
Parell de collament - Par de apriete - Tightening Torque

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Tightening Torques

The following torque figures have been gathered through work we have undertaken on all smart models. This list is not exhaustive and has been based on record information made available to us. These figures are subject to change and should be used with care.

Component	Applicable Engines	Torque
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Pistons / Crank

Piston conrod bolts (2x per piston)
All 450, 451 & 452 engines
15Nm + 90°

Piston conrod bolts (2x per piston)
CDI
5Nm + 25Nm + 180°

Lower crankcase bolts (8x M8)
All 450 & 452
21Nm + 90°

Lower crankcase bolts (8x M8)
CDI
55Nm + 90°

Lower crankcase bolts (M6)
All 450 & 452
9.5Nm

Oil Pump System

Oil pump sprocket
All 450 & 452
20Nm

Oil pump bolts (3x) - Initial Torque
Oil pump bolts (3x) - Final Torque
All 450 & 452
14Nm
9.5Nm

Oil pick up pipe bolts (3x) - Initial Torque
Oil pick up pipe bolts (3x) - Final Torque
All 450 & 452
12Nm
9.5Nm

Oil baffle bolts
All 451
24Nm

Oil filter body bolts - blind hole
All 450 & 452
12Nm

Oil filter body bolts - clearance hole
All 450 & 452
9.5Nm

Oil filter case
All 450 & 452
23Nm

Oil cooler water line to crankcase - initial torque
Oil cooler water line to crankcase - retightening torque
450 Brabus (55kW) & 452
12Nm
9.5Nm

Engine Timing

Timing chain hydraulic tensioner bolts (2x)
All 450 & 452 + 450 CDI
12Nm

Timing case oil duct bolt (1x)
All 450 & 452
30Nm

Timing case bolts - Initial Torque
Timing case bolts - Final Torque
All 450 & 452
12Nm
9.5Nm

Timing case bolts M6
All 451
10Nm

Timing case bolts M8
All 451
23Nm

Bolt connecting end of crank sealing ring to crankcase
All 451
10Nm

Timing case plug
All 451
50Nm

Drive Plates / Pulleys

Belt pulley bolt into crankshaft (1x)
All 450 & 452 + CDI
140Nm + 90°

Bolt holding drive plate to other end of crankshaft
450 599cc engines only
47.5Nm + 90°

Bolt holding drive plate to other end of crankshaft
All 698cc engines only + CDI
45Nm + 90°

Clutch Assembly

Clutch module to drive plate bolts (3x)
All 450 & 452
20Nm + 90° + 10°

Clutch pressure plate to flywheel bolts
All 451
20Nm

Clutch release bearing to gearbox
All 450, 451 & 452
10Nm

Clutch actuator bolts
All 450, 451 & 452
10Nm

Gearbox bolts (gearbox to engine)
All 450 & 452
23Nm

Gearbox bolts (gearbox to engine)
All 451
45Nm

Gearbox oil drain plug
All 450, 451 & 452
43Nm

Gearbox assembly bolts
All 450 & 452
27Nm + release + 25Nm

Cylinder Head

Cylinder head bolts (8x)
All 450 & 452
21Nm + 90° + 90° + 10°

Cylinder head bolts (8x)
CDI
30Nm + 90° + 90° + 90° + 10°

Cylinder head bolts
All 451
25Nm + 90° + 90°

Cylinder head bolt to timing cover (2x)
All 450 & 452
27Nm

Sump

Sump bolts - Initial Torque
Sump bolts - Final Torque
All 450 & 452
12Nm
9Nm

Sump bolts - Initial Torque
Sump bolts - Final Torque
All 451
10Nm
10Nm

Dipstick tube bolt (1x) - Initial Torque
Dipstick tube bolt (1x) - Final Torque
All 450 & 452
12Nm
9Nm

Sump drain plug
All 451
65Nm

Camshaft

Camshaft sprocket bolt (1x)
All 450 & 452
21Nm + 90°+ 10°

Camshaft cap bolt (2x per cap) - Initial Torque
Camshaft cap bolt (2x per cap) - Final Torque
450 599cc engines only
11Nm
8.4Nm

Camshaft cap bolt (2x per cap) - Initial Torque
Camshaft cap bolt (2x per cap) - Final Torque
All 698cc engines
12Nm
12Nm

Rocker Cover

Rocker cover bolts - Initial Torque
Rocker cover bolts - Final Torque
All 450 & 452
12Nm
9.5Nm

Rocker cover bolts

All 451

10Nm

Load bleed plate to crankcase bolts

All 451

10Nm

Ignition Coils

Coil pack bolts (2x per coil pack)

All 450 & 452

14Nm

Coil pack bolts (2x per coil pack)

All 451

10Nm

Starter Motor

Starter motor securing bolt

All 450 & 452

23Nm

Starter motor securing bolt

All 451

42Nm

Constant live connection to starter motor

All 450 & 452

8Nm

Constant live connection to starter motor

All 451

10Nm

Water pump system

Water pump to carrier bolts

All 450 & 452

9.5Nm

Water pump carrier to crankcase bolt
All 450 & 452
20Nm

Water pump pulley to water pump
All 450, 451 & 452
10Nm

Turbo water pipes banjo bolts
All 450 only
19Nm

Turbo water pipes banjo bolts
All 452 only
20Nm

Thermostat to cylinder head - initial torque
Thermostat to cylinder head - final torque
All 450 & 452
12Nm
9.5Nm

Water supply connection to carrier - initial torque
Water supply connection to carrier - final torque
All 450 & 452
14Nm
9.5Nm

Water pump to timing case - M6
All 451
10Nm

Water pump to timing case - M8
All 451
23Nm

Thermostat housing bolts
All 451
10Nm

Coolant pipe bolts (crankcase & oil pan)
All 451
10Nm

Coolant Drain Plug
All 450 & 452
12Nm

Inlets

Fuel rail bolts (to inlet manifold - 2x)
All 450 & 452
8Nm

Fuel rail bolts (to inlet manifold)
All 451
9Nm

Fuel rail to air inlet pipe
All 451
9Nm

Throttle body bolts (to inlet manifold)
All 450, 451 & 452
9Nm

Inlet manifold bolts - Initial Torque
Inlet manifold bolts - Final Torque
All 450 & 452
12Nm
10Nm

Inlet manifold bolts - Initial Torque
Inlet manifold bolts - Final Torque
All 451
20Nm
20Nm

Turbo System

Turbo oil pipe bolts (2x)
450 599cc engines only
7.6Nm

Turbo oil pipe bolts (2x)
All 698cc engines
8Nm

Turbo oil line banjo bolt (to crankcase 1x)
All 450 & 452
10Nm

Wastegate actuator securing bolts (2x)
All 450 & 452
7Nm

Turbo exhaust manifold studs (7x on 599cc, 8x on 698cc)

All 450 & 452
6Nm

Turbo exhaust manifold nuts (7x on 599cc, 6x on 698cc)
All 450 & 452
16Nm

Combination valve line nuts on exhaust manifold (2x)
All 698cc engines only
10Nm

Exhaust studs (2x)
450 599cc & 452
8.5Nm

Exhaust studs (2x)
450 698cc engines only
9Nm

Banjo bolt for exhaust line to combination valve (1x)
All 698cc engines only
34Nm

Bolt for combination valve to cylinder head (1x)
All 698cc engines only
12Nm

Alternator

Alternator wiring nuts
All 450 & 452
8Nm

Alternator wiring nuts
All 451
10Nm

Alternator carrier bolts
599cc engines only
27.5Nm

Alternator carrier bolts
698cc engines
25Nm

Alternator bracket to crankcase bolt

599cc engines only
27Nm

Alternator bracket to crankcase bolt
698cc engines
25Nm

Alternator bracket to crankcase - M8
All 450 & 452
9.5Nm

Alternator bracket to crankcase - M6
All 450 & 452
12Nm

Alternator adjusting nut
599cc engines only
27.5Nm

Alternator adjusting nut
698cc engines
25Nm

Alternator to timing case cover bolt
All 451
23Nm

Belt Drives

Alternator belt tensioner to timing case bolt (1x)
All 450 & 452
20Nm

Airconditioning belt tensioner to timing case cover (1x)
All 450 (with aircon)
20Nm

Main belt tensioner to timing case cover (1x)
All 451
49Nm

Airconditioning belt tensioner eccentric bolt (1x)
All 450 & 452 (with aircon)
21Nm

TIK

TIK bracket to gearbox bolts (2x) - Initial Torque
TIK bracket to gearbox bolts (2x) - Final Torque
All 450 & 452
12Nm
9Nm

Spark plugs

Spark plugs - Initial Torque
Spark plugs - Final Torque
599cc engines only
23Nm
23m

Spark plugs - Initial Torque
Spark plugs - Final Torque
698cc engines only
28Nm
20Nm

Spark plugs - Initial Torque
Spark plugs - Final Torque
All 451
18Nm
18Nm

Sensors and Switches

Oil pressure switch
All 450 & 452
18Nm

Oil pressure switch
All 451
10Nm

Lambda O2 sensors (both sensors if applicable)
All 450 & 452 + CDI
50Nm

Lambda O2 sensor - upstream
All 451
50Nm

Lambda O2 sensor - downstream
All 451

40Nm

MAP sensor bolt (1x)

All 450 & 452

6Nm

Knock sensor bolt (1x)

All 450, 451 & 452

20Nm

TDC sensor bolt (1x)

All 450 & 452

12Nm

TDC sensor bolt (1x)

All 451

11Nm

Camshaft position sensor

All 451

11Nm

Gear position sensor

All 450 & 452

10Nm

Gearbox temperature sensor

599cc pre-2000 only

10Nm

Gearbox RPM sensor

All 450 & 452

10Nm

ECU securing bolts

All 450 & 452 + 450 CDI

2Nm

Engine Mounts

Engine mount - cylinder head bolts - Initial Torque

Engine mount - cylinder head bolts - Retightening Torque

All 450 & 452

28Nm

23Nm

Engine mount - back of crankcase - Initial Torque
Engine mount - back of crankcase - Retightening Torque
All 450 & 452
28Nm
23Nm

Engine mount - gearbox - Initial Torque
Engine mount - gearbox - Retightening Torque
All 450 & 452
28Nm
23Nm

Engine mount to subframe bolts
All 450 & 452
58Nm

Engine mount - right engine to frame
All 451
56Nm

Engine mount - right engine to timing case
All 451
80Nm

Engine mount - left engine to carrier
All 451
56Nm

Engine mount - left engine to transmission
All 451
80Nm

Torque support engine mounts
All 451
115Nm

Carrier for front engine mount to transmission
All 451
23Nm

Carrier for front engine mount to crankcase
All 451
56Nm

Suspension System

Front suspension arm top nut

All 450, 451 & 452
45Nm

Suspension arm top spring plate nut
All 450, 451 & 452
60Nm

Suspension arm C-clamp on rear of hub
All 450 & 452
46Nm

Suspension arm C-clamp on rear of hub
All 451
30Nm + 180°