
	E38, E53	Banjo bolt M18	Replace sealing rings	45 Nm
	E36, E38, E39, E46, E53, E60, E61, E63, E64, E83	Cap screw	Replace sealing ring	36 Nm
	E65, E66, E67	Cap screw	Replace sealing ring	39 Nm
4AZ Hydraulic line connections to DS controller	E31, E32, E34			40 Nm



5AZ Mounting of hydraulic line	E60, E61, E63, E64, E65, E66, E67	M6	Screw, nut or rubber-metal body	7.5 Nm
	E60, E61, E65, E66, E67	M8	Screw, nut or rubber-metal body	19 Nm
	E83, E85 / S54, E86 / S54	M6	Screw, nut or rubber-metal body	8 Nm
6AZ Holder, expansion hose, to vane pump / power steering pump	E60, E61, E63, E64, E65, E66	M6 8.8		7.5 Nm
	E65 / M67	M8-8		19 Nm
7AZ Mounting hydraulic pump to engine block / oil sump	E65			3 Nm
9AZ Oil reservoir to holder	E60, E61, E63, E64	M6		6 Nm
	E65, E66, E67, E83	M6		4 Nm
	E85 / S54, E86 / S54	M6		5.5 Nm
10AZ Expansion hose part 1 to part 2	E60, E61, E63, E64, E65, E66			30 Nm
11AZ Expansion hose mounting	E60	M6		10 Nm
12AZ Line fastening steering hydraulics	E60	M6		7.5 Nm
	E60	M8		19 Nm
13AZ Oil tank holder to body	E83	M8		19 Nm
14AZ Belt pulley to power steering pump	E60, E61, E63, E64, E65, E66, E67	M8 8.8		22 Nm
	E39, E46, E53, E65, E66, E67	M8 10.9		27 Nm
	E83 / M54 / N46	M8		28 Nm
	E83 / M57TU / M57T2 / M47T2, E85 / S54, E86 / S54	M8		22 Nm
15AZ Bracket, pressure line, Dynamic Drive, to oil sump	E65 / M57TU / M57T2, E66 / M57T2			19 Nm
16AZ Bracket, pressure line, to steering gear	E60, E61, E63, E64	M8		19 Nm
17AZ Bracket, hydraulic line, to stabilizer bar mounting	E60, E61, E63, E64	M6		12 Nm
18AZ Bracket, power steering pump, to crankcase	E63 / N52, E64 / N52	M10	Replace aluminium screws/bolts	
			Jointing torque Torque angle	20 Nm 90 째
19AZ				
20AZ Power steering pump to water pump	E46 / N40 / N42 / N45 / N46, E60 / N46T	M8		32 Nm



	E83 / N46	M8		28 Nm
21AZ Bracket, pressure line (ARS), to crankcase	E63 / N52, E64 / N52	M10	Replace aluminium screws/bolts	
			Jointing torque Torque angle	20 Nm 90 째
	E60 / N52, E61 / N52, E63 / N52, E64 / N52, E65 / N52, E66 / N52	M8x17.5	Replace aluminium screw/bolt	
			Jointing torque Torque angle	8 Nm 45 째
22AZ Pressure line to power steering gear	E85 / S54, E86 / S54	M14	Replace sealing rings	33 Nm
23AZ Return line to power steering gear	E85 / S54, E86 / S54	M16	Replace sealing rings	35 Nm



3241 Overview of tightening torques

Power steering pump to engine

Screw

Tightening torque 2Nm

1. Tightening torque 21Nm

Slacken

2. Tightening torque 21Nm



32 43 Electronic Power Steering

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Retaining plate, AFS control unit to body	E60 / E61 / E63 / E64	M6		8 Nm
2AZ AFS yaw sensor to body	E60 / E61 / E63 / E64	M6		8 Nm



32 operating fluid overview

Expendable materials

Lubricating grease FB-1	100 g, Tube	83 23 2 208 093
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33 11 Rear Differential Case with Cover

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Case Covers Transmission allocation	E36 / E38 / E39 / E46 / E53 / E60 / E61 / E65 / E66 / E83 / E85 / E86	M10 8.8	168N 168K 188 188N 188K 210 210N 215	45 Nm
	E46 / E83 / E85	M10 10.9	168K	55 Nm
	E38 / E39 / E46 / E53 / E60 / E61 / E65 / E66 / E83 / E85	M10 10.9	188K	55 Nm
	E46 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E67 / E83	M10	215K	90 Nm
	E38 / E39 / E52	M10x25 10.9	220K	90 Nm
	E38 / E39 / E52	M10x75 10.9	220K	110 Nm
	E38 / E39 / E52	M10x67 10.9	220K	130 Nm
	E65 / E66 / E67	M10	230K	90 Nm
	E85	M10 10.9	168L	55 Nm
	E60 / E61 / E63 / E64	M10 10.9	188L 188LW	55 Nm
	E65 / E66 / E83 / E85 / E86	M10 10.9	188L	55 Nm
	E60 / E63 / E64	M10 10.9	215 with lock	60 Nm
2AZ Side bearing cap (insert into through bore-holes only new coated screws or screws with Loctite 270)	E12 / E21 / E23 / E24 / E28 / E30 / E31 / E32 / E34 / E36 / E38	M8	Type M, G	22 Nm
	E12 / E21 / E28 / E30 / E34 / E36 / E38 / E39	M8	Type K Jointing torque Torque angle	10 Nm 40 °
3AZ Oil fill and drain plug with sealing ring	E30 / E31 / E32 / E34 / E36 / E38 / E39 / E46 / E52 / E53 / E60 / E63 / E83 / E85 / E86		Replace sealing ring	65 Nm
4AZ Drive flange, right	E34 / 525ix	M10		59 Nm
5AZ Drive flange, left (always replace screws)	E34 / 525ix	M14 x 1.5	Jointing torque	90 Nm
			Torque angle	100 + 4 °
6AZ Oil cooler connection to rear differential	E31			35 Nm



7AZ Union nuts pipe oil cooler	E31			17 Nm
8AZ Vibration damper on bracket	E38 / E39 / E46			77 Nm
9AZ Oil filler and oil drain plugs with O-ring on cover / housing	E30 / E31 / E32 / E34 / E36 / E38 / E39 / E46 / E52 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E67 / E83 / E85 / E86		Replace oil filler and oil drain plugs	60 Nm



33 17 Rear axle differential mountings

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Rear axle final drive to rear axle support	E21			90 Nm
	E12, E24 / to 5.82			80 Nm
	E23, E24 / from 5.82, E28 / from 5.82, E30, E32, E34, E36 / Z3 / compact			110 Nm
	E36, E46	Front		95 Nm
	E46 / S54, E85 / S54, E86 / S54	Front	Observe repair instructions.	200 Nm
	E38, E39, E52	Front		150 Nm
	E53, E60, E61, E63, E64, E65, E66, E67, E83, E85 / except S54, E86 / except S54	Front	Observe repair instructions.	100 Nm
	E31, E36	Rear		77 Nm
	E38	Rear		102 Nm
	E38	Rear	also tighten via screw head	75 Nm
	E39	Rear	also tighten via screw head	105 Nm
	E46 / except S54	Rear		174 Nm
	E46 / S54, E85 / S54, E86 / S54	Rear	Observe repair instructions. Jointing torque Angle of rotation	20 Nm 90 Å°
	E52	Rear	also tighten via screw head	102 Nm
	E53, E60 / except S85, E61, E63 / except S85, E64, E65, E66, E67, E83, E85 / except S54, E86 / except S54	Rear	Observe repair instructions.	165 Nm
	E60 / S85, E63 / S85	Rear	Observe repair instructions.	220 Nm
2AZ Rear axle differential to anti-roll bar link and anti-roll bar link to body	E21, E30			90 Nm
3AZ Rear axle differential to rubber mount	E12, E23, E24, E28			87 Nm
	E32, E34			77 Nm
4AZ Rear axle differential lid with rubber mount to body	E30, E36 / Z3 / compact			77 Nm
5AZ Rear axle differential holder to housing cover	E32	M12 8.8		81 Nm
	E32, E34	M12 10.9		102 Nm



6AZ Rubber mount to body	E12, E24			48 Nm
	E23	M8 8.8	Thread, oil and grease free Screw lock with Loctite 270	24 Nm
	E23	M8 10.9	Thread, oil and grease free Screw lock with Loctite 270	37 Nm
	E23, E32	M10 8.8	Thread, oil and grease free Screw lock with Loctite 270	52 Nm
7AZ Rear axle differential holder to rear axle differential	E31	M14 x 1.5		186 Nm
8AZ Rear axle differential holder to rear axle support	E31			127 Nm
9AZ Vibration absorber	E65 / M57TU / M57T2	M12		100 Nm



33 21 Output Shaft Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Output shaft to rear axle differential and drive flange				
Hexagon socket screw	E30, E32, E34	M10x50 10.9	Replace screws	60 Nm
Torx screw without ribbed teeth	E30, E31, E32, E34, E36, E38	M10x50 10.9 (black)	Replace screws	60 Nm
Torx screw with ribbed teeth	E36, E39, E46	M8x40 (black)	Replace screws	64 Nm
	E36, E39, E46, E60, E83, E85	M8x40 (silver)	Replace screws	52 Nm
	E36 / M54 / Z3 3.0i, E46	M10x23 10.9 (silver)	Replace screws	85 Nm
	E30, E36, E38, E39, E46, E52, E53, E60, E61, E63, E64, E65, E66, E83, E85, E86	M10 (silver)	Replace screws	80 Nm
	E36 / Z3 2.8i, E36 / S50 / S52 / S54, E46 / S54, E85 / S54, E86 / S54	M10x46 10.9 (black)	Replace screws	100 Nm
	E31, E38, E39, E60, E63, E64	M12x50 10.9 (black)	Replace screws	135 Nm



33 32 Axle guide and axle strut

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Trailing arm to rear axle support	E34 (M5)		Replace screw. Tighten using special tool 33 3 060 and Hazet 6291-2CT torque wrench.	55 Nm
	E30, E32, E34, E36		Tighten in normal position.	67 Nm
	E30, E32, E34, E36	10.9		77 Nm
2AZ Trailing arm to body	E31	M14 x 1.5		127 Nm
3AZ Trailing arm to wheel carrier	E31	M18 x 1.5		278 Nm
4AZ Control arm to wheel carrier	E31		The taper spigot and bore hole must be free of grease.	80 Nm
	E38, E52	M10		65 Nm
	E39		The taper spigot and bore hole must be free of grease.	55 Nm
	E53			56 Nm
	E60, E61, E63, E64, E65, E66, E67	M10	Replace nut.	65 Nm
	E60, E63, E64, E65, E66	M12	Replace nut.	108 Nm
5AZ Control arm to rear axle support	E31		Tighten in normal position.	95 Nm
	E38		Tighten in normal position.	60 Nm
	E39		Tighten in normal position. With torque wrench Hazet 6290-CT	60 Nm
	E52		Tighten in normal position.	60 Nm
	E53		Tighten in normal position. with special tool 32 3 150 and torque wrench Hazet 6291-ICT	59 Nm
	E60, E61, E63, E64, E65, E66, E67		Replace nut. Tighten in normal position.	65 Nm
6AZ Engine support arm to rear axle support	E31	M14 x 1.5		127 Nm
7AZ Engine support arm to wheel carrier	E31			150 Nm
8AZ Upper wishbone to wheel carrier	E31	M14 x 1.5		127 Nm
	E38, E52			160 Nm
	E39			142 Nm
	E53		Replace nut.	165 Nm



	E60, E61, E63, E64, E65, E66		Replace nut.	165 Nm
	E67		Replace nut.	110 Nm
9AZ Integral link to trailing arm	E31	M16 x 1.5	Tapered spigot and bore both free of grease	120 Nm
10AZ Integral link to upper wishbone	E31	M14 x 1.5		127 Nm
11AZ Upper/lower wishbones to trailing arm	E36, E46	M12 x 1.5	Replace nut. Tighten in normal position.	110 Nm
12AZ Trailing arm to bearing support	E36, E46			110 Nm
	E83, E85, E86	M12 x 1.5 10.9		100 Nm
13AZ Trailing arm bearing support to body	E36, E46, E83, E85, E86			77 Nm
14AZ Upper wishbone to rear axle carrier	E31	M12 x 1.5	Tighten in normal position.	77 Nm
	E36	M12 10.9	Tighten in normal position. Always replace reduced-shaft bolts with multi-purpose bolts and washers, (see BMW Group Parts).	77 Nm
	E38, E39, E52		Tighten in normal position.	110 Nm
	E52		Tighten in normal position.	110 Nm
	E46, E83, E85, E86		Tighten in normal position.	77 Nm
	E53, E60, E61, E63, E64		Replace nut. Tighten in normal position.	100 Nm
	E65, E66, E67		Replace nut. Tighten in normal position. Jointing torque Angle of rotation	100 Nm 90 °
15AZ Lower wishbone to rear axle carrier	E36	M12 10.9	Tighten in normal position. Always replace reduced-shaft bolts with multi-purpose bolts and washers, (see BMW Group Parts).	77 Nm
	E46, E83, E85, E86		Tighten in normal position.	77 Nm
16AZ Support bracket on body	E21 / E30			28 Nm
17AZ Compression strut on body	E46, E83, E85, E86	M8 8.8		21 Nm
	E30, E32, E34, E36, E85, E86	M8 10.9		30 Nm
	E60, E61, E63, E64	M10 10.9		48 Nm
	E65, E66, E67	M10 10.9		38 Nm



18AZ	Auxiliary control arm to trailing arm and rear axle support	E32, E34	M14 x 1.5	Tighten in normal position.	127 Nm
19AZ	Additional strut on rear axle support	E32, E34	M12 x 1.5		110 Nm
20AZ	Swinging arm to rear axle support	E38	Front	Tighten in normal position.	60 Nm
		E39	Front	Tighten in normal position.	58 Nm
		E52	Front	Tighten in normal position.	105 Nm
		E53, E60, E61, E63, E64, E65, E66, E67	Front	Replace nut. Tighten in normal position.	100 Nm
		E38	Rear	Tighten in normal position.	130 Nm
		E39	Rear M12	Tighten in normal position.	115 Nm
		E39 / Touring, M5	Rear M14	Tighten in normal position.	174 Nm
		E52	Rear M14	Tighten in normal position.	160 Nm
		E53, E60, E61, E63, E64, E65, E66, E67	Rear M14	Replace nut. Tighten in normal position.	175 Nm
21AZ	Integral link on front wheel support	E38, E39, E52, E53		Tighten in normal position.	105 Nm
		E60, E61, E63, E64, E65, E66, E67		Tighten in normal position.	100 Nm
22AZ	Screw connection, swinging arm, integral link, wheel carrier	E38		Tighten in normal position.	236 Nm
		E39, E52		Replace nut. Tighten in normal position.	256 Nm
		E53		Replace nut. Tighten in normal position.	250 Nm
		E60, E61, E63, E64, E65, E66, E67		Replace nut. Tighten in normal position.	240 Nm
23AZ	Bracing strut to compression strut / body	E46 / M3 / M3 CSL		Replace screws. Jointing torque Angle of rotation	59 Nm 90 °
24AZ	Upper wishbone to trailing arm	E85, E86	M12x1.5 8.8	Replace nut.	100 Nm
		E83	M12x1.5	Replace nut.	106 Nm
25AZ	Lower wishbone to trailing arm	E85, E86	M12x1.5 10.9	Replace nut. Tighten in normal position.	77 Nm
		E83	M12x1.5 10.9	Replace nut. Tighten in normal position.	100 Nm



26AZ	Tension strut to compression strut / body	E83	M10		60 Nm
27AZ	Heat shield to compression strut	E83, E85, E86	M6		5 Nm
28AZ	Heat shield to compression strut	E65, E66, E67	M8		19 Nm



33 33 Rear Axle Suspension

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Rubber mount to rear axle support	E21, E23			95 Nm
	E21, E24, E28			40 Nm
2AZ Threaded bolt to body	E36			120 Nm
	E36 / Z3 / compact			127 Nm
	E46, E85, E86			90 Nm
3AZ Rear axle support with rubber mounts to body	E36, E46, E83, E85, E86	M12 x 1.5		77 Nm
	E36	M14 x 1.5		140 Nm
	E38			127 Nm
	E39, E52, E53			163 Nm
	E60, E61, E63, E64, E65, E66, E67			165 Nm
4AZ Rear rubber mount to body	E32, E34	M10	Thread, oil and grease free, Screw lock with Loctite 270	45 Nm
5AZ Rear axle support to rear rubber mount	E32, E34	M12		77 Nm
6AZ Fixing the rubber mount/right rear axle support	E67			8 Nm



33 41 Wheel Bearings

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Rear axle shaft to drive flange	E12 / E21 / E23 / E24	Collar nut yellow chromated	Replace collar nut	435 Nm
	E28	Collar nut waxed white M22	Replace collar nut	190 Nm
	E23 / E24 / E28 / E32 / E34	Collar nut waxed white M27	Replace collar nut	250 Nm
2AZ Bearing unit on wheel carrier	E39		Replace screws Jointing torque Torque angle	30 Nm 90 °
	E60		Replace screws Jointing torque Torque angle	30 Nm 90 °
	E53 / E61 / E63 / E64 / E65 / E66			100 Nm
3AZ Drive flange to axle shaft	E53 / E61 / E63 / E64 / E65 / E66 / E67	M27	Replacing collar nut and lightly oil contact face	420 Nm
	E31 / E36 / E38 / E39 / E46 / E52 / E60 / E83 / E85 / E86	M27	Replacing collar nut and lightly oil contact face	300 Nm
	E36 / E46 / E85 / E86	M24	Replacing collar nut and lightly oil contact face	250 Nm
	E30 / E36	M22	Replacing collar nut and lightly oil contact face	200 Nm



33 52 Shock Absorbers

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Shock absorber to trailing arm/ wheel carrier/ swinging arm/ support arm/ control arm (tighten in normal position)	E12, E23, E24, E28, E32, E34, E38, E52			127 Nm
	E21			54 Nm
	E30, E36/7, E36/5			77 Nm
	E31			115 Nm
	E36, E46, E83, E85, E86	M12		100 Nm
	E39, E53	M14	Replace nut	127 Nm
	E60, E61, E63, E64, E65, E66	M14	Replace screw	165 Nm
	E67	M16	Replace screw	250 Nm
2AZ Shock absorber piston rod on thrust bearing	E21, E30			15 Nm
	E23, E24, E28, E34			25 Nm
	E36, E46, E83	M10	Replace nut	14 Nm
	E38, E39, E52	M10	Replace nut	23 Nm
	E38, E39	M14	Replace nut	27 Nm
	E53, E60, E63, E64, E65, E66, E67	M12	Replace nut	27 Nm
	E61	M12	Replace nut	28 Nm
	E85, E86	M10 x 1	Replace nut	13 Nm
3AZ Support on body/rear axle carrier	E36, E38	M8	Replace nut	24 Nm
	E39	Nut and bolt yellow chrome- plated	Replace nut	24 Nm
	E39	Nut and bolt silver-grey	Replace nut	28 Nm
	E46, E52, E60, E63, E64, E65, E66, E67	M8	Replace nuts	28 Nm
	E53	M10	Replace nuts	56 Nm
	E83, E85 / S54, E86 / S54	M8	Replace nuts	24 Nm
	E85 / except S54, E86 / except S54	M8	Replace nuts	27 Nm



33 55 Anti-roll bar

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Anti-roll bar to trailing arm	E30, E31, E36 / Z3 / compact	M8	tighten in normal position	22 Nm
	E31	M10	tighten in normal position	42 Nm
2AZ Anti-roll bar link on anti-roll bar/swinging arm	E38			42 Nm
	E39, E52			65 Nm
	E53			100 Nm
	E60, E61, E63, E64	M10		65 Nm
	E65, E66, E67	M10		58 Nm
	E60, E61, E63, E64, E65, E66, E67	M12		100 Nm
3AZ Retaining bracket, anti-roll bar to rear axle support	E46, E52, E85, E86			22 Nm
	E53			19 Nm
	E60, E61, E63, E64	M8		28 Nm
	E65, E66, E67	M10		60 Nm
	E83	M8		21 Nm
4AZ Anti-roll bar link to bracket	E46, E85, E86	M8	Replace nut	22 Nm
5AZ Anti-roll bar link holder to top wishbone	E46, E85, E86	M8	Replace nuts	22 Nm
6AZ Vibration absorber to retaining bracket of right anti-roll bar	E61	M12		100 Nm
7AZ Anti-roll bar link to anti-roll bar / top wishbone	E83	M10	Replace nuts	65 Nm



33 operating fluid overview

Transmission oil

Hypoid Axle Oil G4	500 ml, Bottle	83222447362
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Transmission oil

Hypoid Axle Oil G3	500 ml, Bottle	83222413512
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Transmission oil

Rear axle differential oil SAF-XJ Booster	3x 1 l, Bottle	83222282583
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Transmission oil

Rear axle differential oil SAF Carbon Mod	500 ml, Bottle	83120445832
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Transmission oil

Hypoid Axle Oil G2	500 ml, Bottle	83222413511
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Transmission oil

Technically suitable rear axle differential oils		
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[Main group 33](#)

Transmission oil

BMW Synthetics OSP	1 l, Bottle	83222365987
	60 l, Barrel	83229407768

Transmission oil

BMW HOC oil	850 ml, Bottle	83222413513
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Transmission oil

Rear axle differential oil MSP/A * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	1 l, Bottle	83222365988
	1000 ml, TU*	83229405462



34 00 Testing and bleeding brakes

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Vent valve	E39 / E38 / E46 / E52 / E53 / E83 / E85 / E86 / E65 / E66 / E67 / E60 / E61 / E63 / E64		Width across flats 7	3,5-5,0 Nm
			Width across flats 9	7-11 Nm
			Width across flats 11	12-16 Nm



34 11 Front Brake

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Brake disk to wheel hub (contact faces between brake disk and wheel hub cleaned and grease-free)	E36 / E39 / E38 / E46 / E52 / E53 / E85 / E86 / E83 / E65 / E66 / E67 / E60 / E61 / E63 / E64		Replace screws	16 Nm
2AZ Brake caliper to steering knuckle (screws lightly oiled, contact surfaces between brake caliper and steering knuckle cleaned and grease-free)	E34 / E36 / E32 / E31 / E38 / E39 / E46 / E52 / E53 / E65, E30 / 325iX, E66 / E67 / E83 / E85 / E86 / E60 / E61 / E63 / E64		Replace self-locking or microencapsulated screws	110 Nm
2AZ with aluminium brake caliper	E31		Replace self-locking or microencapsulated screws	115 Nm
	E12 / E21 / E23 / E24 to 5.82		Replace self-locking or microencapsulated screws	95 Nm
	E28 / E30 / E24 / from 5.82		Replace self-locking or microencapsulated screws	123 Nm
3AZ Guide bolt	E36 / E39 / E38 / E46 / E52 / E53 / E85 / E86 / E83 / E65 / E66 / E67 / E60 / E61 / E63 / E64	wrench size 7 mm	Replace self-locking or microencapsulated screws	30 - 5 Nm
4AZ Bolts to guide pin (always replace)	E30			35 Nm
5AZ Protective plate to steering knuckle	E85 / E86 / E83	M6	Replace self-locking or microencapsulated screws	9 Nm
	E67 / E60 / E61 / E63 / E64 / E65 / E66	M6	Replace self-locking or microencapsulated screws	12 Nm



34 21 Rear Brake

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Brake drum/disc on wheel hub	E39 / E38 / E46 / E52 / E53 / E83 / E85 / E86 / E65 / E66 / E67 / E60 / E61 / E63 / E64		Replace screws	16 Nm
2AZ Wheel brake cylinder on brake anchor plate	E36		Replace self-locking or microencapsulated screws	10 Nm
3AZ Brake anchor plate on trailing arm/wheel carrier	E65 / E66 / E67 / E60 / E61 / E63 / E64	M12	Replace self-locking or microencapsulated screws	110 Nm
	E31 / E32 / E34 / E36 / E38 / E39 / E46 / E53 / E85 / E86	M10	Replace self-locking or microencapsulated screws	65 Nm
	E83	M10	Replace self-locking or microencapsulated screws	65 Nm
5AZ Guide bolt	E36 / E39 / E38 / E46 / E52 / E53 / E83 / E85 / E86 / E65 / E66 / E67 / E60 / E61 / E63 / E64	WAF 7	Replace self-locking or microencapsulated screws	30 - 5 Nm
6AZ Protective plate to wheel carrier	E85 / E86 / E83	M6	Replace self-locking or microencapsulated screws	9 Nm
	E85 / E86 / E83	M8	Replace self-locking or microencapsulated screws	15 Nm
	E53 / E60 / E61 / E63 / E64 / E65 / E66 / E67	M6	Replace self-locking or microencapsulated screws	12 Nm



34 31 Brake Master Cylinder

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Brake master cylinder to brake booster (vacuum)	E30			24 Nm
	E32		Replace self-locking nut.	21 Nm
	E28 / E34 / E36 / E46 / E38 / E39 / E52 / E53 / E85 / E86 / E83		Replace self-locking nut.	26 Nm
	E65 / E66 / E60 / E61 / E63 / E64		Replace self-locking nut. Retighten after 30 minutes.	26 Nm
2AZ Brake master cylinder to brake booster hydraulic	E31 / E32 / E34 / E24		Replace hexagon socket head screw with a hexagon screw, refer to BMW Parts Service	28 Nm
3AZ Expansion tank to brake master cylinder	E36 / E46 / E85 / E86			3,5 Nm
	E83 / E60 / E61 / E63 / E64			8 Å±2 Nm



34 32 Brake Lines

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Retaining screws / Brake hoses	E36 / E38 / E39	M10 x 1		18 Nm
	E53 / E83	M10 x 1		14 Nm
	E60 / E61 / E63 / E64 / E65 / E66 / E67 / E85 / E86 / E46	M10 x 1		14 Nm
	E60 / E61 / E63 / E64 / E85 / E86 / E46	M10 x 1	Blue union screw connection in steel e.g. brake hose	16 Nm
	E60 / E61 / E63 / E64 / E85 / E86 / E46	M10 x 1	Blue union screw connection in aluminium e.g. hydraulic control unit	17 Nm
	E36 / E38 / E39	M12 x 1		18 Nm
	E53 / E83	M12 x 1		14 Nm
	E60 / E61 / E63 / E64 / E85 / E86 / E46	M12 x 1	Blue union screw connection in steel e.g. brake hose	16 Nm
	E60 / E61 / E63 / E64 / E85 / E86 / E46	M12 x 1	Blue union screw connection in aluminium e.g. hydraulic control unit	17 Nm
2AZ Brake hose to brake caliper, front and rear	E85 / E83 / E86 / E46			19 Nm
3AZ Bracket to trailing arm	E85 / E86 / E83	M6		9 Nm
	E85 / E86	M5		5 Nm
4AZ Brake hose to brake caliper, front	E53 / E60 / E61 / E63 / E64 / E65 / E66 / E67	M10 x 1		24 Nm
5AZ Brake hose to brake caliper, rear	E53	Banjo bolt M10x1		40 Nm
	E60 / E61 / E63 / E64 / E65 / E66 / E67	M10 x 1		24 Nm
6AZ Brake lines to hydraulic control unit	E83			17 Nm



34 33 Brake Booster

Tightening Torques

		Type	Thread	Tightening specification	Torque
10AZ	Hydraulic pipe to pressure reservoir on power flow regulator	E31 / E32			47 Nm
11AZ	Hydraulic pipe to pressure reservoir	E31 / E32			40 Nm
12AZ	Brake booster to pedal assembly console	E85 / E86	M8	Retighten 1x after 30 minutes on brake booster	22 Nm
		E36 / E46			25 Nm
		E38 / E39 / E52 / E53			31 Nm
		E65 / E66 / E67 / E60 / E61 / E63 / E64 / E83		Retighten 1x after 30 minutes on brake booster	26 Nm



34 41 Parking Brake

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Handbrake lever to body	E52 / E53 / E60 / E61 / E63 / E64			21 Nm
2AZ Housing cover to parking brake	E65 / E66 / E67			2 Nm
3AZ Actuating unit and control unit of parking brake	E65 / E66 / E67			4 Nm
4AZ Mounting pan to tunnel	E85 / E86	M6		8 Nm
5AZ Spring clip to wheel carrier	E60 / E61 / E63 / E64	M6		8 Nm
6AZ Support Duo-Servo to wheel carrier, rear	E60 / E61 / E63 / E64	M10		60 Nm



35 11 Pedal Assembly Console

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Bearing pedestal to brake assembly and body	E38 / E39 / E52			31 Nm
	E36 / E46			25 Nm
	E53 / E65 / E66 / E67 / E60 / E61 / E63 / E64 / E83		Retighten 1x on brake booster after 30 min.	21 Nm
	E85 / E86	M8	Retighten 1x on brake booster after 30 min	22 Nm
2AZ Bracket to bearing block	E85 / E86	M6		9 Nm



34 51 Slip Control System (ABS, ASC+T, DSC)

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Control unit on hydraulic unit	E46 (MK20)			2,6 Nm
	E46 / E85 / E86 / (MK60)			5+1 Nm
	E38 / E39 / E52 / E53 / E46 AWD / E65 / E66 / E67			2,9 Nm
	E60 / E61 / E63 / E64 / E83			3±0,3 Nm
2AZ Pressure sensor "V" and "H" to master brake cylinder	E46 / E85			25 + 5 Nm
Pressure sensor to hydraulic unit	E38 / E39			20 Nm
	E52 / E53 / E46 AWD / E65 / E66		Only with special tool 34 1 290	19 Nm
3AZ Rotation rate sensor / DSC sensor to holder	E46 / E65 / E66 / E67 / E60 / E61 / E63 / E64 / E83 / E85 / E86			8 Nm
4AZ Bracket, rotation rate sensor to body	E46 / E85 / E86			8 Nm
5AZ Banjo bolt for pre-boost pump intake line to pre-boost pump	E46			20 Nm
6AZ Pulse generator to swivel bearing/wheel carrier	E52 / E53 / E46 / E85 / E60 / E61 / E63 / E64 / E67			8 Nm
	E39 / E38 / E65 / E66			9 Nm
7AZ Rotation rate sensor to body	E38 / E39			8,6 Nm
8AZ Rotation rate sensor to body	E52 / E53			8 Nm
9AZ Bracket to hydraulic unit	E52 / E53 / E46 / E85 / E86 / E83 / E60 / E61 / E63 / E64			8 Nm
10AZ Bracket, hydraulic unit to body	E52 / E53 / E46 / E85 / E86 / E83 / E60 / E61 / E63 / E64			8 Nm
11AZ All screws to precharging pump and holder	E52 / E53 / E46 (M3) / E65 / E66	M6		8 Nm
12AZ Pressure sensor, front and rear for ACC, to brake line	E60 / E61 / E63 / E64			25 + 5 Nm



34 51 Slip Control System (ABS, ASC+T, DSC)

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Control unit on hydraulic unit	E46 (MK20)			2,6 Nm
	E46 / E85 / E86 / (MK60)			5+1 Nm
	E38 / E39 / E52 / E53 / E46 AWD / E65 / E66 / E67			2,9 Nm
	E60 / E61 / E63 / E64 / E83			3±0,3 Nm
2AZ Pressure sensor "V" and "H" to master brake cylinder	E46 / E85			25 + 5 Nm
Pressure sensor to hydraulic unit	E38 / E39			20 Nm
	E52 / E53 / E46 AWD / E65 / E66		Only with special tool 34 1 290	19 Nm
3AZ Rotation rate sensor / DSC sensor to holder	E46 / E65 / E66 / E67 / E60 / E61 / E63 / E64 / E83 / E85 / E86			8 Nm
4AZ Bracket, rotation rate sensor to body	E46 / E85 / E86			8 Nm
5AZ Banjo bolt for pre-boost pump intake line to pre-boost pump	E46			20 Nm
6AZ Pulse generator to swivel bearing/wheel carrier	E52 / E53 / E46 / E85 / E60 / E61 / E63 / E64 / E67			8 Nm
	E39 / E38 / E65 / E66			9 Nm
7AZ Rotation rate sensor to body	E38 / E39			8,6 Nm
8AZ Rotation rate sensor to body	E52 / E53			8 Nm
9AZ Bracket to hydraulic unit	E52 / E53 / E46 / E85 / E86 / E83 / E60 / E61 / E63 / E64			8 Nm
10AZ Bracket, hydraulic unit to body	E52 / E53 / E46 / E85 / E86 / E83 / E60 / E61 / E63 / E64			8 Nm
11AZ All screws to precharging pump and holder	E52 / E53 / E46 (M3) / E65 / E66	M6		8 Nm
12AZ Pressure sensor, front and rear for ACC, to brake line	E60 / E61 / E63 / E64			25 + 5 Nm



34 operating fluid overview

Expendable materials

Lubricating grease Staburags NBU 12K	100 g, Tube	83 23 9 407 810
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Expendable materials

Safety cleaner 2.0	500 ml, Spray can	83192362037
	20 l, Canister	83192362038
	60 l, Canister	83192362040

Expendable materials

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

Brake fluid and hydraulic fluid

Brake fluid DOT4, low viscosity OFF	500 ml, Can	83130042718
	30 , Barrel	83130430440

Brake fluid and hydraulic fluid

Brake fluid DOT4, low viscosity CHN	1 , Can	83132406162
	1 , Can	83132467487

Brake fluid and hydraulic fluid

Brake fluid DOT4 front left, low viscosity * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only. EU	250 ml, Can	83132405975
	500 ml, Can	83132405976
	1 l, Can	83132405977
	5 l, Can	83132405978
	30 l, Barrel	83130443028
	60 l, Barrel	83130443029
	1000 ml, TU*	83132184842
	1000 ml, TU*	83132184843

	1000 ml, TU*	83130443030
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35 11 Pedal Assembly Console

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Bearing pedestal to brake assembly and body	E38 / E39 / E52			31 Nm
	E36 / E46			25 Nm
	E53 / E65 / E66 / E67 / E60 / E61 / E63 / E64 / E83		Retighten 1x on brake booster after 30 min.	21 Nm
	E85 / E86	M8	Retighten 1x on brake booster after 30 min	22 Nm
2AZ Bracket to bearing block	E85 / E86	M6		9 Nm



34 41 Parking Brake Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Handbrake lever to body	E52 / E53 / E60 / E61 / E63 / E64			21 Nm
2AZ Housing cover to parking brake	E65 / E66 / E67			2 Nm
3AZ Actuating unit and control unit of parking brake	E65 / E66 / E67			4 Nm
4AZ Mounting pan to tunnel	E85 / E86	M6		8 Nm
5AZ Spring clip to wheel carrier	E60 / E61 / E63 / E64	M6		8 Nm
6AZ Support Duo-Servo to wheel carrier, rear	E60 / E61 / E63 / E64	M10		60 Nm



35 11 Pedal Assembly Console

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Bearing pedestal to brake assembly and body	E38 / E39 / E52			31 Nm
	E36 / E46			25 Nm
	E53 / E65 / E66 / E67 / E60 / E61 / E63 / E64 / E83		Retighten 1x on brake booster after 30 min.	21 Nm
	E85 / E86	M8	Retighten 1x on brake booster after 30 min	22 Nm
2AZ Bracket to bearing block	E85 / E86	M6		9 Nm



35 40 Pedals

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Accelerator pedal module to body	E65 / E66 / E83 / E85 / E86	M6		9 Nm
	E60 / E61 / E63 / E64 / E67	M6		8 Nm



36 10 Wheels

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Wheel bolt	E30 / E31 / E32 / E34 / E36 / E38 / E39 / E46 / E52 / E60 / E61 / E63 / E64 / E85 / E86	M12	- Screw in the wheel bolts and evenly tighten by hand in a crosswise sequence in order to centre the wheel rim. - Tighten the wheel bolts to the specified tightening torque in a crosswise sequence using a calibrated torque wrench. - Check all wheel bolts in the same sequence and retighten to the prescribed tightening torque if necessary.	120 ± 10 Nm
	E53 / E65 / E66 / E67 / E83	M14	- Screw in the wheel bolts and evenly tighten by hand in a crosswise sequence in order to centre the wheel rim. - Tighten the wheel bolts to the specified tightening torque in a crosswise sequence using a calibrated torque wrench. - Check all wheel bolts in the same sequence and retighten to the prescribed tightening torque if necessary.	140 ± 10 Nm



3610 Overview of tightening torques

Wheel bolt	
M14 After installation, torque of all wheel bolts must be checked again. Wheel bolts must not be oiled!	140Nm



36 11 Wheel Rims

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Wheel cover on disc wheel Bolts coated with blue Loctite No. 243	E31 / E32 / E34			9 Nm
2AZ Valve on disc wheel (RDC)	E38 / E39 / E46 / E53 / E65 / E66			3.5 Nm
3AZ Wheel electronics (RDC) on valve	E38 / E39 / E46 / E53 / E65 / E66			3.5 Nm



36 operating fluid overview

Expendable materials

Tyre-fitting paste	3500 g, Bucket	81220433046
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Expendable materials

Lubricating spray	400 ml, Spray can	83192156562
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37 11 Control and suspension elements, front

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Vent valve to oscillating motor	E60 / E61 / E63 / E64 / E65 / E66			14 Nm
2AZ Vent hose to vent valve	E60 / E61 / E63 / E64 / E65 / E66			5 Nm



37 14 Electric Components

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Wheel camber warning switch to console	E32, E34			9 Nm
2AZ Angled joint of jointed rod	E32, E34			5 Nm
3AZ Hydraulic switch to distributor	E24, E32			25 Nm
4AZ Hydraulic switch to hydraulic control unit	E24, E32			27 Nm
5AZ Solenoid valve to hydraulic control unit	E24, E32			55 Nm
6AZ Ride level sensor to holder	E39, E38, E46, E53, E52, E60, E61, E63, E64, E65, E66, E67, E83, E85, E86			5 Nm
7AZ Control rod / jointed rod to ride height sensor / bracket / control arm	E39, E46			9 Nm
	E53, E60, E61, E63, E64, E65, E66, E67, E83, E85, E86			8 Nm
	E38			5 Nm
	E52			10 Nm
8AZ Bracket ride level sensor to front axle carrier	E85, E86	M6		8 Nm
9AZ Control rod on transverse link (rear)	E38, E83			8 Nm
	E52			10 Nm
10AZ Control rod to swinging arm (rear)	E53, E60, E61, E63, E64, E65, E66			8 Nm
11AZ Bracket ride level sensor to rear axle carrier	E53, E60, E61, E63, E64, E65, E66, E83, E85, E86			8 Nm
12AZ Control lines for oscillating motor, rear, to valve block	E60, E61, E63, E64, E65, E66			35 Nm
13AZ Connecting nuts, hydraulic lines (pressure lines/control lines)	E60, E61, E63, E64, E65, E66			30 Nm
14AZ Line holder / pipe holder / holder	E60, E61, E63, E64, E65, E66			8 Nm
15AZ Control lines for oscillating motor, front, to valve block	E60, E61, E63, E64, E65, E66			35 Nm
16AZ Pressure line DYNAMIC DRIVE circuit to valve block	E60, E61, E63, E64, E65, E66			35 Nm
17AZ Valve block to holder	E60, E61, E63, E64, E65, E66			8 Nm



18AZ	Control lines to oscillating motor	E60, E61, E63, E64, E65, E66			30 Nm
19AZ	Return line to valve block	E60, E61, E63, E64, E65, E66			40 Nm
20AZ	Holder, valve block, to body	E60, E61, E63, E64, E65, E66			8 Nm
21AZ	Connecting nuts, hydraulic lines (return)	E60, E61, E63, E64, E65, E66			35 Nm
22AZ	Bracket for jointed rod to front control arm	E85, E86	M6		8 Nm
23AZ	Transversal acceleration sensor to body	E60, E61, E63, E64, E65, E66	M6		8 Nm
24AZ	DYNAMIC DRIVE control unit to body	E60, E61, E63, E64	M8		2.5 Nm
		E65, E66	M6		4.5 Nm
25AZ	Mounted acceleration sensor to bracket	E65, E66, E67	M6		8 Nm



37 11 Control and suspension elements, front

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Vent valve to oscillating motor	E60 / E61 / E63 / E64 / E65 / E66			14 Nm
2AZ Vent hose to vent valve	E60 / E61 / E63 / E64 / E65 / E66			5 Nm



41 14 Reinforcement plate

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Cap nut to reinforcement plate	All	M5		6 Nm



41 14 Reinforcement plate

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Cap nut to reinforcement plate	All	M5		6 Nm



41 35 Side walls

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Front side panel to body	E63 / E64	M6x22 10.9		12 Nm
	E83	ST6.3x14		7 Nm
	E60 / E61 / E81 / E82 / E85 / E86 / E87 / E88 / E90 / E91 / E92 / E93 / E84	M6		7.6 Nm
	E89	M6		8 Nm
2AZ Front side panel to body	E63 / E64	M6 nut		5 Nm
	E60 / E61	M6 nut		7.6 Nm
	E89	M6 nut		8 Nm
3AZ Front side panel to body	E60 / E61	Sheet metal screw ST4.8x19		7.6 Nm
4AZ Combination holder, side panel, front, to body	E81 / E82 / E87 / E88 / E92	M6		7.6 Nm
5AZ Rear side panel to body	E85 / E86 / E89	M6		7.6 Nm
6AZ Side panel, front, to module carrier/bumper carrier	E70 / E71 / E72	M6x16	Replace bolts	4 Nm
7AZ Front side panel to body Area, A-pillar	E70 / E71 / E72	M6x16	Replace bolts	8 Nm
8AZ Front side panel to body Area, sill	E70 / E71 / E72	Sheet metal screw ST4.8x19	Replace bolts	2.5 Nm
9AZ Front side panel to body	E70 / E71 / E72	M5x20	Replace bolts	5 Nm
10AZ Module carrier, top, to Carrier support	E70 / E71 / E72	M6x26	Replace bolts	8 Nm
11AZ Module carrier, bottom, to engine support	E70 / E71 / E72	M6 nut		7 Nm



41 51 Front doors

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Hinge bolt	E83	M10x56		10 Nm
	E60 / E61 / E85 / E86 / E70 / E71 / E72 / E89	nut M8		27 Nm
	E63 / E64	M6x22 8.8		10.5 Nm
	E81 / E82 / E87 / E88 / E90 / E91 / E92 / E93 / E84	M10x1.25		25 Nm
2AZ Door to door hinge	E63 / E64 / E81 / E82 / E87 / E88 / E90 / E91 / E92 / E93 / E84	nut M8		20 Nm
	E83	nut M8		18.5 Nm
	E60 / E61 / E70 / E71 / E72 / E85 / E86 / E89	M8x28		20 Nm
3AZ Door hinge to body	E63 / E64	M10x35 10.9		46 Nm
	E60 / E61 / E70 / E71 / E72	M12x36 8.8		66 Nm
	E83	M10x30 10.9		56 Nm
	E85 / E86	M10x35 10.9		30 Nm
	E89	M12x23		66 Nm
4AZ Door plug connection to body	E60 / E61 / E63 / E64 / E70 / E71 / E72 / E83 / E85 / E86 / E87 / E81 / E82 / E88 / E90 / E91 / E92 / E89 / E84	M5x16		3 Nm



41 52 Rear doors

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Hinge bolt	E83	M10x56		10 Nm
	E60 / E61 / E70 / E71 / E72	nut M8		27 Nm
	E87 / E90 / E91 / E84	M10x1.25		25 Nm
2AZ Door to door hinge	E83	nut M8		18.5 Nm
	E60 / E61	M8x25		24 Nm
	E70 / E71 / E72	M8x28		20 Nm
	E87 / E90 / E91 / E84	nut M8		20 Nm
3AZ Door hinge to body	E83	M10x35 10.9		56 Nm
	E60 / E61 / E70 / E71 / E72	M12x36 8.8		66 Nm
4AZ Door plug connection to body	E60 / E61 / E70 / E71 / E72 / E83 / E87 / E90 / E91 / E84	M5x16		3 Nm
5AZ Crash reinforcement to inner door panel	E70 / E71 / E72	M8x20		18.5 Nm



41 61 Engine compartment lid

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Engine compartment lid to engine compartment lid hinge	E63 / E64	M8 8.8		18.5 Nm
	E81 / E82 / E83 / E87 / E88 / E90 / E91 / E92 / E93 / E84	M8		15 Nm
	E60 / E61	M8x24 8.8		18.5 Nm
	E85 / E86 / E70 / E71 / E72	M8, nut M8		20 Nm
	E89	Nut M8		18,5 Nm
2AZ Engine compartment lid hinge to body	E63 / E64 / E89	M8 8.8		18.5 Nm
	E83	M8x20 10.9		15 Nm
	E83 / from 05/2006	M8x30 10.9		25 Nm
	E60 / E61	M8x24 8.8		18.5 Nm
	E81 / E82 / E85 / E86 / E87 / E88 / E90 / E91 / E92 / E93 / E70 / E71 / E72 / E84	M8		20 Nm
3AZ Threaded bolt, spacer	E70 / E71 / E72	M6		14 Nm
4AZ Actuator to hinge	E92 / E93 / E89 / E82 / E88	M6 x 16		7,6 Nm



41 62 Rear lid

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Tailgate to tailgate hinge	E63	M6x22		10 Nm
	E64	M8x24		18,5 Nm
	E61	ASA nut M8		20 Nm
	E61	M10 nut		38 Nm
	E60	M8x19.5 8.8		18,5 Nm
	E83 / E85 / E86	M8		20 Nm
	E89	M8		19 Nm
	E81 / E87 / E70 / E84	M8		18.5 Nm
	E71 / E72	M10 x 25 â€¢ 10.9		18,5 Nm
	E90 / E92 / E82 / E88	M8		15 Nm
	E91	M8		30 Nm
	E93	M8x25		20 Nm
2AZ Setting, tailgate hinge	E91	M8		20 Nm
3AZ Tailgate hinge to body	E61 / E83 / E85 / E86 / E90 / E92 / E82 / E88	M8		20 Nm
	E89	M8		19 Nm
	E60 / E64 / E81 / E87 / E84	nut M8		18.5 Nm
	E63 / E70 / E71 / E72	M8		18.5 Nm
	E91	nut M8		20 Nm
4AZ Hinge bolt	E60	nut M8		18.5 Nm
5AZ Earth strap to hinge	E87 / E84	M5 nut		4.4 Nm
6AZ Tailgate, bottom, to tailgate hinge, bottom	E70	M8x22		18.5 Nm
7AZ Tailgate hinge, bottom, to body	E70	M8x22		18.5 Nm
8AZ Fitting screw to tailgate hinge	E70			18.5 Nm
9AZ Limit position, tailgate to body	E70 / E71 / E72	M6 x 21		6 Nm
	E70 / E71 / E72	nutM6		6 Nm
	E70 / E71 / E72	M12x1.5		16 Nm



41 operating fluid overview

Adhesive

Body adhesive K1	195 ml	83190413015
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Adhesive

Body adhesive K2	2x290 ml	83192355849
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Expendable materials

Cavity preservation	1000 ml	83422457338
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Expendable materials

Thin-wall threaded insert M6		41002288195
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Expendable materials

Thin-wall threaded insert M8		41002361595
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Expendable materials

Helicoil thread insert	M12x30 mm	31 10 6 868 499
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Adhesive

Body adhesive K3	2x300 ml	83190417144
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Expendable materials

Betawipe 4800	10 ml	83192357707
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Expendable materials

Bonding base VP 206	30 ml	83199407777
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Expendable materials

Two-component metal filler plus	100+10 g	83192288329
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Expendable materials

Blind rivet N8	ø6,5 mm, Clamping area 6.8-8.8 mm	83192355998
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Expendable materials

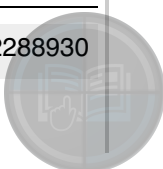
Blind rivet N11 for CFRP connections	ø4,8 mm, Clamping area 2.2-4.7 mm	83197391057
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Expendable materials

Blind rivet N12 for CFRP connections	ø4,8 mm, Clamping area	83197391046
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	4.5-7.5 mm	
Expendable materials		
Plastic nut	Ø18 mm	51161943122
Expendable materials		
Plastic nut	Ø22 mm	07147169847
Expendable materials		
Cavity sealant spray	400 ml	83422457337
Expendable materials		
Twist drill, high-strength	Ø6,8 mm, Length: 79 mm	83192359262
Expendable materials		
Twist drill, high-strength	Ø4,2 mm, Length: 66 mm	83192359263
Expendable materials		
ScotchBrite Multiflex A, very fine		51910402967
Expendable materials		
Adhesive tape		51717901759
Expendable materials		
Reinforcement plate, universal		41217275563
Expendable materials		
Sealant D1 (seam sealing)	310 ml	83422409985
Expendable materials		
Sealant D2 (seam sealing, spreadable)	310 ml	83422409986
Expendable materials		
Cavity foamHS1	400 ml	83429410694
Expendable materials		
Structural foamHS2	420 ml	83190007361
Expendable materials		
Cavity foam HS3 (2K polyurethane foam)	50 ml	83422288930
Expendable materials		



Aluminium adhesive tape (adhesive tape)	50 mm	11007769948
Expendable materials		
Repair rivet for T-bolt	∅2,4 mm, Clamping area 0.8-2.5 mm	07148497787
Expendable materials		
Repair rivet for T-bolt	∅2,4 mm, Clamping area 2.5-6.0 mm	07148497788
Expendable materials		
PrimerP2	50 ml, Gas cartridge	83190302555
Expendable materials		
PrimerP1	50 ml, Bottle	83190302556
Expendable materials		
Cavity sealing wax remover	500 ml, Spray bottle	83120390086
Expendable materials		
Screw EMC screw, SF Plus, M5x15		83190301639
Expendable materials		
Drill bit	∅6,8 mm, Length: 150 mm	83192460425
Expendable materials		
Drill bit	∅4,2 mm, Length: 120 mm	83192460424
Expendable materials		
Blind rivet N1 Ø 6.5 mm ; clamping area 2.8-4.8 mm		83190301414
Expendable materials		
Blind rivet N2 Ø 6.5 mm ; clamping area 4.8-6.8 mm		83190301419
Expendable materials		
Punch rivet N5 Ø 5 mm ; 5 mm long		83192158079



Expendable materials

Blind rivet N7 Ø 6.5 mm ; clamping area 1.5 - 3.5 mm		83192240352
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Expendable materials

Blind rivet N10 Dia. 6.5 mm; clamping area 10.8-12.8 mm		83199144282
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Expendable materials

Blind rivet N9 Dia. 6.5 mm; clamping area 8.8-10.8 mm		83197239634
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Adhesive

Body adhesive K5	50 ml	83192158654
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Expendable materials

Blind rivet N3 Dia. 4 mm; clamping area 1-3 mm		83190301421
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Expendable materials

Blind rivet N6 Dia. 4 mm; clamping area 3-5 mm		83192158655
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Adhesive

Aktivator -205	250 ml, Bottle	83190030155
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Adhesive

Body adhesive K5	195 ml	83192157298
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Adhesive

Body adhesive K4	50 ml, Cartridge	83192456697
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Expendable materials

Punch rivet N4 Ø 3 mm ; 4 mm long		83192457307
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51 11 Front Bumper Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Bumper to bracket	E32	M6		9 Nm
	E36	M8		22 Nm
	E34	M10		43 Nm
2AZ Bumper and bracket to impact absorber	E31	M10	Install bolts with bolt cement.	22 Nm
	E38 / E39 / E46	M10		41 Nm
	E36	M10	Install bolts with bolt cement.	55 Nm
	E32 / E34 / E30 / Mod. 88	M12		48 Nm
	E52			38 Nm
3AZ Impact absorber/bracket to body	E30 / E24			23 Nm
	E31 / E32 / E34 / E36 / E38 / E39	M6		9 Nm
	E32 / E34	M10		48 Nm
	E46 / E52	M8		20 Nm
4AZ Carrier to body	E46 / E65 / E66 / E67	M8		18 Nm
	E60 / E61 / E63 / E64	M8		21 Nm
5AZ Carrier to deformation element	E85 / E86	M10		38 Nm
	E85 / E86	M6		8 Nm
	E83	M8		28 Nm
6AZ Deformation element to body	E85 / E86	M8		19 Nm
	E83	M8		25 Nm
7AZ License plate to bumper	E46 / E60 / E61 / E63 / E64 / E65 / E66			1 Nm
8AZ License plate to bumper (thread repair)	E46 / E60 / E61 / E63 / E64 / E65 / E66	M5		4.5 Nm
9AZ Bumper to front end	E60 / E61			5 Nm



51 12 Rear Bumper Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Bumper to carrier	E31	M10		40 Nm
	E32 / E34 / E36	M8		22 Nm
	E34	M10		42 Nm
2AZ Bumper / carrier to impact absorber	E36	M10	Install bolts with bolt cement.	42 Nm
	E38	M12		45 Nm
	E39	M10		45 Nm
	E46	M10		41 Nm
	E31 / E32 / E34 / E30 / Mod. 88	M12		48 Nm
	E52	M10		38 Nm
	E53	M12		55 Nm
	E85 / E86			19 Nm
	E60 / E61 / E63 / E64	M10		36 Nm
3AZ Impact absorber / carrier to body	E30 / E24			23 Nm
	E31 / E32 / E34	M6		9 Nm
	E36 / E46	M8		22 Nm
	E39	M8		20 Nm
	E53	M8		24 Nm
	E65 / E66 / E67			38 Nm
	E52 / E85 / E86 / E89 /			19 Nm
	E60 / E61 / E63 / E64	M10		36 Nm
	E83	M12		71 Nm
4AZ Bumper to side panel	E30			7 Nm
5AZ Bracket to side panel	E36 / E46			3 Nm
	E39			6 Nm
6AZ Holder, bottom, to body	E36			8.5 Nm
7AZ Screw for lower panel	E36			2.5 Nm
8AZ Bumper to tail panel	E60	M6	Replace screw with sealing washer	2.5 Nm
9AZ Guide to side panel	E83			2 Nm
	E61			3 Nm
10AZ Guide to rear trim panel	E83			2.8 Nm
	E61			4.5 Nm



51 13 Trim Parts, Covers, Handle Strip

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Bracket, roof luggage rack on body	E39 / E46 / E81 / E82 / E87 / E90 / E91 / E92 / E36 / Z3 and M Coupé	M10		20 Nm
2AZ Gutter strip to body (plastic nut)	E46			1 Nm
Gutter strip to body (metal nut or rivet nut)	E46			1,8 Nm
3AZ Roof railing to body	E39		Centre, front, rear	24 Nm
	E61	M8	settling time Check	16 Nm 15 min 16 Nm
	E83	M8	Front Jointing torque Release nut after settling time Jointing torque Angle of rotation	21 Nm 15 min 21 Nm 120 ± 10°
	E83	M8	Centre, rear settling time Check	21 Nm 15 min 21 Nm
	E70 / E84 / E91			19 Nm
	E71 / E72			16 Nm
4AZ Handle strip to tailgate	E39 / Touring			3 Nm
	E46 / E53			2,5 Nm
	E83			1,8 Nm
5AZ Cowl panel cover to body	E60 / E61 / E63 / E64			2,5 Nm
6AZ Centre trim to tailgate	E65 / E66 / E67	M8		2,5 Nm
7AZ Trim to engine compartment lid	E90 / E91			2 Nm
8AZ Additional brake light to tailgate	E89			5 Nm
9AZ Threaded bolt on sliding carriage (roof railing)	E84			15 Nm
10AZ Trim strip to gutter strip	E88 / E89 / E93			1,8 Nm



51 16 Mirrors, Finishers, Ashtrays, Consoles

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Exterior mirror to front door	E31 / E36 / Z3 / E38 / E39 / E52			6 Nm
	E46 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E67 / E83 / E84 / E85 / E86 / E89			6 Nm
			First screw connection for new mirror (cutting process of self-tapping screws)	8 Nm
2AZ Centre console (plastic nut)	E30			5 Nm
3AZ Wooden finisher on carrier	E38			0.6 Nm
4AZ Wooden finisher on carrier	E38			0.8 Nm
5AZ Wooden finisher on carrier	E38			0.7 Nm
6AZ Front drinks holder to function carrier	E38			1.3 Nm
7AZ Wooden finisher to front drinks holder	E38			0.5 Nm
8AZ Screw-in pin to wooden finisher of instrument panel and door panel	E46			0.3 Nm
9AZ Housing for exterior mirror to support	E46 M3 Coupé			1.3 Nm
	E60 M5 / E63 M6			0.7 Nm
	E85 / E86			1.1 Nm
10AZ Brush cable unit to function carrier	E65 / E66 / E67			0.5±0.1 Nm
11AZ Roller sunblind to function carrier	E65 / E66 / E67			0.5±0.1 Nm
12AZ Roller sunblind to brush cable unit	E65 / E66 / E67			1.2 ± 0.2 Nm
13AZ Flap to storage box	E85 / E86			0.5 Nm
14AZ Rearview mirror retaining ring on reinforcement plate	E60 M5 / E63 M6			1.1 Nm
15AZ Notch adapter to mirror base plate	E60 M5 / E63 M6			3.0 Nm
16AZ Centre console to body	E89	M6 / Torx		2.4 Nm
17AZ Centre console to body	E84 / E89			4.6 Nm



18AZ Glove box housing	E84			2.4 Nm
19AZ Bracket, handle, to body	E84			6 Nm



51 21 Front Door Locks

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Door lock to front door	E31 / E36 / E89		Install bolt with bolt cement.	9 Nm
	E46 / E53 / E60 / E61 /			9.5 Nm
	E63 / E64 / E65 / E66 / E67 / E85 / E86			8 Nm
	E83			10 Nm
2AZ Outside handle to front door	E31 / E36			10 Nm
3AZ Door striker to body	E24 / E30			24 Nm
	E31 / E32 / E34			28 Nm
	E65 / E66 / E67 / E85 / E86 /			19 Nm
	E60 / E61 / E63 / E64 / E89 /			21 Nm
	E83		Screw length 18 mm Screw length 20 mm	25 Nm 18.5 Nm
4AZ Adjustment screw to door lock	E46			3 Nm
5AZ Outside handle to lock actuator	E53			3.2 Nm
	E46 / E63 / E64 / E83			2 Nm
	E60 / E61			3 Nm
6AZ Inside door opener to front door	E46 / Saloon / Touring			4 Nm
	E46 / Compact			2.7 Nm
	E65 / E66 / E85 / E86			3 Nm
	E67			4 Nm
7AZ Lock actuator/front cover to front door	E60 / E61 / E63 / E64			2.5 Nm
8AZ Lock actuator/rear cover to front door	E60 / E61 / E63 / E64			3.3 Nm
9AZ Door retainer to A-pillar	E85 / E86			24 Nm
	E60 / E61			21 Nm
	E89			27 Nm
10AZ Door retainer to door	E60 / E61 / E85 / E86			10 Nm
	E89			12 Nm
11AZ Adapter plate, drive, to door	E60 / E61			7.6 Nm
12AZ Drive to adapter plate	E60 / E61			4 Nm
13AZ H-strut to inner door plate	E89		Replace screw (self-locking)	7 Nm
14AZ Power window rail to door	E89			9.5 Nm



15AZ	Carrier, outside door handle, to door outer skin	E89			4.4 Nm
16AZ	Adapter, speaker, to inner door plate	E89			2 Nm
17AZ	Power window motor to inner door plate	E89		Replace screws (self- locking)	7.6 Nm



51 22 Rear Door Locks

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Door lock to rear door	E36		Install bolt with bolt cement.	9 Nm
	E46 / E53 / E60 / E61			9 Nm
	E65 / E66 / E67			10 Nm
2AZ Outside handle to rear door	E36			10 Nm
3AZ Door striker to body	E32 / E34			24 Nm
	E60 / E61 / E65 / E66 / E67			19 Nm
4AZ Adjustment screw to door lock	E46			3 Nm
5AZ Outside handle to lock actuator	E53			3.2 Nm
	E46 / E60 / E61 / E83			2 Nm
6AZ Inside door opener to rear door	E46 / E67			4 Nm
	E65 / E66			3 Nm
7AZ Lock actuator/front cover to rear door	E60 / E61			2.5 Nm
8AZ Lock actuator/rear cover to rear door	E60 / E61			3.3 Nm
9AZ Side impact protection to rear door	E60 / E61			19 Nm
10AZ Adapter plate, drive, to door	E60 / E61			7.6 Nm
11AZ Drive to adapter plate	E60 / E61			4 Nm
12AZ Door retainer to A-pillar	E60 / E61			21 Nm
13AZ Door retainer to door	E60 / E61			10 Nm



51 23 Hood/bonnet locks

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Retaining hook to engine hood/bonnet (replace microencapsulated screws)	E46 / E52 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E83 / E85 / E86 / E89			10 Nm
	E38 / E39			12 Nm
	E36		Hexagon screw Torx bolt	10 Nm 12 Nm
2AZ Lock to body (replace microencapsulated screws)	E36 / E38 / E39 / E46 / E52 / E53 / E60 / E61 / E63 / E64 / E83			10 Nm
	E65 / E66 / E85 / E86			8 Nm
	E89			12 Nm
3AZ Lock to engine hood/bonnet (replace microencapsulated screws)	E36 / E46 / E52			10 Nm
	E39			12 Nm



51 24 Rear lid locks

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Banjo bolt to hydraulic unit and to hydraulic cylinder	E39 / Touring			10 ^{+2.5} Nm
	E65 / E66 / E67			15 Nm
2AZ Oil filler plug to hydraulic unit	E65 / E66 / E67 / E39 / Touring			8 ⁺² Nm
	E61			1 ^{+0.3} Nm
3AZ Engine bolt to hydraulic unit	E65 / E66 / E67			5 ^{+1.5} Nm
4AZ Hydraulic unit to bracket	E61			2 ^{+1.5} Nm
	E65 / E66 / E67			10 Nm
5AZ Rear lid lock to rear lid	E60 / E63 / E64 / E65 / E66 / E67 / E85 / E86			10 Nm
6AZ Striker to body	E60 / E63 / E64 / E65 / E66 / E67 / E85 / E86			10 Nm
7AZ Bracket, hydraulic unit, to body	E65 / E66 / E67			10 Nm
8AZ Bracket, angle sensor, to body	E65 / E66 / E67			7 Nm
9AZ Valve to hydraulic unit	E65 / E66 / E67			14 Nm
10AZ Ball pin for hydraulic cylinder to body	E61		Install with Loctite 270	41 Nm
11AZ Emblem actuator to holder, emblem actuator	E89			4 Nm
12AZ Rear lid lock to rear inner plate	E89			10 Nm
13AZ Rear lid lock to rear inner plate	E89			1.5 Nm
14AZ Striker to body	E89			10 Nm



51 32 Front Door Windows

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Door window glass holder to roller guide	E31 / E36 / Coupé/Convertible			9 Nm
2AZ Door window glass to holder	E31 / E36 / Coupé/Convertible			6 Nm
	E38 / E39 / E46 / E60 / E61 / E85 / E86			8 Nm
	E63 / E64 / E65 / E66 / E89 /			10 Nm
3AZ Main stop to window regulator	E31 / E36			9 Nm
4AZ Window guide to body	E36			10 Nm
5AZ Window winder	E36			6 Nm
6AZ Power window rail to door	E89			9.5 Nm



51 33 Power windows, front

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Flat motor to power window regulator	E31, E36, E65, E66			5 Nm
	E46, E85, E86			4,5 Nm
	E83			3 Nm
	E60, E61, E63, E64			6 Nm
2AZ Window regulator to door	E38, E39, E60, E61, E65, E66, E83			8 Nm
	E36			9 Nm
	E46		Replace nut (self-locking)	9,5 Nm
	E63, E64			9,5 Nm
3AZ Window regulator to door	E85, E86			13,3 Nm
4AZ Window regulator to door	E85 / E86			9,5 Nm
5AZ Flat motor to inner door panel	E89			7,6 Nm
6AZ Support (terminal clamp) flat motor to inner door panel	E89			9,5 Nm



51 35 Power windows, rear

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Motor to window regulator	E84 / E87 / E90 / E91			3.5 Nm
	E70 / E71 / E72			6 Nm
2AZ Window regulator to door	E83			8.2 Nm
	E60 / E61 / E65 / E66			7.6 Nm
	E70 / E71 / E72 / E84 / E87 / E90 / E91			9.5 Nm
	E60 / E61			7.6 Nm
4AZ Additional armour-plated rear window	E70 / SA106		Replace nuts	10 Nm
5AZ Additional armour-plated fixed side window	E70 / SA106		Replace screws or nuts	10 Nm



51 41 Front door trim panel with armrests

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Door trim panel to front door (screw under airbag sticker)	E46 / Convertible / Coupé			2.5 Nm
	E85 / E86 / E46 / Compact			4 Nm
	E89			5.0 Nm
	E60 / E61 / E65 / E66 / E67 / E83			8.0 Nm
2AZ Door trim panel to front door (screw to armrest or door handle)	E46 / Saloon / Touring			2.5 Nm
	E46 / Convertible / Coupé			3.0 Nm
	E46 / Compact			4 Nm
	E63 / E64			3.5 Nm
	E65 / E66 / E67 / E83			8.0 Nm
	E85 / E86			7.0 Nm
3AZ Armrest to door trim panel	E46 / Convertible / Coupé			2.5 Nm
4AZ Door trim panel to front door	E46 / Compact			1.1 Nm
	E60 / E61			0.8 Nm
	E65 / E66 / E67			1.5 Nm
	E63 / E64			3.0 Nm
5AZ Wood/decorative strip to door trim	E65 / E66 / E67			1.2 Nm
	E60 / E61			0.4 Nm
6AZ Speaker frame to door trim	E65 / E66 / E67			0.5 Nm
7AZ Sheet metal nut	E65 / E66 / E67			1.0 Nm
8AZ Door handle to door trim panel	E85 / E86			0.5 Nm
9AZ Carrier to door trim panel	E60 / E61			7.0 Nm



51 42 Rear door trim panel with armrests

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Door trim panel to rear door	E46			2.7 ± 0.5 Nm
	E65 / E66 / E67			8.0 Nm
	E60 / E61			0.8 Nm
	E83			8.2 Nm
	E87			4.2 ± 0.8 Nm
	E90 / E91			3.8 ± 0.8 Nm
2AZ Wood/decorative strip to door trim	E65 / E66 / E67			1.2 ± 0.2 Nm
	E60 / E61			0.4 Nm
3AZ Speaker frame to door trim	E65 / E66 / E67			0.5 ± 0.2 Nm
4AZ Door trim panel to rear door (screw under airbag sticker)	E60 / E61			8.0 Nm
	E83			8.2 Nm
5AZ Carrier to door trim panel	E60 / E61			7.0 Nm
6AZ Armrest to door trim panel	E87			2.0 ± 0.4 Nm
7AZ Door handle to door trim panel	E87			2.0 ± 0.4 Nm



51 42 Rear door trim panel with armrests

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Door trim panel to rear door	E84			4 Nm



51 43 Side Trim Panel with Armrests

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Trim, rear roof pillar (C-pillar) on body	E38			3.0 Nm
	E60			3.5 Nm
	E61 / E65 / E66 / E67			4.0 Nm
	E83			2.0 Nm
2AZ Trim, front roof pillar (A-pillar) on body	E46			2.0 Nm
	E60 / E61 / E63 / E64			2.5 Nm
	E83			2.0 Nm
	E65 / E66 / E67			4.5 Nm
3AZ Side trim panel to body	E46 / Coupé			3 Nm
	E46 / Compact			4.5 Nm
4AZ Armrest to side trim panel	E46 / Coupé			2.5 Nm
5AZ Comfort operating unit to cross-member	E61			3.2 Nm
6AZ Drive to comfort operating unit	E61			2.8 Nm



51 46 Panel, rear parcel shelf, roller sun blind

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Rear parcel shelf to body	E65, E66, E67			2.5 Nm
2AZ Roller sun blind to rear parcel shelf	E38, E39			3 Nm
	E65, E66, E67			2 Nm
3AZ Roller sun blind with rear parcel shelf to body	E38, E39			6 Nm
	E60, E65, E66, E67, E90, E92			4 Nm
4AZ Cover, rollover bar	E88, E93			4.4 Nm
5AZ Trim grille, air outlet, to rollover protection system	E88			3 Nm
	E93			8 Nm
6AZ Lashing eye to trim panel, partition	E89	M6		6 Nm
7AZ Trim panel, partition, to body	E89	M6		3.5 Nm



51 75 Underbody panelling

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Underbody panelling on body	E-series	Screw		3 Nm
		Nut		2.5 Nm



5147 Overview of tightening torques

Oddments tray on body	
Plastic nut	3Nm



51 61 Reinforcement, body

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Trailing link in engine compartment	E60 / E61 / E63 / E64	M8	Replace screws Retightening New part / first-tightening	27 Nm 30,5 Nm
2AZ Structure trailing link, front	E64	M12	Replace screws Jointing torque Angle of rotation	100 Nm 90 째
	E64	M6	Replace screws Jointing torque	8 Nm
3AZ Trailing link to rear axle	E60 / M5, E61 / M5, E63 / M6, E64 / M6	M8	M8 8.8 M8 10.9	24 Nm 30 Nm
	E61, E64	M12	Replace screws Jointing torque Angle of rotation	100 Nm 90 째
	E61, E64	M8	Nut	19 Nm
4AZ Trailing link, rear axle, front	E61 / M5, E64 / M6	M12	Replace screws Jointing torque Angle of rotation	100 Nm 90 째
5AZ Trailing link, rear axle, rear	E61 / M5, E64 / M6	M12	Replace screws Jointing torque Angle of rotation	100 Nm 90 째
6AZ Cross-strut, rear end	E61, E64	M10	Nuts Bolts	41 Nm 59 Nm
7AZ Connection carrier to body (tunnel)	E60, E61, E63, E64, E87, E88, E90, E91, E92 / S65, E93	M8		24 Nm
	E65, E66	M8		19 Nm
	E83	M8		23 Nm
8AZ Vertical strut in luggage compartment	E84			68 Nm



51 71 Gaskets and loose body components

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Front spoiler to bumper	E36 / M3			3 Nm
2AZ Rear spoiler	E34 / Touring, E36 / Z3 Coupé / M Coupé	M6		6 Nm
	E36 / M3	M6		7 Nm
	E53			3 Nm
	E83	M6		10 Nm
	E61			8 Nm
3AZ Reinforcement plate to front axle support/engine support	E46 / excluding all-wheel drive vehicles, E85, E86		Replace screws	
			Jointing torque Angle of rotation	59 Nm 90 °
4AZ Trailing link in engine compartment	E85, E86		Nut	41 Nm
			Replace screw Angle of rotation	56 Nm 105 ±15 °
	E83	M8		19 Nm
	E89		Replace screws Angle of rotation	100 Nm 105 ± 15 °
5AZ Reinforcement plate/trailing link to rear axle	E46 / Convertible, E85, E86	M10	Replace screws	
			Jointing torque Angle of rotation	59 Nm 90 °
6AZ Reinforcement plate to body	E85, E86	M8		21 Nm
7AZ Trailing link to rear axle	E46 / Convertible	M8		24 Nm
	E85, E86		Replace nut	24 Nm
8AZ Cross member, A-pillar, to bracket	E52	M8		19 Nm
9AZ Cross member, A-pillar, middle	E52	M8		10 Nm
10AZ Strut to transmission tunnel	E52	M8		19 Nm
11AZ Cross member, A-pillar, bottom, to bracket	E52	M6		11 Nm
12AZ Support tube to support, steering column upper section	E65, E66, E67	M8		21 Nm
13AZ Support tube to body	E85 / E86	M8		20 Nm
14AZ Heating unit to support tube	E85, E86			4 Nm
15AZ Support tube to body	E60, E61, E63, E64, E83	M8		21 Nm
16AZ Mounting, cover, sill to body	E83	M8		5 Nm
17AZ Cover, partition, to body, front	E61			2,5 Nm



18AZ	Retaining strip, sill trim, to side panel	E61			5 Nm
19AZ	Multifunction pan to body	E60 / M5			3 Nm
		E86			12 Nm
20AZ	Underride protection to retaining bracket	E60, E61	M8	Replace screws	8 Nm
21AZ	Retaining bracket for underride protection to frame side member	E60, E61	M8	Replace screws	8 Nm
22AZ	Protective mat/protective cover to body	E60 / Security	M6	Screw	10 Nm
23AZ	Cross connection (engine compartment) to upper section, support, front panel	E89		Screw	7.6 Nm
24AZ	Stiffening plate to body	E89	M10	Replace screws	
				Jointing torque Angle of rotation	56 Nm 105 ±15 °
25AZ	Stiffening plate to exhaust system	E89		Nut	20 Nm
26AZ	Stiffening plate to body	E89		Nut	24 Nm
27AZ	Diagonal strut in engine compartment	E89		Nut	56 Nm
				Screw	56 Nm



51 operating fluid overview

Expendable materials

Yellow plastic adhesive tape		83199410979
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Expendable materials

Adhesive tape, double-sided		54112290978
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Expendable materials

Cutting cord		81432344272
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Expendable materials

Cleaning agent R1	100 ml, Bottle	83192211217
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Expendable materials

Cleaning agent R2	500 ml	83190417324
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Adhesive

Window glass adhesive Rest of World	300 ml, Cartridge	83192289286
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Adhesive

Window glass adhesive USA	300 ml, Cartridge	83192289181
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Adhesive

Window glass adhesive CHN	300 ml, Cartridge	83192180002
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52 10 Front seats

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Seat to floor plate	E31 / E32 / E34 / E36	M10		44 Nm
	E36 / Z3 front	M8		22 Nm
	E36 / Z3 rear	M10		43 Nm
	E38 / E39 / E46 / E52 / E53 / E63 / E64 / E83 / E85	M10		45 Nm
			Torque angle	90 °
	E60 / E61 / E65 / E66 / E67	M10 (trilobular)	Replace Powerlok screw	44 Nm
2AZ Backrest frame to seat frame	E36			60 Nm
	E63 / E64 / E83 / E85			32 Nm
	E46 all except Convertible		Replace screws	32 Nm
	E65 / E66 / E67 / E60 / E61	M10 (trilobular)	Replace Powerlok screw	33 Nm
	E53			45 Nm
3AZ Support (backrest shell) to headrest rail	E31			6.5 Nm
4AZ Head restraint rail to backrest frame	E31			25 Nm
5AZ Finisher on seat rail	E38 / E39	M4		4 Nm
6AZ Seat frame to seat runner	E38 / E39	M6		15 Nm
	E60 / E61 / E65 / E66	M8		27 Nm
7AZ Actuating unit to seat frame	E46 / E85			10 ^{±2} Nm
8AZ Adjusting screw for eccentric element	E46 / E85			1.4 Nm
9AZ Seat pan to seat frame	E46 / E53 / E63 / E64 / E83 / E85			10 ^{±2} Nm
10AZ Microswitch to front seat	E46			2 ^{±1} Nm
11AZ Backrest frame to seat rail	E31			25 Nm
12AZ Trims to seat mechanism	E63 / E64			3 Nm
13AZ Trim to seat cushion shell	E63 / E64			4.4 Nm
14AZ Backrest frame to seat frame - Screw	E46 Convertible		Replace screws	24 ⁺⁴ Nm
15AZ Backrest frame to seat frame - Pin with knurling and lock nut	E46 Convertible		Replace screws	40 ⁺⁵ Nm
16AZ Seat tilt adjuster to seat mechanism	E46 / E53 / E83 / E85	M6 x 10 (trilobular)	Replace Taptite screw	9 Nm



17AZ	Seat tilt adjuster to seat pan	E46 / E53 / E83 / E85			9 Nm
18AZ	Active head restraint Sliding rails with gas cartridge	E60 / E61 / E65 / E66 / E67			8 Nm
19AZ	Belt guide to backrest	E85			1.25 Nm
20AZ	Kinematic element to backrest frame	E46 Convertible			3 ⁺² Nm
21AZ	Gearing for headrest adjustment	E60 / E61 / E65 / E66 / E67			2.5 ^{±0.5} Nm



52 24 Rear Seat (normal), manual

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Backrest on body	E38	M6		5 Nm
	E60	M8		18.5 Nm
2AZ Head restraint support to backrest	E60	M6	Screws, top	5.6 Nm
			Screws, bottom	8 Nm
3AZ Armrest lock to backrest	E60	M6		8 Nm
4AZ Backrest lock to backrest	E60	M6		19 Nm
5AZ Centre armrest to backrest frame	E60	M6		19 Nm
6AZ Storage compartment casing to body	E63 / E64			7.5 Nm
7AZ Ski bag casing to body (hexagon screw)	E63 / E64	M8		24 Nm
8AZ Lock to body	E60			12.5 Nm
9AZ Top Tether eyelet	E60 / E63 / E65 / E66			17 Nm



52 26 Rear Seats (through-loading system)

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Outer mount (backrest) to body	E60			12.5 Nm
2AZ Centre mount (backrest) to body	E60			12.5 Nm
3AZ Backrest lock to seat back	E60			12.5 Nm
4AZ Centre armrest to seat back	E60	M6		6 Nm
5AZ Outer mount to seat back	E60			38 Nm
6AZ Skibag cover to skibag frame	E60			6 Nm
7AZ Striker to body	E61			19 Nm
8AZ Lashing eye to backrest				
9AZ Lock to backrest	E61			20+5 Nm
10AZ Lock to body	E60			18.5 Nm



52 26 Rear Seats (through-loading system)

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Outer mount (backrest) to body	E60			12.5 Nm
2AZ Centre mount (backrest) to body	E60			12.5 Nm
3AZ Backrest lock to seat back	E60			12.5 Nm
4AZ Centre armrest to seat back	E60	M6		6 Nm
5AZ Outer mount to seat back	E60			38 Nm
6AZ Skibag cover to skibag frame	E60			6 Nm
7AZ Striker to body	E61			19 Nm
8AZ Lashing eye to backrest				
9AZ Lock to backrest	E61			20+5 Nm
10AZ Lock to body	E60			18.5 Nm



54 13 Electrical slide/tilt sunroof components

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Drive to cassette	E31 / E32 / E34 / E36 / E38 / E39 / E46 / E53 / E83			2,8 Nm
	E34 Touring / E60 / E61 / E63 / E65 / E66 / E81 / E82 / E87			3,5 Nm
	E90 / E92			3,8 Nm
	E91			2,5 Nm
	E70 / E71 / E72 / E84			3±0,5 Nm



54 12 Mechanical components, slide/tilt sunroof

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Cable cover to cassette	E36			1,3 Nm
	E38			1,6 Nm
2AZ (Glass) cover to gate Always use new nuts and bolts.	E34 / Touring			5 Nm
	E38 / E46			4,5 Nm
	All others			6 Nm
	All others			6 Nm
3AZ Rail to cassette	E31 / E32 / E34	M4		1,8 Nm
	E32 / E34	M5		2,8 Nm
4AZ Gearbox to cassette	E36			2,8 Nm
5AZ Floating headliner to gate	E36			1,5 Nm
	E38 / E39	M4 x 6		1,5 Nm
	E46			0,9 Nm
6AZ Cassette to body	E36 / E34 / Touring	M5		3,5 Nm
	E46	M6 x 14		5,2 Nm
	E60 / E65 / E66 / E71 / E72	M6		5,5 Nm
7AZ Mount for wind deflector on cassette	E38 / E34			1,2 Nm
	E46			1 Nm
8AZ Stop to floating headliner (glass slide/tilt sunroof)	E38	M4 x 8		0,9 Nm



54 13 Electrical slide/tilt sunroof components

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Drive to cassette	E31 / E32 / E34 / E36 / E38 / E39 / E46 / E53 / E83			2,8 Nm
	E34 Touring / E60 / E61 / E63 / E65 / E66 / E81 / E82 / E87			3,5 Nm
	E90 / E92			3,8 Nm
	E91			2,5 Nm
	E70 / E71 / E72 / E84			3±0,5 Nm



54 operating fluid overview

Brake fluid and hydraulic fluid

Hydraulic fluid for convertible top / lids	250 ml, Bottle	54340394395
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Expendable materials

Lubricating grease Renolit RHF 1	20 g, Bag	83192157321
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61 12 Auxiliary cable Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Battery positive lead to distributor, luggage compartment	E60 / E61 / E63 / E64 / E65 / E66 / E70 / E71 / E72 / E81 / E82 / E83 / E87 / E88 / E90 / E91 / E92 / E93	M8		15 Nm
2AZ Battery positive lead to connector, engine bulkhead	E83	M8		19 Nm
3AZ Battery positive to transfer point, luggage compartment floor	E60 / E61 / E63 / E64 / E65 / E66 / E70 / E71 / E72 / E81 / E82 / E84 / E85 / E86 / E87 / E88 / E90 / E91 / E92 / E93	M8		15 Nm
4AZ Battery positive lead to engine compartment B+ terminal	E70 / E71 / E72 / E81 / E82 / E85 / E86 / E87 / E88 / E90 / E91 / E92 / E93	M8		15 Nm
	E70 / E71 / E72 / E81 / E82 / E85 / E86 / E87 / E88 / E90 / E91 / E92 / E93	M6		8 Nm
5AZ Battery negative lead to body	E70 / E71 / E72 / E81 / E82 / E85 / E86 / E87 / E88 / E92 / E93	M8		15 Nm
6AZ Battery negative lead to body	E90 / E91	M8		21,4 Nm



61 21 Battery with terminal

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Battery positive lead, battery negative lead, safety battery terminal, IBS (screw connection from above)	E38 / E39 / E46 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E67 / E70 / E71 / E72 / E81 / E82 / E83 / E84 / E85 / E86 / E87 / E88 / E90 / E91 / E92 / E93	M6		5 Nm
	E38 / E39	M8		15 Nm
2AZ Power distribution box	E60 / E61 / E63 / E64 / E70 / E71 / E72 / E81 / E82 / E87 / E88 / E90 / E91 / E92 / E93	M8		15 Nm
	E60 / E61 / E63 / E64	M6		5 Nm
3AZ Fuse box	E85 / E86	M8		15 Nm
	E85 / E86	M6		8 Nm
	E85 / E86	M5		5 Nm
4AZ Battery positive lead to distributor, safety battery terminal	E46 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E67 / E70 / E71 / E72 / E81 / E82 / E83 / E85 / E86 / E87 / E88 / E90 / E91 / E92 / E93	M8		15 Nm



61 31 Switch

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Ignition starter switch	E60 / E61 / E63 / E64			0,4 Nm
2AZ Reversing light switch	E36 / E38 / E39 / E46 / E53 / E60 / E61 / E63 / E64 / E81 / E82 / E83 / E85 / E86 / E87 / E88 / E89 / E90 / E91 / E92 / E93	M12		16,0 Nm
3AZ Trim, gear selector switch	E70 / E71 / E72	M4		2,0 Nm
4AZ Gear selector switch	E70 / E71 / E72	M5		5,0 Nm
5AZ Controller	E70 / E71 / E72	M4		1,5 Nm
6AZ Gear selector switch	E60 / E61 / E63 / E64 / E89 / E90 M3 / E92 M3 / E93 M3	M6		7,5 Nm
7AZ Emergency release to gear selector switch	E60 / E61 / E63 / E64	M4		1,6 Nm
8AZ Switch cluster to steering column	E70 / E71 / E72 / E81 / E82 / E84 / E85 / E87 / E88 / E89 / E90 / E91 / E92 / E93			2,5 Nm



61 61 Windscreen wipers

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Wiper motor secured to wiper bracket	E52	M6		9.9 Nm
2AZ Parked position stop to wiper console				
3AZ Wiper contact pressure motor to wiper console				
4AZ Motor crank to wiper motor	E52	M8		27 Nm
5AZ Wiper shaft nut to body				
6AZ Wiper bracket to firewall	E52 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E67 / E70 / E71 / E72 / E81 / E82 / E84 / E85 / E86 / E87 / E88 / E90 / E91 / E92 / E93	M6	If necessary, observe tightening sequence.	10 Nm
7AZ Wiper bracket to rubber buffer	E53	M6		10 Nm
8AZ Wiper arms	E53		Due to risk of releasing: check tightening torque after approx. 15 mins. settling time.	30 Nm
9AZ Wiper arms	E52			27 Nm
10AZ Adjusting screw, wiper arm, right side	E65 / E66 / E67		Due to risk of releasing: check tightening torque after approx. 15 mins. settling time.	30 Nm
11AZ Wiper arms	E85 / E86			25 Nm
	E90 / E91 / E92 / E93	M10		30 Nm
	E70 / E71 / E72 / E81 / E82 / E84 / E87 / E88	M10		35 Nm
12AZ Wiper arm, left side	E60 / E61 / E63 / E64	M10	For torque, see inscription on wiper arm. Due to risk of releasing: check TT after approx. 50 mins. settling time.	30 or 35 Nm
	E65 / E66 / E67	M10	Due to risk of releasing: check tightening torque after approx. 15 mins. settling time.	45 Nm
13AZ Wiper arm, right side	E60 / E61 / E63 / E64	2xM8	For torque, see inscription on wiper arm. Due to risk of releasing: check TT after approx. 50 mins. settling time.	20 Nm
	E60 / E61 / E63 / E64	1xM8 1xM10	Wiper arm without torque label.	17 or 35 Nm



	E65 / E66 / E67	M10	Due to risk of releasing: check tightening torque after approx. 15 mins. settling time.	35 Nm
14AZ Adjusting screw, wiper arm, right side	E60 / E61 / E63 / E64			20 Nm
15AZ Bearing block tension strut/cowl panel	E60 / E61 / E63 / E64			24 Nm
16AZ Nut to deflection lever	E65 / E66 / E67	M10		30 Nm



6161 Overview of Technical Data

Scale range	
Scale range for left-hand drive vehicles	0 ... -10

Scale range	
Scale range for right-hand drive vehicles	For right hand drive vehicles, change the preceding sign of the scale values.
	0 ... +10



61 operating fluid overview

Expendable materials

Protective cover "Vehicle protection" picture panel		8319 2 350 087
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62 11 Instrument panel control unit

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Instrument cluster to instrument panel	E60 / E61 / E63 / E64 / E81 / E82 / E84 / E87 / E88 / E90 / E91 / E92 / E93			1.5 Nm
	E70 / E71 / E72			2.2 Nm



62 30 Head-Up Display

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Height adjustment Head-Up Display Lock nut	E60 / E61 / E63 / E64			18.5 Nm
2AZ Headup display to support frame Screw	E70 / E71 / E72	M6		8 Nm



63 17 Front Fog Lamps, Additional Lamps

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Fog lamp to bumper trim	E60 / E61 / E63 / E64			2.5 Nm ± 0.3 Nm
	E71 / E72			2.0 Nm ± 0.5 Nm
	E81 / E82 / E87 / E88			2.2 Nm
	E83			2.5 Nm ± 0.5 Nm



63 21 Rear light unit

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Retaining nuts, rear light	E60 / E61 / E85 / E86 / E90 / E91 / E92 / E93		See Repair Instruction	2.5 Nm
	E63 / E64 / E70 / E71			2.5 Nm
	E81 / E82 / E87 / E88		See Repair Instruction	2.8 Nm
	E83		See Repair Instruction	4.0 Nm $\pm$ 0.5 Nm
2AZ Retaining screws, rear light	E63 / E64			1.5 Nm
3AZ Retaining clip (clamping claw), rear light	E92 / E93			4.0 Nm
	E70 / E71 / E72			2.5 Nm
4AZ Auxiliary brake light to carrier	E81 / E87			2.3 Nm
5AZ Additional brake light to rear spoiler	E83			2.5 Nm $\pm$ 0.5 Nm



63 21 Rear light unit

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Retaining nuts, rear light	E60 / E61 / E85 / E86 / E90 / E91 / E92 / E93		See Repair Instruction	2.5 Nm
	E63 / E64 / E70 / E71			2.5 Nm
	E81 / E82 / E87 / E88		See Repair Instruction	2.8 Nm
	E83		See Repair Instruction	4.0 Nm $\pm$ 0.5 Nm
2AZ Retaining screws, rear light	E63 / E64			1.5 Nm
3AZ Retaining clip (clamping claw), rear light	E92 / E93			4.0 Nm
	E70 / E71 / E72			2.5 Nm
4AZ Auxiliary brake light to carrier	E81 / E87			2.3 Nm
5AZ Additional brake light to rear spoiler	E83			2.5 Nm $\pm$ 0.5 Nm



64 11 Housing, heater/air conditioner

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Bulkhead adapter	E84, E85, E86, E89			1.0 ± 0.3 Nm
2AZ Blower for heater/air conditioner	E85, E86			1.5 ± 0.3 Nm
3AZ Controller for heating and air conditioning system blower	E84, E85, E86, E89			1.0 ± 0.3 Nm
4AZ Air conditioner to bulkhead	E60, E61, E63, E64, E83, E81, E82, E87, E88, E90, E91, E92, E93			6 Nm
	E70, E71, E72			6.5 Nm
5AZ Cooler box to luggage compartment partition wall	E65, E66, E67			4.5 Nm
6AZ Air conditioner to support tube	E81, E82, E84, E87, E88, E90, E91, E92, E93			9 Nm
7AZ Mounting, positive/negative lead, to electric auxiliary heater	E83			8.8 Nm



64 11 Housing, heater/air conditioner

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Bulkhead adapter	E85, E86, E89			1.0 ± 0.3 Nm
2AZ Blower for heater/air conditioner	E85, E86			1.5 ± 0.3 Nm
3AZ Controller for heating and air conditioning system blower	E84, E85, E86, E89			1.0 ± 0.3 Nm
4AZ Air conditioner to bulkhead	E60, E61, E63, E64, E83, E81, E82, E87, E88, E90, E91, E92, E93			6 Nm
	E70, E71, E72			6.5 Nm
5AZ Cooler box to luggage compartment partition wall	E65, E66, E67			4.5 Nm
6AZ Air conditioner to support tube	E81, E82, E84, E87, E88, E90, E91, E92, E93			9 Nm
7AZ Mounting, positive/negative lead, to electric auxiliary heater	E83			8.8 Nm



64 31 Microfilter system

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Fresh air duct to mounting bracket, left/right	E60, E61, E63, E64	M6		4.5 Nm
2AZ Fresh air duct to bearing block	E60, E61, E63, E64			3.5 Nm
3AZ Pipe clamp to fresh air duct	E60, E61, E63, E64			2.0 Nm



64-2 12 Additional Heater with Controls

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Holder, heater, to body	E60, E61, E63, E64			
2AZ Holder to heater	E60, E61, E63, E64			10 Nm
3AZ Combustion air blower unit to burner housing	E60, E61, E63, E64, E65, E66			4 Nm
4AZ Burner insert to burner housing	E60, E61, E63, E64, E65, E66			4 Nm



64 31 Microfilter system

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Fresh air duct to mounting bracket, left/right	E60, E61, E63, E64	M6		4.5 Nm
2AZ Fresh air duct to bearing block	E60, E61, E63, E64			3.5 Nm
3AZ Pipe clamp to fresh air duct	E60, E61, E63, E64			2.0 Nm



64 52 Air conditioning compressor

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Refrigerant lines to air-conditioning compressor	E36/7 M54, E36/7 S54, E38, E39, E46, E52, E53, E60, E61, E63, E64, E65, E66, E67, E83, E85, E87, E90, E91, E92, E93	M8		20 Nm
2AZ Filler plug, A/C compressor	E36, E38, E39, E46, E52, E53, E60, E61, E63, E64, E65, E66, E67, E83, E85, E87, E90, E91, E92, E93			30±1 Nm
3AZ A/C compressor to carrier	M67TU, M54, N62, S85, N54, N46	M8		21 Nm
	N45, N46, M47T2, M57TU, M57T2	M8		19 Nm
	N52K	M8 x 87	Replace aluminium screw! Jointing torque Angle of rotation	10 Nm 180±15°
	N52K	M8 x 52	Replace aluminium screw! Jointing torque Angle of rotation	10 Nm 90±15 °
	N52	M8 x 87	Replace aluminium screw/bolt Replace! Jointing torque Angle of rotation	10 Nm 180±15 °
	N53 / N51	M8 x 52	Replace aluminium screw/bolt Replace! Jointing torque Angle of rotation	10 Nm 90±15 °
	N53 / N51	M8 x 87	Replace aluminium screw/bolt Replace! Jointing torque Angle of rotation	10 Nm 180±15 °
	E85 S54, E86 S54			20 Nm
4AZ Belt pulley / hub to air conditioning compressor	M47T2			35±5 Nm
5AZ Holder, air conditioning compressor to lower crankcase section	N54			19 Nm
6AZ Cable clip to air conditioning compressor	M47T2			3 Nm



64 52 Air conditioning compressor

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Refrigerant lines to air-conditioning compressor	E70, E71, E72	M8		21 Nm
	E70 / E71, N57X	M6		8 Nm
	E60 / N47, E61 / N47, E81, E82, E87, E88, E90 / N47, E91 / N47, E92 / N47	M8		18,5 Nm
	E84 / E89	M8		18,5 Nm
	E92 / S65	M8		21 Nm
2AZ Oil filler plug, air conditioning compressor	E70, E71, E72			18±1 Nm
	E81 / N43, E82, E88			25 Nm
3AZ A/C compressor to carrier	N52, N52K	M8 x 87	Replace aluminium screw/bolt Replace! Jointing torque Angle of rotation	10 Nm 180±15 °
		M8 x 52	Replace aluminium screw/bolt Replace! Jointing torque Angle of rotation	10 Nm 90±15 °
	N43	M8		23 Nm
	N47	M8 x 90		19 Nm
		M10 x 125		38 Nm
	N54	M8		19 Nm
	N55	M8		19 Nm
	N57X	M10		38 Nm
	M57	M8		19 Nm
	N62	M8		21.4 ± 3.2 Nm
	N63	M8		21.4 ± 3.2 Nm
	S63	M8		21.4 ± 3.2 Nm
4AZ Bracket, pressure line, to compressor	E82 / N54			7,6 Nm
5AZ Bearing support, compressor, to crankcase	E70 / E71		Jointing torque	2 Nm
			Tightening torque	20,5 Nm
6AZ Electric A/C compressor, to crankcase	E72	M8		21,4 ± 3.2 Nm



64 11 Housing, heater/air conditioner

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Bulkhead adapter	E84, E85, E86, E89			1.0 ± 0.3 Nm
2AZ Blower for heater/air conditioner	E85, E86			1.5 ± 0.3 Nm
3AZ Controller for heating and air conditioning system blower	E84, E85, E86, E89			1.0 ± 0.3 Nm
4AZ Air conditioner to bulkhead	E60, E61, E63, E64, E83, E81, E82, E87, E88, E90, E91, E92, E93			6 Nm
	E70, E71, E72			6.5 Nm
5AZ Cooler box to luggage compartment partition wall	E65, E66, E67			4.5 Nm
6AZ Air conditioner to support tube	E81, E82, E84, E87, E88, E90, E91, E92, E93			9 Nm
7AZ Mounting, positive/negative lead, to electric auxiliary heater	E83			8.8 Nm



64 11 Housing, heater/air conditioner

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Bulkhead adapter	E85, E86, E89			1.0 ± 0.3 Nm
2AZ Blower for heater/air conditioner	E85, E86			1.5 ± 0.3 Nm
3AZ Controller for heating and air conditioning system blower	E84, E85, E86, E89			1.0 ± 0.3 Nm
4AZ Air conditioner to bulkhead	E60, E61, E63, E64, E83, E81, E82, E87, E88, E90, E91, E92, E93			6 Nm
	E70, E71, E72			6.5 Nm
5AZ Cooler box to luggage compartment partition wall	E65, E66, E67			4.5 Nm
6AZ Air conditioner to support tube	E81, E82, E84, E87, E88, E90, E91, E92, E93			9 Nm
7AZ Mounting, positive/negative lead, to electric auxiliary heater	E83			8.8 Nm



64 31 Microfilter system

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Fresh air duct to mounting bracket, left/right	E60, E61, E63, E64	M6		4.5 Nm
2AZ Fresh air duct to bearing block	E60, E61, E63, E64			3.5 Nm
3AZ Pipe clamp to fresh air duct	E60, E61, E63, E64			2.0 Nm



64 53 Refrigerant Lines and Expansion Valve

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Refrigerant lines to dryer flask	E83, E85, E86	M8		20 Nm
2AZ Refrigerant lines to expansion valve/double pipe	E46, E83, E85, E86, E81, E82, E87, E88, E89, E90, E91, E92, E93	M8		20 Nm
	E53	M8		18 Nm
	E84	M8		18.5 NM
3AZ Adapter plate to expansion valve	E85, E86, E89	M6		10 ± 2 Nm
4AZ Expansion valve to heater - A/C	E85, E86, E89	M5		5.5 Nm
5AZ Refrigerant line to heater end panel	E85, E86	M6		8.6 Nm
6AZ Refrigerant lines to capacitor	E60, E61, E63, E64, E81, E82, E83, E85, E86, E87, E88, E89, E90, E91, E92, E93	M8		20 Nm
	E84	M8		18.5 Nm
7AZ Refrigerant lines to expansion valve	E60, E61, E63, E64	M6		8.8 Nm
8AZ Refrigerant line to assembly compartment partition reinforcement	E60, E61, E63, E64	M6		7.6 Nm
9AZ Expansion valve to heater - A/C	E46, E60, E61, E63, E64, E83	M5		5.5 Nm
10AZ Refrigerant line to body	E46, E83	M6		5.5 Nm
11AZ Double pipe to expansion valve	E46, E83	M6		8.0 Nm
12AZ Screw plug to capacitor	E53, E81, E82 / E84, E87, E88, E90, E91, E92			3.0 ± 0.5 Nm
13AZ Expansion valve to retaining clip	E81, E82, E84, E87, E88, E90, E91, E92, E93	M6		5.5 Nm
14AZ Pressure sensor in refrigerant line	E53, E60, E61, E63, E64, E65, E66, E81, E82, E83, E84, E85, E86, E87, E88, E89, E90, E91, E92, E93			10 Nm
15AZ Refrigerant line to adapter lead	E60 / N53, E61 / N53, E63 / N53, E64 / N53, E60 / N54, E61 / N54			18 Nm



64 11 Housing, heater/air conditioner

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Bulkhead adapter	E84, E85, E86, E89			1.0 ± 0.3 Nm
2AZ Blower for heater/air conditioner	E85, E86			1.5 ± 0.3 Nm
3AZ Controller for heating and air conditioning system blower	E84, E85, E86, E89			1.0 ± 0.3 Nm
4AZ Air conditioner to bulkhead	E60, E61, E63, E64, E83, E81, E82, E87, E88, E90, E91, E92, E93			6 Nm
	E70, E71, E72			6.5 Nm
5AZ Cooler box to luggage compartment partition wall	E65, E66, E67			4.5 Nm
6AZ Air conditioner to support tube	E81, E82, E84, E87, E88, E90, E91, E92, E93			9 Nm
7AZ Mounting, positive/negative lead, to electric auxiliary heater	E83			8.8 Nm



64 11 Housing, heater/air conditioner

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Bulkhead adapter	E85, E86, E89			1.0 ± 0.3 Nm
2AZ Blower for heater/air conditioner	E85, E86			1.5 ± 0.3 Nm
3AZ Controller for heating and air conditioning system blower	E84, E85, E86, E89			1.0 ± 0.3 Nm
4AZ Air conditioner to bulkhead	E60, E61, E63, E64, E83, E81, E82, E87, E88, E90, E91, E92, E93			6 Nm
	E70, E71, E72			6.5 Nm
5AZ Cooler box to luggage compartment partition wall	E65, E66, E67			4.5 Nm
6AZ Air conditioner to support tube	E81, E82, E84, E87, E88, E90, E91, E92, E93			9 Nm
7AZ Mounting, positive/negative lead, to electric auxiliary heater	E83			8.8 Nm



64 31 Microfilter system

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Fresh air duct to mounting bracket, left/right	E60, E61, E63, E64	M6		4.5 Nm
2AZ Fresh air duct to bearing block	E60, E61, E63, E64			3.5 Nm
3AZ Pipe clamp to fresh air duct	E60, E61, E63, E64			2.0 Nm



64 53 Refrigerant Lines and Expansion Valve

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Refrigerant lines to dryer flask	E83, E85, E86	M8		20 Nm
2AZ Refrigerant lines to expansion valve/double pipe	E46, E83, E85, E86, E81, E82, E87, E88, E89, E90, E91, E92, E93	M8		20 Nm
	E53	M8		18 Nm
	E84	M8		18.5 NM
3AZ Adapter plate to expansion valve	E85, E86, E89	M6		10 ± 2 Nm
4AZ Expansion valve to heater - A/C	E85, E86, E89	M5		5.5 Nm
5AZ Refrigerant line to heater end panel	E85, E86	M6		8.6 Nm
6AZ Refrigerant lines to capacitor	E60, E61, E63, E64, E81, E82, E83, E85, E86, E87, E88, E89, E90, E91, E92, E93	M8		20 Nm
	E84	M8		18.5 Nm
7AZ Refrigerant lines to expansion valve	E60, E61, E63, E64	M6		8.8 Nm
8AZ Refrigerant line to assembly compartment partition reinforcement	E60, E61, E63, E64	M6		7.6 Nm
9AZ Expansion valve to heater - A/C	E46, E60, E61, E63, E64, E83	M5		5.5 Nm
10AZ Refrigerant line to body	E46, E83	M6		5.5 Nm
11AZ Double pipe to expansion valve	E46, E83	M6		8.0 Nm
12AZ Screw plug to capacitor	E53, E81, E82 / E84, E87, E88, E90, E91, E92			3.0 ± 0.5 Nm
13AZ Expansion valve to retaining clip	E81, E82, E84, E87, E88, E90, E91, E92, E93	M6		5.5 Nm
14AZ Pressure sensor in refrigerant line	E53, E60, E61, E63, E64, E65, E66, E81, E82, E83, E84, E85, E86, E87, E88, E89, E90, E91, E92, E93			10 Nm
15AZ Refrigerant line to adapter lead	E60 / N53, E61 / N53, E63 / N53, E64 / N53, E60 / N54, E61 / N54			18 Nm



64 operating fluid overview

Expendable materials

Refrigerant R134a	12 kg, Bottle	83199408386
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Expendable materials

Heating and air conditioning system cleaning agent	1000 ml, Bottle	83192180507
	5000 ml, Bottle	83192219932

Expendable materials

Heating and air conditioning system cleaning agent	100 ml, Can	83192409611
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Expendable materials

Ozonizer	100 ml, Can	83192318666
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Expendable materials

Refrigerant oil PAG-Å-L Denso ND8	500 ml, Can	81342147762
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Expendable materials

UV additive Waeco	500 ml, Can	83192232504
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Expendable materials

Cartridge set for leak detector case	3x , Cartridge	83192232569
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Expendable materials

Cleaning agent UV filter	237 ml, Spray bottle	83192243942
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Expendable materials

Refrigerant R1234yf	5 kg, Bottle	83192354790
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Expendable materials

UV additive	472,5 ml, Can	83192243934
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Expendable materials

Refrigerant oil Sanden SP-A2 <i>* TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only. EU</i>	250 ml, Can	83222339920
	10 ml.	83192287382

	10 ml, TU*	83190143174
Expendable materials		
Refrigerant oil	250 ml, Can	81229407724
* TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	10 ml, TU*	83190143174



65 52 CD/DVD drives and special devices

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Retaining screw, CD/DVD changer to bracket	E60, E61, E63, E64			0.7 Nm
	E65, E66, E67, E70			0.8 Nm
	E83			1.0 Nm
	E53, E85, E90, E91, E92, E93			1.2 Nm
2AZ Mounting bracket CD/DVD changer to body	E83			6.0 Nm
	E90, E91, E92, E93			3.3 Nm
	E53			4.9 Nm
	E60, E61, E63, E64			5 Nm
	E85, E86			4.4 Nm
3AZ CD/DVD drive to Car Communication Computer	E61, E60, E63, E64, E81, E82, E87, E88, E90, E91, E92, E93, R56, R57			0.4 Nm
4AZ Rear compartment DVD player to centre console	E70			3 Nm
5AZ CD/DVD changer to glovebox	E70			6 Nm
6AZ CCC/ CIC/ MASK to dashboard	E70, E71, E72			2.8 Nm



65 52 CD/DVD drives and special devices

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Retaining screw, CD/DVD changer to bracket	E60, E61, E63, E64			0.7 Nm
	E65, E66, E67, E70			0.8 Nm
	E83			1.0 Nm
	E53, E85, E90, E91, E92, E93			1.2 Nm
2AZ Mounting bracket CD/DVD changer to body	E83			6.0 Nm
	E90, E91, E92, E93			3.3 Nm
	E53			4.9 Nm
	E60, E61, E63, E64			5 Nm
	E85, E86			4.4 Nm
3AZ CD/DVD drive to Car Communication Computer	E61, E60, E63, E64, E81, E82, E87, E88, E90, E91, E92, E93, R56, R57			0.4 Nm
4AZ Rear compartment DVD player to centre console	E70			3 Nm
5AZ CD/DVD changer to glovebox	E70			6 Nm
6AZ CCC/ CIC/ MASK to dashboard	E70, E71, E72			2.8 Nm



65 52 CD/DVD drives and special devices

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Retaining screw, CD/DVD changer to bracket	E60, E61, E63, E64			0.7 Nm
	E65, E66, E67, E70			0.8 Nm
	E83			1.0 Nm
	E53, E85, E90, E91, E92, E93			1.2 Nm
2AZ Mounting bracket CD/DVD changer to body	E83			6.0 Nm
	E90, E91, E92, E93			3.3 Nm
	E53			4.9 Nm
	E60, E61, E63, E64			5 Nm
	E85, E86			4.4 Nm
3AZ CD/DVD drive to Car Communication Computer	E61, E60, E63, E64, E81, E82, E87, E88, E90, E91, E92, E93, R56, R57			0.4 Nm
4AZ Rear compartment DVD player to centre console	E70			3 Nm
5AZ CD/DVD changer to glovebox	E70			6 Nm
6AZ CCC/ CIC/ MASK to dashboard	E70, E71, E72			2.8 Nm



65 77 Airbag triggering control

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Airbag control unit	E36, E38, E39, E46, E52, E53			8,8 Nm
	E85			4,6 Nm
	E60, E61, E63, E64, E81, E83, E87, E90, E91, E92, E93			8,0 Nm
	E60 / from 09/2005, E61 / from 09/2005			8,0 Nm
2AZ Impact sensor for side airbag	E36, E38, E39, E46, E52, E53			5,5 Nm
3AZ Sensor, front	E83, E85, E86		Replace screws	8,0 Nm
4AZ Sensor, A-pillar	E65, E66			4,5 Nm
5AZ Sensor, B-pillar	E60, E61, E63, E64, E65, E66, E85, E86			4,6 Nm
	E81, E83, E87, E90, E91, E92, E93			8,0 Nm
6AZ Sensor, vehicle centre	E65, E66			5,5 Nm
	E60, E61, E63, E64			8,0 Nm
7AZ Sensor, front door	E65, E66			8,2 Nm
	E60,, E61, E90, E91, E92, E93			8,0 Nm
	E85, E86			5,6 Nm
	E83			4,6 Nm
8AZ Sensor, rear seat	E65, E66			8,0 Nm
9AZ Acceleration sensor, front	E63, E64, E90, E91, E92, E93		Replace screws	8,0 Nm
	E60, E61		Replace screws	7,0 Nm



65 52 CD/DVD drives and special devices

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Retaining screw, CD/DVD changer to bracket	E60, E61, E63, E64			0.7 Nm
	E65, E66, E67, E70			0.8 Nm
	E83			1.0 Nm
	E53, E85, E90, E91, E92, E93			1.2 Nm
2AZ Mounting bracket CD/DVD changer to body	E83			6.0 Nm
	E90, E91, E92, E93			3.3 Nm
	E53			4.9 Nm
	E60, E61, E63, E64			5 Nm
	E85, E86			4.4 Nm
3AZ CD/DVD drive to Car Communication Computer	E61, E60, E63, E64, E81, E82, E87, E88, E90, E91, E92, E93, R56, R57			0.4 Nm
4AZ Rear compartment DVD player to centre console	E70			3 Nm
5AZ CD/DVD changer to glovebox	E70			6 Nm
6AZ CCC/ CIC/ MASK to dashboard	E70, E71, E72			2.8 Nm



66 54 Night vision camera

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Bracket to bumper carrier	E60 / E61		Nut	4.5 Nm
			Torx bolt	12 Nm
	E63 / E64			15 Nm
	E65 / E66 / E67			4.5 Nm



67-1 31 Drive, seat adjustment

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Drive for seat height adjustment to seat	E60, E61, E65, E66, E67, E70, E71, E72			8 Nm
2AZ Drive for seat tilt adjustment to seat	E60, E61, E65, E66, E67, E70, E71, E72			8 Nm
3AZ Drive for head restraint height adjustment to seat	E60, E61, E65, E66, E67, E70, E71, E72			2.5 Nm
4AZ Drive for backrest head adjustment to seat	E60, E61, E65, E66, E70, E67, E71, E72			10 Nm



67-1 31 Drive, seat adjustment

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Drive for seat height adjustment to seat	E60, E61, E65, E66, E67, E70, E71, E72			8 Nm
2AZ Drive for seat tilt adjustment to seat	E60, E61, E65, E66, E67, E70, E71, E72			8 Nm
3AZ Drive for head restraint height adjustment to seat	E60, E61, E65, E66, E67, E70, E71, E72			2.5 Nm
4AZ Drive for backrest head adjustment to seat	E60, E61, E65, E66, E70, E67, E71, E72			10 Nm



67 62 Drives, power windows

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Motor to window regulator	E46 / E85 / E86 / E93			4.5 Nm
	E31 / E36 / E65 / E66			5 Nm
	E81 / E82 / E83 / E88			3 Nm
	E60 / E61 / E63 / E64 / E84 / E87 / E90 / E91 / E92 / E93			6 Nm
	E70 / E71 / E72		Observe screwing sequence	6 Nm
	E89		Replace bolts.	7.6 Nm



71 60 Trailer Hitch

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Trailer tow hitch to body	E39	Nut M10 and screw M10 10.9	1. Collar nuts M10 trailer tow hitch / rear panel 2. M10 screws to axial struts	59 Nm
	E38	Nut M10 and screw M10 10.9	1. M10 screws, bottom, to cross-member 2. M10 screws, top, to luggage compartment floor 3. M10 screws, front, to axial struts 4. M10 screws, rear, to axial struts	59 Nm
	E60, E61		Replace screw Jointing torque Torque angle	50 Nm 90 Å°
	E65, E66			58 Nm



71 60 Trailer tow hitch (from 03/2007)

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Trailer tow hitch to body	E60, E61		Jointing torque	50 Nm
			Torque angle	90 Å°
2AZ Pivoting unit, trailer tow hitch, to carrier	E60, E61	M12x35	Replace screws	95 Nm
3AZ Socket to ball rod	E60, E61			5 Nm



72 12 Airbag modules

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Side airbag module (door/door trim panel)	E60 / E61 / E63 / E64		Replace screws	8 Nm
2AZ Passenger airbag module (instrument panel)	E60 / E61 / E63 / E64	M6	Replace screws	8 Nm
3AZ Bracket, folding pack for AHPS head airbag, to body	E60 / E61	Metal screw		2.5 Nm
	E63	Self-tapping		3 Nm
4AZ End fitting, AHPS head airbag, to body	E60 / E61 / E63	M6		6 Nm
5AZ Airbag module/knee protection	E63 / E64	M6	Replace screws	8 Nm
6AZ Push-in grommet, gas generator (A-pillar)	E60 / E61 / E63	M6		6 Nm



72 11 Seat Belts

Tightening Torques

	Type	Thread	Tightening specification	Torque
Seat belt, front:				
1AZ Automatic reel			Replace screw	
- to B-pillar, bottom	E60 / E61 / E63			36 Nm
- to backrest	E64			36 Nm
2AZ Belt deflection fitting			Replace screw	
- to B-pillar, top	E60 / E61 / E63			36 Nm
- to head restraint bar	E64			8 Nm
3AZ Corner hoop (to B-pillar, middle)	E60 / E61 / E63			3 $\pm$ 0.5 Nm
4AZ Slide bar for belt - to body	E63		Replace screw	44 Nm
5AZ Anchor fitting, belt			Replace screw	
- to front seat	E60 / E61 / E64			36 Nm
	E64			45 Nm
6AZ Belt buckle tensioner - to front seat			Replace screw	
	E63 / E64			45 Nm
	E60 / E61			36 Nm
7AZ Coupling gearing to centering pin (to seat frame)	E64			3 Nm
8AZ Anchor fitting tensioner	E60 / E61		Replace screw	36 Nm
Seat belt, rear:				
20AZ Automatic reel - normal			Replace screw	
- outer to body	E60 / E63 / E64			36 Nm
- middle to body	E60			36 Nm
21AZ Automatic reel - through-loading			Replace screw	
- middle to backrest	E61			36 Nm
- outer to body	E60 / E61			36 Nm



22AZ Anchor fitting, belt - to floor pan	E60 / E61 / E63 / E64		Replace screw	36 Nm
23AZ Seat belt buckle (lower strap)			Replace screw	
- without buckle retractor	E60 / E61 / E63 / E64			36 Nm
- with buckle retractor	E60 / E61			36 Nm
24AZ Belt deflection fitting - to partition	E63 / E64		Replace screw	36 Nm



72 12 Airbag modules

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Side airbag module (door/door trim panel)	E60 / E61 / E63 / E64		Replace screws	8 Nm
2AZ Passenger airbag module (instrument panel)	E60 / E61 / E63 / E64	M6	Replace screws	8 Nm
3AZ Bracket, folding pack for AHPS head airbag, to body	E60 / E61	Metal screw		2.5 Nm
	E63	Self-tapping		3 Nm
4AZ End fitting, AHPS head airbag, to body	E60 / E61 / E63	M6		6 Nm
5AZ Airbag module/knee protection	E63 / E64	M6	Replace screws	8 Nm
6AZ Push-in grommet, gas generator (A-pillar)	E60 / E61 / E63	M6		6 Nm



83 operating fluid overview

Assembly aids

Lubricants G14	900 ml, Can	83232360412
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Adhesive

Adhesive set K6	25 ml, Tube	83192317925
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Expendable materials

Multifunction spray Brunox	400 ml, Spray can	83230418567
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66 54 Night vision camera

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Bracket to bumper carrier	E60 / E61		Nut	4.5 Nm
			Torx bolt	12 Nm
	E63 / E64			15 Nm
	E65 / E66 / E67			4.5 Nm



99 operating fluid overview

Paints and colours

Emergency program base filler 2K spray	200 ml, Application time 8 h	51910432615
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Paints and colours

INOX spray welding primer	500 ml	83400409992
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Paints and colours

Spray paint, black matt	400 ml	51911900346
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Paints and colours

Paint spray aerosol, inside filler of spare wheel well	400 ml	51910411026
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