RIDER'S MANUAL US MODEL

R 65

Warranty
Operation
Service · Maintenance
Specifications

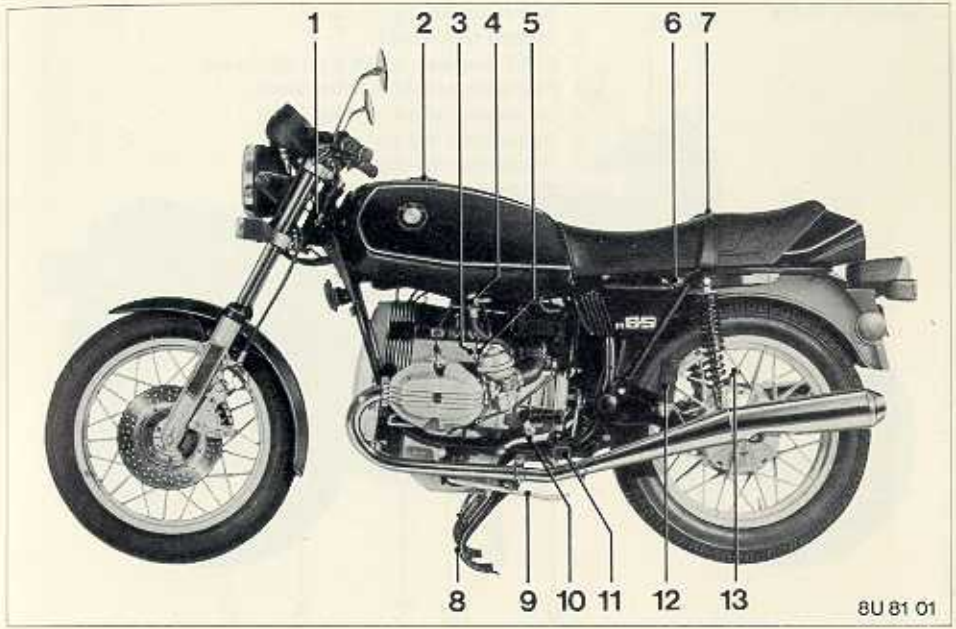
BMW

Contents

Operation

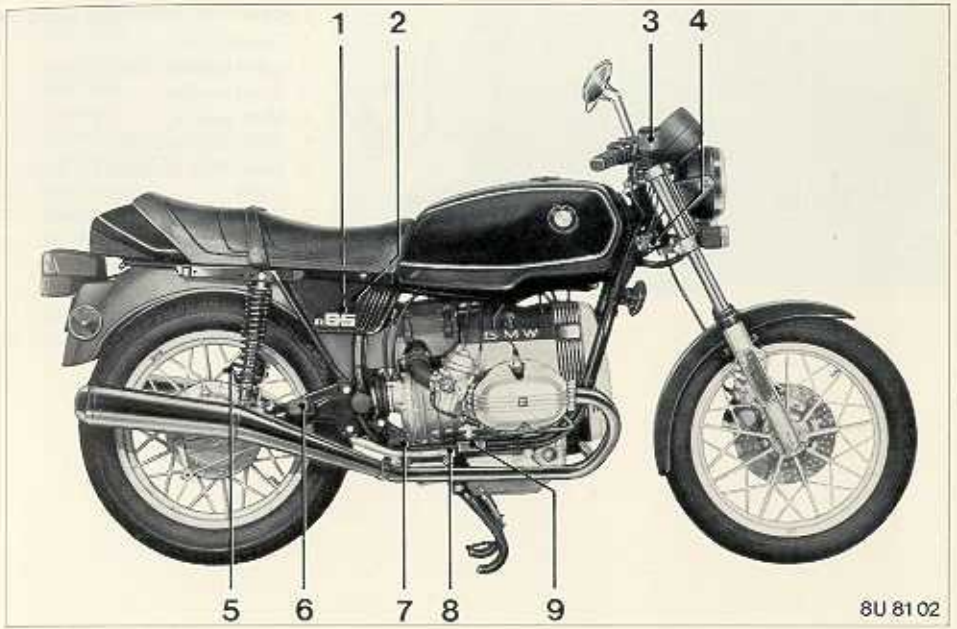
Location of Parts

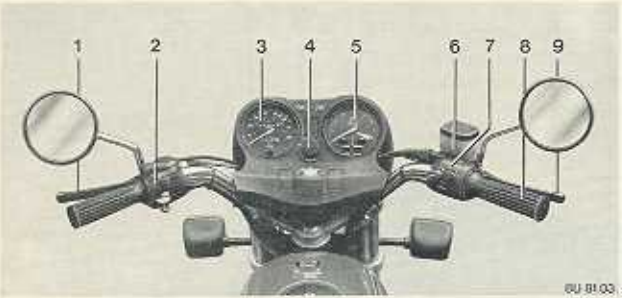
1. Steering lock
2. Fuel filler cap
3. Engine oil dipstick and refill opening
4. Petcock
5. Engine number
6. Seat lock
7. Passenger's hand grip
8. Center stand
9. Side stand
10. Gear shift pedal
11. Rider's foot rest (left)
12. Passenger's foot rest (left)
13. Spring strut adjusting lever (left)



Location of Parts

1. Battery (under battery cover)
2. Toolbox (under seat)
3. Brake fluid reservoir for front disc brake
4. Frame number (on steering head)
5. Spring strut adjusting lever (right)
6. Passenger's foot rest (right)
7. Rider's foot rest (right)
8. Rear brake pedal
9. Manufacturer identification label



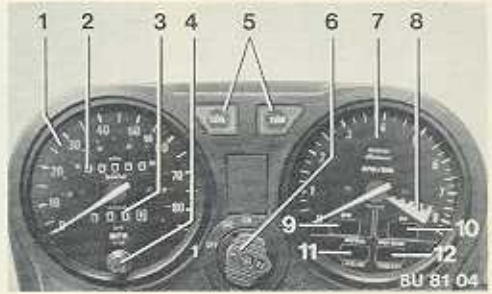


Location of Operating Controls

1. Clutch lever
2. Left handlebar switch unit
3. Speedometer
4. Main switch
5. Revolution counter
6. Brake fluid reservoir for front disc brake
7. Right handlebar switch unit
8. Throttle grip
9. Front brake lever

Location of Instruments and Telltales

1. Speedometer
2. Odometer
3. Tripmeter
4. Tripmeter reset push button
5. Turn indicator flashers
6. Main switch
7. Revolution counter
8. Overspeed warning indication
9. Battery charge telltale (red)
10. Oil pressure warning (red)
11. Neutral indicator (green)
12. Headlight high beam telltale (blue)



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Main Switch Fig. 5

OFF = All electrical systems off – key can be removed.

P = Parking light – key can be removed.

ON = Ignition and all electrical circuits switched on. Battery telltale and oil pressure warning should be illuminated; high beam, neutral and turn indicator telltales operational, automatical switch on of main-beam, key cannot be removed.

6

Left Handlebar Switch Unit. Fig. 6

1 = Horn push button

2 = Dip switch:
Upper position – high beam
Central position – low beam
Lower position – headlight flasher
(returning automatically to low beam)

3 = Turn indicator switch

Caution

Parking light with engine switched off should not be illuminated longer than 2 hours.

7

Right Handlebar Switch Unit. Fig. 7

1 = Kill switch: upper and lower position (OFF) – engine stop.
Central position (RUN) – ignition operational

2 = Starter push button

Note

Engine can only be started with kill switch in "Run" position and gearbox in neutral or declutched.

8

Cold Start Device (Choke) Fig. 8

0 = normal position – for starting with engine at operation temperature
(open throttle slightly)

1 = operating position – for starting cold engine, generally keep throttle closed, open only as far as necessary.
Switch to mid-position and normal position in steps to maintain always best throttle response.

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2 = mid-position – for riding with cold engine.

Petcock. Fig. 9

0 = (left or right): OFF

1 = (down): ON

2 = (up): RESERVE

Warning

Close petcock when parking your motorcycle.

Steering Lock. Fig. 10

Insert key into steering lock and turn to the left while handlebar is

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turned slightly until lock and key can be pressed in – then turn key clockwise and remove it. To unlock, insert key and turn counterclockwise until lock retracts automatically.

Caution

Never leave key in steering lock after releasing steering. The key head could be snapped off when turning the handlebar.

Never open or close the lock violently.

11

Opening of the Dual Seat Fig. 11
To turn up the dual seat, first unlock (position 2) and then press button 1 while slightly pushing down the dual seat.
To lock, turn key clockwise to position 3.

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Helmet Holder, Fig. 12
A hook is provided for locking a helmet to the motorcycle at the front end of the side grip.
When locking the seat, automatically the helmet is secured too.

Warning
Do not operate your motorcycle with a helmet locked in the helmet holder, as it may interfere free movement of the rider's left leg.

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Storage of Cable Lock Fig. 13
As additional equipment a special BMW-steel cable lock can be purchased that fits in the dorsal tube under the tank.

Before Starting – Safety Check
Make it a rule to check the following items before you start your motorcycle.

Tire Treads:
Should have at least:
2 mm up to 80 mph (130 km/h)
3 mm over 80 mph (130 km/h)

Tire Pressures:
Should be corrected to suit load (see page 87 or rear fender label).

Warning
Riding with too low tire pressure may cause damage to the tires and an accident.

Brakes:
Check brake pads and linings.
Rear brake pedal play:
16 to 24 mm (see page 28 and 63)

In case of brake fluid leakage see your BMW dealer immediately.

Clutch:
Clutch lever play: 2 ± 0.5 mm, (see page 29).

Throttle:
Play at carburetors 0.5 to 1 mm must be identical on both cables. (see page 79).

Nuts and Bolts:
Check tightening of front and rear axle nuts and clamp bolts, center stand bolts, footrests, rear spring strut mounting, connecting bolts rear frame to main frame.

Engine Oil:
Oil level should be between the two marks on the dipstick. (Before adding oil – see specs, page 88).

Gasoline:
Check supply in tank.
Do not overfill fuel tank, let some space to allow fuel to expand.

Electrical Equipment:
Check all lighting devices and horn.

Rear-View Mirror
Check and adjust for sufficient rear view.

Rear Spring Struts
Check setting for actual load (see page 29).

Center Stand and Side-Stand
Check that both have snapped back correctly, before riding away.

Warning
If any stand is not fully retracted in its normal designed resting place, it could cause an accident.

When riding, always wear a helmet
A helmet should fit well to avoid fatigue.

If the face shield is scratched, your vision will be affected. Renew a scratched face shield without delay.
It is good practice to carry a spare face shield along.

A dark face shield will possibly be bad when driving at night.

Gloves, a kidney belt and leather boots are other essential items of equipment for protecting your health.

For any trip longer than just "round the block", you should make it a habit of wearing a leather or all-purpose suit. This should provide full wind protection but still "breathe".

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Front Brake Control. Fig. 14
Brake lever free travel was aligned at the factory and cannot be adjusted.

Full pressure should be achieved after approx. 1/3 of total brake lever way.

Caution
The disc brake pads are designed to produce full brake action even after long runs in heavy rain without any response time.

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Rear Brake Control. Fig. 15
Foot brake pedal free travel (a) of 16 to 24 mm can be adjusted by turning nut at linkage (see page 63).

Warning
If in doubt about condition of any brake device, check with your BMW dealer immediately.

Engine Oil Dipstick. Fig. 16
Check oil level after engine has been stopped for some time. Level must not fall below minimum mark.

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Adding oil beyond maximum mark can prove harmful.
The difference between upper and lower mark is approx. 850 cc.

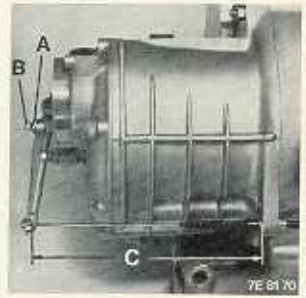
Caution
Use oil of same grade and specs for refilling (see page 88).

Note
To check oil level, push dipstick in – but do not screw in.

17

Clutch control, Fig. 17 and 18
Clutch lever free travel should be 2 ± 0.5 mm.

Adjustment
- Loosen knurled lock nut 1.
- By turning the knurled screw 2 at handlebar control unit adjust clutch lever at gearbox housing to clearance C = 201 + 2 mm. This means, lever shows approx. 4° backwards.
- Tighten knurled lock nut.



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- Loosen lock nut A (13 mm hex. wrench) at clutch lever on gear box.
- By turning screw B (10 mm hex. wrench) at clutch lever on gearbox adjust free travel of 2 ± 0.5 mm either on clutch lever on handlebar control unit or gearbox housing.
- Tighten lock nut at clutch lever on gearbox.

Note
Do not adjust clutch lever free travel with knurled nut and screw on handlebar.

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Rear spring strut adjusting, Fig. 19
Preload can be varied to suit riding and load conditions by adjusting spring support to three different positions:

1 = Normal, for solo riding
2 = for solo and baggage or a light pillion passenger
3 = for maximum load

Starting the engine
Open petcock, put cold start device (choke) to corresponding position (see page 25), switch on ignition, select neutral, or declutch.

Push starter button on right handlebar control unit.
Generally keep the throttle closed, open only as far as necessary.
Release starter button immediately when engine has started. If your motorcycle is equipped with a kickstarter (optional equipment), move pistons until short way before TDC, retract kickstarter and then put your entire weight on it to kickstart the engine – if the engine fails to start, restart immediately after crankshaft stopped rotating.

Your motorcycle is equipped with an electronic ignition system, whose control circuit is switching off within a short time to secure the electronic system.
Reactivating is achieved by repeating starting procedure.

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After start-up, the oil pressure warning lamp (2) should go out and the battery charge telltale (1) should go out above a fast idling speed (see fig. 20).

Caution
If oil pressure warning lamp fails to go out or comes on while riding, stop engine immediately (be careful when motorcycle is in motion. To avoid blocking of rear wheel, pull clutch and brake down smoothly). Check oil level. If it is correct, have motorcycle checked at your BMW dealer. Do not run engine any longer without having eliminated the fault.

Caution
If battery charge telltale fails to go out or lights up while riding, battery is bound to go flat. Have the electrics checked as soon as possible.

Important Break-in Rules
The performance and life of your BMW are greatly influenced by correct break-in. Even the most carefully machined rotating and sliding components tend to bed in further during the inital period of operating. Running-in is best achieved by journeys on country roads with plenty of bends and slight gradients, so that you can ride below the quoted maximum speeds in the various gears, and subject your new machine to frequent changes of engine speed and load, without any risk of exceeding the specified maximum engine speeds.

Avoid violent braking until at least 500 km (app. 300 miles) have been covered, especially from high speed, and do not brake heavily. Brake linings or pads need break-in too, if they are to achieve their full specified friction and wear ratings later on. The tires, like the brakes, need break-in for the first 500 km (app. 300 miles) before they provide maximum grip in all running conditions.

Engine speed limits during break-in
Up to 1000 km (app. 600 miles)
4000 rpm
From 1000 to 2000 km (app. 600 to 1200 miles)
4500 rpm

Note
After 1000 km (600 miles) have been covered, the first Service Check is due.

During this initial service, a number of important checks and adjustments are to be made as well as the oil change, so that your BMW is ready to give reliable performance for a long time to come.

Shifting, Fig. 21
To select neutral, pull clutch lever and press the pedal down repeatedly until the final position is reached. Then raise the pedal once to obtain neutral – the green neutral indicator lamp will come on.

It is easier to engage neutral while the engine is still running. If necessary, allow the clutch to slip slightly.

To ride away from a standstill, pull clutch lever and press the gear shift pedal down – the green neutral indicator lamp will go out. While opening the throttle slightly, release the clutch lever smoothly. Become accustomed to the clutch engagement point.

To shift to higher gear (2nd, 3rd, 4th, and 5th), release the throttle, declutch and pull the gear shift pedal up to engage the next higher ratio. Then accelerate again as necessary and engage the clutch smoothly. If the pedal can be moved up without resistance, the gearbox is in 5th gear.

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To shift down to a lower ratio, release the throttle, declutch and press the gear shift pedal down to the next lower gear. Release the clutch as smoothly as possible, accelerating slightly so that the change to a lower gear is not transmitted abruptly to the drive train and rear wheel.

Caution
Do not shift down at high (above 6000) rpm or the engine may be damaged by overrevving.

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Center Stand, Fig. 22
To put the motorcycle on its centerstand, push stand down on projecting peg until it is touching the ground. Put your right foot onto centerstand end, rest your entire weight on it and pull motorcycle upwards and to the rear using the grab handle below seat. Hold handlebar with left hand to keep motorcycle balanced.

Side Stand. Fig. 23
To put the motorcycle on its sidestand, put sidestand out and push it to the front until stop is reached. Put motorcycle carefully on sidestand. To put motorcycle from sidestand, relieve the weight and push sidestand back to its designed resting place.

Caution
Make sure that the ground is firm and flat. A soft or loose surface could cause the machine to fall over.

Warning
Check that centerstand as well as sidestand have completely snapped back into its designed resting place before riding away.

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General Riding Hints

If this is your first big motorcycle, get accustomed to it step by step, even being an old master. To get accustomed to the approx. 200 kg of your BMW, look for a place where you can practise without any risks – but make sure that you obey all local laws and regulations.

At slow speed, ride in circles and figures of eight, clockwise and counter – clockwise, reducing the radius gradually, sitting on the seat or standing on rider's foot rests. Include grass, sand and loose surfaces like gravel.
The less you need to take your feet off the foot rests at slow and very slow speeds the more confident you are with handling your motorcycle.

Get skilled in technical operation: get used to the clutch engagement point and train shifting gears. Practise acceleration and braking as well as operating all control switches. If you are fully conversant with the operation and take up to road traffic, wear easily visible protecting clothes and – as a rule – a helmet.

Keep your eyes open! It is vital for you to know, what is going on ahead, behind and beside you, as well as to be aware of the road surface which you are about to ride. Sudden, violent acceleration or braking are bound to cause more rapid wear.

Do not allow engine speed to drop too low, in particular on long uphill gradients.

Shift to a lower gear early enough. On downhill gradients, engine braking effect can be enhanced by shifting down to the next lower gear – provided that the maximum engine rpm limit is not exceeded, especially during break-in period! (See breaking-in instructions on page 31).

Never ride downhill with the clutch released, the gearbox in neutral or – particularly dangerous – with the ignition switched off. Always apply both brakes at once smoothly and remember that your brakes are equipped with pads which produce full braking action even in heaviest rain without any response time. Increase pull on the lever and pressure on the pedal gradually, but avoid wheel locking and skids. If you need to apply the brakes, do so **before** you enter a bend. A rider who has to brake when actually cornering has badly misjudged the bend. Maintain an ample safety gap between yourself and other road users. Never overtake anyone who is himself in process of overtaking a slower vehicle. Do not creep through narrow gaps between two columns of vehicles in a traffic jam.

Riding over Obstacles

Avoid riding over cornered or sharp-edged obstacles and curbstones.
If this cannot be avoided, check tires and rims thoroughly, immediately afterwards.

Warning
Straightening damaged parts is not approved and could impair vehicle safety.

As you come to a standstill, select neutral. If the clutch is held out of engagement or allowed to slip for a prolonged period, local overheating may occur and lead to unnecessary wear.

To stop the engine always switch off the ignition.

Warning
Exhaust pipes and muffler become very hot during normal operation of the machine. Avoid touching them.

Two-up Riding

If you are fortunate enough to share your motorcycling pleasure with a pleasant companion, you should make it a rule not to misuse that person's confidence and trust in your riding.

Your companion must be provided with the same complete, good quality riding wear as your own. Adopt a smooth, neat riding style, fold down the passengers footrests and adjust the suspension settings beforehand and explain the most important safety factors to any newcomer to motorcycling as following:
Keep a firm hold on the rider in front or on the seat handgrip. Don't lean excessively into curves, nor resist the normal heeling-over movement. When cornering to the left, look ahead over the front rider's left shoulder. And when cornering to the right, look over the right shoulder. Keep your feet on the passenger's footrests, and keep still whenever the motorcycle is in motion.

Don't distract the rider's attention.

Never carry an animal on the motorcycle.

Wet Weather Riding
If you are equipped with good wet-weather clothing – integral helmet, rainproof suit, waterproof gloves and boots – you can ride for hours on end through bad weather without discomfort. Remember to accelerate more gently to prevent wheelspin, to brake as smoothly as possible, to increase the distance you maintain from other vehicles and – in all circumstances – to reduce your speed.

Take care when crossing rails, manhole covers or solid-block surfaces.

Your dealer can supply products which prevent misting of helmet face shield or goggles.

Long Range Touring
On a touring vacation or very long journey, you should take the following items with you as a precaution:

- 1 oil filter
- 1 set of spark plugs
  1 spark plug cap with cable
- A few M 6 and M 8 bolts and nuts
- Wire, insulating and adhesive tape
- 2 spare inner tubes (front and rear)
- 1 carburetor throttle return spring
  1 diaphragm for constant depression plunger
- 1 choke return spring some 8 Amp fuses
- 1 set of control cables

The cables can be taped in place alongside the existing ones leading from the handlebar controls.

Before starting a major journey it is always a good idea to have the machine checked over thoroughly at your BMW dealer's.

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Tool-Set, Fig. 24
The tool-set is located in the toolbox underneath the dual seat. It contains all necessary tools to carry out different operations on the motorcycle.

Loading Schedule

Max. number of persons:	2 (1 rider and 1 passenger)
Max. load incl. persons and additional accessories:	193 kg (425 lbs.)
Max. permissible gross weight:	398 kg (877 lbs.)
Max. load in BMW saddle bags (each)	10 kg (22lbs.)
on BMW luggage rack	5 kg (11 lbs.)
in BMW tank-bag	10 kg (22 lbs.)

Make as much use of a tank-bag as possible, as its weight does not affect weight distribution between the axles so severly. When using saddle bags, always install both bags and divide load between them.

Note
When using a tank-bag, make sure that the tank ventilation in the filler cap is clear.

Warning
Never exceed the maximum permissible loading weight.

Saddle bags
To accomodate your luggage, we recommend the **BMW saddle bags.**

The saddle bags hold approx. 10 kg each, with space for a helmet – and are designed for the machine. However, when fully laden you should not exceed 130 kmph (82 mph).

Service – without doubts!

High quality engineering inspires confidence. You need not ride your new BMW very far to discover this.

A high-quality motorcycle deserves expert attention and care, so that your riding pleasure remains undisturbed for many years.

Try to have your BMW serviced or repaired at an authorized BMW workshop always. All the equipment and facilities available there are specially made to suit BMW and the workshop is required by contract to install only genuine BMW parts. You should always be suspicious when offered other parts of allegedly equivalent quality, since we are unable to test them and vouch for their suitability.

Genuine BMW parts protect you against difficulties and reduce the risk to which you are exposed on the roads. Genuine BMW parts are not merely 'spares', but identical with the parts originally fitted.

The range of genuine BMW parts comprises all spare parts and units as well as accessory items supplied by BMW MOTORRAD GMBH, whether they are manufactured by BMW itself or obtained from subcontractors.

Replacement of 'one original part by another' ensures that the superior design and engineering concept of every BMW is maintained, so that you can make full and safe use of your machine's performance.

Every authorized BMW motorcycle dealer is required to keep full stocks of the following genuine BMW items:

Frequently required BMW spare parts.

A complete range of genuine BMW accessories.

The world-wide BMW MOTORRAD GMBH parts service ensures that all BMW dealers stock only the genuine BMW parts for which the BMW MOTORRAD GMBH provides a full quality guarantee.

Genuine BMW Accessories

We offer you more than just a lot:
the whole lot.
This implies a comprehensive system of complementary and perfect accessories as well as optimum motorcycle clothing for rider and passenger alike.

The harder to please a motorcyclist and the more practice he has, the more attention he will pay to highly pretentious accessories. Do never make compromises – demand the best: Seize the opportunity that offers you the wide range of genuine BMW accessories. Equip yourself as well as your motorcycle to your own taste, yet not running any risk'.

Genuine BMW accessories have been designed in compliance with BMW's own standards to guarantee not only the same non-compromise BMW quality as goes into the motorcycle itself, but also to ensure that the accessories you buy will match your machine perfectly and thus not affecting your riding safety. A full BMW quality guarantee on all genuine BMW accessories is evidence of our attention to even the smallest details.

Genuine BMW Motorcycle Accessories
The comprehensive range of accessories:

Saddlebag and suitcase
Saddlebags with separate inner suitcase, and various types of tank bags.

Technical accessories
E.g. luggage carrier, saddle bags and saddle bag carrier, HD spring damper, steering damper, cylinder protection bars, cockpit fairing, windshield, twin horns, multi-purpose lamp, auxiliary driving lights, socket, hazard warning flashers, additional instruments, heated handlebar grips.

Maintenance and Service
E.g. inspection set, oil change set, tire service set, paint spray, super toolkit.

For safety reasons we advise you to use genuine BMW accessories exclusively.

Genuine BMW Motorcycle Clothing
Engineers have participated in designing BMW motorcycle clothing to ensure a harmonious combination of function and design that determines BMW's own line:

BMW leather clothing
suits, boots, gloves, kidney belts – a complete range of various colors and designs
BMW underwear
BMW sweater
BMW rain clothing
BMW overall
BMW sports and wind jacket

Genuine BMW motorcycle accessories and clothing can be obtained from any authorized BMW motorcycle dealer.

The various accessories listed above may not all be permitted in certain countries on account of local legislation.

Your BMW dealer will gladly advise you and provide detailed information.

Maximum Loads, Additional Accessories

Important Recommendations
All pieces of baggage should be attached as low down as possible, so that the machine's center of gravity is not altered.

Avoid items that project beyond the rear of the machine, as these can make the motorcycle unsafe to ride. Baggage must always be secured firmly. Make sure that no item can come loose during the journey. Check that the load is secure at regular intervals (but do not attempt to inspect the baggage while the machine is in motion). Secure any loose items before continuing the journey.

Do not carry heavy or bulky items on the luggage rack (optional equipment). This is intended only for lighter, smaller loads, and overloading at this point can upset the machine's weight distribution.

Check that the items carried on the machine do not affect the lights, ground clearance, maximum cornering angle, the controls and instruments, front and rear suspension travel or any other functions of the motorcycle and its equipment. If a fairing, windshield, backrest or similar accessory is attached, there is a risk that stability and handling may be affected – not only by the additional weight but also by the aerodynamic forces acting to the motorcycle. Poorly designed or constructed accessories will spoil the machine's handling, particularly when the distribution of weight between the axles is not ideal. Additional weight at the handlebar or on the fork increases the inertia which has to be overcome when steering, and can seriously endanger safe riding.

Additional items of electrical equipment can overload the motorcycle's electric system. This motorcycle is neither designed for use with a sidecar nor for towing a trailer, BMW does not manufacture any accessories for these purposes and cannot be responsible for any undesirable effects on performance or stability which they may cause.

BMW warns intending users of non-approved items that road safety may suffer, and recommends them to consider the possible consequences most carefully before using the motorcycle in a manner not approved by the manufacturer.

Service and Maintenance

Before delivering your motorcycle to you, your BMW dealer will have carried out a **Free Pre-Delivery Check.**

At 1000 km (600 miles) it is vitally important for the reliability and a long life of your motorcycle that the important **600 miles (1000 km) Service Check** will be performed.

At an odometer reading of 7500 km (5000 miles) the **BMW Service** is due.

At 15.000 km (10.000 miles) the comprehensive **BMW Inspection** must be carried out. After this, **BMW Service** and **BMW Inspection** alternate every 7.500 km (5.000 miles). On the following pages all items of the **600 miles (1000 km) Service Check** and the regular maintenance are scheduled and explained.

Important
- All these instructions are based on the assumption that this motorcycle will be used for its intended purpose under regular circumstances only. **Operation in unusual or extreme conditions will require more frequent servicing.**
- The wearing quality of several items is influenced not only by mileage, but also by time, so we recommend to **have at least 2 BMW Inspections performed each year.**
- Make sure that **all service work is confirmed by the dealer's stamp and signature** in the spaces provided for in this manual. This precaution will prevent possible difficulties in establishing eventual warranty claims.

After the **600 miles (1000 km) Service Check** the reminder label for the next **BMW Service** from this manual should be affixed under the seat at a point where it cannot be overlooked. The same procedure should be followed up for all subsequent **Service** and **Inspection** reminders. Therefore, take this manual with you when the motorcycle is returned to your dealer for maintenance.

Every authorized BMW dealer carries out the various works according to flat rates in the manufacturer's official flat rate manual. He is in possession of all required special tools and knows your motorcycle best. Therefore, we recommend that all maintenance and repair should be performed there.

Service Schedule R 65

Operations	600 miles (1000 km) Service Check	BMW Service	BMW Inspection
○ Changing engine oil and replacing oil filter cartridge	X	X	X
○ Changing oil in gearbox, drive shaft housing, final drive and telescopic fork	X		X
○ Lubrication of swinging arm bearings and clutch cable joints		X	
○ Replacing air cleaner element			X
○ Cleaning carburetor float chambers	X	X	X
○ Cleaning petcock (filter screen in outlet)			X
○ Removing front and rear wheel, check brake caliper, disk, drum and pads or linings as well as all operating parts, replacing damaged parts if necessary*, check bearing play, adjust if necessary*. Installing front and rear wheel			X
○ Checking free travel of rear brake, adjust if necessary	X		X
○ Checking free travel of clutch, adjust if necessary	X		X
○ Tightening of cylinder head nuts, adjusting valve clearances	X	X	X
○ Renewing of spark plugs			X
○ Control of ignition timing	X		X

* Extra charge for this service

Service Schedule R 65

Operations	600 miles (1000 km) Service Check	BMW Service	BMW Inspection
Checking bearing play of steering and swinging arm, adjust if necessary*			X
○ Checking brake fluid level; checking hydraulic brake system for leaks. **Important: Change brake fluid annually**	X		X
○ Checking acid level of battery, adding distilled water if necessary*			X
○ Checking battery poles, cleaning and lubricating if necessary*			X
○ Check tightening of bolts and nuts: Engine, center stand to frame, side stand, spring strut mounting, rear frame to main frame, axle nut and clamping bolts, hose clamps on carburetors and bellows of drive shaft	X		X
○ Synchronizing carburetors and adjusting cables	X	X	X
○ Final inspection and check for road safety: condition of tires, wheels, tire pressure, lights, signals, indicator lamps, clutch, shifting, foot- and hand-operated brakes, steering instruments	X	X	X

* Extra charge for this service

Recommendation:
Lubricate steering and wheel bearings at 30.000 km or 20.000 miles intervals.

We certify that below services have been performed in accordance with BMW instructions.

Pre-delivery
check

performed correctly

on _____

at _____ km (miles)

_____

Dealerstamp and Signature

We certify that below services have been performed in accordance with BMW instructions.

600 miles (1000 km)
Service Check

performed correctly

on _____

at _____ km (miles)

_____

Dealerstamp and Signature

Lubrication Chart

1 Oil level control plug for final drive oil level
2 Filler plug for final drive
3 Drain plug for final drive
4 Drain plug for drive shaft housing
5 Filler plug for drive shaft housing
6 Grease nipple for swinging arm bearing (2 = left + right)
7 Full-flow oil filter
8 Oil drain plug for telescopic fork (2 = left + right)

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9 Engine oil dipstick and refill opening
10 Drain plug for engine oil
11 Drain plug for gearbox oil
12 Filler plug gearbox oil
13 Grease nipple for swinging armbearing (2 = left + right)
14 Clutch lever pivot
15 Filler plug for telescopic fork oil (2 = left + right)

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Lubrication

Engine Oil Change. Fig. 27
Open drain plug (8 mm Allen key) and drain oil at normal operating temperature (approx. 80°C/ 195°F) only.

Install new gasket and reinstall drain plug.

Refill fresh oil after filter renewal at dipstick opening.

Oil capacity (incl. filter renewal): 2500 cc 2.6 qt

Oil level: between two marks (MIN-MAX) on dipstick. Difference between these two marks is about 850 cc.

Oil grade: Brand name engine oil (see page 88).

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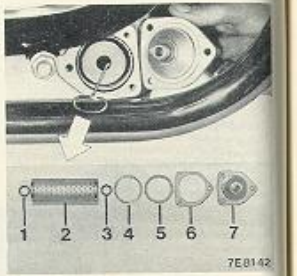
Caution
Make sure that all gaskets and the sheet metal ring are correct positioned.



28

Engine Oil Filter Renewal. Fig. 28
Loosen three cover screws (10 mm hex. wrench).
Remove cover incl. O-rings, paper gasket and sheet metal ring. Pull out filter element using a thin wire hook.
Remove rear O-ring of center pipe. Install new O-ring (1) on center pipe. Put new filter element (2) and sheet metal ring (4) inside oil filter housing; put new paper gasket (6), small (3) and large (5) O-ring on cover. Reinstall cover (7).

29

Gearbox Oil Level. Fig. 29
Check oil level by detaching filler plug (8 mm Allen key).

Oil level: up to lower edge of filler opening with motorcycle in level position.
If necessary add oil of same grade (see page 89).
Install new gasket and retighten filler plug.

30

Gearbox Oil Change, Fig. 30
Drain oil at normal operating temperature (80°C/195°F).
Drain plug (19 mm hex. wrench)
Clean magnet on end of plug from foreign material.
Install new gasket and retighten drain plug.
Oil capacity: 800 cc.

Oil grade: Brand name hypoid gear lube, see page 89 for correct viscosity.

31

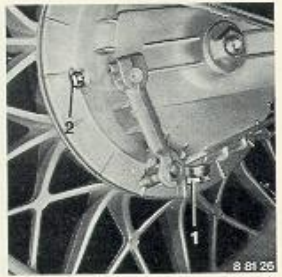
Drive Shaft Housing Oil Level, Fig. 31
Check oil level by detaching filler plug (17 mm hex. wrench) Insert a suitable rod (e.g. screwdriver) vertically and allow it to rest on the rear drive bevel.

Oil level: 2 mm above bevel with motorcycle in level position. If necessary add oil of same grade (see page 89). Retighten filler plug.

32
Drive Shaft Housing Oil Change.
Fig. 32
Drain oil at normal operating temperature only (approx. 60°C/ 140°F).
Drain plug: 17 mm hex. wrench. Retighten drain plug incl. new gasket.

Oil capacity: 150 cc.

Oil grade: Brand name hypoid gear lube, see page 89 for correct viscosity.



33
Final Drive Oil Level. Fig. 33
Check oil level by detaching oil level control screw (2) with 12 mm hex. wrench. Oil level should be up to control opening with motorcycle in level position. If necessary add oil of same grade through combined bleeding and refill screw (see fig. 34), 17 mm hex. wrench, until oil level reaches control opening. Install new gasket and retighten both screws.

34
Final Drive Oil Change.
Fig. 34
Drain oil at normal operating temperature only (approx. 60°C/ 140°F).
Drain plug: 19 mm hex. wrench (fig. 33, detail 1)
Clean magnet on end of plug from foreign material.
Retighten drain plug incl. new gasket.

Oil capacity: 350 cc or up to control opening.

Oil grade: Brand name hypoid gear lube, see page 89 for correct viscosity.

35
Telescopic Fork Oil Level.
Fig. 35
To check oil level place motorcycle on centerstand and allow front fork to extend fully. Remove upper filler plugs (8 mm Allen key backing up with 19 mm hex. wrench). Insert a piece of 5 mm (3/16 in) strong welding rod (approx. length: 1 m) until it touches the bottom. Alternate on both sides.

Oil level: 30 mm above bottom identical on both sides.

36
Telescopic Fork Oil Change.
Fig. 36
Put motorcycle on centerstand. Unscrew drain plugs (12 mm hex. wrench) on both sides.
Pull both sliders up and down. Allow used oil to drain out completely. Reinstall drain plugs incl. new gaskets. Refill fresh oil through filler plug holes. Install new gaskets and retighten filler plugs.
Bleed the telescopic fork by compressing it several times.

Total capacity of each fork leg: 190 cc.
Refill capacity of each fork leg: 175 cc.
Oil grade: see specifications (page 89).

Lubrication of Wheel Bearings
Every 30 000 km (20 000 miles) check grease content and repack with grease if necessary.

Grease grade: multipurpose lithium saponified.

Note
It is recommended to have this done by an authorized BMW dealer.

37

Lubrication of Rear Swinging Arm Bearings, Fig. 37
Remove dust covers left and right. Lubricate using a grease gun with taper nozzle. Reinstall dust covers.

Grease grade: multipurpose, Lithium based.

Lubrication of clutch controls
Pivot and control cable nipple require a few drops of engine oil, as well as the control cable nipple on clutch lever at gearbox.

Note
All control cables are provided with permanent gliding coating inside.

Therefore they are maintenance free and should not be lubricated.

Warning
Keep tires, brake disc, brake pads and linings clean from any lubricant.

38

Removing of the Gas Tank, Fig. 38
Close petcock, pull off fuel hose and bleeding hose. Fold back dual seat and place tool-box on rear fender to avoid incidential closing of dual seat. Whilst pulling fastener, press gas tank down on the rear end. Lift the rear end of tank backwards and then lift it on frontside upwards out.

Reverse order to reinstall.

Battery
At least once a month, check acid level in cells of battery. If level has dropped too low, add distilled water (not acid) to approx. 5 mm above top of plates inside cells.

Keep top of battery clean and dry. Protect terminal posts and clips against corrosion by applying a thin coat of special acid resistant grease (Vaseline). If the motorcycle is out of service for a lenghty period, recharge battery once a month in order to prevent sulfate growth on plates or give it to the workshop to be serviced over this period. For battery capacity, see specifications.

Warning
Never allow battery acid or lead oxide from the terminals to touch your skin or your clothing. Keep sparks or naked flames away. Recharge battery only in a well ventilated area. Batteries produce high explosive gases.
Filler caps must be tight.

Caution
When charging battery, always disconnect negative (–) and positive (+) cable to prevent damage to the diode board and remove filler plugs. Protect immediate area from paint damages due to escaping gases.

Caution
Battery acid is corrosive to metal and enameled surfaces. Before recharging or removing battery, always switch off engine and disconnect terminals. Never run engine without battery connected, or else alternator may become destroyed. Check that battery venting hose is routed correctly, and open.

39

Removal of Battery, Fig. 39
- Open dual seat, remove tool-box and side covers.
- Loose rubber ribbons to remove battery cover.
- Disconnect battery leads – first negative then positive lead.
- Pull venting hose.
- Unplug cable connector and put aside.
- Pull battery out upwards.

Reverse order for reinstallation.

Adjustment of Bearings
Steering-, wheel-, and rear swinging arm bearings are tapered roller bearings, and are preloaded. For proper function absence of play and correct torque is required.

Note
We recommend that all bearing adjustments should be carried out by an authorized BMW dealer.

40

Steering Bearings Check. Fig. 40
Put motorcycle on center stand.
Push and pull fork legs vigorously. No play is allowed. If necessary have bearing pre-load retorqued correctly.

41

Wheel Bearings Check. Fig. 41
Put motorcycle on center stand.
Have alternatively front and rear wheel off the ground. Push and pull then vigorously in sideways direction.
No play is allowed.
If necessary have bearing preload retorqued correctly.

42

Rear Swinging Arm Bearings Check. Fig. 42
Put motorcycle on centerstand.
Lift rear wheel off the ground.
Push and pull rear swinging arm vigorously sideways. No play is allowed.
If necessary have bearing preload retorqued correctly.

Brakes

Front Disc Brake
The disc brake pads are selfadjusting, so that there is no need of any adjustment.

Renewing Brake Pads. Fig. 43
Remove plastic cover from brake caliper.

Force out both brake pad retaining pins from the inside with a suitable drift.
Push back plungers, thereby make sure that there is enough space in the brake fluid reservoir to allow brake fluid to flow back.
Lift off spreader spring and pull out brake pads.
Insert new brake pads.
Assembly in reverse order.

Brake Fluid
When brake pads are new, brake fluid level in reservoir should be up to upper 'Max', marking. As brake pads wear, level in reservoir drops.

Warning
Brake fluid must be kept out of reach of children as it may be harmful or even fatal if swallowed. In case of contact with skin or eyes flush with water. Brake fluid is also harmful to any paint finishes.

43

Warning
If pressure at handbrake lever is too low, brake system must be bled and checked for leakage.

44

45

Bleeding the Brake System
If action of disc brake lever feels 'soft', brake system must be bled. First open reservoir (Philips head screw driver), **Fig. 44** then add brake fluid, to correct level, reinstall cap. After this, remove protecting cap of bleed screw at caliper. Mount bleed hose and immerse it in a container containing brake fluid. **Fig. 45**

Apply handbrake lever a number of times until braking pressure is detected. Hold lever tight and open bleed screw.

Do not release lever until bleed screw has been closed. Repeat this process until brake fluid emerges from hose into container entirely free from air bubbles. Tighten bleed screw.
Correct brake fluid level

Note
Do not pump brake fluid reservoir dry, or else air will again penetrate brake system.

Warning
Brake fluid is hygroscopic and is thus capable of absorbing moisture from atmosphere over a considerable period of time. To ensure that brake system remains fully reliable, brake fluid must be replaced once a year. Never recycle used brake fluid.
Use only DOT 4 fluid from a sealed container.

46

47

Rear Drum Brake

Control of Brake Lining Wear
To check the brake linings for adequate thickness, control openings are provided in the wheel hub. (see fig. 46).
Minimum thickness: 1 mm

Renewing Brake Linings
Remove rear wheel (see page 65). Loosen control nut (10 mm hex. wrench). Push out upper brake shoe. Disconnect release spring and remove shoes. To install new brake shoes with lining, proceed in reverse order. Adjust brake.

Adjusting Drum Brake, Fig. 47
Turn control nut on end of pull rod until rear wheel brake just begins to bite. Then turn wing nut back by 2 to 3 turns, this complies with approx. 16 – 24 mm play at foot brake pedal (see page 28).

Warning
If there is too little free movement, the brake may lock-up while the machine is being ridden.

Routine Check of Brake System
Every 15.000 km (10.000 miles) examine all elements of brake operating linkage. Clean brake drum and shoes.
Check conditions of brake disc and pads. Check hydraulic hoses, brake caliper and master cylinder for leakage.

Note
We recommend to have all work on brake system carried out by an authorized BMW dealer.

Operations you can perform yourself

Wheels

Removing and installing Front Wheel. Fig. 48.

- Place motorcycle on center stand.
- From toolkit under seat, remove following items:
  a) 22 mm open-end wrench
  b) 13 mm open-end wrench
  c) 6 mm Allen key
  d) Drift
- Loosen axle clamp bolts (2) with Allen key and 13 mm wrench.
- Remove axle nut (1) with 22 mm wrench. Make sure that washer is not lost.
- Insert drift through transverse hole in axle while turning to and fro slightly. A spacing sleeve (3) will fall from left fork end of axle.
- Pull out wheel forwards.

Caution
Do not apply brake lever when wheel is removed.

48

To install wheel, proceed in reverse order. Note that brake disc(s) must be correctly located between brake pads in caliper(s). Do not forget spacing sleeve and washer.

Caution
Before tightening the right clamp bolt, lower machine off its stand and compress front suspension firmly several times.

This will relieve trapped stresses or distortion between the fork legs.
Tighten clamp bolts. Note correct tightening torque (see page 81).

Removing and installing Rear Wheel. Fig. 49

- Place machine on center stand and adjust rear spring struts to maximum load.
- Use following tools from toolkit under seat:
  a) 22 mm open-end wrench
  b) Two 13 mm open-end wrenches
  c) Drift
- Loosen clamp bolt with 13 mm wrenches.
- Loosen axle nut with 22 mm wrench, and remove it incl. washer
- Place drift through transverse hole in axle and pull out axle turning slightly to and fro.
- Pull off wheel toward the left then pull out to the rear.

49

When rear wheel has been removed, clean brake drum and shoes. Lubricate slightly splines in hub with high temperature grease. Assemble in reverse order. Clean axle, grease slightly and insert into wheel hub, turning to and fro. Do not forget washer. Tighten clamp bolt. Transverse hole in axle should face to the rear. Note correct tightening torques (see page 81).

Warning
Ensure that brake drum and linings are clean from any grease.

Tires

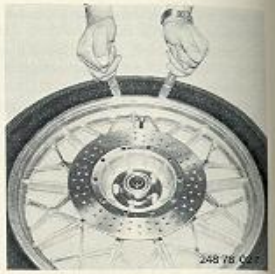
Check tire inflation pressure before riding or at least once a week when tires are cold (Tire temperature must not differ from outside temperature). Inspect tires regularly for punctures, cuts etc. as well as for tread wear (see page 87). If in doubt about tire condition see your authorized BMW dealer.

Warning
Never ride with improperly inflated, excessively worn or eventually damaged tires.

Replacing tires
Always replace tire **and** tube.
Never use patched tubes.
Front and rear wheel tire must be of same brand and suitable type and size, (see page 87) or rear fender label. For proper replacing we recommend your authorized BMW dealer.
Have wheel(s) balanced after new tire is fitted.

In an emergency keep to following procedure:
- Remove wheel with affected tire.
- Unscrew valve and remove locknut.
- Place wheel on clean and flat surface.
- Press tire into rim well around entire periphery (Do not damage brake disc).
- Press tire bead into well base opposite valve and lift tire bead over rim shoulder starting at valve (see Fig. 50)
- Remove tube.
- Lift second bead over rim in same way.
  To install tire, press tire bead into well base starting opposite valve.
- Install tube.
- Press second bead into well base.
- Inflate tire and check proper alignment to rim.
- Drive slowly and carefully to nearest service facility and have wheel and tire checked by a competent person.

Caution
Mind specifications on tire sidewall regarding direction of rotation.



50

Warning
Tires, other than those recommended may be hazardous.
Follow tire manufacturers recommendations and obey laws.

Replacing Bulbs and Fuses

Caution
If working on the electrical system disconnect the negative cable of the battery.
This is done by loosening negative cable at right of gearbox, next to speedometer gearing (10 mm hex. wrench). Insulate cable.
Take care not to loose screw.

Detaching Headlight Reflector
(necessary if replacing H4 bulb, parking light bulb)
Tilt headlamp up slightly and loosen headlight bezel clamp bolt.
Insert screwdriver blade between front bezel and headlamp at lowest point to support removal.
Reassemble in reverse order.

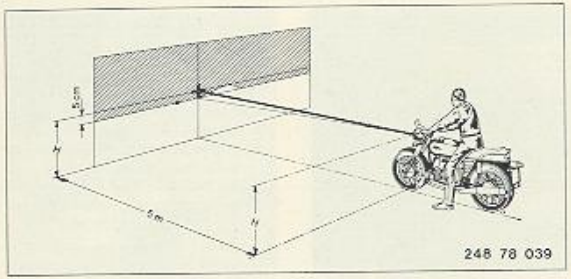
51

Replacing H4 Bulb. Fig. 51
Disconnect multi-pin plug and pull back wire spring clip. Remove used bulb, insert new one. Reassemble in reverse order.

52

Replacing Parking Light Bulb. Fig. 52
Pull parking light bulb holder out of plug-in mounting.
Press in bulb and turn counterclockwise for removal.
Insert new bulb in the same way but turn clockwise.

Caution
Do not handle new bulbs with your fingers, but always use clean fabric.



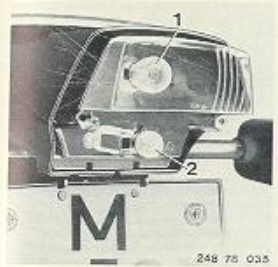
53

Headlight Beam Setting, Fig. 53

Check tire pressures, correct if necessary.
Adjust rear suspension for solo riding.
Position motorcycle on its wheels without using stand. Have a person sitting on the motorcycle.
Measure height of headlight centerline and transfer to wall.

Make marking 5 cm (2 in) below on wall.
Turn on low beam, slacken headlight retaining nut and tilt lamp until light-dark boundary meets mark on wall rising to the right above 5 cm (2 in) and then falling away. Tighten retaining nuts.

Refer to above drawing for correct location of motorcycle.



54

Replacing Rear Light Bulbs. Fig. 54
Loosen two Phillips-head screws and remove lens. Press in bulb turning counterclockwise and then pull it out. Insert new bulb turning clockwise. Reassemble in reverse order.

1 = Brake light 12 V 21 W
2 = Rear light 12 V 5 W

55

Replacing Turn Indicator Bulbs. Fig. 55
Loosen two Phillips-head screws and remove lens. Press in bulb turning counterclockwise and then pull it out. Insert new bulb turning clockwise.
Reassemble in reverse order.

Caution
Install lens with "TOP" mark up.

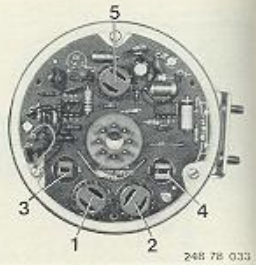
56

Replacing Bulbs of Combined Instrument
Detach covering on bottom of combined instrument (2 Phillips head screws).

Speedometer Lighting Fig. 56
Pull out plug in bulb holder. Remove bulb by pulling lightly. Insert new bulb.

57

Tachometer Lighting and Telltales Fig. 57
Detach multi-pin plug and remove protective cover (Phillips head screwdriver). Pull out plug-in bulb holder of affected bulb. Remove bulb turning counterclockwise. Insert new bulb.
When reassembling make sure that gasket of protective cover is located correctly.



58

Tachometer Lighting and Telltales. Fig. 58
1 = Headlight high beam telltale
2 = Neutral indicator
3 = Oil pressures warning
4 = Battery charge telltale
5 = Tachometer lighting

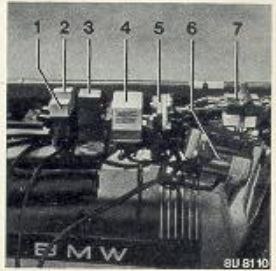
59

Turn Indicator Repeaters. Fig. 59
Turn bulb holder slightly to release and pull out. Remove bulbs (1,2) turning counterclockwise. Insert new bulbs.

60

Replacing Fuses, Fig. 60
Fold back dual seat and remove tool-box. Open fuse box (knurled screw). Blown fuses can be identified at melted metal strip. Pull such a fuse out of spring clips and press in new one.

Caution
Never replace fuses by ones of a higher amperage rating than 8 Amps or even worse by any makeshift device.



61

Central electric under tank. Fig. 61
1. Light relay
2. Starter relay
3. Flasher unit
4. Voltage regulator
5. Control unit for transistor ignition
6. Single ignition coil
7. Plug connectors

General Care

Wash your motorcycle regularly. Especially all moving parts (pedals, levers, linkages of carburetors etc.) and the cooling fins of the engine should be free of any contamination to ensure their proper function. After cleaning lubricate the particular items, if necessary.

Outer surfaces of engine, gearbox, final drive, sliding tubes of telescopic fork, hubs and rims, exhaust system are best treated with a cold cleanser.

For painted areas use a suitable shampoo. Synthetic parts such as instrument housing or fairing windscreen are to be cleaned by a special cleanser or using water and a mild soap.

Do not use a high pressure steam cleaner to avoid possible damage by intruding water in wheel bearings, alternator housing etc.

After washing, dry the whole motorcycle thoroughly, especially all brake components to avoid any possible corrosion or malfunction. To facilitate this, let engine run for a few minutes.

Spray all electrical devices with a universal oil, which displaces water and eliminates creeping currents to avoid possible faults caused by moisture.

Lubricate the felt inserts of the rubber collars on the telescopic fork with engine oil or multi purpose grease.

Remove tar stains, dead insects and rectify minor paint damages which may occur during normal operation as soon as possible to prevent paint discoloration or patches of rust. To remove tar stains use a suitable chemical remover instead of sharp tools to avoid scratches. Treat rubber components with glycerine or talcum.

Coat all sheet metal surfaces with a corrosion inhibiting compound.

Treat all painted areas with a suitable protection wax.

Warning
Make quite sure that all traces of cleaning or lubricating compounds are removed from brake discs, drum, pads and linings.

Caution
Fuel or agressive solvents must not touch synthetic parts such as instrument housing, switches and the windscreen of the fairing.

If storing your motorcycle out of service during the cold season the following additional measures should be obtained:

1. Drain fuel out of fuel tank. Remove fuel tank, fill in 1/2 litre (0.5 US quarts) of engine oil. Close all openings and shake well tank, reinstall it. Clean float chambers of both carburetors.
2. Remove battery, take it to a service station for maintenance and storage.
3. Store motorcycle in a dry room, support center stand by wood blocks, so that both wheels are off the ground.
4. Protect the motorcycle by a dust cover.

   When restoring, drain out oil of fuel tank, fill in gas. Install battery. Have brake fluid renewed. Check tire pressures. Renew engine oil including filter.

   Renew oil in gearbox, swinging arm, final drive, telescopic fork.

Troubleshooting Guide

Trouble	Cure
Engine fails to start	
Main switch in wrong position	Switch to operating position
Kill switch in "OFF" position	Switch to "RUN" position
Gear engaged	Pull clutch or shift to neutral
Choke in wrong position	Use choke as situation requires
Throttle twistgrip in wrong position	Open throttle only as far as necessary
Fuel tank empty	Add fuel
Petcock closed	Open petcock
Battery flat	Recharge battery*
Battery cables loose	Clean and retighten cables
Spark plugs contaminated	Clean spark plugs, renew if in doubt about condition, adjust gap
Engine flooded	Drain combustion chambers, dry spark plugs
Ignition system defective	Have checked ignition system by a competent person

* **Caution**

Recharge battery only with positive (+) and negative (–) cable disconnected and filler plugs removed.

Troubleshooting Guide

Trouble	Cure
Engine runs unevenly, loss of performance	
Air filter contaminated	Renew filter.
Choke being applied too long	Disengage choke.
Throttle cables maladjusted	Adjust cables.
Carburetors contaminated	Have carburetors cleaned by a competent person.
Spark plugs contaminated	Clean spark plugs, renew if in doubt about condition, adjust gap.
Valves maladjusted	Adjust valves at cold engine temperatures.
Fuel/air mixture incorrect	Have carburetors adjusted, have intake system checked for leakage by a competent person.
Ignition system defective	Have ignition system checked by a competent person.
	Warning **Your BMW is equipped with an electronic ignition system and ignition voltage is extremely high and may be harmful when touching open connections on spark plug caps, ignition cables and coil, while engine is running or ignition is switched on.**
Loss of compression or different compression left and right	Have valves, cylinder head gasket and piston rings checked by a competent person.

Emission Related Maintenance

Crankcase Emission Control System

This system draws the crankcase fumes into the combustion air intake and works maintenance free.

Pulse Air System

This system supplies additional oxygen to the exhaust gas and thus improves the emission values without weakening engine performance.
When releasing throttle, this system is cut off, controlled by vacuum pipes connected to the carburetors. This device is also maintenance free.

Intake Air Cleaner

Running the engine with blocked air cleaner element will increase fuel consumption and reduce engine power. Check air cleaner for contamination regularly, renew if necessary.

62

Air Cleaner Element Renewal, Fig. 62

To remove filter element open clips on both sides, lift intake cover slightly, pull out filter element. Insert new element in same way. Take care that filter element is placed correctly into position and clips are fastened tightly.

Caution

Round bent edges of element must face forward.

Upper side is marked "top".

63

Checking Cylinder Head Nuts. Fig. 63 and 64

Remove rocker cover (Fig. 63) by loosening center nut (13 mm) and 2 side nuts (10 mm). Check tightening torque (page 81) of 4 nuts on rocker arm mountings (15 mm) and of 2 retaining nuts (15 mm) above and below at cold engine with a torque wrench according to the sequence shown in fig. 64.

64

Checking Valve Clearances, Fig. 65

To be checked according to the service schedule or each time after tightening cylinder head nuts (cold engine).
Unscrew spark plugs, shift to 5th gear and turn rear wheel, until cylinder is at top dead center on compression stroke. Both valves will then be closed. Check valve clearances using a feeler gauge inserted between valve and rocker.

65

If necessary, adjust valve operating clearances by loosening lock nut (12 mm) and turning adjusting screw (12 mm). Afterwards, tighten lock nut firmly and recheck valve operating clearance.

Note

Valve clearances **for the first 1000 km (600 miles) are:**
Inlet: 0.10 mm (0.004 in)
Outlet: 0.25 mm (0.01 in)
After the first 1000 km (600 miles) the valve clearances are:
Inlet: 0.05 mm (0.002 in)
Outlet: 0.20 mm (0.008 in)

66

Spark Plugs. Fig. 66

Clean spark plugs by dipping in gasoline and brushing, but do not use a metal brush. Check spark plug electrode gap using a feeler gauge. If necessary, adjust:

a = 0.6 + 0.1 mm. Before installing plugs apply a little graphit grease to threads.

Ignition System

Warning
Your BMW is equipped with an electronic ignition system and therefore the ignition voltage is extremely high and may be harmful, when touching open connections on spark plug caps, ignition cables and coil when engine is running or ignition is switched on.

Caution
Timing the ignition by means of a test lamp is not possible – it may damage the impulse transmitter.

Note
The ignition system is fully electronic without breaker points and therefore it is maintenance free.

67

Checking Ignition Timing. Fig. 67
Use a strobe timing light, with trigger coil on right hand ignition cable. Adjust engine speed to approx. 3500 rpm (fully advance) by opening the twist grip slightly. At this speed the flywheel mark "Z" (ignition timing 32° b TDC) should be visible as a bright spot in line with the mark in the inspection hole. If the spot is above the mark, the ignition is too far advanced; if below the mark, the ignition is too far retarded.

68

Timing Ignition, Fig. 68
Loosen two Allen screws on ignition box. Turning impulse transmitter housing in the same direction as engine rotation (clockwise) will retard the ignition, and turning it against direction of engine rotation will advance ignition (engine crankshaft and camshaft rotate in same direction).
Retighten screws firmly when adjustment has been completed.

69

Adjusting engine idling, Fig. 69
Stopped engine must be at operating temperature.
Tighten idle mixture control screw (1) fully on both carburetors. Loosen it by 3/4 turns.

Adjust throttle butterfly stop screw (2) on both carburetors until it just touches throttle butterfly lever, than turn clockwise 1/2 turn.

Start engine.
Adjust engine idle speed to 950 ± 150 rpm by turning simultaneously both throttle butterfly screws.

Adjust both idle mixture control screws simultaneously to maximum idle speed. Then turn them clockwise not more than 1/4 turn.

Note
All engine tuning should be carried out by an authorized BMW dealer.

Warning
Setting the engine idling by alternately disconnecting the spark plug caps while engine is running may be harmful due to extremely high voltage of the ignition system.

70

Adjusting throttle cables, Fig. 70.
The free movement of the throttle cables must be identical on both carburetors (0.5 to 1 mm).
If necessary, loosen lock nut (10 mm wrench), and turn the throttle cable adjusting screw to the right to increase free play or to the left to reduce play. Tighten lock nut.

Tightening Nuts and Bolts

Check following bolts for tightness regularly:

1. Axle nuts and clamp bolts front and rear.
2. Engine mounting nuts front and rear.
3. Center stand and side stand mounting bolts.
4. Hose clips of intake system.
5. Hose clips of drive shaft housing bellows.
6. Rocker cover attachment.
7. Rear spring strut mouting.
8. Rear frame mounting to main frame.
9. Timing chain cover to engine (initial service only).

This must be carried out at least every 15.000 km (10.000 miles) or after maintenance or repair of related items.

Note
For correct tightening torques see specifications.

Specifications

Tightening Torques

Location	Wrench size	Tightening Torque
Wheel axle nuts, front and rear	22 mm hex.	45–48 Nm (33–35 ft. lb.)
Clamp bolts for wheel axle, front	13 mm hex.	14–16 Nm (10–12 ft. lb.)
Clamp bolt for wheel axle, rear	13 mm hex.	15–17 Nm (11–13 ft. lb.)
Rear frame mounting to main frame, upper and lower	13 mm hex.	15–17 Nm (11–13 ft. lb.)
Spring struts mounting bolts,	17 mm hex.	35–40 Nm (26–29 ft. lb.)
upper left and right	17 mm hex.	35–40 Nm (26–29 ft. lb.)
lower right	17 mm hex.	30–35 Nm (22–26 ft. lb.) lower left
Center stand mounting bolts	17 mm hex.	34–37 Nm (25–27 ft. lb.)
Engine mounting nuts, front and rear	17 mm hex.	70–77 Nm (52–57 ft. lb.)
Cylinder head nuts	15 mm hex.	in three steps: 15 Nm (11 ft. lb.) 30 Nm (22 ft. lb.) 39 Nm (29 ft. lb.)
12-sided bolts at gearbox output flange	10 mm, 12-sided	38–42 Nm (28–31 ft. lb.)
12-sided nuts at rear wheel drive flange	12 mm, 12-sided	60 Nm (44 ft. lb.)
Finned exhaust pipe nuts	special size	160 – 180 Nm (118–133 ft. lb.)
Spark plugs	20,8 mm hex.	23–30 Nm (17–22 ft. lb.)

Note For further tightening torques see Repair Manual

Dimensions

Overall width (handlebars, without mirrors)	mm	730
(engine)	mm	688
Overall height without mirror (motorcycle unladen)	mm	1080
Seat height, unladen	mm	approx. 810
Overall length	mm	2110
Wheelbase (curbweight)	mm	1400

Weights

Dry weight	kg	185
Unladen weight (with lubricants, fuel and tools)	kg	205
Permissible gross weight = unladen weight + total of rider, passenger and baggage	kg	398
Permissible wheel load front (at 2.1 bar)	kg	140
Permissible wheel load rear (at 2.2 bar)	kg	270
Max. No. of persons including rider		2

Carburetors R 65

Design		2 inclined constant depression carburetors with needle jet, vacuum plunger, throttle butterfly and central lever float
Type, left		64/32/325
right		64/32/326
Throat dia.	mm	32
Main jet		145
Needle jet		266
Jet needle		Bing 46–241
Needle position		3
Idle jet		40

Engine

Design		Horizontally opposed 4-stroke twin, with overhead valves in hemispherical combustion chambers
Displacement		649.6
Cylinder bore	mm	82
Piston stroke	mm	61.5
Compression ratio		8.2 : 1
Direction of rotation		clockwise, looking at front side
Max. permissible speed	rpm	7650
Max. continuous speed	rpm	7300
Idle speed	rpm	950 ± 150
Location of engine No.		near dipstick
Valve clearances (cold engine)	mm (inch)	intake: 0.05 (0.002); up to 1000 km (600 miles) 0.10 (0.004) exhaust: 0.20 (0.008); up to 1000 km (600 miles) 0.25 (0.01)

Primary transmission

Clutch		Dry single-plate with diaphragm spring.
Gearbox, design		5-speed with dog sleeve shift, load cycle damping in all gears, hook type shift action; flange mounted to engine.
Ratios	1st gear	4.40 : 1
	2nd gear	2.86 : 1
	3rd gear	2.07 : 1
	4th gear	1.67 : 1
	5th gear	1.50 : 1

Secondary transmission

Transmission from gearbox to rearwheel		Enclosed cardan shaft in right swinging arm, universal joint at gearbox end, load cycle damping, helical spline drive connector at final drive end.
Final drive, design		Enclosed palloid cut bevel pinions
Ratio		3.56 : 1
Number of teeth		32 : 9
Speedometer drive ratio	(km)	0.819
	(miles)	1.318

Chassis

Frame	Welded dual loop steel tube cradle frame, bolted-on rear section. **Not suitable for sidecar or trailer attachment.**
Suspension, front	Telescopic fork with large capacity double acting hydraulic shock absorbers; total travel of 175 mm.
rear	Swinging arm with spring struts of 3 position coil springs and double acting hydraulic shock absorbers; total travel of 110 mm
Front wheel caster	approx. 96 mm
Max. steering angle	2 x 42°
Location of manufacturer's plate	on right cradle tube, close to brake pedal
Location of frame number	on right gusset plate of steering head
Brakes	
Front, design	Hydraulic single disc with fixed caliper Disc diameter 260 mm Contact area 37 cm^2
Rear, design	Mechanical simplex drum Drum diameter 200 mm Contact area 89^2

Wheels and Tires

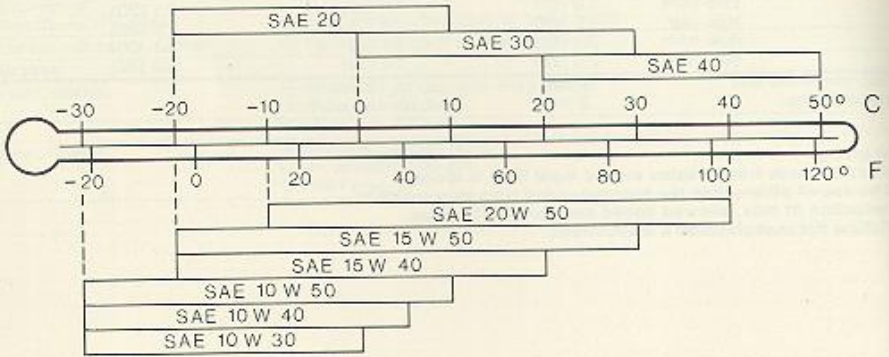
Wheels, design	cast light alloy		
size-front	1.85 B x 18		
size-rear	2.50 B x 18		
Tires, design	Cross-ply with tube		
size-front	3.25 S 18		
size-rear	4.00 S 18		
Tire pressures in bar (lbs/sq. in) cold tires	up to 130 km/h	up to 160 km/h	Exceeding 160 km/h
solo-front	1.9 (27)	1.9 (27)	2.1 (30)
solo-rear	1.8 (26)	2.0 (29)	2.2 (32)
dual-front	2.1 (30)	2.1 (30)	2.1 (30)
dual-rear	2.0 (29)	2.2 (32)	2.3 (33)
Recommended min. tread depths:	2 mm 3 mm	up to 130 km/h above 130 km/h	

Warning
Keep to these tread depths even if legal limit is lower.
The use of others than the recommended tires may result in reduction of max. allowed speed and permissible load.
Follow tire manufacturer's instructions.

Fuel and lubricants

Fuel	leaded or unleaded gasoline min. RON = 91 resp. Minimum Octane Rating, (R+M)/2 = 87	Tank capacity litres (US gal.) 22 (5.8) incl. reserve 2 (0.4)
Engine Oil	Brand name four-stroke oil, API class SE	capacity with filter change cc 2500 ≈ 2.6qt

Viscosity-/outside temperature range:



Lubricants

Gearbox oil	Brand name hypoid gear oil	Capacity cc 800
Drive shaft oil	SAE 80 below 5°C/41°F	150
Final drive oil	SAE 90 above 5°C/41°F	350
Telescopic fork oil	Castrol DB Hydraulic Fluid; Esso Univis J 13; Mobil DTE 11; Mobil Aero HFA; Shell 4001; Shell Aero Fluid 4; Golden Spectro Suspension Fluid	
	Capacity per fork leg	cc 190
Grease for splines on rear wheel/final drive	Molycote BR 2 or Liqui Moly LM 47 L	
Battery pole grease	Acid free grease	
Grease for bearings of wheels, steering head and others	Brand name multi purpose fibre based wheel bearing grease with 180°C (356°F) drip point	
Brake Fluid		
Grade	DOT 4 Capacity, refilling and bleeding approx. 300 cc	

Electrical system

Battery	Varta, 12 V, 16 Ah
Starter	Bosch 0.7 kW
Alternator	Bosch 280 W
Ignition system	Breakerless ignition system with single ignition coil and Hall impulse transmitter (maintenance free)
Coil	Bosch, twin spark type
Ignition timing	32° bTDC above 3500 rpm
Spark plugs	Bosch W 6 D; Beru 14 – 6 D; Champion N 7 Y
Spark plug electrode gap	0.6 + 0.1 mm

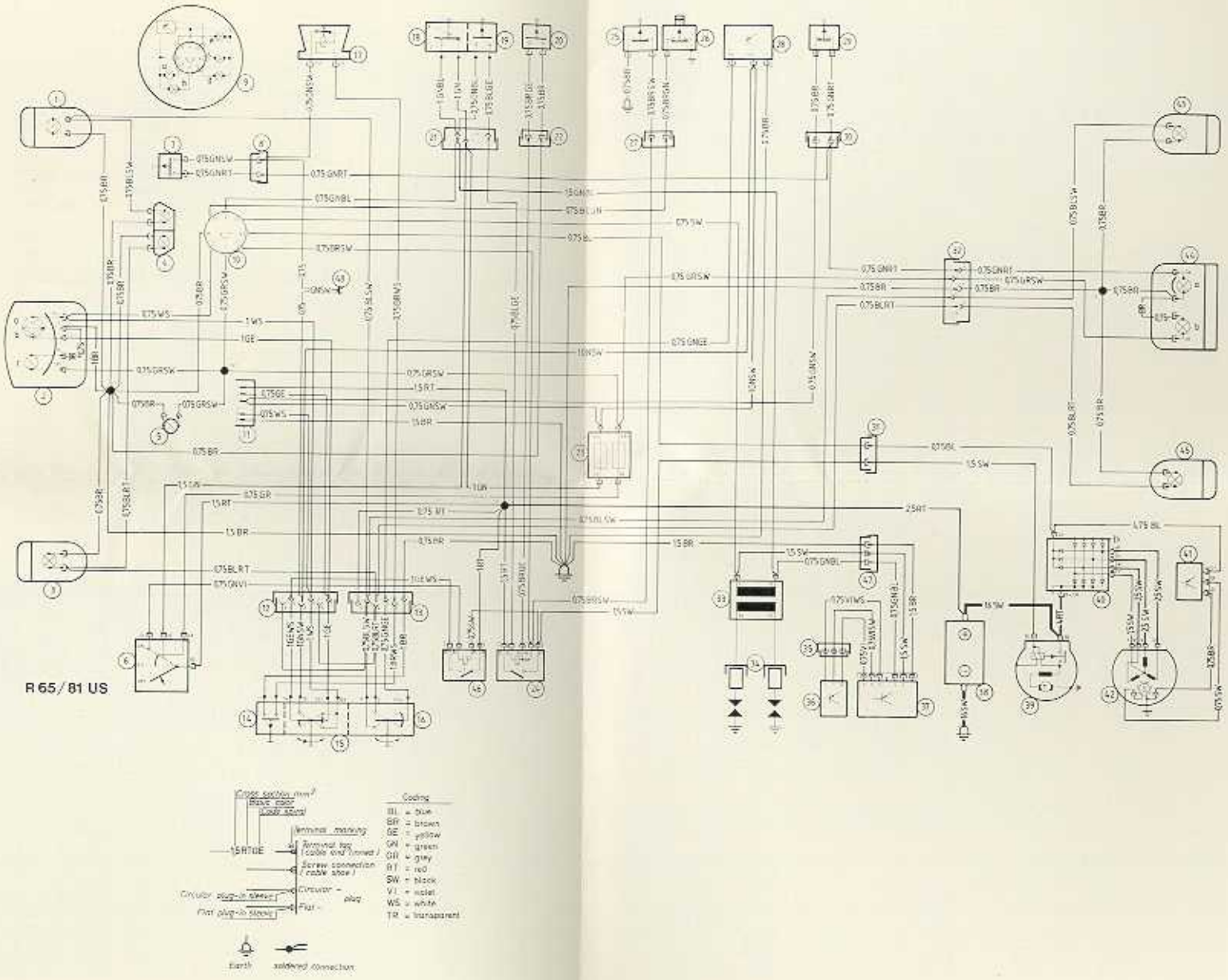
Warning
Your BMW is equipped with an electronic ignition system, working at very high voltage. Therefore incorrect handling may be harmful.

Electrical system

Turn indicator relay			12 V – 2 (4) x 21 W
Headlight high and low beam			H 4 halogen twin filament bulb, 60/55 W
Parking light			12 V, 4 W
Indicator lights:	Headlight high beam	blue	12 V, 3 W
	Oil pressure	red	12 V, 3 W
	Neutral	green	12 V, 3 W
	Battery charge	red	12 V, 3 W
	Turn indicator	green	12 V, 3 W
Illumination	Speedometer		12 V, 3 W
	Tachometer		12 V, 3 W
Fuses (2)			8 A
Turn indicators, 2 each front and rear			12 V, 21 W
Rear light and licence plate light			12 V, 5 W
Stop light			12 V, 21 W

Key to wiring diagram R 65

1 Front right turn indicator
2 Headlight
  a) High beam
  b) Low beam
  c) Parking light
3 Front left turn indicator
4 Turn indicator repeater right and left
5 Speedometer illumination
6 Main switch
7 Front brake light switch
8 Plug connection to front brake light switch
9 Revolution counter
  a) Headlight high beam indicator
  b) Illumination
  c) Generator charging telltale (red)
  d) Neutral indicator (green)
  e) Oil pressure warning indicator (red)
10 Plug connection (8-poles) to revolution counter
11 Plug connection to optional equipment
12 Plug connection (red) to handlebar switch unit (left)
13 Plug connection (black) to handlebar switch unit (left)
14 Horn push button switch
15 Main light control switch with dimmer switch and high beam flasher
16 Turn indicator switch
17 Horn
18 Kill Switch
19 Starter push button
20 Clutch operated switch
21 Plug connection (white) to handlebar switch unit (left)
22 Plug connection to clutch operated switch
23 Fuse box
24 Starter relais
25 Neutral indicator switch
26 Oil pressure switch
27 Plug connector to neutral indicator and oil pressure switch
28 Flasher unit
29 Rear brake light switch
30 Plug connection to rear brake light switch
31 Plug connection to engine
32 Plug connection to rear light
33 Double spark ignition coil
34 Spark plugs with caps
35 Plug connection to impulse transmitter
36 Hall impulse transmitter
37 Control unit for transistor ignition
38 Battery
39 Starter
40 Diode board
41 Voltage regulator
42 Alternator
43 Rear right turn indicator
44 Rear light
  a) Stop light
  b) Rear light and license plate illumination
45 Rear left turn indicator
46 Light relay
47 Plug connection to ignition
48 Connection for optional equipment voltmeter


R 65/81 US
Cross section mm²
Basic color
Guide stripe
Terminal marking
Terminal lug (cable end sleeve)
Screw connection (cable shoe)
Circular plug-in sleeve
Circular plug
Flat plug-in sleeve
Flat plug
Coding
BL = blue
BR = brown
GE = yellow
GN = green
GR = grey
RT = red
SW = black
VI = violet
WS = white
TR = transparent
Earth
soldered connection

Conversion table

From metric system:		to English (F. P. S.) system:		multiply with conversion factor:
Millimeters	mm	Inches	in.	0.039
Centimeters	cm	Inches	in.	0.394
Meters	m	Feet	ft.	3.281
Kilometers	km	Miles	mi.	0.621
Kilometers/hour	km/h	Miles/hour	mph	0.621
Square centimeters	cm^2	Square inches	sq. in.	0.155
Cubic centimeters	cm^3, cc	Cubic inches	cu. in.	0.061
Liters	l	US quarts	qt.	1.057
Kilograms	kg	Pounds	lb.	2.205
Newton-meter	Nm	Foot pounds	ft. lb.	0.723
Bar	bar	Pounds/square inch	lb./sq. in.	14.5

From English (F. S. P.) system:		to metric system:		multiply with conversion factor:
Inches	in.	Millimeters	mm	25.40
Inches	in.	Centimeters	cm	2.54
Feet	ft.	Meters	m	0.305
Miles	mi.	Kilometers	km	1.609
Miles/hour	mph	Kilometers/hour	km/h	1.610
Square inches	sq. in.	Square centimeters	cm^2	6.452
Cubic inches	cu. in.	Cubic centimeters	cm^3, cc	16.387
US quarts	qt.	Liters	l	0.946
Pounds	lb.	Kilograms	kg	0.454
Foot pounds	ft. lb.	Newton-meter	Nm	1.383
Pounds/square inch	lb./sq. in.	Bar	bar	0.069

At a glance

Tire pressures		up to 130 km/h (81 mph)	up to 160 km/h (100 mph)	over 160 km/h (100 mph)
in bar (lbs/sq. in.) (cold tires)	solo front	1.9 (27)	1.9 (27)	2.1 (30)
	solo rear	1.8 (26)	2.0 (29)	2.2 (32)
	dual front	2.1 (30)	2.1 (30)	2.1 (30)
	dual rear	2.0 (29)	2.2 (32)	2.3 (33)

Spark plugs Electrode gap mm	0.6 + 0.1	
Valve clearances mm (inch) (cold engine)	Inlet	0.05 (0.002); up to 1000 km (600 miles) 0.10 (0.004)
	Exhaust	0.20 (0.006); up to 1000 km (600 miles) 0.25 (0.01)

Capacities

Fuel, leaded or unleaded, min. RON: 91 resp. Minimum Octane Rating: 87	total cap. 22 litres (5.8 US gal.)
Engine oil; brand name fourstroke API Class SE (see page 88)	total cap incl. filter renewal 2500 cc level must be between two marks on dipstick
Gearbox oil; Hypoid gear oil, API Class GL 5 SAE 80 below 5°C, SAE 90 above 5°C	total capacity 800 cc level must be up to lowest point of filler opening
Drive shaft oil; Hypoid gear oil, API Class GL 5 SAE 80 below 5°C, SAE 90 above 5°C	total capacity 150 cc level must be 2 mm above bevel with motorcycle on centerstand and rear wheel touching ground
Final drive oil; Hypoid gear oil, API Class GL 5, SAE 80 below 5°C, SAE 90 above 5°;	total capacity 350 cc level must be up to control opening with motorcycle on centerstand and rear wheel touching ground