

Bmw R850c R1200c Service Repair Manual

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Repair Manual



R 850 C
R 1200 C

BMW AG Motorcycle Division
After Sales

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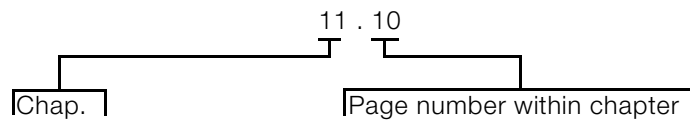
Introduction

This repair manual will help you to perform all the main maintenance and repair work correctly and efficiently. It should be consulted regularly by workshop personnel as an addition to the practical and theoretical knowledge obtained in Training School courses. It is a contribution towards achieving even higher Service quality.

A new issue of this repair manual will be published if amendments or additions (supplements) are needed. The latest issue date is shown in the header of the microfiche. Microfiches rendered invalid by the new issue should be destroyed without delay.

All information in both text and illustrations refers to motorcycles in standard condition or with Original BMW accessories installed, and not to motorcycles which have been modified in any way to depart from the manufacturer's specification.

- The repair manual is structured in the logical sequence of the work to be performed: Removal, Dismantling, Repair, Assembly, Installation.
- The entire contents are divided into individual chapters, corresponding to the Construction Groups.



- Work to be performed during an Inspection is described in Group 00. The various Inspection routines are numbered I, II, III and IV. This numbering is repeated in the work descriptions which follow, so that work can take place without interruption.
- Use of the BMW special tools needed for certain tasks is described in the work instructions.

If the need arises, repair instructions are also issued in the form of Service Information. This information is of course incorporated into the next issue of the repair manual. We also recommend you to consult the detailed illustrations on the Parts microfiches as an additional source of information.

BMW AG Motorcycle Division
After Sales

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BMW AG Motorcycle Division

Maintenance schedule

R 1100 S / R 850/1200 C / R 1150 GS



		BMW Inspection at 1000 km (600 miles)	BMW Service every 10 000 km (6 000 miles)	BMW Inspection every 20 000 km (12 000 miles)	BMW Annual Service
Customer _____	Licence plate No. _____				
Order No. _____	Mechanic's signature _____				
Read the fault code memory with the MoDiTeC		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Change oil while at regular operating temperature and renew the oil filter element if motorcycle is used only for short journeys or at outside temperatures under 0°C (32 °F), every 3 months, but at least every 3 000 km (1 800 miles) *)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Change oil in gearbox while at operating temperature at least every 2 years*)				<input type="checkbox"/>	<input type="checkbox"/> every 2 years
Change oil in rear wheel drive while at regular operating temperature; if necessary, clean inductive sensor on rear wheel every 40 000 km (24 000 miles) or at least every 2 years *)		<input type="checkbox"/>		<input type="checkbox"/> 40 000 (24 000)	<input type="checkbox"/> every 2 years
Renew fuel filter *) normally every 40 000 km (24 000 miles), if fuel quality is poor every 20 000 km (12 000 miles)				<input type="checkbox"/> 40 000 (24 000)	
Check battery acid level, if necessary add distilled water Clean and grease the battery terminals, if necessary				<input type="checkbox"/>	<input type="checkbox"/>
Renew intake air filter element in very dusty or dirty operating conditions, renew the intake air filter element every 10 000 km (6 000 miles) or even more often if necessary *)				<input type="checkbox"/>	
Renew Poly-V belt *) renew Poly-V belt every 60 000 km (36 000 miles); do not adjust				<input type="checkbox"/> 60 000 (36 000)	
Check brake fluid level at front and rear and top up if necessary *)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Check operation of brake system and freedom from leaks; repair/replace items if nec. *)				<input type="checkbox"/>	
Examine brake pads and discs for wear, renew if necessary *)			<input type="checkbox"/>	<input type="checkbox"/>	
Change the brake fluid annually					<input type="checkbox"/>
Check clutch fluid level		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Change the clutch fluid every 40 000 km (24 000 miles) or at least every 2 years *)				<input type="checkbox"/> 40 000 (24 000)	<input type="checkbox"/> every 2 years
Check tightness of rear wheel studs		<input type="checkbox"/>			
Check rear wheel bearing play by tilting wheel				<input type="checkbox"/>	
Check swinging arm bearings (zero play); adjust if necessary *)		<input type="checkbox"/>		<input type="checkbox"/>	
Grease the side stand pivot		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Check function of side stand contact switch		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check condition of spark plugs			<input type="checkbox"/>		
Renew spark plugs *)				<input type="checkbox"/>	
Check security of cylinder head nuts		<input type="checkbox"/>			
Check/adjust valve clearances		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Check throttle cable for free movement, abrasion and kinking; renew if necessary *) Check cable play Check synchronisation and eliminate leaks *)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Final inspection with road safety and functional check: – Condition of tyres and wheels, rims and spokes if applicable, tyre pressures – Lights and signalling equipment – Telltale and warning lights – Clutch, gear shift – Front and rear brakes, steering – Instruments – If necessary, test ride		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
*) Charged as an additional item					

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Pre-delivery check

R 1100 S / R 850/1200 C / R 1150 GS



<p>_____</p> <p>Customer</p>	<p>_____</p> <p>Licence plate No.</p>	<p>BMW Pre-delivery check</p>
<p>_____</p> <p>Order No.</p>	<p>_____</p> <p>Mechanic's signature</p>	
<p>Check the shipping crate for damage</p>		<input type="checkbox"/>
<p>Motorcycle:</p> <ul style="list-style-type: none"> - unpack - install remaining items - inspect for damage - check that delivery is complete: <ul style="list-style-type: none"> tools documentation keys correct optional extras 		<input type="checkbox"/>
<p>Fill and charge the battery (mark with charging date)</p>		<input type="checkbox"/>
<p>Check engine oil level when cold; add oil if necessary</p>		<input type="checkbox"/>
<p>Check clutch operating fluid level and brake fluid levels at front and rear</p>		<input type="checkbox"/>
<p>Check headlight beam angle, adjust if necessary</p>		<input type="checkbox"/>
<p>Check security of rear wheel studs (comply with correct tightening torque)</p>		<input type="checkbox"/>
<p>Check tyre pressures</p>		<input type="checkbox"/>
<p>Fill fuel tank</p>		<input type="checkbox"/>
<p>Final inspection as functional check:</p> <ul style="list-style-type: none"> - Clutch, gear shift - Front and rear brakes - Lights and signalling equipment, telltale and warning lights, instruments - Check operation of optional extras, ABS - If necessary, test ride 		<input type="checkbox"/>
<p>Confirm pre-delivery check in Service and Technical Booklet</p>		<input type="checkbox"/>
<p>Final cleaning</p>		<input type="checkbox"/>
<p>Motorcycle handed over on:</p>		

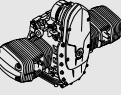
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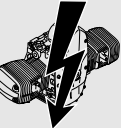
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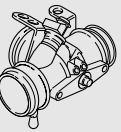
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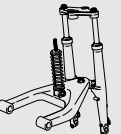
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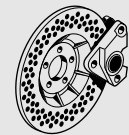


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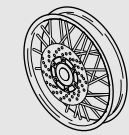


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00 Maintenance and general instructions



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Tightening torques

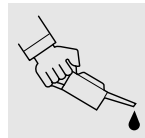
Model	R 850/1200 C
Connection	Nm
11 Engine	
Cylinder head	
Tightening sequence:	
1. Tighten cylinder head nuts (oiled) crosswise	
1.1 Tighten all nuts to correct torque for joint	20
1.2 Tighten all nuts to correct angle	90°
1.3 Tighten all nuts to correct angle	90°
2. M 10 bolt	40
3. M 6 screw	9
After 1000 km (600 miles), tighten cylinder head nuts crosswise:	
1. Unfasten one nut	
2. Tighten one nut to initial value	20
3. Tighten nut to wrench angle	180°
4. Unfasten/retighten M10 screw	40
Timing gear carrier to cylinder head	9
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Camshaft	
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Camshaft bearing cap	15
Rotary breather	
Vent line to alternator mount cover	
M 8 screw	20
Banjo screw	25
Alternator mount cover	
M 6 screw	9
M 8 screw	20
Auxiliary shaft	
Chain sprocket to crankshaft	10
Chainwheel to auxiliary shaft	70
Chain tensioner housing to engine block	9



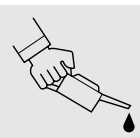
Model	R 850/1200 C	
Connection	Nm	
11 Engine		
Oil filter		
Oil filter		11
Oil drain plug		32
Oil pump		
Mesh filter basket to engine block		9
Oil pump cover		9
Pressure relief valve		35
Oil pressure switch		30
Oil cooler		
Oil cooler pipe to engine block		10
Cooling oil line - banjo screw with oil vent valve		25
Oil cooler to frame		9
Oil cooler return line to engine block		35
Screw-in union for oil cooler connection at engine block		35 (clean threads and apply Loctite 603 to inner and outer threads and in the contact face area)
Cylinders		
Tightening sequence:		
1. M 8 screw		20
2. M 6 screw		9
3. Chain guide rail pivot screw		18
Timing chain		
Chain tensioner		32
Connecting rod		
Big end cap	Joint torque	20
	Additional wrench angle	80°
Crankcase		
Tightening sequence:		
1. M10 screw (oiled)		45
2. M 8 screw (oiled)		20
3. M 6 screw		9



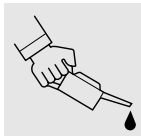
Model	R 850/1200 C	
Connection	Nm	
12 Engine electrics		
Starter motor to engine	20	
Starter cover to housing	7	
Positive lead to starter motor	10	
Alternator to cover mount	20	
Tensioning and retaining strap at alternator	20	
Spacer at alternator	20	
Positive lead to alternator	15	
Belt pulley at alternator	50	
Belt pulley to crankshaft	50	
Poly-V belt preload	8	
Spark plug	20	
Ignition coil holder to frame	9	
13 Fuel preparation and control		
Oil temperature sensor to engine block	25	
Air temperature sensor to air cleaner cover	10	
16 Fuel tank and lines		
Fuel tank to rear frame	10	
18 Exhaust system		
Manifold to cylinder head	24	
Clip on muffler	55 (apply Never Seez to clip contact surface)	
Oxygen sensor (lambda probe) to muffler	45 (apply Never Seez to thread)	
21 Clutch		
Clutch housing	Joint torque Additional wrench angle	40 (oil screw threads lightly) 32°
Housing cover	12	
Slave cylinder to gearbox	9	
Clutch line to handlebar fitting	18	



Model	R 850/1200 C	
Connection	Nm	
23 Transmission		
Oil filler plug	23	
Oil drain plug	55	
Gearbox to engine block	22	
Gear shift pedal to rear frame	41	
Selector lever to selector shaft	9	
Gearbox cover to gearbox housing	9	
31 Front fork		
Fixed tube to fork bridge	35 (free from oil and grease)	
Slider tube bridge to slider tube	22 (clean thread + Loctite 243)	
Quick-release axle clamp screws	20	
Threaded journal to frame	130 (clean thread + Loctite 243)	
Ball joint to fork slider bridge	230 (apply light coat of Never Seez to thread)	
Leading link to ball joint	130 (clean thread + Loctite 2701)	
Leading link to engine	right	73
Screw cap at leading link	left	42 (apply light coat of Never Seez to thread)
Spring strut to frame	40	
Spring strut to leading link	40	
32 Steering		
Handlebar at fork bridge	21 (apply light coat of Never Seez to thread)	
Twistgrip to handlebar	8	
33 Rear wheel drive		
Oil filler plug	23	
Oil drain plug	23	
Threaded ring	118 (Hylomar SQ 32 M)	
Hexagon nut, input bevel gear	200 (clean thread + Loctite 2701)	
Cover at rear-wheel drive housing	35	
Rear-wheel drive to swinging arm	24	
Swinging arm bearing journal to rear frame	right	9
Swinging arm bearing journal to rear frame	left	7 (clean thread + Loctite 2701)
Locknut at swinging arm bearing journal	160	
Suspension strut to rear frame	50	
Suspension strut to rear swinging arm	50	



Model	R 850/1200 C
Connection	Nm
34 Brakes	
Brake caliper at fork slider tube	40
Brake caliper to rear wheel drive	40
Brake disc to front wheel	24 (clean thread + Loctite 2701)
34 Brakes	
Brake disc to rear wheel drive	21 (clean thread + Loctite 2701)
Master cylinder to footrest assembly	8
Brake pedal to footrest assembly	37
Brake lines/brake hose to brake components	18
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Rear brake caliper bleed screw	4
Pressure modulator bleed screw	9
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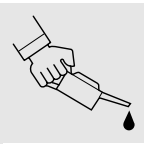
Model	R 850/1200 C
Connection	Nm
46 Frame	
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Side (prop) stand pivot mount to engine	21
Side (prop) stand to pivot mount	42 (clean thread + Loctite 243)
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Table of operating fluids

Item	Use	Order number	Quantity
Lubricant			
Optimoly MP 3	High-performance lubricating paste	07 55 9 062 476	100 g tube
Optimoly TA	High-temperature assembly paste	18 21 9 062 599	100 g tube
Silicone grease 300, heavy	Damping grease	07 58 9 058 193	10 g tube
Retinax EP2	Wheel, steering head and taper roller bearing grease	83 22 9 407 845	100 g tube
Contact spray	Contact spray	81 22 9 400 208	300 ml aerosol
Chain spray	Drive chain	72 60 2 316 676 72 60 2 316 667	50 ml spray 300 ml spray
Sealants			
3-Bond 1110 B	Surface sealant	07 58 9 056 998	5 g tube
3-Bond 1209	Surface sealant	07 58 9 062 376	30 g tube
omni VISC 1002	Surface sealant	07 58 1 465 170	90 g tube
Loctite 574	Surface sealant	81 22 9 407 301	50 ml tube
Curil K 2	Heat-conductive sealant	81 22 9 400 243	250 g can
Hylomar SQ 32 M	Permanently elastic sealant	81 22 9 400 339	100 g tube
Adhesives and retaining agents			
Loctite 648	Joint adhesive (low clearance)	07 58 9 067 732	5 g bottle
Loctite 638	Joint adhesive (greater clearance)	07 58 9 056 030	10 ml bottle
Loctite 243	Thread retainer, medium-strength	07 58 9 056 031	10 ml bottle
Loctite 270	Thread retainer, strong	81 22 9 400 086	10 ml bottle
Loctite 2701	Thread retainer, strong	33 17 2 331 095	10 ml bottle
Loctite 454	Cyanacrylate adhesive (gel)	07 58 9 062 157	20 g tube
Cleaner			
Brake cleaner	Brake cleaner	83 11 9 407 848	600 ml aerosol
Metal Polish	Polish for chromium plated parts	82 14 9 400 890	100 g tube
Testing agent			
Penetrant MR 68	Crack testing agent for aluminum housings	83 19 9 407 855	500 ml spray
Entwickler MR 70	Crack testing agent for aluminum housings	81 22 9 407 495	500 ml spray





Key to maintenance intervals

- BMW Inspection 1000 km/600 miles **I**
- BMW Service **II**
- BMW Inspection **III**
- BMW Annual Service **IV**

Reading out MoDiTeC fault memory

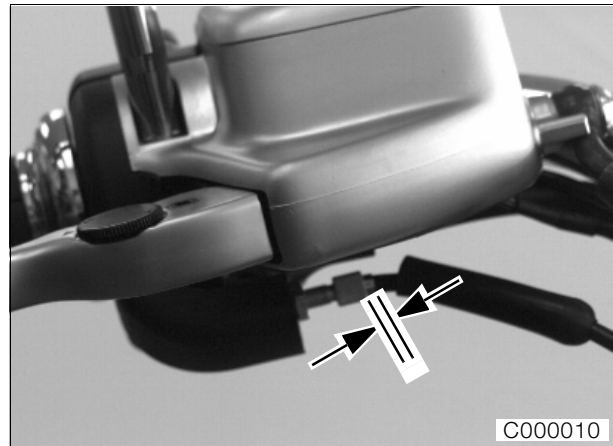
(Inspections I, II, III and IV)

- Remove the left air cleaner trim panel.
- Connect MoDiTeC to diagnostic plug.
- Read out the fault memory.
- Perform any repair work indicated.

Checking throttle cable play, adjusting if necessary

(Inspections I and III)

- Check throttle cable for free movement and freedom from abrasion or kinking; renew if necessary.
- With the steering turned to various angles, open the throttle twistgrip fully and allow it to close again.
- When released, the twistgrip must return to the closed position by itself.



- Pull back the protective cap.
- Preset throttle cable play with the engine cold to 1.5 mm (0.06 in).
- Warm the engine up to its regular operating temperature.
- Adjust throttle cable play to 0.5 mm (0.02 in).

Adjusting value:

Initial throttle cable play setting

(engine cold) 1.5 mm (0.06 in)
Throttle cable play (engine warm) .. 0.5 mm (0.02 in)

Changing engine oil, renew oil filter element

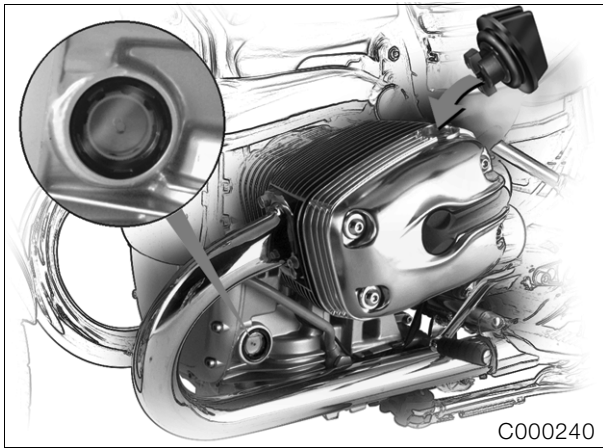
(Inspections I, II, III and IV)



Note:

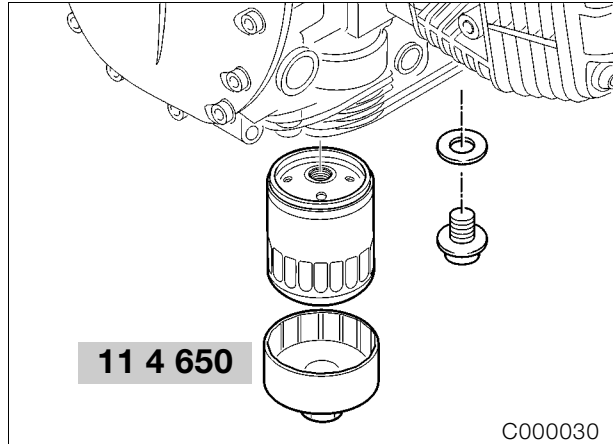
If the motorcycle is ridden only for short distances or outside temperatures are below 0°C (32°F): change the oil and renew the oil filter element every 3 months, but at least every 3 000 km (1 800 miles).

- Change the oil while it is at regular operating temperature.



- Remove screw plug.

- Unscrew oil drain plug and drain off oil.
- Fit new seal and screw in drain plug.



- Use oil filter wrench, **BMW No. 11 4 650**, to unscrew and remove the oil filter.
- Coat sealing ring on new oil filter element with oil and screw in.
- Add oil.
- Insert and tighten the screw plug.
- Check engine oil level with the motorcycle in a horizontal position; use the auxiliary stand, **BMW No. 00 1 550**.

Caution:

Never add engine oil above the MAX mark.



Tightening torque:

Oil filter.....	11 Nm
Oil drain plug.....	32 Nm

Fill quantity for engine:

With oil
filter change .. 3.75 l (6.6 Imp. pints/3.96 US quarts)
Without oil
filter change .. 3.50 l (6.2 Imp. pints/3.69 US quarts)
Oil volume between MIN and
MAX marks.....0.50 l (0.88 Imp. pint/0.52 US quart)

Engine oil grade:

Brand-name HD oil for four-stroke spark-ignition engine, API classifications SE, SF, SG; combination with CC or CD specification.