

ENGINE

Engine - Tightening Torques - X6 (N54)

ENGINE BLOCK

11 11 ENGINE BLOCK

ENGINE BLOCK-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Description	Tightening Specification
1AZ Main bearing bolts (steel bolts 10.9)	N54	M10x100	Replace screws	
			Jointing torque	20 Nm
			Torque angle	70 °
2AZ Bedplate Aluminum screws/bolts are marked with blue paint.	N54	M10x27	Replace screws Thread repairs exclusively with Al Heli-coil. Jointing torque and angle of rotation must be observed without fail.	
			Jointing torque	15 Nm
			Torque angle	90 °
3AZ Bedplate Aluminum screws/bolts are marked with blue paint.	N54	M8x37	Replace screws Thread repairs exclusively with Al Heli-coil. Jointing torque and angle of rotation must be observed without fail.	
			Jointing torque	10 Nm
			Torque angle	90 °
4AZ Bedplate Aluminum screws/bolts are marked with blue paint.	N54	M10x41	Replace screws Thread repairs exclusively with Al Heli-coil. Jointing torque and angle of rotation must be observed without fail.	
			Jointing torque	15 Nm

			Torque angle	90 °
5AZ Oil spray nozzles to engine block	N54		Hollow bolt	12 Nm
6AZ Screw plug, water drain	N54	M14x1.5	Replace seal	25 Nm
7AZ Screw plug, timing case upper section	N54	M22x1.5	Replace seal	50 Nm
8AZ Screw plug, timing case lower section	N54	M16x1.5	Replace seal	30 Nm

CYLINDER HEAD

11 12 CYLINDER HEAD WITH COVER

CYLINDER HEAD WITH COVER-TIGHTENING TORQUE SPECIFICATIONS

	Type	thread	Tightening Specification
11AZ Cylinder head cover	All	M6	10 Nm
	All	M7	15 Nm
	M21	M8	15 Nm
12AZ Oil trap to cylinder head cover	M21	M8	17 Nm
13AZ Timing case to cylinder head	All	M7	15 Nm
	All	M8	20 Nm
14AZ Plug for oil channel (micro-encapsulated)	M47/M57	M12 x 1.5	20 Nm
15AZ Vent plugs to cylinder head (coolant)	M67		2 Nm

11 12 CYLINDER HEAD WITH CYLINDER HEAD COVER

CYLINDER HEAD WITH CYLINDER HEAD COVER-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Description	Tightening Specification
1AZ Cylinder head bolt	N54	M11 x 135	Replace screws.	
			Jointing torque	30 Nm
			1st angle of rotation	90 °
			2. Angle of rotation	90 °

			3. Angle of rotation	45 °
2AZ Cylinder head bolt	N54	M9 x 95 M9 x 125	Replace screws.	
			Jointing torque	30 Nm
			1st angle of rotation	90 °
			2. Angle of rotation	omitted
			3. Angle of rotation	45 °
3AZ Cylinder head bolt	N54	M9 x 30 M9 x 70		22 Nm
4AZ Cylinder head cover to cylinder head.	N54	M6		8.5 Nm
5AZ Metal bracket to cylinder head.	N54	M6 x 16		8 Nm
6AZ Lifting eye to cylinder head.	N54	M8 x 20		19 Nm
7AZ Ignition coil cover to cylinder head cover.	N54	M6 x 20		4 Nm
8AZ Hexagon screw (2 x) Metal bracket for ignition coil cover to cylinder head cover.	N54	M6 x 12		4 Nm

OIL SUMP

11 13 OIL SUMP

OIL SUMP-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Description	Tightening Specification
Optional extra designation: SA203 = All-wheel drive SA205 = Automatic transmission				
1AZ Plug (1 x) Oil drain to oil sump.	N54	M12 x 1.5	Replace sealing ring.	25 Nm
2AZ ASA screw (20 x with optional	N54	M8 x 26	Replace screw. Thread repairs	

extra SA203) (23 x with optional extra SA205) Oil sump (aluminum) to crankcase lower half. The end faces of the aluminum screw heads are painted blue.			exclusively with aluminum Heli-coil threaded insert. Jointing torque and angle of rotation must be observed without fail.	
			Jointing torque	8 Nm
			Torque angle	90 °
3AZ ASA screw (5 x M8 x 112 with optional extra SA203) (2 x M8 x 112 with optional extra SA205) (3 x M8 x 92 with optional extra SA203 or SA205) Oil sump (aluminum) to crankcase lower half. The end faces of the aluminum screw heads are painted blue.	N54	M8	Replace screw. Thread repairs exclusively with aluminum Heli-coil threaded insert. Jointing torque and angle of rotation must be observed without fail.	
			Jointing torque	8 Nm
			Torque angle	180 °
4AZ ASA screw (1 x M8 x 36 with optional extra SA203) Oil sump (aluminum) to crankcase lower half. The end faces of the aluminum screw heads are painted blue.	N54	M8	Replace screw. Thread repairs exclusively with aluminum Heli-coil threaded insert. Jointing torque and angle of rotation must be observed without fail.	
			Jointing torque	8 Nm
			Torque angle	90 °

5AZ ASA screw (6 x without optional extra SA203) (7 x with optional extra SA203) Oil deflector to crankcase lower half. The end faces of the aluminum screw heads are painted blue.	N54	M6 x 20	Replace screw. Thread repairs exclusively with aluminum Heli-coil threaded insert. Jointing torque and angle of rotation must be observed without fail.	
			Jointing torque	4 Nm
			Torque angle	90 °
6AZ ASA screw (3 x) Transmission to oil sump.	N54	M8 x 50		19 Nm
7AZ Hexagon screw (1 x) Holder, transmission oil cooler line, to oil sump.	N54	M6 x 30		8 Nm
8AZ Hexagon nut (3 x) Oil level sensor to oil sump.	N54	M6		8 Nm
9AZ Transmission fluid cooler bracket to oil sump	N54	M8		9 Nm

11 13 OIL SUMP

OIL SUMP-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Description	Tightening Specification
1AZ Oil drain plug	N57	M12 x 1.5	Replace sealing ring	25 Nm
2AZ Oil sump to crankcase	N57	M8 x 30 M8 x 110	Replace seal	25 Nm

HOUSING COVER

11 14 CASE COVERS

CASE COVERS-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Description	Tightening Specification
1AZ Transmission cover plate to crankcase Aluminum screws/bolts are marked with blue paint.	N54	M6x16	Replace screws Thread repairs exclusively with Al Heli-coil Jointing torque and angle of rotation must be observed without fail.	
			Jointing torque	4 Nm
			Torque angle	45 °

CRANKSHAFT WITH BEARING

11 11 ENGINE BLOCK

ENGINE BLOCK-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Description	Tightening Specification
1AZ Main bearing bolts (steel bolts 10.9)	N54	M10x100	Replace screws	
			Jointing torque	20 Nm
			Torque angle	70 °
2AZ Bedplate Aluminum screws/bolts are marked with blue paint.	N54	M10x27	Replace screws Thread repairs exclusively with Al Heli-coil. Jointing torque and angle of rotation must be observed without fail.	
			Jointing torque	15 Nm
			Torque angle	90 °
3AZ Bedplate Aluminum screws/bolts are marked with blue paint.	N54	M8x37	Replace screws Thread repairs exclusively with Al Heli-coil. Jointing torque and angle of rotation must be observed without fail.	
			Jointing torque	10 Nm
			Torque angle	90 °

4AZ Bedplate Aluminum screws/bolts are marked with blue paint.	N54	M10x41	Replace screws Thread repairs exclusively with Al Heli-coil. Jointing torque and angle of rotation must be observed without fail.	
			Jointing torque	15 Nm
			Torque angle	90 °
5AZ Oil spray nozzles to engine block	N54		Hollow bolt	12 Nm
6AZ Screw plug, water drain	N54	M14x1.5	Replace seal	25 Nm
7AZ Screw plug, timing case upper section	N54	M22x1.5	Replace seal	50 Nm
8AZ Screw plug, timing case lower section	N54	M16x1.5	Replace seal	30 Nm

11 24 CONNECTING RODS AND BEARINGS

CONNECTING RODS AND BEARINGS-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Description	Tightening Specification
1AZ Connecting rod bolts	N54	M9	Replace, wash and oil screws	
			Jointing torque	20 Nm
			Torque angle	140 °

11 21 CRANKSHAFT AND BEARINGS

CRANKSHAFT AND BEARINGS-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Description	Tightening Specification
1AZ Increment wheel on crankshaft	S54	M5 10.9	Replace screws	
			Jointing torque	5.0 Nm
			Torque angle	45 °
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

CRANKSHAFT AND BEARINGS-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Description	Tightening Specification
1AZ Torsion damper (hub) to crankshaft (central bolt 12.9)	N54	M16x80	Replace screws Lightly oil screws and threads	
			Jointing torque	100 Nm
			Torque angle	360 °

FLYWHEEL

11 22 FLYWHEEL

FLYWHEEL-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Description	Tightening Specification
1AZ Flywheel to crankshaft (automatic transmission)	N54	M12x1.5x25.5	Replace screws	
			1. Jointing torque	30 Nm
			2. Final tightening	125 Nm
2AZ DM flywheel to crankshaft (manual transmission)	N54	M12x1.5x25.35	Replace screw	120

VIBRATION DAMPER

11 23 VIBRATION DAMPER

VIBRATION DAMPER-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Description	Tightening Specification
3AZ Belt pulley/vibration damper to hub	S38/B36	M8 10.9		34 Nm
	N40/N42 / N45/N46 / S38/B38	M8 10.9		34 Nm
	All/others	M8		22 Nm

4AZ Belt pulley to vibration damper	S38/B35	M8 8.8		22 Nm
	S50	M8 8.8		22 Nm
5AZ Sprocket with hub or hub to crankshaft	M40	M16 x 1.5	Replace screw	310 Nm
	M42/M43 / M43TU/M44	M16 x 1.5	Replace screw	330 Nm
6AZ Hub to crankshaft	N40/N42 / N45/N46	M16 x 1.5	Replace screw	300 Nm

11 23 VIBRATION DAMPER

VIBRATION DAMPER-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening Specification
1AZ ASA screw (6 x) Vibration damper to crankshaft hub.	N54	M8 x 16	35 Nm

CONNECTING ROD

11 11 ENGINE BLOCK

ENGINE BLOCK-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Description	Tightening Specification
1AZ Main bearing bolts (steel bolts 10.9)	N54	M10x100	Replace screws	
			Jointing torque	20 Nm
			Torque angle	70 °
2AZ Bedplate Aluminum screws/bolts are marked with blue paint.	N54	M10x27	Replace screws Thread repairs exclusively with Al Heli-coil. Jointing torque and angle of rotation must be observed without fail.	
			Jointing torque	15 Nm
			Torque angle	90 °
3AZ Bedplate Aluminum screws/bolts are marked with blue	N54	M8x37	Replace screws Thread repairs exclusively with Al Heli-coil.	

paint.			Jointing torque and angle of rotation must be observed without fail.	
			Jointing torque	10 Nm
			Torque angle	90 °
4AZ Bedplate Aluminum screws/bolts are marked with blue paint.	N54	M10x41	Replace screws Thread repairs exclusively with Al Heli-coil. Jointing torque and angle of rotation must be observed without fail.	
			Jointing torque	15 Nm
			Torque angle	90 °
5AZ Oil spray nozzles to engine block	N54		Hollow bolt	12 Nm
6AZ Screw plug, water drain	N54	M14x1.5	Replace seal	25 Nm
7AZ Screw plug, timing case upper section	N54	M22x1.5	Replace seal	50 Nm
8AZ Screw plug, timing case lower section	N54	M16x1.5	Replace seal	30 Nm

11 24 CONNECTING RODS AND BEARINGS

CONNECTING RODS AND BEARINGS-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Description	Tightening Specification
1AZ Connecting rod bolts	N54	M9	Replace, wash and oil screws	
			Jointing torque	20 Nm
			Torque angle	140 °

V-RIBBED BELT W. TENSION AND DEFLECTION ELEMENT

11 28 V-RIBBED BELT WITH TENSION AND DEFLECTION ELEMENT

V-RIBBED BELT WITH TENSION AND DEFLECTION ELEMENT-TIGHTENING TORQUE SPECIFICATIONS

			Tightening
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	Type	Thread	Specifications
1AZ ISA screw (1 x) Belt tensioner with deflection pulley to engine block.	N54	M10 x 110	40 Nm
2AZ ISA screw (1 x) Deflection pulley 80 x 30	N54	M10 x 40	38 Nm
3AZ ISA screw (1 x) Deflection pulley 90 x 30	N54	M10 x 40	38 Nm
4AZ ASA screw (1 x) Belt tensioner to crankcase upper section.	N54	M10 x 65	38 Nm
5AZ Deflection pulley 65 x 33	N54	M10 x 65	40 Nm
6AZ Deflection pulley 72 x 32	N54	M10 x 40	40 Nm
7AZ ISA screw (1 x) Deflection pulley 73.8 x 24.92 to crankcase upper section.	N54	M10 x 40	38 Nm

CAMSHAFT

11 31 CAMSHAFT

CAMSHAFT-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Description	Tightening Specifications
1AZ Upper and lower bearing strip of camshaft (steel screw 10.9)	N54	M7x70	Insert screws dry	
			Jointing torque	8 Nm
			Torque angle	60 °
2AZ Chain drive module to cylinder head	N54	M6x35		8.5 Nm
3AZ Guide rail to crankcase	N54	M8		20 Nm
4AZ Guide rail to cylinder head	N54	M7		14 Nm
5AZ Chain tensioner to cylinder head	N54	M22 x 1.5	Replace sealing ring	55 Nm
6AZ Screw plug in	N54	M18x1.5		25 Nm

cylinder head				
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VARIABLE CAMSHAFT

11 36 VARIABLE CAMSHAFT CONTROL

VARIABLE CAMSHAFT CONTROL-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Description	Tightening Specifications
1AZ VANOS with sensor wheel to inlet and exhaust camshafts	N54	M10x94	Replace screw	
			Jointing torque	20 Nm
			Torque angle	180 °
2AZ Non-return valve VANOS to cylinder head	N54	M14 x 1.5		13 Nm
3AZ Solenoid valve holder to cylinder head	N54	M6x12		10 Nm

OIL PUMP WITH FILTER

11 41 OIL PUMP WITH STRAINER AND DRIVE

OIL PUMP WITH STRAINER AND DRIVE-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Description	Tightening Specifications
1AZ Intake pipe to bedplate	N54	M6x30	Replace screws Thread repairs exclusively with Al Heli-coil. Jointing torque and angle of rotation must be observed without fail.	
			Jointing torque	4 Nm
			Torque angle	100 °
2AZ Oil pump to bedplate	N54	M8x123	Replace screws Thread repairs exclusively with Al Heli-coil. Jointing torque and angle of rotation	

			must be observed without fail.	
			Jointing torque	10 Nm
			Torque angle	180 °
	N54	M8x31	Replace screws Thread repairs exclusively with Al Heli-coil. Jointing torque and angle of rotation must be observed without fail.	
			Jointing torque	10 Nm
			Torque angle	90 °
3AZ Chain module to crankcase and oil pump	N54	M6x16	Replace screws Thread repairs exclusively with Al Heli-coil. Jointing torque and angle of rotation must be observed without fail.	
			Jointing torque	4 Nm
			Torque angle	45 °
4AZ Sprocket to oil pump	N54	M8	Jointing torque	20 Nm
			Torque angle	45 °

OIL FILTER AND LINES

11 42 OIL FILTER AND PIPES

OIL FILTER AND PIPES-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Description	Tightening Specifications
1AZ Oil filter cap to oil filter housing	N54			25 Nm
2AZ Oil filter housing to cylinder head	N54	M8 x 78 M8 x 48 M8 x 28		22 Nm
3AZ Oil-coolant heat exchanger to oil filter housing.	N54	M8 x 20		16 Nm
4AZ ISA screw (1 x)	N54	M8 x 35		19 Nm

Assembly, oil feed line to crankcase top section				
5AZ ISA screw (1 x) Assembly, oil feed line to exhaust turbocharger	N54	M6 x 12		8 Nm
6AZ Oil pressure line to crankcase	N54	M8 x 12		20 Nm
7AZ ISA screw (2 x) Oil return line to exhaust turbocharger	N54	M6 x 12		8 Nm
8AZ ISA screw (1 x) Oil return line to crankcase bottom section	N54	M6 x 16		8 Nm
9AZ Oil feed to exhaust turbocharger	N54	M6 x 12		8 Nm
10AZ Oil return to crankcase	N54	M12 x 10		20 Nm
11AZ Screw plug to oil filter housing	N54	M20 x 1.5	Replace sealing ring	50 Nm

WATER PUMP WITH DRIVE

11 51 COOLANT PUMP WITH DRIVE

COOLANT PUMP WITH DRIVE-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Description	Tightening Specifications
1AZ Coolant pump to crankcase	N54	M8 x 26	Replace screws. Thread repairs exclusively with aluminum Heli-coil threaded insert. Jointing torque and angle of rotation must be observed without fail.	
			Jointing torque	10 Nm

			Torque angle	90 °
2AZ ASA screw (3 x) Coolant pump to bracket.	N54	M8 x 27		20.5 Nm
3AZ Hose clamp (1 x) Coolant hose between coolant pump and coolant thermostat.	N54	L42-48		3 Nm
4AZ Hose clamp (1 x) Coolant hose between coolant pump and feed line.	N54	L42-48		3 Nm

11 65 TURBOCHARGER AND CONTROL

TURBOCHARGER AND CONTROL-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening Specifications
1AZ Exhaust turbocharger H.P. to exhaust manifold	N57S	M8x22	25 Nm
2AZ Exhaust turbocharger L.P. to exhaust manifold	N57S	M10x25	40 Nm
3AZ Compressor bypass to low-pressure stage	N57S	M8	8 Nm

FAN

11 52 FAN

FAN-TIGHTENING TORQUE SPECIFICATIONS

	Type	Tightening Specifications
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

THERMOSTAT AND CONNECT

11 53 THERMOSTAT AND CONNECTIONS

THERMOSTAT AND CONNECTIONS-TIGHTENING TORQUE SPECIFICATIONS

	Type	thread	Tightening Specifications
1AZ Thermostat housing	All	M6	10 Nm
2AZ Bleeder screw	All	M8	8 Nm

11 53 THERMOSTAT AND CONNECTIONS**THERMOSTAT AND CONNECTIONS-TIGHTENING TORQUE SPECIFICATIONS**

	Type	Thread	Description	Tightening Specifications
1AZ Thermostat housing to coolant pump.	N54	M6 x 25		8 Nm
2AZ Thermostat housing to coolant pump.	N54	M8 x 16		20 Nm
3AZ ASA screw (4 x) Assembly, feed line to crankcase top section	N54	M6 x 20		9 Nm
4AZ Feed line to coolant pump.	N54	L42-48	Hose clamp	3 Nm
5AZ Feed line to thermostat	N54		Hose clamp	3 Nm
6AZ Coolant hose to cylinder head	N54	M6 x 23		9 Nm
7AZ ISA screw (1 x) Coolant feed line to exhaust turbocharger	N54	M6 x 12		8 Nm
8AZ ISA screw (1 x) Coolant return line to exhaust turbocharger	N54	M6 x 12		8 Nm
9AZ ISA screw (1 x) Coolant return line to crankcase top section	N54	M6 x 16		8 Nm
10AZ ISA screw (2 x)	N54	M6 x 16		8 Nm

Coolant feed lines to assembly, feed line				
11AZ EJOT screw (1 x) Housing, coolant thermostat, to holder.	N54	M5 x 21.8		9 Nm
12AZ Hose clamp (2 x) Coolant hose between coolant thermostat and radiator.	N54	L42-48		3 Nm

INTAKE MANIFOLD

11 61 INTAKE MANIFOLD

INTAKE MANIFOLD-TIGHTENING TORQUE SPECIFICATIONS

	Type	thread	Tightening Specifications
1AZ Intake manifold on cylinder head	All	M8	22 Nm
	All	M7	15 Nm
	All	M6	10 Nm
2AZ Soundproofing hood to holder	M60/1/M60/2 / M62	M6	8 Nm

11 61 INTAKE MANIFOLD

INTAKE MANIFOLD-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening Specifications
1AZ Hexagon screw (1 x) Air intake manifold to cylinder head.	N54	M7 x 50	15 Nm
2AZ Hexagon nut (6 x) Air intake manifold to cylinder head.	N54	AM7	15 Nm
3AZ Hose clamp (1 x) Gaiter, rear charge-air duct to front charge-air duct.	N54	L65-72	3 Nm

11 65 TURBOCHARGER AND CONTROL

TURBOCHARGER AND CONTROL-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Description	Tightening Specifications
1AZ Flange nut (with internal serrations) (8 x) Exhaust turbocharger to cylinder head	N54	M7	Replace flange nut.	20 Nm
2AZ ASA screw (4 x) Heat shield/retaining plate to crankcase top section	N54	M6 x 16		8 Nm
3AZ ASA screw (4 x) Holder EPPC to cylinder head	N54	M6 x 20		9 Nm
4AZ Bracket, air duct, compressor 2, to cylinder head	N54	M6 x 15		9 Nm
5AZ Vacuum reservoir to bracket for vacuum reservoir	N54	M8		20 Nm
6AZ Bracket, vacuum reservoir, to body	N54	M6 x 14		5 Nm
7AZ Bracket to engine longitudinal member	N54	M6		5 Nm
8AZ EPPC to bracket, EPPC, with heat shield	N54	M6		5 Nm
9AZ Hexagon nut (3 x) Vacuum unit (wastegate valve) to bracket	N54	M6		8 Nm
10AZ Lock nut to vacuum unit (wastegate valve) linkage	N54	M6		7 Nm
11AZ Hexagon screw (2 x)	N54	M8		20 Nm

Bracket, vacuum unit (wastegate valve), to turbocharger				
12AZ Band clamp (2 x) Charge-air duct to turbocharger.	N54	M6	Replace band clamp.	3.5 Nm

EXHAUST MANIFOLD

11 62 EXHAUST MANIFOLD

EXHAUST MANIFOLD-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Description	Tightening Specifications
1AZ Exhaust manifold to cylinder head Coat screw connections with CRC copper paste	All	M6	Replace nuts	10 Nm
	M50/M52 / M52TU/M54 / M56/S52/S50 US	M7	Replace nuts	20 Nm
	All/others	M7	Replace nuts	15 Nm
	M10	M8	Upper row of stay bolts installed with bolt cement	
				23 Nm
	M21	M8		12 Nm
			Replace nuts Retighten after 2000 km Slacken nuts by a 1/4 turn	
				12 Nm
	M41/M47 / M47TU/M51 / M57/M57TU	M8	Replace nuts	20 Nm
	All/others	M8	Replace nuts	23 Nm

11 62 EXHAUST MANIFOLD

EXHAUST MANIFOLD-TIGHTENING TORQUE SPECIFICATIONS

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	Type	Thread	Description	Tightening Specifications
1AZ Exhaust manifold to cylinder head Coat screw connections with CRC copper paste	N54	M8	Replace nuts	20 Nm

SUPERCHARGER

11 65 TURBOCHARGER AND CONTROL

TURBOCHARGER AND CONTROL-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening Specifications
1AZ Exhaust turbocharger H.P. to exhaust manifold	N57S	M8x22	25 Nm
2AZ Exhaust turbocharger L.P. to exhaust manifold	N57S	M10x25	40 Nm
3AZ Compressor bypass to low-pressure stage	N57S	M8	8 Nm

11 65 TURBOCHARGER AND CONTROL

TURBOCHARGER AND CONTROL-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Description	Tightening Specifications
1AZ Flange nut (with internal serrations) (8 x) Exhaust turbocharger to cylinder head	N54	M7	Replace flange nut.	20 Nm
2AZ ASA screw (4 x) Heat shield/retaining plate to crankcase top section	N54	M6 x 16		8 Nm
3AZ ASA screw (4 x) Holder EPPC to cylinder head	N54	M6 x 20		9 Nm

4AZ Bracket, air duct, compressor 2, to cylinder head	N54	M6 x 15		9 Nm
5AZ Vacuum reservoir to bracket for vacuum reservoir	N54	M8		20 Nm
6AZ Bracket, vacuum reservoir, to body	N54	M6 x 14		5 Nm
7AZ Bracket to engine longitudinal member	N54	M6		5 Nm
8AZ EPPC to bracket, EPPC, with heat shield	N54	M6		5 Nm
9AZ Hexagon nut (3 x) Vacuum unit (wastegate valve) to bracket	N54	M6		8 Nm
10AZ Lock nut to vacuum unit (wastegate valve) linkage	N54	M6		7 Nm
11AZ Hexagon screw (2 x) Bracket, vacuum unit (wastegate valve), to turbocharger	N54	M8		20 Nm
12AZ Band clamp (2 x) Charge-air duct to turbocharger.	N54	M6	Replace band clamp.	3.5 Nm

VACUUM PUMP

11 66 VACUUM PUMP

VACUUM PUMP-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Description	Tightening Specifications
1AZ Vacuum pump to crankcase	N54	M6x40	Flat mushroom head screw 10.9 Replace screws	11 Nm

2AZ Sprocket wheel to vacuum pump	N54	M10x30	Screw 12.9 washed and oiled	66 Nm
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AIR PUMP, LINES

11 72 AIR PUMP, LINES AND CONTROL VALVES

AIR PUMP, LINES AND CONTROL VALVES-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening Specifications
1AZ Secondary air valve to cylinder head	N52	M6	8 Nm
2AZ Secondary air pump to mounting bracket/pump carrier	N52	M6	8 Nm
3AZ Intake hose/intake line to body	N52	M6	8 Nm

EMISSION CONTROL

11 78 EMISSIONS CONTROL, CONTROL SENSOR/MONITOR SENSOR

EMISSIONS CONTROL, CONTROL SENSOR/MONITOR SENSOR-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening Specifications
1AZ Control sensor/monitor sensor	N54	M18 x 1.5	50 Nm
2AZ Bracket, oxygen sensor, to transmission	N54	M8x16	20 Nm

11 78 EMISSIONS-CONTROL, LAMBDA OXYGEN SENSOR

EMISSIONS-CONTROL, LAMBDA OXYGEN SENSOR-TIGHTENING TORQUE SPECIFICATIONS

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