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Repair Manual

K 1200RS

**BMW AG Motorcycle Division
After Sales**

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Published by BMW AG Motorcycle Division
After Sales
UX-VS-2

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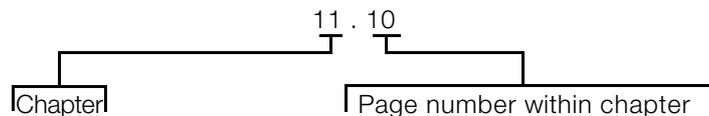
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Introduction

This repair manual will help you to perform all the main maintenance and repair work correctly and efficiently. If it is consulted regularly by workshop personnel it will form a useful addition to the theoretical and practical knowledge acquired at the BMW Training Centre. It is a contribution towards achieving even higher Service quality.

All information in both text and illustrations refers to motorcycles in standard condition or with genuine 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, Disassembly, 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, as an additional source of information, the Electronic Parts Catalogue (ETC), which contains clear and easy-to-follow illustrations.

If the work described here is restricted to a particular equipment specification, for instance if a specific optional extra (OE) is fitted, this is stated in square brackets at the start of the item concerned, e.g. **[LT]**.

Please refer to the following pages as well for a description of other symbols used and how to work with it.

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Published by: BMW AG Motorcycle Division
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 UX-VS-2

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Usage

Each chapter starts with the list of contents.

The list of contents is followed by the Technical Data table.

Chapter 00 "Maintenance and general instructions" details the handover checklist and lists all tightening torques and operating fluids.

Key to symbols

In this Workshop Manual for the K 1200 model, the following symbols are used; their meanings are explained in the table.

Special instructions aimed at improving the work procedures



Note:

Specific information on operating, inspecting and adjusting work for the motorcycle as well as maintenance procedures.



Caution:

Instructions and precautions specifically intended to prevent damage to the motorcycle. Failure to comply with them could invalidate the warranty.



Caution:

This symbol stands for precautions and measures which are essential in order to protect the rider or other persons from possibly severe or fatal injury.

Contents

Headlines for the work described in the chapter..... with the relevant page number

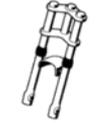
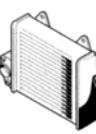


Tightening torques:

Values are stated if they differ from DIN EN 24 014 or DIN 912 ISO industrial standards.

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00 Maintenance and General Information

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Tightening torques

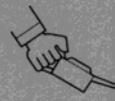
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Model	K 1200 RS
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Table of operating fluids

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
Never Seez	Lubricating paste	83 23 9 407 830	100 g tube
Shell Retinax EP2	(Taper) roller bearing grease	83 23 9 407 845	100 g tube
Contact spray	Contact spray	81 22 9 400 208	300 ml aerosol
Sealants			
Three-Bond 1209	Surface sealant	07 58 9 062 376	30 g tube
Adhesives and retaining agents			
Loctite 648	Structural adhesive, ultra-high speed	07 58 9 067 732	5 g 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	33 17 2 331 095	10 ml bottle
Cleaner			
Brake cleaner	Brake cleaner	81 22 9 407 704	600 ml aerosol



Key to maintenance intervals

Maintenance intervals consist of the first Inspection (after the first 1000 km/app. 600 miles), the BMW Service, BMW Inspection and BMW Annual Service.

Inspection 1000 km/600 miles

BMW Running-in Check after the first 1000 km/600 miles.

BMW Service

After the first 10,000 km/6000 miles and each additional 20,000 km/12,000 miles (at 30,000 km ... 50,000 km ... 70,000 km/18,000 miles ... 30,000 miles ... 42,000 miles).

BMW Inspection

After the first 20,000 km/12,000 miles and each additional 20,000 km/12,000 miles (at 40,000 km ... 60,000 km ... 80,000 km/24,000 miles ... 36,000 miles ... 48,000 miles).

BMW Annual Service

Certain items of maintenance work depend on elapsed time as well as the distance the bike has covered. They should therefore be carried out at least once a year (e.g. renewing brake fluid). If these items cannot be carried out during a Service or an Inspection, an Annual Service must be performed.

In this Workshop Manual, the individual maintenance intervals are shown by the following codes:

- Inspection at 1000 km (600 miles) I
- BMW Service at 10,000 km (6000 miles) II
- BMW Inspection at 20,000 km (12,000 miles) ... III
- BMW Annual Service IV



Changing engine oil, renewing oil filter element

(Inspections I, II, III IV)



Note:

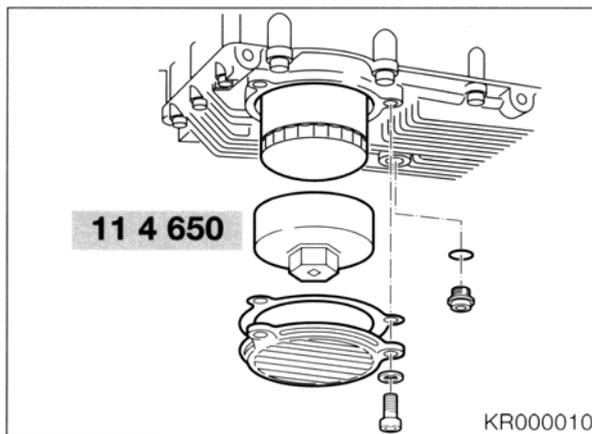
Change the oil and renew the oil filter at least every 6 months. If ridden only for short distances or at outside temperatures below 0 °C, perform this work every 3 months or at least every 3,000 km/ 1,800 miles).



Caution:

Note the precautions which must be taken if the engine is run in an enclosed space. If an engine failure occurs, the oil tank and feed line must be cleaned with the material used for this purpose in the workshop, and then blown through with compressed air.

- Drain the engine oil only when it is at regular operating temperature.
- Place the motorcycle on its main (centre) stand, in a horizontal position.
- Remove the engine spoiler (→ 46.12).



- Take out the oil filler plug.
- Remove the oil drain plug from the engine.
- Drain the oil completely.
- Take out the screws (2) holding the oil filter cover.
- Unscrew the oil filter with special wrench (3), **BMW No. 11 4 650**.
- Unscrew and remove the oil filter.



Note:

Always install the oil drain plug with a new sealing ring.

- Screw the oil drain plug in with a new sealing ring, and tighten.
- Coat the sealing rings on the new oil filter with oil.
- Screw the oil filter in hand-tight; note the instructions on the filter.
- Renew the seal in the oil filter cover if necessary.
- Install in the reverse order of work.
- Add oil at the oil filler plug.
- Screw in and tighten the oil filler plug.



Caution:

Never add engine oil above the MAX mark in the oil level sight glass.

- Check oil level only at least 10 minutes after completing a trial run/test drive and stopping the engine; check the oil level and correct it if necessary.

Operating fluids:

Brand-name HD oil, API classification SF, SG or SH; the CD or CE suffixes are permissible; alternatively, brand-name HD oil of CCMC classification G4 or G5; suffix PD2 is permissible.

Engine oil content:

With filter change 3.75 l (6.6 Imp. pints)
 Without filter change 3.50 l (6.2 Imp. pints)
 Oil volume between
 MIN and MAX marks 0.50 l (0.88 Imp. pint)



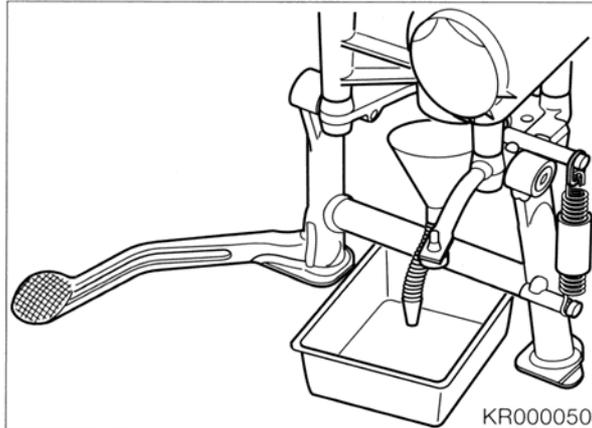
Tightening torques:

Oil drain plug 30 Nm
 Oil filter cover fastening 10 Nm
 Oil filter 11 Nm

Gearbox oil change

(Inspection III)

- Drain the oil from the gearbox only at regular operating temperature.
- Place the motorcycle on its main (centre) stand in a horizontal position.
- Unscrew the oil filler plug.
- Loosen the oil drain plug.
- Place a suitable vessel under the gearbox to trap the oil and hold a funnel under the drain plug.
- Unscrew the oil drain plug by hand and allow the oil to drain through the funnel into the vessel.



- Drain the oil out completely.
- Screw the oil drain plug back in with a new sealing ring.
- Add fresh gear oil.
- Screw the oil filler plug back in with a new sealing ring.

Tightening torques:

Oil drain plug	55 Nm
Oil filler plug	23 Nm

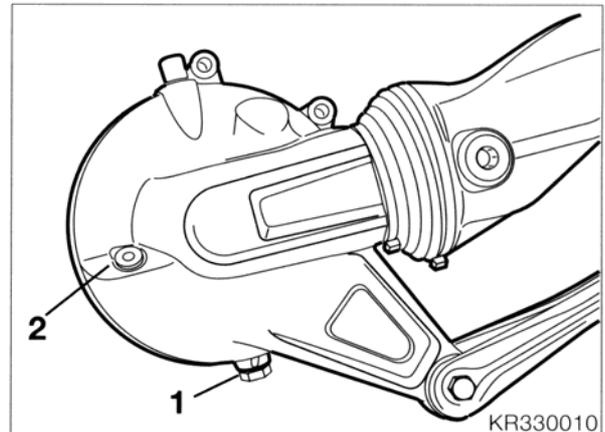
Quantities:

Initial filling..... app. 0.8 l (1.4 Imp. pints)
 During oil changes add oil up to lower edge of filler hole.

Rear wheel drive oil change (every 40,000 km/24,000 miles)

(Inspections I, III)

- Drain the oil only when it is at regular operating temperature.
- Place the motorcycle on its main (centre) stand, in a horizontal position.
- Take out the oil filler (2) and drain (1) plugs.



- Drain the oil out completely.
- Screw in oil drain plug (1) with a new sealing ring.
- Add oil to the rear wheel drive.
- Screw in oil filler plug (2) with a new sealing ring.

Tightening torques:

Oil drain plug	23 Nm
Oil filler plug	23 Nm

Quantities:

Initial filling 0.25 l (0.44 Imp. pint)
 During oil changes 0.23 l (0.41 Imp. pint)

Oil grade for rear wheel drive:

Brand-name hypoid gear oil, SAE 90, API class GL 5.

Checking valve clearances, adjusting if necessary

(Inspection III)



Note:

Renew the facing on the chain tensioner rail and the chain guide rail every 60,000 km/36,000 miles.

Checking valve clearances



Caution:

Never unscrew the spark plugs before measuring valve clearances. Particles of oily soot could become lodged behind the exhaust valve head and falsify the measurement.

- Remove left side section of fairing.
- Remove the cylinder head cover.
- Turn the engine over by means of the rear wheel.
- Measure valve clearance with feeler gauge.
- Max. engine temperature 35 °C.
- Make a nominal-actual comparison to determine size of replacement tappets.

Valve clearances:

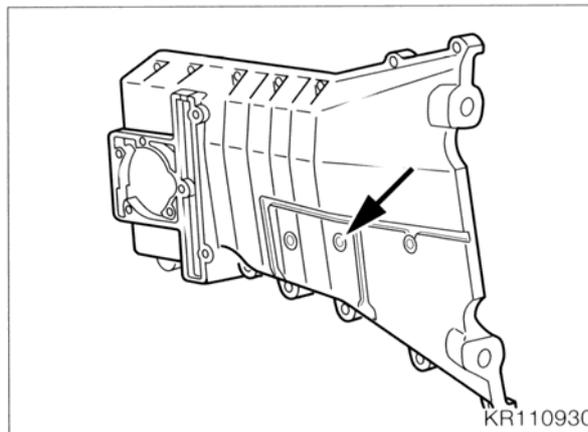
Inlet 0.15...0.20 mm (0.006...0.008 in)
Exhaust 0.25...0.30 mm (0.010...0.012 in)

Adjusting valve clearances



Note:

The camshafts must be removed before the bucket-type tappets can be renewed.



- Remove the screw plug (arrow) for the chain tensioner in the timing case cover.
- Prevent the chain tensioner from moving in the timing case cover with chain tensioner pin, **BMW No. 11 6 740**.



Note:

Turn or press the camshaft in the normal direction of rotation (for app. 20 to 30 seconds if the engine is cold), until the oil has been forced out of the chain tensioner and the pin can inserted fully.



Caution:

Set the piston to the centre of the cylinder (cylinder 1 app. 90° before top dead centre), to avoid damage to the valves and piston.

- Unscrew the slide rail.
- Loosen the chain sprockets, holding the camshaft at the hexagon.
- Take off the chain sprockets and slide rail.



Note:

Secure the timing chain with a cable strap.

- Turn the camshafts until the tops of the cams are exposed.
- Remove the thrust bearing cap first in order to prevent tilting.
- Release the radial bearing caps uniformly and remove them.
- Take out the camshafts.
- Using rubber suction device, **BMW No. 11 3 251**, pull the bucket-type tappets out of the cylinder head as necessary and renew them.
- Oil the camshafts at their bearing points.



Note:

Note correct identification of camshafts.

Inlet side: one groove after thrust bearing
 Exhaust side: no grooves after thrust bearing

The camshaft bearing caps are also marked.

Inlet side: odd numbers
 Exhaust side: even numbers

The numbers increase from the front (timing end) to the rear.

- Insert the camshafts so that the tops of the cams are exposed.
- Install the inner bearing caps first.
- Tighten the bearing caps uniformly, working from the inside outwards.
- Install the thrust bearing (timing end) with slide rail last and do not tighten it until the chain sprockets have been installed.

Tightening torque:

Bearing cap..... 9 Nm

- Turn the camshafts so that the grooves at the rear (opposite end from timing end) are vertical in relation to the cylinder head.
- The grooves at the timing end must face towards the crankshaft.
- Attach aligning device, **BMW No. 11 3 700**, and secure tightly to camshaft bearing caps.



Caution:

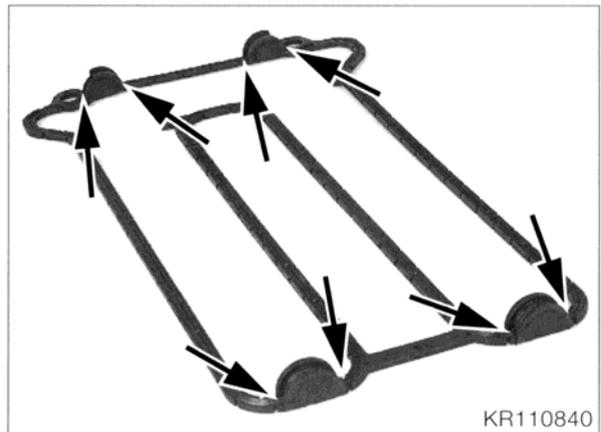
When turning the crankshaft, make sure that the timing chain does not come away from the crankshaft sprocket.

- Turn the crankshaft through a further 90° (note correct direction of rotation), the piston in cylinder 1 must move up to top dead centre (cylinder 1 = at timing end).
- Install the inlet camshaft chain sprocket so that the timing chain is as taut as possible at the guide rail.
- Insert the screw as far as possible.
- Install the exhaust camshaft chain sprocket so that the timing chain is as taut as possible between the sprockets (in the slide rail).
- Insert the screw as far as possible.
- Tighten the bearing cap with guide rail.
- Remove the aligning device, **BMW No. 11 3 700**.
- Tighten the chain sprockets, holding the hexagon on the camshaft to prevent it from turning.
- Remove the chain tensioner clamping tool and tighten the screw plug.

Tightening torque:

Bearing cap 9 Nm
 Chain sprockets..... 56 Nm
 Screw plug for chain tensioner pin..... 9 Nm

- Turn the engine over and check the relative positions of the camshaft chain sprockets and the crankshaft (at TDC).
- Install the cylinder head cover gasket with the half-moon cutouts first. The marks at the front and rear of the gasket and the cylinder head cover must coincide.



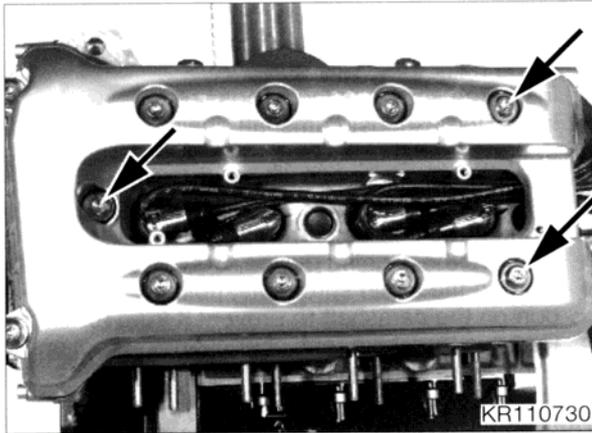
KR110840

- Apply a thin coat of **Three Bond 1209** at the areas where the cylinder head, timing case cover and cylinder head cover meet and at the half-moon cutouts (arrows).



Renewing spark plugs

(Inspection III)



- Attach the cylinder head cover. Insert the front centre screw (timing end, arrow) and both rear screws (arrows) in order to locate the gasket.



Note:

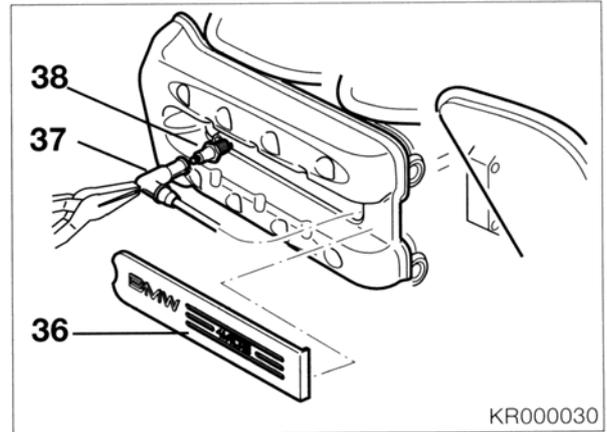
Do not forget the contact spring.

- Screw all bolts in fully.
- Tighten the bolts in a crosswise pattern, working from the inside outwards.

Tightening torque

Cylinder head cover 9 Nm

- Attach engine spoiler.
- Attach the left side section of the fairing.

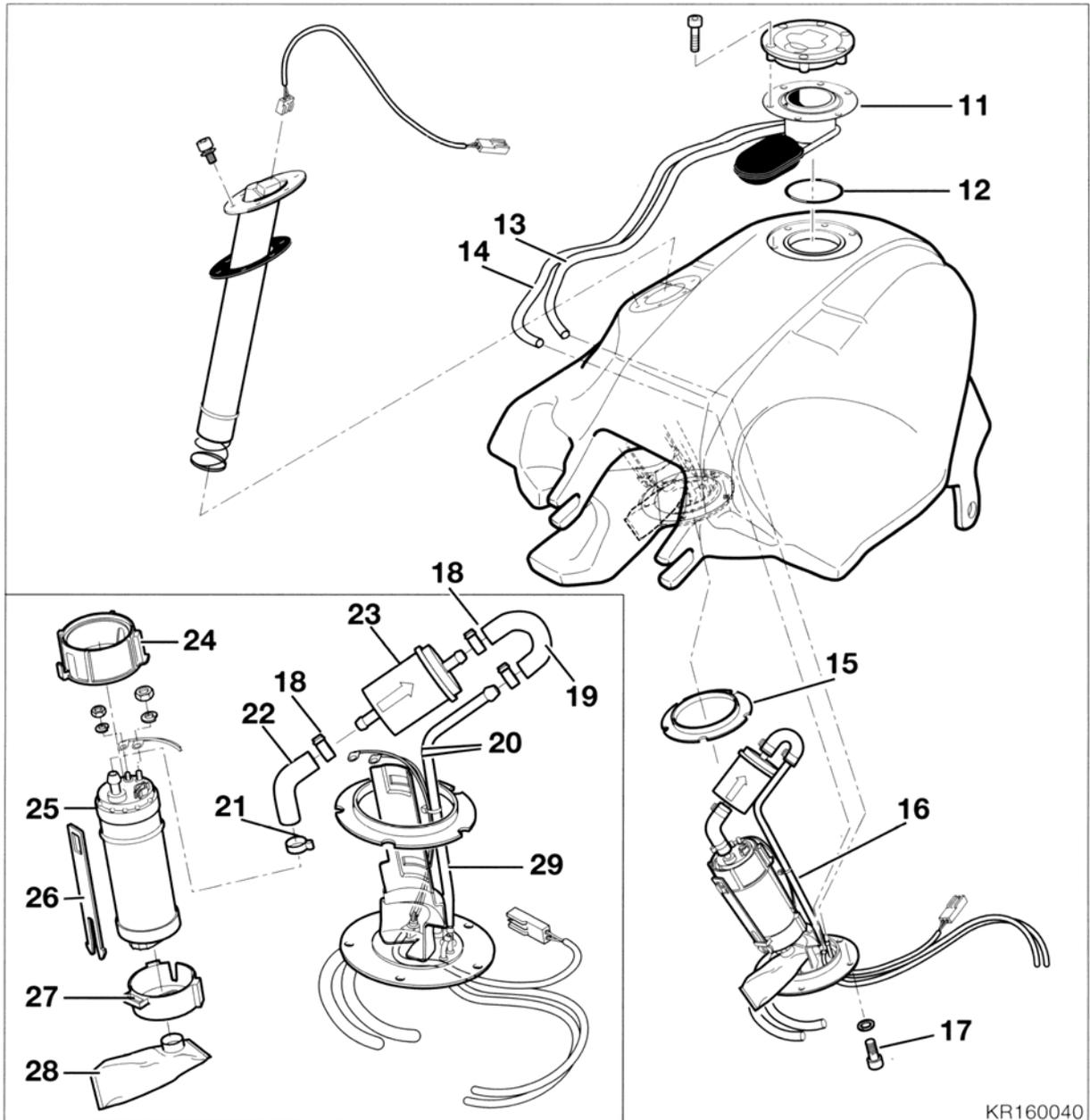


- Remove left side section of fairing. (→ 46.10)
- Take off push-fit screen panel (36).
- Pull off spark plug caps (37) with flat pliers.
- Unscrew and remove spark plugs (38) with spark plug wrench, **BMW No. 12 3 500**.
- Install in the reverse order of work.



Tightening torque:

Spark plugs 20 Nm



KR160040

Renewing fuel filter (every 40,000 km/24,000 miles)

(Inspection III)



Note:

If the fuel is of poor quality, renew the fuel filter every 20,000 km/12,000 miles.

- Remove fuel tank. (→ 16.5)



Warning:

Comply with safety precautions when handling or working with fuel.

- Drain fuel tank.

Removing the fuel pump unit

- Take out screws (17).
- Pull fuel pump unit (16) far enough out of the fuel tank to enable the clips on drain hose (13) and vent hose (14) to be undone with pliers.
- Pull off the hoses.
- Remove fuel pump unit (16) completely, with gasket (15).

Removing and installing fuel filter

- Open fastenings (18) with pliers.
- Pull fuel hoses (22) and (19) off fuel filter (23).



Caution:

Note correct direction of flow through fuel filter.



- Attach fuel hoses to new fuel filter.
- Close fastenings (18) with pliers, **BMW No. 13 1 500**.

Installing fuel pump unit

- Insert fuel pump unit (16) with gasket (15) into fuel tank.
- Attach drain hose (13) and vent hose (14). Close fastenings with pliers, **BMW No. 13 1 500**.
- Insert and tighten fastenings (17).



Tightening torque:

Pump unit to fuel tank 5 Nm

Removing/installing fuel pump

- Take off connecting wire (20).
- Open hose clip (21) with pliers and pull off the hose.
- Release holder (26).
- Pull off vibration damper (24) at pump outlet.
- Pull fuel pump (25) with pump inlet vibration damper (27) off holder (29).
- Pull pump inlet vibration damper (27) off fuel pump (25).
- Lever off suction-side filter (28).



Caution:

When installing, note correct position of suction-side filter (28) and do not damage it.

- Offer up the new suction-side filter and secure it with pliers, **BMW No. 13 1 500**.
- Further installation is in the reverse order of work.



Tightening torque:

Pump unit to fuel tank 5 Nm

Checking hose unions on fuel system

Check hose unions on fuel system for leaks and take up any slack at hose clips (Inspections I, III)

- Make a visual check on the hoses and hose unions.
- The connections must be tight, with no points of leakage on the fuel system.



Warning:

Defective or porous hoses and faulty hose unions must be renewed immediately.

Checking hose unions on the cooling system

Check the hose unions on the cooling system for leaks and if necessary take up slack at hose clips (Inspections I, III)



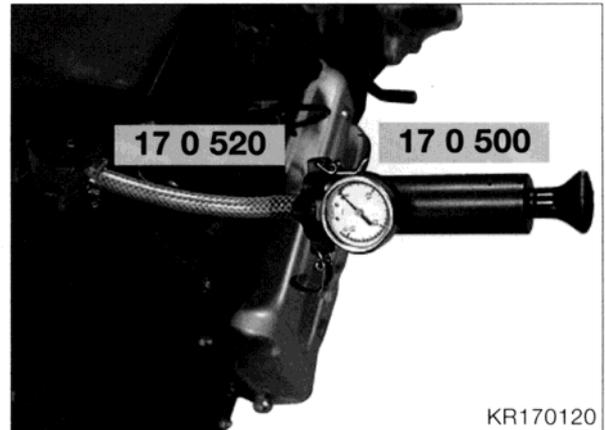
Caution:

To avoid corrosion in the cooling system, fill the coolant circuit completely before laying the motorcycle out of use for a lengthy period, and add the specified antifreeze and corrosion inhibitor.

- Make a visual check on the hoses, hose unions and radiators.
- The unions must be tight and the cooling system should not exhibit any leaks.
- If necessary, remove foreign bodies from the radiator fins and straighten fins that have become bent.
- Check coolant level and concentration; add coolant if necessary.

Check cooling system for leaks

- Take off the left side section of the fairing. (→ 46.10)
- Unscrew the filler cap.



- Screw pump, **BMW No. 17 0 500**, with adapter and threaded stub pipe, **BMW No. 17 0 520**, on to the filler pipe.
- Pressure-test the cooling system; the pressure must remain unchanged for at least 5 minutes.

Adjusting value:

Test pressure..... 1.5 bar

- Attach the cap.