

Rider's manual US Models

R 60/7

R 80/7

R 100/7

R 100 S

R 100 RS

BMW AG



Model

Frame number

On right gusset plate (close to steering head)

Engine number

on engine oil filler pipe (left side)

License number

Motorcycle owner

Address

Telephone number

Supplying dealer

Date first registered

You will receive 2 keys with your new BMW:

1 for steering, ignition, fuel filler cap and dual seat (with folding head)

1 spare key (with rigid head)

Keep the spare key in a safe place where it can be reached in an emergency.

Make a note of the key number in case you need a replacement key.

BMW AG

The motorcycle you own may due to special equipments vary from the herewith described standard models.

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,

We are glad to welcome you to the ranks of BMW riders, and congratulate you on the acquisition of your new machine. This motorcycle will provide you with abundant riding pleasure for many years to come, provided that you observe the following precautions:

Read the Rider's Manual completely and carefully before operating your motorcycle.

Always ride in true BMW style, with all senses aware; study the road situation and avoid risks. Keep your BMW in the best possible mechanical condition at all times.

Apart from this **Rider's Manual**, which contains the main items of information on your new motorcycle, you will also receive a **Technical Data and Service** Manual with detailed descriptions of your BMW's engineering features, and servicing vouchers.

On long journeys it is wise to carry both booklets with you. The Rider's Manual should be placed always in the compartment under the seat.

Wishing you safe, pleasant journeys always.

Yours very sincerely,
BMW Motorrad GmbH

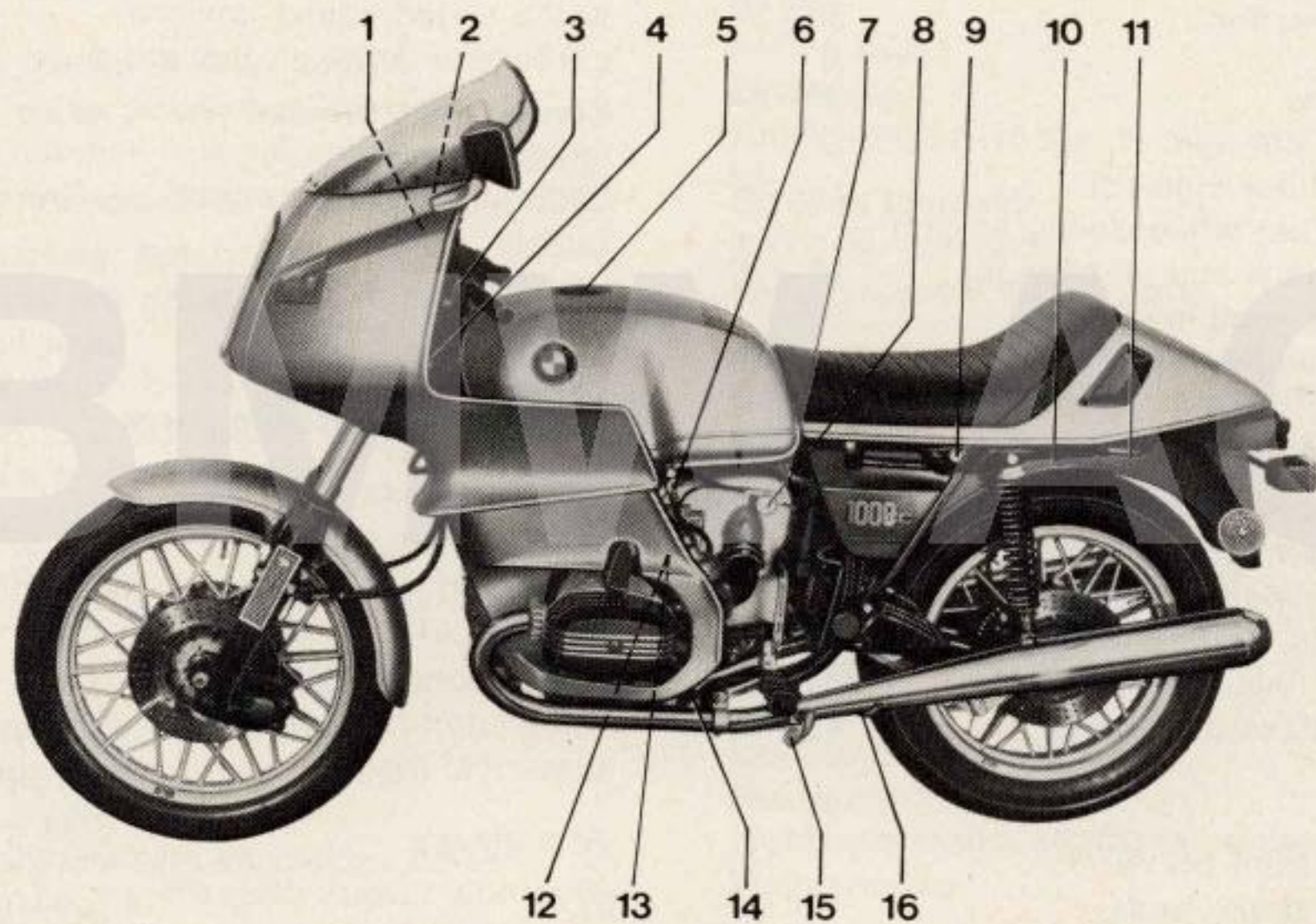
Contents

Where is everything?	6–9
Controls	10
Instruments and telltale lamps	11
Ignition switch, handlebar controls	12–13
Steering damper, fuel pet cocks, shock absorber settings	13
Before starting: Safety check	14–16
Tire treads, tire pressures, engine oil level	14
Fuel tank, lights, brake and rear lights and turn indicators	15
Handbrake and foot brake	16
Compartment for first aid kit	16
Rider's clothing	17
Helmet, leathers, rainproof suit	17
Starting, riding and parking	18–22
Center stand, fuel pet cock, ignition key, kill switch	18
Starting a cold engine, starting a warm engine, telltale lamps	19
Selecting neutral	20
Putting motorcycle on stand (center or side stands)	21

Steering lock, helmet holder	22
Running-in rules	23
Riding	23–25
Riding hints	23
Cornering	24
Riding on wet roads, two-up riding	25
On long journeys	26
Tank-top rucksack, BMW panniers, spare parts	26
Jobs you can perform yourself	27–34
Removing and installing front wheel	27
Removing and installing rear wheel	28
Tire-changing	29
Changing bulbs or flasher unit	30
Changing fuses, telltale lamp, turn indicator or rear light bulbs	31
Headlight beam setting	32
General care	32
Laying up the motorcycle	33
Restoring to use	33
Maximum loads, additional accessories	34
Maintenance	35–61
Jobs that should be left to the service station	35

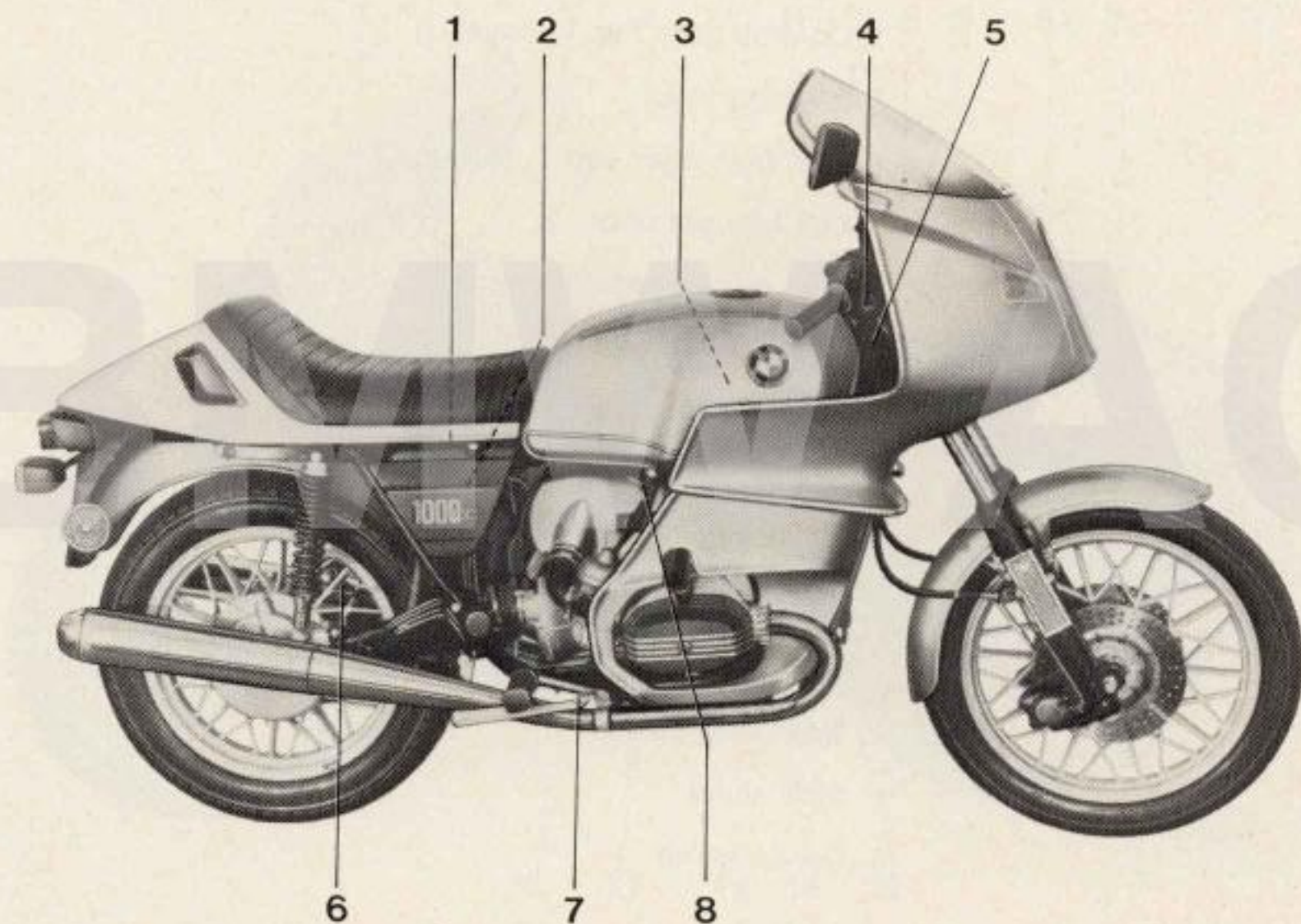
Maintenance schedule	36 – 37
Tools	36
BMW Maintenance	36 – 37
BMW Inspection	36 – 37
Oil changes	38 – 41
Engine oil change, renewing filter element	38
Gearbox, rear wheel swinging arm – oil level check and oil changes	39 – 40
Final drive – oil level check and oil changes	40
Telescopic forks – oil level check and oil changes	41
Play in steering and wheel bearings	42
Swinging arm bearings	43
Throttle twistgrip, brake and clutch lever pivots, brake master cylinder operating lever	44 – 45
Battery, intake air cleaner	45 – 46
Brakes	46 – 49
Adjusting front brake	46
Renewing brake pads	47
Brake fluid, bleeding brakes	48
Adjusting rear brake	49

Carburetors	50 – 53
Cleaning carburetors	50
Throttle slide, vacuum slide	51
Idling speed, idling mixture, carburetor settings, fuel pet cock	51 – 53
Spark plugs, breaker points gap	54
Ignition timing	55 – 56
Cylinder head nuts, valve clearances	56 – 57
Clutch	57
Wheel spokes, rims	58
Tightening torques	59
Lubrication chart	60 – 61
Failures and possible cures	62 – 63
Specifications	64 – 70
Engine, carburetors	64
Fuels and lubricants	65 – 66
Brake fluid	66
Dimensions, weights	67
Rims and tires	68
Electrical system	68 – 69
At a glance	70 – 71
Electrical circuit diagram	72 – 75



Where is everything

1. Ignition switch
2. Instruments and telltale lamps
(see Fig. 4, page 11)
3. Controls (see Fig. 6, page 12)
4. Steering lock
5. Fuel tank filler cap
6. Left fuel pet cock
7. First aid kit compartment
8. Cold-start (choke) lever
9. Seat lock
10. Helmet holder
11. Air pump
12. Engine number
13. Engine oil dipstick
14. Gear shift pedal
15. Side stand
16. Center stand



1. Toolbox (under seat)
2. Battery, brake fluid reservoir for rear disc brake — R 100 RS only —
3. Brake fluid reservoir for front disc brake (under fuel tank)
4. Controls (see Fig. 7, page 12)
5. Frame number
6. Shock absorber adjusting lever (see Fig. 9, page 13)
7. Brake pedal
8. Right fuel pet cock



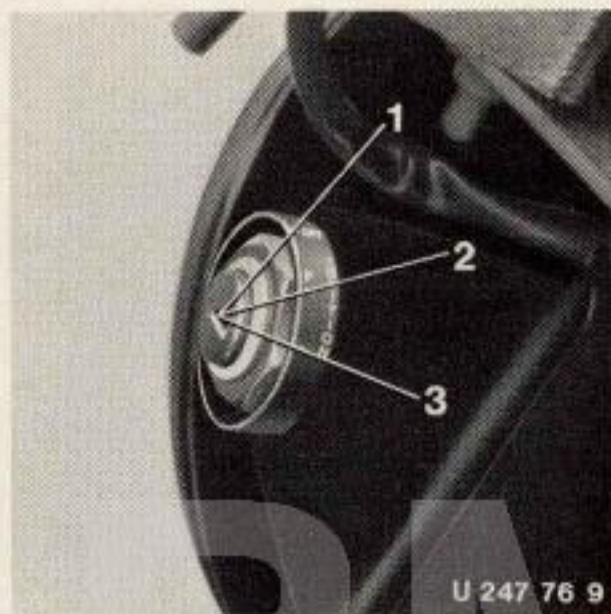
The controls

1. Ignition and light switch
(see **Fig. 5**, page 12)
2. Kill switch
3. Starter push button
4. Throttle twistgrip
5. Clutch lever
6. Front brake lever
7. Turn indicator switch
(moved up = left turn,
moved down = right turn)
8. Main light switch
9. Low beam (dip) switch
10. Horn push



The instruments and telltale lamps

1. Speedometer with mileage and trip recorders (for Canada: with miles and kms. dial)
2. Tachometer
3. Clock (standard on R 100 S and R 100 RS only; special equipment on R 60/7 – R 100/7)
4. Voltmeter (standard on R 100 S and R 100 RS only; special equipment on R 60/7 – R 100/7)
5. Turn indicator repeater
6. Oil pressure warning lamp (orange)
7. Battery charge telltale lamp (red)
8. Neutral indicator (green)
9. Brake fluid level telltale lamp (red)
10. Headlight high beam telltale lamp (blue)



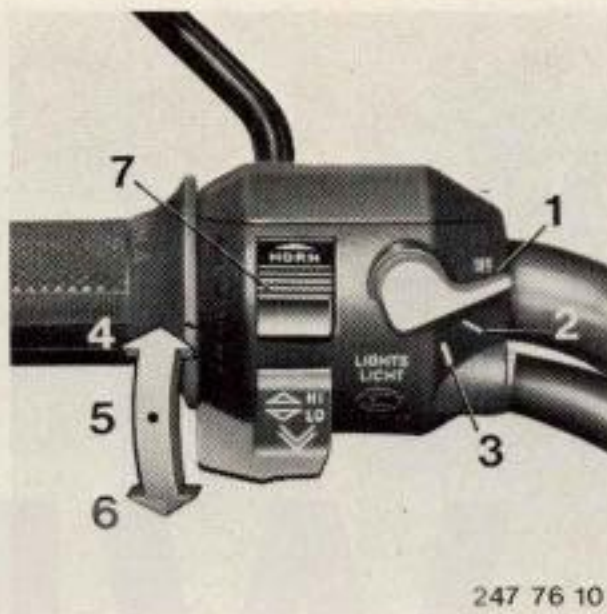
5

The main switch and its key positions. Fig. 5

1. 'O' position — key can be removed
2. Parking light — key can be removed
3. Ignition and all electrical circuits switched on (battery charge telltale and oil pressure warning lamp should be illuminated).

For Canada:

The lighting system provides automatic switch on of main beam.



6

Left handlebar controls. Fig. 6

Main light switch

Position 1: lights off

Position 2: Parking light

Position 3: Main beam (high or low, depending on position of dip switch)

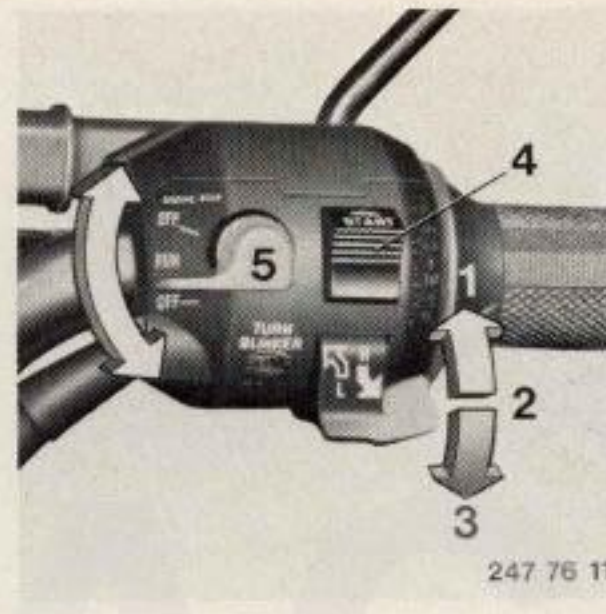
Dip switch

Position 4: high beam

Position 5: low beam

Position 6: Headlight flasher — switch returns automatically to position 5 after use

Button 7 is pressed to sound the horn



7

Right handlebar controls. Fig. 7

Kill switch 5 can be moved either up or down ('OFF') to stop the engine immediately in an emergency.

Note:

The engine can only be started when the switch is in its central ('RUN') position. In both 'OFF' positions, the switch cuts off the power supply to the ignition and starter.

Starter push button 4 — push to operate the electric starter

Note:

The engine can only be started with the gearbox in neutral or with the clutch lever pulled. This avoids the risk of accidental starting with a gear selected.

Turn indicator switch

Position 1 (top): left turn indicated

Position 2 (center): off

Position 3 (bottom): right turn

Hydraulic steering damper

(standard on R 100 RS only; special equipment on R 60/7 — R 100 S)

Position 0: disconnected (for town riding and good road surfaces).

Position 1: for poor road surfaces.

Position 2: for very poor road surfaces.



8

Left and right fuel pet cocks

Position 1 (lever down): open

Position 2 (lever to left or right): closed

Position 3 (lever up): reserve fuel supply. **Fig. 8**



9

Shock absorber settings

The preload at the rear suspension coil springs can be varied without the use of special tools to suit riding and load conditions.

Position 1 (normal): for solo riding

Position 2 (medium): for heavy loads or a light pillion passenger

Position 3 (hard): for maximum load. **Fig. 9**

Pillion footrests

The pillion footrests can be adjusted to obtain the most suitable riding position.

Before starting

Safety check

Tire treads

The tires of a fast single-track vehicle like your BMW motorcycle should never have a tread depth less than

$\frac{5}{64}$ inch (2 mm) up to 80 mph
(130 km/h)

$\frac{1}{8}$ inch (3 mm) over 80 mph
(130 km/h)

Tire pressures

The tire pressures specified by the manufacturer ensure optimum performance, roadholding and tire life. For this reason, check pressures once a week and correct if necessary.

Warning

The stability and handling characteristics of your motorcycle could become unsafe by the use of improper tire inflation pressures, worn tires or tire brand names not approved by BMW. Therefore it is very important to observe the recommendations shown on the adhesive label on the rear fender below the seat.



10

Engine oil level

If possible, check engine oil level after the engine has been stopped for some time.

The oil should be between the two marks on the dipstick. It should never be allowed to fall below the minimum mark. Adding oil beyond the maximum mark is pointless and can even prove harmful. **To check oil level**, remove the dipstick and push it back, **do not screw it in**. **Fig. 10**
Oil consumption: max. 2350 mpg

Change to another grade of oil only when the engine oil is changed completely, including filter element renewal.

The specified grade of oil is shown on page 66.

Fuel tank

The tank holds 24 liters (6.3 US gal) of which 3 liters (0.79 US gal) form a reserve supply. The tank filler cap has been recessed for safety reasons. The screw cap can be opened by means of the folding loop handle.

Warning

Never overfill your gastank. Spilled gas is highly inflammable either when dripping on the hot engine or when smoking.

After the running-in period, you can use the trip mileage recorder several times to determine how far you can ride on average with a full tank before switching to reserve. This will avoid the embarrassment of running out of fuel.

Checking the lights

After starting the engine, check that the lights are working by holding the hand close in front of the glass:

- Parking light
- High beam headlight
- Low beam headlight

As a safety precaution leave the dipped beam headlight on during the day (as prescribed by law in Canada), so that other road users can identify your machine more easily.

Important: to maintain full light transmission through the headlight panel on the RS integral cockpit, clean it on both sides regularly with a suitable detergent (for removal and installation, see Page 30).

Checking rear and brake lights

Check the brake light whenever the rear light is checked. The brake light should come on when the brake pedal is depressed or the hand (front) brake lever pulled.

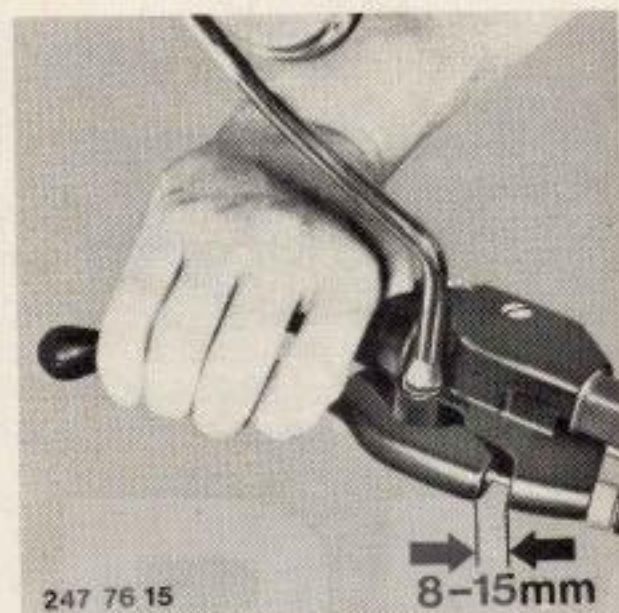
Checking turn indicators

Turn indicator bulbs are exposed to heavy loads.

A defective turn indicator can have serious consequences, particularly when turning across oncoming traffic. You should therefore check the turn indicators regularly.

If the turn indicator telltale lamp does not light up, this normally indicates that a turn indicator bulb has failed.

It is good practice always to carry a spare bulb (12 V, 21 W) along.



11

Front brake

There should be not more than 8–15 mm ($\frac{5}{16}$ – $\frac{5}{8}$ in) play at the front brake lever (see Fig. 11).



12

Foot brake (drum brake)

The foot brake should not have more than 25 mm (1 in) of travel (see Fig. 12). If necessary, correct by turning the wing nut on the linkage (see page 49).

Foot brake (disc brake)

On the R 100 RS, the brake pedal free travel (for the rear disc brake) is correctly adjusted at the factory and must not be altered.

Shock absorbers

Do not forget to examine the two rear suspension unit preload adjusters; are both levers in the same position? (see page 13).



13

First aid kit compartment

A compartment is designed into the seat to store a first aid kit, or other suitable items (see Fig. 13).



247 76 17

14

Rider's clothing

Helmet, leather and rainproof suit

The helmet should comply with the test standards imposed by law, and should fit well enough to avoid fatigue even on a long journey.

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. **Fig. 14**

For any journeys longer than just 'round the block', you should make a habit of wearing a leather or all-purpose suit. This should provide full wind protection but still 'breathe', that is to say admit air to keep you cool.

Gloves, a 'kidney belt' and leather boots are other essential items of equipment for the serious rider.

Remember that leathers and many all-purpose riding suits are not rainproof.

We therefore recommend you to carry a roll-up rain suit which is genuinely waterproof, rain gloves and waterproof overshoes.

Anyone who catches a cold from riding a motorcycle has only himself to blame!

Starting, riding and parking

Center stand

Hold the left handlebar grip with your left hand and the grab handle on the seat with your right hand. Push the motorcycle forwards to drop it from the stand. Return the stand to its rejected position.

Fuel pet cock

Open both fuel pet cocks (for positions, see page 13).



15

Ignition switch

Turn the key fully clockwise to the 'on' position.

When the ignition is switched on, the green, red and orange telltale lamps should be illuminated (see Fig. 15).

If the green lamp fails to come on, it must be shifted to neutral.



16

Kill switch

Move the red kill switch on the right handlebar to "RUN".

Fig. 16



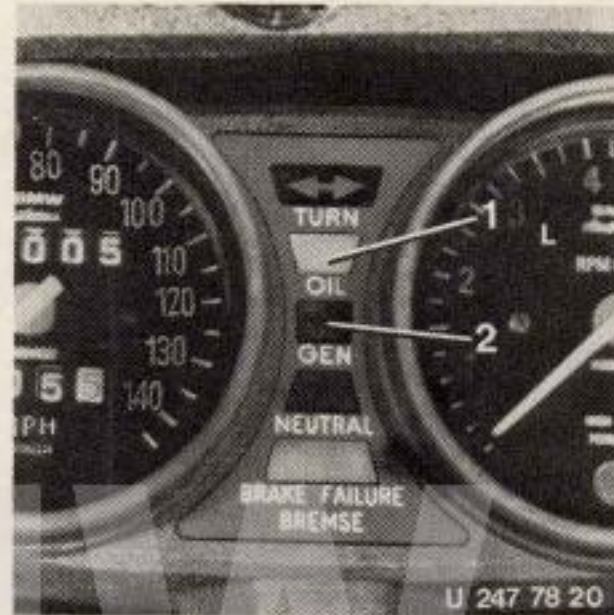
17

Starting a cold engine

Press the choke fully down (see **Fig. 17**). Keep the twistgrip closed and press the starter button. If necessary, open the throttle slightly as soon as the engine begins to run. When the engine is running, push back the choke as soon as it begins to run unevenly. To ride away with the engine still cold, return the choke to mid-position (step).

Starting an engine already at normal operating temperature

Do **not** use the choke. Open the twistgrip to max. $\frac{1}{4}$ of throttle opening and press starter button.



18

Telltale lamps

When the engine is running, the oil pressure warning 1 (orange) and battery charge telltale 2 (red) lamps in the combined instrument cluster should go out above a fast idling speed. **Fig. 18**. If the oil pressure warning lamp comes on when you are riding the machine, pull the clutch lever **immediately** and switch off the ignition. Check engine oil level: if it is adequate, seek professional advice.

If the battery charge telltale lamp comes on while riding, take the machine to your dealer as soon as possible, or else the battery will go flat.

Selecting neutral with machine at a standstill

Press the pedal down repeatedly until the final position is reached. Then raise the pedal once (See **Fig. 19**) to obtain neutral. The green neutral indicator lamp should come on.

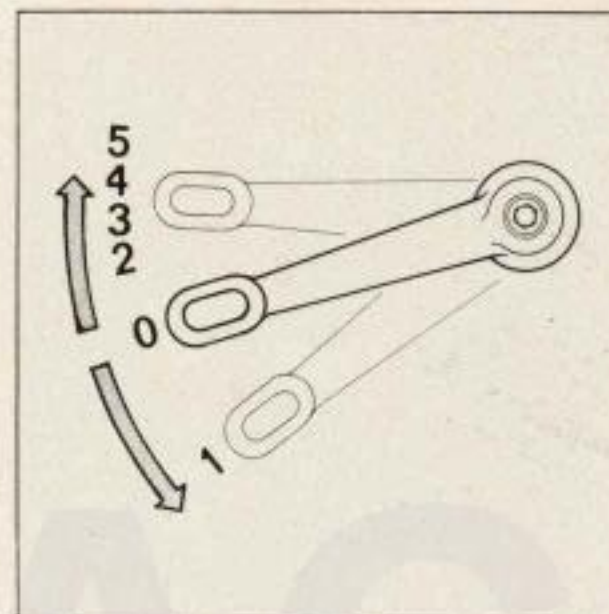
Selecting neutral with the engine running

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

To prevent damage to the starter gear or flywheel gear ring, do not restart the engine until it has entirely ceased to rotate.

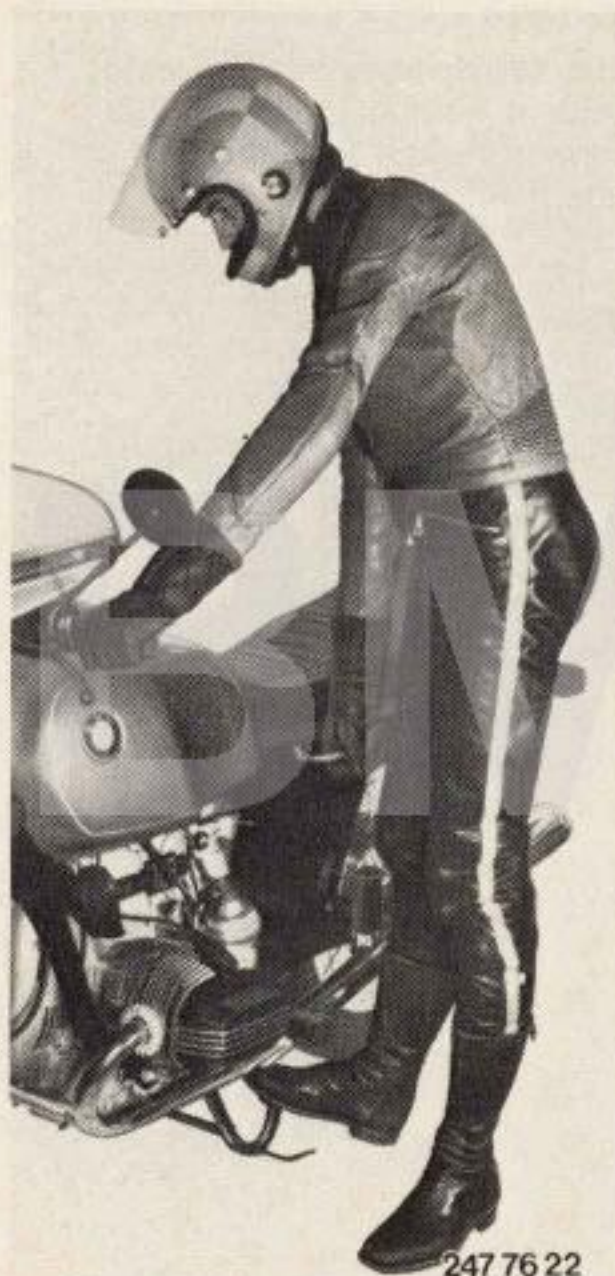
To ride away from a standstill, declutch by pulling the lever and press the gear shift pedal down once. The green neutral indicator lamp will go out. Open the throttle slightly and at the same time release the clutch lever gradually and smoothly. You can become accustomed to the clutch take-up point by engaging first gear and letting the machine move away without opening the throttle.

To shift to a higher gear (2nd, 3rd, 4th and 5th), release the throttle, declutch and pull the gear shift pedal up to engage the next higher ration. Then accelerate again as necessary and engage the clutch smoothly. You can detect whether the gearbox is in 4th or 5th by applying upward pressure to the pedal with your toe (do not operate the clutch). If the pedal can be moved, the gearbox is in 5th; if not, in 4th.



19

To shift down to a lower ratio, release the throttle, declutch and press the gear shift pedal down to the next lower ratio. Release the clutch as smoothly as possible and at the same time accelerate slightly particularly when using the engine's braking effect at high speeds, so that the change in retarding action is not transmitted abruptly to the rear wheel.



Center and side stands

To put the motorcycle on its center stand, push down with the right foot on the projecting peg until both curved pads are touching the ground. Now transfer your foot to the tread plate of the center stand, rest your entire weight on it and pull the motorcycle upwards and to the rear by means of the grab handle below the seat. Hold the handlebar with the left hand to keep the machine balanced.

Fig. 20

Make sure that the ground surface is firm. A soft surface (e. g. tar) could lead to the pads sinking in and the machine falling over.

Don't forget to lock up the steering when leaving your machine.

During the night turn on the parking lights to make your machine more visible to traffic.



21

The **side stand** is designed to support the machine when it is parked only for a short time. When the motorcycle is raised to a vertical position, the side stand folds back into place automatically.

Warning

In spite of this recheck the side stand returning back into place before riding away, as a safety precaution. Should the side stand remain extended for any reason, it could lead to a serious crash, for instance when cornering. Fig. 21



22

To lock the machine, the key must be inserted into the steering lock and turned to the left while the handlebars are turned slightly until the lock and key can be pressed in. The steering lock is held in the closed position by turning the key to the right (clockwise). The key can then be removed. To unlock, the key must be turned counterclockwise. Then the steering lock returns automatically and the key can be removed.

Fig. 22



23

Warning

Never leave the key in the lock after releasing the steering. The key head could be snapped off when the handlebars are turned.

Helmet holder

A hook is welded to the frame under the lockable seat. Two helmets can be held by this hook and locked into position with the seat.

Fig. 23

Caution

Do not operate your machine with a helmet locked in the helmet holder as it will rub on the tire.

Exhaust system

Warning

Exhaust pipes and mufflers become very hot during normal operation of the machine. Avoid touching them after stopping the engine and parking the motorcycle.

Some useful running-in rules

The performance and life of your BMW are greatly influenced by correct running-in (break-in). Even the most carefully machined rotating and sliding components tend to bed in further during the initial period of operation. 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.

Engine speed limits during running-in:

From 0 to 1 000 km (app. 600 miles): 4 000 rpm

From 1 000 km (app. 600 miles) to 2 000 km (app. 1 200 miles): 4 500 rpm.

Avoid violent braking until at least 500 km (app. 300 miles) have been covered, especially from high speeds, and do not brake heavily. Brake linings or pads need running in too, if they are to achieve their full specified friction and wear ratings later on.

The tires, like the brakes, need running-in for the first 500 km (app. 300 miles) before they provide maximum grip in all running conditions.

Note:

After 1 000 km (600 miles) have been covered, the first Maintenance is due.

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

Riding . . .

Riding hints

If this is your first big motorcycle, get accustomed to it gradually. At slow speed, ride in circles and figures of eight, reducing the radius gradually, and include grass, sand and loose surfaces. You will soon become confident that you have this 200 kg (440 lb) machine safely under control, and are ready to make more ambitious runs.

Wear easily visible clothing. And keep your eyes open! It is vital for you to know what is going on ahead, behind and beside you, and to be aware of the road surfaces over 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 speed limit is not exceeded! 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 to an equal extent. Increase pull on the lever and pressure on the pedal gradually, but avoid wheel locking and skids.

Warning

Please note that after a long run in heavy rain without the disc brake having been used, the first application may not produce the full anticipated braking action. To avoid this, apply the front brake lightly at intervals.

As you come to a standstill, remember to select neutral and not just pull the clutch lever. 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. If the machine is to be halted or parked for any length of time, close the fuel pet cocks.

Cornering

The most important factor in cornering which you must master is the **approach to a corner**. **Left hand corners**, particularly when the view is obstructed, should be approached at the right hand edge of the road. As soon as you can see the remainder of the curve and the road ahead, you can swing over towards the center line.

Right hand corners, on the other hand, should be approached near the center of the road, after you have checked in your mirror that you are not obstructing a faster vehicle. Do not cross the center line, however. After entering the corner and estimating the sharpness of the curve, you can move gradually back over from the apex of the curve towards the right hand edge of the road.

If you need to apply the brakes, do so **before** you enter the 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, but try to pass them on the outside without crossing the center line, provided that the traffic column is moving slowly enough and the driver you are about to overtake has noticed you.

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, white lines on the road, cobbles or solid-block surfaces. Your dealer can supply products which prevent misting of helmet face shield and goggles.

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, particularly if an attractive lady, must be provided with the same complete, good quality riding gear as your own. Adopt a smooth, neat riding style, adjust the pillion footrests and the suspension settings beforehand and explain the most important safety factors to any newcomer to motorcycling as follows:

Keep a firm hold on the rider in front or on the seat grab handle. 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 pillion footrests, and keep still whenever the motorcycle is in motion. Don't distract the rider's attention.

Never carry an animal on the motorcycle.



24

On long journeys

Saddle bags, tank-top rucksack

To accommodate your luggage, we recommend the **BMW tank-top rucksack** and **BMW saddle bags**. The saddle bags each hold 22 lbs approximately — with space for a helmet — and are designed to match the machine. However, when fully laden you should not exceed 130 kmph (82 mph). **Fig. 24**

For exact informations regarding maximum loads etc., see page 34

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

- 1 spare air cleaner element
- 1 oil filter
- 1 set of spark plugs
- 1 cylinder head gasket
- 2 O-rings (base gasket)
- A few M 6 and M 8 bolts and nuts
- Spring washers
- Wire, insulating tape and adhesive tape
- Rubber bands
- 1 spare inner tube
- 1 carburetor throttle return spring
- 8 Amp fuses
- 1 set of breaker points
- 1 distributor centrifugal advance assembly
- 1 set control cables

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

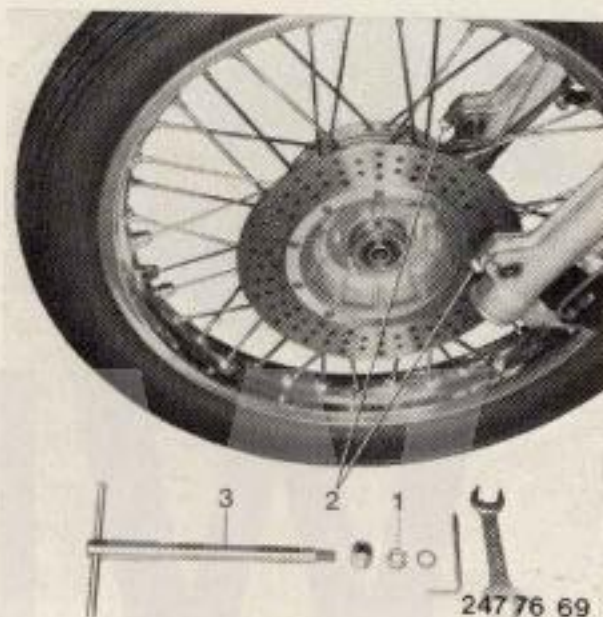
Before starting a major journey, it is always a good idea to have the machine checked over thoroughly by a professional workshop. If you are intending to travel abroad, make sure that you have the necessary information concerning local driving license regulations, inoculations and other requirements. Details can be obtained from consulates, travel agents, automobile clubs etc.

Removing and installing front wheel

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

Fig. 25

Jobs you can perform yourself



If a twin disc brake is installed, make sure that the wheel is installed in the correct direction of rotation, so that the floating brake caliper settings are not disturbed (mark the wheel on removal if necessary). Do not apply the brake when the wheel is removed.

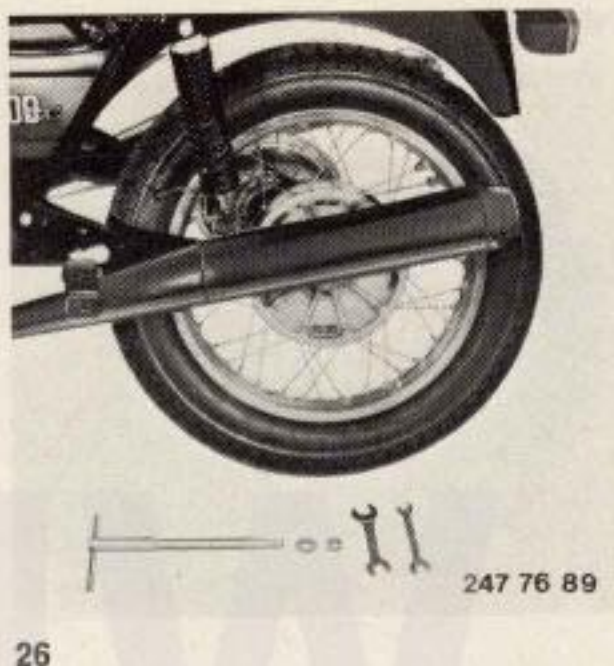
To install the wheel, proceed in the reverse order. Note that the brake disc(s) must be correctly located between the brake pads in the floating caliper(s). Do not forget the spacing sleeve and the washer.

Before tightening the clamp bolt, lower the machine off its stand and compress the front suspension firmly several times. This will relieve trapped stresses or distortion between the fork legs. Tighten the clamp bolt. Note correct tightening torque.

Removing and installing rear wheel

It is simple enough to remove and install the front wheel with brake disc(s) on your BMW, but removal and installation of the rear wheel can only be described as child's play, thanks to the use of shaft drive on all BMW models.

- Place the machine on its center stand and set the rear suspension unit adjuster levers to maximum load.
- Use the following tools from the toolkit under the seat:
 - a) 22 mm open-end wrench
 - b) 13 mm open-end wrench.
 - c) Drift
 - d) 17 mm open-end wrench (BMW R 100 RS only)
- Loosen the clamp bolt with the 13 mm wrench.
- Loosen the axle nut with the 22 mm wrench, and remove complete with washer.
- Remove brake caliper retaining bolts (on R 100 RS only) with 17 mm open-end wrench.
- Place the drift through the transverse hole in the axle and pull out the axle, at the same time turning slightly to



- and fro. On R 100 RS: detach hydraulic hose mount at left swinging arm tube, lift the brake caliper away from the brake disc and place it to one side. Do not apply the brake pedal.
- Pull off the wheel towards the left swinging arm, then pull out rearwards and to the left. On R 100 RS: lean machine slightly to right and pull wheel out downwards and to left. **Fig. 26**

When the rear wheel has been removed, the brake drum and shoes can be cleaned.

Before installing the brake caliper (R 100 RS), press the brake pads carefully back to produce the necessary gap for the brake disc.

Assembly is in the reverse sequence. Clean the axle, grease lightly and insert into the wheel hub, turning slightly at the same time. Do not forget the washer. Finally, tighten the clamp bolt. The transverse hole in the axle should again face to the rear. Note correct tightening torques.



247 76 90

27

Tire-changing

To remove a tire, let the air out and press the tire bead away from the rim shoulder all round one side after unscrewing the valve collar nut.

Press the tire bead on one side into the rim well (the side opposite the safety retaining notches). Lift the tire bead over the rim shoulder with two tire levers on the opposite side (the side with the safety retaining notches).

Fig. 27

Take out the tube. Lift the second bead over the rim in the same way.

Warning

When a new tire is installed, the tube and the rim tape should also be renewed. We recommend using a tire and tube from the same manufacturer in all cases. Never patch the tube except in an emergency. Renew the patched tube as soon as possible.

To install the tire on the rim, press one tire bead over the rim and into the well (on the side opposite the safety retaining notches).

The colored spot on the tire must be immediately adjacent to the valve.

Using a tire lever, lift the tire step by step over the rim shoulder at both sides, avoiding excessive force. Apply a proper lubricant to simplify tire fitting.

Insert the tube and push the valve through the hole in the rim. Secure the valve by screwing the collar nut on by about 5 threads. Inflate the tube slightly.

(If no air line is available, use the pump in the clip under the seat.)

Press the second tire bead over the rim on the same side as the safety retaining notches. The valve must be pushed back until the valve collar nut is against the rim. Starting at the valve, press the tire bead over the rim shoulder with the tire levers. Inflate the tire and check that the moulded marker line on the tire wall is the same distance from the rim all round.

Keep to the specified tire pressures.

Have the wheel and tire balanced.

Changing bulbs or flasher unit

When working on the electrical system disconnect the negative lead to the battery.

This is done by unscrewing the battery negative lead at the right of the gearbox, next to the speedometer shaft, with a 10 mm open-ended wrench. Insulate the lead and insert the bolt again so that it is not lost.

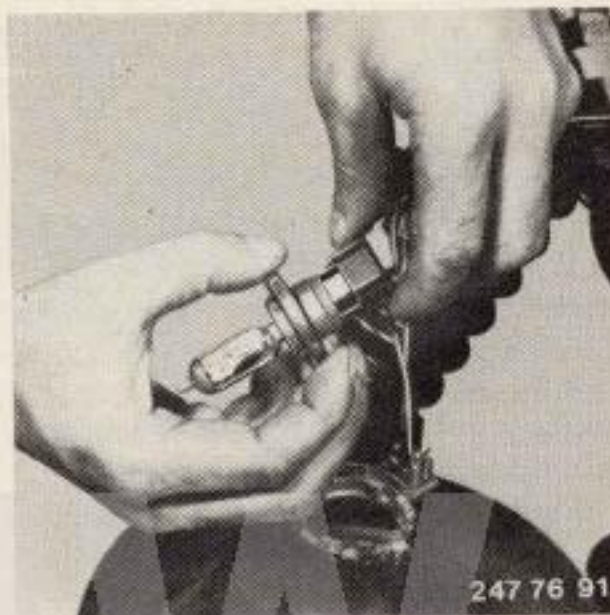
Changing the H4 headlight bulb

On the RS Integral-Cockpit, loosen the 4 knurled nuts on the inside of the light beam tunnel. Extract the tunnel with lens to the front. Tilt the headlight up slightly and loosen the headlight bezel clamp bolt.

Detaching the reflector:

Insert a screwdriver blade between the front bezel and the headlight housing at the lowest point on the headlight, turn sideways and force off the headlight bezel and the reflector.

Disconnect the multi-pin plug and pull back the wire spring clip. The H4 bulb can then be removed from the reflector.



28

Do not handle the new bulb with the fingers, but always use a clean cloth.

Fig. 28



29

Changing parking light bulb

Pull the parking light bulb holder out of the plug-in mounting, press in the bulb and turn to the left counterclockwise to remove. On the RS Integral-Cockpit, remove the glass after taking out the 2 Phillips-head screws, then change the bulb.

Changing the turn indicator relay

Detach the turn indicator relay and take off the multi-pin plug.

Fig. 29



30

Changing fuses

There are 2 fuses (8 Amp) on the contact plate in the headlight housing (**Fig. 30**). A blown fuse can be identified by the melted metal strip. Pull it out of the spring clips and press in a replacement fuse.

Warning:

Never effect temporary repairs to blown fuses. Always carry a few fuses in reserve in the tool-kit. Do not use fuses of a higher amperage rating than the original ones (8 Amp).

Recurrent blown fuses are a sign that there is a fault in the electrical system. Have it traced and repaired by a specialist workshop.

Changing telltale lamp bulbs and instrument lighting bulbs

Unscrew and remove the speedometer and revolution counter shafts. Loosen the three hexagon retaining bolts. Raise the combined instrument, remove the Phillips-head screw for the multi-pin plug, pull out the plug and take off the combined instrument.

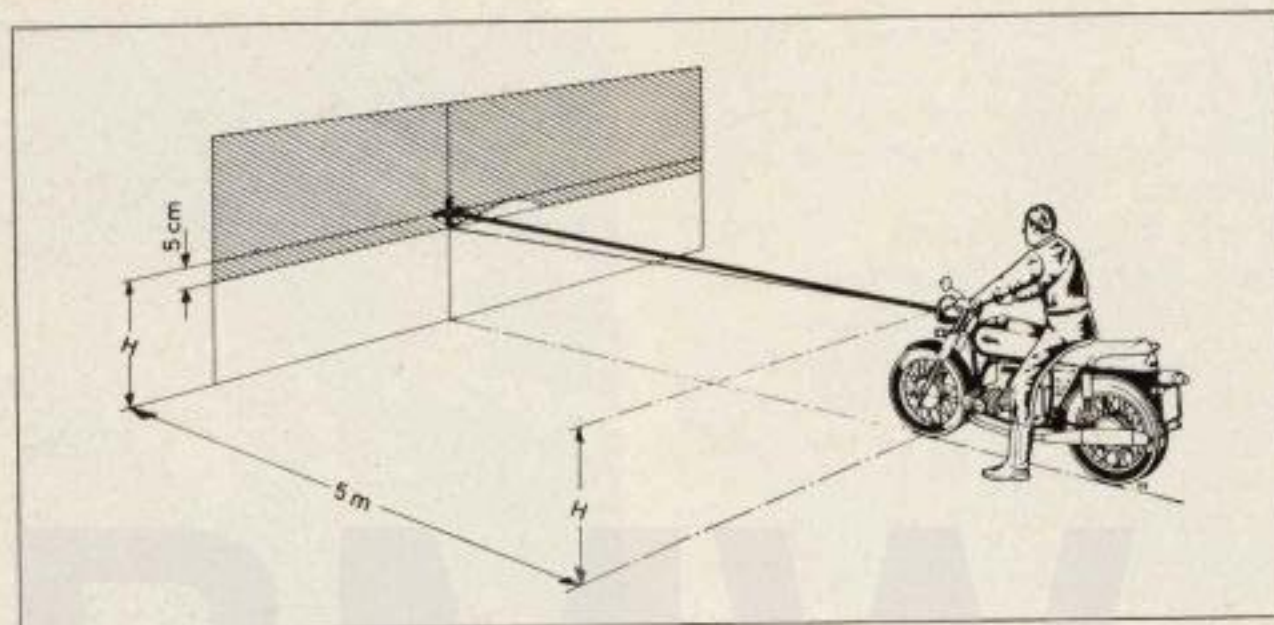
The pin-base bulbs can be changed after removing the outer cover and the end cap.



31

Changing turn indicator and rear light bulbs

Remove two Phillips-head screws from the taillight or turn signal lens and pull the lens out from the housing. Remove the bulb by turning counterclockwise and pulling outward. The rear light bulb is of the twin-filament type. Install the turn indicator lenses with the 'TOP' marking uppermost, and the rear light lens with the clear panel for license plate illumination at the bottom. **Fig. 31**



32

Headlight beam setting

The machine should be positioned on its wheels (not on the stand) 5 m (16ft 5 in) distance from a light-colored wall, on a flat surface. The tire pressures should be correct and the rear suspension set for solo riding. The rider should sit on the machine. Measure to the front wheel contact point.

Measure the height to the headlight centerline and transfer to the wall. Mark with a cross, and make a second cross 5 cm (2 in) below the first. **Fig. 32**

Turn on the low (dipped) beam

headlight, slacken the headlight retaining nuts slightly and alter the angle of the headlight until the light-dark boundary starts at the center of the lower cross, rises at the right to the height of the upper cross, then falls away.

When this setting has been obtained, tighten the headlight retaining nuts again firmly.

General care

The engine and gearbox housing itself and the final drive casing are best treated with a cold cleanser. All remaining enamel or chrome parts can be washed with clean water

to which a detergent has been added. It is best to cover the carburetors, exhaust muffler outlets and handlebar controls with plastic sheet during washing. Road dust and dirt contain various chemicals which can damage paintwork if not removed promptly. For this reason your motorcycle should be washed as regularly as possible, especially while still new.

Warning: make quite sure that all traces of detergent or cold cleanser are removed from the brake discs and linings.

Tar stains, dead insects or minor paint damage caused by flying stones should be removed or rectified as soon as possible, in order to prevent paint discoloration and patches of rust. Never remove tar stains with a sharp object such as a knife blade; instead, use a tar stain remover. Clean rubber components only with water or glycerin.

Warning

Fuel or chemical solvents should not touch synthetic parts such as the instrument housing, switches and the windscreen of the fairing.

Storing the motorcycle out of service

If you intend to lay up your motorcycle during the cold season of the year or for a still longer period, the following precautions will help to guard against corrosion and superficial damage:

1. Drain the oil when the engine is warm, and clean the oil mesh strainer and oil sump.
2. Add corrosion inhibiting oil up to the lower mark on the dipstick (app. 1 Liter = 1.05 US quarts). Run the engine for about 1 minute off-load. Remove the oil filter and close the empty filter chamber.

When laying up for more than 6 months, drain oil from gearbox, swinging arm and final drive and add corrosion inhibiting oil. Contents: gearbox 0.4 liter (0.4 US quart), swinging arm 0.05 liter (0.05 US quart), final drive 0.1 liter (0.1 US quart). Place the machine on its center stand, engage 2nd gear and run the engine at a fast idle for a few seconds.

3. Unscrew the spark plugs and add 15 to 20 cm³ of upper cylinder protecting compound to each cylinder through the spark plug holes. Turn the engine over for a few moments with the starter, and leave the pistons at top dead center. Screw the spark plugs back in.
4. Clean the carburetors and close the fuel taps.
5. Remove the battery and take to a service station for maintenance and storage.
6. Thoroughly clean and dry the motorcycle. Spray the brake and clutch lever pivots and the center stand pivots with a suitable lubricant.
7. Apply a coating of acid-free grease to all bright metal and chromium plated parts, and spray the motorcycle with a protective oil.
8. Store the motorcycle in a dry room, on its center stand. Place wood blocks under both front fork ends and the rear swinging arm so that the wheels are clear of the ground.

For details of corrosion inhibiting oil, upper cylinder preservative, acid-free grease and oil see list of fuels and lubricants (see page 67).

Restoring the motorcycle to service

1. Drain out the corrosion inhibiting oil and fill with fresh oil of the normal grade. Do not forget to install the full-flow oil filter element.
2. Install the battery, connect the leads, tighten the terminal nuts and apply terminal grease to the posts and clips.
3. Clean the spark plugs and check the gaps. Correct if necessary. Before screwing in, apply a small amount of graphite grease to the threads.

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. The weight of baggage should be distributed equally between the left and right sides of the machine. Avoid items that project beyond the rear of the machine, as these can cause oscillation and make the motorcycle unsafe to ride. Baggage must always be secured firmly. Make sure that no items 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. This is intended only for lighter, smaller loads, and overloading at this point can upset the machine's weight

distribution, handling and aerodynamics.

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 on 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 handlebars or on the forks increases the inertia which has to be overcome when steering, and can **seriously endanger safe riding**. If fairings etc. not included in the BMW range of accessories are subsequently installed, preference should be given to designs attached to the main

frame, not to the handlebars. Additional items of electrical equipment can overload the motorcycle's electrical system. This motorcycle is not designed for use with a sidecar or 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 such 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 recommended by the manufacturers.

Number of persons: 2 (rider and 1 passenger)

(1) Max. additional load for R 60/7 — R 100/7:	183 kg (404 lb)
for R 100 S	178 kg (393 lb)
for R 100 RS:	168 kg (370 lb)

(2) Load distribution in panniers (saddle bags), each:	10 kg (22 lb)
on luggage rack:	5 kg (11 lb)
in tank-top rucksack:	10 kg (22 lb)

(1) Please remember that any additional accessories or items of equipment installed on the machine (fairings etc.) reduce the additional load which can be carried by their total weight.

(2) Make as much use of the tank-top rucksack as possible, as items carried in it do not affect weight distribution between the axles so severely.

Warning:

Direct or consequential damage of any kind caused to the motorcycle or parts thereof as a result of accidents attributable to incorrect usage or the installation of non-approved accessories are not covered by the warranty.

Maintenance

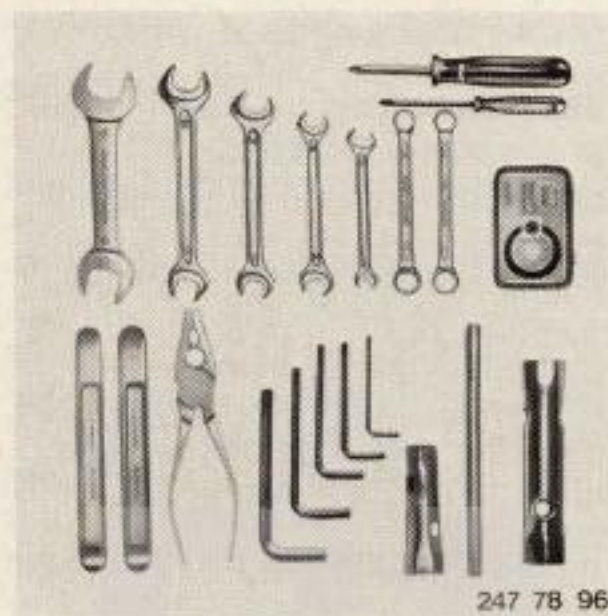
Jobs that should be left to the professional workshop

Many motorcycle enthusiasts possess both the expert knowledge and the tools to perform a whole series of maintenance jobs, such as oil changes, filter renewals, carburetor adjustment, checking valve clearances and ignition timing, entirely on their own.

However, there are other maintenance tasks which call for more experience or the use of special tools, such as adjusting wheel, swinging arm or steering bearings or working on the brakes. For this reason, the machine should always be taken to a professional workshop for the prescribed service and inspection routines to be performed.

Warning:

Before making technical modifications such as fitting other tires mufflers etc., please contact your professional workshop who will gladly inform you on functionality, legal laws and regulations and factory recommendations.



247 78 96

33

Standard toolkit. Fig. 33

Maintenance schedule

	BMW Maintenance every 15 000 km (10 000 miles), starting at 7 500 km (5 000 miles)	BMW Inspection every 15 000 km (10 000 miles), starting at 15 000 km (10 000 miles)
Engine oil change, page 38	X ¹	X
Renew filter element, page 38	X	X
Check gearbox oil level, page 39	X	
Gearbox oil change, page 39		X ¹
Check oil level in rear swinging arm, page 39	X	
Oil change in swinging arm, page 40		X ²
Check oil level in final drive, page 40	X	
Oil change in final drive, page 40		X ¹
Oil change in telescopic forks, page 41		X ²
Grease swinging arm bearings, check play, adjust if necessary, page 43		X
Lubricate brake and clutch lever pivots and twistgrip, page 44	X	X
Check battery acid level, page 45	X ³	X ³
Inspect battery terminals, clean and grease if necessary *), page 45		X
Clean intake air cleaner, page 45, 46	X	
Renew intake air cleaner element, page 45, 46		X
Check steering play and adjust if necessary *, page 42	X	X
Check wheel bearing play and adjust if necessary *), page 42, 43		X
Adjust clutch, page 57	X	X
Adjust free travel at front and rear brakes, page 46, 49	X	X
Check brake fluid level, change brake fluid annually *), page 48, 49	X	X

Maintenance schedule	BMW Maintenance every 15 000 km (10 000 miles), starting at 7 500 km (5 000 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 *), page 46	X	X
Inspect drum and disc brakes and operating linkage/cables, page 49		X
Inspect brake system for leaks (hydraulic circuit), page 47		X
Adjust carburetors, clean if necessary *)		
Check cable slack, adjust if necessary, page 50 — 53	X	X
Clean fuel pet cock, page 53		X
Reset spark plug gaps, page 54	X	
Renew spark plugs, page 54		X
Check breaker points gap and ignition timing, adjust if necessary, page 54 — 56	X	X
Grease pivot journal of centrifugal ignition advance assembly, page 54		X
Check tightening torque of cylinder head nuts, page 56	X	X
Check valve clearances and adjust if necessary, page 56, 57	X	X
Check wheel spokes and retension if necessary *), page 58		X
Inspect rims, page 58		X
Take up any slack at nuts and bolts, page 59	X	X
Test ride and final acceptance check, page 58	X	

*) Charged as an additional item.

¹ At least every 6 months; every 3 months if motorcycle is ridden only on short, local journeys and if outside temperatures are below 0°C (32°F), or at least every 3 000 km (2 000 miles).

² At least once a year

³ At least once a month



34

Change engine oil and renew filter element

Change engine oil only when the engine is at normal operating temperature. Oil changes are needed every 7500 km (5000 miles), or not later than every 6 months. If the machine is ridden only for short distances, or at outside temperatures below 0° (32° F), change the oil every 3 months or after a max. of 3000 km (2000 miles).

Remove the drain plug (8 mm intl. hex.), allow the old to drain out and replace the drain plug tightly. Check that gasket is in good condition.



35

The oil filter is to be renewed during the oil change, remove the filter before draining the oil.

Fig. 34

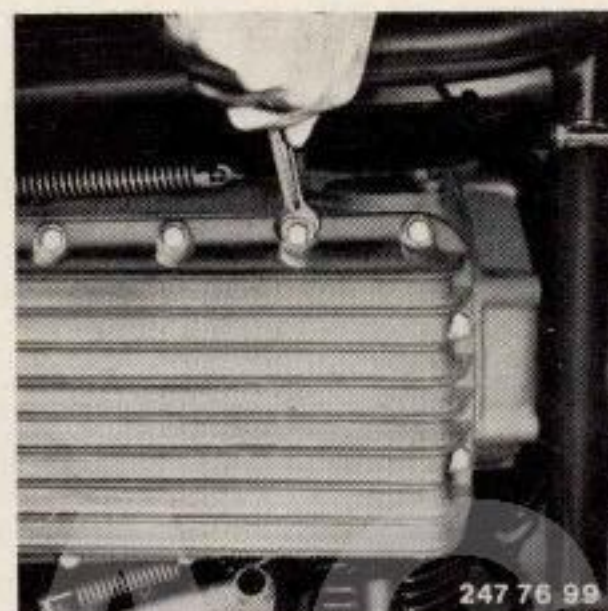
Total oil capacity: 2.0 liters (2.1 US quarts) + 0.25 litres (0.26 US quarts) if the oil filter is changed.

Oil level up to the upper mark on the dipstick, but never higher than this. See **Fig. 10**

Oil grade: See specifications.

Filter element:

Renew the element every 7500 km (5000 miles) during an engine oil change. Take out the 3 10 mm hex. screws and remove the



36

end cover. Remove the 17 mm hex. screw and lay aside together with the filter cover and O ring. Pull out the filter element using a thin wire hook and insert the new element, making sure that the gaskets are in good condition. **Fig. 35**

Oil sump:

After the first 1000 km (600 miles), remove the 10 mm hex. screws and take off the oil pan.

Clean the oil pan thoroughly together with the oil mesh strainer and check condition of gasket before re-attaching to the engine block. **Fig. 36**



37

Gearbox oil level and oil change
Check oil level every 7500 km (5000 miles). If necessary, add a brand-name oil of the same grade as originally used until the level reaches the lowest turn of the thread in the filler opening; first remove the filler plug (8 mm) with an Allen key and retighten firmly after adding the oil.

Fig. 37

Change gearbox oil only when the motor cycle is at normal operating temperature and at



38

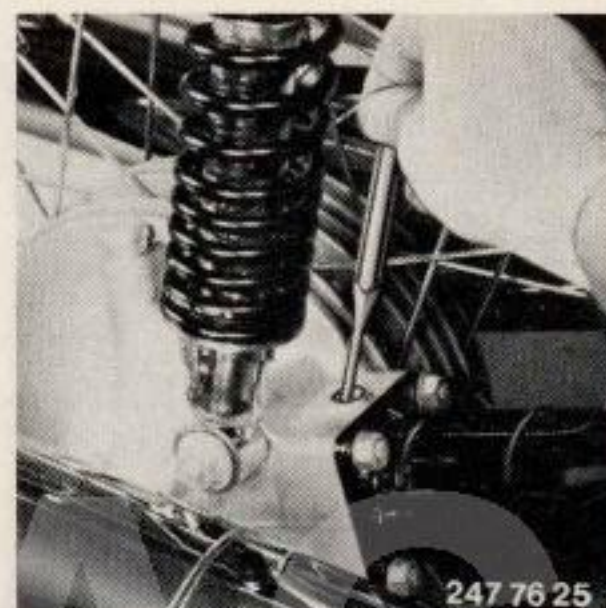
least every 15 000 km (10 000 miles) or once a year. Remove the oil drain plug (19 mm wrench) followed by the oil filler plug (8 mm wrench). After the old oil has drained out, replace the drain plug and tighten firmly. Add new oil via the filler plug.

Fig. 38

Oil capacity: approx. 0.8 liter (0.9 US quart).

Oil level up to lowest thread in filler opening.

Oil grade: See specifications.



39

Drive shaft housing oil level and oil change

Check oil level with the machine on its stand, every 7500 km (5000 miles). To check level, insert a suitable rod **vertically** into the filler opening and allow it to rest on the rear drive housing. The oil level should be 2 mm (0.08 inch) up the measuring rod. If necessary, add a brand-name oil of the same grade as that previously used, and retighten the filler plug (17 mm wrench) firmly.

Fig. 39



40

Change oil in the drive shaft housing only when at normal operating temperature, every 15 000 km (10 000 miles) or at least once a year. Remove the oil drain plug followed by the oil filler plug (both 17 mm wrench). After the old oil has drained out, insert the drain plug and retighten firmly. Add new oil through the filler opening.

Fig. 40

Oil capacity: approx. 0.15 liter (0.16 US quart).

Oil level: 2 mm (0.08 inch) above rear drive housing with the



41

machine on its stand.

Oil grade: See specifications.

Final drive oil level and oil change

Check oil level every 7500 km (5000 miles) and if necessary add a brand-name oil of the same grade previously used until the level reaches the lowest thread in the filler opening. Retighten the filler plug (8 mm) with an Allen key.

Fig. 41



42

Change the oil in the final drive only when at normal operating temperature, every 15 000 km (10 000 miles) or at least once a year. Remove the oil drain plug (19 mm wrench) followed by the oil filler plug (8 mm Allen key). After allowing the old oil to escape, replace the drain plug tightly. Fill with new oil.

Fig. 42

Oil capacity: Approx. 0.25 liter (0.26 US quart).

Oil level: up to lowest thread in filler opening.

Oil grade: See specifications.

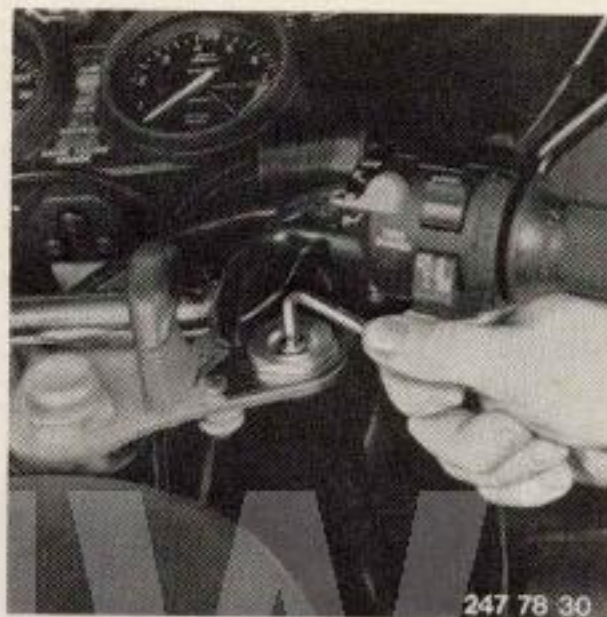


43

Telescopic fork — oil level and oil change

Check oil level by placing the machine on its center stand and allowing the fork to extend fully. Remove the upper end bolts. With the aid of a piece of 5 mm ($\frac{3}{16}$ in) diameter welding rod 1 m (40 in) long, check that the oil level is 50 mm (2 in) and if necessary add oil of the same specifications.

Oil change every 15 000 km (10 000 miles), or at least once a year.



44

To change the oil, allow the telescopic fork to extend fully while the machine is on its stand. Remove the rubber caps from the bottom plugs of the tubular fork sliders and unscrew the hexagon nuts (13 mm wrench) while holding the internal hexagon (4 mm key) on the damper tube to prevent turning.

Fig. 43

Unscrew bolts at top of fork tubes with an Allen Key to vent the tubes.

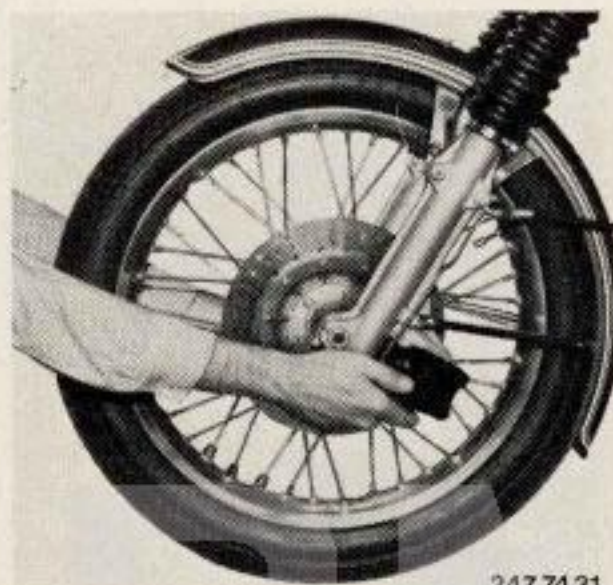
Fig. 44

Pull both sliders down and allow the oil to escape. Replace the hexagon nuts at the bottom of the tubular fork sliders and add fresh oil.

Total capacity of each fork leg 250 cm³ (approx. 8,75 fl. oz.)

Refill capacity per fork leg, when changing oil: 235 cm³ (approx. 8,25 fl. oz.)

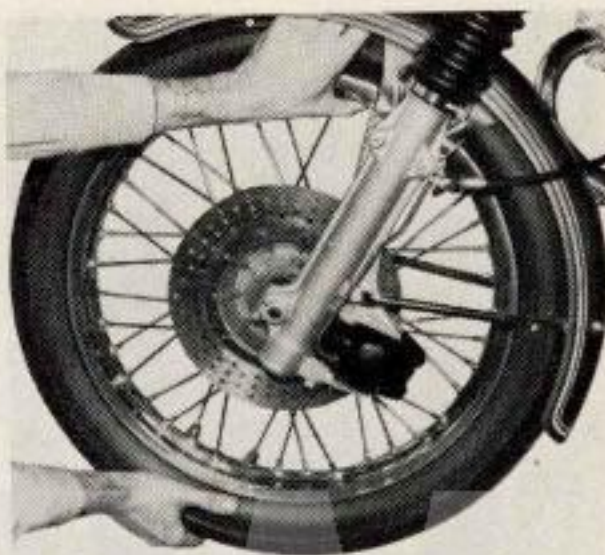
Oil grades: See Specifications.



45

Steering and wheel bearing play
Check steering play after the first 1000 km (600 miles), then every 1000 km (600 miles), then every 7500 km (5000 miles). Put the motorcycle on its center stand and push and pull the fork legs vigorously. There should be no play — if play is detected, have the steering head bearings adjusted in a professional workshop. **Fig. 45**

The precise degree of steering bearing preload can only be adjusted by using a friction measuring gauge.



46

Check wheel bearing play after the first 1000 km (600 miles), then every 15 000 km (10 000 miles) by putting the machine on its center stand with the wheel off the ground and pulling and pushing them vigorously in a sideways direction. No play should be noticeable. **Fig 46**

Wheel bearings should be adjusted only by a professional workshop.

Every 30 000 km (20 000 miles), check grease content of wheel hub bearings and repack with grease if necessary. For details of the proper grease, see specifications. This work should also be performed only by a professional workshop.



47

Rear swinging arm bearings

Check for absence of play at the rear wheel swinging arm bearing every 15 000 km (10 000 miles) by

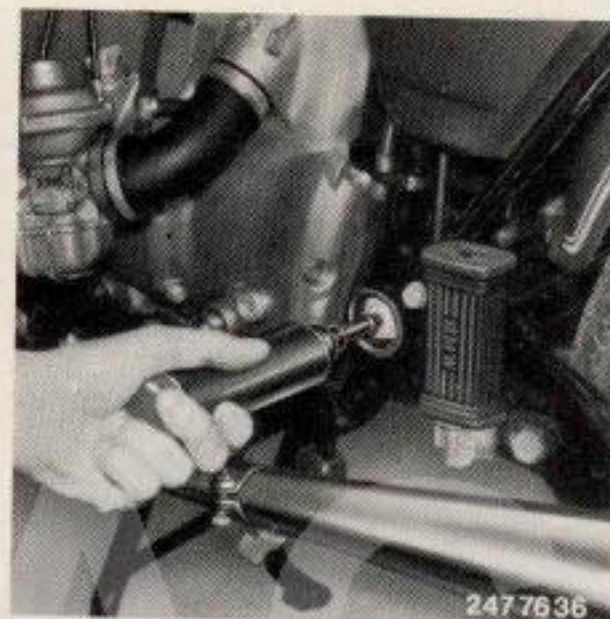
pulling and pushing the complete swinging arm while holding the machine firm at the handgrip on the main frame.

Fig. 47



48

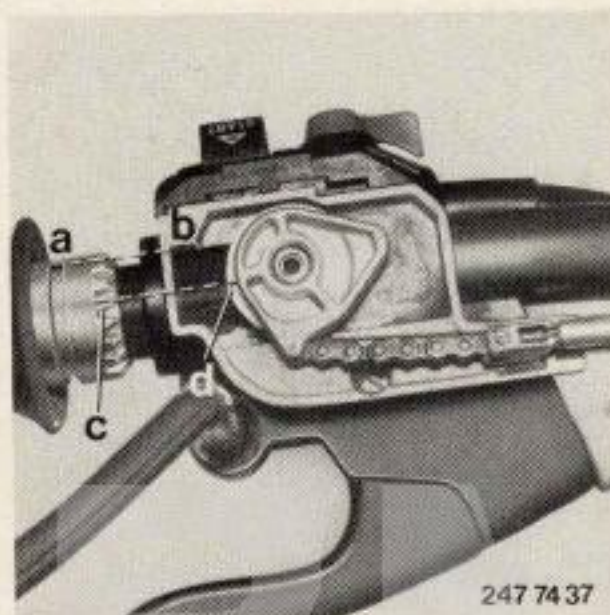
If necessary, adjust. Take off the plastic cap, loosen the lock nut with the ring wrench included in the toolkit, pre-load both bearing pins to a torque of 20 ± 2 Nm (14.4 ± 1.4 ft. lb.) with a suitable Allen key and release again. Finally, tighten to 10 ± 2 Nm (7.2 ± 1.4 ft. lb.) and retighten the lock nut (approx. 100 Nm/72 ft. lb.). **Fig. 48**



49

Lubricate the rear wheel swinging arm bearings with the grease gun, using a taper nozzle.

Fig. 49



50

Throttle twist grip, brake and clutch lever pivots

Check the throttle twist grip every 7500 km (5000 miles) for free movement; if necessary, push back the waterproof cap, unscrew and remove the cover, loosen tension screw and pull off the grip. Lubricate the inner grip, gear drive and chain. Note when reassembling that the slotted end "a" in the twist grip should be in line with the end of cutout "b" in the housing. Put the lower wire cable into the double nipple and insert cam



51

and chain in that way that the mark "c" on the toothed end of the grip is in one line with the mark "d" on the cam. Unless this precaution is taken, movement of the throttle cables will be restricted. Place the upper throttle cable into the double nipple, mount the cover and at the same time pull back the upper outer cable until the end sleeve on the outer cable can engage in the cutout on the cover. Tighten the cover and push on the waterproof cap.

Fig. 50

Grease the pivots on the foot brake (item 5), the side stand (item 12) and the clutch lever (item 16) every 7500 km (5000 miles), using a grease gun (see pages 60, 61).

Grease the pivot points for the clutch and the brake cable nipples every 7500 km (5000 miles). Disconnect the clutch cable at the clutch throw-out arm and loosen the brake adjusting screw on the master cylinder. Loosen the lock nuts on the clutch and brake lever pivot shafts, unscrew the shafts and pull the levers out of the pivot blocks. Disconnect the wire cables, allow a few drops of lubricating oil to penetrate the outer cables and grease the nipple retaining cutouts. Reassemble in reverse order. Make sure that the wire cables are not bent sharply.

Fig. 51



52

Master brake cylinder operating lever

Remove the brake pressure pin and grease lightly at both ends with Molykote BR 2 (or Liqui Moly LM 47 L). Oil the lever pivot slightly every 7500 km (5000 miles).

Warning:

No grease or oil must penetrate the master brake cylinder.

Fig. 52

Battery

Every 7500 km (5000 miles), but at least once a month, check acid level in the cells of the

battery. If the level has dropped too low, add distilled water (not acid) to app. 0,2 in (5 mm) above the tops of the plates inside the cells, then screw back the 6 cell plugs firmly. Keep the top of the battery clean and dry. Protect the terminal posts and clips against corrosion by applying a thin coat of special acid resistant grease.

Warning

Never allow battery acid or lead oxide from the terminals to get on to your clothing. Do not inspect battery acid level with a naked flame, or a dangerous explosion may result.

If the motor cycle is out of service for a lengthy period, recharge the battery once a month in order to prevent sulfate formation on the plates. For battery capacity, see specifications.

Warning

Before recharging the battery, always switch off the engine and disconnect the terminals, or else peak voltages produced in the charger may destroy the alternator diodes.



53

Intake air cleaner

Remove the air filter element

every 7500 km (5000 miles) — more often if the air contains a high proportion of dust. Carefully knock the element to remove loose dust, and blow through from the inside with a compressed air jet containing no oil. If the air cleaner element is severely contaminated, and in any case after every 15 000 km (10 000 miles), renew element. Running the engine with a blocked air cleaner element will

increase fuel consumption and reduce engine power.

To remove the air cleaner element, take off the intake manifold and remove the retaining screw (but do not detach the choke control). Then remove the filter housing by pulling straight out from the motor.

When installing the air cleaner element place it over the 3 pins in the rear half of the housing, then place the left filter housing half against the lower and side gearbox housing joints and push into position. Support the cylinder head screw with the left hand to simplify insertion.

Fig. 53

Brakes

Check the efficiency and lever travel of the brakes at regular intervals, or at least every 7500 km (5000 miles). Brake lining wear can be checked visually as follows:

On drum brake, through inspection holes on left side of hub; on disc brakes by looking down on to inner brake lining.

Warning

For safety reasons, worn brake shoes and pads must always be renewed in good time (min. lining thickness = 1.5 mm (0.06 in)).

Adjusting front brake

If cable stretch has led to excessive handbrake lever movement, the lever must be adjusted. This can only be carried out at the master brake cylinder (after the fuel tank has been removed) by using a BMW special tool.

Renewing brake pads, adjusting brake caliper

The brake caliper must be removed to renew the brake pads. Take off the end cap on the eccentric pin and extract the pin with a long 8 mm screw (to be screwed in by several complete turns) (**Fig. 54**). Next, pull the brake caliper to the rear, remove the inner pad retaining spring and take both brake pads out of the caliper.

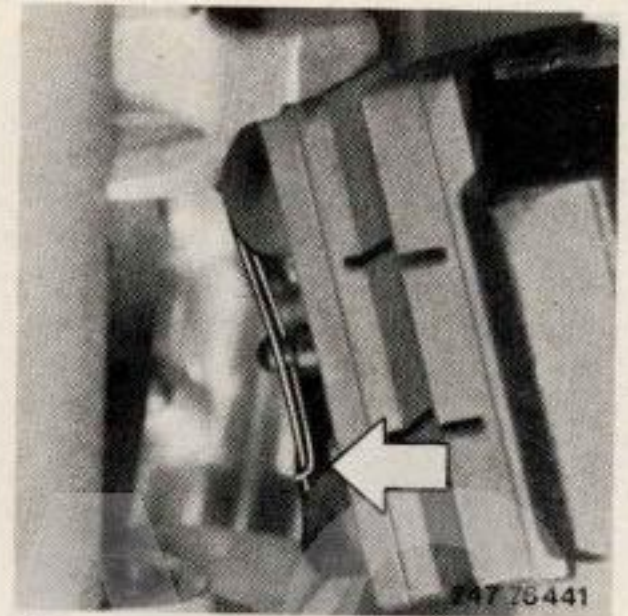
Before inserting new pads, push the piston back into the wheel brake cylinder with a screw clamp. Lightly grease the guide pin for the outer brake pad (with Molykote BR 2 or Liqui Moly LM 47 L), then install the O-ring and the outer pad. Secure the inner brake pad with the retaining spring, the angled end of which must face down (**Fig. 55**). Install the brake caliper, grease and insert the eccentric pin.

To adjust the brake pads, turn the pin with a screwdriver until the inner pad is parallel to the inner face of the brake disc (pull the brake caliper slightly outwards).



54

Apply one or two heavy marks with a felt-tipped pen to the inside of the brake disc, working from the inside to the outside edge. Turn the front wheel and pull the brake caliper outwards. Examine the ink marks to ensure that the full area of the inner brake pad is touching the disc. The outer pad is operated by the brake cylinder piston and is aligned automatically. Grease the spring, replace the end cap and tighten to 60 ± 5 Nm (43 ± 3.6 ft. lb).



55

When the front wheel is removed the handbrake lever must not be operated, or else the brake piston will be forced out and brake fluid will escape.

Warning

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

Brake fluid

If brake fluid level drops in either the front or (on R 100 RS) the rear hydraulic brake circuit, an electric warning device in the brake fluid reservoir causes the telltale light in the combined instrument to come on.

Sudden violent braking may affect fluid level and cause the float to move up and down, so that the telltale light flickers. If the brake fluid telltale light remains on, the reason for brake fluid loss must be determined without delay.

When the brake pads are new, brake fluid level in the reservoir should be up to the upper 'MAX' marking. As the brake pads wear, the level in the reservoir drops. Do not overfill, or else the fluid may overflow and damage the motor cycle's paintwork.

Warning

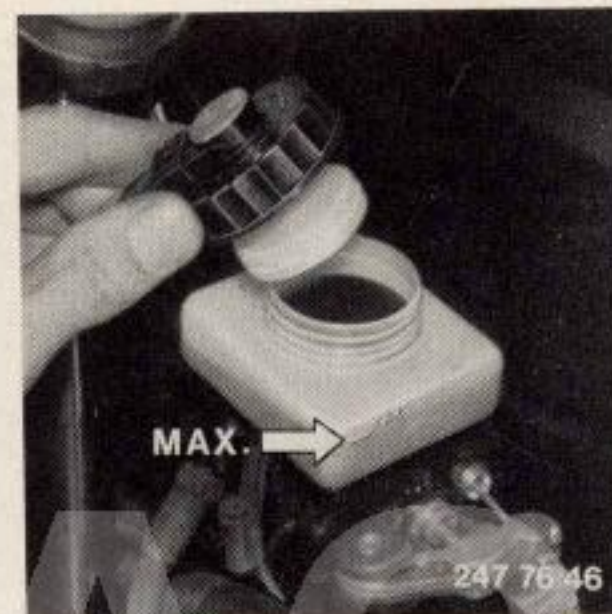
Brake fluid must be kept out of reach of children as it may be harmful or even fatal if swallowed. In case of contact with skin or eyes, flush with water.



56

Bleeding the brake system

If the action of the brake lever or pedal (R 100 RS) feels "soft", the brake system should be bled. First remove the tank and right battery cover (R 100 RS), then add fluid to the correct level in the brake fluid reservoir. After this, remove the cap protecting the bleed screw, mount the bleed hose and immerse it in a container containing brake fluid. Apply the hand-brake lever a number of times until braking pressure is detected. Hold the lever applied



57

against this pressure and open the bleed screw, at the same time pulling firmly on the lever. Do not release the lever until the bleed screw has been closed. Repeat this process until brake fluid emerges from the hose into the container entirely free from air bubbles. Tighten bleed screw.

Warning

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

Figs. 56 and 57

Warning

Brake fluid is hygroscopic, and is thus capable of absorbing moisture from the atmosphere over a considerable period of time. To insure that the brake system remains fully reliable, the brake fluid must be replaced once a year by a professional workshop.



58

Rear wheel brake (R 60/7 – R 100 S)

Adjust the **foot brake** (rear wheel) by turning the wing nut on the end of the pull rod until the rear wheel brake just begins to bite. Then turn the wing nut back by 3 to 4 turns.

Warning

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

Fig. 58

Rear wheel brake (R 100 RS)

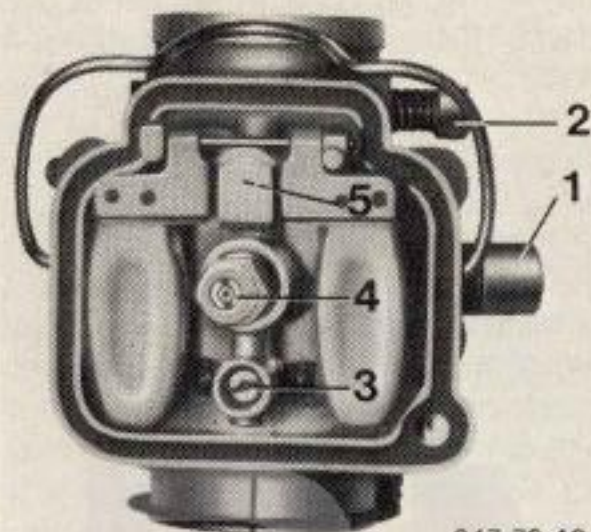
The disc brake pads are self-

adjusting, so that there is no need to take up routine pad wear.

Every 15 000 km (10 000 miles), examine all elements of the brake operating linkage. Clean the brake drum and shoes. Grease the brake operating cam. Do not use sandpaper or emery cloth on the brake linings if they appear shiny, and do not taper off or chamfer the ends of the linings.

Check free movement of front brake caliper and condition of brake discs and pads.

All work on the brake system should be carried out only by a professional workshop.



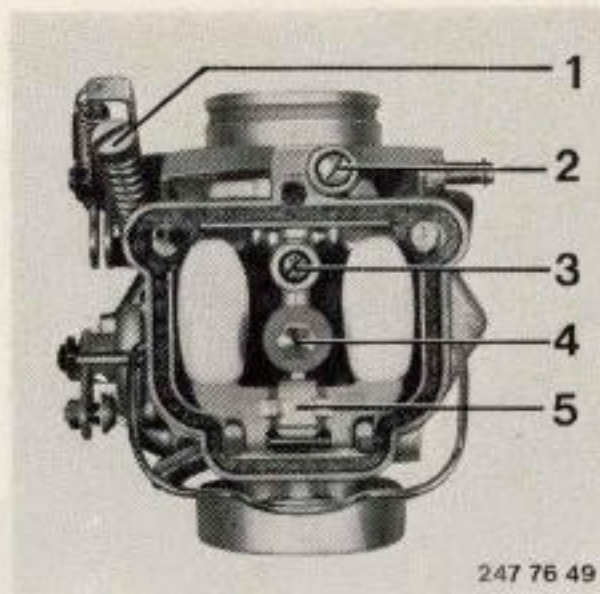
247 76 48

59

Carburetors

Carburetor cleaning should if possible be carried out by a professional workshop.

In an emergency, the carburetors used on all models can be removed and all fuel and air passages together with float needle valve 5, main jet 4 and idle jet 3 blown through with compressed air. Clean the float housing at the same time, making sure that the throttle slide or throttle stop screw 1 is not disturbed.

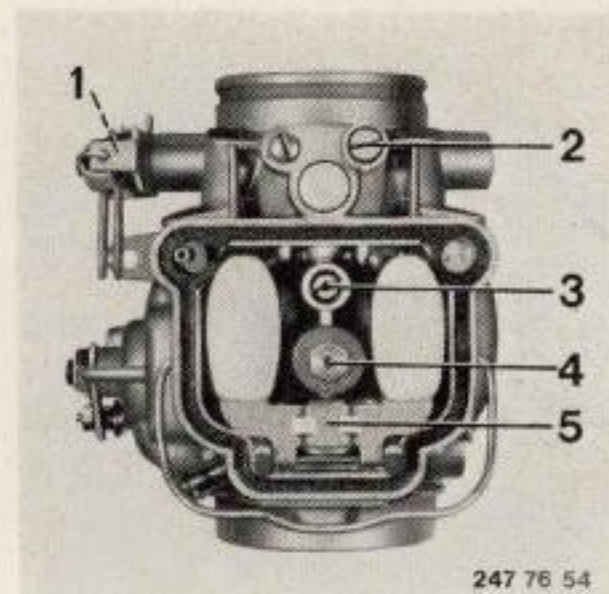


247 76 49

60

After reassembling the carburetor, screw in the idle air or idle mixture regulating screw 2 as far as possible without using force, then unscrew as follows to obtain the basic setting:

$\frac{1}{4}$ to $1 \frac{1}{4}$ turns (R 60/7)	Fig. 59
$\frac{1}{2}$ to 1 turn (R 75/7)	Fig. 60
1 turn (R 100/7)	Fig. 60
1 to $1 \frac{1}{2}$ turns (R 100 S)	Fig. 61
1 to $1 \frac{1}{2}$ turns (R 100 RS)	Fig. 61

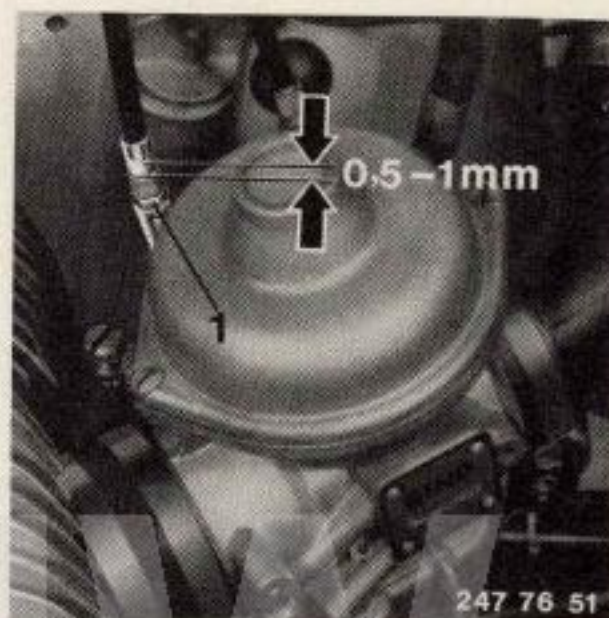


247 76 54

61

Insert the throttle slide (R 60/7) in a dry condition, and tighten the cover screw firmly by hand (without using pliers). Make sure that the locating lug on the cover is correctly engaged in the housing.

The vacuum slide (R 80/7 — R 100 RS) with diaphragm and jet needle should be inserted dry, with the locating lug on the diaphragm pressed into the cutout in the sealing groove on the upper part of the carburetor. This will ensure that pressure equalizing passages in the vacuum piston are on the throttle butterfly side. Mount the vacuum housing cover and tighten the slotted screws ensuring that the throttle cable adjusting screws are on the same side as the cold start mechanism and throttle butterfly lever. If correctly installed, the vacuum piston should move by its own weight to both limit positions in the guide passage. Connect the throttle cables and check free movement with the twist grip fully closed (0.5 to 1 mm/0.02 to 0.04 inch). If neces-



62

sary, loosen lock nut 1 (9 mm wrench) and turn the throttle cable adjusting screw to the right to increase free play or to the left to reduce play. This basic setting of the throttle cable must in all cases be identical on the left and right sides of the engine.

Fig. 62

Adjust engine idle speed when the engine is at its normal operating temperature and with the twist grip fully closed.



63

Correct idle speed is between 600 and 800 rpm. If the engine idles at this speed, check by removing each plug cap in turn and consulting the revolution counter to ensure that both cylinders are working uniformly.

If the cylinders are not operating evenly or the idle speed is higher or lower than the specified value, adjust the carburetors as follows:

Type R 60/7

Adjust the running speed of the cylinder which deviates most from the specified idle speed until it matches the other cylinder. This is done by turning the throttle slide stop screw 2 to the right (to speed up the engine) or to the left (to slow down the engine). In order to obtain the most favorable mixture setting turn the idle air regulating screw 1 carefully in either direction and check that engine speed rises slightly. When the central setting has been found, the mixture is correctly adjusted. Repeat this procedure on the second carburetor.

Fig. 63



64

If engine speed is now outside the permitted limit of 600 to 800 rpm turn both throttle stop screws 2 to the left by an equal amount to reduce engine speed or to the right if engine speed needs to be increased. Repeat the final adjustment at the idle air regulating screw.

Types R 75/7 — R 100 RS

Adjust the cables of the cold start device until tension is uniform (play in cable 0.5 to 1 mm/ 0.02 to 0.04 inch). Unscrew the cable adjusting screws on both

carburetors completely, so that the throttle butterfly levers are not suspended on the throttle cables.

Figs. 64 and 65

Move the idle mixture regulating screw 1 and throttle butterfly stop screw 2 on both carburetors to their basic settings: in the case of the idle mixture regulating screw, tighten fully and unscrew by 1 turn. Tighten the throttle stop screw until it just touches the stop on the throttle lever, then screw in by 1 further turn. Turn the idle mixture regulating screws on both carburetors to the left and right until the most suitable mixture setting is obtained (indicated by engine speed reaching its maximum value).

Continue carburetor adjustment alternately on the left and right carburetors. Unscrew the throttle stop screw step by step, and locate the best setting of the idle mixture regulating screw again after each movement. Repeat this entire procedure until

the cylinder being adjusted ceases to fire after a few turns of the engine when working alone (spark plug cap on opposite cylinder removed).

To adjust transition from idle speed to part load, open the twist grip slightly so that engine idle speed is increased. Remove the spark plug caps in turn to check that both cylinders are operating evenly. If necessary, adjust the throttle cable of the cylinder which picks up slower so that less free movement is present. This is done by turning the adjusting screw to the left and locking with the hex. nut (9 mm wrench).

Warning

Avoid running your machine in closed places as exhaust gases contain extremely poisonous carbon monoxide.

Do not run the engine longer than necessary and no longer than 10 minutes, or an overheating problem could result.



65

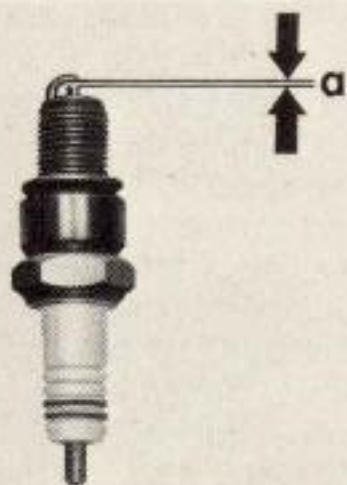
Fuel pet cock

Every 15 000 km (10 000 miles), remove the **mesh screen filter** in the fuel pet cock for cleaning.

1. Close the fuel pet cock.
2. Unscrew the collar nut (17 mm wrench).
3. Take off hose union and screen, and clean the screen in gasoline.
4. Do not re-use gasket if damaged. Reassemble screen filter.

Removal of the complete fuel pet cock

1. Drain the fuel tank.
2. The quick-acting union nut (24 mm wrench) has a normal right-hand thread on the fuel tank side and a left-hand thread on the fuel pet cock side. Hold the fuel pet cock and turn the nut to the left, then remove pet cock and nut.
3. When reassembling, do not re-use gasket unless in perfect condition. The wider end of nut faces upwards. Engage both threads on nut with the threads on the fuel tank and fuel pet cock simultaneously.



247 76 56

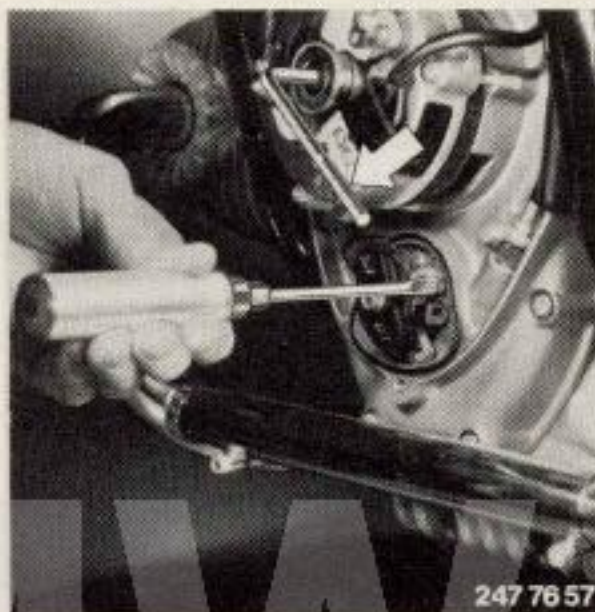
66

Spark plugs

Check the **spark plug electrode gap** with a feeler gauge every 7500 km (5000 miles) and also when installing new spark plugs. If necessary, bend the side (ground) electrode to the specified gap of $a = 0.6 \pm 0.1$ mm (0.024 ± 0.004 inch). **Fig. 66**

Clean spark plugs by dipping in gasoline and brushing, but do not use a metal brush. Before screwing the plug into the cylinder, apply graphite grease to the threads.

Replace spark plugs after every 15 000 km (10 000 miles).



247 76 57

67

Breaker points gap, breaker lubricating felt, ignition timing

Check breaker gap every 7 500 km (5000 miles): disconnect the **battery**, remove the 3 Allen screws (5 mm) and take off the generator cover. If no dwell angle meter is available, unscrew the spark plugs and turn the engine clockwise, looking from the front, by means of the Allen screw (6 mm) holding the alternator rotor. Continue to turn until the breaker arm lifts off fully. Replace burnt breaker

points. Measure breaker points gap with a feeler gauge (0.35 to 0.40 mm — $\frac{1}{64}$ inch). To adjust the breaker points gap, loosen the set screw slightly, insert a screwdriver blade between the 2 small pins and into the slot on the breaker plate and turn the screwdriver slightly until a gap of 0.35 to 0.40 mm ($\frac{1}{64}$ inch) is obtained. Tighten the set screw and check that the gap has not altered. **Fig. 67**

Rub a small quantity of high temperature point cam grease into the **lubricating felt** every 15 000 km (10 000 miles), and check that the felt is resting correctly on the cam.

Every 15 000 km (10 000 miles), loosen the hexagon nut (10 mm wrench) and take off the **centrifugal advance unit**. Grease the pivot pin for the centrifugal advance unit lightly with Bosch Ft 1 v 26 grease. Check for proper spring action.

Check **ignition timing** every 7500 km (5000 miles) or whenever the breaker points gap is reset.

- a) Connect one terminal of a **test lamp** to the condenser, the other to ground (earth) with the ignition switched on.

Fig. 68

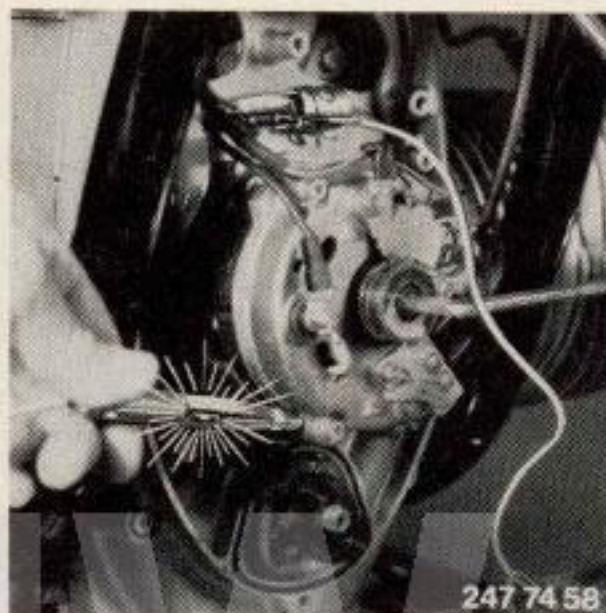
The test lamp must light up when the center "S" mark on the flywheel is in line with the mark in the inspection hole as the engine is turned clockwise (normal direction of engine rotation). The centrifugal advance weights must not move.

Fig. 69

Ignition is timed to take place at 6° before TDC. The difference between the firing points of the left and right cylinders should not exceed $\pm 3^\circ$ (note marks above and below "S").

- b) Connect a **strobe timing light** between the spark plug cap and the plug and direct the light on to the flywheel rim through the inspection hole while the engine is running.

At engine idle speed (600–800 rpm) the center "S" flywheel mark (ignition retarded) should appear as a bright line in the



68

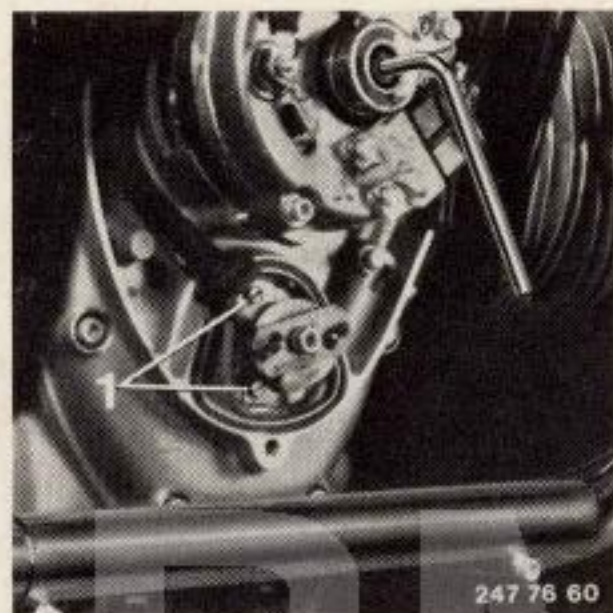
inspection hole. If the line is above center, the ignition is too far advanced; if below center, the ignition is too far retarded. As engine speed increases the "S" mark will move upwards out of the inspection hole (movement starts at approx. 1550 rpm). If engine speed is increased still further, the "F" flywheel mark (ignition advanced) will appear at the bottom of the inspection hole, and should reach the mark in the inspection hole at an engine speed of 3000 rpm (full centrifugal advance).



69

Retiming the ignition: Loosen the two screws 1 on the contact breaker base plate. Turning the base plate in the same direction as engine rotation will retard the ignition, and turning it against the direction of engine rotation will advance the ignition (the engine crankshaft and camshaft rotate in the same direction). Retighten the 2 screws firmly when the adjustment has been completed. **Fig. 70**

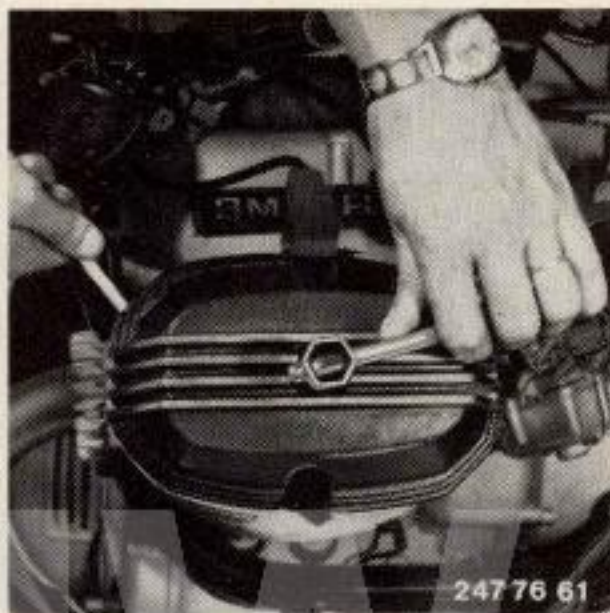
When checking ignition timing with a test lamp, turn the engine through 45° against the normal



70

direction of rotation (the test lamp will go out). This will ensure that when the engine is turned in its normal direction of rotation, any possible lost motion will be eliminated. Re-check ignition timing with the test lamp.

Timing the ignition with the strobe light: if ignition advance is incorrect, check runout on the advance mechanism mounting shaft (max. 0.02 mm/0.0008 inch) and free movement of the centrifugal advance cam on the shaft.

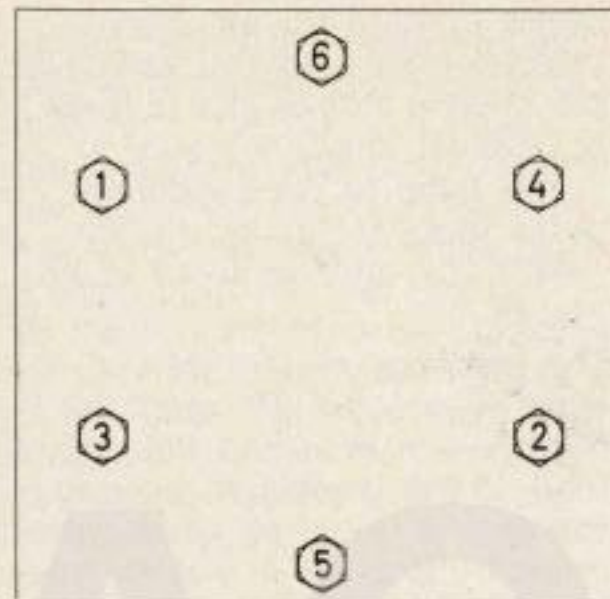


71

Cylinder head nuts, valve clearances

Every 7500 km (5000 miles), check the **tightening torques** of the nuts on the 4 through bolts and the 2 cylinder head retaining nuts. Remove the rocker cover by loosening the cap nut (13 mm) and the 2 side nuts (10 mm).

Fig. 71

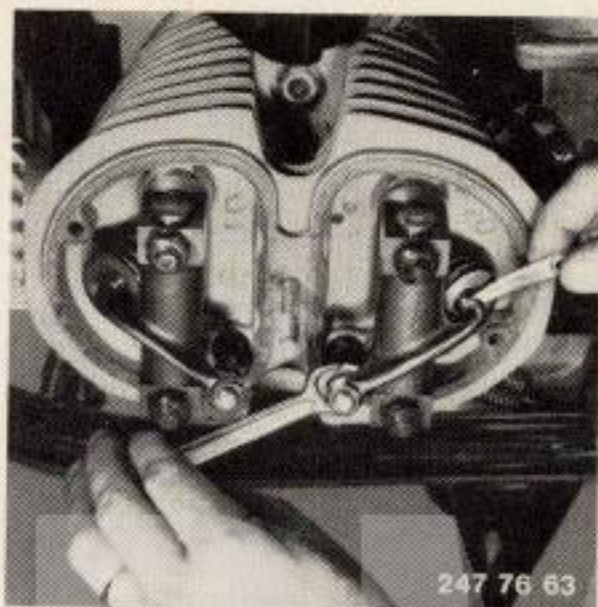


72

If necessary, tighten the nuts with a torque wrench with the engine cold in accordance with the tightening sequence shown here (35+4 Nm/25+2.8 ft. lb).

Fig. 72

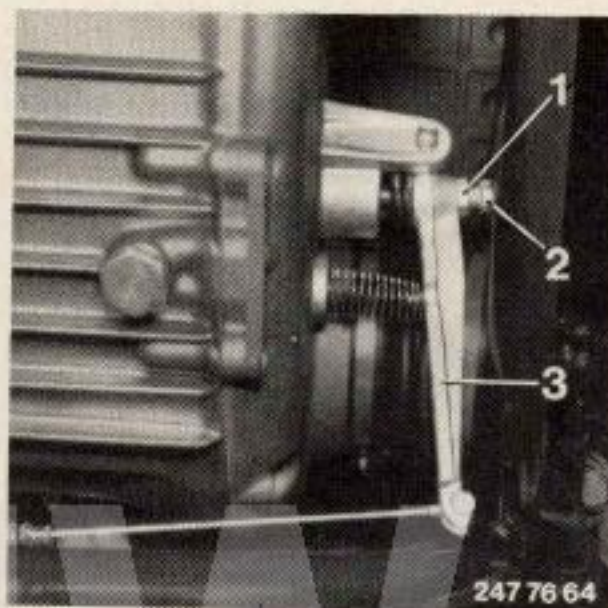
Check valve clearances — this work has to be carried out each time the cylinder through bolt or cylinder head nuts are retightened — with the engine stopped and cold, using a feeler gauge inserted between the valve stem and the rocker. Unscrew the spark plugs and turn the engine



73

with an Allen key (6 mm) at the alternator rotor attachment screw until the cylinder on which valve clearance is being adjusted is at top dead center on the compression stroke. Both valves will then be closed. If necessary, adjust valve operating clearances (inlet 0.10 mm — outlet 0.15 mm) by loosening the lock nut (12 mm wrench) and turning the adjusting screw (12 mm wrench). Afterwards, tighten the lock nut firmly and recheck valve operating clearance.

Fig. 73

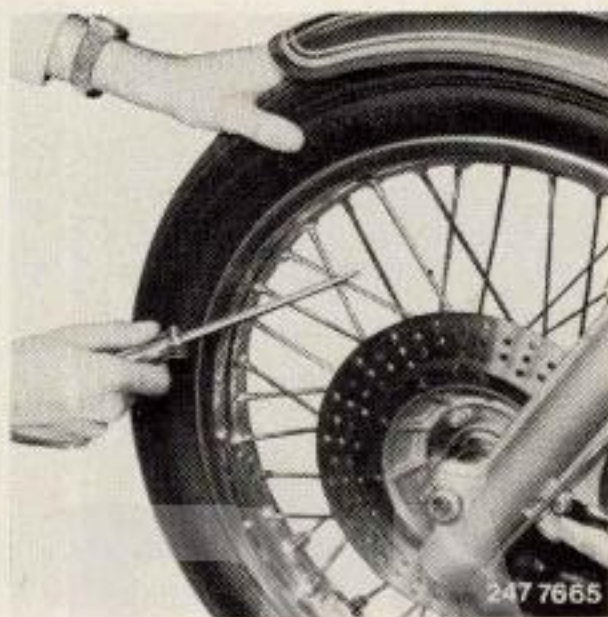


74

The clutch is correctly adjusted when there is approx. 2 mm (0.08 inch) of play at the clutch throwout lever 3. In addition, the clutch throwout lever must be positioned parallel to the gear-box housing cover while the clutch lever is halfway pulled. Deviations encrease the force necessary to operate it. Play can be increased by screwing in the knurled cable adjuster on the clutch operating lever mounting, or decreased by unscrewing the adjuster. If the range of adjustment provided is insufficient, play

can be decreased by loosening lock nut 1 (13 mm wrench) and tightening adjusting screw 2 (10 mm wrench) at the throwout lever. Loosening the screw provides increased play. After adjustment, tighten the locknut on the set screw.

Fig. 74



75

Wheel spokes, rims

Every 15 000 km (10 000 miles), check uniform tension of the wheel spokes. Strike them in turn with a screwdriver — a high or low sound will indicate excessive or insufficient spoke tension.

Fig. 75

If spokes are retensioned, always remove the tire, tube and rim tape and file away any spoke ends protruding into the rim well to prevent damage to the tube and thus risk of accident.

If lateral or vertical rim runout is detected, have the wheel centered and rebalanced.

Warning

Insufficient spoke tension, wheel unbalance and rim runout can affect the stability and handling of your motorcycle.

Test ride, final inspection

After each inspection, the machine should be test-ridden and checked for road safety. Correct operation of the brakes, gear shift, clutch and instruments must be confirmed, as well as free movement of the steering. For the final acceptance check, tire condition and pressures, lights, horn, warning and telltale lights and rear view mirrors must be examined and tested.

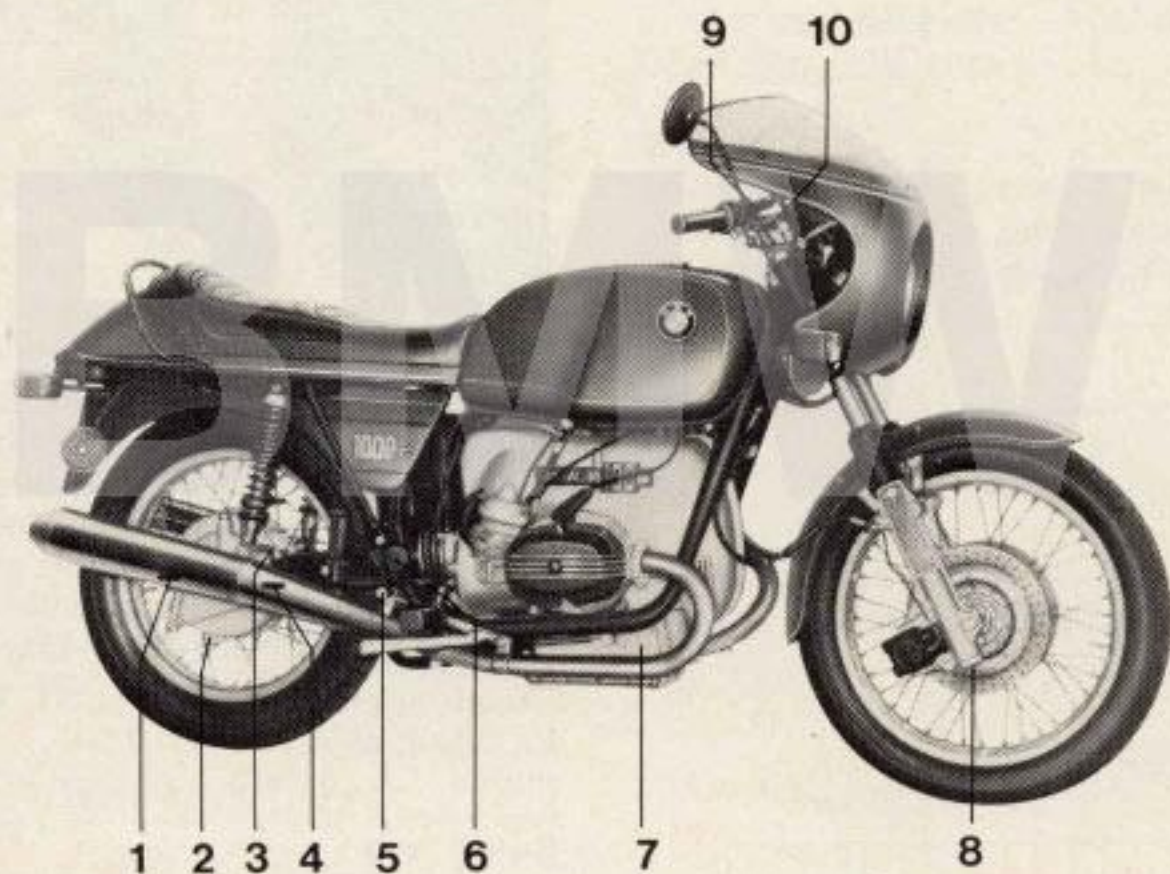
Tightening nuts and bolts

Check that the following nuts and bolts are firmly tightened every 7500 km (5000 miles):

Location	Wrench size
1. Front and rear axle nuts	22 mm
2. Front and rear engine mounting screws	19 mm
3. Hexagon screws securing center stand to frame	17 mm
4. Hose clips on carburetors	
5. Rocker cover attachment	
1) cap nut	13 mm
2) hexagon nuts	10 mm
6. Rear shock absorber mounting (upper and lower)	17 mm
Pre-delivery check only:	
7. Attachment of drive shaft to gearbox output shaft flange 4 12-sided bolts	10 mm
During first maintenance service only:	
8. Timing chain cover to engine	
9 Allen screws	5 mm
3 internal hexagon nuts	5 mm

Tightening torques

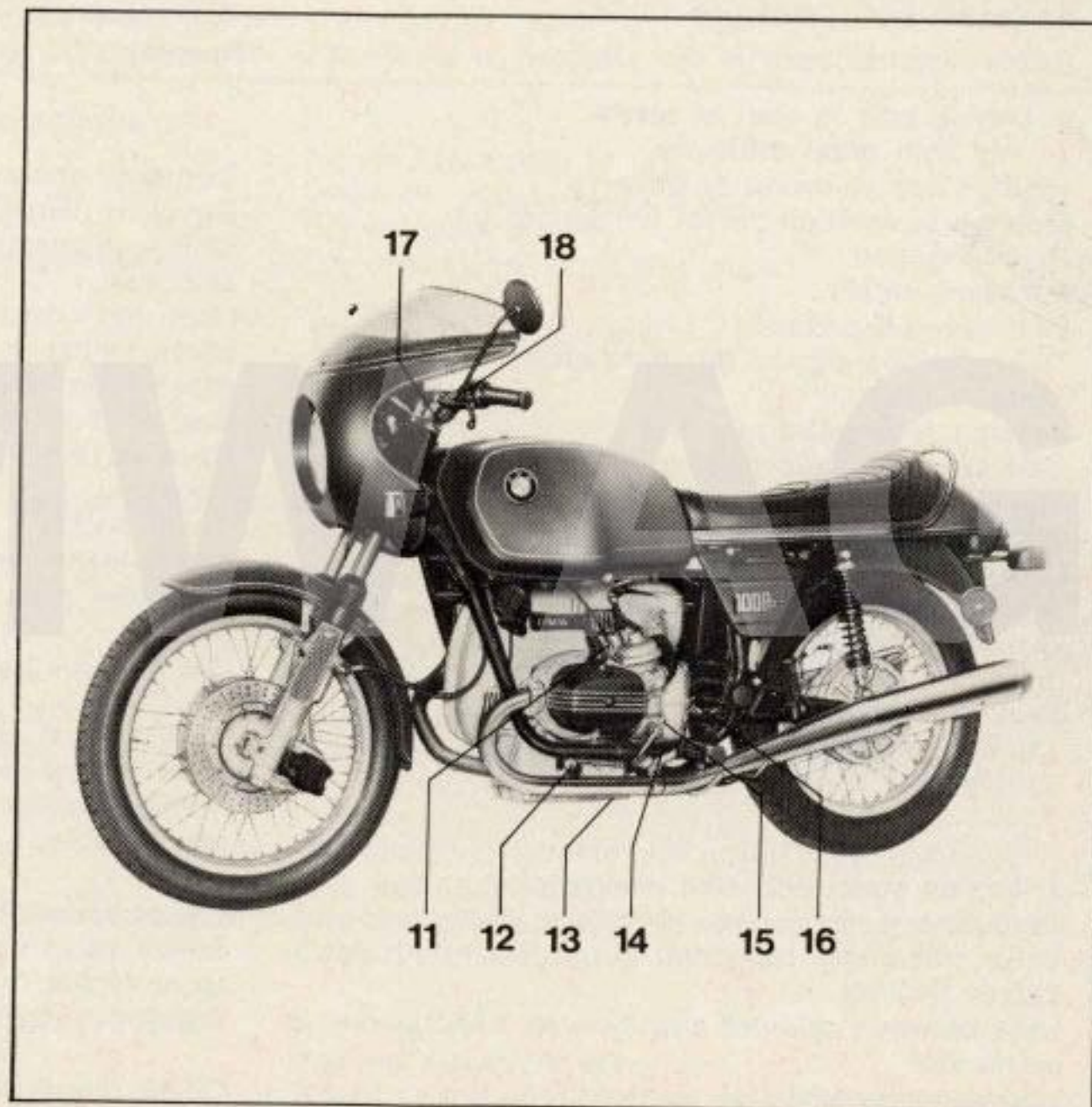
	ft. lb	Nm
Cylinder head nuts	25 + 3	(35 + 4)
Finned exhaust pipe nut	116 + 14	(160 + 20)
Centering nut, telescopic fork	87 + 7.2	(120 + 10)
Hex. nut for oil drain, telescopic fork	16.6 + 2	(23 + 3)
Axle nuts, front and rear	32.5 + 2	(45 + 3)
Clamp screw for wheel axle, front	10.9 + 1.5	(15 + 2)
Clamp screw for wheel axle, rear	10.1 + 3	(14 + 4)
Swing arm pivot pin	7.2 + 1.5	(10 + 2)
Nuts	72	(100)
12-sided bolts drive shaft	27.5 + 3	(38 + 4)



Lubrication chart

- 1 Filler plug for final drive
- 2 Drain plug for final drive
- 3 Filler plug for drive shaft housing
- 4 Drain plug for drive shaft housing
- 5 Grease nipple for footbrake linkage
- 6 Grease nipple for swinging arm bearing
- 7 Full-flow oil filter
- 8 Oil drain plug for telescopic fork
- 9 Throttle cable mechanism
- 10 Brake lever pivot

- 11 Engine oil dipstick
- 12 Grease nipple for side stand
- 13 Engine oil drain plug
- 14 Gearbox oil drain plug
- 15 Gearbox oil filler plug
- 16 Grease nipple for clutch throwout arm
- 17 Telescopic fork filler plug
- 18 Clutch lever pivot



What to do if . . .

Failures and possible cures

Cause	Remedy
1. Engine fails to start or starts only with great difficulty	
Ignition key in wrong position	Switch to operating position
Emergency ignition switch not turned on	Switch to 'RUN'
Gear engaged	Shift to neutral or pull clutch lever
Fuel tank empty	Add fuel
Fuel pet cocks closed	Open pet cocks
Twistgrip opened too far when engine is cold	Close twistgrip
Blocked filter	Clean filter element or renew
Leaking or blocked fuel line	Seal or blow through fuel line
Defective fuel supply valve in float chamber	Have valve renewed
Idle jet blocked	Clean jet
Dirty breaker points	Clean points
Loose or defective ignition lead	Check leads, renew if necessary
Spark plug wet — water condensate or excessive fuel	Dry spark plug
Breaker points or spark plug electrode gaps too large	Check and adjust gaps
Valve sticking open	Decarbonize valves
Battery flat	Have battery recharged in workshop.
	Note: Recharge battery only with both positive (+) and negative (—) leads removed
2. Engine starts but idles unevenly	
Carburetor settings too rich or too lean	Adjust carburetor settings
Valve clearances too small	Adjust valve clearances
Valves leaking	Have valves reground
Leak between cylinder and cylinder head gasket or carburetor	Check for leaks at cylinder and carburetor joints
Low compression	Check piston rings or re-bore cylinders

Cause	Remedy
3. Engine idles unevenly when warm, exhaust smokes Fuel feed valve leaking, idle mixture setting too rich	Repair valve; readjust idle mixture settings
4. Engine runs unevenly, misfires occasionally Spark plug gaps too large Spark plugs oiled up or sooted Ignition leads wet or defective Spark plug cap short-circuiting (recognizable by sooted burn marks) Fault in ignition system Blocked carburetor jets Blocked fuel line Water condensate in float bowl	Adjust spark plug gaps Clean or replace spark plugs Dry or replace leads Dry or replace spark plug caps Replace defective parts Clean jets Clean fuel line Clean float bowl
5. Engine overheats, runs on when ignition is switched off Fuel mixture too lean Ignition timing incorrect Breaker points gap incorrect Engine cylinder cooling fins blocked with dirt Thermal rating of spark plugs too low	Check and adjust carburetor settings, check that the correct jets are installed Check and adjust timing Adjust breaker points gap, check ignition and retime if necessary Clean cooling fins Use spark plugs according to specification
6. Engine pre-ignites under load Fuel octane rating too low Heavy oil carbon residues in combustion chambers Ignition advanced too far	Use only brand-name fuel of the correct quality (see specifications) Remove cylinders heads and clean pistons Correct ignition timing
7. Starter does not work when button is pressed Fault in starter button or starter relay Flat battery	Replace defective parts Recharge battery, if necessary correct acid level

Specifications

Engine		R 60/7	R 80/7	R 100/7	R 100 S	R 100 RS
Engine type		Horizontally opposed 4-cycle, 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	7000
Displacement	cm ³	599	745	980	980	980
Cylinder bore	mm (inch)	73.5 (2.894)	84.8 (3.338)	94 (3.701)	94 (3.701)	94 (3.701)
Piston stroke	mm (inch)	70.6 (2.780)	70.6 (2.780)	70.6 (2.780)	70.6 (2.780)	70.6 (2.780)
Compression ratio		9.2 : 1	9.2 : 1	9.0 : 1	9.5 : 1	9.5 : 1
Carburetors						
Design		2 inclined Bing slide-type carburetors with needle jet and central lever float	2 inclined Bing constant depression carburetors with needle jet, vacuum plunger, throttle butterfly and central lever float			
Carburetor type number, left		1/26/123	64/32/201	64/32/19	94/40/103	94/40/103
right		1/26/124	64/32/202	64/32/20	94/40/104	94/40/104
Carburetor throat dia.	mm (inch)	26 (1.02)	32 (1.26)	32 (1.26)	40 (1.57)	40 (1.57)
Main jet		140	148	150	170	170
Needle jet		2.68 with accelerator pump	2.66	2.68	2.66	2.66
Jet needle number		4	46-241	46-241	46-341	46-341
Needle position		2	3	3	3	3
Idle jet		40	50	50	45	45
Idle air jet		—	1 mm dia.	1 mm dia.	1 mm dia.	1 mm dia.

Fuels and lubricants**R 60/7 — R 100 RS**

Fuel	High test gasoline			
Tank capacity	liters (US gals.)	24 (6.3)		
including reserve	liters (US gals.)	3 (0.8)		
Engine oil	Brand-name highest quality engine oil for outside temperatures			
	mostly above	+30° (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)	Brand-name Hypoid gear oil	above 5° C (41° F)	below 5° C (41° F)
	0.8 (0.85)			
Rear drive shaft housing oil capacity	liters (US quarts)		SAE 90	SAE 80
	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; Mobil Aero HFA; Mobil DTE 11; Castrol Code 1971; Premium Fork Lubricant "Spectro SAE 10" (for competition purposes only)			
Capacity per fork leg	liters (US quarts)	0.25 (0.26)		

Fuels and lubricants**R 60/7 – R 100 RS**

Breaker felt lubricating pad and centrifugal advance mechanism	Bosch Ft 1 v 4 grease (high temperature point cam grease)
Centrifugal advance pivot shaft	Bosch Ft 1 v 26 grease
Brake pressure stud on master cylinder	Molykote BR 2 or Liqui Moly LM 47 L
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 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" brake fluid
Capacity, refilling and bleeding	0.5 liter (0.5 US quarts)

Dimensions		R 60/7	R 80/7	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 (motor cycle 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	mm (inch)	2180 (85.9)	2180 (85.9)	2180 (85.9)	2180 (85.9)	2180 (85.9)
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 without fuel or tools	kg (lb)	195 (430)	195 (430)	195 (430)	200 (441)	210 (463)
Unladen weight with lubricants, 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 wheel loads, solo						
front, at 1.9 atm (27 psi) tire pressure	kg (lb)		160 (353)			
rear, at 2.0 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

Rims and tires		R 60/7	R 80/7	R 100/7	R 100 S	R 100 RS
Rims	front:		1.85 B x 19			1.85 B x 19*
	rear:		2.15 B x 18			2.50 B x 18*
Tires	front:	3.25 S 19		3.25 H 19		
	rear:	4.00 S 18		4.00 H 18		

* Cast light alloy wheels

Electrical system

Battery	Varta, 12 V, 28 Amp/h
Starter	Bosch, 0,6 hp (0.44 kW)
Starter relay	Bosch, type 0 332 014 118
Alternator	R 60/7, R 75/7: Bosch, type 0 120 340 004 R 100/7, R 100 S, R 100 RS: Bosch, type 0 120 340 005
Alternator drive	Direct from crankshaft
Voltage regulator	Bosch, AD 1/14 V
Condenser	0.2 μ F
Coils (2)	Bosch E 6 V

	R 60/7	R 80/7	R 100/7	R 100 S	R 100 RS
Spark plugs	Bosch W 175 T 30	○			
	Bosch W 200 T 30		○		
	Bosch W 225 T 30	○		○	○
	Beru 175/14/3 A	○			
	Beru 200/14/3 A		○		
	Beru 230/14/3 A	○		○	○
	Champion N 10 Y	○			
	Champion N 7 Y		○		
	Champion N 6 Y	○		○	○

Ignition contact breaker	with automatic centrifugal advance, mounted on camshaft		
Adjustment begins at engine speed rev/min	1550		
Adjustment ends at engine speed rev/min	3000		
Breaker points gap	0.35 to 0.40 mm (0.014 to 0.016 inch)		
Ignition timing	$6^{\circ} \pm 3^{\circ}$ bTDC		
Automatic timing advance range	$25^{\circ} \pm 2^{\circ} 30'$ at crankshaft		
Spark plug electrode gap mm (inch)	0.6 (0.024) + 0.1 (0.004)		
Turn indicator flasher unit	Hella TBB 26 1-4 x 21 W - 12 W		
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
	Brake	red	12 V, 1,2 W
	Neutral	green	12 V, 1,2 W
	Battery charge	red	12 V, 3 W
	Turn indicator	green	12 V, 3 W
Illumination:	Speedometer		12 V, 3 W
	Rev. counter		12 V, 3 W
Fuses (2)	8 A		
Turn indicators, 2 each front and rear	12 V, 21 W		
Rear and license plate light	}	double filament bulb	12 V, 21/5 W
Stop light			

At a glance

Spark plugs	R 60/7	R 80/7	R 100/7	R 100 S	R 100 RS
Bosch W 175 T 30		○			
Bosch W 200 T 30			○		
Bosch W 225 T 30	○			○	○
Beru 175/14/3 A		○			
Beru 200/14/3 A			○		
Beru 230/14/3 A	○			○	○
Champion N 10 Y		○			
Champion N 7 Y			○		
Champion N 6 Y	○			○	○

Electrode gap	mm (inch) 0.6 (0.024) + 0.01 (0.004)
Ignition timing	6° before TDC
Breaker points gap	mm (inch) 0.35 to 0.40 (0.014 to 0.016)
Dwell angle	78 ± 1°

Valve clearances with engine cold

Inlet 0.10 mm (0.004 inch)
 Exhaust 0.15 mm (0.006 inch)

Tire pressures

in bar (lb/in²) when tires cold — add 0.3 (4) when tires hot

Solo	front	1.9 (27)	up to 160 km/h (100 mph)
		2.1 (30)	above 160 km/h (100 mph)
	rear	1.8 (26)	up to 130 km/h (81 mph)
		2.0 (28)	130 to 160 km/h (81 to 100 mph)
With pillion passenger	front	2.2 (31)	above 160 km/h (100 mph)
		2.1 (30)	for all speed ranges
	rear	2.0 (28)	up to 130 km/h (81 mph)
		2.2 (31)	130 to 160 km/h (81 to 100 mph)
		2.3 (33)	above 160 km/h (100 mph)

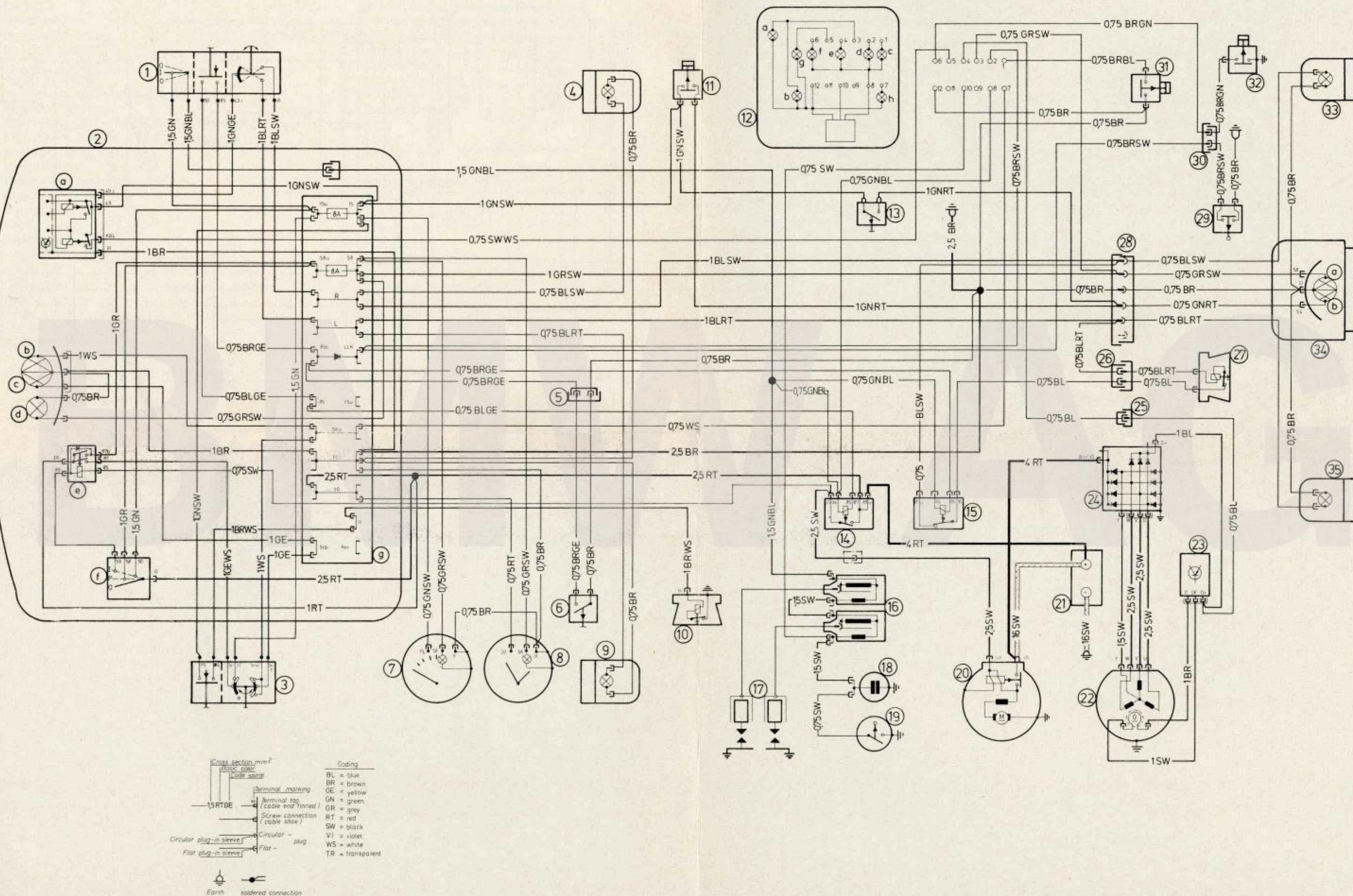
Capacities

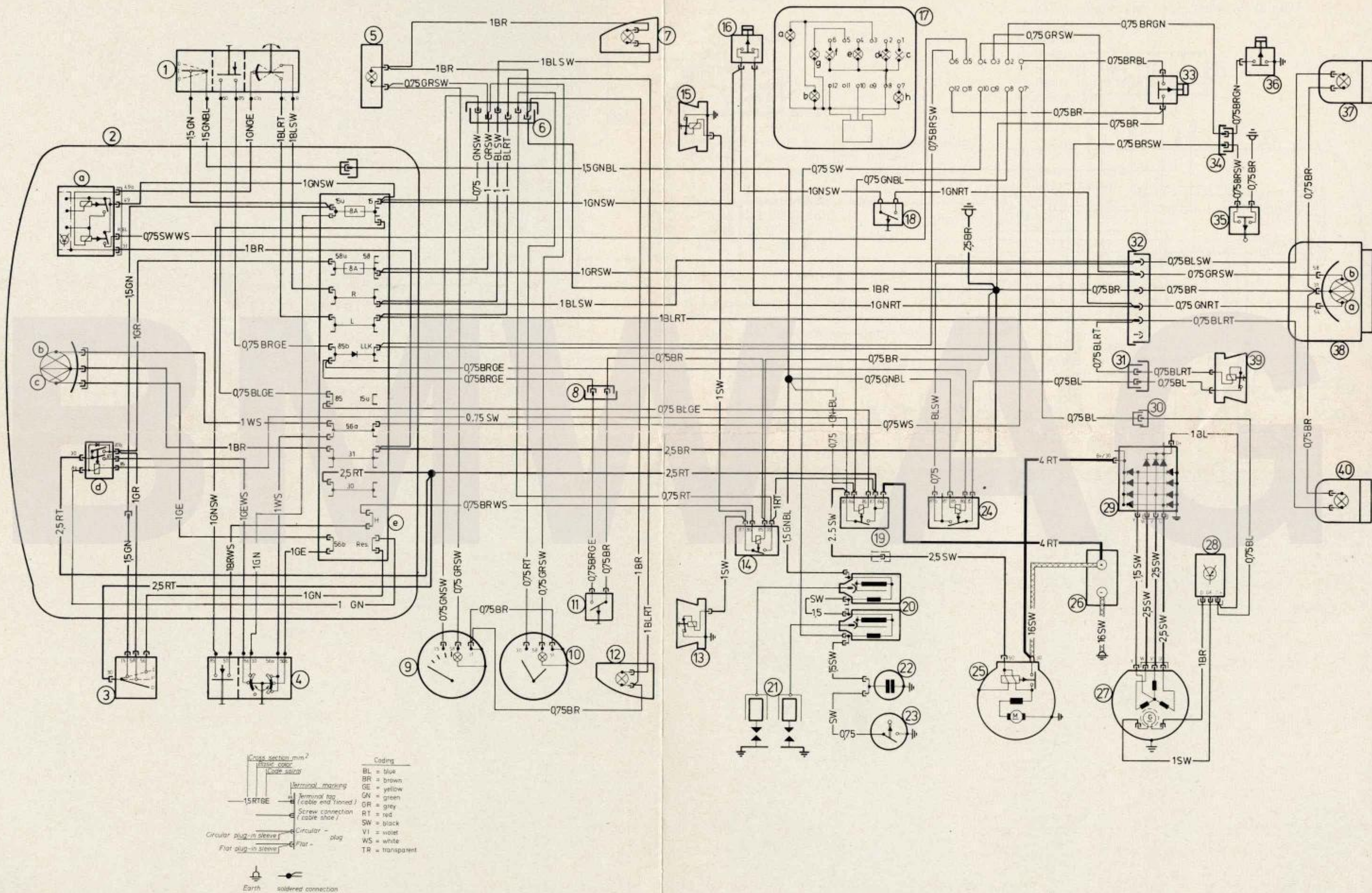
Fuel tank	24 liters (6.3 US gal.) incl. 3 liters (0.8 US gal.)	High test gasoline
Engine oil	2 liters (2.1 US quarts) plus 0.25 liter (0.26 US quart) if filter is changed	Brand-name highest quality engine oil For oil grades, see page 66
Gearbox	0.8 liter (0.9 US quart)	Brand-name hypoid gear oil above 5° C (41° F) SAE 90 below 5° C (41° F) SAE 80
Rear wheel drive housing	0.15 liter (0.16 US quart)	
Final drive	0.25 liter (0.26 US quart)	
Telescopic forks	0.28 liter (0.29 US quart) per fork leg	Shock absorber fluid, see page 66
Brake system	Single disc brake 0.075 liter (0.08 US quart) Twin disc brake 0.09 liter (0.1 US quart)	DOT 4 brake fluid

Key to wiring diagram

BMW R 60/7 — R 100 S

- | | |
|---|---|
| 1 Turn indicator switch with starter button and kill switch | g) Turn indicator repeater (green) |
| 2 Headlight | h) Headlight high beam indicator (blue) |
| a) Flasher unit | 13 Brake pedal stoplight switch |
| b) High beam | 14 Starter relay |
| c) Low beam | 15 Relay |
| d) Parking light | 16 Ignition coils |
| e) Light relay | 17 Spark plugs with caps |
| f) Ignition/light switch | 18 Condenser |
| g) Contact plate with fuses | 19 Contact breaker |
| 3 Main light control switch with dimmer switch, high beam flasher and horn button | 20 Starter |
| 4 Front right turn indicator | 21 Battery |
| 5 plug, 2-pole | 22 Alternator |
| 6 Clutch operated switch | 23 Voltage regulator |
| 7 Voltmeter (R 100 S only) | 24 Diode board |
| 8 Clock (R 100 S only) | 25 Plug, 1-pole |
| 9 Front left turn indicator | 26 Plug, 2-pole |
| 10 Horn | 27 Buzzer |
| 11 Hydr. operated front brake stop switch | 28 Plug, 6-pole |
| 12 Combined instrument | 29 Neutral indicator switch |
| a) Speedometer illumination | 30 Plug, 2-pole |
| b) Revolution counter illumination | 31 Brake fluid level switch |
| c) Brake fluid level telltale (red) | 32 Oil pressure switch |
| d) Neutral indicator (green) | 33 Rear right turn indicator |
| e) Charge indicator (red) | 34 Rear light |
| f) Oil pressure telltale (orange) | a) Stop light |
| | b) Rear and license plate light |
| | 35 Rear left turn indicator |





Key to wiring diagram

BMW R 100 RS

-
- | | |
|---|---|
| 1 Turn indicator switch with starter button and kill switch | f) Oil pressure telltale (orange) |
| 2 Headlight | g) Turn indicator repeater (green) |
| a) Flasher unit | h) Headlight high beam indicator (blue) |
| b) High beam | 18 Brake pedal stoplight switch |
| c) Low beam | 19 Starter relay |
| d) Light relay | 20 Ignition coils |
| e) Contact plate with fuses | 21 Spark plugs with caps |
| 3 Ignition/lightlock | 22 Condenser |
| 4 Main light control switch with dimmer switch, high beam flasher and horn button | 23 Contact breaker |
| 5 position light, front | 24 Relay |
| 6 Plug, 6-pole | 25 Starter |
| 7 Front right turn indicator | 26 Battery |
| 8 Plug, 2-pole | 27 Alternator |
| 9 Voltmeter | 28 Voltage regulator |
| 10 Clock | 29 Diode board |
| 11 Clutch operated switch | 30 Plug, 1-pole |
| 12 Front left turn indicator | 31 Plug, 2-pole |
| 13 Horn, left | 32 Plug, 6-pole |
| 14 Horn relay | 33 Oil pressure switch |
| 15 Horn, right | 34 Plug, 2-pole |
| 16 Hydr. operated stop light switch | 35 Neutral indicator switch |
| 17 Combined instruments | 36 Brake fluid level switch |
| a) Speedometer illumination | 37 Rear right turn indicator |
| b) Revolution counter illumination | 38 Rear light |
| c) Brake fluid level telltale (red) | a) Rear and license plate light |
| d) Neutral indicator (green) | b) Stop light |
| e) Charge indicator (red) | 39 Buzzer |
| | 40 Rear left turn indicator |

BMW AG

BMW Motorrad GmbH München

Bestell-Nr. 01 41 9 798 047 7,5 VII. 77 3. Aufl. engl. US Printed in Western Germany au