BMW MOTORRAD

BMW S1000 RR

K67

(0E21/0E23/0E24/0E20/0E43)

Repair Guide

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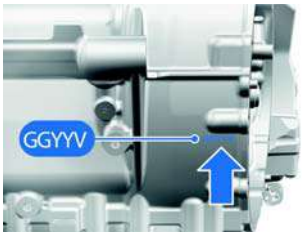
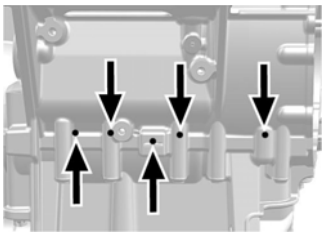
General Information

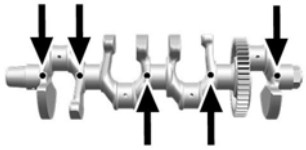
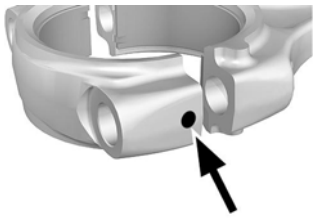
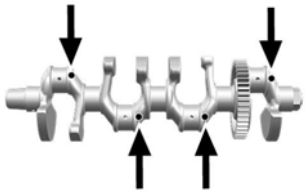
Repair Guide

Technical data - S 1000 RR

11 - Engine

Designation	Precondition	Value	Valid
CO2 emission	following world-wide harmonised motorcycle test cycle (WMTC)	149 g/km	
Torque	at engine speed 11000 min^{-1}	113 Nm	
Press loss through valves or cylinder	Engine at operating temperature	max 30 %	
Running-in speed	Odometer reading 0...300 km	<7000 min^{-1}	
	Odometer reading 300...1000 km	<9000 min^{-1}	
	Odometer reading 0...1000 km	no full load	
Maximum engine speed		max 14600 min^{-1}	
Displacement		999 cm^3	
Piston stroke		49.7 mm	
Compression test pressure	Good	min 13 bar	
	Normal	10...13 bar	
	Poor	max 10 bar	
Idle speed	Engine at regular operating temperature	1270^{+50}_{-50} min^{-1}	
Engine design		Oil-/water-cooled four-stroke inline four, with four valves per cylinder	
Engine number location		Crankcase, bottom right	
Engine type		A10A10A	
Nominal capacity	at engine speed 13500 min^{-1}	152 kW	
Compression ratio		13,3:1	
Cylinder bore		80 mm	
Engine oil, capacity	with filter change	approx. 4.0 l	
	Fluids and lubricants		
	Viscosity class		
Engine oil, capacity	with filter change	approx. 4.0 l	
	Specification (SAE 5W-40, API SJ / JASO MA2, Additives (e.g. molybdenum-based) are not permissible because they can attack coated components of the engine, BMW Motorrad recommends BMW Motorrad ADVANTEC Ultimate oil.)		
Engine oil, specified level 	Engine at operating temperature, vehicle is in vertical position	between **MIN** and **MAX** mark	
Engine oil, quantity for topping up	Difference between **MIN** and **MAX**	max 1.3 l	
11 12 - Cylinder head with cover			
Wear limit, tilt clearance, valve to valve guide	at valve lift $10^{+0.1}_{-0.1}$ mm	max 0.40 mm	
		1.02 mm	

Correlation of cylinder-head gasket (mark: 1 hole)	for piston protrusion <2.62 mm		
Correlation of cylinder-head gasket (mark: 2 holes)	for piston protrusion ≥2.62 mm	1.12 mm	
11 21 - Crankshaft with bearings			
Bore diameter for crankshaft main bearing		38.000...38.015 mm	
Colour codes of crankshaft bearing shells	Crankcase yellow / crankshaft yellow	Bearing shells, yellow	
	Crankcase yellow/crankshaft violet	Bearing shells, green	
	Crankcase yellow / crankshaft green	Bearing shells, blue	
	Crankcase green / crankshaft green	Bearing shells, green	
	Crankcase green / crankshaft yellow	Bearing shells, blue	
	Crankcase green / crankshaft violet	Bearing shells, black	
	Crankcase violet / crankshaft violet	Bearing shells violet	
	Crankcase violet/crankshaft yellow	Bearing shells, green	
	Crankcase violet / crankshaft green	Bearing shells, black	
Labelling on crankcase Classification of crankshaft bearing shells (main bearing) 	Labelling on engine housing top section (in direction of travel, rear)	(**G**) green / (**Y**) yellow / (**V**) violet	
Identification of main bearing and crankshaft journal on crank web 	BMW part number / revision index	1234567 12	
	Date / Time	YYMMD HHMM	
	sequential ID number	123456	
	Main bearing classification 1-5	GGYYV (example)	
	Pin bearing classification 1-4	RBRB (example)	
Marks on crankcase Classification of crankshaft bearing shells (main bearing) 	Colour dots above the crankcase sealing face (at rear as viewed in forward direction of travel)	yellow/green/violet	
Mark for classification of the crankshaft bearings for identifying the bearing shells	Labelling on crank web	(**G**) green / (**Y**) yellow / (**V**) violet	

			
Mark for classification of the crankshaft bearings for identifying the bearing shells	Coloured dots on the crankshaft	yellow/green/violet	
			
11 24 - Conrod with bearings			
Conrod bearing, bore diameter 	Identification/colour coding on the connecting rod foot	A/red or B/blue	
Conrod bearing, bore diameter 	Identification/colour coding on the connecting rod foot	A/red or B/blue	
Colour codes, conrod bearings Assignment, conrod/conrod cap	Rod bore red (A) / crankshaft journal red	Bearing shell red	
	Rod bore blue (B) / crankshaft journal blue	Bearing shell blue	
	Rod bore blue (B) / crankshaft journal red	Bearing shell violet	
	Rod bore red (A) / crankshaft journal blue	Bearing shell violet	
Mark for classification of the conrod bearings	Coloured dots on the crankshaft	red/blue	
			
Overview of conrod marks 	A	Correlation, conrod bearing cap to conrod	
	B	Weight class	
	C	Hole diameter	
	D	Production date	
11 25 - Piston with rings and bolts			
Piston, installed direction		Arrow in direction of travel	
11 34 - Valves with springs			

Exhaust valve clearance	Engine cold	0.20...0.26 mm	
Inlet valve clearance	Engine cold	0.14...0.20 mm	
11 40 - Oil supply			
Oil pressure	idle	1.5 bar	
Engine oil is at regular operating temperature	at engine rpm 6000 min -1	3.5 bar	

Technical data - S 1000 RR

12 - Engine electrical system

Designation	Precondition	Value	Valid
Type of Ignition system		BMS-O	
12 12 - Ignition lead, spark plugs			
Electrode gap of spark plug		$1.0^{+0.1}_{-0.1}$ mm	
Spark plugs, manufacturer and designation		NGK LMAR9FI-10G	
Spark plug thread		M10 x 1	
12 31 - Alternator with drive and fasteners			
Alternator type		Permanent magnet generator	
Alternator power		450 W	

Technical data - S 1000 RR

13 - Fuel preparation and control

Designation	Precondition	Value	Valid
Alternative fuel grade		Super unleaded (power- and consumption-related restrictions.) maximum 10 % ethanol, E10 95 ROZ/RON 90 AKI	
Recommended fuel grade		Super Plus, unleaded maximum 5% ethanol, E5 98 ROZ/RON 93 AKI	

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16 - Fuel supply

Designation	Precondition	Value	Valid
Usable fuel capacity		approx. 16.5 l	
Fuel reserve		approx. 4 l	
16 14 - Delivery, preparation and measurement, control unit, fuel pump			
Operating pressure of fuel pump		5 bar	
Delivery rate of fuel pump		60 l/h	

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17 - Cooling

Designation	Precondition	Value	Valid
Cut-in temperature for coolant temperature warning		118 °C	
Cooling system test pressure	Test pressure must remain unchanged: min 5 min	2 bar	
Coolant, specified level 	cold engine	between **MIN** and **MAX** mark on the expansion tank	
Coolant, total capacity		2.95 l	
	General consumable (Antifreeze and corrosion inhibitor)		
Coolant's ability to resist freezing temperatures		min −25 °C	
Coolant-full quantity	Difference between **MIN** - and **MAX**-mark	0.15 l	
	Coolant system, total	2.95 l	
17 40 - Fan			
Cut-in temperature for radiator fan	Coolant temperature sensor	101 °C	
17 65 - Thermostat with housing			
Opening temperature for coolant circuit thermostat		85 °C	

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21 - Clutch

Designation	Precondition	Value	Valid
Clutch type		Multi-plate oil-bath (anti-hopping) with self-reinforcement	
21 21 - Clutch with driver plate			
Height of entire plate stack		48.7 mm	

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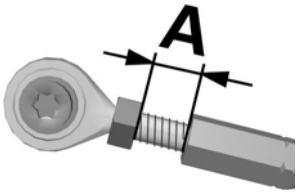
23 - Gearbox

Designation	Precondition	Value	Valid
Type of transmission		Claw-shift 6-speed gearbox, integrated into engine block	
23 22 - Gears			
Gearbox transmission ratios	Primary transmission ratio	1.652 (76:46 teeth)	
	1st gear	2.647 (45:17 teeth)	
	2nd gear	2.091 (46:22 teeth)	
	3rd gear	1.727 (38:22 teeth)	
	4th gear	1.500 (33:22 teeth)	
	5th gear	1.360 (34:25 teeth)	
	6th gear	1.261 (29:23 teeth)	
23 41 - External gearshift components			
Selector-rod-end setting 	free length of thread on **lower** ball joint	6^{+2}_{-2} mm	

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31 - Front axle, front-wheel steering

Designation	Precondition	Value	Valid
Type of front suspension		Upside-down telescopic fork	
Spring travel, front	at front wheel	120 mm	
Type of front suspension		Upside-down telescopic fork	
Fork oil, capacity of left fork leg		approx. 350 ml	
	Telescopic fork oil (Telescopic fork oil, type 2)		
Fork oil, capacity of right fork leg		approx. 350 ml	
	Telescopic fork oil (Telescopic fork oil, type 2)		
Level of fork oil in left fork leg (air chamber)	Forks fully compressed and damper unit bled, compression spring and spacer bush removed	135^{+2}_{-2} mm	
	Telescopic fork oil (Telescopic fork oil, type 2)		
Level of fork oil in right fork leg (air chamber)	Forks fully compressed and damper unit bled, compression spring and spacer bush removed	135^{+2}_{-2} mm	
	Telescopic fork oil (Telescopic fork oil, type 2)		
31 42 - Telescopic forks			
Load-dependent adjustment of spring preload Negative spring displacement of front wheel	including rider 85 kg	40^{+2}_{-2} mm	
Projection of fork tube in fork bridge, top	measured without fork cover	6 mm	
Fixed fork tube outside diameter		45 mm	
Fixed fork tube runout		max 0.2 mm	
Compression stage, basic setting, front	Road use with rider 85 kg	Position 5	
	Racing use with rider 85 kg	Position 7	
Rebound stage, basic setting, front	Road use with rider 85 kg	Position 5	
	Racing use with rider 85 kg	Position 5	

Technical data - S 1000 RR

32 - Steering and wheel alignment

Designation	Precondition	Value	Valid
32 73 - Bowden cables			
Distance between adjusting screw and handlebar fitting (clutch-cable setting)		$3^{+1.5}_{-1.5}$ mm	
Clutch-lever play	measured on outer clutch lever, handlebars in straight-ahead position, with cold engine	3...5 mm	
Clutch-lever play	measured on outer clutch lever, handlebars in straight-ahead position, with cold engine	3...5 mm	
32 76 - Steering damper			
Steering damper basic setting	Public roads	Turn adjusting screw until the limit position in the direction (A), then turn in direction (B) for 8 clicks.	
	Racing	Turn adjusting screw until the limit position in the direction (A), then turn in direction (B) for 4 clicks.	

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33 - Rear axle, rear-wheel drive and rear-wheel guidance

Designation	Precondition	Value	Valid
Spring travel, rear	at rear wheel	117 mm	
Type of final drive		Chain drive	
Type of rear suspension		Two-arm aluminium swinging arm	
33 35 - Rear wheel swinging arm with pivot mount, link			
Traction strut gap dimension to compensate the swinging arm pivot point setting	Basic setting	9.5 mm	
	Adjustment range	8.0...13.0 mm	
	Swinging arm pivot point Position 2	12.5 mm	
	Swinging arm pivot point Position 3	13.0 mm	
33 54 - Spring strut, mounting parts			
Load-dependent adjustment of spring preload	Road use with rider 85 kg	35^{+2}_{-2} mm	
Suspension compression at rear wheel	Racing use with rider 85 kg	30^{+2}_{-2} mm	
Compression stage, basic setting, rear	Road use with rider 85 kg	Turn adjusting screw (1) until the limit position in the direction (+), then turn in direction (–) for 5 clicks.	
	Racing use with rider 85 kg	Turn adjusting screw (1) until the limit position in the direction (+), then turn in direction (–) for 3 clicks.	
Rebound stage, basic setting, rear	Road use with rider 85 kg	Turn adjuster knob until the limit position in the direction (A), then turn in direction (B) for 5 clicks.	
	Racing use with rider 85 kg	Turn adjuster knob until the limit position in the direction (A), then turn in direction (B) for 3 clicks.	
33 82 - Traction drive, chain pinion, belt pinion			
Number of teeth, rear-wheel drive Pinion / sprocket		17:45	
Secondary transmission ratio		2,647	
33 83 - Traction drive, chain, belt			
Chain deflection	Motorcycle with no weight applied, supported on its side stand	45...50 mm	
Permissible chain length	measured from the **centre** of 10 rivets, chain pulled taut	max 144 mm	

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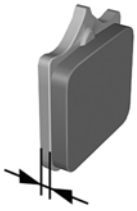
34 - Brakes

Designation	Precondition	Value	Valid
Brake fluid level, front 	Brake-fluid reservoir horizontal	The brake fluid level may not drop below the **MIN** mark. Hydraulic fluid (Brake fluid, DOT4)	
Brake fluid level, rear 	Brake-fluid reservoir horizontal	The brake fluid level may not drop below the **MIN** mark Hydraulic fluid (Brake fluid, DOT4)	
34 11 - Front wheel brakes			
Type of front brake		Twin disc brake, diameter 320 mm, 4-piston fixed caliper	
Brake-pad material, front		Sintered metal	
Brake-pad wear limit, front 	Friction pad only, without backing plate	min 1 mm	
Brake-pad wear limit, front	Friction pad only, without backing plate. The wear indicators (grooves) must be clearly visible	min 1 mm	
Brake disc diameter, front		320 mm	
Brake disc lateral runout, front	removed, at outer diameter, components cooled down	max 0.1 mm	
	installed, at outer diameter, components cooled	max 0.15 mm	
Brake disc thickness, front	When new	4.5 mm	
	Wear limit	min 4.0 mm	
Play of brake controls Front brake	on the piston	0.6...1.4 mm	
Thickness of brake-pad carrier plate 		min 4.5 mm	
34 21 - Rear wheel brakes			
Brake-pad wear limit, rear 	Friction pad only, without backing plate.	min 0.9 mm	

Brake-pad material, rear		Organic material	
Type of rear brake		Hydraulically actuated disc brake with 1-piston floating caliper and fixed disc	
Brake disc diameter, rear		220 mm	
Brake disc lateral runout, rear	removed, at outer diameter, components cooled down	max 0.1 mm	
	installed, at outer diameter, components cooled	max 0.15 mm	
Brake disc thickness, rear	When new	5 mm	
	Wear limit	min 4.5 mm	

Technical data - S 1000 RR

35 - Foot operation

Designation	Precondition	Value	Valid
35 21 - Footbrake lever, connecting linkage			
Blow-by clearance of the footbrake lever	between the footbrake lever and footrest plate	2 mm	
Blow-by clearance of the footbrake lever	between the footbrake lever and footrest plate	2...3 mm	

Technical data - S 1000 RR

36 - Wheels and tyres

Designation	Precondition	Value	Valid
36 23 - Electronic components			
Wheel-speed sensor, rear Distance from sensor ring		$0.8^{+0.8}_{-0.7}$ mm	
Wheel-speed sensor, front Distance from sensor ring		$0.8^{+0.8}_{-0.7}$ mm	
36 30 - Motorcycle wheels			
Balance weight for rear wheel Weights have to be affixed with one half on the left and one half on the right, in other words centred on the rim		max 80 g	
Balance weight for front wheel Weights have to be affixed with one half on the left and one half on the right, in other words centred on the rim		max 80 g	
Permissible rear-wheel imbalance		max 5 g	
Permissible front-wheel imbalance		max 5 g	
36 31 - Wheels with bearings			
Rear-wheel type		Aluminium cast wheel	
Rear wheel rim size		6.0" x 17"	
Front-wheel type		Aluminium cast wheel	
Front-wheel rim size		3.50" x 17"	
36 32 - Tyres			
Speed category, front/rear tyres	required at least 270 km/h	W	
Wheel valve test pressure		4 bar	
Tyre designation, rear		190/55 ZR 17	
Tyre designation, front		120/70 ZR 17	
Tyre pressure, rear	with cold tyre; one-up and two-up	2.9 bar	
Tyre pressure, front	with cold tyre; one-up and two-up	2.5 bar	
Tyre tread depth, front and rear	for Germany	min 1.6 mm	
Load index, rear tyre		min 75 g/cm^3	
Load index, front tyre		min 58 g/cm^3	
Recommended tyre combinations		An overview of currently approved tyres is available from your authorised BMW Motorrad Retailer or on the Internet at **bmw-motorrad.com**.	

Technical data - S 1000 RR

46 - Frame and mounted components

Designation	Precondition	Value	Valid
46 51 - Motorcycle frame			
Position of the vehicle identification number		Frame, front right on steering head	
Frame type		Aluminium composite bridge frame, engine also load bearing	
Type plate location		Frame, front right on steering head	

Technical data - S 1000 RR

61 - General vehicle electrics

Designation	Precondition	Value	Valid
61 13 - Plug, terminal			
Fuse 1	**DWA**, **OBD**, ignition switch, instrument cluster	15 A	
Fuse 2	Multifunction switch left, **RDC** control unit, sensor box	7.5 A	
Main fuse	Alternator regulator, isolating relay, **BCL**, **BMS-O**, **ABS**, **SAF**	40 A	
Electrical rating of on-board sockets	Total for all sockets	max 5 A	
61 21 - Battery with holder			
Battery type		AGM (Absorbent Glass Mat)	
Battery rated capacity		8 Ah	
Battery rated voltage		12 V	

Technical data - S 1000 RR

63 - Lights

Designation	Precondition	Value	Valid
63 10 - Front lights, position lights and side lights			
Bulb for parking light		LED	
63 12 - Headlight			
Distance from light/dark limit to upper edge of low-beam headlight light-emitting surface	Chassis and suspension in the basic setting and vehicle subject to a load of 85 kg	5 cm	
Distance between headlight and vertical surface For headlight adjustment		5 m	
Bulbs for the low-beam headlight		LED	
Bulb for high-beam headlight		LED	
63 13 - Flashing turn indicators, front			
Bulbs for turn indicators		LED	
63 21 - Rear light cluster			
Bulb for tail light/brake light		LED	
63 23 - Flashing turn indicators, rear			
Bulbs for flashing turn indicators, rear		LED	
63 26 - Number-plate light			
Light source for the number plate light		LED	

Technical data - S 1000 RR

65 - Audio, navigation, information systems

Designation	Precondition	Value	Valid
65 75 - Anti-theft alarm			
Activation time on arming		approx. 30 s	
Alarm duration		approx. 26 s	

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77 - Optional accessories, motorcycle

Designation	Precondition	Value	Valid
77 41 - Case, liner			
Maximum permissible speed for riding with aluminium cases fitted to the motorcycle		max 180 km/h	
Payload per aluminium case		max 10 kg	
77 43 - Topcase, liner			
Maximum permissible speed for riding with aluminium topcase fitted to the motorcycle		max 180 km/h	
Payload of aluminium topcase		max 5 kg	
77 45 - Tank rucksack			
Maximum permissible speed for riding with the tank bag fitted to the motorcycle		≤130 km/h	
Tank rucksack volume	without capacity expansion	approx. 7 l	
	Capacity expansion	approx. 3 l	
Payload of tank rucksack		≤5 kg	

Tightening torques - S 1000 RR		
11 - Engine	**Value**	**Valid**
11 11 - Engine block		
Main bearing screw connection		
M9 x 95	Closing torque, 20 Nm	
	1st additional angle of rotation, 90°	
	2nd additional angle of rotation, 90°	
Main bearing screw connection		
M9 x 95	1st additional angle of rotation, 90°	
	2nd additional angle of rotation, 90°	
Main bearing screw connection		
M9 x 95	Closing torque, 20 Nm	
Crankcase screw connection		
M6 x 40	9 Nm	
Crankcase screw connection		
M8 x 65	Closing torque, 20 Nm	
	Additional angle of rotation, 90°	
Starter cover on crankcase		
M6 x 25	5 Nm	
Screw plug on engine		
M10 x 1 x 6	10 Nm	
11 12 - Cylinder head with cover		
Cylinder head cover to cylinder head		
M6 x 20	10 Nm	
Camshaft bearing cap to cylinder head		
M6 x 35	**Tightening sequence: See repair manual**	
	1st tightening torque, 5 Nm	
	2nd tightening torque, 13 Nm	
Cover for secondary air system to cylinder head cover		
M6 x 20	5 Nm	
Threaded plug (cam-follower shaft) to cylinder head		
M10 x 1	10 Nm	
Cylinder head to crankcase		
M8	1st tightening torque, 20 Nm	
	1st additional angle of rotation, 90°	
	2nd additional angle of rotation, 90°	
	3. Additional angle of rotation, 45°	
Cylinder head to frame		
Cylinder head, left, to frame, M10 x 50	60 Nm	
Cylinder head, right, to frame, M10×50, Renew screw	**Tightening sequence: with taper elements (expander element outside)**	
	1st tightening torque, 30 Nm	
	2nd additional angle of rotation, 90°	
Cylinder head/crankcase on right to frame		

M10×50, Renew screw	**Tightening sequence: with taper elements (expander element outside)**	
	1st tightening torque, 30 Nm	
	2nd additional angle of rotation, 90°	

11 13 - Oil sump

Oil drain plug to oil pan

M16 x 1.5	28 Nm	

Oil pan to crankcase

M6 x 35, Renew screw	Tightening torque, 3 Nm	
	Additional angle of rotation, 90°	

11 14 - Housing cover

Clutch cover to crankcase

M6 x 35, Renew screw	Tightening torque, 3 Nm	
	Additional angle of rotation, 90°	

Engine cover, left, to crankcase

M6 x 35, Renew screw	Tightening torque, 3 Nm	
	Additional angle of rotation, 90°	

Engine cover, left, to crankcase

M6 x 35, Renew screw	Tightening torque, 3 Nm	
	Additional angle of rotation, 90°	
M6 x 40, Renew screw	Tightening torque, 7 Nm	

Insulating mat with retaining plate to engine housing cover on right

M5 x 10 - 10.9, Renew screw Thread-locking compound (micro-encapsulated)	5 Nm	

Screw plug for crankshaft

M40	12 Nm	

11 21 - Crankshaft with bearings

Sprocket wheel timing chain drive to crankshaft

M12 x 1.5 x 40	120 Nm	

11 24 - Conrod with bearings

Threaded fasteners for conrods

MJ8 x 1 x 35	Closing torque, 5 Nm	
	Pre-tensioning torque, 25 Nm	
	Additional angle of rotation, 105^{+5}°	

11 31 - Camshaft

Axle for timing chain drive reduction gear to cylinder head

M10 x 40	60 Nm	

Tensioning/slide rail for timing chain to crankcase

M16 x 1.5	30 Nm	

Timing-chain tensioner to cylinder head

M20 x 1.5	42 Nm	

11 36 - Camshaft adjustment

Switching cam adjuster to camshaft bearing cap

M6 x 30 - 10.9	13 Nm	

11 41 - Oil pump with strainer and drive

Oil-coolant pump chain guide to crankcase		
M6 x 20	9 Nm	
Pinion on shaft for oil/coolant pump		
M6, Renew nut	10 Nm	
Oil-coolant pump to crankcase		
M6 x 35	9 Nm	
Screw plug for oil pressure control valve to crankcase		
M14 x 1.5 x 10	25 Nm	
11 42 - Oil filter and lines		
Oil filter to engine		
Lubricate seal with engine oil	11 Nm	
Oil filter adapter to crankcase		
M20 x 1.5	35 Nm	
Oil line to crankcase		
M6 x 16	9 Nm	
Screw connection oil spray bar to crankcase		
M5 x 12	5 Nm	
11 51 - Coolant pump with drive		
Oil/Coolant pump to crankcase		
M6 x 35	9 Nm	
11 53 - Thermostat and on-engine coolant lines		
Connecting branch for coolant pump to crankcase		
M40 x 2	12 Nm	
11 61 - Intake system		
Air intake to cylinder head		
M6 x 16, Renew screw Thread-locking compound (micro-encapsulated)	8 Nm	
11 72 - Secondary air system		
Secondary air system changeover valve to intake air silencer		
PT40 x 15	3 Nm	
11 78 - CO adjustment, oxygen sensor		
Monitoring oxygen sensor to exhaust manifold		
M12 x 1.25 Thinly lubricate thread, Lubricant (Optimoly TA)	25 Nm	
Front oxygen sensor to exhaust manifold		
M14 x 1.25 Thinly lubricate thread, Lubricant (Optimoly TA)	45 Nm	

Tightening torques - S 1000 RR		
12 - Engine electrical system	**Value**	**Valid**
12 12 - Ignition lead, spark plugs		
Spark plug in cylinder head		
M10 x 1	12 Nm	
12 31 - Alternator with drive and fasteners		
Stator to engine housing cover, left		
M6 x 25 - 10.9, Renew screw Thread-locking compound (micro-encapsulated)	10 Nm	
Holder for alternator cable to engine cover		
M5 x 16 Thread-locking compound (Loctite 243, Medium strength)	4.5 Nm	
Magnet wheel to crankshaft		
M12 x 1.5 x35 - 10.9 Thread lightly oiled	120 Nm	
12 32 - Regulator		
Voltage regulator to holder		
M6, Renew nut Thread-locking compound (mechanical)	8 Nm	
12 41 - Starter with fastener		
Starter motor to crankcase		
M6 x 35	8 Nm	
Wiring harness (positive wire) to starter motor		
M5 x 10	3 Nm	
12 52 - Plug, clips, loose parts		
Engine wiring harness (earth) to cylinder head		
M5 x 10	5 Nm	
Wiring harness (earth) to crankcase		
M6 x 12	8 Nm	
12 62 - Coolant temperature		
Coolant temperature sensor to thermostat housing		
M12 x 1.5	15 Nm	
12 72 - Transmitter for control unit		
Knock sensor to crankcase		
M8 x 30	20 Nm	
Crankshaft sensor on engine housing cover		
M6 x 20, Renew screw	5 Nm	
Camshaft sensor to cylinder head		
M6 x 16	10 Nm	
Switching cam sensor on cylinder head cover		
M6 x 16	5 Nm	

Tightening torques - S 1000 RR		
13 - Fuel preparation and control	**Value**	**Valid**
13 54 - Throttle valve and actuation		
Fuel injection pipe to intake silencer		
TS5 x 14	3 Nm	
Injection strip on throttle valve assembly		
M5 x 16, Renew screw Thread-locking compound (micro-encapsulated)	4 Nm	
Screw clamp for throttle valve connection	1.5 Nm	
13 63 - Electromechanical switchgear		
Servomotor for unfiltered-air flap to air intake duct		
Screw for plastic, 6 x 22	2 Nm	
13 71 - Intake air silencer		
Intake silencer to throttle-valve assembly		
M6 x 12	6 Nm	
Intake silencer to frame		
M6 x 30	8 Nm	
Rear air guide to frame		
M6 x 12	8 Nm	
Servomotor to intake silencer		
Screw for plastic, 6 x 22	3 Nm	

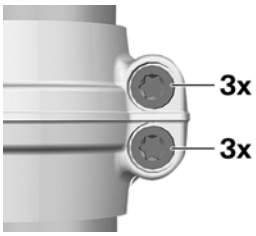
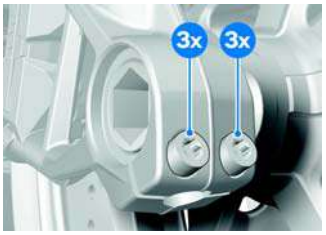
Tightening torques - S 1000 RR		
16 - Fuel supply	**Value**	**Valid**
16 11 - Fuel tank with filler neck		
Fuel tank to retaining bridge, rear		
M6 x 115	5 Nm	
Fuel tank to frame		
M8	19 Nm	
Fuel filler cap to fuel tank		
M5 x 20	2.5 Nm	
16 13 - Breather, emissions monitoring		
Holder, activated charcoal filter to frame		
M6 x 16	5 Nm	
Tank ventilation distributor to throttle valve		
M5 x 16	5 Nm	
16 14 - Delivery, preparation and measurement, control unit, fuel pump		
Electric fuel pump to fuel tank		
M5 x 20	5 Nm	

Tightening torques - S 1000 RR		
17 - Cooling	**Value**	**Valid**
Coolant line to bracket		
M5 x 16	5 Nm	
17 11 - Radiator with fasteners		
Radiator holder to crankcase		
M8 x 24	8 Nm	
Radiator to frame		
M6 x 25	8 Nm	
17 13 - Expansion tank		
Coolant expansion tank to frame		
M6 x 20	8 Nm	
17 21 - Oil cooler		
Oil cooler to radiator		
M5 x 16, Renew screw Thread-locking compound (micro-encapsulated)	5 Nm	
17 22 - Oil cooler lines		
Return line for oil cooler to engine		
M6 x 16, Renew screw Thread-locking compound (micro-encapsulated)	8 Nm	
Oil lines for oil cooler to crankcase		
M6 x 20	8 Nm	
17 40 - Fan		
Fan to radiator		
Screw for plastic, 5 x 18	4 Nm	
17 65 - Thermostat with housing		
Thermostat cover to crankcase		
M6 x 25	9 Nm	

Tightening torques - S 1000 RR		
18 - Exhaust system	**Value**	**Valid**
18 51 - Exhaust system parts with mountings		
Cover to exhaust flap		
M5 x 12	5 Nm	
Bracket for exhaust manifold to frame		
M8 x 34, Renew screw Thread-locking compound (micro-encapsulated) Lubricate shank, Lubricant (Optimoly TA)	19 Nm	
Servomotor holder for exhaust flap to frame		
M5 x 10	2 Nm	
Servomotor holder for exhaust flap to engine		
Aluminium screw, M6 x 25	5 Nm	
Exhaust manifold to holder		
M8 x 70, Renew screw Thread-locking compound (micro-encapsulated)	18 Nm	
Bracket to silencer		
M6 x 16, Renew screw Thread-locking compound (micro-encapsulated)	12 Nm	
Exhaust manifold to cylinder head		
M7	14 Nm	
Clamping collar for rear silencer		
M8	14 Nm	
Clamping collar for rear silencer		
M8	24 Nm	
Silencer to footrest system		
M8 x 40	19 Nm	
Servomotor for exhaust flap to Bowden-cable counter support		
Screw for plastic, TS5 x 15	2 Nm	

Tightening torques - S 1000 RR		
21 - Clutch	**Value**	**Valid**
21 21 - Clutch with driver plate		
Pressure plate to driver		
M6 x 25 Screws oiled	10 Nm	
Clutch hub to drive shaft		
M20 x 1.5, Renew nut Thread-locking compound (micro-encapsulated)	**Tightening sequence: 1st tightening torque**	
	190 Nm	
	Loosen screw connection	
	Tightening sequence: 2nd tightening torque	
	190 Nm	
	Caulk nut to transmission shaft	

Tightening torques - S 1000 RR		
23 - Gearbox	**Value**	**Valid**
23 00 - Gearbox		
Pinion to transmission output shaft		
M24 x 1.5 secure with profile washer, Thread-locking compound (mechanical)	125 Nm	
23 12 - Bearing in housing, sealing rings		
Bearing retaining plate with bearing carrier to crankcase		
M5 x 18	5 Nm	
23 14 - Electrical components		
Gearbox potentiometer to selector-drum carrier		
M5 x 14 - 10.9	5 Nm	
23 31 - Internal gearshift components		
Locking lever to crankcase		
M6 x 30	9 Nm	
Locking plate of gearshift rail to crankcase		
M5 x 12	5 Nm	
Selector star to selector drum		
M6 x 25, Renew screw Thread-locking compound (micro-encapsulated)	8 Nm	
Bearing carrier, selector drum, to crankcase		
M6 x 25	9 Nm	
Gearshift shaft (retaining plate) to crankcase		
M6 x 16	9 Nm	
23 41 - External gearshift components		
Gearshift lever to side-stand pivot mount		
M8 x 65	19 Nm	
Gear selector lever to gearshift shaft		
M6 x 25	8 Nm	
Gearshift rod to gearshift lever		
M6 x 20, Renew screw Thread-locking compound (micro-encapsulated)	8 Nm	
Gearshift rod to gear selector lever		
M6 x 20, Renew screw Thread-locking compound (micro-encapsulated)	8 Nm	
Selector rod to gearshift lever		
M6 x 20, Replace screw Thread-locking compound (micro-encapsulated)	8 Nm	

Tightening torques - S 1000 RR		
31 - Front axle, front-wheel steering	**Value**	**Valid**
31 42 - Telescopic forks		
Damper unit to forkleg		
M8 x 25 Thread-locking compound (micro-encapsulated)	25 Nm	
Cover to fixed fork tube	20 Nm	
Adjustment specification, steering-head bearing		
top slotted nut, M35 x 1 Secure with circlip	Tightening torque, 1 Nm turn further until circlip can be installed	
Adjustment specification, steering-head bearing		
bottom slotted nut, M35 x 1	Tightening torque, 40 Nm Swing fork 3x to the left/right slacken (forks turned fully to the left), 80° Tightening torque (forks turned fully to right), 15 Nm	
Fork bridge, top, to fork fixed tube		
M8 x 25	19 Nm	
Fork bridge, bottom, to fork fixed tube 		
M8 x 35	**Tightening sequence: Tighten screws six times in alternate sequence** 19 Nm	
Clamping screws in axle holder 		
M8 x 35	**Tightening sequence: Tighten screws six times in alternate sequence** 19 Nm	
Lock nut (on damper rod) to fork-leg cap	15 Nm	
Adjusting steering-head bearing (for maintenance)		
Bottom slotted nut, M30 x 1	(forks turned fully to right), 15 Nm	
Rubber ring		
Top slotted nut, M30 x 1 Secure with circlip	Tightening torque, 1 Nm turn further until circlip can be installed	
Quick-release axle in threaded bush		

M24 x 1.5	50 Nm	

Top fork bridge to steering tube		
M28 x 1 Thread-locking compound (Loctite 243, Medium strength)	100 Nm	

Tightening torques - S 1000 RR		
32 - Steering and wheel alignment	**Value**	**Valid**
32 71 - Motorcycle handlebars		
Bracket for reservoir to fork bridge		
M6 x 10, Renew screw Thread-locking compound (micro-encapsulated)	8 Nm	
Expansion tank to bracket		
M5 x 18	5 Nm	
Handlebar weight to handlebar half		
M8 x 35	19 Nm	
Handlebar half to fork leg		
Threaded pin, M6 x 10	8 Nm	
Clamping bolt, M8 x 25	19 Nm	
Handlebar half to fork leg		
Threaded pin, M6 x 10	8 Nm	
32 72 - Handlebar lever		
Adapter to clamp		
M3 x 14	1 Nm	
Bleed screw to handlebar fitting		
M7 x 12	5 Nm	
Throttle twistgrip to handlebar		
M3.5 x 30	2 Nm	
Handbrake fitting to handlebars		
M6 x 20	**Tightening sequence: tighten top until fully closed** 8 Nm	
Clutch lever fitting to handlebar		
M6 x 20	**Tightening sequence: tighten top until fully closed** 8 Nm	
Hand lever to clutch lever fitting		
M6, Renew nut Thread-locking compound (mechanical)	**Tightening sequence: Tighten the nut, counter-holding the bolt** 6 Nm	
Hand lever to handbrake fitting		
M6, Screw	1 Nm	
M6, Renew nut Thread-locking compound (mechanical)	**Tightening sequence: Tighten the nut, counter-holding the bolt** 6 Nm	
32 73 - Bowden cables		
Guide clip for clutch cable to upper fork bridge		
M5 x 16	2 Nm	
Clutch cable counter support to engine		
M6 x 16	10 Nm	
32 76 - Steering damper		
Steering damper to fork bridge		

M8 x 35, Renew screw Thread-locking compound (micro-encapsulated)	19 Nm	

Steering damper to frame		
M8 x 55, Renew screw Thread-locking compound (micro-encapsulated)	19 Nm	

Tightening torques - S 1000 RR		
33 - Rear axle, rear-wheel drive and rear-wheel guidance	**Value**	**Valid**
33 35 - Rear wheel swinging arm with pivot mount, link		
Rear wheel swinging arm to frame		
M27 x 1.25	Tightening torque, 15 Nm Loosen, 120° Tightening torque, 5 Nm	
M18 x 1.5, Renew nut Thread-locking compound (mechanical)	100 Nm	
Nut on swinging arm axle		
M18 x 1.5, Replace nut Thread-locking compound (mechanical)	100 Nm	
Swinging arm axle to frame		
M27 x 1.25	Tightening torque, 15 Nm Loosen, 120° Tightening torque, 5 Nm	
Locknut of the final-drive chain tensioning screw		
M8	19 Nm	
33 54 - Spring strut, mounting parts		
Spring strut to swinging arm		
M12 x 75 - 10.9, Renew screw Thread-locking compound (micro-encapsulated)	100 Nm	
Spring strut at deflection lever		
M12 x 75 - 10.9 Thread-locking compound (micro-encapsulated)	100 Nm	
Clamping bolt at adjusting strut		
M6 x 25	8 Nm	
Screw in adjusting ring		
M5 x 16	6 Nm	
Relay lever to frame		
M10 x 25, Renew screw Thread-locking compound (micro-encapsulated)	38 Nm	
Pivot strut to rear wheel swinging arm		
M12 x 75 - 10.9, Renew screw Thread-locking compound (micro-encapsulated)	100 Nm	
Link strut to relay lever		
M12 x 75 - 10.9, Renew screw Thread-locking compound (micro-encapsulated)	100 Nm	
33 84 - Traction drive, chainwheel, belt wheel		
Chain sprocket to chain-sprocket carrier		
M12 x 1.5 - 10, Renew nut Thread-locking compound (mechanical)	**Tightening sequence: tighten in diagonally opposite sequence** 110 Nm	
33 85 - Mounted parts, traction drivetrain		
Chain drop guard to engine		
M6 x 45	5 Nm	

Chain guard to swinging arm		
M5 x 14, Renew screw Thread-locking compound (micro-encapsulated)	2 Nm	

Pinion cover to chain failure protection		
M5 x 20	2 Nm	

Tightening torques - S 1000 RR		
34 - Brakes	**Value**	**Valid**
34 11 - Front wheel brakes		
Radial brake caliper on wheel axle clamp		
M10 x 65	38 Nm	
Brake disc to front wheel		
M8 x 27 - 10.9, Renew screw Thread-locking compound (micro-encapsulated)	**Tightening sequence: tighten in diagonally opposite sequence** 19 Nm	
Bleed screw on handbrake lever fitting		
M7	5 Nm	
Bleed screw, front, in banjo bolt		
M6	6 Nm	
Locking pin for front brake pads		
Steel locking pin	8 Nm	
34 21 - Rear wheel brakes		
Expansion tank to rear frame		
M5 x 20, Renew screw Thread-locking compound (micro-encapsulated)	5 Nm	
Brake disc to rear wheel		
M6 x 18, Renew screw Thread-locking compound (micro-encapsulated)	**Tightening sequence: tighten in diagonally opposite sequence** 8 Nm	
Rear brake calliper bleeder screw		
M10	14 Nm	
34 31 - Footbrake cylinder, tandem brake master cylinder		
Brake fluid reservoir to rear frame		
Renew screw Thread-locking compound (micro-encapsulated)	5 Nm	
Footbrake cylinder with heel deflector, right, to footrest plate		
M6 x 30, Renew screw Thread-locking compound (micro-encapsulated)	8 Nm	
Pushrod, footbrake cylinder		
M6, Locknut	6 Nm	
34 32 - Brake lines		
Brake hose with banjo bolt to components		
M10 x 1	24 Nm	
Holder, brake line/brake hose		
M5 x 14, 3 mm collar	5 Nm	
Brake-hose distributor to fork bridge		
M6 x 16	8 Nm	
34 51 - Mechanical, hydraulic components		
ABS pressure modulator to rear carrier		
M6 x 17, 6 mm collar	5 Nm	

Tightening torques - S 1000 RR		
35 - Foot operation	**Value**	**Valid**
35 21 - Footbrake lever, connecting linkage		
Footbrake lever to front footrest holder		
M8 x 35, Renew screw Thread-locking compound (micro-encapsulated)	19 Nm	

Tightening torques - S 1000 RR		
36 - Wheels and tyres	**Value**	**Valid**
36 23 - Electronic components		
Wheel-speed sensor to brake calliper mount, rear		
M6 x 16, Renew screw Thread-locking compound (micro-encapsulated)	8 Nm	
Wheel-speed sensor, front to forkleg		
M6 x 16, Renew screw Thread-locking compound (micro-encapsulated)	8 Nm	
Bracket for wheel-speed sensor cable to fork		
M5 x 10	5 Nm	
Wheel speed sensor cable clip to brake calliper mount		
M5 x 10 - 10.9, Renew screw Thread-locking compound (micro-encapsulated)	5 Nm	
Sensor ring to rear wheel		
M5 x 10	5 Nm	
Sensor ring to front wheel		
M5 x 10	5 Nm	
36 31 - Wheels with bearings		
Rear quick-release axle in swinging arm		
M24 x 1.5 Thread-locking compound (mechanical)	125 Nm	
Tyre pressure monitoring (RDC) sensor to wheel rim		
M8, Renew nut Thread-locking compound (micro-encapsulated)	6 Nm	

Tightening torques - S 1000 RR		
46 - Frame and mounted components	**Value**	**Valid**
46 51 - Motorcycle frame		
Rear frame to frame		
M10 x 35	38 Nm	
Engine to frame		
Engine, left, to frame, M10 x 50	60 Nm	
Engine, right, to frame		
M10×50, Renew screw	**Tightening sequence: with taper elements (expander element outside)**	
	1st tightening torque, 30 Nm	
	2nd additional angle of rotation, 90°	
Nut for service data package bush to frame		
M36 x 0.75 Thread-locking compound (Loctite 270, High strength)	50 Nm	
Nut for service data package bush to frame		
M36 x 0.75, Renew nut Thread-locking compound (Loctite 270, High strength)	70 Nm	
Positioning of the swinging arm pivot point bush in the main frame, left		
M6 x 12	8 Nm	
Positioning of the swinging arm pivot point bush in the main frame, right		
M6 x 26,7	5 Nm	
Stud bolt for tank fastening to frame		
M8	19 Nm	
Absorber weight to steering head		
M8 x 50	19 Nm	
46 53 - Side stand		
Pivot mount for side stand to frame		
M10 x 40, Renew screw Thread-locking compound (micro-encapsulated)	56 Nm	
Side stand to pivot mount		
M10 x 1	35 Nm	
Side-stand switch to pivot-bearing screw		
M6 x 16, Renew screw Thread-locking compound (micro-encapsulated)	6 Nm	
46 61 - Front-wheel cover		
Front-wheel cover to slider tube		
M5 x 14, 3 mm collar, renew screw Thread-locking compound (micro-encapsulated)	2 Nm	
46 62 - Rear-wheel cover, number-plate carrier		
Adapter to number plate carrier		
M5 x 14, 3 mm collar	2 Nm	
Rear carrier to rear frame		
M5 x 20	2 Nm	

Rear carrier to rear frame		
M6 x 24, 3 mm collar	5 Nm	

Number-plate carrier to rear frame		
M5 x 25, without collar	2 Nm	

46 63 - Motorcycle fairing, windscreen		

Front panel carrier to main frame		
M6 x 16, Renew screw Thread-locking compound (micro-encapsulated)	5 Nm	

Fork partition to bottom fork bridge		
M5 x 14, 3 mm collar	2 Nm	

Bracket for rear left engine spoiler to engine		
M10 x 12 - 10.9	19 Nm	

Engine spoiler bracket front left or right to engine		
M6 x 12, Renew screw Thread-locking compound (micro-encapsulated)	5 Nm	

Bracket for engine spoiler right rear to engine		
M8 x 16	19 Nm	

Trim panels		
M5	2 Nm	

Windscreen to trim panel and air inlet		
M5 x 16	1 Nm	

Windscreen to air intake	1 Nm	

46 71 - Engine fasteners, footrests		

Front footrest holder to main frame		
M8 x 25	19 Nm	

Heel deflector, left, to footrest plate		
M6 x 20	8 Nm	

Footrest pin to footrest		
M6 x 12, Renew screw Thread-locking compound (micro-encapsulated)	8 Nm	

Tightening torques - S 1000 RR		
51 - Trim panels	**Value**	**Valid**
51 16 - Mirrors, covers, ashtrays, stowage compartments		
Mirror to front panel carrier		
M6, Replace nut Thread-locking compound (mechanical)	8 Nm	
51 25 - Other fasteners		
Ignition/steering lock to fork bridge		
M8 x 18, Renew screw Thread-locking compound (micro-encapsulated)	Tighten bolt until tool handle shears off.	

Tightening torques - S 1000 RR		
52 - Seats and seat bench	**Value**	**Valid**
52 53 - Seat		
Bearing support for tail-hump cover/passenger seat to rear frame		
M5 x 20, Renew screw Thread-locking compound (micro-encapsulated)	2 Nm	
Front seat to rear frame		
M5 x 14, 3 mm collar	3 Nm	

Tightening torques - S 1000 RR		
61 - General vehicle electrics	**Value**	**Valid**
61 11 - Wiring harness		
Cable duct to intake silencer		
TS5 x 15, Screw for plastic	3 Nm	
Cable duct to frame		
M5 x 25	2 Nm	
61 13 - Plug, terminal		
On-board diagnosis connector to rear carrier		
TS4 x 12, Screw for plastic	1 Nm	
61 21 - Battery with holder		
Wiring harness to battery		
M6 x 13,5	5 Nm	
Battery tray to rear frame		
M5 x 16	5 Nm	
61 31 - Switch, sensor		
Switch for intelligent emergency call to adapter		
M5 x 22 Thread-locking compound (mechanical)	3 Nm	
Right multifunction switch to throttle grip		
Screw for plastic, PT2.5 x 15	0.5 Nm	
Cover to right multifunction switch		
Screw for plastic, PT2.5 x 15	0.5 Nm	
Handlebar grip, left, to handlebar		
M3.5 x 30	2 Nm	
Multi-controller to grip		
Screw for plastic, TSRS 2.5 x 23	0.5 Nm	
Microswitch to clutch lever fitting		
M2 x 22	0.3 Nm	
61 33 - Emergency power siren, horn		
Horn to headlight		
M6 x 25, 3 mm collar	8 Nm	
61 35 - Control units, module		
Control unit holder for chassis and suspension adjustment to engine		
M6 x 30	8 Nm	
RDC control unit to bracket		
M5 x 14	2 Nm	
Rotational speed sensor to frame		
M6 x 20	8 Nm	
Engine control unit bracket to frame		
M5 x 25	5 Nm	
61 36 - Relay		

Relay cover to relay carrier		
M5 x 14, 3 mm collar	2 Nm	

Relay carrier to engine		
M6 x 16	8 Nm	

Tightening torques - S 1000 RR		
63 - Lights	**Value**	**Valid**
63 12 - Headlight		
Headlight to front panel carrier		
M6 x 30	8 Nm	
63 21 - Rear light cluster		
Rear light/turn indicator bulb to number plate carrier		
M6 x 20	3 Nm	
Nut, M6 Thread-locking compound (mechanical)		
63 23 - Flashing turn indicators, rear		
Turn indicator/rear light cluster to number-plate carrier		
M6 x 20	3 Nm	

Tightening torques - S 1000 RR		
65 - Audio, navigation, information systems	**Value**	**Valid**
65 75 - Anti-theft alarm		
Anti-theft alarm bracket to rear carrier		
M5 x 12	2 Nm	

Tightening torques - S 1000 RR		
77 - Optional accessories, motorcycle	**Value**	**Valid**
77 02 - Maintenance and Technology		
Swinging-arm adapter to rear wheel swinging arm		
M8 x 30	20 Nm	
77 14 - Engine guard, crash bars		
Guard, left, to crankcase cover		
M6 x 40	**Tightening sequence: see installation instructions** 7 Nm	
Guard, right, to timing-gear cover		
M6 x 45	9 Nm	
77 21 - Wheels		
Front brake disc to forged wheel or Carbon wheel		
Cylinder-head screw, M8 x 25	**Tightening sequence: tighten in diagonally opposite sequence** 24 Nm	
Rear brake disc to forged wheel or Carbon wheel		
M6 x 16, Renew screw Thread-locking compound (micro-encapsulated)	**Tightening sequence: tighten in diagonally opposite sequence** 8 Nm	
End stoppers in rear axle		
M8 x 50	20 Nm	
End stoppers in front axle		
M8 x 50	20 Nm	
77 22 - Handlebars scope		
Switch tongue to clutch lever		
M2, Renew screw Thread-locking compound (micro-encapsulated)	0.3 Nm	
Brake/clutch lever protector on handlebars		
M8 x 40	20 Nm	
Remove adjuster to clamp		
M6 x 40	12 Nm	
77 25 - Frame, footrests, mounted parts		
Foot brake lever to footrest plate		
M8 x 35	20 Nm	
Footbrake cylinder to footrest plate		
M6 x 20	10 Nm	
77 31 - Trim panels		
Cover for mounting of mirror		
M6 x 25	3 Nm	
77 44 - Mounted parts, topcase, luggage carrier		
Spacer for saddlebags to rear frame		
M8 x 30	19 Nm	
77 45 - Tank rucksack		

Rear attachment to holder		
M5 x 14	2 Nm	

Front attachment to rubber grommet		
M5 x 25	2 Nm	

77 52 - Audio, navigation, information system

USB charging socket to holder		
M18 x 1	3 Nm	

Service data - S 1000 RR

Designation	Precondition	Value	Valid
11 - Engine			
Running-in speed	Odometer reading 0...300 km	<7000 min^{-1}	
	Odometer reading 300...1000 km	<9000 min^{-1}	
	Odometer reading 0...1000 km	no full load	
Engine oil, capacity	with filter change	approx. 4.0 l	
	Fluids and lubricants		
	Viscosity class		
Engine oil, specified level 	Engine at operating temperature, vehicle is in vertical position	between **MIN** and **MAX** mark	
Engine oil, quantity for topping up	Difference between **MIN** and **MAX**	max 1.3 l	
1134 - Valves with springs			
Exhaust valve clearance	Engine cold	0.20...0.26 mm	
Inlet valve clearance	Engine cold	0.14...0.20 mm	
1212 - Ignition lead, spark plugs			
Spark plugs, manufacturer and designation		NGK LMAR9FI-10G	
13 - Fuel preparation and control			
Recommended fuel grade		Super Plus, unleaded maximum 5% ethanol, E5 98 ROZ/RON 93 AKI	
16 - Fuel supply			
Usable fuel capacity		approx. 16.5 l	
Fuel reserve		approx. 4 l	
17 - Cooling			
Cooling system test pressure	Test pressure must remain unchanged: min 5 min	2 bar	
Coolant, specified level 	cold engine	between **MIN** and **MAX** mark on the expansion tank	
31 - Front axle, front-wheel steering			
Fork oil, capacity of left fork leg		approx. 350 ml	
	Telescopic fork oil (Telescopic fork oil, type 2)		
Fork oil, capacity of right fork leg		approx. 350 ml	
	Telescopic fork oil (Telescopic fork oil, type 2)		
Level of fork oil in left fork leg (air chamber)	Forks fully compressed and damper unit bled,	135^{+2}_{-2} mm	

	compression spring and spacer bush removed	
	Telescopic fork oil (Telescopic fork oil, type 2)	
Level of fork oil in right fork leg (air chamber)	Forks fully compressed and damper unit bled, compression spring and spacer bush removed	135^{+2}_{-2} mm
	Telescopic fork oil (Telescopic fork oil, type 2)	
3142 - Telescopic forks		
Projection of fork tube in fork bridge, top	measured without fork cover	6 mm
3273 - Bowden cables		
Distance between adjusting screw and handlebar fitting (clutch-cable setting)		$3^{+1.5}_{-1.5}$ mm
Clutch-lever play	measured on outer clutch lever, handlebars in straight-ahead position, with cold engine	3...5 mm
3383 - Traction drive, chain, belt		
Chain deflection	Motorcycle with no weight applied, supported on its side stand	45...50 mm
Permissible chain length	measured from the **centre** of 10 rivets, chain pulled taut	max 144 mm
34 - Brakes		
Brake fluid level, front	Brake-fluid reservoir horizontal	The brake fluid level may not drop below the **MIN** mark.
	Hydraulic fluid (Brake fluid, DOT4)	
Brake fluid level, rear	Brake-fluid reservoir horizontal	The brake fluid level may not drop below the **MIN** mark
	Hydraulic fluid (Brake fluid, DOT4)	
3411 - Front wheel brakes		
Brake-pad wear limit, front	Friction pad only, without backing plate. The wear indicators (grooves) must be clearly visible	min 1 mm
Brake disc thickness, front	When new	4.5 mm
	Wear limit	min 4.0 mm
3421 - Rear wheel brakes		
Brake-pad wear limit, rear	Friction pad only, without backing plate.	min 0.9 mm
		
Brake disc thickness, rear	When new	5 mm
	Wear limit	min 4.5 mm
3630 - Motorcycle wheels		

Balance weight for rear wheel Weights have to be affixed with one half on the left and one half on the right, in other words centred on the rim		max 80 g	
Permissible rear-wheel imbalance		max 5 g	
Permissible front-wheel imbalance		max 5 g	
Balance weight for front wheel Weights have to be affixed with one half on the left and one half on the right, in other words centred on the rim		max 80 g	
3632 - Tyres			
Wheel valve test pressure		4 bar	
Tyre pressure, rear	with cold tyre; one-up and two-up	2.9 bar	
Tyre pressure, front	with cold tyre; one-up and two-up	2.5 bar	
Tyre tread depth, front and rear	for Germany	min 1.6 mm	
6121 - Battery with holder			
Battery type		AGM (Absorbent Glass Mat)	
6312 - Headlight			
Distance from light/dark limit to upper edge of low-beam headlight light-emitting surface	Chassis and suspension in the basic setting and vehicle subject to a load of 85 kg	5 cm	
Distance between headlight and vertical surface For headlight adjustment		5 m	

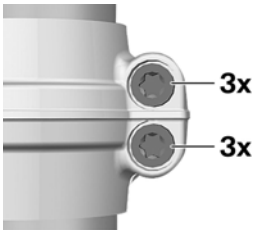
11 12 - Cylinder head with cover		
Cylinder head cover to cylinder head		
M6 x 20	10 Nm	
Camshaft bearing cap to cylinder head		
M6 x 35	**Tightening sequence: See repair manual**	
	1st tightening torque, 5 Nm	
	2nd tightening torque, 13 Nm	
11 13 - Oil sump		
Oil drain plug to oil pan		
M16 x 1.5	28 Nm	
11 14 - Housing cover		
Screw plug for crankshaft		
M40	12 Nm	
11 21 - Crankshaft with bearings		
Sprocket wheel timing chain drive to crankshaft		
M12 x 1.5 x 40	120 Nm	
11 36 - Camshaft adjustment		
Switching cam adjuster to camshaft bearing cap		
M6 x 30 - 10.9	13 Nm	
11 42 - Oil filter and lines		
Oil filter to engine		

Lubricate seal with engine oil	11 Nm	
12 12 - Ignition lead, spark plugs		
Spark plug in cylinder head		
M10 x 1	12 Nm	
12 72 - Transmitter for control unit		
Crankshaft sensor on engine housing cover		
M6 x 20, Renew screw	5 Nm	
Switching cam sensor on cylinder head cover		
M6 x 16	5 Nm	
13 54 - Throttle valve and actuation		
Fuel injection pipe to intake silencer		
TS5 x 14	3 Nm	
13 71 - Intake air silencer		
Intake silencer to throttle-valve assembly		
M6 x 12	6 Nm	
Intake silencer to frame		
M6 x 30	8 Nm	
Rear air guide to frame		
M6 x 12	8 Nm	
16 11 - Fuel tank with filler neck		
Fuel tank to retaining bridge, rear		
M6 x 115	5 Nm	
Fuel tank to frame		
M8	19 Nm	
17 11 - Radiator with fasteners		
Radiator to frame		
M6 x 25	8 Nm	
23 00 - Gearbox		
Pinion to transmission output shaft		
M24 x 1.5 secure with profile washer, Thread-locking compound (mechanical)	125 Nm	
23 41 - External gearshift components		
Gearshift lever to side-stand pivot mount		
M8 x 65	19 Nm	
31 42 - Telescopic forks		
Damper unit to forkleg		
M8 x 25 Thread-locking compound (micro-encapsulated)	25 Nm	
Cover to fixed fork tube	20 Nm	
Adjustment specification, steering-head bearing		
top slotted nut, M35 x 1 Secure with circlip	Tightening torque, 1 Nm turn further until circlip can be installed	

Adjustment specification, steering-head bearing		
bottom slotted nut, M35 x 1	Tightening torque, 40 Nm	
	Swing fork 3x to the left/right	
	slacken (forks turned fully to the left), 80°	
	Tightening torque (forks turned fully to right), 15 Nm	

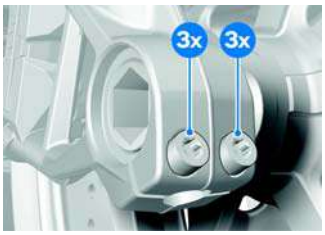
Fork bridge, top, to fork fixed tube		
M8 x 25	19 Nm	

Fork bridge, bottom, to fork fixed tube



M8 x 35	**Tightening sequence: Tighten screws six times in alternate sequence**	
	19 Nm	

Clamping screws in axle holder



M8 x 35	**Tightening sequence: Tighten screws six times in alternate sequence**	
	19 Nm	

Lock nut (on damper rod) to fork-leg cap	15 Nm	

Adjusting steering-head bearing (for maintenance)		
Bottom slotted nut, M30 x 1	(forks turned fully to right), 15 Nm	
Rubber ring		
Top slotted nut, M30 x 1	Tightening torque, 1 Nm	
Secure with circlip	turn further until circlip can be installed	

Quick-release axle in threaded bush		
M24 x 1.5	50 Nm	

Top fork bridge to steering tube		
M28 x 1 Thread-locking compound (Loctite 243, Medium strength)	100 Nm	

32 71 - Motorcycle handlebars

Handlebar half to fork leg		
Threaded pin, M6 x 10	8 Nm	

32 76 - Steering damper

Steering damper to fork bridge		
M8 x 35, Renew screw Thread-locking compound (micro-encapsulated)	19 Nm	

33 35 - Rear wheel swinging arm with pivot mount, link		
Locknut of the final-drive chain tensioning screw		
M8	19 Nm	
33 84 - Traction drive, chainwheel, belt wheel		
Chain sprocket to chain-sprocket carrier		
M12 x 1.5 - 10, Renew nut Thread-locking compound (mechanical)	**Tightening sequence: tighten in diagonally opposite sequence** 110 Nm	
33 85 - Mounted parts, traction drivetrain		
Chain guard to swinging arm		
M5 x 14, Renew screw Thread-locking compound (micro-encapsulated)	2 Nm	
Pinion cover to chain failure protection		
M5 x 20	2 Nm	
34 11 - Front wheel brakes		
Radial brake caliper on wheel axle clamp		
M10 x 65	38 Nm	
Brake disc to front wheel		
M8 x 27 - 10.9, Renew screw Thread-locking compound (micro-encapsulated)	**Tightening sequence: tighten in diagonally opposite sequence** 19 Nm	
Bleed screw on handbrake lever fitting		
M7	5 Nm	
Bleed screw, front, in banjo bolt		
M6	6 Nm	
34 21 - Rear wheel brakes		
Brake disc to rear wheel		
M6 x 18, Renew screw Thread-locking compound (micro-encapsulated)	**Tightening sequence: tighten in diagonally opposite sequence** 8 Nm	
Rear brake calliper bleeder screw		
M10	14 Nm	
34 32 - Brake lines		
Brake-hose distributor to fork bridge		
M6 x 16	8 Nm	
36 23 - Electronic components		
Wheel-speed sensor, front to forkleg		
M6 x 16, Renew screw Thread-locking compound (micro-encapsulated)	8 Nm	
Bracket for wheel-speed sensor cable to fork		
M5 x 10	5 Nm	
Sensor ring to front wheel		
M5 x 10	5 Nm	
36 31 - Wheels with bearings		
Rear quick-release axle in swinging arm		
M24 x 1.5	125 Nm	

Thread-locking compound (mechanical)		

Tyre pressure monitoring (RDC) sensor to wheel rim		
M8, Renew nut Thread-locking compound (micro-encapsulated)	6 Nm	

46 61 - Front-wheel cover

Front-wheel cover to slider tube		
M5 x 14, 3 mm collar, renew screw Thread-locking compound (micro-encapsulated)	2 Nm	

46 63 - Motorcycle fairing, windscreen

Fork partition to bottom fork bridge		
M5 x 14, 3 mm collar	2 Nm	

Bracket for engine spoiler right rear to engine		
M8 x 16	19 Nm	

Bracket for rear left engine spoiler to engine		
M10 x 12 - 10.9	19 Nm	

61 35 - Control units, module

Engine control unit bracket to frame		
M5 x 25	5 Nm	