

11 00 Standard screw connection

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Screws and nuts		M5		5 Nm $\pm$ 0.5
2AZ Screws and nuts		M6		8 Nm $\pm$ 1
3AZ Screws and nuts		M7		13 Nm $\pm$ 2
4AZ Screws and nuts		M8		19 Nm $\pm$ 3
5AZ Screws and nuts		M10		38 Nm $\pm$ 5
6AZ Hose clamp, WAF 5				1.0 to 1.5 Nm
7AZ Hose clamp, WAF 6				2.5 up to 3.5 Nm

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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 Engine block

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Main bearing bolts (steel bolts 10.9)	N55	M10x100	Replace screws Jointing torque Torque angle	20 Nm 70 ㄲ
2AZ Bedplate Aluminium screws/bolts	N55	M10x27	Replace screws Thread repairs exclusively with Al Helicoil. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	15 Nm 90 ㄲ
3AZ Bedplate Aluminium screws/bolts	N55	M8x37	Replace screws Thread repairs exclusively with Al Helicoil. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	8 Nm 90 ㄲ
4AZ Bedplate Aluminium screws/bolts are marked with blue paint.	N55	M10x41	Replace screws Thread repairs exclusively with Al Helicoil. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	15 Nm 90 ㄲ
5AZ Oil spray nozzles to engine block	N55		Hollow bolt	12 Nm
6AZ Screw plug, coolant drain plug	N55	M14x1.5	Replace screw with sealing ring	25 Nm
7AZ Screw plug, timing case upper section	N55	M22x1.5	Replace screw with sealing ring	50 Nm
8AZ Screw plug, timing case upper section	N55	M33x1.5	Replace screw with sealing ring	50 Nm
9AZ Screw plug, timing case lower section	N55	M16x1.5	Replace screw with sealing ring	27 Nm



11 00 Standard screw connection

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Screws and nuts		M5		5 Nm $\pm$ 0.5
2AZ Screws and nuts		M6		8 Nm $\pm$ 1
3AZ Screws and nuts		M7		13 Nm $\pm$ 2
4AZ Screws and nuts		M8		19 Nm $\pm$ 3
5AZ Screws and nuts		M10		38 Nm $\pm$ 5
6AZ Hose clamp, WAF 5				1.0 to 1.5 Nm
7AZ Hose clamp, WAF 6				2.5 up to 3.5 Nm

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11 12 Cylinder head with cylinder head cover

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Cylinder head bolt	N55	M11 x 173	Replace screws. Jointing torque 1. Angle of rotation 2. Angle of rotation	30 Nm 90 ° 180 °
2AZ Cylinder head bolt	N55	M9 x 170	Replace screws. Jointing torque 1. Angle of rotation 2. Angle of rotation	30 Nm 90 ° 180 °
3AZ Cylinder head bolt	N55	M9 x 30 M9 x 70		22 Nm
4AZ Cylinder head cover to cylinder head.	N55	M6		8.5 Nm
5AZ Towing lug to cylinder head	N55			30 Nm
6AZ Ignition coil cover to cylinder head cover.	N55	M6 x 30		4 Nm
7AZ Metal bracket for ignition coil cover to cylinder head cover.	N55	M6 x 16		8 Nm
8AZ Ignition coils and injector slot to cylinder head	N55	M6 x 30		8.5 Nm
9AZ EMC plate to ignition coils and injector slot (EMC = electromagnetic compatibility)	N55	M6 x 20		8.0 Nm
10AZ EMC plate to ignition coils and injector slot (EMC = electromagnetic compatibility)	N55	M6 x 18.5	Earth connection	8.5 Nm
11AZ Screw plug in oil chamber	N55	M16 x 1.5	Replace screw with sealing ring	27 Nm



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
Injector shaft to cylinder head	
M6x30	8,5Nm
Sealing flange to cylinder head cover	
M6x20 hexagon screw	10Nm
M6x18 external Torx	5,5Nm

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11 13 Oil sump

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Oil drain plug to oil sump	N55	M12x1.5	Replace sealing ring.	25 Nm
2AZ Oil sump (aluminium) to crankcase lower half.	N55	M8x26	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	8 Nm 90 째
3AZ Oil sump (aluminium) to crankcase lower half.	N55	M8x92 M8x112	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	8 Nm 180 째
4AZ Oil sump (aluminium) to crankcase lower half (AWD)	N55	M8x36	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	8 Nm 90 째
5AZ Oil deflector to crankcase lower half.	N55	M6x20	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	4 Nm 90 째
6AZ Transmission to oil sump.	N55	M8x50 8.8		19 Nm
7AZ Oil level sensor to oil sump.	N55	M6		8 Nm



1113 Overview of tightening torques

Oil drain plug			
M12			25Nm
Renew the sealing ring.			
Oil sump to crankcase			
M8x36	Jointing torque		8Nm
Renew screws.	Angle of rotation		90°
Oil sump to crankcase			
M8x92	Jointing torque		8Nm
Renew screws.	Angle of rotation		180°
Oil sump to crankcase			
M8x112	Jointing torque		8Nm
Renew screws.	Angle of rotation		180°
Oil sump to crankcase			
M8x26	Jointing torque		8Nm
Renew screws.	Angle of rotation		90°



11 24 Connecting Rods and Bearings

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Connecting rod bolts	N55	M9	Replace, wash and oil screws	
			Jointing torque	20 Nm
			Angle of rotation	70 °
			Angle of rotation	70 °

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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 Jointing torque Torque angle	5.0 Nm 45 Å°
Increment wheel on crankshaft		M5 10.9	Replace screws	13 Nm
Increment wheel on crankshaft		M5 8.8	Replace screws	5.5 Nm

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11 21 Crankshaft and Bearings

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Torsion damper (hub) to crankshaft (central bolt 12.9)	N55	M18x108	Replace screw Lightly oil screw and thread Jointing torque Torque angle	 100 Nm 270 Â°

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11 11 Engine block

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Main bearing bolts (steel bolts 10.9)	N55	M10x100	Replace screws Jointing torque Torque angle	20 Nm 70 ㄲ
2AZ Bedplate Aluminium screws/bolts	N55	M10x27	Replace screws Thread repairs exclusively with Al Helicoil. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	15 Nm 90 ㄲ
3AZ Bedplate Aluminium screws/bolts	N55	M8x37	Replace screws Thread repairs exclusively with Al Helicoil. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	8 Nm 90 ㄲ
4AZ Bedplate Aluminium screws/bolts are marked with blue paint.	N55	M10x41	Replace screws Thread repairs exclusively with Al Helicoil. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	15 Nm 90 ㄲ
5AZ Oil spray nozzles to engine block	N55		Hollow bolt	12 Nm
6AZ Screw plug, coolant drain plug	N55	M14x1.5	Replace screw with sealing ring	25 Nm
7AZ Screw plug, timing case upper section	N55	M22x1.5	Replace screw with sealing ring	50 Nm
8AZ Screw plug, timing case upper section	N55	M33x1.5	Replace screw with sealing ring	50 Nm
9AZ Screw plug, timing case lower section	N55	M16x1.5	Replace screw with sealing ring	27 Nm



11 00 Standard screw connection

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Screws and nuts		M5		5 Nm $\pm$ 0.5
2AZ Screws and nuts		M6		8 Nm $\pm$ 1
3AZ Screws and nuts		M7		13 Nm $\pm$ 2
4AZ Screws and nuts		M8		19 Nm $\pm$ 3
5AZ Screws and nuts		M10		38 Nm $\pm$ 5
6AZ Hose clamp, WAF 5				1.0 to 1.5 Nm
7AZ Hose clamp, WAF 6				2.5 up to 3.5 Nm

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11 22 Flywheel

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Flywheel to crankshaft (automatic transmission)	N55	M12x 19	Replace screws 1. Jointing torque 2. Final tightening	60 Nm 45 °
2AZ DM flywheel to crankshaft (manual transmission)	N55	M12x 25	Replace screw 1. Jointing torque 2. Final tightening	60 Nm 45 °

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11 23 Vibration Damper

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Vibration damper to crankshaft hub.	N55	M8 x 16 screw 10.9		35 Nm

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11 24 Connecting Rods and Bearings

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Connecting rod bolts	N55	M9	Replace, wash and oil screws	
			Jointing torque	20 Nm
			Angle of rotation	70 °
			Angle of rotation	70 °

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11 11 Engine block

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Main bearing bolts (steel bolts 10.9)	N55	M10x100	Replace screws Jointing torque Torque angle	20 Nm 70 ㄲ
2AZ Bedplate Aluminium screws/bolts	N55	M10x27	Replace screws Thread repairs exclusively with Al Helicoil. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	15 Nm 90 ㄲ
3AZ Bedplate Aluminium screws/bolts	N55	M8x37	Replace screws Thread repairs exclusively with Al Helicoil. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	8 Nm 90 ㄲ
4AZ Bedplate Aluminium screws/bolts are marked with blue paint.	N55	M10x41	Replace screws Thread repairs exclusively with Al Helicoil. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	15 Nm 90 ㄲ
5AZ Oil spray nozzles to engine block	N55		Hollow bolt	12 Nm
6AZ Screw plug, coolant drain plug	N55	M14x1.5	Replace screw with sealing ring	25 Nm
7AZ Screw plug, timing case upper section	N55	M22x1.5	Replace screw with sealing ring	50 Nm
8AZ Screw plug, timing case upper section	N55	M33x1.5	Replace screw with sealing ring	50 Nm
9AZ Screw plug, timing case lower section	N55	M16x1.5	Replace screw with sealing ring	27 Nm



11 00 Standard screw connection

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Screws and nuts		M5		5 Nm $\pm$ 0.5
2AZ Screws and nuts		M6		8 Nm $\pm$ 1
3AZ Screws and nuts		M7		13 Nm $\pm$ 2
4AZ Screws and nuts		M8		19 Nm $\pm$ 3
5AZ Screws and nuts		M10		38 Nm $\pm$ 5
6AZ Hose clamp, WAF 5				1.0 to 1.5 Nm
7AZ Hose clamp, WAF 6				2.5 up to 3.5 Nm

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11 28 V-ribbed belt with Tension and Deflection Element

Tightening Torques

	Type	Thread	Tightening specification	Torque
Standard belt drive				
1AZ Belt tensioner with deflection pulley to engine block.	N55	M10 x 90		38 Nm
AZ Belt tensioner with deflection pulley to engine block.	N55	M10 x 103		38 Nm
2AZ Deflection pulley 65 x 32	N55	M10 x 55		60 Nm
3AZ Deflection pulley 75 x 32	N55	M10 x 55		60 Nm
4AZ Holder for deflecting element to oil sump	N55	M10 x 37		38 Nm
5AZ Holder for deflecting element to oil sump	N55	M10 x 30		38 Nm
6AZ Deflecting element 75	N55	M10 x 55		56 Nm
7AZ Deflecting element 90	N55	M10 x 55		56 Nm
SGR belt (start alternator belt)				
8AZ Belt tensioner to crankcase (operating tensioner)	N55	M10 x 90		38 Nm
9AZ Belt tensioner to crankcase (start tensioner)	N55	M10 x 55		38 Nm
10AZ Deflecting element 75	N55	M10 x 55		56 Nm
11AZ Holder for deflecting element to oil sump	N55	M10 x 37	ASA screw (exterior star handle)	38 Nm
12AZ Holder for deflecting element to oil sump	N55	M10 x 30	ISA countersunk screw (interior star handle)	38 Nm



1130 Overview of tightening torques

SWZ2249117		
Screw M6	Tightening torque	10Nm

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11 31 Camshaft

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Upper and lower bearing strip of camshaft (steel screw 10.9)	N55	M7x70	Insert screws dry Jointing torque Angle of rotation	8 Nm 60 Å°
2AZ Eccentric shaft bearing cap to cylinder head	N55	M6x27		8.5 Nm
3AZ Camshaft bearing cap to cylinder head	N55	M6x30.5		8.5 Nm
4AZ Chain drive module to cylinder head	N55	M6x35		8 Nm
5AZ Guide rail to crankcase	N55	M8		20 Nm
6AZ Guide rail to cylinder head	N55	M7		14 Nm
7AZ Chain tensioner to cylinder head	N55	M22 x 1.5	Do not retighten the chain tensioner. Replace sealing ring, thread lightly oiled	55 Nm
8AZ Screw plug in cylinder head	N55	M18x1.5		25 Nm



1131 Overview of tightening torques

Chain tensioner to cylinder head	
M22x1.5 Renew the sealing ring.	55Nm
Preload timing chain	
	Tightening torque 0,6Nm

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11 36 Variable Camshaft Control

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ VANOS with sensor wheel to inlet and exhaust camshafts	N55	M10x94	Replace screw Jointing torque Torque angle	20 Nm 180 Å°
2AZ Non-return valve VANOS to cylinder head	N55	M14 x 1.5		13 Nm
3AZ Solenoid valve holder to cylinder head	N55	M6x12		9 Nm

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1136 Overview of tightening torques

Adjuster to camshaft			
M10x94 Renew screw.	Jointing torque		20Nm
	Angle of rotation		180°
Holder, VANOS solenoid valve			
M6x12			9Nm

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11 37 Variable valve gear

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Slide block to cylinder head.	N55	M6x23		10 Nm
2AZ Torsion spring (throttle return spring) to cylinder head.	N55	M6x20		10 Nm
3AZ Electrical servomotor to cylinder head.	N55	M6x16		10 Nm
4AZ Oil spray nozzle to guide block.	N55	M6x30		10 Nm
5AZ Stop screw of eccentric shaft to cylinder head.	N55	M6		10 Nm
6AZ Valvetronic sensor to holder.	N55	M6x20		8 Nm
7AZ Holder for valvetronic sensor.	N55	M6x20		8 Nm

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1137 Overview of tightening torques

Bearing cap to cylinder head		
M6x27		8,5Nm
Gate to cylinder head		
M6x23		10Nm
Oil spray nozzle to gate		
M6x30		10Nm
Return spring to cylinder head		
M6x20		10Nm
Servomotor to cylinder head		
M6x16		10Nm
Stop screw of eccentric shaft to cylinder head		
M6		10Nm



11 41 Oil pump with strainer and motor

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Intake pipe with oil deflector to crankcase lower section (bedplate)	N55	M6x30	Replace screws Thread repairs exclusively with Al Helicoil. Jointing torque and angle of rotation must be observed without fail. Jointing torque Angle of rotation	4 Nm 90 °
2AZ Oil pump to bedplate	N55	M8x123	Replace screws Thread repairs exclusively with Al Helicoil. Jointing torque and angle of rotation must be observed without fail. Jointing torque Angle of rotation	10 Nm 180 °
	N55	M8x31 M8x37	Replace screws Thread repairs exclusively with Al Helicoil. Jointing torque and angle of rotation must be observed without fail. Jointing torque Angle of rotation	10 Nm 90 °
3AZ Chain module to crankcase and oil pump	N55	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	4 Nm 45 °
4AZ Hydraulic valve of oil pump to crankcase	N55	M6x16	Jointing torque	4 Nm
			Angle of rotation	45 °
5AZ Sprocket to oil pump	N55	M8	Jointing torque	20 Nm
			Angle of rotation	45 °
6AZ Triangular drive to oil pump	N55	M6x16	Jointing torque	4 Nm
			Angle of rotation	45 °
7AZ Chain tensioner to crankcase	N55	M6x16		10 Nm



11- 42 Oil Filter and Lines

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Oil filter cap to oil filter housing	N55			25 Nm
2AZ Oil filter housing to cylinder head	N55	M8 x 78 M8 x 43 M8 x 28		22 Nm
3AZ Oil-coolant heat exchanger to oil filter housing.	N55	M8 x 20		16 Nm
4AZ Oil feed line (exhaust turbocharger) to crankcase-upper part.	N55	M6x16		8 Nm
5AZ Oil feed line to exhaust turbocharger.	N55	M6 x 12		8 Nm
6AZ Oil return line to turbocharger	N55	M6 x 16		8 Nm
7AZ Oil return line to crankcase bottom section	N55	M6 x 16		8 Nm
8AZ Screw plug to oil filter housing	N55	M20		40 Nm



1142 Overview of tightening torques

Oil filter cover to oil filter housing	
	25Nm

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11 51 Coolant pump with drive

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Coolant pump to crankcase	N55	M8 x 26	Renew 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 Coolant pump to holder (only for vehicles with holder).	N55	M8 x 27	Renew 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 °
3AZ Coolant hose between coolant pump and coolant thermostat.	N55	L42-48		3 Nm
4AZ Coolant hose between coolant pump and feed line.	N55	L42-48		3 Nm
5AZ Auxiliary water coolant holder for EME to retaining bracket	N55, F10h / F01h / F02h / F30h	M6 x 14		10 Nm



11 52 Fan

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Fan clutch on water pump Coupling nut (left-hand threads)	All			40 Nm
	M54			45 Nm
2AZ Fan to fan clutch	All			10 Nm

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11 53 Thermostat and Connections

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Thermostat housing to coolant pump.	N55	M6 x 25		8 Nm
2AZ Thermostat housing to holder.	N55			9 Nm
3AZ Holder to radiator	N55		Self-tapping screw	3 Nm
4AZ Feed line to crankcase.	N55	M6x16		8.5 Nm
5AZ Feed line to coolant pump.	N55	L42-48	Hose clamp	3 Nm
6AZ Oil-to-water heat exchanger (ÖWWT) feed line.	N55	L18-24	Hose clamp	3 Nm
7AZ Coolant line to cylinder head (short-circuit line).	N55	M6 x 23		8.5 Nm
8AZ Coolant line to thermostat.	N55		Hose clamp with corrugated spring	3 Nm
9AZ Coolant hose from thermostat to coolant pump	N55	L42-48		3 Nm
10AZ Radiator supply and drain line to exhaust turbocharger	N55	M6 x 16		8 Nm
11AZ Coolant return line to crankcase.	N55	M6 x 16		8 Nm



1153 Overview of tightening torques

Coolant line to coolant pump	
Clamp	3Nm
Coolant thermostat housing to coolant pump	
M6x25	8Nm

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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

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11 61 Intake manifold

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Air intake manifold to cylinder head.	N55	M7	Hexagon nut	15 Nm
2AZ Air intake manifold to cylinder head.	N55	M7x50		15 Nm
3AZ Gaiter to charge air line	N55		Hose clamp	3 Nm

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11 65 Turbocharger and Control

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Exhaust turbocharger to cylinder head	N55	M7	Replace flange nut.	13 Nm
2AZ Heat shield/retaining plate to crankcase top section	N55	M6 x 16		8 Nm
3AZ Pressure converter (EPDW) to cylinder head.	N55	M6 x 16		8.5 Nm
4AZ Pressure converter (EPDW) to holder with heat shield.	N55	M6 x 16		9 Nm
5AZ Vacuum unit (wastegate valve) to bracket	N55	M6		7 Nm
6AZ Lock nut to vacuum unit (wastegate valve) linkage	N55	M6		7 Nm
7AZ Bracket, vacuum unit (wastegate valve), to turbocharger	N55	M8		7 Nm
8AZ Holder to exhaust turbocharger.	N55	M8		20 Nm
9AZ Exhaust turbocharger holder to cylinder crankcase.	N55	M8	Replace micro-encapsulated screws	20 Nm



11 65 Turbocharger and Control

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Exhaust turbocharger to cylinder head	N55	M7	Replace flange nut.	13 Nm
2AZ Heat shield/retaining plate to crankcase top section	N55	M6 x 16		8 Nm
3AZ Pressure converter (EPDW) to cylinder head.	N55	M6 x 16		8.5 Nm
4AZ Pressure converter (EPDW) to holder with heat shield.	N55	M6 x 16		9 Nm
5AZ Vacuum unit (wastegate valve) to bracket	N55	M6		7 Nm
6AZ Lock nut to vacuum unit (wastegate valve) linkage	N55	M6		7 Nm
7AZ Bracket, vacuum unit (wastegate valve), to turbocharger	N55	M8		7 Nm
8AZ Holder to exhaust turbocharger.	N55	M8		20 Nm
9AZ Exhaust turbocharger holder to cylinder crankcase.	N55	M8	Replace micro-encapsulated screws	20 Nm



1165 Overview of tightening torques

Lock nut on wastegate valve controller to exhaust turbocharger	
M6	6,6 ± 1Nm
Wastegate valve controller to exhaust turbocharger	
M4x12	2 ± 0,3Nm

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11 66 Vacuum pump

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Vacuum pump to crankcase	N55	M6x40	Flat mushroom head screw 10.9 Replace screws	10 Nm
2AZ Sprocket wheel to vacuum pump	N55	M10x30	Screw 12.9 washed and oiled	66 Nm

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11 78 Emissions control, control sensor / monitoring sensor

Tightening Torques

	Type	Thread	Tightening specifications	Torque
1AZ Control sensor	N55	M18 x 1.5	Universal oxygen sensor ADV	50 Nm
2AZ Monitor sensor	N55	M18 x 1.5	LSF 4.2	50 Nm
3AZ Bracket, oxygen sensor, to cylinder head	N55	M6 x 16		8 Nm
4AZ Bracket, oxygen sensor, to cylinder head cover	N55	K60 x 22	EJOT-PT self-tapping screw	8 Nm

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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

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11 11 Engine block

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Main bearing bolts (steel bolts 10.9)	N55	M10x100	Replace screws Jointing torque Torque angle	20 Nm 70 ㄲ
2AZ Bedplate Aluminium screws/bolts	N55	M10x27	Replace screws Thread repairs exclusively with Al Helicoil. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	15 Nm 90 ㄲ
3AZ Bedplate Aluminium screws/bolts	N55	M8x37	Replace screws Thread repairs exclusively with Al Helicoil. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	8 Nm 90 ㄲ
4AZ Bedplate Aluminium screws/bolts are marked with blue paint.	N55	M10x41	Replace screws Thread repairs exclusively with Al Helicoil. Jointing torque and angle of rotation must be observed without fail. Jointing torque Torque angle	15 Nm 90 ㄲ
5AZ Oil spray nozzles to engine block	N55		Hollow bolt	12 Nm
6AZ Screw plug, coolant drain plug	N55	M14x1.5	Replace screw with sealing ring	25 Nm
7AZ Screw plug, timing case upper section	N55	M22x1.5	Replace screw with sealing ring	50 Nm
8AZ Screw plug, timing case upper section	N55	M33x1.5	Replace screw with sealing ring	50 Nm
9AZ Screw plug, timing case lower section	N55	M16x1.5	Replace screw with sealing ring	27 Nm



11 00 Standard screw connection

Tightening Torques

	Type	Thread	Tightening specification	Torque
1AZ Screws and nuts		M5		5 Nm $\pm$ 0.5
2AZ Screws and nuts		M6		8 Nm $\pm$ 1
3AZ Screws and nuts		M7		13 Nm $\pm$ 2
4AZ Screws and nuts		M8		19 Nm $\pm$ 3
5AZ Screws and nuts		M10		38 Nm $\pm$ 5
6AZ Hose clamp, WAF 5				1.0 to 1.5 Nm
7AZ Hose clamp, WAF 6				2.5 up to 3.5 Nm

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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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