TECHNICAL DATA AND SERVICE US MODELS

R 60/7

R 75/7

R 100/7

R 100 S

R 100 RS

Model

Chassis No.

License No.

Vehicle Owner

Address

Telephone No.

Dealer

Date of first registration

We reserve the right to modify designs, equipment and accessories in the interests of continuing technical development. Dimensions, weights and performance data are quoted to generally accepted tolerances. Errors and omissions excepted.

Dear BMW Enthusiast.

Congratulations on your decision in favor of the BMW motorcycle, with its powerful yet refined twin-cylinder horizontally-opposed engine and shaft drive – built to the finest engineering standards.

In order that you can familiarize yourself with the technical details of your motorcycle, we have prepared this Technical Data and Service Manual.

Apart from interesting details of the BMW motorcycle's engineering features, it provides a full summary of all maintenance work to be performed by your BMW dealer at the specified intervals.

Remember to take this manual along when your machine is due for service or inspection work. The BMW dealer will confirm in the spaces provided that all the necessary maintenance and inspection work has been performed without interruptions.

And now, enjoy the sheer riding pleasure that your BMW can offer – and which will, we are sure, make you a firm friend of the BMW blue-and-white badge if you are not one already.

Contents

Technical description

Engine

The engine used in the type R 60/7 – R 100 RS motorcycles is an air-cooled horizontally opposed twin cylinder, 4-cycle unit.

The engine block takes the form of a 1-piece tunnel housing, reinforced by internal webs. It contains the crankshaft and camshaft.

The 1-piece crankshaft is a steel drop forging. Great rigidity is achieved by generously dimensioned main bearing journals and a high degree of overlap with the big-end bearing journals. The main and big-end bearing surfaces are treated for maximum surface hardness and resistance to abrasion.

The crankshaft runs in 4-layer main bearings pressed directly into the crankcase at the flywheel end and into a drop forged light alloy bearing cap at the alternator end. Careful dynamic balancing of the crankshaft ensures exceptional freedom from vibration. The **split, drop forged connecting rods** run on the crankpin in 4-layer bearings, and have I-section shafts.

The big-end bolts are screwed directly into the positively located big-end bearing caps. The small-end bearing is a pressed-in bronze bushing.

The camshaft is a case hardened phosphatized die casting located below the crankshaft, and running directly in the crankcase at the rear and in a cast iron flange with a brass bushing at the front. The rear end of the camshaft carries the inner rotor of the oil pump, and the front end the drive sprocket, the worm wheel for the revolution counter drive and the centrifugal advance cam for the distributor.

The off-center pistons are of cast aluminium alloy, with 3 piston rings; the top ring is a hard chromed spheroidal graphite ring, the second a cutaway ring and the third a double chamber oil scraper ring. The piston pin is of ample size and of the fully floating type; it is located in the piston on both sides by spring circlips to prevent axial movement.

The cylinders are made from a combination of materials. A cast iron liner is surrounded by a light alloy finned barrel thus assuring excellent heat dissipation, keeping rubbing surface temperatures low and thus improving oil adhesion.

Two pushrod outer tubes are pressed into the base of the cylinder and sealed against the engine block with rubber sleeves; these also act as oil return tubes from the cylinder head.

The cylinders are mounted on the crankcase using a special sealing compound (Hylomar). In addition, the 2 oil passages at the upper tie rod bolts are sealed with O-rings. The cylinder head has a metal-asbestos gasket.

The cylinder heads are of light alloy, with carefully designed fins and shrunk-in valve seats (fine perlitic gray cast iron for the inlet valves, high alloy gray cast iron for the exhaust valves). The valve guides are press fitted.

The cylinder heads are attached to the crankcase by 4 through bolts on each side, which also locate and retain the cylinder barrels. In addition the cylinder head is secured directly to the cylinder barrel by 2 nuts. The through bolts also carry the valve rocker needle roller bearings. The use of pressed-in pushrod tubes ensures that cooling air can reach those parts of the cylinder head which are subject to the highest thermal loadings, thus maintaining temperatures at a satisfactorily low level.

The valves are operated from the camshaft by hardened cast tappets, pushrods and rockers. The camshaft is driven at half engine speed by a duplex chain. Any stretching of the duplex chain is compensated for by a chain tensioner operated by a leaf spring.

The pushrods are manufactured from light alloy tube with approximately the same coefficient of expansion as the cylinder heads; this prevents alterations in valve operating clearances.

The exhaust valves consist of a highly heat conductive ferritic stem and a high alloy austenitic, scale resistant head; in addition the valve stems are hard chromium plated and the valve seat is armoured. The keeper arrangement permits the valves to rotate during operation.

Lubricating system

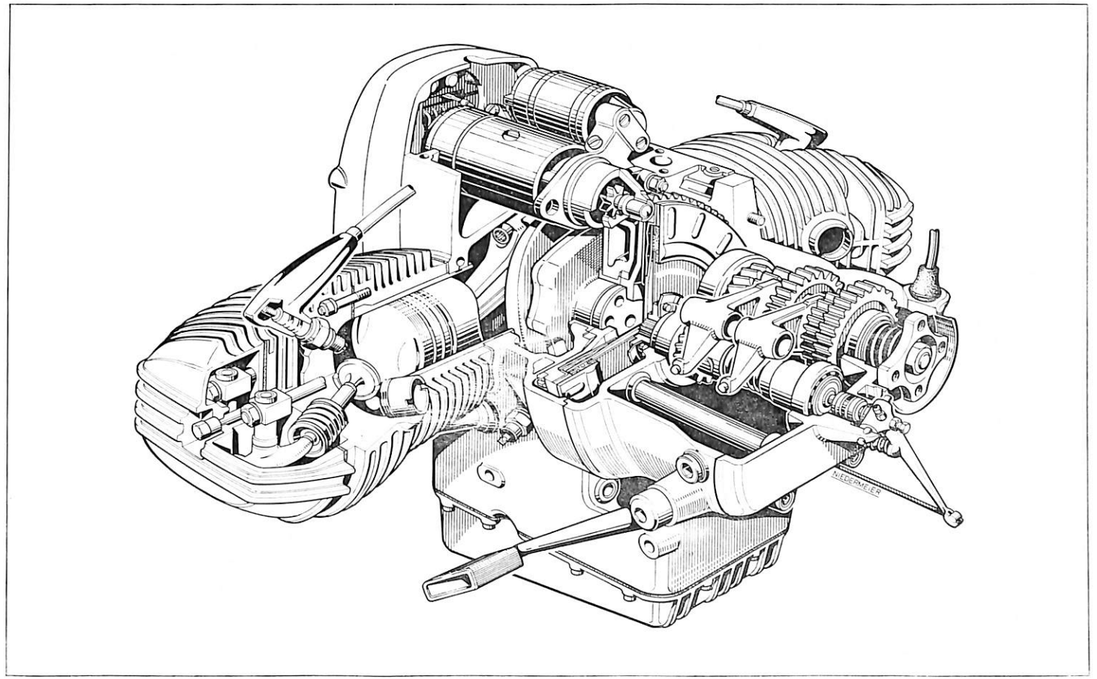
The engine employs a high pressure recirculating lubricating system with a full flow oil filter.

The lubricating oil pump is an Eaton trochoid gear type pump driven from the camshaft. It draws oil from the oil pan through an immersed dome with perforated metal screen, pumps it through the main lubricating passage to the full flow oil filter and from there to an annular passage in the camshaft bearing flange to the oil gallery in the main bearing cap.

From the annular gallery in the bearing cap the oil first passes through a hole in the left sidewall of the engine block to the rear main bearing, and then through 2 upward sloping passages in either crankcase sidewall to the upper tie rod bolts. The holes for the upper cylinder tie rod bolts are used to convey oil to the rocker pedestals and shafts, and thus to lubricate the rocker bearings and other timing gear components.

The connecting rods are lubricated through passages in the crankshaft, using oil drawn from the anular groove, in the front or rear main bearing bushing. The rear camshaft bearing is lubricated by oil leak from the oil pump. The timing chain runs beneath the normal oil level in the oil pan, and is additionally lubricated by oil emerging from the front main bearing and pressure relief valve.

Crankcase ventilation is obtained by drawing fumes against the direction of crankshaft rotation through a settling chamber, in which the oil mist is deposited, to a non-return valve. From this point the fumes are re-introduced into the combustion air intake.



Carburetors

Slide type carburetor — type R 60/7

R 60/7 models are equipped with 2 Bing plunger slide carburetors with a 26 mm throat and removable, centrally located float chamber. The carburetors are inclined and are attached to the cylinder-heads by a clamp ring.

Fuel flows into the **float chamber** 4 through a feed hose, the correct level being maintained in all driving attitudes of the machine by a double plastic float 5, which operates the float needle valve 11 via a pivot pin 10. The float chamber is vented to atmosphere, and supplies fuel to the main and idle jets.

The main jet 6 is screwed into the lower end of mixing tube 8 together with main jet block 7. Needle jet 12, into which a conical jet needle 16 is inserted, is mounted on the upper end of the mixing tube. The jet needle together with plunger piston 17 is raised or lowered by throttle operating cable 18. This enlarges or reduces the fuel outlet cross-section at the needle jet and the cross-section of air venturi. A proportion of the intake air by-passes the needle jet: this air supply is drawn from the air intake pipe 15 through passage 14; and causes pre-atomisation of the fuel emerging from the annular opening of the needle jet. In air venturi 15, the fuel/air mixture strikes the main air flow and a further intensive atomising process takes place before the mixture passes into the cylinder combustion chamber.

When the throttle is opened, upward movement of the jet needle frees plunger 9 of the **accelerator pump.** This is pressed up by a spring beneath and forces fuel above the plunger via the needle jet into the intake tract. In the carburetor's idle setting, the plunger is pressed back down by the jet needle, and fuel allowed to reach the space above the plunger at the same time via a miniature plate valve. This closes and cuts off the fuel supply as soon as the plunger moves up during acceleration, thus preventing fuel from flowing back into the float chamber.

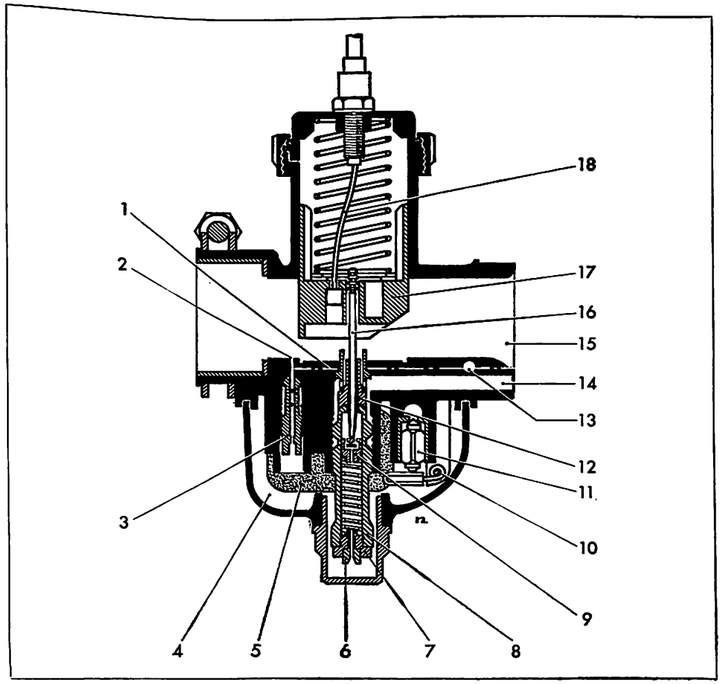
Fuel drawn in from the float chamber through **idle jet** 3 is mixed with air emerging from idle air passage 1, the volume of which can be adjusted with idle air regulating screw 13. This mixture enters the air venturi through a small passage 2 immediately behind the throttle slide. If the idle air regulating screw is screwed in, a richer mixture will be obtained; if screwed out, the mixture will be weakened.

Idle speed is regulated by means of the **throttle slide stop screw,** whereas the idle air regulating screw governs the fuel-air mixture strength.

In order to prevent fuel from flowing into the cylinders in the event of a leaking fuel feed valve, excess fuel is conducted away to the outside by a pipe in the float chamber.

To provide a richer mixture, especially when starting a cold engine, the carburetor contains a second, considerably smaller and more simple slide system; this is the **cold start or choke unit.** If its slide (cold start plunger) is raised against spring pressure by the operating cable, the engine will draw additional fuel via the cold start jet and riser pipe while the main throttle slide remains closed.

The choke operating cable must be installed with adequate free movement, so that the choke plunger can close completely.



Constant depression carburetors – types R 75/7, R 100/7, R 100 S, R 100 RS

The R 75/7 – R 100 RS models are equipped with 2 Bing constant depression carburetors using a throttle butterfly and removable, centrally located float chamber. Throat diameter is 32 mm on the R 75/7 and R 100/7, and 40 mm on the R 100 S and R 100 RS. These carburetors are inclined and flexibly mounted on the cylinder heads by means of rubber sleeves and 2 clamp straps.

Fuel enters the float chamber 8 via a feed hose and is here maintained at a constant level regardless of riding attitude by a double plastic float 13, which operates float needle valve 9 via pivot 7. The float chamber is vented at 2 points to atmosphere.

Main jet system

Fuel passes from the float chamber via main jet 10, main jet block 12 and needle jet 14 to pre-atomiser 4, where it is pre-mixed with additional air drawn in via passage 6 on the air intake pipe. The fuel-air mixture then passes to air venturi 3 and strikes the main intake air flow, where it is intensively atomised before entering the combustion chambers on the engine.

Air flow is controlled by a vacuum plunger 20 linked permanently to a diaphragm 22, and operating as follows:

When throttle butterfly 21 is opened, the partial vacuum in air venturi 3 is connected to vacuum chambers 23, which in turn are linked via 2 passages 19 in vacuum plunger 20 to the main air venturi. Space 1 below diaphragm 22 is connected by passage 2 directly with the intake manifold; for this reason pressure at this point is higher than in the air venturi. Diaphragm 22 now raises vacuum plunger 20 sufficiently to restore pressure below the vacuum plunger to the original value (constant depression carburetor system). Any change in engine speed or throttle butterfly opening is thus related to a given plunger position and air venturi cross-section, corresponding to the load which the engine is called upon to exert.

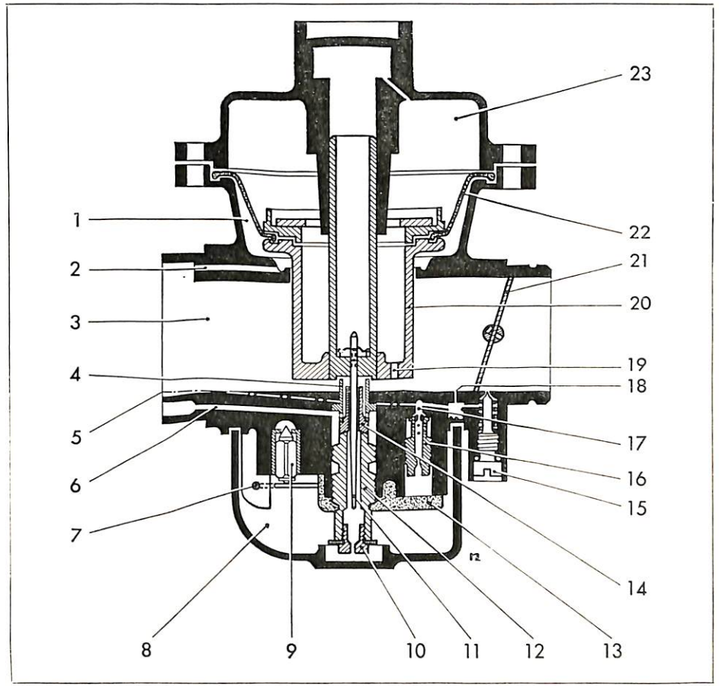
In addition to the partial vacuum in the air venturi, the quantity of fuel is controlled at full load by main jet 10, and over the part load range by the conical jet needle 11 attached to vacuum plunger 20; depending on the position of the vacuum plunger, the annular cross-section of needle jet 14 is increased or reduced.

The idle system operates completely independent of the main jet system. Fuel drawn through idle jet 18 is mixed in chamber 17 with air drawn in from idle air passage 5, and enters the air venturi through a small hole behind throttle butterfly 21. With the aid of idle mixture regulating screw 15 the correct mixture for engine idling can be obtained, with the throttle butterfly stop screw the quantity of fuel supplied for engine idling. Two by-pass passages 18 also convey fuel-air mixture to the air venturi. This is intended to improve the transition from the idle jet to the main jet system. They act only when throttle butterfly 21 has been opened slightly.

The **cold-start device** is an independent rotary valve unit, which operates only during starting and while the engine is still cold. It can be engaged and cancelled by the rider, and is cable operated. Inside the float chamber a space is provided as a cold-start fuel reservoir, with a cold start immersed tube entering from above. The partial vacuum developed during starting acts on the outlet aperture of the cold start system behind the throttle butterfly since the throttle butterfly is almost closed (idle position). In this way, the vacuum also acts on the immersed cold start tube, and fuel in the cold start reservoir space is drawn into the mixing area of the rotary valve housing together with additional fuel supplied from the float chamber as the initial supply is consumed. In the mixing chamber the fuel is converted to an emulsion with the aid of a cold-start air supply entering through a calibrated hole. This extremely rich starting emulsion is then conveyed to the air flow entering through the throttle butterfly gap and forms the starting mixture supply in the air venturi. This process ensures reliable starting even at very low temperatures.

When the engine has started, an initial emulsion is formed by means of a calibrated air hole in the cold start immersed tube, and the starting mixture is in this way weakened so that the engine continues to run smoothly during the initial riding period.

Connections for a synchronizing device which enables both idle and part load carburetor settings to be accurately adjusted are at the front outside of the carburetor, next to the type plate (on the R 75/7 and R 100/7), or underneath (R 100 S, R 100 RS).



Clutch

A single dry plate clutch connects the engine crankshaft and gearbox input shaft. When the clutch is engaged, a diaphragm spring forces the pressure plate and clutch disc against a contact ring which is bolted to the flywheel. This establishes a rigid drive line between the gearbox and the engine, since the flywheel itself is connected to the engine crankshaft and the clutch plate to the gearbox input shaft.

A diaphragm is spot welded to the pressure plate between the flywheel and the contact ring. This diaphragm permits axial movement of the pressure plate and transmits part of the engine torque.

The clutch plate has a bonded friction lining and is mounted on the splines of the gearbox input shaft in such a way as to permit axial movement. Slots are provided between the flywheel and contact ring, through which dust from the clutch linings can escape; this also assists in keeping the clutch plate cool.

To disengage the engine from the transmission, the clutch throwout arm is operated by cable from the clutch lever on the handlebar, and compresses the diaphragm spring by means of a thrust rod acting on the pressure plate. This disengages the friction drive between the clutch plate and contact ring, and interrupts the drive line from the engine to the gearbox.

The clutch throwout arm pivots on a mounting cast into the gearbox cover. When the clutch lever is released, a spring forces the throwout arm back to its initial position.

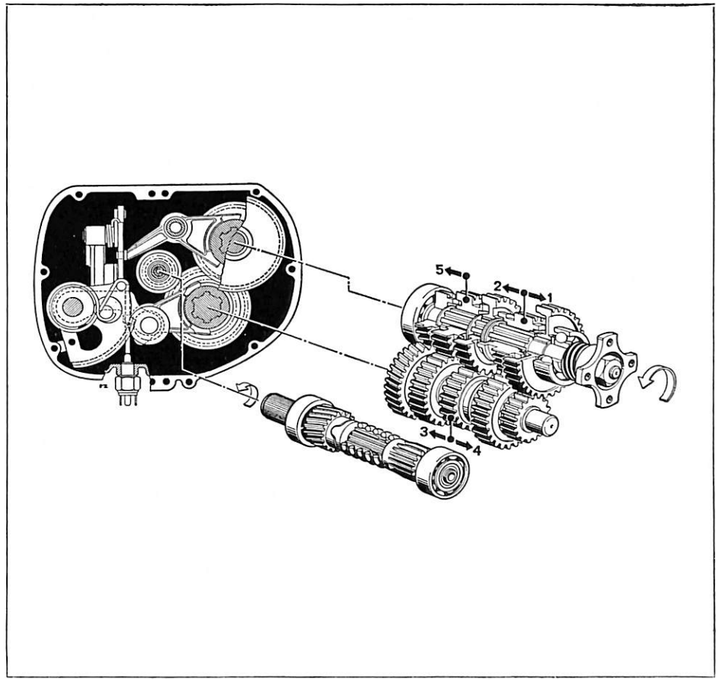
Gearbox

The five-speed gearbox is mounted at the rear of the crankcase to form a single unit. It enables the overall drive ratio to be varied in such a way that the engine can operate under favorable load conditions at all road speeds. The gearbox primarily consists of the input shaft, layshaft and output shaft – all three running in generously dimensioned ball bearings at front and rear – together with the shift mechanism.

The hollow drilled input shaft, in which the clutch thrust rod is located, carries the input pinion at the front. This can be tilted very slightly on the shaft by a spring loaded cam, which absorbs and reduces input shocks from the power unit. The layshaft and output shaft each have 5 paired gear wheels in constant mesh.

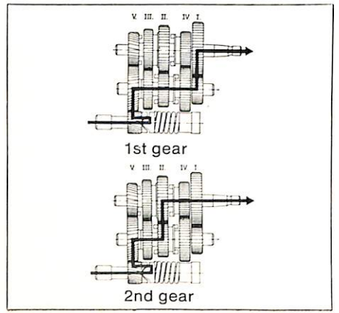
Gears are selected by pressing down or lifting up the foot shift lever.

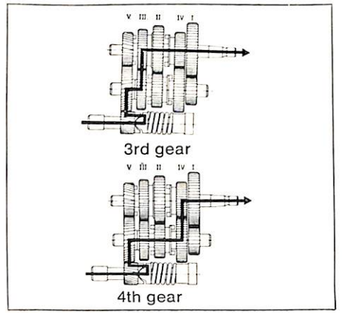
When the gearshift lever is moved, a hooked lever rotates 2 cam discs; actuating journals on the 3 selector forks are located in slots stamped in the shift cams, and respond to the degree of movement of the cams.

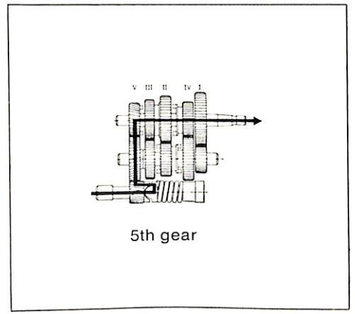


The selector forks in turn move the gear pinions on the output and layshafts. These gear pinions are provided with dogs on their end faces which engage in the recesses between corresponding dogs on the adjacent free-running pinion. In this way, the pinion for the gear selected at any given moment is coupled rigidly to the shaft. The various shift positions are determined by a spring-loaded lever provided with a roller which engages in recesses on the periphery of one selector disc.

In neutral, a contact switch screwed into the base of the gearbox housing closes an electric circuit and causes a green neutral indicator light in the combined instrument to come on.



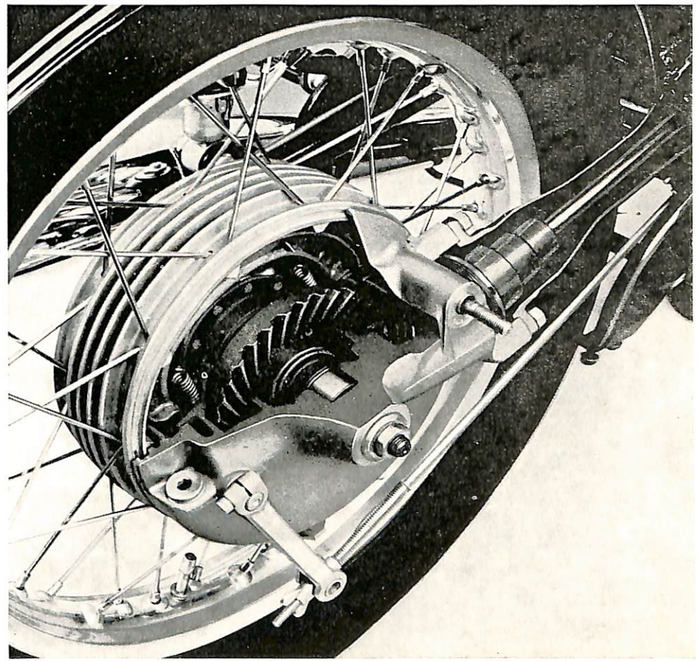




Rear wheel drive

The rear wheel is driven by a cardan shaft running in an oilbath in the right rear swinging arm. The universal joint on the gearbox end of the drive shaft is bolted to a drive flange mounted on a taper on the gearbox output shaft. An internally splined coupling is mounted on another taper at the rear of the drive shaft, and engages with a toothed coupling mounted on the splined shaft of the rear wheel drive bevel pinion, and retained axially by a nut. This toothed coupling compensates for variations in the length of the drive shaft. The rear wheel drive pinion runs at the front in a double-row taper roller bearing with split inner race; the crown wheel with which it engages is supported on the outside by a needle roller bearing and on the wheel side by a ball bearing. The bevel pinion and crown wheel employ the Palloid tooth pattern, and are carefully broken in and installed to ensure completely noiseless running. The crown wheel is partly immersed in an oilbath, and transfers lubricating oil by this means to the bevel pinion and bearings.

Power is transmitted from the crown wheel to the motor cycle's rear wheel by a spline coupling. This from of connection simplifies rear wheel removal. The rear wheel drive housing and the housing cover are manufactured from a high-strength light alloy, and are bolted together to form an oil tight



seal. The final drive is vented by way of a labyrinth in a dome cast onto the top of the housing. In order to prevent possible oil leakages through the radial seal ring in the housing cover from reaching the brake linings, excess oil is directed away through a hole next to the oil plug on the final drive housing, and leading to atmosphere. The final drive gear ratio depends on the size of engine installed (see specifications).

Frame

The twin loop tubular frame is manufactured from welded oval section tube of high strength. The cradle tubes cross over the backbone tube just behind the steering head. This provided a degree of longitudinal elasticity at the steering head without affecting the very high torsional rigidity. In addition, the fuel tank center tunnel can be kept very shallow.

The rear section of the frame, a very light triangulated structure, is bolted to the double loop main frame and can easily be removed.

The engine is mounted in the frame by 2 through bolts which also connect the two lower cradle members of the frame.

The **passenger footrests** can be folded up, and are adjustable to obtain the most comfortable position.

The R 100 RS is supplied without pillion footrests in the single-seat version.

The frame is not designed to have a sidecar attached.

For **parking** the motorcycle, a center and a side stand are provided.

Fuel system

The fuel tank ist mounted at the front on a specially shaped rubber element and at the rear on 2 rubber-metal blocks. In this way, stresses are eliminated and the tank can easily be taken off by removing two knurled nuts.

The screw-on **filler cap** is recessed for safety reasons, and impact resistant.

2 fuel pet cocks are screwed directly into the tank and equipped with 2 fuel feed tubes each. The longer tube is in each case designed to trap a reserve supply of approx. 3 liters (0.8 US gal.) in the tank. Fuel level in each half of the tank is kept constant by means of an equalizer line passing through the air cleaner chamber, which acts when both fuel taps are open.

Telescopic front fork

The fork stem of the telescopic front fork turns on 2 taper roller bearings in the steering head of the frame, thus ensuring free movement, absence of play and freedom from maintenance. The steel upper fork bridge and forged aluminium lower fork bridge connect the fork guide tube rigidly to the 2 hard chromium-plated heat treated steel fixed fork tubes. A shock absorber nozzle is screwed into the lower end of each fixed fork tube. Aluminium sliding fork tubes are installed over each fixed fork tube, and the bottom screws on these are connected with a damper tube which moves inside the shock absorber nozzle on the fixed fork tube. Fork damping on extension is thus provided by the change in the annular damper nozzle section in each fork, whereas calibrated holes in the damper tube provide telescopic fork damping on compression. An important part is played in this process by the damper chamber located between the hydraulic piston screwed on to the shock absorber tube and the damper nozzle. The damper valve attached below the hydraulic piston closes the damper camber off on extension of the forks, so that the oil is forced to flow through the damper nozzle. On compression, the damper chamber is opened again, so that the oil can escape via the calibrated holes in the damper tube and return from the spring chamber to the damper chamber. Since the outer diameter of the damper tube expands conically at each end, the damper nozzle provides a hydraulic limit stop at the extreme upper and lower positions of the fork.

A ball valve attached at the lower end of the damper tube prevents the sliding fork tubes from jamming if the fork extends beyond the hydraulic limit stop.
A progressive rate coil spring in each fixed fork tube is supported on a fixed spring plate at the top and rests on the hydraulic piston at the bottom.

The 2 sliding fork tubes are connected by a robust bridge plate to provide the necessary torsional rigidity and support the fender. The turning angle of the front fork is 42° in either direction (38° on R 100 RS).

Rear wheel suspension

The rear wheel is held in a long, comfortably sprung swinging arm, supported on the main frame by adjustable taper roller bearings designed to operate without play. This type of mounting ensures that the rear wheel can be aligned with the front wheel to close limits.

Road shocks are absorbed and damped by 2 spring damper units mounted by means of silentblock bushings to the rear section of the frame at the top, and to the final drive housing and swinging arm at the bottom.

A progressive rate coil spring in each unit is supported at the top by the outer tube and at the bottom by the adjusting sleeve. The lower spring unit connecting lugs are welded to the outer tubes of the hydraulic shock absorbers, but the upper lugs are screwed to the shock absorber piston rod.

The limit stop for compression movement of the suspension is formed by a double taper rubber buffer between the upper spring unit mounting lug and the shock absorber. The limit stop for extension movement of the suspension is provided by a plastic buffer within the double-acting hydraulic shock absorber. Pre-load of the progressive rate coil springs can be adjusted to 3 positons with the aid of an adjusting sleeve attached to each spring unit and acting on a cam.

Hydraulic steering damper

A 3-position adjustable hydraulic steering damper on the R 100 RS (optional on R 60/7 – R 100 S) ensures that the handlebars always remain completely steady while the machine is moving. The rear of the damper cylinder is pivot-mounted to the main frame, and the piston rod attached to the fork at a point outside its axis of rotation, so that the damper is extended and retracted as the steering is turned. The cylinder is filled with shock absorber fluid to slow down movement of the piston and thus of the telescopic fork. The more rapid the movement of the forks, the more powerful the retarding effect of the damper.

The hydraulic damper can be disconnected by turning the adjusting grip counter-clockwise to the O position. This brings the pivot point of the piston rod into line with the axis of rotation of the fork, so that the piston rod is no longer extended or retracted as the steering is turned.

BMW Cockpit

This fairing is used as standard equipment on the R 100 S and can be specified as an option on the R 60/7, R 75/7 and R 100/7 models.

It is attached to the handlebars and forks and is a cleverly shaped sports fairing offering good protection despite compact dimensions. It can be easily detached and weighs only approx. 2 kg (4,4 lb).

The integrated instruments are well protected against bad weather beneath the fairing and offer the rider additional information.

The cockpit is hot molded and given several layers of stove enamel. The upper section is made from splinter-proof, scratch-resistant polycarbonate.

RS Integral-Cockpit

The ingenious pattern of the Integral-Cockpit used on the R 100 RS prevents unpleasant turbulence and partial vacuum build-up behind the fairing.

It also offers protection against rain, cold winds and dirt.

All these functions have been developed by wind-tunnel testing, and permit the rider to adopt a relaxed body position, thus reducing fatigue and contributing to road safety.

The special pattern nose, with spoiler, recessed headlight with safety glass panel, the integrated flashing turn indicators and hand guards and the specially matched mirrors have the effect of ensuring outstanding roadholding and handling at high speeds without incurring compromises in the form of inconvenience at lower speeds.

This is enhanced by the low weight of the complete fairing, totalling only approx. 9.5 kg (21 lb) with fittings.

The RS sports fairing is manufactured by the hot molding process and given several coats of stove enamel. It consists of several sections which can thus be replaced individually if necessary.

The lower section can be detached in a matter of minutes and the machine ridden with only the upper section attached.

As on the R 100 S, the transparent upper section consists of splinterproof, scratch-resistant polycarbonate material. Routine machine maintenance is scarcely affected by fairing, since all the major engine assemblies can still be reached without difficulty.

The engine's electrical equipment can easily be reached if the engine grille is detached.

Road wheels

The road wheels have light-alloy safety well base rims of a pattern designed to prevent the tire from flying off in the event of rapid deflation. Each rim is connected to the wheel hub by 40 straight spokes. The BMW R 100 RS is equipped as standard with cast light alloy wheels which are optionally available also for the R 60/7 – R 100 S models. Each wheel runs on 2 accurately pre-set, adjustable taper roller bearings providing free running without axial play. The bearings employ multi-lip special shaft sealing rings to keep out dust and water.

Brakes

Front brakes

The R 60/7, R 75/7 and R 100/7 models are equipped with a single disc brake at the front; R 100 S and R 100 RS have a twin disc brake.

The floating caliper (s) is operated hydraulically by a brake line from the master cylinder. This is located in a protected position under the tank and operated by wire cable. A sensor on the fluid reservoir causes a brake fluid telltale lamp in the instrument cluster to light up when the level drops below the minimum mark.

The floating caliper (s) is pivoted on an adjustable eccentric pin.

The corrosion-resistant stainless steel discs are drilled to reduce weight and improve water drainage.

Rear brake

The rear wheel is equipped with a leading and trailing shoe drum brake operated by a linkage from the brake pedal. The brake linings are bonded to the shoes and consist of a material with a coefficient of friction which does not decrease with heat.

Inspection apertures in the drum enable the lining thickness to be checked at any time.

Dual seat

The dual seat hinges up at one side and can be locked with the same key used for the steering lock. The removable tool box and tire inflator are kept beneath the dual seat. In addition, the R 100 S and R 100 RS have a storage compartment for goggles and gloves at the rear of the dual seat.

The dual seat is not sprung, so as not to interfere with the carefully balanced, long-travel front and rear suspension. Instead, it is provided with thick foam-rubber padding.

The BMW R 100 RS is supplied as standard with a single seat.

Electrical system

The electrical system consists of an alternator 3 driven from the crankshaft, a centrifugal spark advance unit with contact breaker 4, driven from the camshaft, a diode board 1 mounted above the alternator, the ignition condensor 2 and the electrical components housed beneath the tank: starter relay 5, voltage regulator 6, starter 7 and 2 ignition coils 8; in addition, the battery is located beneath the tool box, and 2 spark plugs together with the lighting, signal and monitor equipment complete the electrical system. **Fig. 9 and 10**

The alternator consists of a claw-pole rotor running in the stator housing and mounted on a taper at the front end of the crankshaft. Exciter current is supplied to the alternator by 2 sliprings. The cast front stator ring carries the carbon brush holder with 2 plug connections. Opposite this is a plug board with 3 connections for 3-phase current takeoff. The alternator begins to deliver current at a fast idle speed, so that ample power is available even if a very high load is placed on the battery. The current flowing through the battery charge indicator light is used for pre-excitation of the alternator; of the electrical system is operating correctly the charge indicator light should go out as engine speed reaches a fast idle.

The diodes of diode board rectify the 3-phase current produced by the alternator.

The voltage regulator is of the contact type, and is attached to the frame backbone below the fuel tank.

The centrifugal ignition advance mechanism advances the spark as engine speed increases.

The contact breaker interrupts the primary current circuit in the coils at a given moment on each engine revolution. This induces a high voltage (8500 to 13 000 V) in the secondary winding of the **coils,** so that the spark plugs can ignite the fuel-air mixture.

The ignition condenser is primarily intended to reduce sparking and erosion at the breaker points.

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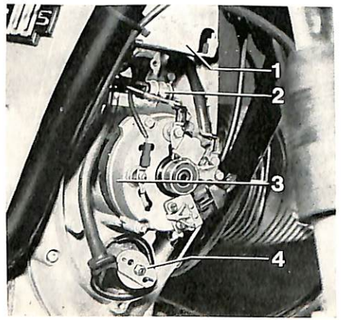
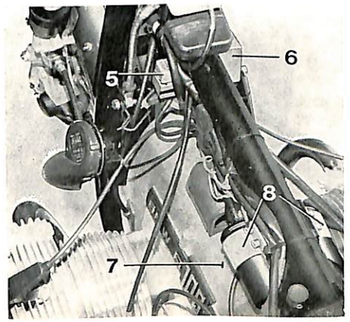


The starter consists of a series-wound motor with starter pinion and engaging system.

The gearbox and clutch-operated switch prevent the starter from being accidentally operated if a gear is selected and the clutch not disengaged.

The 12-volt starter battery of 28 Amp/hour capacity is mounted on a flexible battery tray. It is required for starting the engine and also supplies the energy consumed by the electrical system when the engine is idling or at a standstill.

10



Service

Before delivering your motorcycle to you, the BMW dealer will have carried out a **free pre-delivery check.** Details of the work involved and confirmation that it has been performed are given on page 22.

Always have the maintenance work scheduled in the BMW Service Program performed promptly, as described on pages 24–25. Make sure that the work is confirmed by the dealer's stamp and signature in the spaces provided for in this manual.

This precaution will prevent possible difficulty in establishing warranty claims, should these be necessary. In addition, proof that servicing work has all been carried out regularly and completely will be of great benefit to you when your motorcycle is sold at a later date.

After the **1st Maintenance** at 1 000 km (600 miles), the regular pattern of maintenance work laid down in the BMW Service Program should be followed. At a speedometer reading of 7 500 km (5 000 miles), the **BMW Maintenance** is due. At 15 000 km (10 000 miles), your motorcycle should be brought in for the comprehensive **BMW Inspection** to be performed. After this, BMW Maintenance and Inspection alternate every 7 500 km (5 000 miles).

When he carries out the 1st Maintenance, your dealer will detach the reminder label for the next Maintenance from this manual and affix it under the seat, at a point where you cannot overlook it. The same procedure will be followed for all subsequent Maintenance and Inspection reminders.

In the interests of obtaining maximum reliability and long service from your motorcycle, we recommend you to have **at least 2 BMW Inspections** carried out **each year,** even if the distance to be covered between them according to the BMW Service Program has not been fully attained.

We also recommend that you **change the brake fluid once each year.**

Each BMW authorized dealer has a list of recommended prices, based on the flat rates we have calculated (the time required to perform the different jobs). This procedure ensures that charges are based on the same principle throughout the Service Organization, all over the world.

Any lubricants, seals etc. needed during service and maintenance work and cleaning the machine if needed will be shown separately on the invoice.

Please do not forget to take this manual with you when the motorcycle is returned to your dealer for Maintenance or Inspection work.

5 000 miles BMW Maintenance
(7 500 km)

Date Mileage

Stamp and signature

25 000 miles BMW Maintenance
(37 500 km)

Date Mileage

Stamp and signature

45 000 miles BMW Maintenance
(67 500 km)

Date Mileage

Stamp and signature

10 000 miles BMW Inspection
(15 000 km)

Date Mileage

Stamp and signature

30 000 miles BMW Inspection
(45 000 km)

Date Mileage

Stamp and signature

50 000 miles BMW Inspection
(75 000 km)

Date Mileage

Stamp and signature

15 000 miles BMW Maintenance
(22 500 km)

Date Mileage

Stamp and signature

35 000 miles BMW Maintenance
(52 500 km)

Date Mileage

Stamp and signature

55 000 miles BMW Maintenance
(82 500 km)

Date Mileage

Stamp and signature

20 000 miles BMW Inspection
(30 000 km)

Date Mileage

Stamp and signature

40 000 miles BMW Inspection
(60 000 km)

Date Mileage

Stamp and signature

60 000 miles BMW Inspection
(90 000 km)

Date Mileage

Stamp and signature

5 000 miles (7 500 km)

BMW Maintenance

not later than (6 months)

(date) _____

25 000 miles (37 500 km)

BMW Maintenance

not later than (6 months)

(date) _____

45 000 miles (67 500 km)

BMW Maintenance

not later than (6 months)

(date) _____

10 000 miles (15 000 km)

BMW Inspection

not later than (6 months)

(date) _____

30 000 miles (45 000 km)

BMW Inspection

not later than (6 months)

(date) _____

50 000 miles (75 000 km)

BMW Inspection

not later than (6 months)

(date) _____

15 000 miles (22 500 km)

BMW Maintenance

not later than (6 months)

(date) _____

35 000 miles (52 500 km)

BMW Maintenance

not later than (6 months)

(date) _____

55 000 miles (82 500 km)

BMW Maintenance

not later than (6 months)

(date) _____

20 000 miles (30 000 km)

BMW Inspection

not later than (6 months)

(date) _____

40 000 miles (60 000 km)

BMW Inspection

not later than (6 months)

(date) _____

60 000 miles (90 000 km)

BMW Inspection

not later than (6 months)

(date) _____

The "National Traffic & Motor Vehicle Safety Act of 1966" requires manufactures to be in a position to contact the vehicle owners when a correction of a product defect becomes necessary. Please fill in the attached postcard if you change your address or purchase a used BMW or import your motorcycle into this country.

Address:

USA Butler and Smith, Inc.
Walnut and Hudson Streets
Norwood, N. J. 07648

Canada BMW Motorcycle Distributors
204 Yorkland Avenue
Willowdale, Ontario

PLEASE CHECK ONE:

☐ ADDRESS CHANGE

☐ SECOND OWNER

☐ OVERSEAS DELIVERY

MODEL

ENGINE/SERIAL NO. Near dipstick /steering head

MONTH DAY YEAR DATE

LAST NAME FIRST NAME

NUMBER STREET

CITY STATE ZIP CODE

Attn: Service Department

Mail to:

Mail to:

Attn: Service Department

Mail to:

Attn: Service Department

POST CARD

FREE PRE-DELIVERY CHECK

- ☐ Check oil level in engine, gearbox, final drive, rear wheel drive housing and telescopic fork. Check brake fluid level.
- ☐ Check operation of headlight high and low beam, parking lights, brake, license plate and turn indicator lights, headlight high beam, battery charge, neutral indicator, brake fluid and oil pressure telltale lamps and horn.
- ☐ Check tightness of bolts and nuts: Quick-release axle nuts and clamp bolts, front and rear. Engine mounting bolts, front and rear. Center stand retaining bolts. Upper and lower rear shock absorber retaining bolts. Carburetor hose clips. 4 12-sided bolts holding cardan shaft to gearbox output flange.
- ☐ Test ride the motor cycle, check operation of clutch, gear shift, speedometer, tachometer, steering, foot and hand brakes. Check engine idle settings.
- ☐ Check external appearance of motor cycle.

Vehicle in perfect condition:

.....
Dealer Signature

DEALER NAME .....

STREET & NO .....

CITY / STATE .....

Zip code .....

PLEASE CHECK ONE:

☐ ADDRESS CHANGE

☐ SECOND OWNER

☐ OVERSEAS DELIVERY

MODEL

ENGINE/SERIAL NO.

Near dipstick /steering

DATE

MONTH DAY YEAR

LAST NAME

FIRST NAME

NUMBER STREET

CITY STATE

ZIP CODE

PLEASE CHECK ONE:

☐ ADDRESS CHANGE

☐ SECOND OWNER

☐ OVERSEAS DELIVERY

MODEL

ENGINE/SERIAL NO.

Near dipstick /steering head

DATE

MONTH DAY YEAR

LAST NAME

FIRST NAME

NUMBER STREET

CITY STATE

ZIP CODE

DATE	MILEAGE	REP. ORD. NO.	DESCRIPTION OF SERVICE WORK	PARTS	LABOR	TOTAL

OWNER'S LAST NAME FIRST NAME INITIAL

SERIAL/ENGINE NO.

NUMBER STREET

DELIV. DATE

MODEL ..../.......... COLOR ....

CITY STATE

DEALER NO.

ZIP CODE

TIRE SERIAL NUMBER

IMPORTANT: Information must be recorded to comply with Federal Government regulations

FRONT:

TEL. NO. ( )

REAR:

☐ MALE ☐ FEMALE

☐ SINGLE ☐ MARRIED

☐ CHILDREN YOUR AGE

IS THIS YOUR FIRST MOTORCYCLE ☐ YES ☐ NO

NUMBER PREVIOUSLY OWNED BY YOU ....

BRAND: .... DISPL. CC: ....
MOST RECENTLY OWNED

....
OTHERS OTHERS

....
OTHERS OTHERS

OCCUPATION ....

WHY DID YOU SELECT A BMW:

☐ REPUTATION
☐ APPEARANCE
☐ PERFORMANCE
☐ RELIABILITY & LONG LIFE

TRADE-IN: ☐ YES ☐ NO

DO YOU OWN A MOTORCYCLE IN ADDITION: ....
MAKE

MAIN USE(S)

☐ TRANSPORTATION TO WORK
☐ TOURING
☐ SPORT
☐ OTHER ....

WHERE DID YOU FIRST LEARN ABOUT BMW

☐ ADVERTISING ☐ FRIEND'S RECOMMENDATION
☐ WRITEUP IN CYCLE MAGS ☐ DEALER'S RECOMMENDATION

YOUR FAVORITE MAGAZINE(S) ....

DATE .... OWNER'S SIGN. ....

105 000 miles
(157 500 km)

BMW Maintenance

not later than (6 months)

(date) _____

85 000 miles
(127 500 km)

BMW Maintenance

not later than (6 months)

(date) _____

65 000 miles
(97 500 km)

BMW Maintenance

not later than (6 months)

(date) _____

110 000 miles
(165 000 km)

BMW Inspection

not later than (6 months)

(date) _____

90 000 miles
(135 000 km)

BMW Inspection

not later than (6 months)

(date) _____

70 000 miles
(105 000 km)

BMW Inspection

not later than (6 months)

(date) _____

115 000 miles
(172 500 km)

BMW Maintenance

not later than (6 months)

(date) _____

95 000 miles
(142 500 km)

BMW Maintenance

not later than (6 months)

(date) _____

75 000 miles
(112 500 km)

BMW Maintenance

not later than (6 months)

(date) _____

120 000 miles
(180 000 km)

BMW Inspection

not later than (6 months)

(date) _____

100 000 miles
(150 000 km)

BMW Inspection

not later than (6 months)

(date) _____

80 000 miles
(120 000 km)

BMW Inspection

not later than (6 months)

(date) _____

OWNER'S LAST NAME | FIRST NAME | INITIAL | SERIAL/ENGINE NO.

NUMBER STREET | DELIV. DATE

CITY | MODEL ...../..... | COLOR

STATE | DEALER NO.

ZIP CODE | TIRE SERIAL NUMBER | FRONT:

IMPORTANT: Information must be recorded to comply with Federal Government regulations | REAR:

TEL. NO. ( ) | IS THIS YOUR FIRST MOTORCYCLE ☐ YES ☐ NO

☐ MALE ☐ FEMALE | NUMBER PREVIOUSLY OWNED BY YOU .....

☐ SINGLE ☐ MARRIED | BRAND: ..... DISPL. CC: .....

☐ CHILDREN YOUR AGE ☐☐ | MOST RECENTLY OWNED

OCCUPATION ..... OTHERS .....

WHY DID YOU SELECT A BMW: OTHERS .....

☐ REPUTATION TRADE-IN: ..... OTHERS .....

☐☐☐ APPEARANCE

☐☐☐ PERFORMANCE ☐ YES ☐ NO

☐ RELIABILITY & LONG LIFE DO YOU OWN A MOTORCYCLE IN ADDITION: .....

MAIN USE(S) MAKE

WHERE DID YOU FIRST LEARN ABOUT BMW

☐ TRANSPORTATION TO WORK ☐ ADVERTISING ☐ FRIEND'S RECOMMENDATION

☐☐☐ TOURING ☐ WRITEUP IN CYCLE MAGS ☐ DEALER'S RECOMMENDATION

SPORT YOUR FAVORITE MAGAZINE(S) .....

OTHER ..... DATE ..... OWNER'S SIGN. .....

☐ OTHER ..... DATE ..... OWNER'S SIGN. .....

105 000 miles BMW Maintenance
(157 500 km)

Date Mileage

Stamp and signature

85 000 miles BMW Maintenance
(127 500 km)

Date Mileage

Stamp and signature

65 000 miles BMW Maintenance
(97 500 km)

Date Mileage

Stamp and signature

110 000 miles BMW Inspection
(165 000 km)

Date Mileage

Stamp and signature

90 000 miles BMW Inspection
(135 000 km)

Date Mileage

Stamp and signature

70 000 miles BMW Inspection
(105 000 km)

Date Mileage

Stamp and signature

115 000 miles BMW Maintenance
(172 500 km)

Date Mileage

Stamp and signature

95 000 miles BMW Maintenance
(142 500 km)

Date Mileage

Stamp and signature

75 000 miles BMW Maintenance
(112 500 km)

Date Mileage

Stamp and signature

120 000 miles BMW Inspection
(180 000 km)

Date Mileage

Stamp and signature

100 000 miles BMW Inspection
(150 000 km)

Date Mileage

Stamp and signature

80 000 miles BMW Inspection
(120 000 km)

Date Mileage

Stamp and signature

Free pre-delivery check

1. Check oil level in engine, gearbox, final drive, rear wheel drive housing and telescopic forks.
   Check brake fluid level.
2. Check operation of headlight high and low beam, parking lights, brake, license plate and turn indicator lights, headlight high beam, battery charge, neutral indicator, brake fluid and oil pressure telltale lamps and horn.
3. Check tightness of bolts and nuts:
   Quick-release axle nuts and clamp bolts, front and rear
   Engine mounting bolts, front and rear
   Center stand retaining bolts
   Upper and lower rear shock absorber retaining bolts
   Carburetor hose clips
   4 12-sided bolts holding cardan shaft to gearbox output flange.
4. Test ride the motorcycle, check operation of clutch, gear shift, speedometer, tachometer, steering, foot and hand brakes. Check engine idle settings.
5. Check external appearance of motorcycle.

Free Pre-delivery Check
correctly carried out

on _____

at _____ miles (km)

_____

Stamp and signature

Initial service
at 1000 km (600 miles)

1. Change engine oil at normal operating temperature, renew oil, filter element, clean oil sump and mesh strainer.
2. Change oil in gearbox.
3. Change oil in rear wheel drive housing.
4. Change oil in final drive.
5. Service the battery.
6. Check steering and wheel bearings and adjust if necessary *.
7. Adjust brakes and bleed disc brake system if necessary*. Check and adjust clutch if necessary.
8. Check throttle cable settings, adjust if necessary.
9. Check ignition timing and adjust if necessary.
10. Tighten cylinder head nuts to correct torque of 3.5 mkp (25 lb.ft), then adjust valve clearances when engine is cold.
11. Tighten nuts and bolts as follows:
    Quick-release axle nuts and clamp bolts, front and rear
    Engine mounting bolts, front and rear
    Center stand retaining bolts
    Upper and lower rear shock absorber mountings
    Carburetor hose clips
    Engine chaincase cover.
12. Check wheel spokes, tighten if necessary *.

* billed as a separate item.

600 mile (1000 km) Initial Service
correctly carried out

on _____

at _____ miles (km)

_____

Stamp and signature

Supplement to maintenance schedule page 25

Tighten nuts and bolts as follows:

Quick-release axle nuts and clamp bolts, front and rear
Engine mounting bolts, front and rear
Center stand retaining bolts
Upper and lower rear shock absorber mountings
Carburetor hose clips
Cylinder head covers

Maintenance schedule	BMW Maintenance (every 15 000 km — 10 000 miles) starting at 7 500 km (5000 miles)	BMW Inspection (every 15 000 km — 10 000 miles) starting at 15 000 km (10 000 miles)
Change engine oil	x[1]	x
Renew oil filter element	x	x
Check gearbox oil level	x	
Change gearbox oil		x[2]
Check oil level in drive shaft housing	x	
Change oil in drive shaft housing		x[2]
Check oil level in final drive	x	
Change oil in final drive		x[2]
Change oil in telescopic fork		x[2]
Grease rear wheel swinging arm bearings and check play, adjust if necessary		x
Grease brake and clutch pivots and throttle twist grip	x	x
Check battery acid level	x[3]	x[3]
Check condition of battery posts, clean and grease if necessary *		x
Clean intake air cleaner	x	
Renew intake air cleaner element		x
Check steering play, adjust if necessary *	x	x
Check wheel bearing play, adjust if necessary *		x
Check and adjust clutch if necessary	x	x
Adjust travel at front and rear wheel brakes	x	x
Check brake fluid level	x	x

Maintenance schedule	BMW Maintenance (every 15 000 km — 10 000 miles) starting at 7 500 km (5000 miles)	BMW Inspection (every 15 000 km — 10 000 miles) starting at 15 000 km (10 000 miles)
Check brake linings/pads and renew if necessary *	x	x
Check drum and disc brakes and their controls and levers		x
Examine brake system for leaks		x
Adjust carburetors, clean if necessary *. Check play at cables, adjust if necessary	x	x
Clean fuel pet cocks		x
Adjust spark plug electrode gaps	x	
Renew spark plugs		x
Check breaker points gap and ignition timing, adjust if necessary	x	x
Grease pivot pin of centrifugal ignition advance		x
Check correct tightness of cylinder head nuts	x	x
Check valve clearances, adjust if necessary	x	x
Examine wheel spokes, tighten if necessary *		x
Check condition of wheel rims		x
Tighten all nuts and bolts if slack (page 23)		x
Test ride and final acceptance	x	x

* Billed as a separate item.
[1] At least every 6 months, if motorcycle is ridden only for short distances or at outside temperatures below 0° C (32° F), or at least every 3000 km (2000 miles)
[2] At least once a year.
[3] At least once a month.

BMW motorcycle limited warranty

Butler & Smith Inc. * warrants BMW motorcycles to be free of defects in materials or workmanship for a period of twelve (12) months from the date of delivery without mileage limitation.

To obtain service under this warranty, the BMW motorcycle must be brought upon discovering the defect to the workshop of the authorized BMW motorcycle dealer from whom the motorcycle was purchased. If this is not possible, because of for instance occurring of defects on a trip preventing further safe operation, it may be brought to any other authorized BMW motorcycle dealer.

Performance under this warranty is conditioned upon presentation of a plastic wallet-size registration card issued by Butler & Smith and containing the following information:

1. Purchaser's name and address
2. Engine number
3. Model and color
4. Firm name of selling dealer
5. Date of purchase (MDY)
6. Expiration date (MDY)

Upon presentation of the plastic ownership registration card, the dealer will, without charge for parts and labor, either repair or replace the defective part(s) **(with the exception of those excluded from this warranty).** The decision to repair or replace said part(s) being wholly the responsibility of Butler & Smith, Inc. Parts for which replacements are made become the property of Butler & Smith, Inc.

Butler & Smith makes no other express warranty on this product. The duration of any implied warranties, including the implied warranty of merchantability, is limited to the duration of the express warranty herein contained. Butler & Smith, Inc. hereby excludes incidental and consequential damages, including loss of time, inconvenience, or loss of use of the vehicle, for any breach of any express or implied warranty including the implied warranty of merchantability applicable to this product. Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above exclusions or limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

To keep this warranty in effect, the owner must have all maintenance services and oil changes performed at the specified intervals and in accordance with the instructions in the **BMW rider's manual** and the **technical data and service manual.** Proof must be provided by a paid invoice and filling in appropriate boxes in the **BMW technical data and service manual.**

The warranty shall be null and void if:

1. **The maintenance services and oil changes are not performed at the specified intervals or in accordance with the instructions in the BMW rider's manual.**
2. **The speedometer mileage has been altered or the true mileage cannot be readily determined.**
3. **Parts or accessories have been installed which are not the same quality as BMW replacement parts or accessories or are substantially different in their design or which visibly affect the operation or performance of the motorcycle or its parts.**
4. **The motorcycle has been or is engaged in racing or other competitive events.**

This warranty does not apply to the following items:

- **A. Maintenance services, oil changes and filters.**
- **B. Mechanical adjustments which may become necessary through normal wear and tear.**
- **C. Ignition timing accuracy and carburetor settings.**
- **D. Defects, damage or other conditions resulting from misuse, neglect, abuse, abnormal stress or strain, or the attachment of unsuitable parts or accessories.**
- **E. Any part which has not been correctly installed.**
- **F. Damage occurring through corrosion resulting from battery acid, road salt, weather condition, environmental influence or improper accident repairs.**
- **G. Exhaust pipes on which the chrome has discolored.**
- **H. Rubber handgrips, foot rest rubbers, foot shift rubbers and control cable rubber shields.**
- **I. Clutch components due to wear and tear.**
- **J. Brake linings and brake pads due to wear and tear.**
- **K. Spark plugs and ignition points.**
- **L. Incandescent bulbs and fuses.**

Tires and batteries may have separate warranties from their respective manufacturers; they **are not covered by this warranty.**

The satisfaction and goodwill of purchasers of BMW motorcycles are of primary concern to Butler & Smith, Inc. and its dealers. In the event a warranty matter is not handled to your satisfaction, the following is suggested:

1. Discussion of the problem with the BMW authorized dealership management.
2. If satisfaction is not abtained through your authorized BMW dealer, the Service Manager of Butler & Smith, Inc. responsible for your authorized BMW dealers territory should be informed by letter including all details.

Butler & Smith, Inc.
Walnut Street & Hudson Avenue
Norwood, New Jersey 07648

Butler & Smith, Inc.
135 East Stanley Street
Compton, California 90220

* (in Canada: The vendor)

Technical data

Engine	R 60/7	R 75/7	R 100/7	R 100 S	R 100 RS
Pattern	2-cyl., 4-cycle horizontally opposed, with overhead valves in hemispherical combustion chambers				
Max. permissible engine speed (rev/min)	7200	7400	7400	7400	7400
Max. continuous engine speed (rev/min)	6500	6500	6800	7000	7200
Bore/stroke mm	73.5/70.6	82/70.6	94/70.6	94/70.6	94/70.6
Displacement cm^3	599	745	980	980	980
Compression ratio	9.2:1	9.0:1	9.1:1	9.5:1	9.5:1
Direction of rotation	clockwise looking at alternator				
Fuel consumption (to DIN 70030 standard)					
liters/100 km	5.5	4.5	5.5	5.45	5.75
mpg (US)	42.8	52.3	42.8	43.11	40.87
(at 110 km/h = 68.5 miles/h)					

Carburetors	R 60/7	R 75/7	R 100/7	R 100 S	R 100 RS
Pattern	Two inclined Bing slide carburetors with needle jet and central lever float	Two inclined Bing constant depression carburetors with needle jet, vacuum slide, throttle butterfly and central lever float			
Carburetor type					
left	1/26/123	64/32/13	64/32/19	94/40/103	94/40/105
right	1/26/124	64/32/14	64/32/20	94/40/104	94/40/106
Barrel diameter mm	26	32	32	40	40
Main jet	140	145	150	170	170
Needle jet	2.68 with accelerator pump	2.66	2.68	2.66	2.68
Jet needle number	4	46–241	46–241	46–341	46–341
Needle position	2	3	3	3	2
Idle jet	40	50	50	45	45
Idle air jet	–	1 ∅	1 ∅	1 ∅	1 ∅

Transmission	R 60/7	R 75/7	R 100/7	R 100 S	R 100 RS
Clutch	Single dry plate, with diaphragm spring; 200 mm (7.9 in) dia.				
Gearbox	5-speed gearbox with claw-type shift, flange mounted to engine. Shock damping of drive torque in all gears, hooked lever shift.				
Gearbox ratios	1st gear 2nd gear 3rd gear 4th gear 5th gear	4.4:1 2.86:1 2.07:1 1.67:1 1.50:1			
Transmission from gearbox to rear wheel	Enclosed cardan shaft in right swinging arm, universal joint at gearbox end, helical splined coupling at final drive end.				
Final drive	Palloid pattern crown wheel and pinion.				
Final drive ratio No. of teeth	1:3.56 9/32	1:3.36 11/37	1:3.0 11/33	1:2.91 11/32	1:2.91 11/32
Special version No. of teeth			1:3.2 10/32	1:3.09 11/34	1:3.0 11/33
Speedometer gearing (km) (miles)	0.819 1.318	0.773 1.244	0.691 1.112	0.67 1.078	0.67 1.078

Frame					
Design	Duplex steel tube cradle frame, manufactured from welded oval section tube, with bolted-on rear section; not suitable for sidecar attachment.				
Manufacturer's plate Chassis number	on right gusset plate (close to steering head) on steering head, at right				
Suspension, front wheel rear wheel	Telescopic fork with large capacity double-acting hydraulic shock absorbers, 200 mm (7.9 inch) travel. Swinging arm with 3-position spring struts and double-acting hydraulic shock absorbers, 125 mm (4.9 inch) travel.				
Max. steering lock	42°				38°
Front wheel caster mm (inch.)	approx. 90 (3.5)				

	R 60/7	R 75/7	R 100/7	R 100 S	R 100 RS
Front brake	Hydraulic single disc, with floating caliper			Hydraulic twin disc, with floating caliper	
Brake disc(s) diameter mm (in)	260 (10.24)				
Effective lining area cm² (in²)	40 (6.2)			80 (12.4)	
Rear brake	Full-width hub with light alloy brake drum; cast-in perlitic cast iron rings, leading and trailing shoes				
Brake drum diameter mm (in)	200 (7.9)				
Effective lining area cm² (in²)	214 (33.2)				
Rims front rear	1.85 B x 19 2.15 B x 18				1.85 B x 19* 2.50 B x 18*
Tires front rear	3.25 S 19 4.00 S 18			3.25 H 19 4.00 H 18	

* Cast light alloy wheel

Fuels and lubricants	R 60/7—R 100 RS
Fuel	Super (premium), min. octane number 98 (RM), 88 (MM); to DIN 51 600 standard
Tank capacity liters (US gals.)	24 (6.3)
including reserve liters (US gals.)	3 (0.8)
Engine oil for outside temperatures	Brand-name HD spark ignition engine oil
mostly above + 30° C (86° F)	SAE 40 SAE 20 W 50
all the year round above 0° C (32° F)	SAE 20 W 40 SAE 20 W 50
mostly below 0° C (32° F)	SAE 10 W 30 SAE 10 W 40 SAE 10 W 50
Engine oil capacity without filter change	liters (US quarts) 2 (2.1)
including filter change	liters (US quarts) 2.25 (2.4)

Gearbox oil quantity	liters (US quarts) 0.8 (0.85)	Brand-name Hypoid gear oil	above 5° C (41° F) SAE 90	below 5° C (41° F) SAE 80
Rear drive shaft housing oil capacity	liters (US quarts) 0.15 (0.16)			
Final drive oil capacity	liters (US quarts) 0.25 (0.26)			

Telescopic fork	Shell 4001; Shell Aero Fluid 4; Castrol DB Hydraulic Fluid; Castrol Shock Absorber 1—318; BP Aero Hydraulic; BP Olex HLP 28449; Aral P 3441 damper oil; Aral 1010
Capacity per fork leg	liters (US quarts) 0.28 (0.3)
Breaker felt lubricating pad and centrifugal advance mechanism	Bosch Ft 1 v 4 grease
Centrifugal advance pivot shaft	Bosch Ft 1 v 26 grease
Brake pressure studs on master cylinder	Molykote BR 2

	R 60/7—R 100 RS
Wheel bearings and all other greasing points	Brand-name multi-purpose grease with 180° C (356° F) drip point
Corrosion inhibiting oil	SAE 20 engine corrosion inhibiting oil
Upper cylinder preservative	Upper cylinder preservative for 4-cycle spark ignition engines
Acid-free grease	Corrosion inhibiting grease
Protective oil	Vehicle bodywork preservative compound; must not attack paintwork, rubber components or plastics, and should be easy to remove.

Brake fluid

Grade	DOT 4; ATE "SL"
Quantity for first filling, bleeding incl. liter (US quarts)	approx 0.5

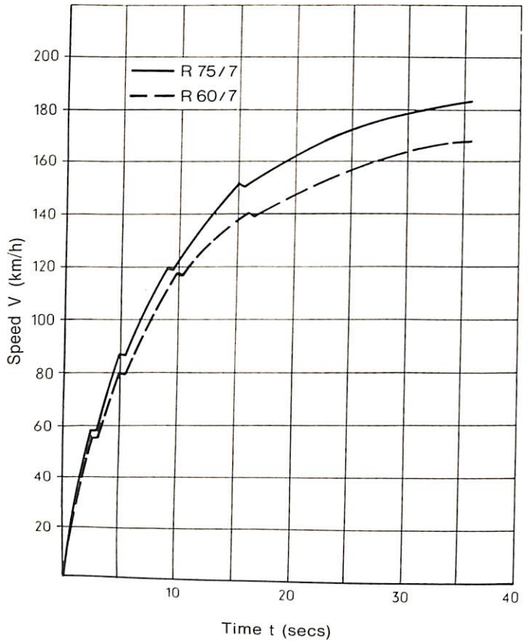
Dimensions		R 60/7	R 75/7	R 100/7	R 100 S	R 100 RS
Overall width (engine)	mm (inch)	746 (29.4)	746 (29.4)	746 (29.4)	746 (29.4)	746 (29.4)
Overall height without mirror (motorcycle unladen)	mm (inch)	1080 (42.5)	1080 (42.5)	1080 (42.5)	1210 (47.6)	1300 (51.2)
Seat height, unladen	mm (inch)	810 (31.9)	810 (31.9)	810 (31.9)	820 (32.3)	820 (32.3)
Overall length		2130 (83.9)	2130 (83.9)	2130 (83.9)	2130 (83.9)	2130 (83.9)
Wheelbase with rider weighing 75 kg (165 lb)	mm (inch)	1465 (57.7)	1465 (57.7)	1465 (57.7)	1465 (57.7)	1465 (57.7)
Ground clearance, with rider weighing 75 kg (165 lb)	mm (inch)	165 (6.5)	165 (6.5)	165 (6.5)	165 (6.5)	165 (6.5)

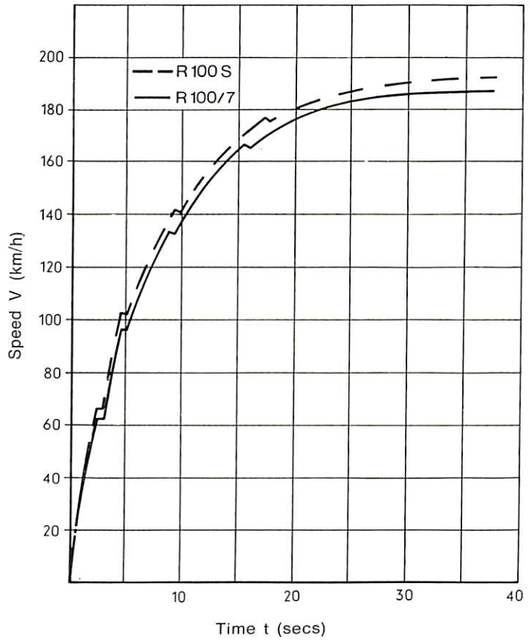
Weights						
Unladen weight with lubricants but fuel or tools	kg (lb)	195 (430)	195 (430)	195 (430)	200 (441)	210 (463)
Unladen weight with lubricants, 17 liters (3.7 Imp./4.5 US gal) of fuel and tools	kg (lb)	215 (474)	215 (474)	215 (474)	220 (485)	230 (507)
Permissible gross weight = unladen weight + total of rider, passenger and baggage	kg (lb)	398 (877)	398 (877)	398 (877)	398 (877)	398 (877)
Permissible wheels loads, solo						
front, at 1.9 atm (27 psi) tire pressure	kg (lb)		160 (353)			
rear, at 2.5 atm (29 psi) tire pressure	kg (lb)		245 (540)			
Permissible wheel loads with passenger						
front, at 2.0 atm (29 psi) tire pressure	kg (lb)		178 (392)			
rear, at 2.25 atm (32 psi) tire pressure	kg (lb)		270 (595)			
Max. No. of persons including rider			2 persons			1 person *

* with dual seat (optional extra): 2 persons

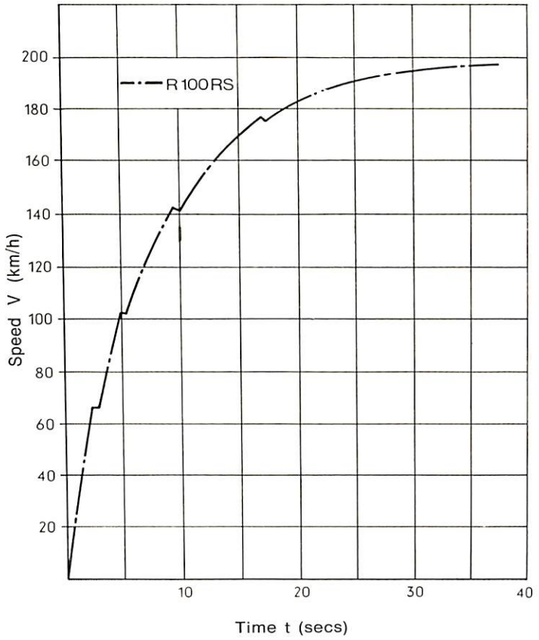
Performance	R 60/7	R 75/7	R 100/7	R 100 S	R 100 RS
The top speed actually attainable by the motorcycle after break-in depends to a large extent on the wind resistance offered by the driver as a result of his size, riding attitude and clothing, and also road and weather conditions.					
Top speed, rider seated km/h (mph)	155 (97)	165 (103)	178 (110)	195 (121)	197 (122)
Top speed, rider crouched km/h (mph) app.	167 (104)	177 (110)	188 (117)	over 200 (124)	over 200 (124)
Acceleration					
from 0 to 50 km/h (31 mph) sec	2.2	2.0	1.6	1.6	1.6
from 0 to 80 km/h (50 mph) sec	5.0	4.4	3.7	3.5	3.5
from 0 to 100 km/h (62 mph) sec	7.6	6.6	5.1	4.7	4.7
from 0 to 120 km/h (75 mph) sec	11.2	9.5	7.3	6.8	6.8
from 0 to 140 km/h (87 mph) sec	16.5	12.9	9.9	8.8	8.9
from 0 to 160 km/h (100 mph) sec	27.1	19.4	13.8	12.6	12.7

Acceleration through gears

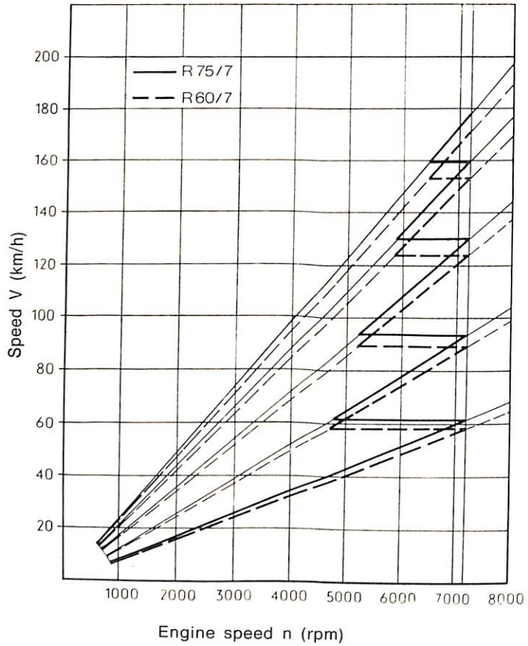


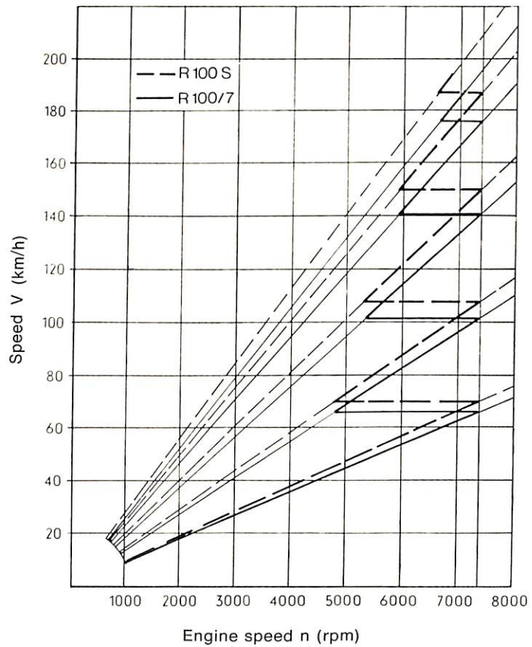


Acceleration through gears

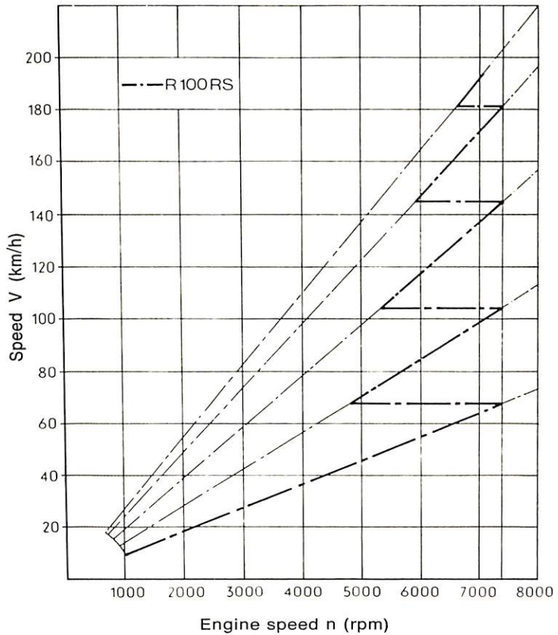


Road speed – engine speed





Road speed – engine speed



Electrical system

Battery	Varta, 12 V, 28 Amp/h
Starter	Bosch, Type 0 001 157 023; 0,6 hp
Starter relay	Bosch, Type 0 332 014 118
Alternator	R 60/7, R 75/7: Bosch Type 0 120 340 004, 280 W R 100/7, R 100 S, R 100 RS: Bosch Type 0 120 340 005, 240 W
Alternator drive	direct from crankshaft
Diode board	Bosch, Type 0 197 002 003
Voltage regulator	Bosch, Type 0 190 601 009 AD 1/14 V
Condenser	0.2 μ F – 25 %
Coils (2)	Bosch, E 6 V
Contact breaker	on camshaft, with automatic centrifugal ignition advance
Advance begins at engine speed rev/min	1550
Advance ends at engine speed rev/min	3000
Ignition timing	6° ± 3° before TDC
Control range	25° ± 2° 30′ at crankshaft

Spark plugs

	R 60/7	R 75/7	R 100/7	R 100 S	R 100 RS
Bosch W 200 T 30		○	○		
Bosch W 225 T 30	○			○	○
Beru 200/14/3 A		○	○		
Beru 230/14/3 A	○			○	○
Champion N 6 Y	○			○	○
Champion N 7 Y		○	○		

Spark plug electrode gap mm (inch)	0.7 (0.028)		
Headlight	Bosch type 0 303 850 100,	180 mm (7.1 inch) diameter	
Turn indicator flasher unit	Hella TBB 26 – 1 – 4 x 21 W – 12 V		
Headlight high and low beam		H 4 halogen double filament bulb, 60/55 W	
Parking light		12 V/4 W	
Indicator lights: Headlight high beam	blue	12 V/1.2 W	
Oil pressure	orange	12 V/1.2 W	
Neutral	green	12 V/1.2 W	
Brake	red	12 V/1.2 W	
Battery charge	red	12 V/3 W	
Turn indicator	orange	12 V/3 W	
Dial illumination Speedometer		12 V/3 W	
Revolution counter		12 V/3 W	
Fuses (2)		8 Amp	
Turn indicators, 2 each front and rear		12 V/21 W	
Rear light / Stop light	double filament bulb	12 V/5 W 12 V/21 W	
Horn		Fiamm CTP	

Notes

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