

Contents	Page		
Controls and instruments		Starting a cold engine,	
Where is everything?	8-11	starting a warm engine, telltale lamps	21
Controls	12	Selecting neutral	22
Instruments and telltale lamps	13	Putting motorcycle on stand	
Ignition switch, handlebar controls	14-15	(center or side stands)	23
Steering, damper, fuel pet cock,		Steering lock, padlock with	
shock absorber settings	15	steel cable, helmet holder	24
Before starting: Safety check		Running-in rules	25
Tire treads, tire pressures,		Riding	
engine oil level, fuel tank	6-17	Riding hints	26
Rear and brake lights,		Cornering, crossing kerbs	27
turn indicators	17	Riding on wet roads, two-up riding	28
Handbrake and foot brake,		On long journeys	
checking spring struts	18	Tank-top rucksack,	
First aid kit	18	panniers, spare parts	29
Rider's clothing		Jobs you can perform yourself	
Helmet, leathers, rainproof suit	19	Removing and installing front wheel	30
Technical modifications	19	Removing and installing rear wheel	31
Starting, riding and parking		Tire-changing	32-33
Center stand, fuel pet cock,		Changing bulbs,	
ignition key, kill switch	20	flasher unit or fuses	34-37
		Headlight beam setting	38
		General care	39
		Laying up the motorcycle,	
		restoring to use	40

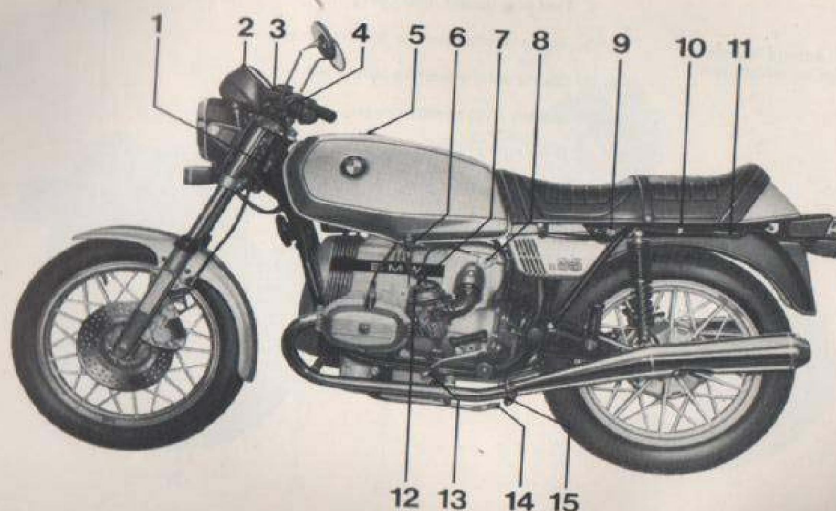
Jobs that should be left to the service station	41	Swinging arm bearings - play, lubrication	62
Engine - faults and remedies	42-44	Throttle twistgrip, brake and clutch lever and prop stand pivots	
Servicing - maintenance		- lubrication	63
General instructions	46	Battery	64
Free pre-delivery check	47	Intake air cleaner	65
Confirmation panels, reminder labels	48-49	Brakes	
1st Service at 1 000 km (app. 600 miles)	50	Checking brake pad/lining thickness, renewing brake pads/linings	66
Toolkit, maintenance schedule (BMW Service, BMW Inspection)	51-53	Adjusting rear brake, checking actuating linkage and brake fluid	67
Lubrication chart	54-55	Bleeding brakes	68
Oil changes, lubrication and maintenance		Fuel system	
Engine oil change, renewing filter element, oil pan bolts	56-57	Carburetors - cleaning, adjusting	69-71
Gearbox -		Fuel pet cock, fuel tank	72
oil level check and oil changes	57	Ignition system	
Rear swinging arm - oil level check and oil changes	58	Spark plugs	72
Final drive - oil level check and oil changes	59	Distributor, breaker points gap	73
Telescopic forks - oil level check and oil changes	60	Ignition timing	74-75
Play in steering and wheel bearings	61		

Cylinder heads	
(Tightening torque, valve clearances	76
Clutch	
Clutch adjustment	77
Trial ride, final acceptance	77
Tool sizes, tightening torques	78
BMW parts and accessories	80-81
Specifications	
Engine	82-84
Transmission	85
Frame	86-87
Fuel and lubricants	88-89
Electrical system	90-91
Dimensions and weights	92
Performance	93-96
At a glance	98-99
Electrical wiring diagram	100

Where is everything?

Note: Figures in square brackets [] = page number on which item is described

1. Steering lock [24]
2. Instruments and telltale lights [13, 21]
3. Ignition/light switch [12, 14]
4. Controls [12, 14, 15]
5. Fuel tank filler cap [16]
6. Fuel pet cock [15]
7. Engine number
8. Cold-start (choke) lever [21]
9. Seat lock [24]
10. Helmet holder [24]
11. Air pump [33]
12. Engine oil dipstick [16]
13. Gear shift pedal [22]
14. Side stand [23]
15. Center stand [23]

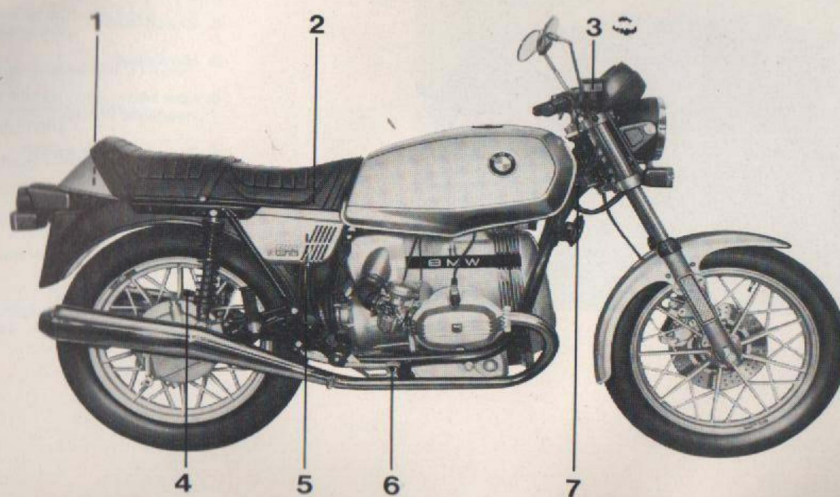


248 78 001

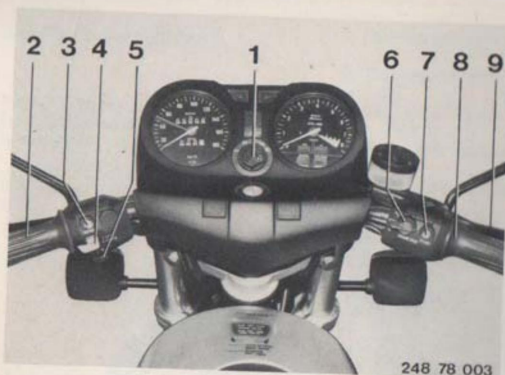
Where is everything?

Note: Figures in square brackets
[] = page number on which item
is described

1. First aid kit [18] in dualseat
2. Tool box (under seat) [51]
3. Brake fluid reservoir for disc brake
4. Spring strut adjusting lever [15]
5. Battery [64] (under cover)
6. Brake pedal [18]
7. Frame number



248 78 002



248 78 003

The controls

1. Ignition and light switch
2. Clutch lever
3. Horn push
4. Low beam (dip) switch and headlight flasher
5. Turn indicator switch
6. Kill switch
7. Starter push button
8. Throttle twistgrip
9. Front brake lever

The instruments and telltale lamps

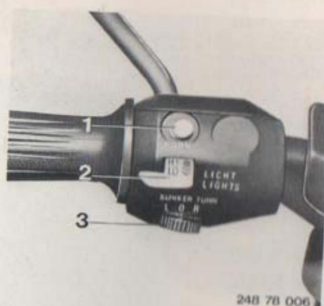
1. Speedometer with distance and trip recorders
2. Tachometer (revolution counter)
3. Turn indicator repeaters, left/right (green)
4. Battery charge telltale lamp (red)
5. Neutral indicator (green)
6. Oil pressure warning lamp (orange)
7. Headlight high beam telltale lamp (blue)



5

The 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, high beam and neutral indicating telltales operational)
- 4 = Switched on, including parking light
- 5 = Switched on, including low or high beam headlight and parking light



6

Left handlebar controls Fig. 6

- 1 = Horn push
- press to sound horn
- 2 = Low beam (dip) switch
- moved up: high beam
- center: low (dipped) beam
- moved down: headlight flasher
Switch returns to center position automatically after use
- 3 = Turn indicator switch
'L' position: left flashing turn indicators operate
'O' position: off
'R' position: right flashing turn indicators operate



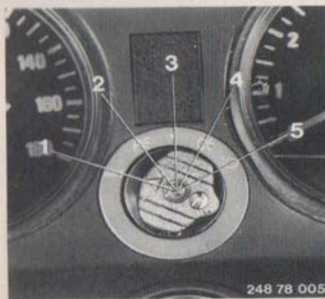
7

Right handlebar controls. Fig. 7

- 1 = Ignition kill switch
- push switch up or down ('OFF') to switch off the engine immediately in an emergency

Important

Engine can only be started in central ('RUN') position of switch; ignition and starter circuits are both interrupted in the two 'OFF' positions.

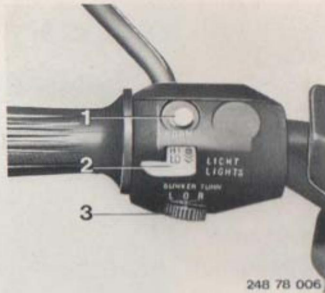


248 78 005

5

The 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, high beam and neutral indicating telltales operational)
- 4 Switched on, including parking light
- 5 Switched on, including low or high beam headlight and parking light



248 78 006

6

Left handlebar controls Fig. 6

- 1 = **Horn push**
 - press to sound horn
- 2 = **Low beam (dip) switch**
 - moved up: high beam
 - center: low (dipped) beam
 - moved down: headlight flasher
- Switch returns to center position automatically after use
- 3 = **Turn indicator switch**
 - 'L' position: left flashing turn indicators operate
 - 'O' position: off
 - 'R' position: right flashing turn indicators operate



248 78 007

7

Right handlebar controls. Fig. 7

- 1 = **Ignition kill switch**
 - push switch up or down ('OFF') to switch off the engine immediately in an emergency

Important

Engine can only be started in central ('RUN') position of switch; ignition and starter circuits are both interrupted in the two 'OFF' positions.

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, so that other road users can identify your machine more easily.

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 severe loads in operation. 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 repeater telltale fails to operate, this indicates a blown bulb.

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

Before starting

Safety checks

Tire treads

Even if national legislation permits tire treads only 1 mm (0.04 in) deep, as in some countries, the tires of a fast single-track vehicle like your BMW motorcycle should never have a tread depth less than 2 mm (0.08 in) for maximum safety at up to app. 130 km/h (81 mile/h) or 3 mm (0.12 in) at higher speeds.

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. The tire pressures are shown on pages 87 and 98, and also on an adhesive label on the rear mudwing, below the seat.

Engine oil level

Check **regularly**, after the engine has been stopped for some time. The oil should be between the two marks on the dipstick.



10

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

Max. oil consumption: 0.1 liter/100 km (app. 350 miles/imp. pint, 560 miles/US quart).

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

The design of our engines makes it unnecessary to use any **additives** in the oil, provided that a high-grade lubricating oil of reputable make is employed. This applies also to the gearbox, final drive and telescopic forks.

Fuel tank

The tank holds 22 liters (4.8 imp. gal, 5.8 US gal) of which app. 2 l (0.4 imp. gal, 0.5 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.

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.

For reliable operation, use brand-name fuel (either Super/Premium or regular grade depending on motorcycle model) with a minimum octane number as shown on pages 88 and 98. No upper-cylinder or other fuel additives are needed.



14

247 76 17

Rider's clothing

Helmet, leather and rainproof suits

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!

Technical modifications

Before you attempt any **technical modifications or install a different size or type of tire, please study the factory's recommendations on the adhesive label under the dual seat** and in these instructions. If necessary, consult your BMW service station for advice on the practical value, legality and desirability (according to BMW factory recommendations) of the intended modification.

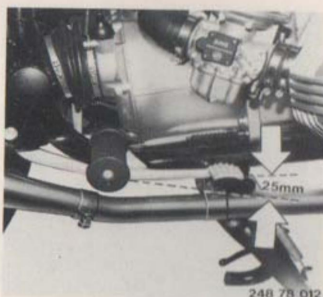


11

Front brake – checking

Handbrake lever play is a fixed value for design reasons and cannot be adjusted. Fig. 11

Any sudden change in handbrake lever play indicates a fault in the hydraulic system – see pages 66–68.



12

Foot brake – checking

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 67).



13

Spring struts – checking

Do not forget to examine the two rear suspension unit preload adjusters; are both levers in the same position (see page 15)?

First aid kit

Your machine has a first aid kit stowed under the dualseat, in a compartment at the back.

Fig. 13

Check that the contents are complete and still in good condition from time to time (they are subject to ageing).



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. 1/4 and press starter button.



18

Telltale lamps

When the engine is running, the oil pressure warning light 1 (orange) and battery charge telltale 2 (red) 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, consult a BMW service station.

If the battery charge telltale lamp comes on while riding, take the machine to a BMW service station as soon as possible, or else the battery will go flat.

Starting, riding and parking

Center stand

Hold the left handlebar grip with your left hand and the grab handle below the seat with your right hand. Push the motorcycle forwards to drop it from the stand.

Fuel pet cock

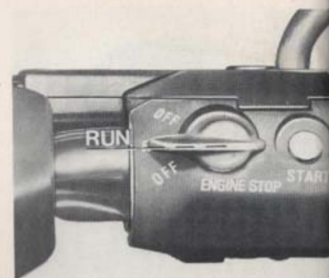
Open the fuel pet cock (for positions, see page 15).



15

Ignition/light switch

Turn the key fully clockwise to the 1st position (no lights on). **Fig. 15.** When the ignition is switched on, the green, red and orange telltale lamps should be illuminated. If the green lamp fails to come on, shift to neutral.



248 78 015

16

Kill switch

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

Fig. 16

Selecting neutral with machine at a standstill

Press the pedal down repeatedly with the toes of the left foot 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.

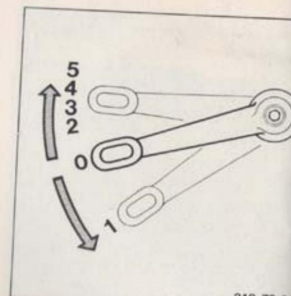
Selecting neutral with the engine running

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 ratio. 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.



248 78 018

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.



248 78 019

Center and side stands

To put the motorcycle on its center stand, push it 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.



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.

In spite of this, check that the side stand 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 the handlebars 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.

Fig. 22

Warning:

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



23

As an additional means of safeguarding your machine against theft, a padlock with steel cable (BMW accessory) can be stored neatly and invisibly in the backbone tube of the frame.

Fig. 23



24

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. 24

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 min⁻¹

From 1 000 km (app. 600 miles) to

2 000 km (app. 1 200 miles):

4 800 min⁻¹

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

Riding...

Riding hints

If this your first full-size 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.

Keep the low headlight beam on. Wear easily visible clothing and a safety helmet at all times. 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 up 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 cock.

Riding...

Riding hints

If this your first full-size 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.

Keep the low headlight beam on. Wear easily visible clothing and a safety helmet at all times. 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 up 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 cock.

Cornering

The most important factor in cornering which you must master is the **approach to a corner**.

The rules below apply to countries with right hand traffic. For left hand traffic the contrary is valid.

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 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.

Riding over kerbs

Avoid driving too violently over kerb stones and similar obstructions. If this is unavoidable, reduce speed to a walking pace. If forced to surmount such an obstacle at high speed in an emergency, always inspect the wheel rims (particularly the front wheel, which takes the brunt of the impact) for damage to the rim shoulder immediately afterwards. If the rim or the entire wheel, the tire or tube are damaged or distorted in any way, always renew as a safety precaution.

Warning: attempts to straighten or re-align distorted rims or cast alloy wheels are prohibited, as this constitutes a road safety risk. The same applies to repairs to damaged tires.

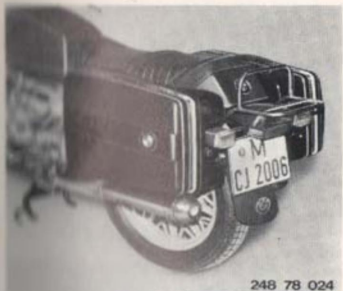
Wet weather riding

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 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. That's all!

Your BMW is not only one of the lightest machines in its class, but also one of the easiest and most pleasant to ride. It has exceptionally long-travel suspension, carefully tuned shock absorbers and can carry a heavy payload (up to 398 kg, 877 lb).



28

On long journeys

Saddle bags, tank-top rucksack

To accommodate your luggage, we recommend the **BMW tanktop rucksack** and **BMW saddle bags**. The saddle bags each hold 35 liters (11.24 ft³) – with space for a helmet – and are designed to match the machine. However, when fully laden (10 kg [22 lb] per bag, max. 5 kg [11 lb] on luggage grid) you should not exceed 130 km/h (8 mile/h).

Fig. 28

When using the saddle bags, always install both bags and try to distribute the load evenly between them.

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
 - A few M 6 and M 8 bolts and nuts
 - Spring washers
 - Wire, insulating tape and adhesive tape
 - Rubber bands (app. 5 mm [0.2] wide, cut from an old inner tube)
 - 1 spare inner tube
 - 1 carburetor throttle return spring
 - 8 Amp fuses
- Those anxious to allow for every possible contingency should also pack:
- 1 set of breaker points
 - 1 set control cables

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

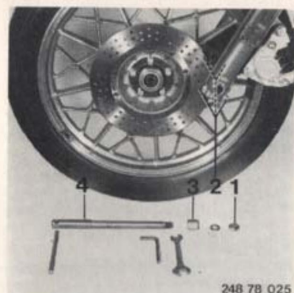
Before starting a major journey, it is always a good idea to have the machine checked over thoroughly by the BMW service shop. If you are intending to travel abroad, make sure that you have the necessary information concerning local driving license regulations, inoculations and other requirements. Details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

Jobs you can perform yourself

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) 13 mm open-end wrench
 - c) 6 mm Allen key
 - d) Drift
- Loosen the axle clamp bolts (2) with the Allen key and 13 mm wrench.
- 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 (4) and pull out the axle while turning to and fro slightly. A spacing sleeve (3) will fall from the left fork end of the axle.
- Pull the wheel out forwards.

Fig. 26



26

If a twin disc brake is installed (special equipment) 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 operate the front brake lever with the wheel 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 and 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
- Loosen the clamp bolt with the 13 mm wrench.
- Loosen the axle nut with the 22 mm wrench, and remove complete with washer.
- Place the drift through the transverse hole in the axle and pull out the axle, at the same time turning slightly to and fro.



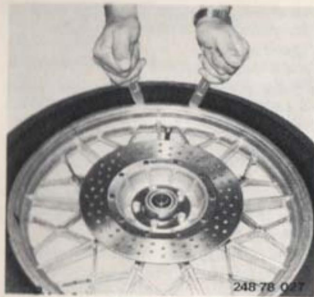
27

- Pull off the wheel toward the left swinging arm, then pull out rearwards. **Fig. 27**

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

Lubricate splines in hub with Molykote BR 2 or LiquiMoly LM 47 L.

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.



28

Tire-changing

To remove a tire, unscrew the valve core to let the air out, and remove the safety nut. Place the wheel on the ground with the brake disc uppermost and press the tire into the well of the rim all round. If the wheel has a twin disc brake, prevent damage to the brake disc underneath by using a suitable protective underlay. Press the



29

tire bead into the well at the point farthest away from the valve and ease the tire over the rim shoulder with tire levers, starting at valve (Fig. 28). Pull out the inner tube and lever off the second tire bead in the same manner.

Warning:

If the tire grips very firmly and no suitable removing equipment is available (e.g. on a journey), place the wheel under the center stand and tilt the machine so that the left or right side of the stand presses the tire into the rim well when the rider's weight is applied (Fig. 29). **Be careful not to press the stand down on to the wheel rim, or the rim shoulder may be damaged.** When fitting a new tire, the tube must be replaced at the same time. Always use a tire and tube from the same manufacturer. Do not patch the tube except in an emergency, then discard as soon as convenient. To fit the tire, press the bead into the rim well at the opposite side to the valve.

The color spot on the tire cover must be next to the valve. The tire cover is then lifted evenly over the rim shoulder in easy stages at both sides of the rim, using only a minimum of force. A slip agent (e.g. 'Contifix') can be applied to make the tire slide more easily over the rim.

Insert the inner tube and secure the valve in its hole by screwing the nut on by about 6 threads. Inflate the inner tube slightly. If no air line is available, use the tire pump kept under the seat.

Next press the second tire bead into the rim well starting on the opposite side to the valve. Ease the tire bead over the rim shoulder with tire levers starting from the valve and working in opposite

directions round the wheel.

Press the valve in as far as the nut will allow while fitting the outer cover. Inflate the tire and check that the line moulded all round the side of the cover is the same distance away from the rim. Inflate to the correct working pressure. If no slip agent is used when fitting the tire, it may fail to adopt the correct position if inflated with the motorcycle pump, which can only develop a pressure of max. 2.5 bars. The tire requires a pressure of between 2.5 and 4 bars to force the bead over the additional safety 'hump'. If a sudden loud bang is not heard, the tire has failed to move out over this hump. In this case, ride the machine with great care to the next garage or service station with a compressed air line, and reposition the tire by inflating to the higher pressure. Have the wheel and tire balanced.

Important note:

If cross-country tires are fitted at a late date, remember that the maximum speed data (which refer to the tires fitted as standard equipment) will no longer apply. Comply with the tire manufacturer's recommendations (normally for a maximum speed of 130 km/h (81 mile/h)). A label stating the maximum speed limit for the tires on the machine should be affixed in the rider's field of view.

Changing bulbs, fuses or flasher unit

When working on the electrical system, switch off the affected electrical consumer, or as an increased safety precaution 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.

Changing the H4 headlight bulb

Unscrew the Phillips-head clamp screw at the base of the headlight bezel ring, and lever the ring with reflector away from the headlight body with a screwdriver.



30

Disconnect the multi-pin plug and pull back the wire spring clip. The H4 bulb can then be removed from the reflector. Fig. 30

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



31

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. Fig. 31



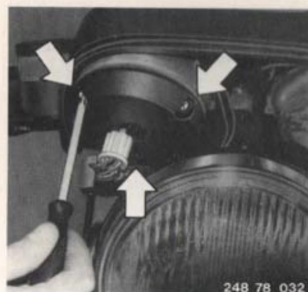
32

Renewing bulbs for instrument lighting or telltale lamps

Detach trim at base of combined instrument (2 Phillips-head screws).

Speedometer lighting

Pull the plug-in bulb holder out of the speedometer body and remove the valve-base bulb (3 Watt) by pulling lightly. Fig. 32

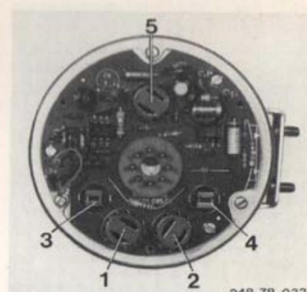


33

Revolution counter lighting

Detach the multi-pin plug and remove the protective cover after taking out the 3 screws (normal screwdriver). When assembling, make sure the gasket is correctly positioned. Fig. 33

Pull off holder (5, Fig. 34) for 3 Watt valve-base bulb after giving it a quarter-turn counterclockwise. Detach the bulb by pulling lightly.



34

Telltale lamps in revolution counter

After detaching the multi-pin plug and the protective cover (Fig. 33), remove the affected bulb holder and valve-base bulb as described for the revolution counter lighting.

1 = headlight high beam telltale (3 Watt)
2 = neutral indicator (3 Watt)
3 = oil pressure warning (1.2 Watt)
4 = battery charge telltale (1.2 Watt)
5 = revolution counter lighting (3 Watt)
Fig. 34

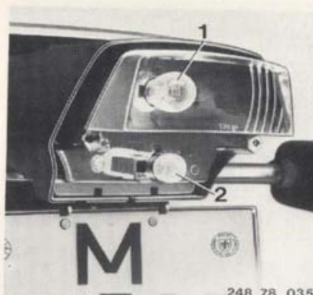


35

Turn indicator repeaters

- 1 = right flashing turn indicator (3 Watt)
2 = left flashing turn indicator (3 Watt)
Fig. 35

Turn the affected bulb holder slightly to release it, then pull out. Renew the valve-base bulb as described for the revolution counter lighting.



36

Renewing rear light bulbs

Take out the two Phillips-head screws and remove the lens. Press the blown bulb in, turn to the left and remove.

- 1 = Brake light (21 Watt spherical bulb)
2 = Rear light and license plate light (spherical bulb, 5 Watt)
Fig. 36



37

Renewing turn indicator bulbs

Take out the Phillips-head screws and remove the lens. Press in the spherical bulb (21 Watt), turn to the left and remove.

Important: install the lens in the turn indicator housing with the 'TOP' mark uppermost.
Fig. 37



38

Renewing blown fuses

Pull off right battery cover by hand (rubber grip seal). The two 8 Amp fuses are accessible when the fuse box is opened (knurled screw).

- 1 = Parking and rear lights, speedometer and revolution counter lighting
2 = Horn, turn indicators, brake light, tailgate lamps, special equipment
Fig. 38

A blown fuse can be recognized by the 4 melted metal strip. Pull the fuse out of its spring clips and press in a new fuse of the correct rating.

Never patch up blown fuses or replace with unsuitable materials. This could cause a fire. Always carry a few spare fuses on the machine.

If a fuse blows repeatedly, there is probably a fault in the electrical circuits it protects. Have the fault traced and rectified by a competent workshop.

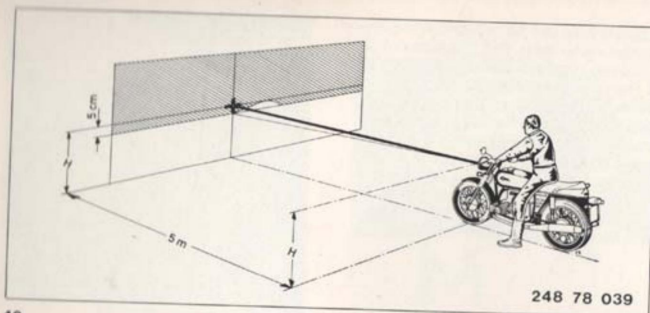


39

Renewing turn indicator flasher unit

Pull off the right battery cover by hand (rubber grip seal).

Pull the flasher unit up out of its base.
Fig. 39



248 78 039

40

Headlight beam setting

The machine should be positioned on its wheels (not on the stand) 5 m (16 ft) 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. 40

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 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, handlebars and handlebar controls with plastic sheet during washing. Do not allow any chemical solvents – cold cleansers, petrol (gasoline) or benzene – to come into contact with plastic components.

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.

A suitable paintwork preservative can then be applied. Always wash off salt from winter roads with cold water, as warm water increases the chemical action of the salt.

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.

When the dualseat is opened, an adhesive label under the tank will be seen; this indicates the paint code of your machine. If quoted to your BMW dealer, it will avoid accidental purchase of the wrong shade when repairing minor paintwork blemishes. 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.

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 = 1.75 Imp. pints, 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 (0.7 Imp. pint, 0.42 US quart), swinging arm 0.05 liter (0.09 Imp. pint, 0.05 US quart), final drive 0.1 liter (0.18 Imp. pint 0.11 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 tap.
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, page 89.

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 a new 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.

Jobs that should be left to the BMW 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 an authorized BMW workshop for the prescribed service and inspection routines to be performed.

For reasons of safety you are recommended to use only genuine BMW factory-supplied parts and accessories.

BMW offers a wide range of special equipment from raised 'touring' handlebars to full cockpit fairings. Ask your BMW dealer to provide details.

What to do if...

Faults and remedies

Cause	Remedy
1. Engine fails to start or starts only with great difficulty	
Ignition key in wrong position	Switch to operating position
Emergency ignition (kill) switch not turned on	Switch to 'RUN'
Gear engaged	Shift to neutral or pull clutch lever
Fuel tank empty	Add fuel
Fuel tap closed	Open fuel taps
Twistgrip opened too far when engine is cold	Close twistgrip
Blocked air cleaner	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
Battery flat	Have battery recharged in workshop. Note: Recharge battery only with both positive (+) and negative (-) leads removed

Cause	Remedy
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
3. Engine idles unevenly when warm, exhaust smokes too rich	
Fuel feed valve leaking, idle mixture setting too rich	Repair or renew valve; adjust idle mixture settings
4. Engine runs unevenly, misfires occasionally	
Spark plug gaps too large	Adjust spark plug gaps
Spark plugs oiled up or sooted	Clean or replace spark plugs
Ignition leads wet or defective	Dry or replace leads
Spark plug cap short-circuiting (recognizable by sooted burn marks)	Dry or replace spark plug caps
Fault in ignition system	Replace defective parts
Blocked carburetor jets	Clean jets
Blocked fuel line	Clean fuel line
Water condensate in float bowl	Clean float bowl
5. Engine overheats, runs on when ignition is switched off	
Fuel mixture too lean	Check and adjust carburetor settings, check that the correct jets are installed
Ignition timing incorrect	Check and adjust timing
Breaker points gap incorrect	Adjust breaker points gap, check ignition and retune if necessary
Engine cylinder cooling fins blocked with dirt	Clean cooling fins
Thermal rating of spark plugs too low	Use spark plugs according to specification

Cause

Remedy

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**7. Starter does not work when button is pressed**
Fault in starter button or starter relay
Flat battery

Correct ignition timing

Replace defective parts
Recharge battery, if necessary correct acid level**Service and maintenance**

Before you receive your new BMW motorcycle from your authorized BMW dealer, it will be given a **free-of-charge pre-delivery check**. The scope of this work and a form for confirming that it has been properly carried out are shown on the following page.

Please have all the maintenance work laid down in the BMW service program (see pages 51-53) performed punctually by an authorized BMW service workshop, and make sure that the corresponding panels in this booklet are filled in and signed. This is essential if a warranty claim has to be submitted. In any case, written evidence that you have had all the necessary servicing work performed on your machine by an authorized BMW dealer is invaluable when the motorcycle is up for sale later.

After the **1st Service** at 1 000 km (app. 600 miles), the BMW service program calls for regular routine Service and Inspection work. At 7 500 km (5 000 miles), a **BMW Service** is due. At 15 000 km (10 000 miles) speedometer reading, the more comprehensive **BMW Inspection** should be carried out.

After this, BMW Service and BMW Inspection routines alternate every 7 500 km (5 000 miles).

After carrying out the 1st routine service, your BMW dealer will remove the reminder label for the next BMW Service and affix it below the dualseat, where you are bound to notice it when using the motorcycle. All subsequent BMW Inspections and Service routines will be shown in the same way.

In the interests of reliability and to maintain your motorcycle operational over an extended period, you are recommended to have **at least two BMW Inspections per year** performed, even if the full distance called for in the BMW servicing program has not always been covered.

Every BMW dealer charges for BMW servicing work according to prices calculated from the factory's official flat rate manual. This ensures that the same conditions apply throughout the BMW motorcycle service organization when charging for services rendered.

Any lubricants, seals etc. needed and a motorcycle cleaning which proves necessary will be charged as separate items.

Please remember to take this rider's handbook with you when returning your motorcycle to the workshop for service work.

Free pre-delivery check

1. Check oil levels in engine, gearbox, drive shaft housing and final drive.
2. Check brake fluid level.
3. Restore battery acid level.
4. Check operation of high and low headlight beams and parking light, brake and license plate lights, flashing turn indicators, telltale and warning lights for headlight high beam, battery charge, neutral indicator, brake fluid level and oil pressure, horn signal and auxiliary instruments if fitted.
5. Check tightness of bolts and nuts: front and rear quick-release axle nuts and clamp bolts, front and rear engine mounting bolts, center stand retaining bolts, rear spring strut mountings (upper and lower), hose connections on carburetors, drive shaft flexible gaiter and telescopic forks, four 12-sided bolts retaining drive shaft at gearbox output flange, handlebar mountings.
6. Adjust headlight beam settings; check tire pressures; check contents of toolbox, keys, documentation and presence of adhesive labels.
7. Final ride: check operation of clutch, gear shift, instruments, steering, foot brake, handbrake, engine idle settings; oil leaks on engine, gearbox, swinging arm, final drive, telescopic forks and fuel system leaks.

Free pre-delivery check

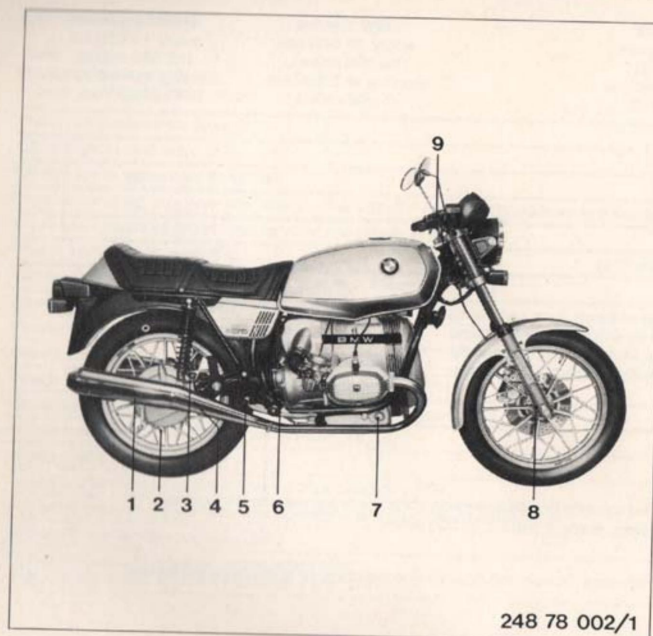
performed correctly

on _____

at _____

km (miles)

Signature and company stamp

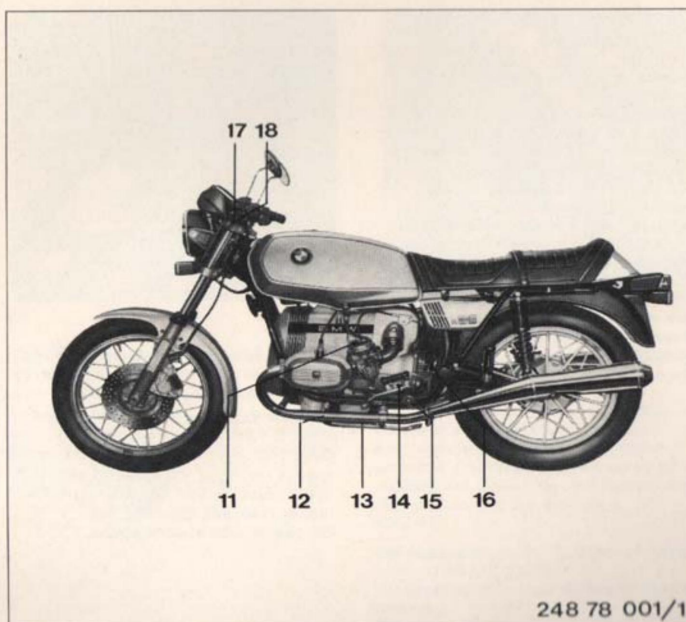


Lubrication chart

- 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 foot brake linkage
- 6 Grease nipple for swinging arm bearing
- 7 Full-flow oil filter
- 8 Oil drain plug for telescopic fork
- 9 Throttle cable mechanism

248 78 002/1

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



248 78 001/1

Oil changes, lubrication and maintenance

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 oil to drain out and replace the drain plug tightly. Check that gasket is in good condition. **Fig. 44**

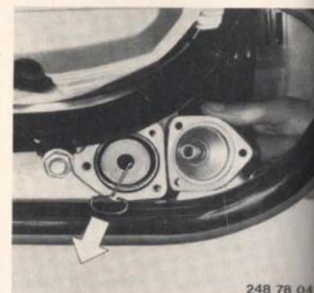


248 78 040

44

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

Total oil capacity: 2.0 litres (3.5 Imp. pints, 2.1 US quarts) + 0.25 litre (0.44 Imp. pint, 0.28 US quart) 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.

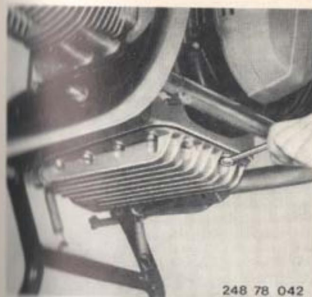


248 78 041

45

Filter element:

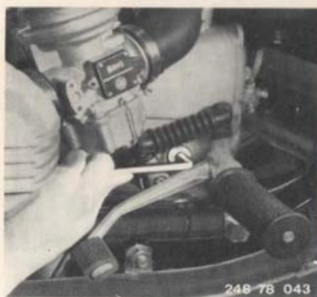
Renew the element every 7500 km (5000 miles) during an engine oil change. Take out the three 10 mm hex screws and remove the end cover and O-rings. Pull out the filter element using a thin wire hook and insert the new element, making sure that the gaskets are in good condition. **Fig. 45**



46

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. 46**



47

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. 47**



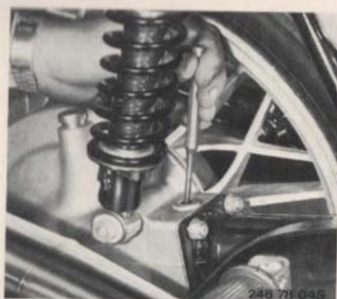
48

Change gearbox oil only when the motorcycle is at normal operating temperature and at 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. 48**

Oil capacity: approx. 0.8 liter (1.4 imp. pints, 0.85 US quart).

Oil level up to lowest thread in filler opening.

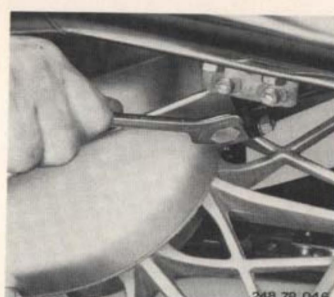
Oil grade: See specifications.



49

Rear wheel drive 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 clutch 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. 49**



50

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. 50**

Oil capacity: approx. 0.15 liter (0.26 imp. pint, 0.16 US quart).

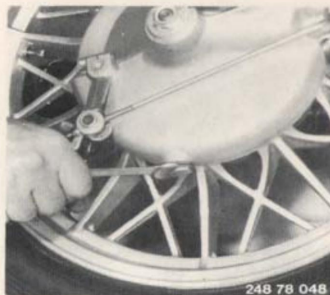
Oil level: 2 mm (0.08 inch) above clutch housing with the machine on its stand.

Oil grade: See specifications.



51

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. 51



52

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. 52

Oil capacity: Approx. 0.25 liter (0.44 Imp. pint, 0.28 US quart).
Oil level: up to lowest thread in filler opening.
Oil grade: See specifications.



53

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 screw plugs with an 8 mm Allen key. Insert a piece of 5 mm (0.2 in) diameter welding rod 0.6 m (24 in) long as far as possible and check that the oil is at the specified level of 50 mm (2 in).



54

Oil change every 15 000 km (10 000 miles), or at least once a year. Remove the drain plugs (10 mm wrench) from the lower fork slider tubes.

Fig. 53
 Remove the upper screw plugs with an 8 mm Allen key to vent the fork tubes.
Fig. 54

Expel the oil by compressing the telescopic forks 5–10 times. Screw the bottom plugs back in and add fresh oil.

Total capacity of each fork leg when initially filling or changing oil 190 cm³ (approx 6.7 fl. oz.).

Oil grades: See Specifications.

Important:

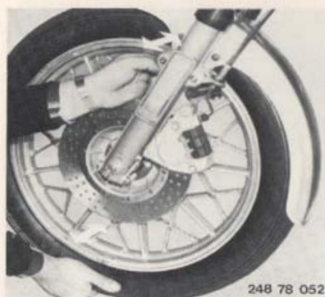
After refilling, bleed the dampers by compressing and extending the telescopic forks 5–10 times. The full damping action should be noticeable.



55

Steering and wheel bearing play
Check steering play after the first 1000 km (600 miles), then every 7000 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. **Fig. 55**

The precise degree of steering bearing preload can only be adjusted by an authorized BMW workshop, using a friction measuring gauge.



56

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. 56**

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 an authorized BMW workshop.



57

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. 57**

Adjustment, if necessary, must only be carried out by an authorized BMW service station.



58

Lubricate the rear wheel swinging arm bearings with the grease gun, using a taper nozzle. First lever off the left and right plastic bearing caps with a screwdriver.

Fig. 58



59

Check the throttle twist grip every 7500 km (5000 miles) for free movement; if necessary unscrew and remove the cover. 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 and chain in that way that the mark "c" on the toothed end of the grip is in line with the mark "d" on the cam.



60

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.

Fig. 59

Grease the pivots on the foot brake (item 5), the side stand (item 4) and the clutch lever (item 16) every 7500 km (5000 miles), using a grease gun. Grease the pivot point for the clutch cable nipple every 7500 km (5000 miles). Fig. 60

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.



To remove the air cleaner element, take off the intake manifold and remove the retaining screw (but do not detach the choke control). Turn the air cleaner housing half to one side and pull out the filter element. 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 cheese head screw with the left hand to simplify insertion.

Fig. 61

61

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.

66

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 brake by looking down on to inner brake lining (lever off plastic cover first with screwdriver).

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)).

Renewing front disc brake pads

1. Lever plastic cover away from brake caliper with a screwdriver.
2. Force out both brake pad retaining pins from the inside with a suitable drift.
3. Lift off the spreader spring and pull the brake pads out upwards.

Fig. 62



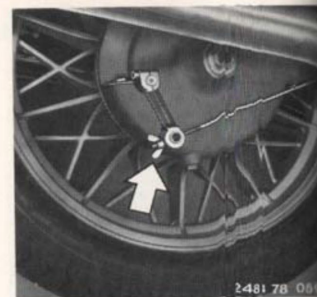
62

To install new pads, work in the opposite sequence. The disc brake pads have automatic compensation for wear, so that no adjustment is needed subsequently.

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.



63

Renewing and adjusting rear brake pads/linings:

Drum brake:

Remove the wheel (see page 311). Slacken the wingnut on the pull rod. Fig. 63

Press the upper brake shoe out with a screwdriver. Disconnect the return springs and take out the brake shoes. Install in the reverse order.

Rear wheel brake

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. 63

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 brake linings if they appear shiny. Do not taper off or chamfer the ends of the linings.

Brake fluid

In the front hydraulic brake circuit, brake fluid level in the reservoir should be up to the upper 'MAX' marking.

Fig. 64

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.



64

Warning:

Brake fluid is hygroscopic, that is to say it absorbs moisture from the air over a period of time. To ensure that the hydraulic brakes always remain fully operational, the **brake fluid must be renewed once a year** by your BMW dealer.



65

Bleeding the brake system

If the action of the brake lever feels "soft", the brake system should be bled.

First add fluid to the correct level in the brake fluid reservoir on the right handlebar. After this, remove the cap protecting the bleed screw, mount the bleed hose and immerse it in a vessel containing brake fluid. Apply the handbrake lever a number of times until braking pressure is detected. Hold the lever applied 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 vessel 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. 64 and 65

Note that all work on the brake system should be carried out only by a BMW service station.

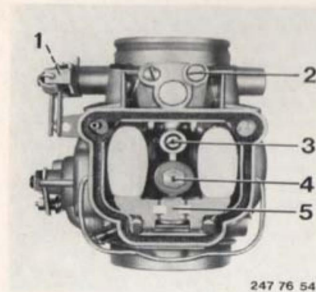
Important:

See note on page 15

Fuel system

Carburetor cleaning should be carried out by an authorized BMW workshop. In an emergency, the carburetors 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.

After reassembling the carburetor, screw in the idle air or idle mixture regulating screw 2 as far as possible without using force, then unscrew by app. 1 turn to obtain the basic setting. Fig. 66



66

The vacuum slide

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.



67

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 necessary, loosen lock nut (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. 67

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.

Carburetor adjustment should only be undertaken by an authorized BMW service station. However, in a genuine emergency, proceed as follows:

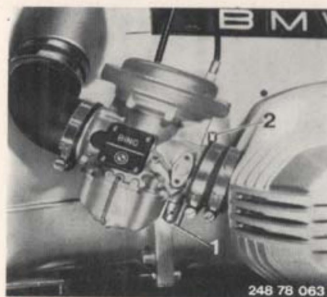
Adjust engine idle speed when the engine is at its normal operating temperature and with the twist grip fully closed. Insert an adaptor (Beru EP 1 suppressor unit) into the spark plug cap and connect to the ignition lead. This will prevent the waterproof cap from burning out when the spark plug lead is tested by allowing sparks to jump from the cap to the cylinder.

Correct idle speed is between 800 and 1000 min⁻¹. If the engine idles at this speed, check by removing each plug cap in turn and listening for a drop in speed or 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:

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. Allow a cold engine to warm up; use choke to start. 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



68

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).

Fig. 68

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

Do not run the engine at idle speed for more than 10 minutes.

Removal of the complete fuel tap

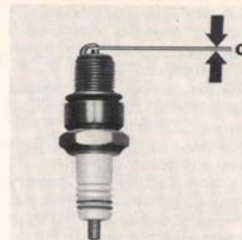
1. Drain the fuel tank.
2. Pull off fuel hose at fuel tap.
3. The quick-acting union nut (24 mm wrench) has a normal right-hand thread at the fuel tank end and a left-hand thread at the fuel tap end. Hold the fuel tap and turn the nut to the left, then remove the tap and nut.
4. When reassembling, do 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 tap simultaneously.

Removing the fuel tank

1. Close the fuel tap.
2. Pull off fuel hose at fuel tap.
3. Open dualseat and remove tool tray.
4. Pull tank retaining hoop over stub pipe at top of frame, and remove to rear. At the same time, press rear of tank down.
5. Raise tank slightly, pull towards dualseat and lift off (front first).

Ignition system

Check the **spark plug electrode gaps** 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 $a = 0.6 + 0.1 \text{ mm } 0.024 + 0.004$ inch). Fig. 69



69

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).



70

Ignition contact-breaker assembly
Check the **points gap** every 7 500 km (5 000 miles).
Remove the three (5 mm) Allen screws and detach the engine cover. Remove the cap from the contact-breaker assembly (1 normal screw).

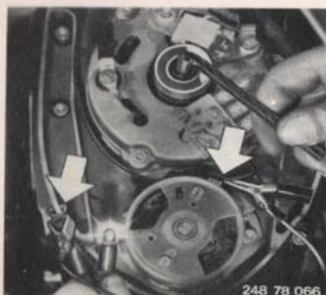
If a dwell angle tester is not available, unscrew the spark plugs and turn the engine clockwise (looking towards rear of machine) by means of the 6 mm Allen screw holding the rotor, until the contact breaker arm lifts away fully. Check the breaker points gap with a feeler gauge; it should be 0.4 mm (0.016 in).

Fig. 70

Adjusting breaker points gap:

Slacken the retaining screw slightly and insert a screwdriver blade between the small pins and into the slot on the breaker plate. Turn the screwdriver gently to obtain a points gap of 0.4 mm (0.016 in). Retighten the retaining screw and check that the breaker points gap has not altered.

Apply a narrow wedge-shaped area of Bosch Ft 1 v 4 grease to the **fiber slider pad** of the breaker arm on the side facing the arm pivot, every 7 500 km (5 000 miles).



71

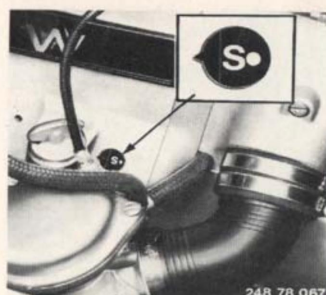
Check ignition timing every 7500 km (5000 miles) or whenever the breaker points gap is reset.

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

Fig. 71

The test lamp must light up when the "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. 72

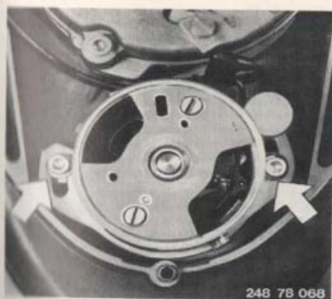


72

Ignition is timed to take place at 6° before TDC.

- 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 (800–1000 min⁻¹) the center "S" flywheel mark (ignition retarded) should appear as a bright spot in the inspection hole. If the spot is above center, the ignition is too far advanced; if below center, the ignition is too far retarded. To check the centrifugal ignition control system (max. advance 32° before TDC) run the engine at not less than 3000 min⁻¹. Mark "z" must appear in the inspection hole.



73

Retiming the ignition: Loosen the two 4 mm Allen screws on the contact breaker base plate. Turning the base plate in the same direction as engine rotation will retard the ignition, 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. 73

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

76

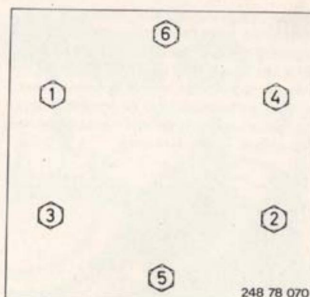


74

Cylinder head

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. 74

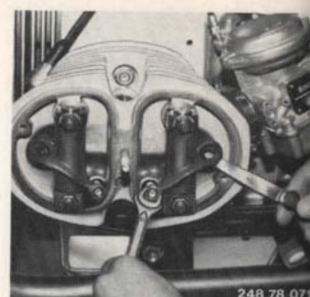


75

Tighten the nuts with a torque wrench with the engine cold in accordance with the tightening sequence shown here ($40 \pm 2 \text{ Nm} / 29 \pm 1.5 \text{ ft.lb.}$).

Fig. 75

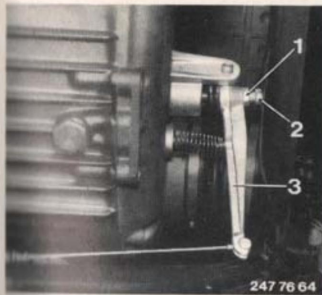
Check valve clearances – this work has to be carried out each time the cylinder through bolt or cylinder head nuts are retightened – with the engine stopped and cold, using a feeler gauge inserted between the valve stem and the rocker. Unscrew the spark plugs and turn the engine with an Allen key (6 mm) at the alternator rotor attachment screw until the cylinder on which valve clearance is being



76

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 [0.004 in] exhaust 0.15 mm [0.006 in]) by loosening the lock nut (12 mm wrench) and turning the adjusting screw (12 mm wrench). Afterwards, tighten the lock nut firmly and check valve operating clearances again.

Fig. 76



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. 77

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.

77

Clutch

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 gearbox housing cover while the clutch lever is half pulled.

Deviations increase 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

78

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	(screwdriver)
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 (four 12 sided bolts)	10 mm
During first Service only:	
8. Timing chain cover to engine	
3 internal hexagon nuts	5 mm
9 Allen screws	5 mm

Tightening torques

	ft. lb.	Nm
Cylinder head nuts (in 3 passes), 15/35/40 Nm [11/25/29 ft. lb.]	25-29	35-40
Finned exhaust pipe nut	116-130	160-180
Axle nuts, front and rear	33-37	45-50
Clamp screw for wheel axle, front	11+1.5	15+2
Clamp screw for wheel axle, rear	11+1.5	15+2
12-sided bolts, drive shaft	27-30	38-42

Specifications

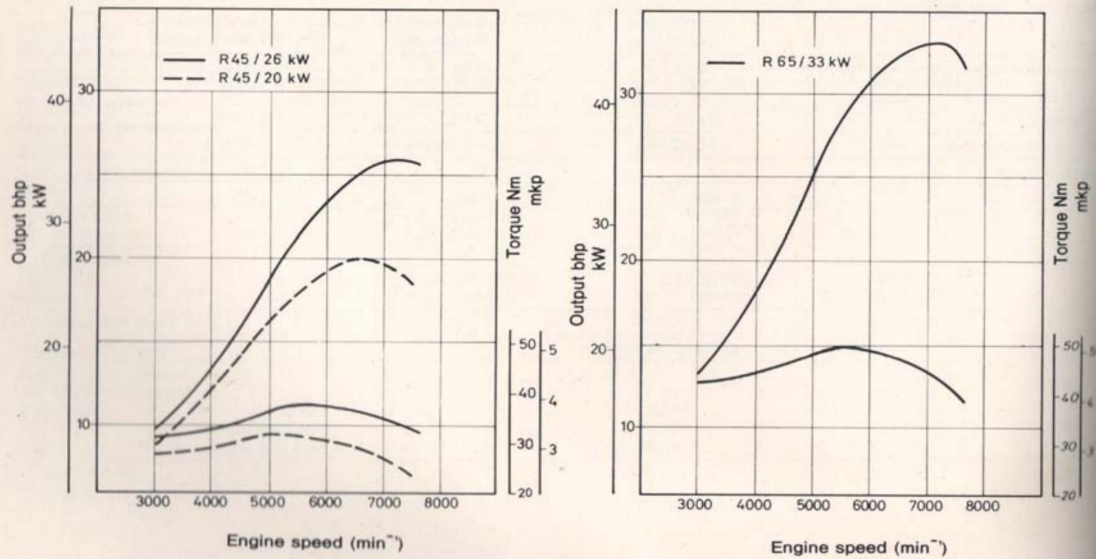
Engine		R 45 (20 kW)	R 45 (26 kW)	R 65
Engine type		Horizontally opposed 4-cycle twin, with overhead valves in hemispherical combustion chambers.		
Max. output at engine speed	DIN kW (hp) min ⁻¹	20 (27) 6500	26 (35) 7250	33 (45) 7250
Max torque at engine speed	Nm (mkp) (lb. ft) min ⁻¹	31.3 (3.2)(23.1) 5000	37.5 (38) (27.6) 5500	50 (51) (36.9) 5500
Max. permissible engine speed	min ⁻¹	7650	7650	7650
Max. continuous engine speed	min ⁻¹	7000	7300	7300
Cylinder bore	mm (inch)	70 (2.756)	70 (2.756)	82 (3.228)
Piston stroke	mm (inch)	61.5 (2.421)	61.5 (2.421)	61.5 (2.421)
Displacement				
– effective	cm ³ (in ³)	473.4 (28.89)	473.4 (28.89)	649.6 (39.64)
– fiscal	cm ³ in ³	470 (28.68)	470 (28.68)	645 (39.36)
Compression ratio		8.2 : 1	9.2 : 1	9.2 : 1
Direction of rotation		clockwise, looking down on to generator		
Fuel consumption by DIN 70030 standard test method	l/100 km mile/gal (imp.) mile/gal (us)	5.0* 56.5* 47.0*	4.5** 62.8** 52.3**	4.6** 61.4** 51.1**

* Regular fuel

** Super (premium) fuel

	R 45 (20 kW)	R 45 (26 kW)	R 65
2 inclined Bing constant depression carburetors with needle jet, vacuum plunger, throttle butterfly and central lever float			
or type number,	64/26/201 64/26/202	64/28/201 64/28/202	64/32/2030 64/32/2040
or throat dia. mm (inch)	26 (1.02) 118	28 (1.10) 123	32 (1.26) 140
it	2.66	2.66	2.66
e number	46-241	46-241	46-241
osition	2 45	2 45	3 45

Engine output



Transmission	R 45 (20 kW)	R 45 (26 kW)	R 65
Clutch	Single dry plate with diaphragm spring, 160 mm (6.3 in) diameter		
Gearbox	5-speed with dog clutch shift, in unit with engine. Drive torque damping in all gears; hook shift action		
Gear ratios	1st	4.4 to 1	
	2nd	2.86 to 1	
	3rd	2.07 to 1	
	4th	1.67 to 1	
	5th	1.50 to 1	
Transmission from gearbox to rear wheel	Totally enclosed cardan shaft in right swinging arm tube; universal joint at gearbox end, curved spline drive connector and torsional vibration damper at final drive end		
Final drive	Pallid cut bevel pinions		
Final drive ratio	4.25 : 1	3.89 : 1	3.44 : 1
Number of teeth	34 : 8	35 : 9	31 : 9
Speedometer drive ratio (km) (miles)	0.978	0.895	0.793
	1.575	1.441	1.267

Frame and running gear	R 45 (20 kW)	R 45 (26 kW)	R 65
Frame	Dual-loop steel tube cradle frame, welded from oval section tube, with bolted on rear section Not suitable for sidecar		
Location of manufacturer's plate and frame number	on right gusset plate, close to steering head		
Suspension, front	Telescopic fork with large-volume double-acting hydraulic dampers; total travel 175 mm (6.9 in)		
rear	Swinging arm with progressive-rate coil spring struts incorporating three rate settings and double-acting hydraulic dampers; total travel 110 mm (4.3 in)		
Max. front fork angle	42°		
Front wheel caster	96 mm (3.78 in)		
Front brake	Hydraulic single disc with fixed caliper		
Brake disc diameter mm (in)	260 (10.2)		
Effective rubbed area cm² (in²)	42 (6.5)		
Rear drum brake	Light alloy full width hub with leading and trailing shoes		
Brake drum diameter mm (in)	200 (7.9)		
Effective rubbed area cm² (in²)	107 (16.6)		

Wheels and tires	R 45 (20 kW)	R 45 (26 kW)	R 65
Wheels	Cast light alloy, BMW design		
Wheel sizes, front	1.85 B x 18		
rear	2.50 B x 18		
Tires	Cross-ply, tubed*		
Tire sizes, front	3.25-18		3.25 S 18
rear	4.00-18		4.00 S 18

* See also note on page 33

Tire pressures when cold

		Solo		With pillion passenger	
		Front	Rear	Front	Rear
Up to 130 km/h (81 mile/h)	bar (lb/in²)	1.9 (27)	1.8 (26)	2.1 (30)	2.0 (28)
130-160 km/h (81-100 mile/h)	bar (lb/in²)	1.9 (27)	2.0 (28)	2.1 (30)	2.2 (31)
Above 160 km/h (100 mile/h)	bar (lb/in²)	2.1 (30)	2.2 (31)	2.1 (30)	2.3 (33)

Warning: keep to these recommended tread depths even if legal limit is lower:

Minimum permissible tread depths:
2 mm (0.08 in) for speeds up to 130 km/h (81 mile/h)
3 mm (0.12 in) for speeds above 130 km/h (81 mile/h)

Fuels and lubricants**R 45 – R 65**

Fuel	Super (premium), min. octane number 98 (RM), 88 (MM); to DIN 51 600 standard. Regular grade to DIN 51 600 standard, min. octane number 91 (RM), 82 (MM)*				
Tank capacity including reserve	liters (Imp. gal, US gal) 22 (4.8, 5.8) liters (Imp. gal, US gal) 2 (0.4, 0.5)				
Engine oil	Brand-name HD spark ignition engine oil, API class SE for outside temperatures				
	mostly above	30°C (86°F)	SAE40	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
	all the year round above	-20°C (-4°F)	SAE 15 W 50		
Engine oil capacity without filter change	liters (Imp. pints, US quarts) 2 (3.5, 2.1)				
including filter change	liters (Imp. pints, US quarts) 2.25 (4.0, 2.4)				
Gearbox oil quantity	liters (Imp. pints, US quarts) 0.8 (1.4, 0.85)			above 5°C (41°F)	below 5°C (41°F)
Rear drive shaft housing oil capacity	liters (Imp. pints, US quarts) 0.15 (0.26, 0.16)	Brand-name Hypoid gear oil			
Final drive oil capacity	liters (Imp. pints, US quarts) 0.25 (0.44, 0.26)		SAE 90	SAE 80	
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; Esso UNIVIS J 13; INA amortizol Premium Fork Lubricant "Spectro SAE 10" (for competition purposes only)				
Capacity per fork leg – when refilling	liter (Imp. pint, US quart) 0.19 (0.33, 0.2) liter (Imp. pint, US quart) 0.19 (0.33, 0.2)				

* R45 with 20 kW engine only

Lubricants**R 45 – R 65**

Breaker felt lubricating pad and centrifugal advance mechanism	Bosch Ft 1 v 4 grease
Splines at the rear wheel	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 spark ignition engines
Acid-free grease	Corrosion inhibiting grease
Protective oil	Vehicle bodywork preservative compound; must not attack paintwork, rubber components or plastics, and should be easy to remove.

Brake fluid

Grade	DOT 4 "SL" (ATE)
Quantity when bleeding and refilling	app. 0.3 liter (0.53 Imp. pint, 0.32 US quart)

Electrical system	R 45 – R 65			
Battery	Varta, 12 V, 16 Amp/h			
Starter	Bosch, 0.7 kW			
Alternator	Bosch, 280 W			
Alternator drive	Direct from crankshaft			
Voltage regulator	Bosch, AD 1/14 V			
Condenser	0.2 μ F			
Coils (2)	Bosch E 6 V			
Contact breaker	Mechanical, with centrifugal advance unit in enclosed housing; dynamic control			
Advance begins	1550 min ⁻¹			
Advance ends	3000 min ⁻¹			
Breaker points gap	0.45 $\pm$ 0.05 mm (0.018 $\pm$ 0.002 in)			
Ignition timing	6° bTDC			
Adjustment range	32° at min. 3000 min ⁻¹			
Spark plugs		R 45 (20 kW)	R 45 (26 kW)	R 65
	Bosch W 175 T 30	○		
	Bosch W 225 T 30		○	○
	Beru 175/14/3 A	○		
	Beru 225/14/3 A		○	○
	Champion N 10 Y	○		
	Champion N 6 Y		○	○
Spark plug electrode gap mm (inch)	0.6 (0.024) + 0.1 (0.004)			

Electrical system

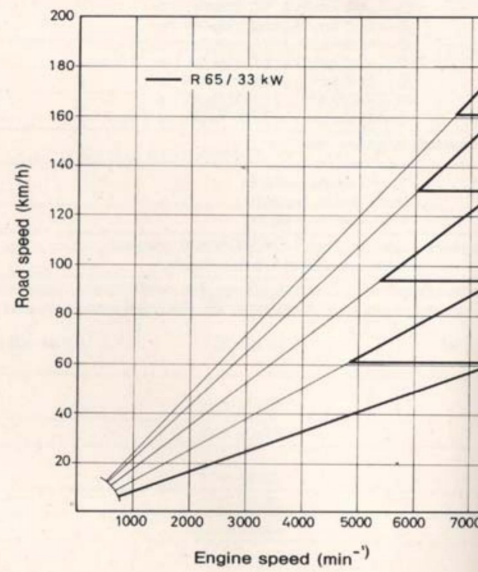
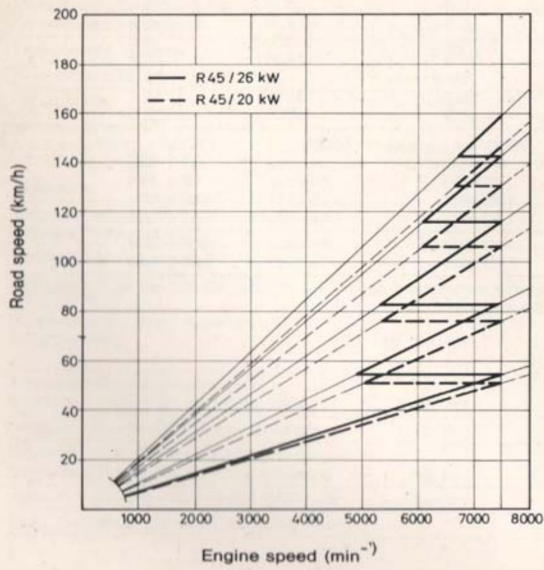
Turn indicator flasher unit			
Headlight high and low beam			H 4 halogen double filament bulb, 60/55 W
Parking light			12 V, 4 W
Indicator lights: Headlight high beam	blue		12 V, 3 W
	oil pressure	orange	12 V, 1.2 W
	Neutral	green	12 V, 3 W
	Battery charge	red	12 V, 1.2 W
	Turn indicator	green	12 V, 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 light			12 V, 5 W
Stop light			12 V, 21 W

Dimensions		R 45 (20 kW)	R 45 (26 kW)	R 65
Overall width (engine)	mm (inch)		688 (27.1)	
Overall height without mirror (motor cycle unladen)	mm (inch)		1080 (42.5)	
Seat height, unladen	mm (inch)		770 (30.3)	
Overall length	mm (inch)		2110 (83.1)	
Wheelbase	mm (inch)		1390 (54.7)	
Ground clearance, with rider weighing 75 kg (165 lb)	mm (inch)		105 (4.13)	
Weights				
Unladen weight with lubricants without fuel or tools	kg (lb)		205 (452)	
Permissible gross weight = unladen weight + total of rider, passenger and baggage	kg (lb)		398 (877)	
Power/weight ratio at permitted all-up weight	kg (lb)/kW	19.9 (43.9)	15.3 (33.7)	12.1 (26.7)
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. number of persons including rider			2 persons	

Performance		R 45 (20 kW)	R 45 (26 kW)	R 65
Acceleration 0 - 50 km/h (31 mile/h) s		3.0	2.7	2.3
0 - 80 km/h (50 mile/h) s		5.6	5.0	4.1
0 - 100 km/h (62 mile/h) s		8.5	7.4	5.9
0 - 120 km/h (75 mile/h) s		13.8	11.2	8.6
0 - 140 km/h (87 mile/h) s		29.7	19.0	13.2
0 - 160 km/h (100 mile/h) s		-	-	24.3
0 - 400 m (1312 feet) s		16.6	15.8	14.7
0 - 1000 m (3280 feet) s		32.5	30.7	28.5
Max. speeds in gears min ⁻¹		7500	7500	7500
1st - km/h (mile/h)		51 (32)	54 (34)	61 (38)
2nd - km/h (mile/h)		76 (47)	83 (52)	94 (58)
3rd - km/h (mile/h)		105 (65)	115 (71)	130 (81)
4th - km/h (mile/h)		130 (81)	142 (88)	161 (100)
Top speed - rider seated normally km/h (mile/h)		140 (87)	148 (92)	165 (103)
- rider crouched km/h (mile/h)		145 (90)	160 (99)	175 (109)

The ultimate top speed of the motorcycle, when run in, depends to a large extent on drag (air resistance), as caused by the driver's size, seated position and clothing, on the road condition and on the weather.

Road speed – engine speed



Acceleration through gears

