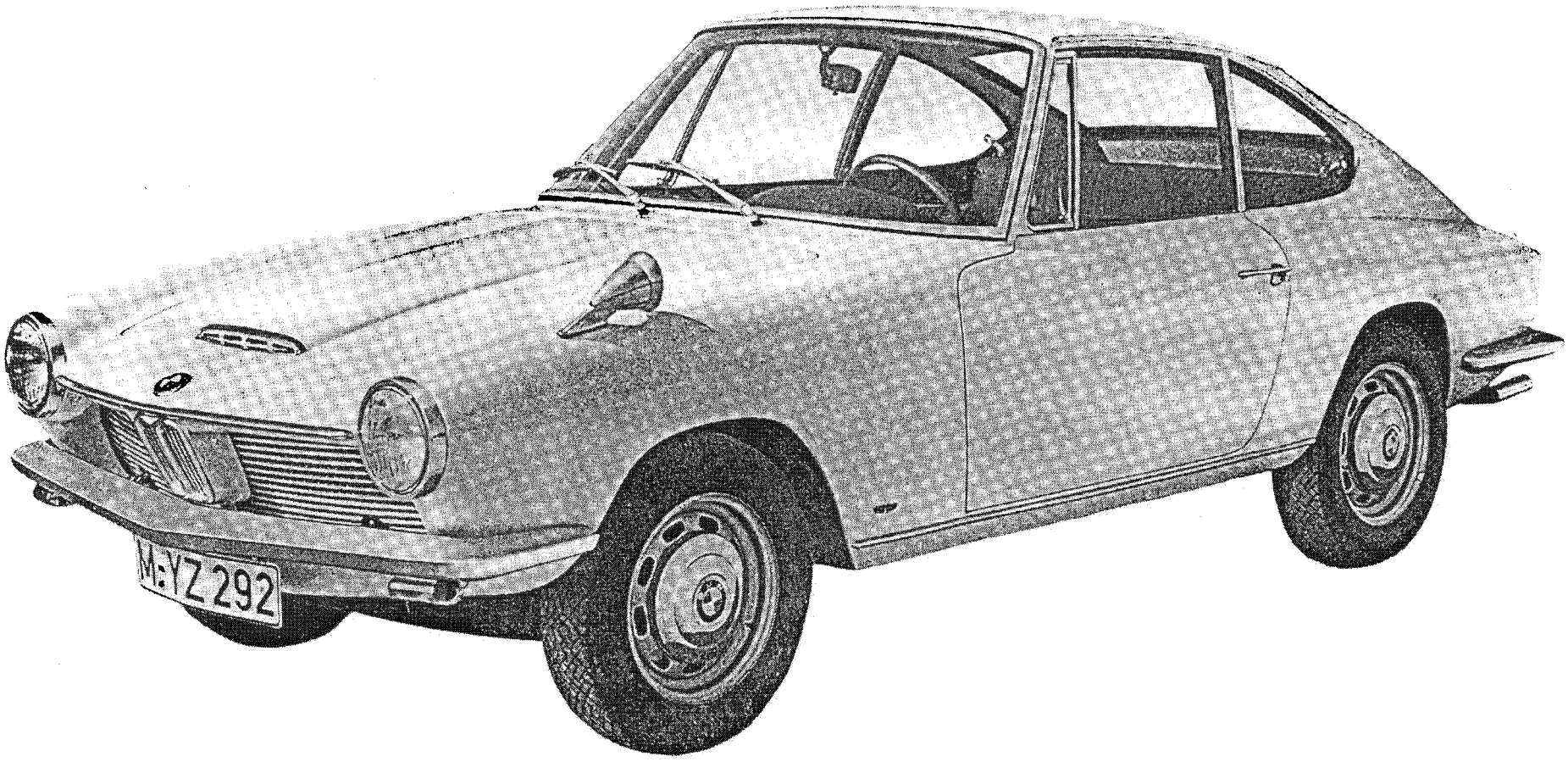
Owner's handbook

1600 GT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Dear BMW enthusiast,

The BMW 1600 GT, with its reserves of power and safety, its liveliness and elegance, is now in your possession.

We congratulate you on your new acquisition and wish you pleasant motoring.

Before you set out for the first time, spare a few moments to familiarise yourself with your new car – even though you are most probably a motorist of some experience.

Our owner's handbook will tell you all you need to know in order to make driving the car a constant source of pleasure, and will also mention the steps you should take to ensure proper maintenance.

You will very soon feel quite at home behind the wheel of this high-performance car – our engineers have tried their best on your behalf.

And now it's time for you to enjoy a new feeling: the sheer joy of driving your BMW 1600 GT.

Sincerely yours,
BAYERISCHE MOTOREN WERKE AG.

We reserve the right to make alterations
to designs, equipment or accessories
in the interests of further development.
Dimensions, weights and performance data are
quoted subject to normal tolerances.
No liability can be accepted for the
appearance of errors.

Contents

Before you start – all you need to know

The **manufacturer's plate, chassis and engine numbers** are the means of identifying your car when comparing it with the logbook.
The entries in the logbook should always agree exactly with the numbers and details on the car. This information is required for inquiries, inspections, spare part ordering and similar purposes, and you should know where it is to be located.

Manufacturer's plate: under the bonnet, at the rear on the right-hand side looking forwards. **Fig. 1**

Chassis number: under the bonnet, on the right-hand side looking forwards, marked on the battery attachment panel. **Fig. 1**

Engine number: on the lower left-hand side of the engine block, looking forwards. **Fig. 2**

You will have received two pairs of keys for your new BMW. It is a good idea to put the second pair immediately in a safe place, but one where they can be reached immediately if you should lose the first pair. Of course any BMW dealer will gladly help you out in case of difficulty.

If you should need to buy new keys, the process will be speeded up if you can quote the numbers on the old keys when ordering. Check that the key numbers are correctly recorded in the service booklet. **Fig. 3**

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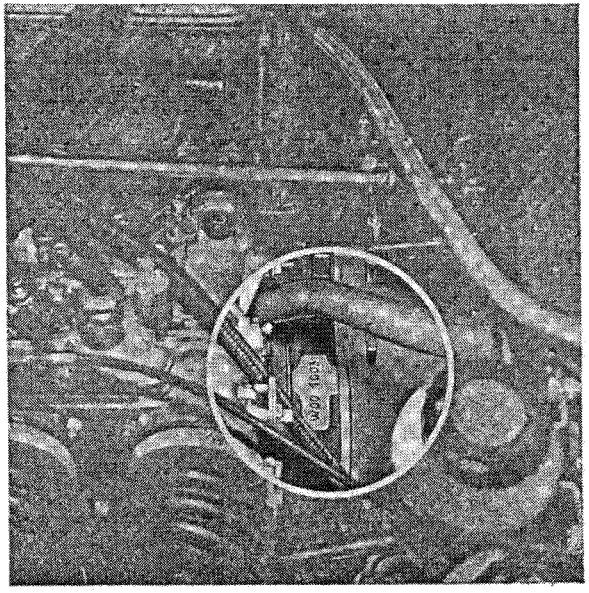

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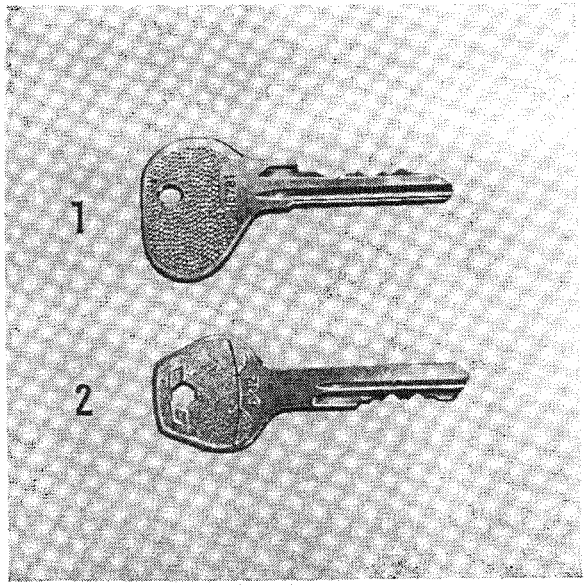
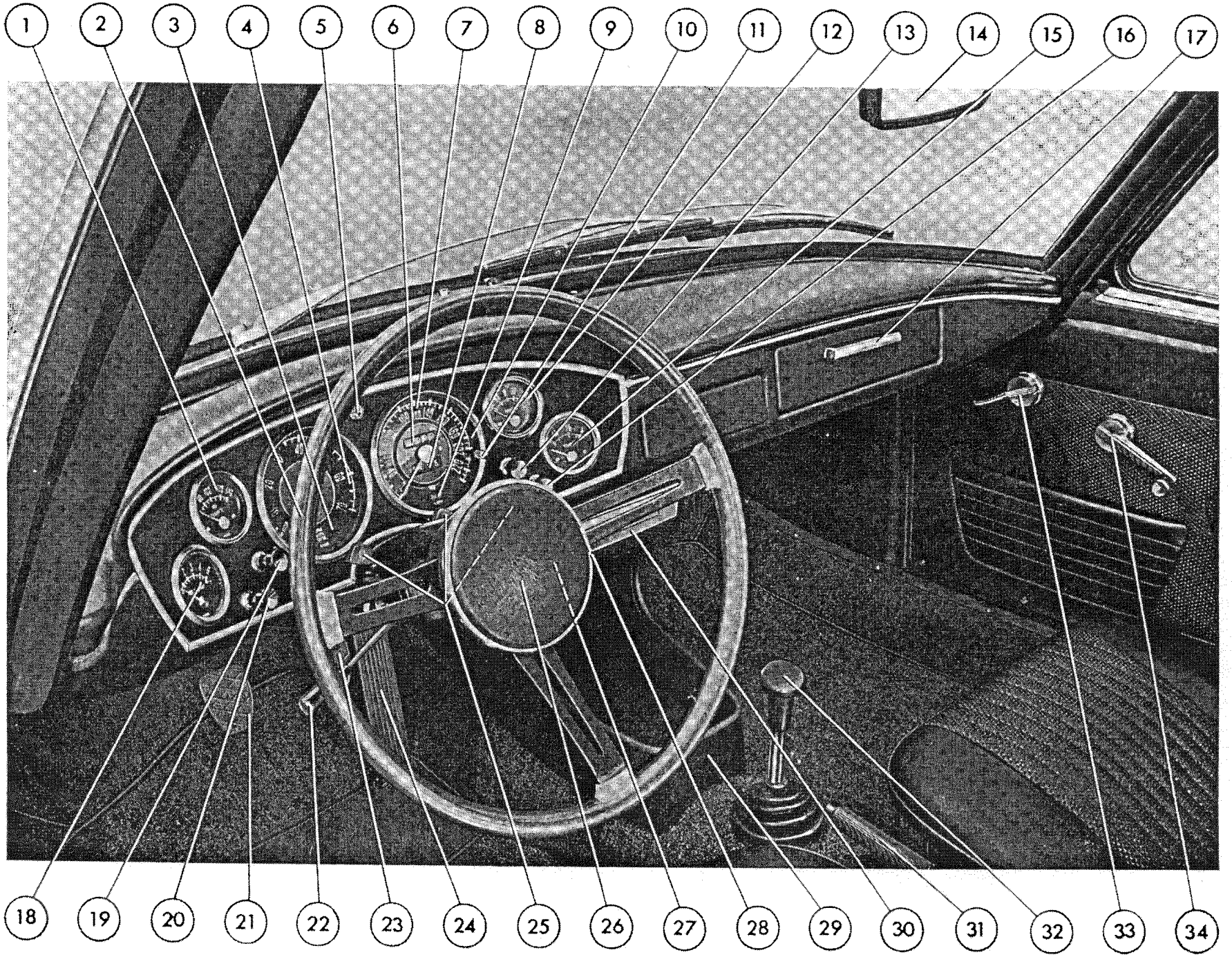


Instruments and Controls

1. Oil thermometer
2. Battery charge telltale (red)
3. Oil pressure telltale (green)
4. Revolution counter
5. Choke telltale (yellow)
6. Mileage recorder
7. Headlamp main beam telltale (blue)
8. Trip mileage recorder
9. Turn indicator telltale (green)
10. Speedometer
11. Trip recorder reset knob
12. Cooling water thermometer
13. Heater blower switch
14. Interior rear view mirror
15. Fuel gauge
16. Screenwiper/screenwasher switch
17. Glove box
18. Oil pressure gauge
19. Side and headlamp switch, 2-stage, and panel lighting
20. Choke knob
21. Clutch pedal
22. Turn indicator, dipping and headlamp flasher lever
23. Brake pedal
24. Accelerator pedal
25. Heater/ventilator levers
26. Horn button
27. Steering lock and ignition/starter switch
28. Parking light selector switch
29. Storage compartment
30. Ashtray
31. Handbrake lever
32. Gear lever
33. Door handle
34. Window winder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The **ignition/starter switch** is combined with the steering lock, and mounted on the right-hand side of the steering column enclosure. Insert key 1 (Page 6, **Fig. 3**) and turn to the right as far as position (2) – Garage. You will hear the steering lock being withdrawn from the steering column, but if necessary move the steering wheel slightly to assist. The steering is now unlocked, the key may be withdrawn again if desired and the radio (optional extra) will operate. **Fig. 7**

Turn the key further to the right until the "Fahrt" (Drive) position (3) is reached: this switches on the ignition, and the battery charge (red) and oil pressure (orange) telltales should be illuminated. The fuel gauge will register the amount of fuel in the tank. In this position the key cannot be withdrawn.

To lock the steering press the key in slightly while turning back from position (2) – Garage – to position (1) – Halt. This will overcome the built-in safety catch. If necessary turn the steering wheel slightly to allow the steering lock to engage with the steering column.

2-position **headlamp and light switch, Fig. 8:**

Position 1 – parking and instrument panel lights
Position 2 – headlamps

The **turn indicator and dipping lever** on the left of the steering column can be operated with one finger of the left hand, without taking the hand off the steering wheel. **Fig. 9**

Moving the lever up or down parallel with the steering wheel rim operates the appropriate flashing indicators.

A regular ticking sound and illumination of the green warning lamp in the speedometer tells you that the flasher unit is operating correctly (1).

When the steering wheel is returned to the straight-ahead position the turn indicators are automatically cancelled, but if the turn was only slight it may be necessary to return the lever to the central position by hand.

When the headlamp main beams are illuminated (lever pulled towards steering wheel) a blue telltale lights up in the speedometer (2).

To **flash the headlamps** pull the lever towards the steering wheel.

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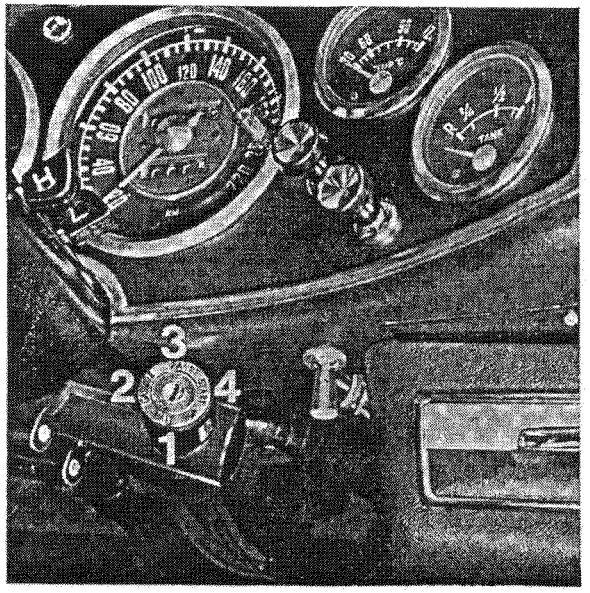

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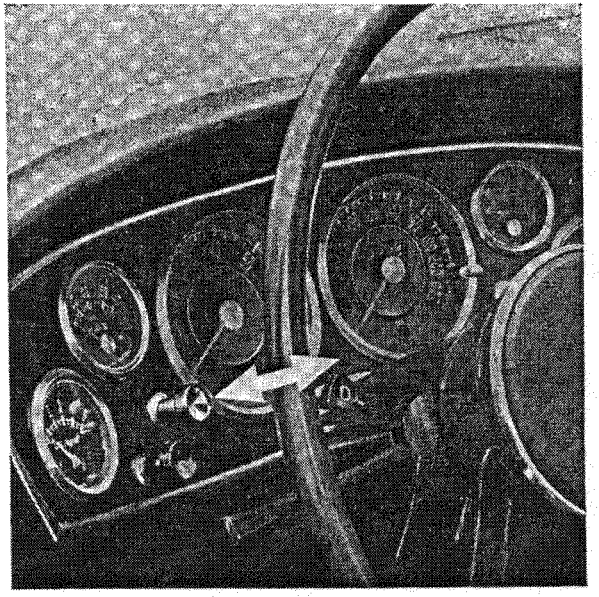

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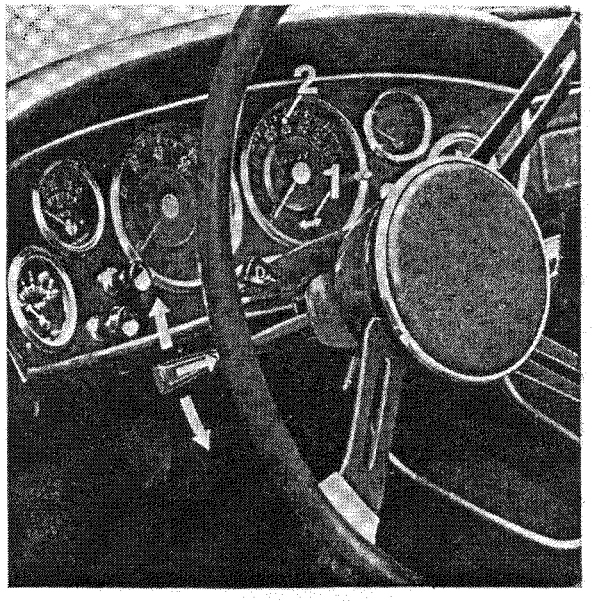

The **horns** are sounded by pressing the horn push in the centre of the steering wheel.
When the ignition key is turned to the "Halt" position and removed, movement of a selector switch on the right of the steering column switches on the appropriate parking lights. **Fig. 10**

Lever moved to left
= front and rear left-hand side
Lever moved to right
= front and rear right-hand side

The **screenwipers** have two speeds, selected by pulling out the knob to its first or second position. **Fig. 11**

Use the faster speed only in heavy rain.
By pulling out and holding the knob beyond the second position the **screenwasher** can be switched on. The wipers are self-parking when the knob is pushed home fully.

Warning: Never operate the screenwasher if the fluid reservoir is empty.

The **twin-jet screenwasher nozzle** is mounted midway between the two wiper pivots. Either of the jets may be repositioned, using a needle, if the water spray does not strike the windscreen in the desired position.

The **fluid reservoir** for the screenwasher is mounted inside the engine compartment on the right-hand side. **Fig. 12**

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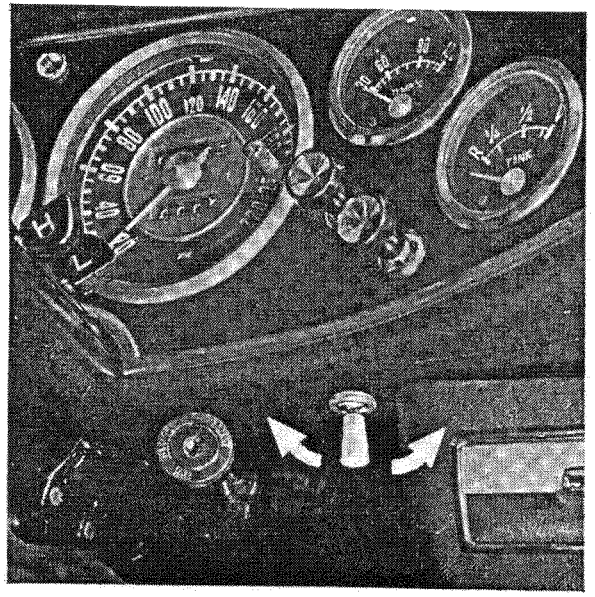

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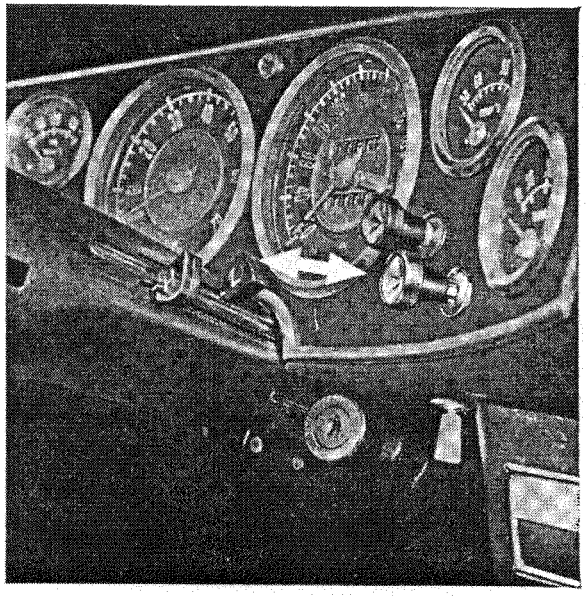

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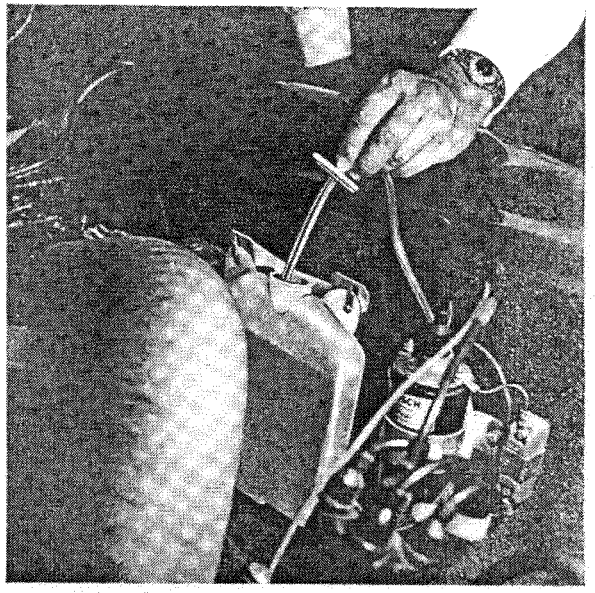

The **trip mileage recorder** in the speedometer can be reset by turning the knob to the left. Do not attempt to zero the trip recorder when the vehicle is in motion. **Fig. 13**

The **oil pressure gauge** indicates the pressure of the lubricating oil circulating in the engine. As the engine reaches its normal operating temperature the oil pressure may drop slightly. **Fig. 14**

In addition to the oil pressure gauge, a green **oil pressure telltale** (see Page 9 No. 3) is mounted at the bottom of the revolution counter on the right. If this telltale lights up while the engine running, and there is known to be sufficient oil in the engine, the engine should be stopped at once and the nearest BMW dealer consulted. Once the engine is warm the oil pressure telltale may occasionally flicker or light up at idling speeds, but this need not give cause for alarm.

The **oil thermometer** indicates the temperature of the engine oil. Maximum oil temperature is in the region of 130° C (265° F).
If the engine is adequately filled with oil, the ignition timing correct and the V-belt to the water pump properly tensioned, and yet the oil temperature still tends to rise above 130° C (pointer entering red area on dial), proceed at once to your nearest BMW dealer at low speed, without over-revving the engine. **Fig. 14**

The **cooling water thermometer** provides a check on the temperature of the water in the vehicle's cooling system. **Fig. 15**

Warning:
If thermometer indicates 0°–60° C:
The engine is not yet properly warm. Proceed at slow speed and without over-revving the engine.

From 60°–110° C:
Normal operating temperature range.

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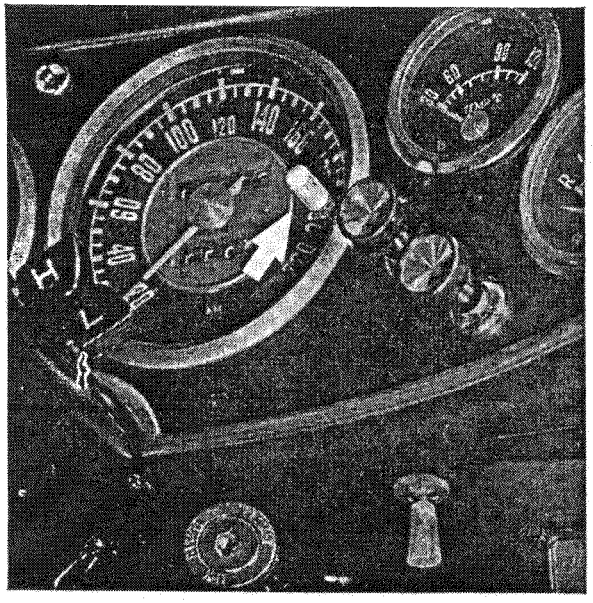

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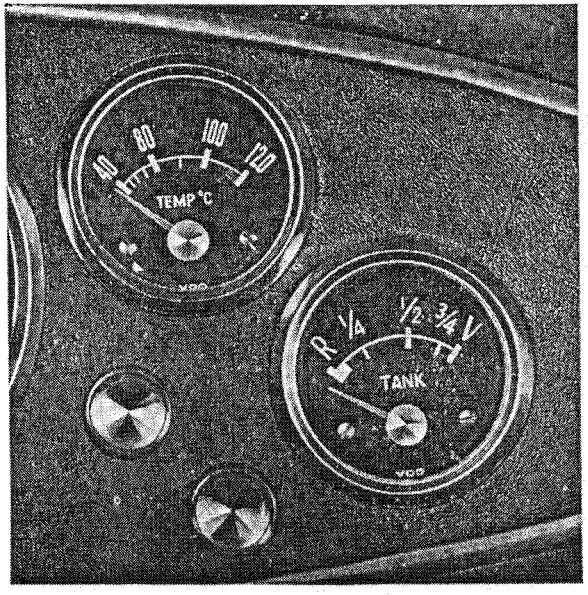

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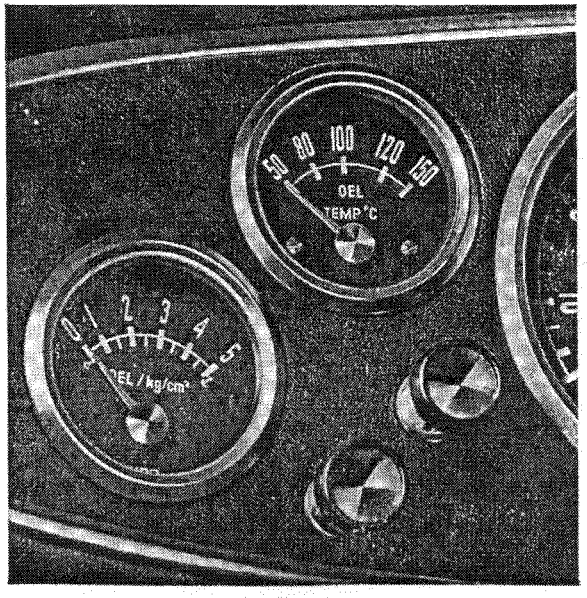

Above 110° C (red danger area on dial): The engine is overheating. There is no cause for alarm it the needle reaches or enters the red zone for a short period if the engine is working very hard or the outside temperature is extremely high. However, if the needle tends to remain in the red zone for long periods, the cooling system is definitely in need of attention (see procedure outlined on Page 25).

When the ignition is switched on, the **fuel gauge** will indicate the contents of the fuel tank. If the needle points to "R" you should fill up with petrol as soon as possible, since only some 2 gallons (10 litres) remain in the tank. **Fig. 15**

The **fuel filler cap** is located on the right-hand side at the rear of the vehicle.
Fig. 16 shows the arrangement of the **rear lights:**

1. Flashing turn indicator (yellow)
2. Rear light with reflector (red)
3. Stop light (red)
4. Reversing lamp (white)

The **luggage compartment light** will operate whenever the main side-head-lamp switch (Page 10, **Fig. 8**) is pulled out.
The **handbrake** works on the rear wheels. To brake or secure the car, pull the lever upwards. To release the lever first pull it up slightly, then press in the knob on the end of the lever and move the lever downwards. **Fig. 17**

A useful hint: To avoid noise when applying the handbrake, first depress the knob.
The position of the gear lever for each speed can be seen from the **gate pattern** diagram below. There is synchromesh on all forward speeds. **Fig. 18**

To engage reverse gear (only when the car is standing still) the lever must be pushed over to the left until a slight resistance is overcome.

With the ignition switched on and reverse gear engaged, both **reversing lamps** will be illuminated.

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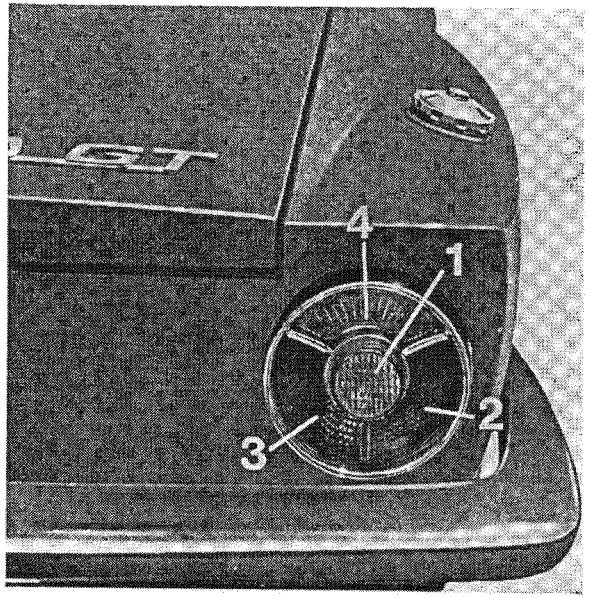

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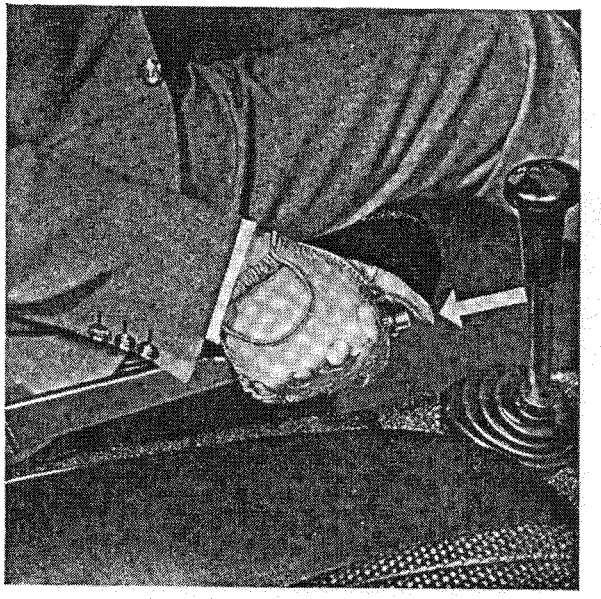

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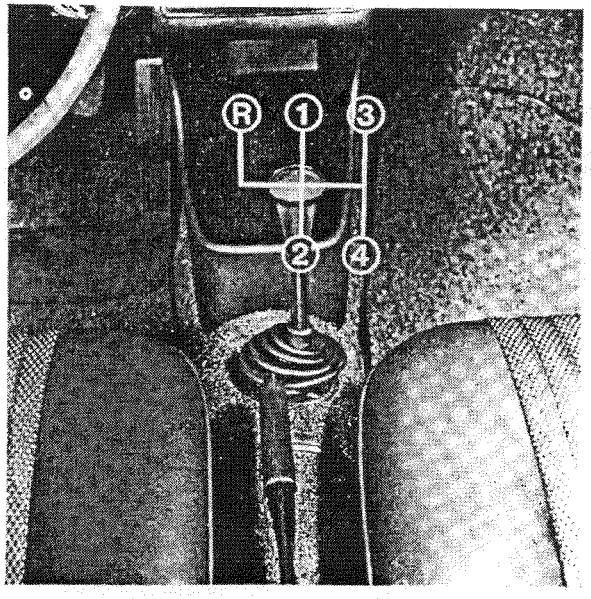

For **fore-and-aft adjustment** of the **front seats,** pull up the lever on the left-hand side of the seat and slide the seat forwards or backwards to the desired position. Release the lever and move the seat very slightly to ensure that the locking mechanism has engaged. **Fig. 19**

The **front seat backs** are adjustable for angle after pulling up lever 1, **Fig. 20,** on the outside of the seat. The seat back can be reclined by overcoming a slight spring pressure, or allowed to move under spring action to a more upright position. As soon as the lever is released the seat back will lock in the appropriate position.

To enable the rear seats to be reached more easily, the front seat backs may be folded forward after pulling up lever (1) to release the locking mechanism. Fine adjustment of seat back angle is also provided by turning handwheel (2) on the outside of the reclining seat base.

Front seat **safety belt anchorages** are provided on the body shell. Your BMW dealer knows the correct mounting points and will gladly fit a set of safety belts to your car.

The **interior rear view mirror** can be dipped to avoid dazzle from cars behind by moving lever (1). **Fig. 21**

The interior rear view mirror housing also includes the **interior light.** Switch (2) has the following positions:

to left: permanently on

to right: illuminated only when driver's door is open (switch on door post).

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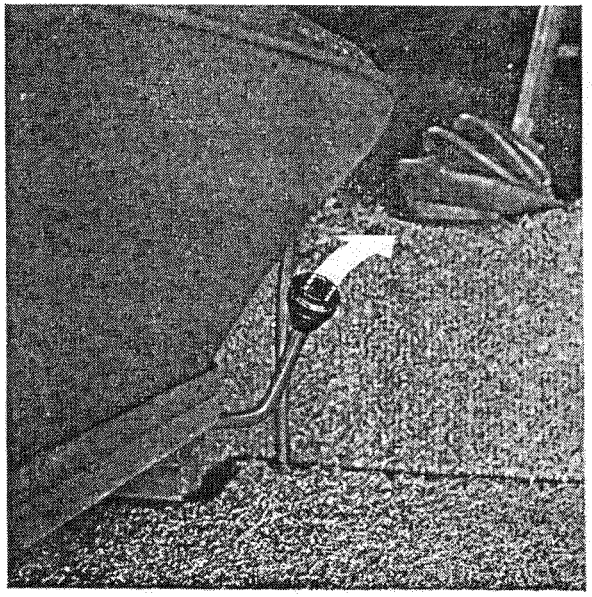

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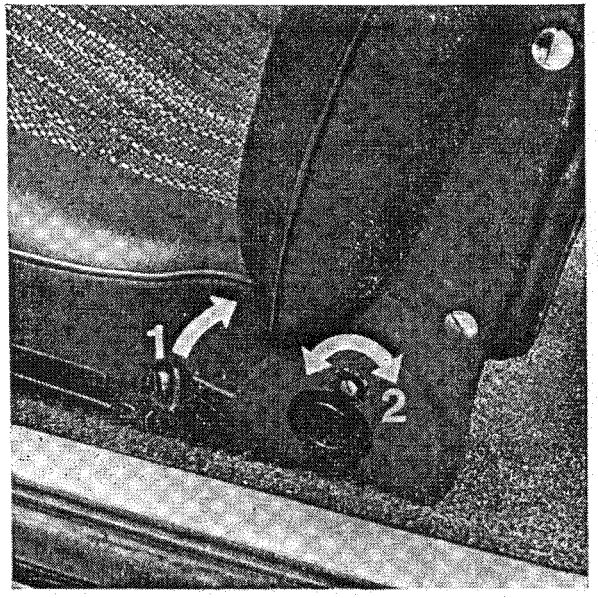

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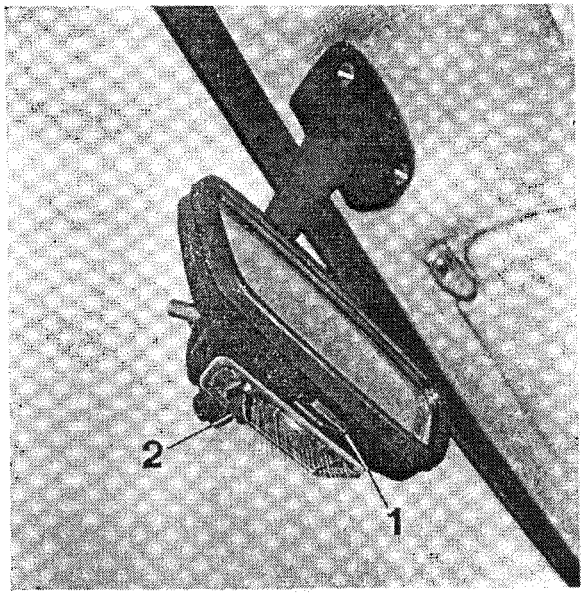

Please ensure that both interior and exterior rear view mirrors are adjusted to suit your driving position. The **outside mirror** can be locked with a screwdriver so that accidental shocks, such as may occur when the car is washed, do not disturb the selected position. **Fig. 22**

The **sun visors** can be swung downwards to avoid glare from sunlight directly ahead. The passenger's sun visor is provided with a make-up mirror on the back.

The **glove box lid** has a magnetic catch. A light pull is sufficient to open the lid.

To empty the **ashtray** on the facia: Pull out the ashtray as far as the stop, press down the leaf spring and remove the ashtray from its holder. **Fig. 23**

The **bonnet** opens forwards, and is released from within the car by swinging over the locking lever under the instrument panel to the right, next to the heater distributor box. **Fig. 24**

The open bonnet can be propped by a strut on the left-hand side of the engine compartment.

Warning: Do not attempt to close the bonnet unless the locking lever is swung up. After closing the bonnet, move the lever down to lock it securely.

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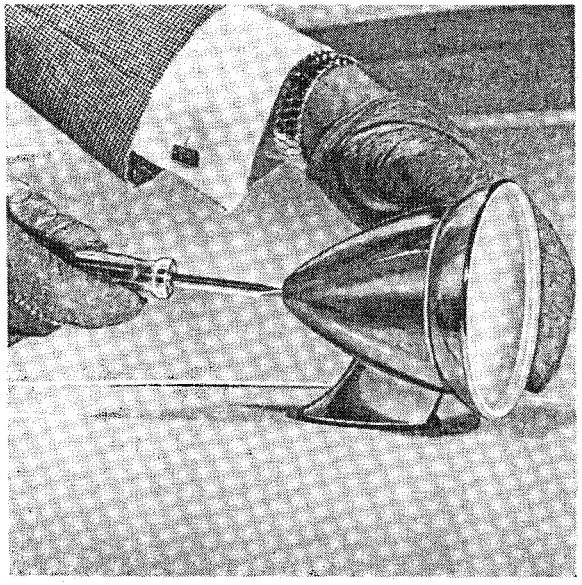

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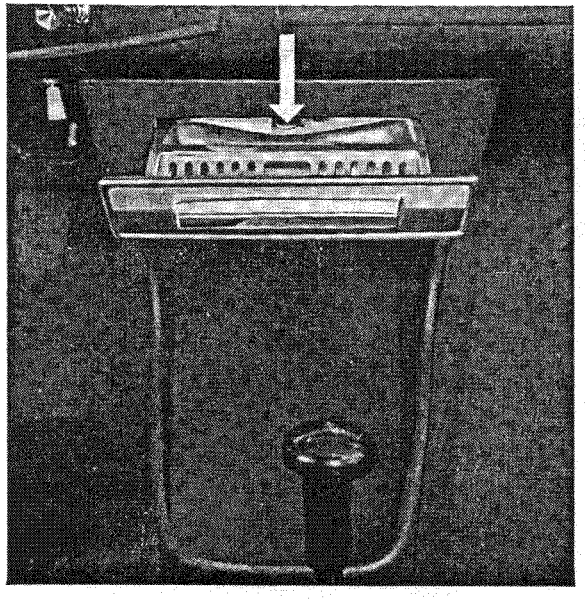

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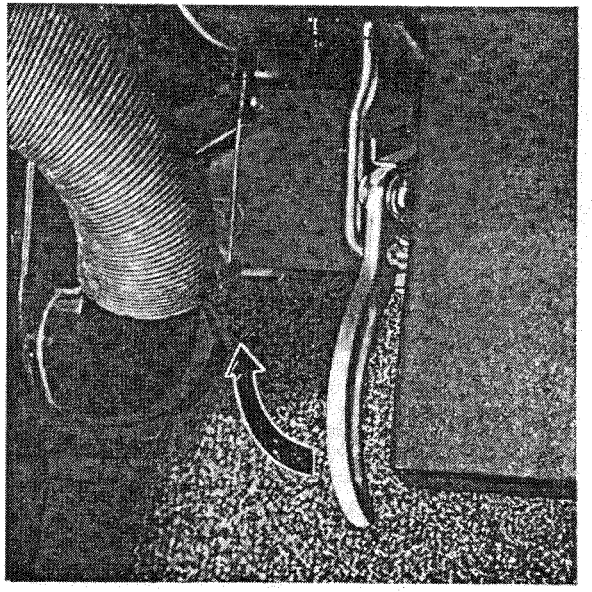

The **heater/ventilator unit** of the BMW 1600 GT enables the temperature to be controlled within fine limits.

With the aid of the three levers mounted on the steering column enclosure, any desired air supply temperature between full heat output and unheated fresh air can be selected and distributed. **Fig. 25**

Air supply slide lever (L):
If this lever is moved towards the steering wheel, cold air will enter the car and can be directed either predominantly towards the footwells or towards the windscreen, depending on the position of demister slide lever (D).

Heater slide lever (H):
If this lever is moved towards the steering wheel, the flow of cold air will be heated.

Demister slide lever (D):
This lever enables you to direct the airflow between the footwells or the windscreen, the proportions being continuously variable.

In damp conditions or when the windscreen is misted over it is best to close the heater outlets to the footwells (by moving lever (D) towards the steering wheel), so that the full output of the heater can reach the windscreen.

If misting over is very heavy, or there is ice on the windscreen, increase airflow by switching on the heater blower. Do not use the blower, however, until adequate heat is developed by the engine (water thermometer should read above 60° C). **Fig. 26**

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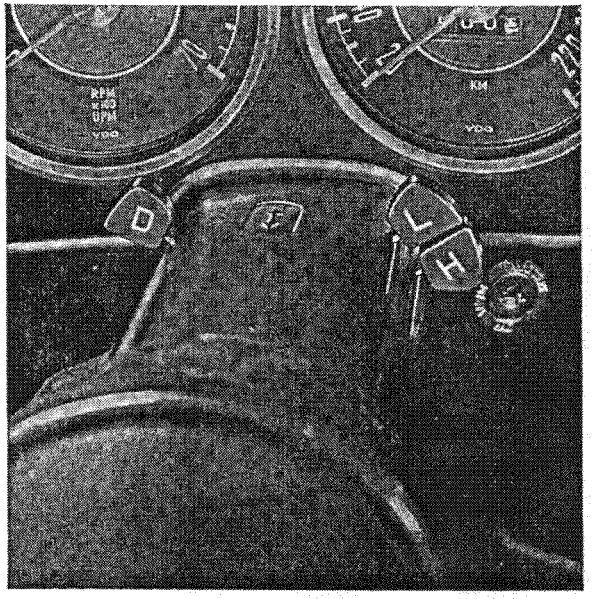

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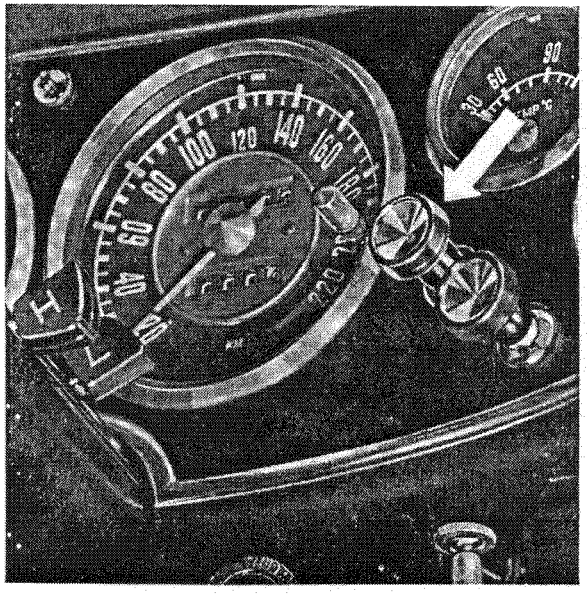

To open the front **quarter-lights,** push the catch forward. To close, swing the window back flush with the side panel, then move the catch back over its stop. When leaving the car, remember to secure both quarter-lights to prevent thieves from entering the interior. **Fig. 27**

Extra ventilation or air extraction can be obtained by opening the front-hinged rear side windows. A rotary knob is fitted to the catch to secure the window in the desired position. **Fig. 28**

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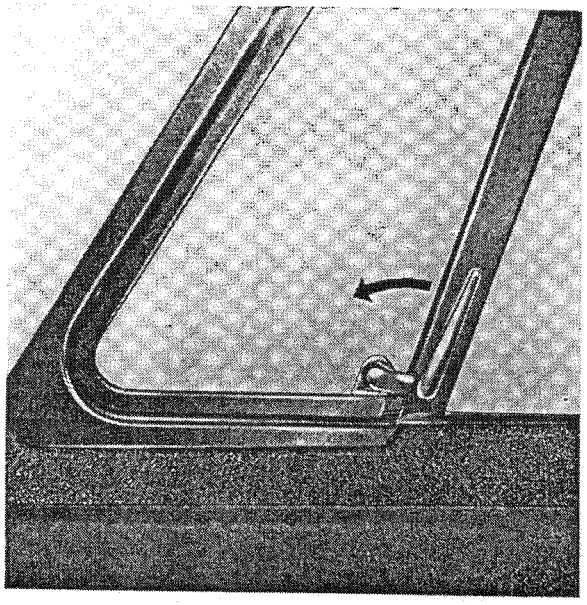

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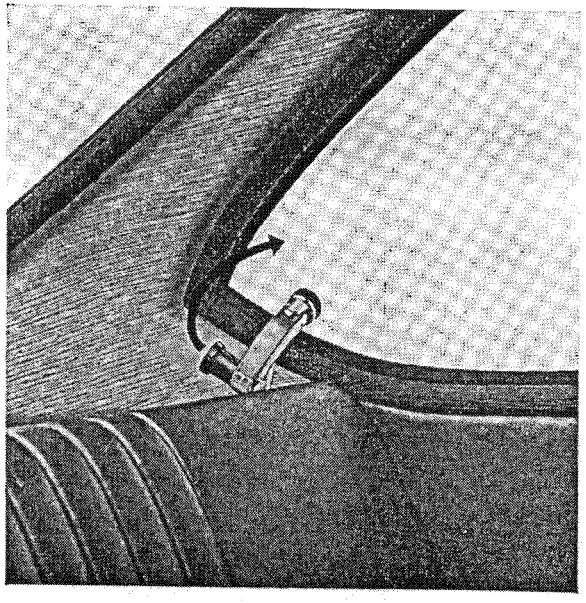

Setting off

Before operating the starter, always check that the gear lever is in neutral.

Depending on engine temperature and outside conditions, it may be necessary to operate the **choke. Fig. 29**

a) pull out the choke fully if the outside temperature is less than −10° C (+ 14° F).

b) if the outside temperature is very low indeed, also depress the accelerator pedal once or twice briefly to inject a little fuel into the inlet manifold, at the same time operating the starter to turn the engine over.

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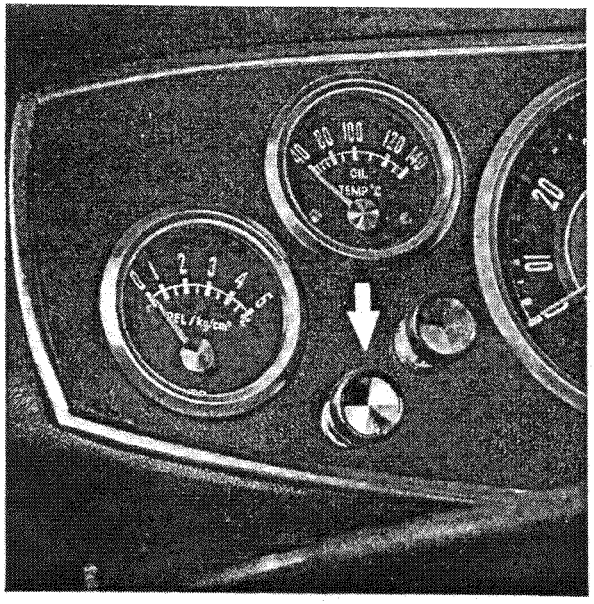

When the engine fires, allow it to run for 3–5 seconds, then push back the choke knob a certain distance until the engine runs evenly.

If the engine is warm (normal operating temperature) the choke and accelerator need not be touched. **If the engine is hot,** the accelerator should be depressed while operating the starter.

The **starter** is operated by turning the ignition key fully to the right ("Start" position) until the engine fires. However, do not allow the starter to turn the engine for longer than about 10 seconds. When released, the ignition key will spring back of its own accord to the "Fahrt" (Drive) position. While operating the starter the radio (optional extra) will be automatically switched off.

To make starting easier, especially during extremely cold weather, it is a good idea to switch off all other current-consuming items, and also to depress the clutch pedal.

If the starter has to be operated a second time before the engine will fire, the ignition key must first be returned from the "Fahrt" (Drive) to the "Garage" position. This intentional delay mechanism is introduced in order to prevent as far as possible the starter pinion from being re-engaged while the engine is still turning. You should try to avoid using the starter unless the engine has come to a complete standstill. This will avoid damage to the teeth on the starter pinion and flywheel.

As soon as the engine is running at a fast idling speed, the oil pressure (green) and battery charge (red) telltales should go out. The oil pressure gauge should begin to record the build-up of oil pressure in the engine.

If the battery charge telltale lights up while on the road, you should take the car as soon as possible to a BMW dealer, or else the battery will become completely discharged.

It is unnecessary to allow the engine to warm up at idling speed; better results are obtained by setting off at once, using **moderate engine speeds only.** If the choke was used for starting, push it in as soon as the engine runs evenly (the telltale will be extinguished). Only if the outside temperature is exceptionally low should a cold engine be run for about 30 seconds at a fast idling speed, mainly to ensure that all parts receive an adequate supply of lubricant.

In all cases avoid running a cold engine at high speeds, as this will seriously shorten its operating life.

When disengaging the clutch, always depress the pedal fully; while driving, never rest the left foot on the clutch pedal.

To switch off the ignition and stop the engine, turn the key to the "Garage" position.

Running-in – but how?

The engine of your BMW 1600 GT is not sealed, in other words we have imposed no artificial limitation on its performance. As a result it is up to you to achieve maximum life expectancy and economic results from your car by observing the following simple **running-in rules.**

Maximum permitted speeds for the first 600 miles (1000 km):

1st gear	20 mph	(35 kph)
2nd gear	40 mph	(60 kph)
3rd gear	60 mph	(95 kph)
4th gear	80 mph	(125 kph)

Fig. 30

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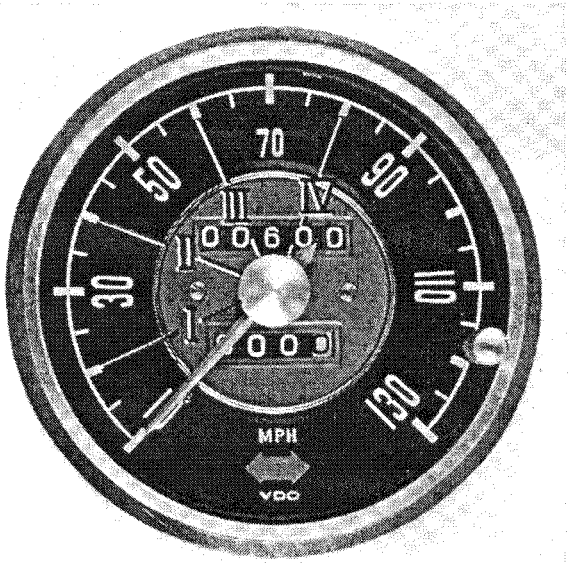


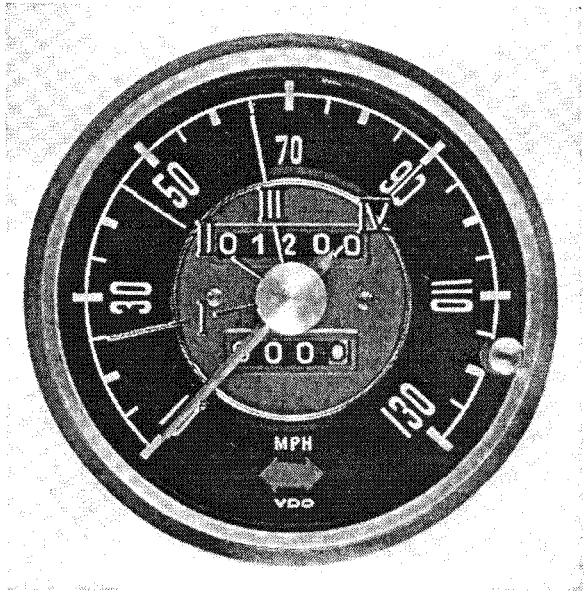
Maximum permitted speeds between 600 miles (1000 km) and 1200 miles (2000 km):

1st gear	25 mph	(40 kph)
2nd gear	45 mph	(70 kph)
3rd gear	65 mph	(110 kph)
4th gear	90 mph	(145 kph)

Fig. 31

During running-in the maximum permitted speeds in each gear should only be maintained for short periods. Make frequent speed changes, and try to use a wide variety of engine speeds during a journey. Change down in good time, especially when climbing gradients.

31



Running in brakes: Until about 300 miles (500 km) have been covered, try to avoid heavy brake applications, especially from high speeds, and do not subject the brakes to extended tests, or the brake linings will subsequently fail to achieve their normal low wear rates and high stopping power.

During the **running-in period** the gear lever, steering and other controls may appear **stiff to move.** The normal running-in process will cause this tendency to disappear after a short period of operation.

Engine speed can be read off on the **revolution counter** at all times. **During the running-in period,** please observe the following **engine speed limits:**

0—600 miles (0—1000 km)
= 4500 rpm
Fig. 32

600—1200 miles (1000—2000 km)
= 5000 rpm
Fig. 33

Allowing the engine to labour is at least as harmful as exceeding the permitted speeds. Try to keep engine speed above 1500 rpm on the road.

After the first 1200 miles (2000 km) have been covered, you may **gradually** increase your speed towards the maximum permitted road speed of 119 mph (190 kph), provided that road and traffic conditions permit.

The **maximum permited continuous engine speed** is 6200 rpm.

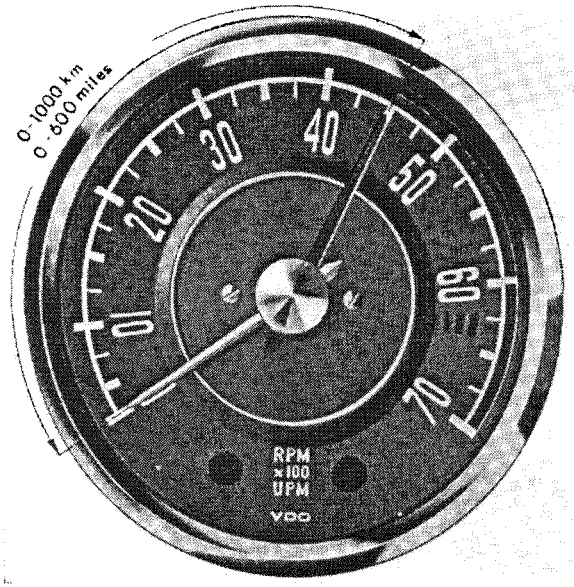
The **maximum permitted continuous road speed** in 4th gear is 119 mph (190 kph).

Never allow the pointer of the revolution counter to enter the red sector on the dial (engine speed in excess of 6400 rpm), especially when descending long main-road hills or accelerating in the intermediate gears. **Fig. 34**

Maximum permitted speeds after running-in is complete:

1st gear	30 mph	(48 kph)
2nd gear	57 mph	(92 kph)
3rd gear	85 mph	(136 kph)
4th gear	119 mph	(190 kph)

32



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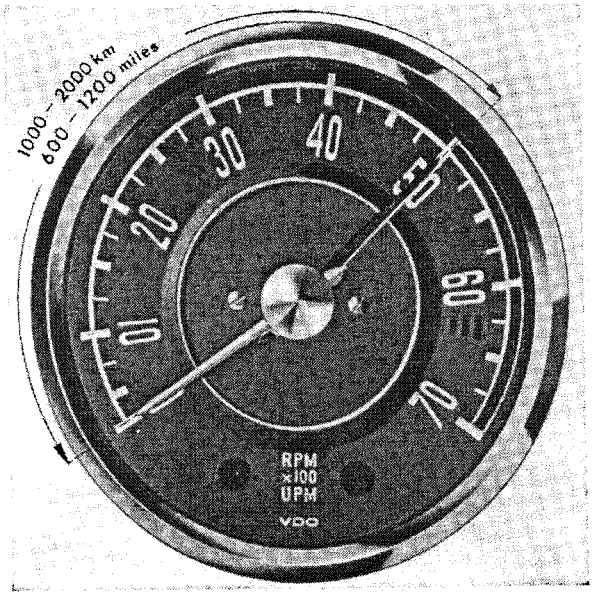

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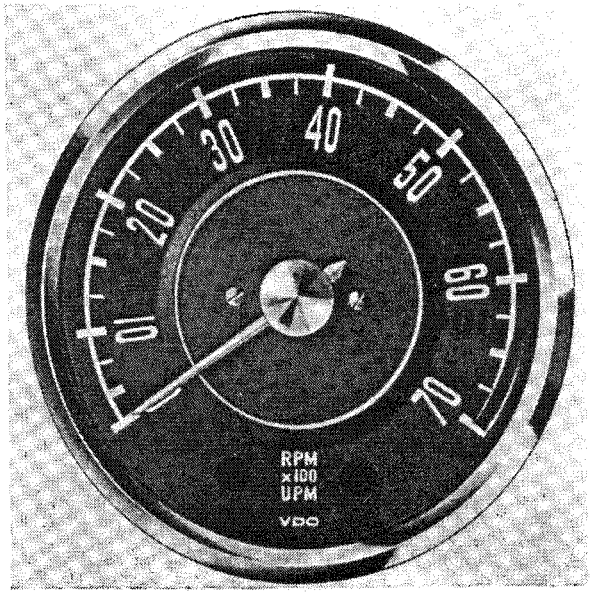


On your way

For its correct operation the engine requires to be supplied with a commercially available branded premium grade petrol having a minimum octane rating of 99 (Research method).
If you find yourself obliged to buy petrol with a lower octane rating, in other words with less anti-knock resistance, the following procedure should largely avoid "knocking" or "pinking" in the engine: keep the engine speed at 2500 rpm or above, change down in good time and accelerate only gently.

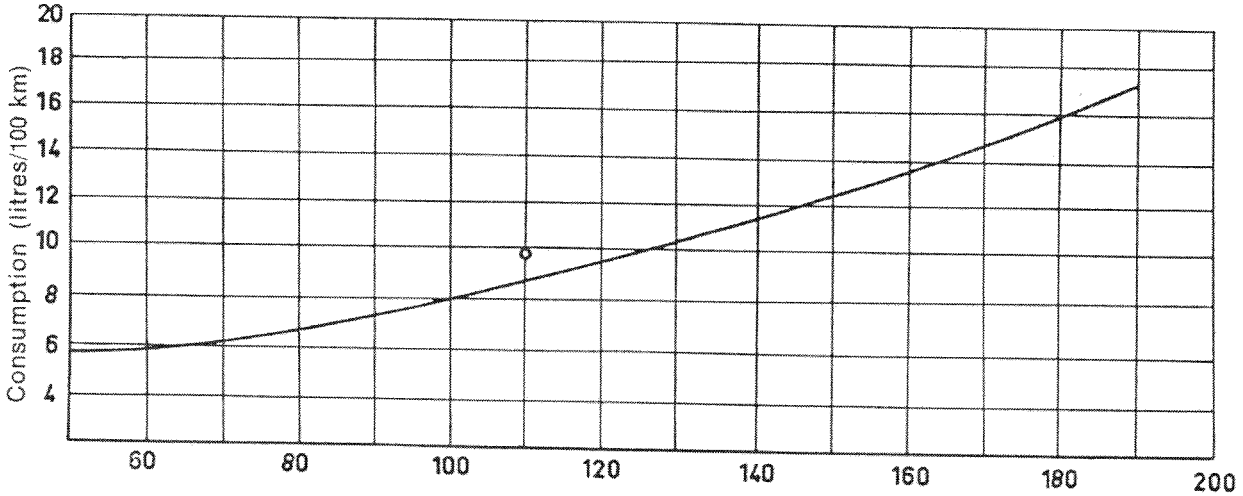
A graph of road speed/engine speed can be found on Page 53.

Your car's **fuel economy** depends mainly on your own style of driving. Just as travel by the fastest trains involves payment of a supplementary fee, so high speeds, acceleration to the limit in each gear, violent cornering and last-minute braking all take their toll, not only in terms of increased fuel and oil consumption but also through rapid tyre wear, early brake lining renewal and more severe loads on the transmission.

Fig. 35 shows the relationship of fuel consumption to road speed for a standard model with two passengers.

35

Fuel consumption at steady speeds



o = Fuel consumption (standard test method)

The **"standard" fuel consumption** is arrived at in accordance with a special test routine. It is in no way identical with the "average" fuel consumption, which may be affected by a large number of factors: driving methods, load carried, road conditions, traffic density and flow, weather conditions, tyre pressures etc.
If you have been stuck in a traffic jam or slow-moving column of cars for a long time, we suggest that you take the first available opportunity of letting your car's engine **"take a deep breath"** by travelling for a mile or two using fairly high engine speeds. If any build-up of carbon has occurred, this routine will disperse it.

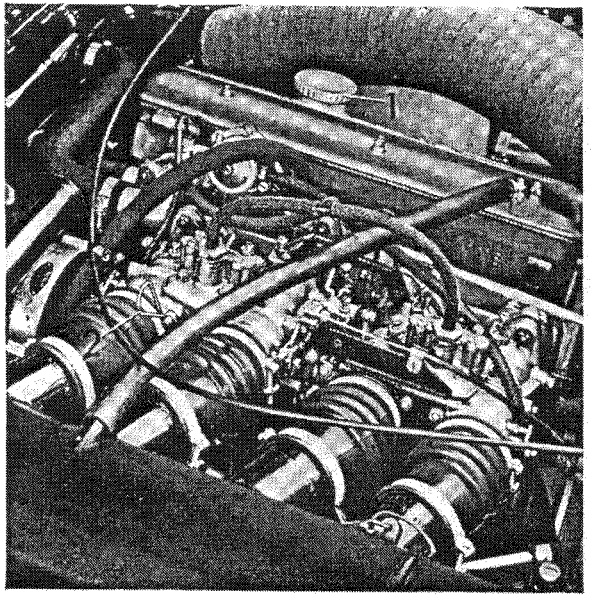
Engine oil consumption, like fuel consumption, depends on a variety of factors.
Our engines are designed to take full advantage of the highly-developed oils offered by reputable firms nowadays. Note that neither the engine itself nor the gearbox or final drive require the employment of **any additive.**

However, you should not change to a different brand of oil unless a complete oil change, including the oil filter, is undertaken.
We recommend checking the oil level before the start of a journey **(Fig. 36, 2).** If necessary add fresh oil of the same brand as that already present in the engine. The filler cap can be seen in **Fig. 36, 1.** Fill only until the oil level reaches the upper mark on the dipstick.

It is useless to overfill the engine and can even cause damage in certain circumstances. The quantity of oil represented by the distance between the upper and lower marks on the dipstick is 1.5 litres (2.6 Imp. pints). The oil level should not be allowed to fall below the lower mark. Do not attempt to remove the filler cap when the engine is running.

A well-tried rule: After a long spell of **pass-storming** or **motorway driving** at wide throttle openings, do not switch off the engine at once but allow it to idle or run under light load for a short period; this will disperse pockets of heat in the cooling system and prevent loss of cooling water.

36

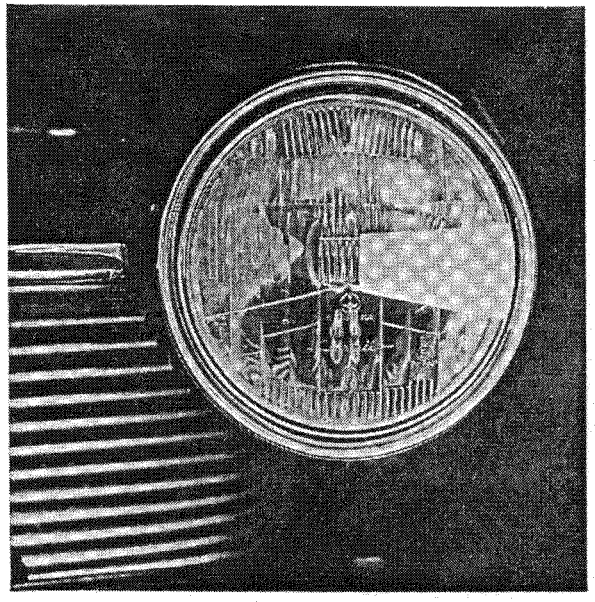


Warning: To remove the cap on the compensator reservoir when the engine is warm, use a glove or cloth and turn the cap only after pressing the button (**Fig. 66,** Page 41) to allow pressure to escape.

Downhill stretches are better negotiated if the engine's braking effect is increased by changing down to a lower gear. Never drive downhill with the clutch pedal depressed, the gear lever in neutral or the ignition switched off.

After a long run on wet roads, through driving rain or snow, the first subsequent brake application may call for rather more pedal pressure than usual.

37



Continuous **increased pedal pressure** is a sign that the **brake pads are worn down.** For safety reasons, each brake caliper is fitted with a spreader spring which comes into action when the minimum brake pad thickness is reached, and thus draws your attention to the need for pad renewal before the discs themselves are damaged. When this point is reached, please have the brake pads renewed without delay by your BMW dealer.

When **touring abroad** we recommend that you take with you certain spare parts in case of emergency: bulbs, fuses, V-belts, spark plugs, gaskets etc. Your BMW dealer will gladly advise on the selection of these parts.

In general, you are required to display an international registration plate at the rear of your car when touring abroad, but the regulations differ in various countries. Information can be obtained from motor clubs, consulates etc.

When the car is taken to a country which drives on the opposite side of the road, you should stick a piece of adhesive material over the wedge-shaped area on the headlamp lenses, so that the asymmetric dipped beam of your car does not dazzle oncoming traffic. **Fig. 37** shows how to do this when using a left-hand drive car in a country where they drive on the left-hand side of the road.

When using the car during the cold season of the year, take the following precautions: add a branded antifreeze to the **cooling water** in the proportions stated by the antifreeze manufacturer. The total capacity of the cooling system is 9.5 litres (15.8 Imp. pints). For procedure when draining and refilling the cooling system, see Pages 40–41. The opportunity should also be taken to inspect the cooling system for leaks and to replace perished or porous hoses.

Adding a branded antifreeze to the fluid in the **screenwasher** reservoir will also help to keep this unit functioning correctly in cold weather. The container holds approx. 1 litre (1.8 Imp. pints).

If the normal outside temperature is less than 0° C (32° F), a **branded HD engine oil of SAE 10 W 30 grade** should be **used.**

In such circumstances do not wait until the next routine oil change is due.

An essential item for reliable starting is a well-charged **battery.** In cold conditions the battery's efficiency falls, yet at the same time the loads imposed on it are much greater than in warmer weather.

Warning: If the battery is to be recharged without removing from the car, both battery cables must be disconnected. Never run the engine while recharging the battery. Disconnect the cables with the engine **stopped.**

In the interests of directional stability and precise steering, **winter tyres** should always be fitted to **all 4 wheels** (better to all 5 wheels) if used at all. They should all be of the same make and type; this is particularly important in the case of spiked tyres. In the same way, your car should always be equipped either with **all** cross-ply or **all** radial-ply tyres, never with a mixture of the two. Do not exceed a maximum speed of 80 mph (130 kph).

Please maintain the prescribed tyre pressures and have the wheels rebalanced after every tyre or wheel change.

When driving with **snow chains** in place, do not exceed 45 mph (70 kph).

If parking the car in freezing conditions, engage 1st or reverse gear to hold the car firm, but do not apply the handbrake. This is to ensure that the brake pads or linings do not freeze solid to the discs or drums.

If a little fine powdered graphite is blown into the various **locks,** they will not freeze up. Do not use glycerine or deicing fluids, as these can cause damage to the locks. If a lock should freeze solid despite these precautions, warm the key before insertion to thaw out the lock mechanism. To prevent the **rubber sealing strips** round the doors, bonnet and luggage compartment from freezing up, they should be coated with a little glycerine.

Chromium-plated polished components may be protected in winter with a transparent lacquer.

The **underside** of your car is provided with a coat of underseal as standard. Before the cold season starts, it is particularly recommended that the condition of the underseal be checked and a fresh coat applied if necessary. Spraying with oil-bound compounds offers no lasting protection against corrosion, and may damage rubber components beneath the car and cause existing underseal to become detached. You are therefore asked to use only wax- or bitumen-based compounds. Your BMW dealer can recommend suitable products from reputable manufacturers. When the underseal is applied the disc brakes must be carefully shielded. No protective compound must reach the brake piston sealing sleeves or brake discs.

In winter it is wise to carry with you:

sand, to assist in starting on icy uphill gradients;

a shovel, in case the car has to be dug out of a drift;

a flat board or plank to put under the jack;

a brush and scraper for the removal of snow and ice from the bodywork and windows.

What to do, if . . .

Just occasionally your car may develop a minor fault which you can put right yourself, if there is no service station conveniently to hand.
A flat tyre is fortunately a rare event these days. If you should be unlucky, pull into the side of the road as soon as possible, and apply the handbrake. Unless you are well clear of the road you should then run back and display a warning triangle or flashing signal lamp at an adequate distance to the rear.

The **spare wheel, jack and toolkit** are housed on the left-hand side of the luggage compartment. **Fig. 38**

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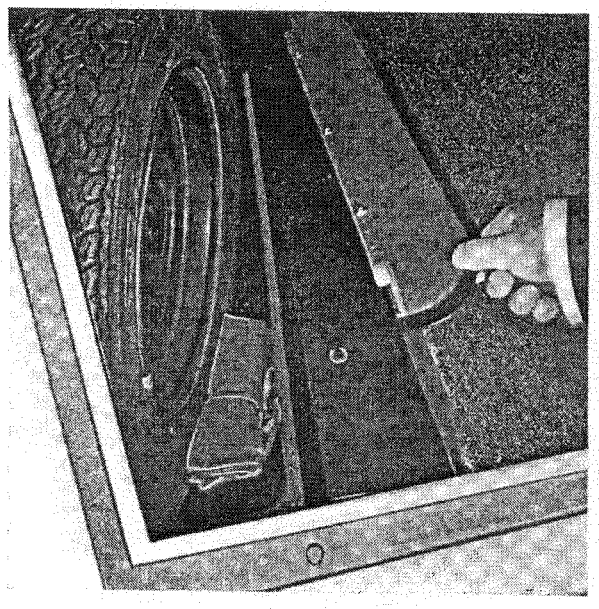

Carefully lever off the hub cap, using the hook provided on one end of the wheel brace. Support the hub cap with the other hand as it becomes loose. **Fig. 39**

Loosen the wheel nuts **slightly.** Attach the jack to the bodywork seam close to the wheel it is intended to remove. Make quite sure that the support pad on the jack is securely located by the seam and is quite flat against the floor panel. Raise the car with the jack until the wheel is well clear of the ground. **Fig. 40**

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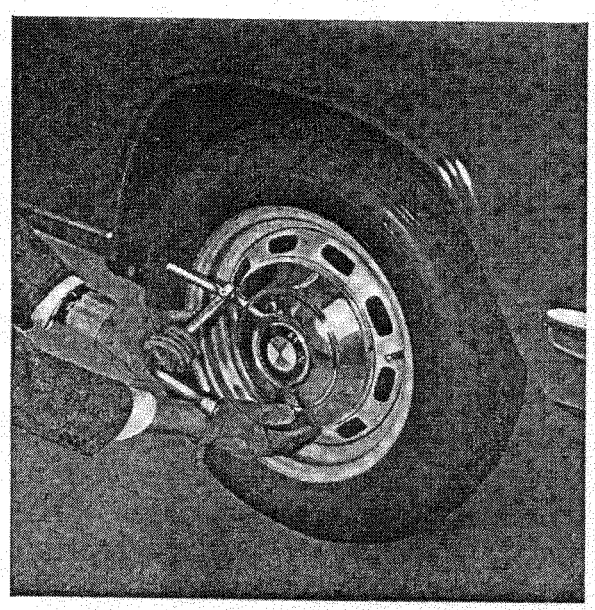
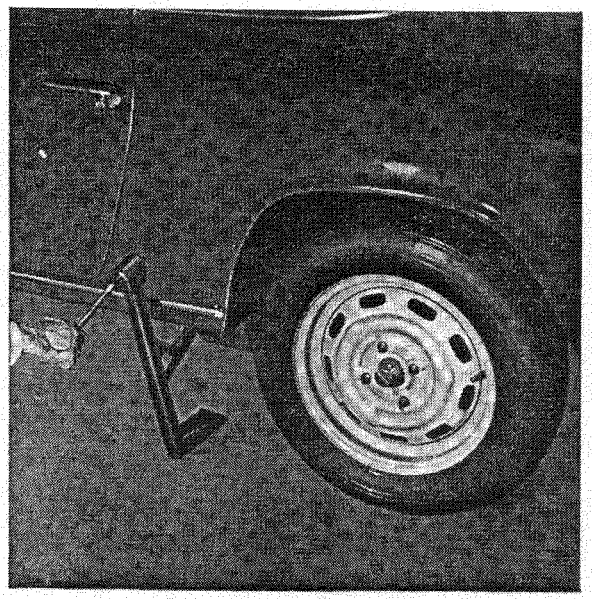


Screw off the wheel nuts and change the wheel. Replace the wheel nuts and screw up evenly all round the wheel. Lower the car with the jack, then **firmly tighten** the wheel nuts, working crosswise. Refit the hub cap by first placing over two of the protruding lugs, then striking gently on the edge to force the cap over the third lug. Do not forget to have the flat tyre repaired and the wheel rebalanced at the earliest opportunity.

40



Starter will not turn when ignition key is in "Start" position:

Test battery condition by switching on headlamps and then trying starter.

1. If the headlamps go out slowly, the battery is insufficiently charged or has a fault. Recharge battery or exchange it. Push or tow-start the car. To tow-start, engage 3rd gear, switch on ignition and depress the clutch pedal. As soon as the car is moving steadily forward, engage the clutch.
2. If the headlamps go out immediately, check that the cable terminals at the battery and starter are making good contact, and tighten if necessary.
3. If the brightness of the headlamps does not diminish, consult your BMW dealer (a fault in the starter is indicated).

Engine will not start although starter functions correctly:

Assuming that the starting routine on Page 18 was followed correctly, and that there is enough fuel in the tank, failure to start could be due to a fault in the ignition system or the fuel supply.

1. Check that all spark plug leads are properly in place and that all cables on the coil, distributor and terminals are making good contact. Look for short-circuits caused by water penetrating when the car was last washed.
2. Remove spark plugs and check gaps and general condition (see Page 42).
3. The correct functioning of each spark plug can be checked by attaching the appropriate lead and laying the metal body of the plug on an unpainted part of the engine block. When the starter is operated, sparks should be seen jumping the electrode gap. If no spark is visible, attach a different plug to the same lead and repeat the test. If no spark occurs this time, the ignition distributor must be examined (see Page 43).
4. To check that fuel is reaching the engine, detach the fuel supply line from the carburettor and operate the starter. If no fuel emerges from the supply line, the fuel pump and various fuel lines must be examined (see page 42). On the other hand, if fuel is pumped through as far as the carburettor, unscrew the jets (see Pages 48 and 49) one after another and clean them by blowing through. If this fails to clean them, use a single bristle from a clothes brush, dusting brush or similar, but never clean the jets with a needle, wire or other sharp object.

Cooling water temperature too high:

1. Carefully remove the filler cap from the radiator (first allow pressure to escape by pressing the button on the cap, see Fig. 66, Page 41) and check water level. Never add water **if the engine is hot** and a great deal of water has evaporated; wait until the engine has cooled to the extent that a hand can be placed on it.
2. If cooling water is continually lost, check the filler cap, all hose connections, and the radiator block itself for leaks.
3. Check condition of fan belt, and adjust tension or replace as necessary (see Page 46).
4. Check ignition timing (see Page 43).
5. If necessary, instruct your BMW dealer to flush out the cooling system.

Faulty brakes:

At the first sign that a fault may have developed in the brake system, we strongly recommend you to contact a BMW dealer immediately.

Car brought to a standstill by wheelspin (deep snow, sand, soft ground etc.): Do not press down too far on the accelerator; before the next attempt to extricate the car is made, place some form of firm support beneath the rear wheels (in a real emergency the car's floor mats could be used). If possible, obtain help in pushing the car out of the ruts it has made, before they become too deep. Apply the handbrake slightly if necessary to prevent a rear wheel spinning. Do not forget to release the handbrake as soon as it has had the desired effect.

Towing another car:

Should you wish to assist another motorist by towing his car with your BMW, first ensure that the other car is not heavier than your own.

To remove a **wiper blade,** hinge the wiper arm away from the windscreen. Press the blade out of its attachment on the arm and withdraw upwards. **Fig. 41**

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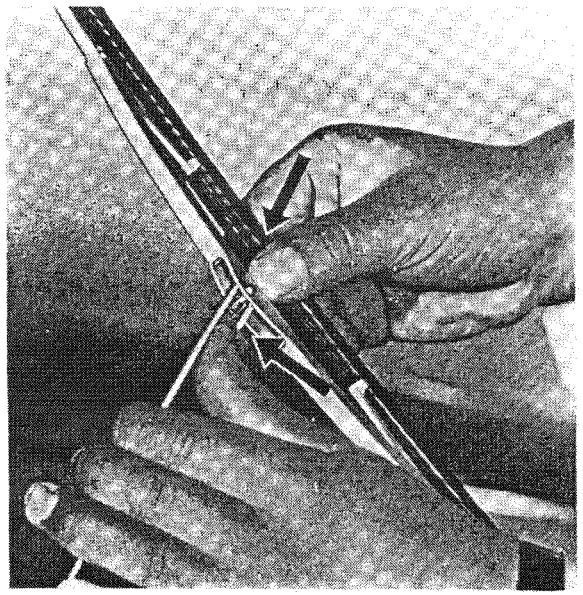

If any power consuming electrical component fails on your car, first check the fuses.

Key to fuses:

No.	Fuse (to DIN 72 581)	Power-consuming item
1	8 Amp	Interior and stop lights
2	8 Amp	Turn indicators, reversing lamps, heater blower, horn relay and instruments (+): revolution counter, fuel gauge, water thermometer, oil thermometer. Also: battery charge, oil pressure and choke telltales.
3	8 Amp	RH dipped beam
4	8 Amp	RH dipped beam
5	8 Amp	Front RH sidelight and RH rear light (including RH parking lights)
6	8 Amp	LH main beam and main beam telltale
7	8 Amp	LH dipped beam
8	8 Amp	Front RH sidelight and RH rear light (including LH parking lights)
9	16 Amp	Screenwipers, screenwasher unit, twin-tone horns (with cigar lighter if fitted)

Note:
The number plate and instrument panel lighting is also provided with an 8 Amp fuse. This fuse is fitted into the cable and hangs down beneath the instrument panel in a safety retainer just above the pedals. To change fuse, push the two halves of the bayonet fastening together and separate. Refit in the reverse sequence.

The **fusebox** is just under the bonnet on the left-hand side. **Fig. 42**

The melted metal strip indicating a blown fuse can be clearly seen through the clear plastic cover of the fusebox. Snap the blown fuse out of its spring clips and press in a replacement.

Never try to repair a blown fuse with a piece of wire (there is a risk of fire). If the fuse blows repeatedly, the fault should be investigated by a specialist workshop.

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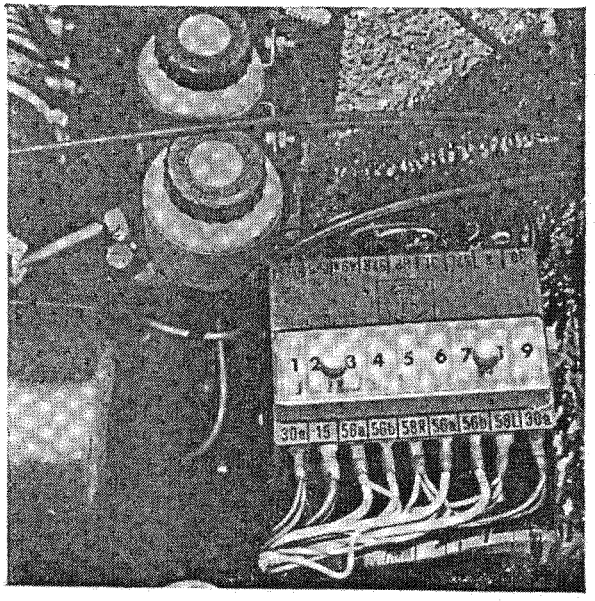

When **changing bulbs** or carrying out any other work on the electrical system, always switch off the item concerned or remove the negative terminal from the battery to avoid short circuits.

Never touch the glass of new bulbs with the fingers. Handle them with a clean cloth or paper handkerchief. When removing headlamp bulbs, try to avoid disturbing the setting of the beam adjustment screws.

Instrument panel lighting:

If a bulb fails, remove it complete with holder from the rear face of the affected instrument. The bulb is released from the holder by pressing in slightly and turning.

Speedometer:

Illumination:
2 indicator type bulbs (H), 2 Watt
Main beam telltale:
1 indicator type bulb (H), 2 Watt
Turn indicator telltale:
1 indicator type bulb (I), 2 Watt

Revolution counter:

Illumination:
2 indicator type bulbs (H), 2 Watt
Battery charge telltale:
1 indicator type bulb (H), **4 Watt**
Oil pressure telltale:
1 indicator type bulb (H), 2 Watt

Warning: Make sure that the battery charge telltale bulb is always of **4 Watt** rating.

Oil thermometer:
Illumination:
1 indicator type bulb (H), 2 Watt

Water thermometer:
Illumination:
1 indicator type bulb (H), 2 Watt

Fuel gauge:
Illumination:
1 indicator type bulb (H), 2 Watt

Choke telltale:
1 indicator type bulb (I), 2 Watt.

Interior light:
A 5 Watt (L) festoon bulb is fitted in the housing behind the mirror. Using a screwdriver or similar tool, prise the housing carefully away and fit the new bulb. **Fig. 43**

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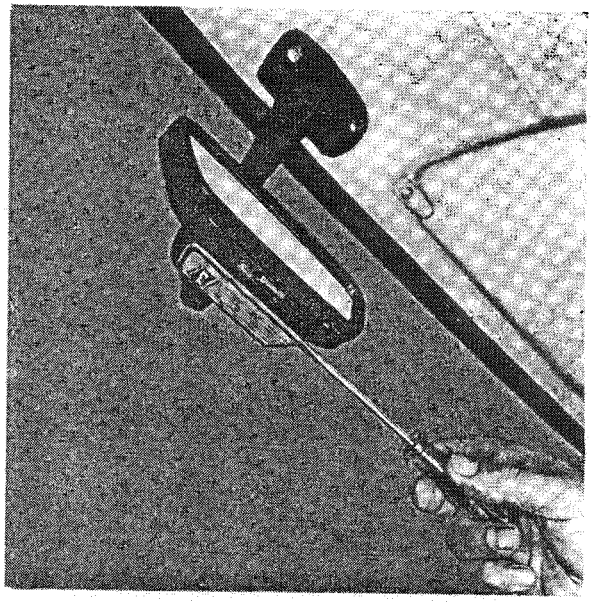

Main and dipped headlamp beams:

To replace the double-filament bulb, pull off the headlamp bezel. **Fig. 44**

Loosen the 3 retaining screws, turn the retaining ring to the left, and remove the reflector and lens unit. Push back the spring clips, remove the bulb in its holder and pull off the cable plug. When fitting the new 45/40 Watt double-filament bulb (A), note the recesses in the reflector rim. **Fig. 45**

The **sidelight bulb** (4 Watt [HL] indicator type) is merely pulled out rearwards to replace. The bulb is then removed from the holder by pressing in slightly and turning.

Because correct **headlamp adjustment** is of such vital importance in terms of road safety, it is best to leave this job to a specialist workshop equipped with the proper equipment.

If this is not possible, take off the headlamp bezel and adjust the headlamp beam with a Phillips head screwdriver. **Fig. 46**

1 = Horizontal adjusting screw
2 = Vertical adjusting screw

Please, refer to page 30 and 31 for headlamp adjustment.

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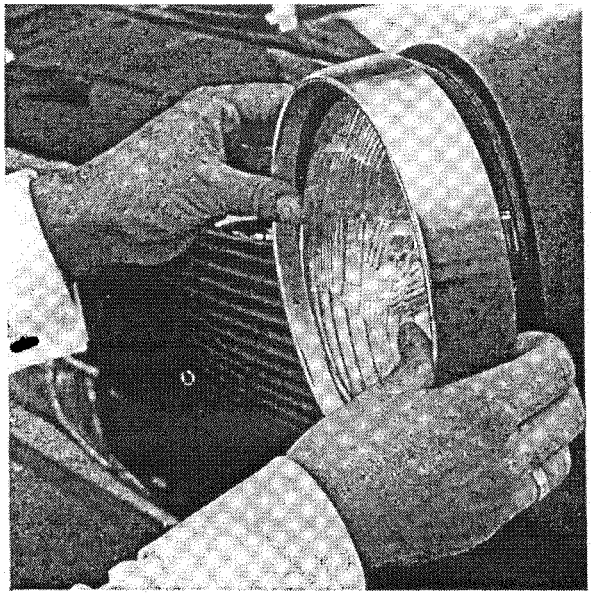

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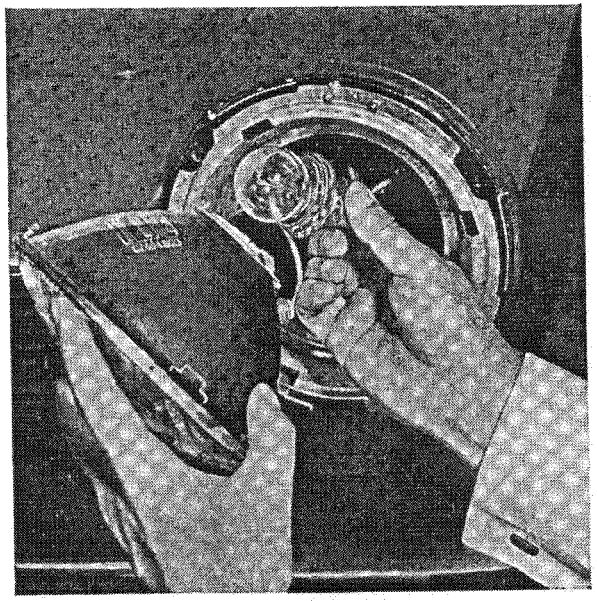

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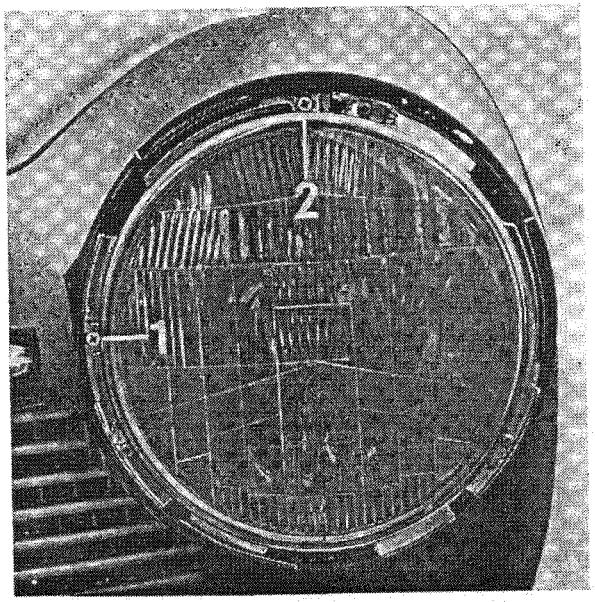


Front turn indicators:

Loosen the two screws and remove from bumper complete with nuts and locking washers, plastic lens and bulb housing. Press in the 18 Watt spherical bulb (R) and turn to remove. **Fig. 47**

Rear lights:

Open the luggage compartment, unscrew the two nuts and remove the bulb holder. **Fig. 48**

Take the defective bulb out of the holder and replace as follows:

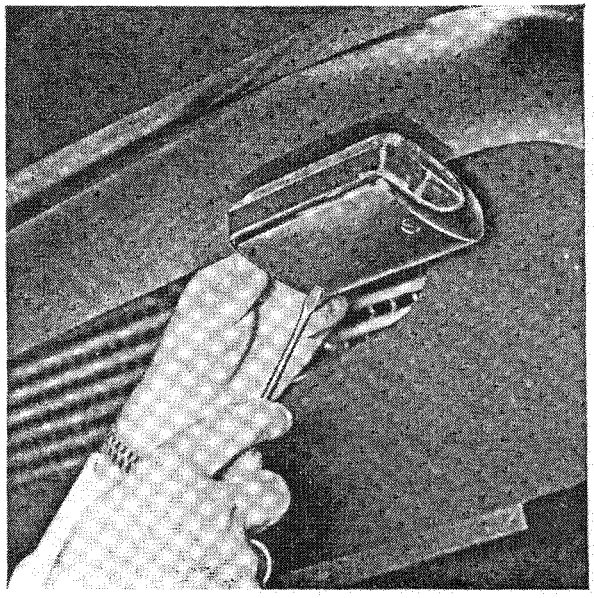
1. Turn indicator: 21 Watt spherical bulb.
2. Reversing lamp: 15 Watt (F) spherical bulb.
3. Rear (parking) light: 5 Watt (G) spherical bulb.
4. Brake lamp: 21 Watt spherical bulb.

Number plate lights:

Remove the two screws and take off the plastic lens. **Fig. 49**

The contact clips for the 5 Watt (L) festoon bulbs must have sufficient spring action to make good metal contact with the bulb caps. If necessary bend the spring clips inwards slightly and clean them.

47



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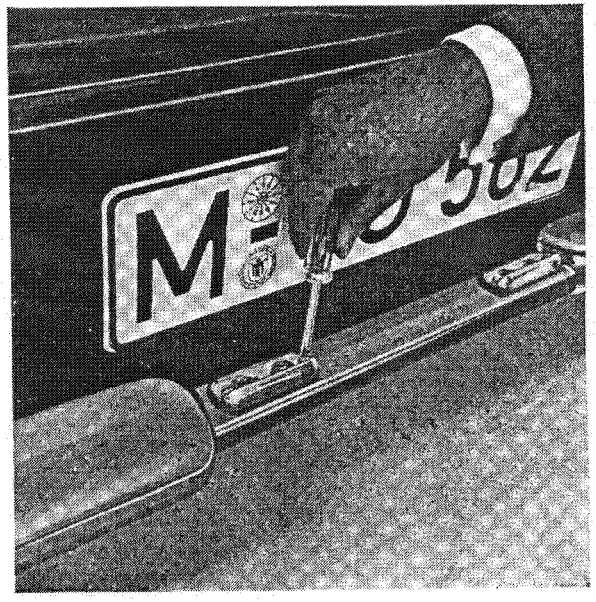

If no beam setting device is available, adjust the headlamps as follows:

Position the vehicle on a flat, level surface at 5 meters (approx. 16 feet) from a light-coloured wall. Mark a point on this wall to coincide with the vehicle's longitudinal centre-line.

Extend the centre-line vertically to give line V-V. **Fig. 50**

Get someone to sit in the centre of the rear seat. Measure the actual height of the headlamp centres from the ground, and transfer this measurement to the wall, marking out horizontal line h-h. Mark line a parallel to h-h and 5 cm (2″) below it.

Measure the distance between the car's headlamps, divide equally and mark lines b and c on the wall at corresponding distances from vertical centre-line V-V.

Headlamp adjustment with dipped beam in use:

Cover up one headlamp. Set the other headlamp beam to the correct height by turning adjusting screw 2, **Fig. 46.** The height is correct when the left-hand side of the horizontal light-dark boundary coincides with line a. Next turn horizontal adjusting screw 1 until the junction between the horizontal part of the boundary line and the part angled upwards at 15° coincides exactly vertical line b (or c).
Repeat the procedure for the second headlamp.

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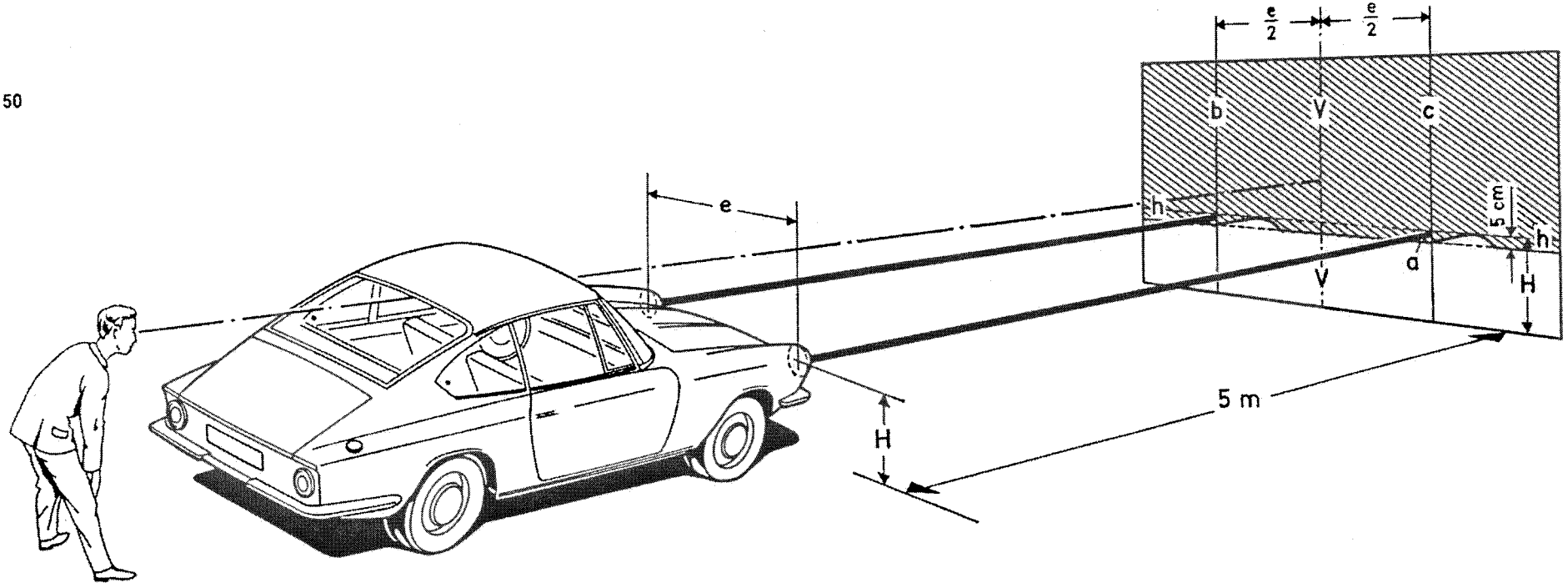

Adjusting "Sealed-Beam" Headlamps

To adjust these headlamps, use an optical or photoelectric aiming device and follow the manufacturer's instructions. If no such equipment is available, position the car on a flat level surface some 25′ (7.6 m) away from a light-coloured wall. Check that the tyres are inflated to the correct pressure. Get someone to sit in the centre of the front seats. Extend the car's longitudinal centre-line as far as the wall and erect a vertical line V from this point.

Draw a horizontal line h-h on the wall at the height of the car's headlamp centre-line (H is approx. 26″/66 cm). Draw 2 parallel lines a and b 2″ (5 cm) and 4″ (10 cm) below line h-h. Transfer the distance (approx. 43.3″/110 cm) between the headlamp centres to the wall, dividing it symmetrically to give points through which vertical lines c and d should be drawn.

Now draw short vertical lines 6″ (15 cm) to the left and right of both lines c and d, crossing lines h-h, a and b. The resulting rectangles, shown shaded in the diagram, enable the headlamps to be adjusted with great accuracy **Fig. 51.**

Adjustment should be carried out with the headlamp main beam in use.

For height setting, turn upper plastic knurled button and for horizontal adjustment, turn the lateral one according to **Fig. 46.**

The headlamps are properly aimed when the centre of the zone of greatest intensity strikes the wall on the cross formed within the shaded rectangle, or at least at some point within the rectangle.

The above headlamp alignment instructions will satisfy the regulations of most areas. Where local or state laws specify different settings, the headlamp adjustment should be modified to conform with such laws.

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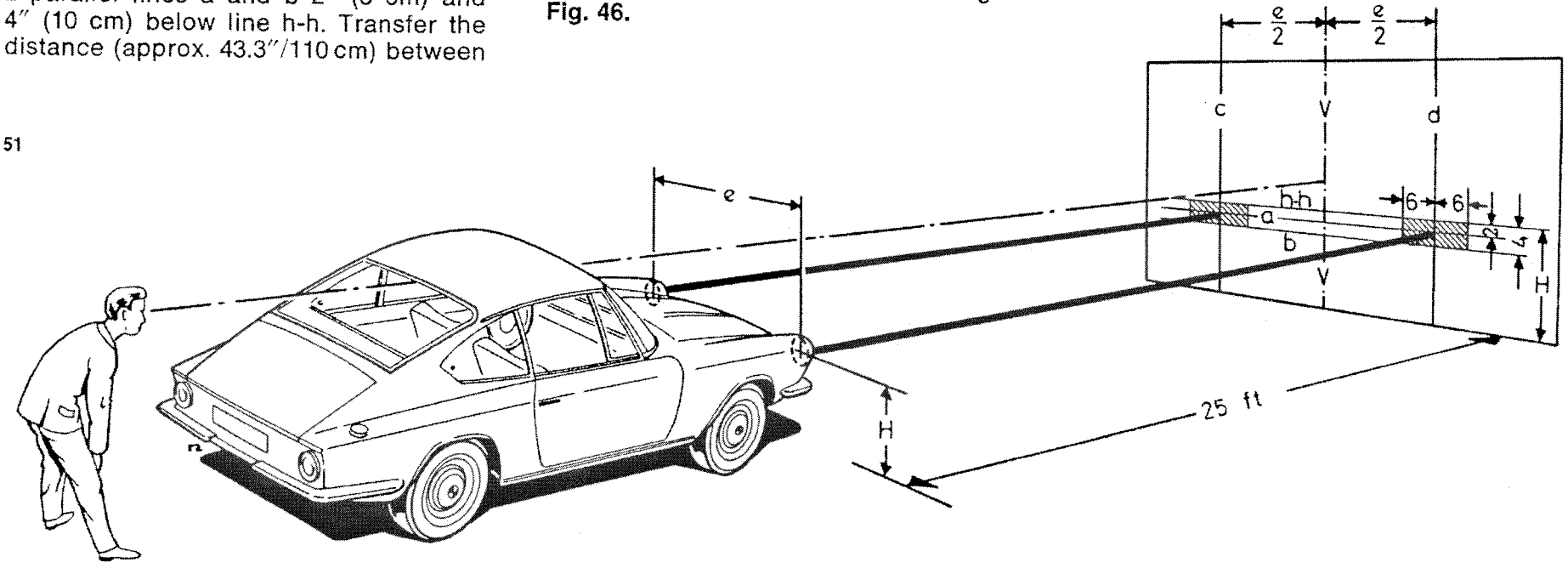


Care and maintenance

A brand-new car always looks smart. How yours will look after years of willing service is quite another matter, and depends on the trouble you take to look after it.

Please do not **wash the car** in direct sunlight, nor when the bonnet top is still warm, as patches may develop in the paintwork.

Road dirt and dust contain many chemical elements which can damage the paintwork if allowed to remain in place for too long. For this reason any car – particularly a new one – should be washed as often as practicable.

Traces of tar, dead insects or marks caused by thrown-up stones should be removed without delay or touched up where necessary. This will prevent discoloration of the paintwork or the formation of rust at the affected parts.

Clean out the inside of the car with a brush or vacuum cleaner.

Dirt should be removed from the paintwork with a fine spray of water, and hosed away thoroughly.

After hosing down, wash the car with plenty of warm water using a sponge or washleather glove, starting with the roof. Rinse the sponge at frequent intervals. Wash the lower part of the body and the wheels last of all, and if possible keep a separate sponge for these areas.

After washing, hose the car down most thoroughly a second time and dry off with a clean leather so that no marks are left by droplets of water.

If the car cannot be properly cleaned by washing with water alone, it should be treated with a reputable make of car cleaner or shampoo, mixed with water in the proportions specified by the manufacturer of the product. The car should then be washed or hosed down with plenty of clean water. Too frequent use of shampoos and cleaners removes oil from the paintwork, which then tends to become brittle, necessitating the application of a good-quality preservative.

It is easy to tell when your car's paintwork needs the application of a polish or preservative: the water no longer forms round globules on the paint surface.

Whatever branded product you apply to your car's bodywork should always be used in strict accordance with its manufacturer's instructions.

Minor damage to the paintwork can be touched up with a BMW spray aerosol. The colour of the paintwork is indicated by an adhesive label attached under the bonnet near the manufacturer's plate.

Chromium plated and polished parts should be cleaned with water, or with soapy water if very dirty. A branded chrome protector can then be applied.

Patches of tar should never be removed with a hard object such as a knife. Instead, use a proprietary tar remover.

External rubber parts should be washed down with water or treated with glycerine only.

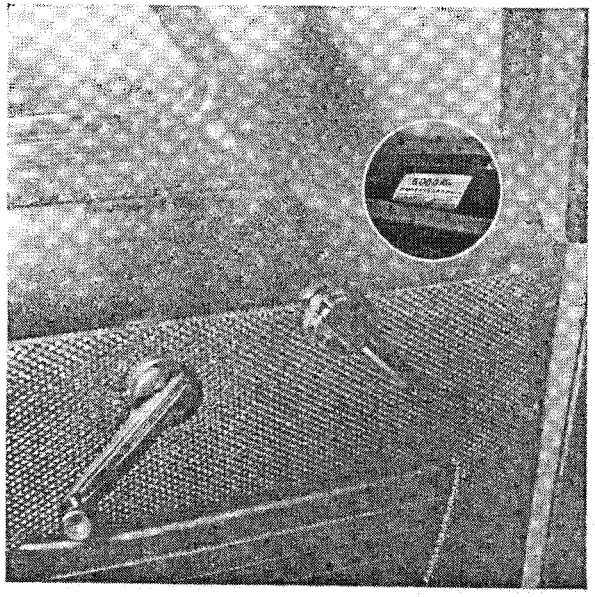
Clean the **wiper blades** with soapy water. The blades will normally require replacement at least once a year.

White-wall tyres are delivered with a protective coating, and after fitting the coating should be removed with soapy water and a brush. If the white-wall tyres become exceptionally dirty, a proprietary brand of special cleaner will normally restore them without difficulty.

Imitation leather should be wiped down with a damp cloth and dried at once.

When you take delivery of your car you receive a **Service Booklet,** in which your name and details of the car will have been entered. After carrying out the **free pre-delivery inspection,** your BMW dealer will remove the appropriate section of the booklet and will make an entry to confirm that the work has been done. The same procedure will be followed during for the initial inspection at 1000 miles (1500 km).

52



In addition your BMW dealer will attach the first adhesive label to the driver's door pillar **(Fig. 52),** to remind you when the next service is due.

This and all subsequent service and inspection work should be confirmed in the appropriate spaces in the Service Booklet.

Please ensure that the confirmation has been entered; if you should ever need to claim under the guarantee this information may be required, and in any case you will be glad later on to have this clear proof that your car has been well looked after.

We strongly recommend you to have the prescribed service and inspection work carried out **at regular intervals** by your BMW dealer. This is the only way to ensure that all the work has been done in accordance with the latest works recommendations. A list giving the names and addresses of the widespread BMW dealer network is supplied to you on delivery, so that your car can receive proper attention even if you have travelled a long way from your home garage.

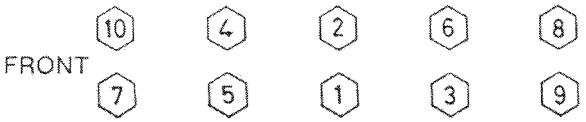
To ensure the reliability and long operating life of your car we advise a **minimum of twice-yearly inspections,** even if the mileage covered since the last service has not yet reached the correct figure.

1st Inspection

after 1000 miles (1500 km)

1. Change oil in engine and oil filter housing, and renew filter element. The engine must be warm.
2. Change oil in gearbox while warm.
3. Change oil in final drive while warm.
4. Half-shafts: examine sliding joint bellows for leaks.
5. Check steering box oiltightness, and top up if required.
6. Check radiator water level, top up if required, and in winter check anti-freeze.
7. Examine all brake lines and connections for leaks, damage or distortion. Check level of brake fluid in reservoirs (3/4 full) and top up if required.
8. Clean out fine mesh sieve and bowl on fuel pump. Tighten fuel pump bolts to correct torque.
9. Tighten all screws on carburettor to correct torque.
10. Check V-belt tension (5–10 mm [0.2–0.4"] movement in response to finger pressure) and adjust if required.
11. Inject 2 drops of engine oil into the ignition distributor oil nipple.
12. Take up any slack on all engine bolts and nuts (for tightening torque values, see Specification):

This includes engine mountings (right and left), inlet and exhaust manifolds, exhaust pipe flange, oil sump and cylinder head bolts (to be tightened with engine cold or at max. 35° C [95° F] water temperature). For tightening sequence, see sketch.



13. Check valve clearances (inlet and exhaust 0.15–0.20 mm/0.006–0.008″), contact breaker points gap (0.4 mm/0.016″), dwell angle (60°) and ignition timing (TDC, using 12 V test lamp). These tests to be carried out with engine switched off and cold or at max. water temperature 35° C (95° F). Adjust as required.
14. Take up any slack on nuts and bolts for: front axle, steering, gearbox, propellor shaft, rear axle, brakes. For tightening torque values, see Specification.
15. Take up any slack on nuts and bolt for: bodywork and exhaust system.
16. Check steering in straight-ahead position for absence of play, and adjust if required.
17. Test foot brake and adjust (rear only) as required. Bleed the brake system. Check handbrake and adjust as required.
18. Check clutch operating clearance (3.0 mm/0.12″ at thrust rod) and adjust as required.
19. Test front wheel bearings for play and adjust if required.
20. Check tyre pressures and correct if required.
21. If necessary, rebalance all four road wheels (this work is invoiced separately).
22. Check headlamp beam settings and adjust if required.
23. Carry out final check on all items affecting road safety (brakes, steering, clutch, instrument readings, controls, rear view mirror, lights, horn). Check carburettor idling settings and adjust if required (use Synchrotester).

Service

every 8000 miles (12 000 km), starting at 4000 miles (6000 km) speedometer reading

1. Change oil in engine and oil filter housing, and renew filter element. The engine must be warm.
2. Check radiator water level and top up if required. In winter check anti-freeze.
3. Check battery acid level, and top up with distilled water if required. Clean the battery and coat the terminal posts with suitable grease.
4. Intake air silencer: knock out dust carefully from air filter elements and blow through from inside to clean. If severely clogged, fit new filter elements.
5. Examine all brake lines and connections for leaks, damage or distortion. Check level of brake fluid in reservoirs (3/4 full) and top up if required. Measure overall thickness of brake pads with linings (min. 7 mm/0.28″) and renew if worn.
6. Carry out final check on all items affecting road safety and reliability (brakes, steering, clutch, instrument readings, controls, rear view mirror, lights, headlamp beam settings, horn). Check carburettor idling settings and adjust if required (use Synchrotester).

Inspection

every 8000 miles (12 000 km), starting at 8000 miles (12 000 km) speedometer reading

1. Change oil in engine and oil filter housing, and renew oil filter element. The engine must be warm.
2. Check gearbox oil level and top up if required. (Change gearbox oil every 16 000 miles [24 000 km] while warm.)
3. Check final drive oil level and top up if required.
4. Half-shafts: examine sliding joint bellows for leaks.
5. Check steering box oil level and top up if required.
6. Check radiator water level and top up if required. In winter check anti-freeze.

7. Check battery acid level and top up with distilled water if required. Clean the battery and coat the poles with special grease.
8. Check level of brake fluid in reservoirs (3/4 full) and top up if required.
9. Clean out fine mesh sieve and bowl on fuel pump. Tighten fuel pump bolts to correct torque.
10. Check V-belt tension (5—10 mm [0.2—0.4"] movement in response to finger pressure) and adjust if required.
11. Inject 2 drops of engine oil into the ignition distributor oil nipple.
12. Oil carburettor linkage and pivots.
13. Fit new spark plugs.
14. Take off distributor rotor arm and let two drops of engine oil soak into the distributor shaft lubricating pad. Warning: no oil must overflow or reach the contact breaker points. Apply a little Bosch Ft 1 v 22 grease to the baseplate ball guide track, and a small amount of Bosch Ft 1 v 4 grease to the heel of the contact breaker hammer.
15. Take up any slack all engine bolts and nuts (for tightening torque values, see Specification): this includes cylinder head bolt (to be tightened with engine cold or at max. 35° C (95° F) water temperature, tightening sequence as shown in sketch on preceding page), engine mountings right and left, inlet and exhaust manifolds, exhaust pipe flange, carburettor and fuel pump retaining bolts and oil sump.
16. Check valve clearances (inlet and exhaust 0.15-0.20 mm/0.006-0.008"), contact breaker points gap (0.4 mm/0.016"), dwell angle (60°) and ignition timing (TDC, using 12 V test lamp). These tests to be carried out with engine switched off and cold or at max. water temperature 35° C (95° F). Adjust as required.
17. Intake air silencer: renew both filter elements.
18. Check steering in straight-ahead position for absence of play, and adjust if required.
19. Propellor and half-shafts: check condition of universal joints and rubber couplings.
20. Take up slack on nuts and bolts for: front axle, steering, gearbox, propellor shaft, rear axle, brakes (for tightening torque values), see Specification).
21. Disc brakes: measure overall thickness of brake pads with linings (min. 7 mm/0.28") and renew if worn. Examine rubbing surfaces of discs for damage.
22. Front wheel bearings: check play and adjust if required.
23. Change round running wheels in the prescribed pattern. Check tyre pressures and correct if required. Check condition of tyres: if signs of uneven tread wear are present, measure toe-in. A full test of wheel alignment, with adjustment if required, may be specified (to be invoiced separately).
24. Rebalance all four road wheels (to be invoiced separately).
25. Check clutch operating clearance (3.0 mm/0.12" at the thrust rod) and adjust if required.
26. Examine all brake lines and connections for leaks, damage or distortion. Clean brake drums and linings, and examine for wear. Check handbrake cable for freedom of movement. Adjust brakes.
27. Take up any slack on nuts and bolts for: bodywork and exhaust system.
28. Oil door, bonnet and luggage compartment hinges. Grease bonnet and luggage compartment locks, door catches and strikers. Check that all catches are operating correctly.
29. Apply a light coating of glycerine to the outer faces of the door seals, swivelling window rubbers and other rubber mating surfaces outside the car.
30. Check headlamps beam settings and adjust if required.
31. Carry out final check on all items affecting road safety (brakes, steering, clutch, instrument readings, controls, rear view mirror, lights, horn). Check carburettor idling settings and adjust if required (use Synchrotester).

Description of service procedure

The **engine oil** should be changed only when warm, after the engine has been running. Oil changes are necessary: during the summer months every 4000 miles (6000 km), during the winter months every 2000 miles (3000 km). If the car is used only for local journeys, change the oil once a month.
Unscrew the oil drain plug (19 mm spanner) on the right-hand lower part of the sump, allow the old oil to run out completely, then retighten the plug firmly. **Fig. 53**

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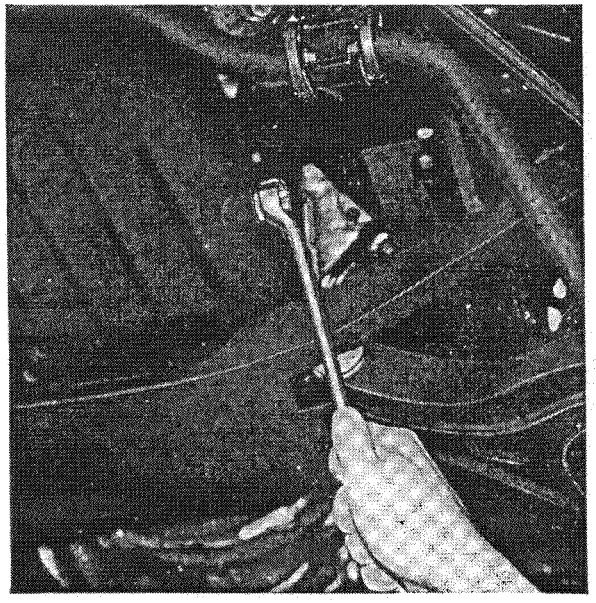

Total oil capacity: 4 litres (7 Imp. pints) + 0.25 litre (0.44 Imp. pints) if the oil filter is changed.
Fill to the upper mark on the dipstick, never higher.
Oil grade: for outside temperatures above 0° C (32° F), any branded HD oil for 4-stroke petrol engines, grade SAE 30; for outside temperatures below 0° C (32° F), grade SAE 10 W 30.
Renew the **oil filter element** every 4000 miles (6000 km) when the engine oil is changed. Unscrew the retaining bolt (17 mm spanner) and remove it together with the sealing ring and filter casing, leaving the upper part of the filter in place.

Full-flow oil filter (Fig. 54)

1. Oil input from pump
2. Filtered oil to lubrication points
3. Pressure relief valve
4. Upper part of filter
5. Sealing ring
6. Rubber sealing ring
7. Filter casing
8. Filter element
9. Outlet pipe
10. Retaining bolt
11. Rubber seal
12. Spring
13. Sealing ring

Clean the filter casing, renew the element, fit a new sealing ring if damaged, and re-assemble. **Fig. 54**

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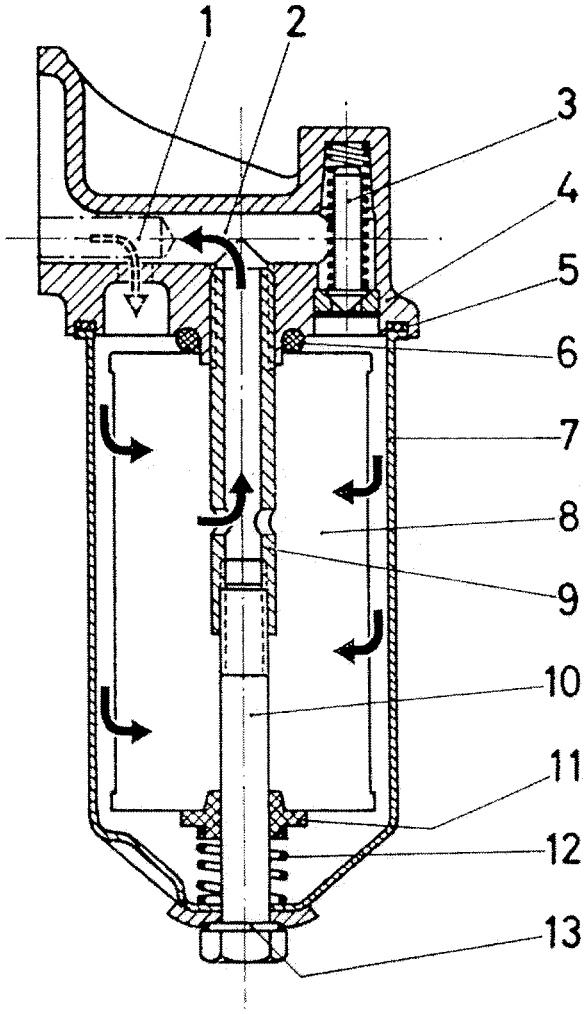

Change the gearbox oil only while warm, every 16 000 miles (24 000 km). First unscrew oil drain plug (1), then the oil filler plug (2) on the left-hand side of the gearbox (both 17 mm spanner). This will help the oil to drain more rapidly.

Next replace the drain plug and tighten firmly. Both drain and filler plugs have conical threads, and should not therefore be replaced by plugs having metric threads. **Fig. 55**

Total oil capacity: 1 litre (1.75 Imp.pints).

Correct oil level: to underside of filter orifice.

Oil grade: branded SAE 80 gearbox oil (not hypoid gear oil).

Change final drive oil after the first 1000 miles (1500 km) while warm.
Unscrew oil drain plug, then the oil filler plug on the left- hand of the final drive casing (both 19 mm spanner). This will help the oil to drain more quickly. Clean the drain plug and replace, tightening firmly. **Fig. 56**

Total oil capacity: 0.9 litre (1.6 Imp.pints).

Oil level: to lower edge of filler orifice. Check oil level every 8000 miles (12 000 km).

Oil grade:
branded SAE 90 hypoid gear oil.

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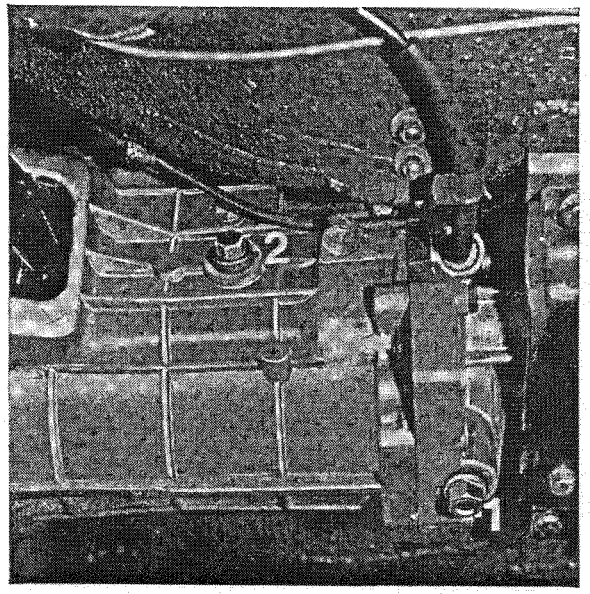

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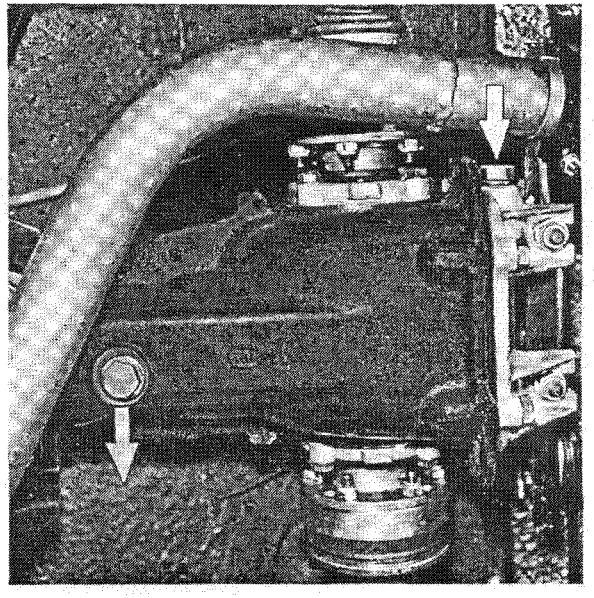

The **steering box** is permanently oil-filled, and thus no drain plug is fitted. The oil level should be checked every 8000 miles (12 000 km). **Fig. 57**

Total oil capacity: 300 cc (10.5 fl. oz.).

Oil level: to lower edge of filler orifice.

Oil grade: branded hypoid gear oil, SAE 90.

The **idler arm bearing** on the front axle beam opposite the steering box needs no maintenance.

The **wheel bearings** should be serviced only by a BMW dealer; every 40 000 miles (60 000 km) the grease content should be checked and grease added if required. **Fig. 58**

Grease: branded multi-purpose grease, drip point 180° C (355° F).

The transparent **hydraulic brake and clutch fluid reservoirs** are located on the left-hand side of the engine compartment. They enable a visible check on fluid level to be carried out. **1** = brake fluid reservoir. **2** = clutch fluid reservoir. **Fig. 59**

We recommend that inspection be made at least every 4000 miles (6000 km). Be careful not to allow brake fluid to contact the paintwork, which it will damage. If a loss of brake fluid is indicated, put the car in the hands of your BMW dealer at once.

Fluid level: 3/4 full.

Fluid type: ATE brake fluid, blue.

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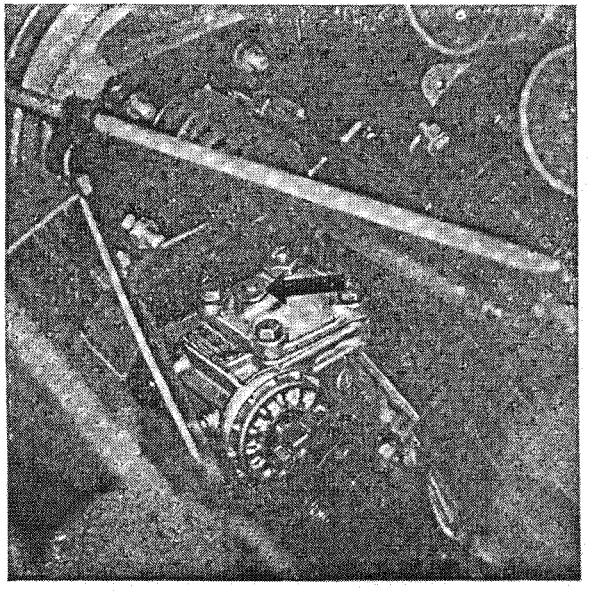

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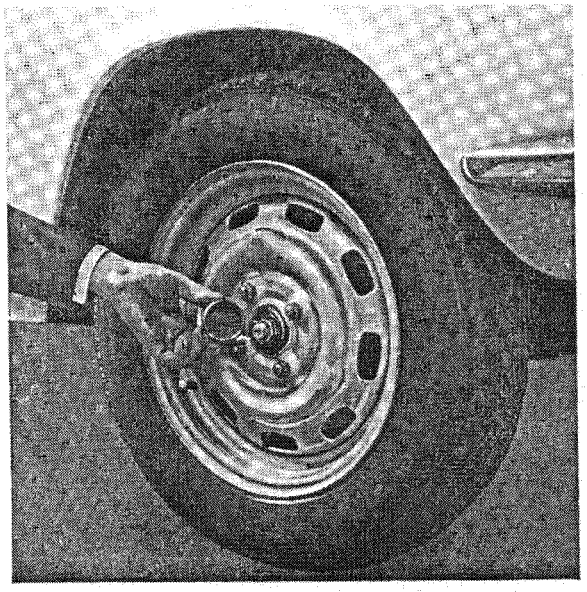

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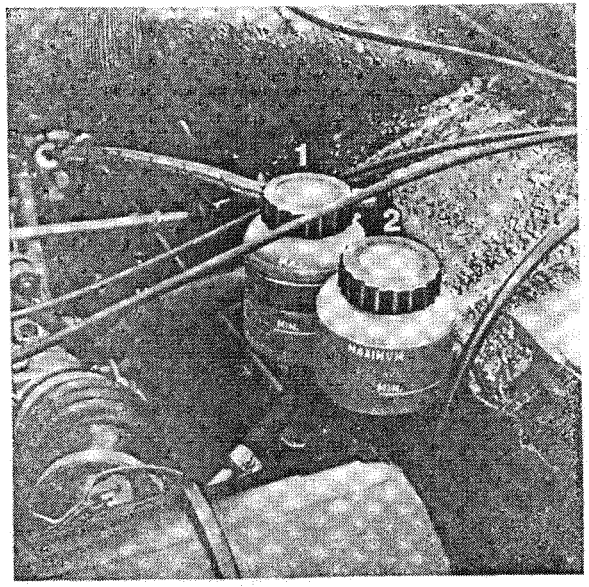

Lubricating ignition distributor:
Every 8000 miles (12 000 km):

Apply a narrow layer of Bosch Ft 1 v 4 grease to the **fibre heel** of the contact breaker rocker arm. **Fig. 60**

Take out the distributor rotor and let a couple of drops of engine oil soak into the **felt pad** in the distributor shaft. **Fig. 61 left**

Apply 2 drops of engine oil to the outer nipple of the distributor shaft and re-tighten nipple. **Fig. 61 right**

Warning: no oil must overflow or be allowed to reach the contact breaker points. Excess oil in the distributor can cause misfiring, and oil vapour present causes the contact breaker points to burn away rapidly.

Every 8000 miles (12 000 km) check **clutch operating clearance** at the thrust rod (left lower side of the clutch housing). To reset the prescribed clearance of 3.0 mm (0.12″), loosen the locknut (13 mm) and adjust the setting nut (1) (19 mm). When clearance is correct, re-tighten locknut. **Fig. 62**

Loss of fluid from the clutch operating system will allow air to enter and prevent complete clutch withdrawal with the risk of gearbox damage. Top up fluid and bleed system by means of bleed screw (2).

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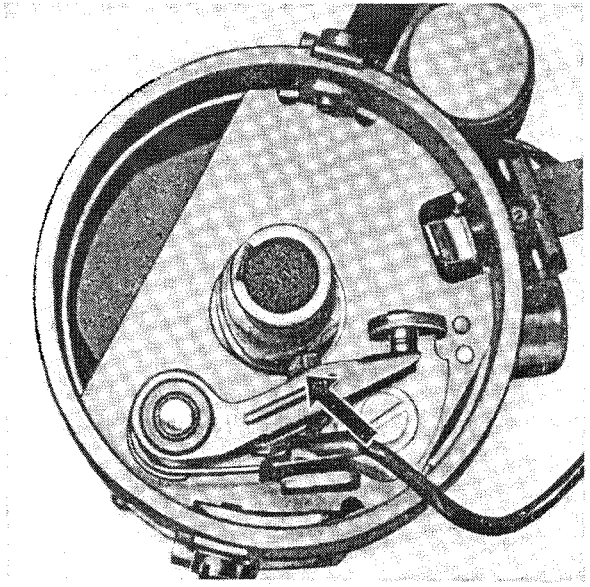

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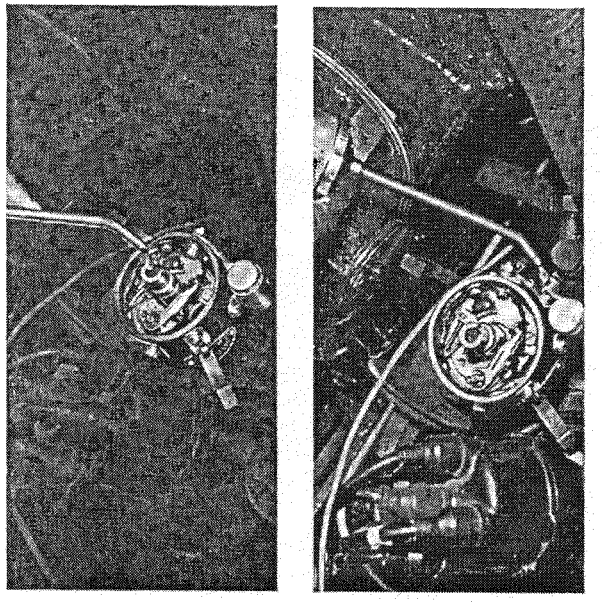

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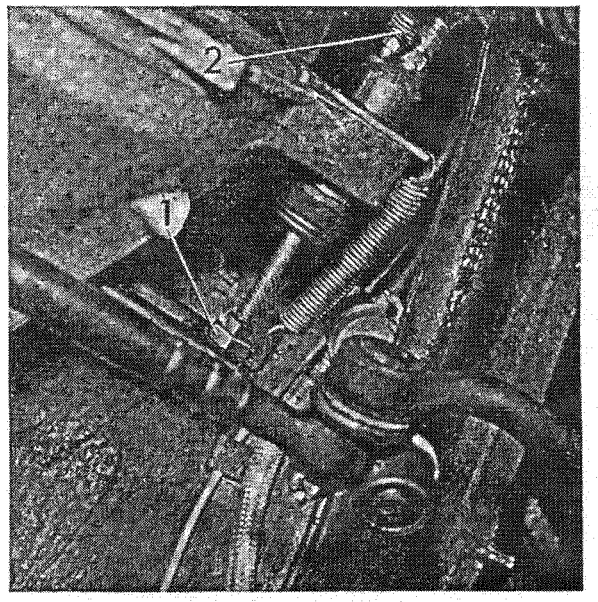

With a view to achieving even tyre wear, the **wheels** should be changed round every 8000 miles (12000 km). On each side of the car the front and rear wheels should be exchanged. Never change the wheels crosswise from one side of the car to the other. The spare wheel can be included in the wheel changing pattern if desired. **Fig. 63**

Have the wheels statically and dynamically **balanced** every 8000 miles (12000 km), if possible while in place on the car and as soon as they have been changed round. If signs of uneven wear are detected in the course of a regular tyre inspection for wear, damage, foreign bodies, etc. we recommend that an expert check on wheel alignment at normal loading be carried out as soon as possible.

In addition to regular checks on water level in the radiator, we also suggest that about twice a year the complete **cooling system,** with the heater switched on, be thoroughly flushed through with mains water. While doing this, check the filler cap of the compensator reservoir for good sealing and correct functioning of the pressure and vacuum relief valves.

The best times for this work are:

1. before the cold season sets in, when the cooling system is being filled with anti-freeze;
2. at the end of the cold season, when the anti-freeze is drained from the cooling system. On this occasion flushing out should be followed by refilling with pure water to which a branded anti-corrosion product has been added in the proportions recommended by the manufacturer.

The complete cooling system, including heater, has a **capacity** of 9.5 litres (15.8 Imp. pints). **To drain** the system of water:

1. Open drain cock at the bottom of the radiator (14 mm spanner). **Fig. 64**
2. Remove plug at the rear right-hand side of the engine block (19 mm spanner). **Fig. 65**

While draining the cooling system the heater lever (H) on the instrument panel must be pulled up (see page 16, Fig. 25).

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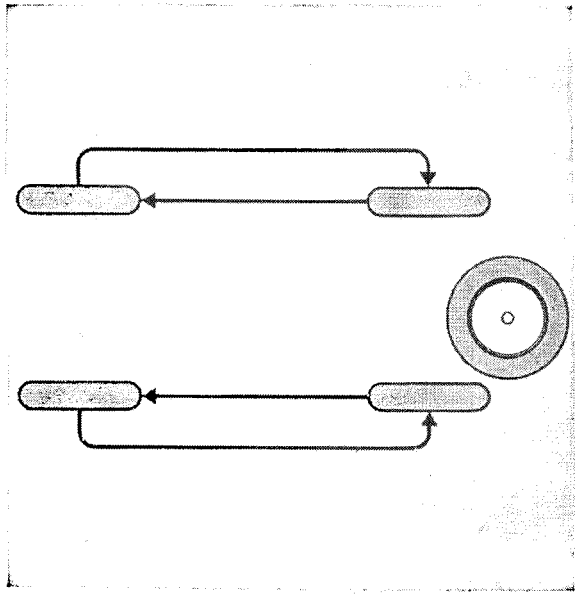

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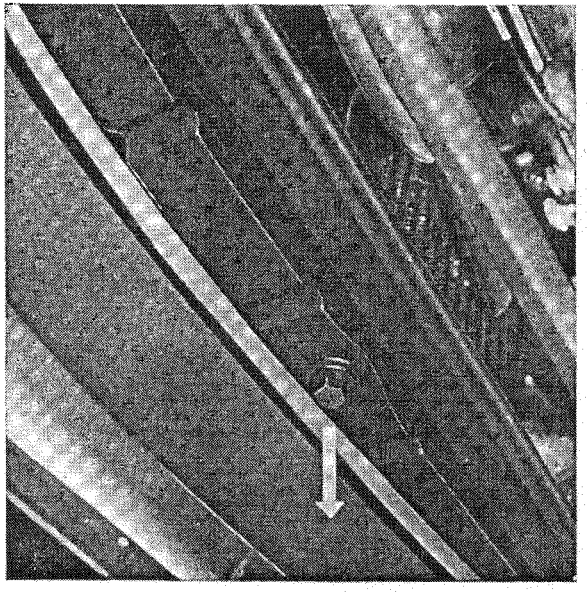

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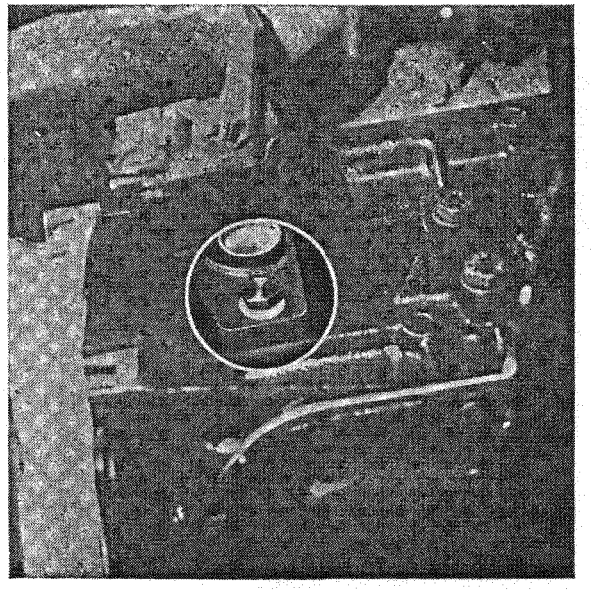

Refilling an empty cooling system:

Set the heater lever to warm and fill the cooling system by topping-up the compensator reservoir. Replace the filler cap, turning as far as the second stop. Drive the car, or allow the engine to run, until the normal operating temperature is reached. Unscrew filler cap as far as the first stop, thereby allowing air to escape from the cooling system, then remove completely. Top up radiator to a point no higher than 2 cm ($^3/_4$″) below the base of the filler orifice. Replace cap and tighten. **Fig. 66**

Every 4000 miles (6000 km) or at least once a month, the **battery acid level** should be checked. To do this, unscrew and remove the 6 plugs along the centre of the battery. The acid level should be approx. 5 mm (0.2″) above the upper surface of the plates in each cell, in other words level with the mark which can be seen through the plug orifice.

If the acid level is too low, top up to the correct marking with distilled water. Do not use acid for this purpose. **Fig. 67**

The top part of the battery should always be kept clean and dry. The **terminal clamps and posts** can be protected against corrosion by an application of Bosch Ft 1 v 40 anti-acid grease. **Fig. 68**

Warning: make sure that no acid or lead oxide from the terminals reached your clothing. Do not bring a naked light near the battery as there is a risk of explosion.

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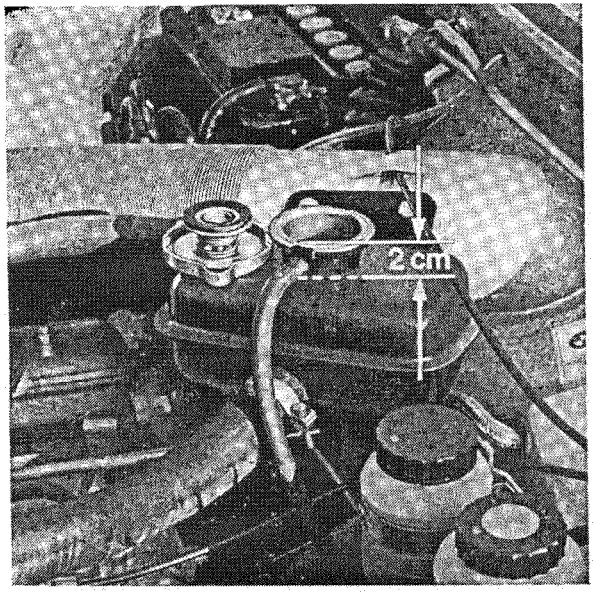

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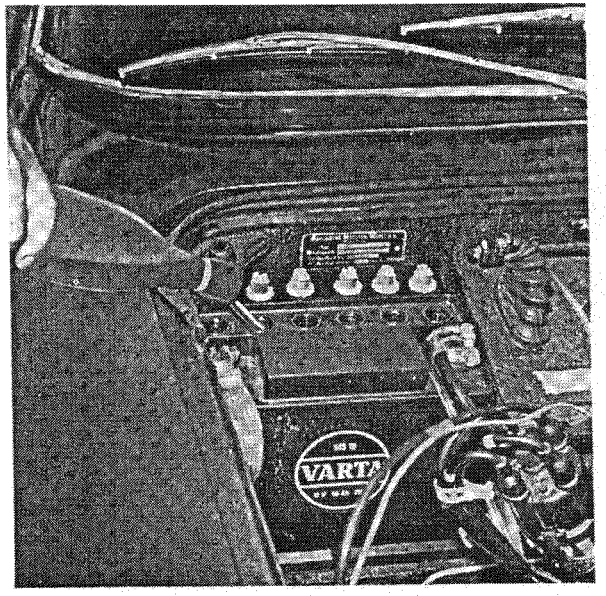

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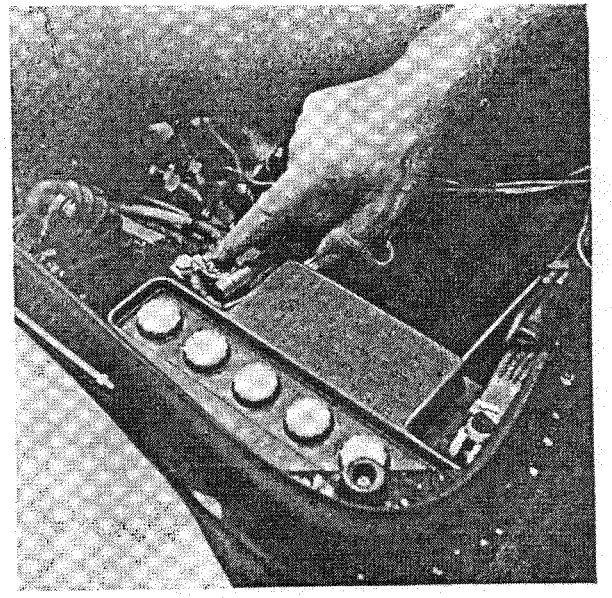


Every 4000 miles (6000 km) the **air intake silencer filter elements** should be removed by undoing the over-centre catches, and examined to see how much dirt they contain. Dirt adhering to the elements can be carefully knocked off and blown out from the inside; if the elements are severely contaminated, however, and in any case after every 8000 miles (12 000 km), they should be renewed. **Fig. 69**

Continuing use of choked air filter elements will increase fuel consumption and lower the car's performance.

Clean the fine mesh filter and bowl in the fuel pump by taking off the fuel pump cover plate (SW 8 bolt and sealing ring). **Fig. 70**

Remove the fine mesh sieve, wash in clean petrol and remove dirt from bowl. Do not use the same sealing ring when refitting unless it is in good condition. Tighten the 6 fillister-head screws on the fuel pump evenly with a screwdriver.

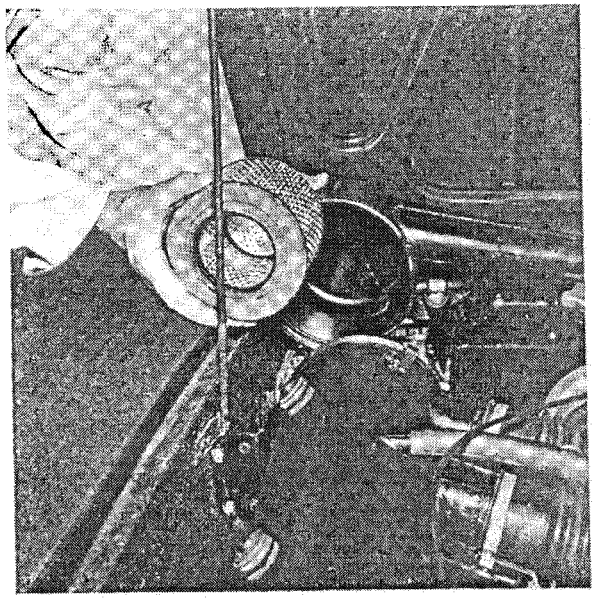
Checking **spark plug electrode gaps:**

check the gaps of new plugs before fitting. Use a feeler gauge and set the correct gap of 0.6 + 0.1 mm (0.024 + 0.004") by bending the earth electrode. **Fig. 71**

Clean sparking plugs with a brush (not a metal brush) dipped in petrol, and apply a little graphite grease to the threads before replacing in the cylinder head.

Renew the spark plugs every 8000 miles (12 000 km).
Details of the correct types of spark plug are given on the inside back cover.

69



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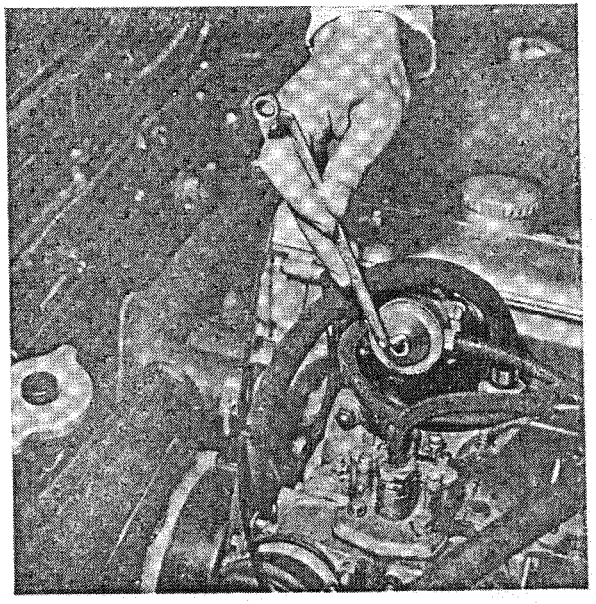

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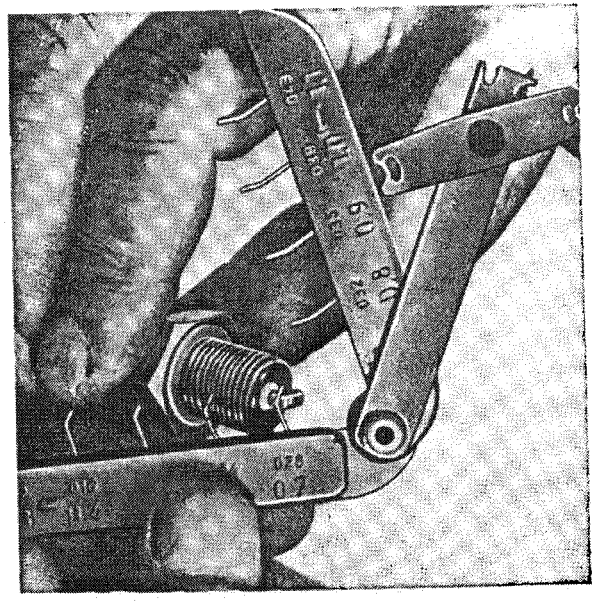


Check contact breaker gap
every 8000 miles (12 000 km).

If no instrument for the measurement of dwell angle is available, remove distributor cap, take out spark plugs and turn the engine slowly, using a socket wrench or special tool on the V-belt pulley securing nut (30 mm). Never turn the engine over by means of the fan blades. Continue to turn the engine clockwise, looking from front to back of the vehicle, until the contact breaker arm is fully raised (fibre heel is resting on the highest point of the distributor shaft cam). If the contact breaker points are severely eroded they should be renewed.

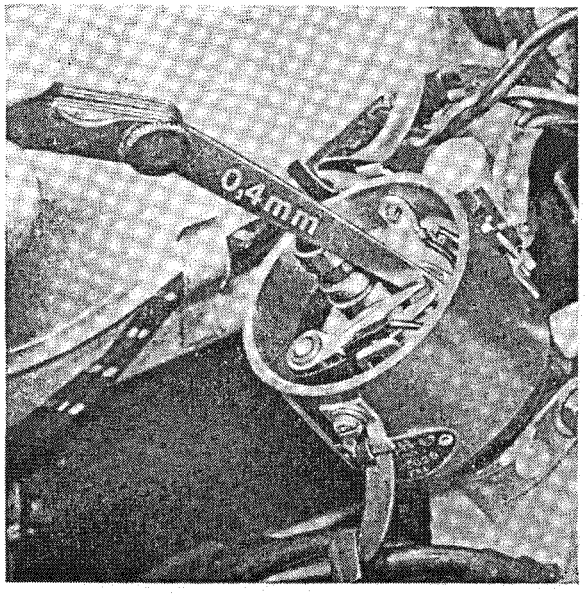
Check that the gap is 4.0 mm (0.16″) by using a feeler gauge. **Fig. 72**

Resetting contact breaker gap:

Slightly loosen locking screw "a", insert a screwdriver blade between the 2 small studs "b", so that it engages with slot "c", on the contact breaker mounting, then turn the blade gently until a gap of 0.4 mm (0.016″) can be measured between the points. Re-tighten locking screw "a" and check that the setting has not altered. **Fig. 73**

Checking the ignition timing: this shuold always be done after the contact breaker gap has been reset, and in any case every 8000 miles (12 000 km). The work must be done with the engine **stopped and cold,** or at a max. water temperature of 35° C (95° F). The ignition point (TDC for No. 1 cylinder) will be found on the crankshaft V-belt pulley. The TDC mark is the notch which appears on **both** flanges of the V-belt pulley. **Fig. 74**

72



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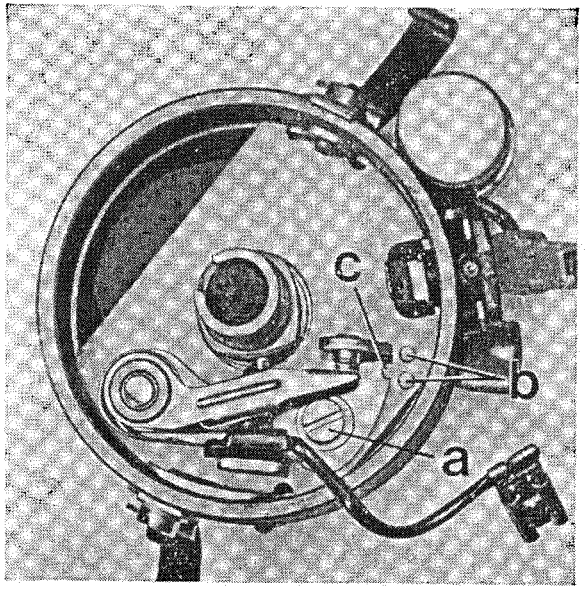

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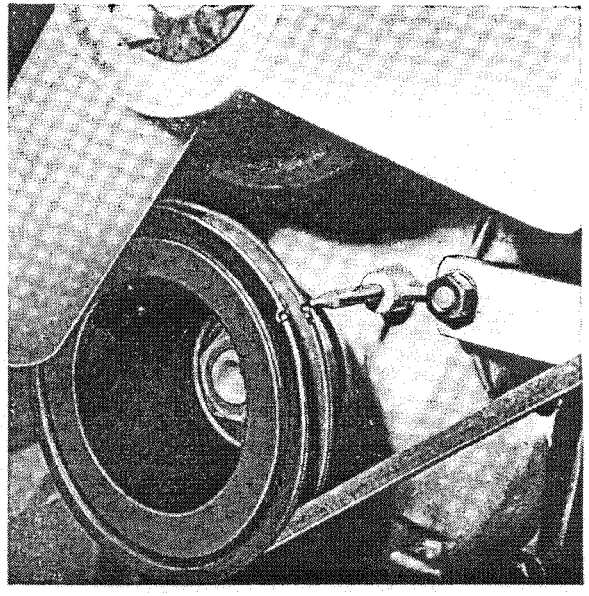


Attach a 12 V test lamp between terminal 1 of the coil and earth. Detach high-tension lead from the coil, remove spark plugs and switch on ignition. Turn the engine over slowly by means of a spanner or special tool applied to the V-belt pulley securing nut (30 mm). Turn the engine clockwise until the test lamp lights up. The ignition point mark on the pulley should then be exactly opposite the pointer mounted on the engine. **Fig. 75**

Adjusting ignition timing:

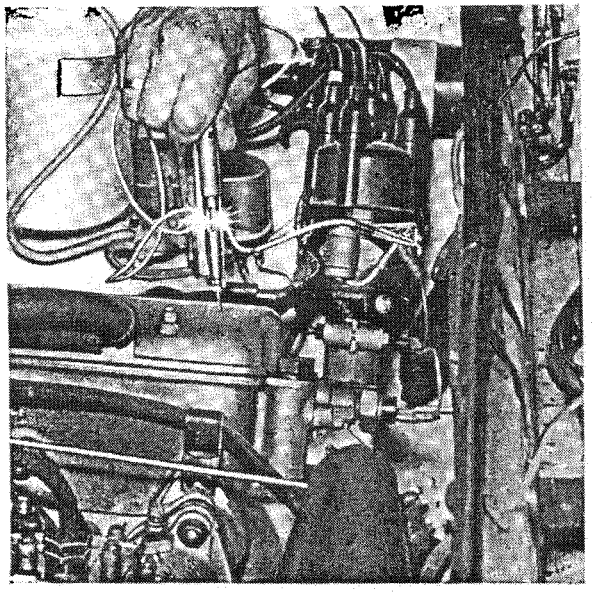
Loosen the hexagon clamping nut (10 mm) holding the tubular body of the distributor, and rotate the distributor slightly. **Fig. 76**

Turning the distributor body clockwise retards the ignition, turning it anti-clockwise advances the ignition.
After turning the distributor and retightening the clamp, check the ignition timing again. Turn back the crankshaft anticlockwise through about 45° (the test lamp will go out). This is to ensure that the next time the engine is turned forwards, all play and backlash in the various components will have been taken up.

The test lamp should light up when the ignition point marked on the V-belt pulley reaches the engine-mounted pointer.

Check valve clearances and adjust if necessary every 8000 miles (12 000 km). The **engine** should be **at rest** and **cold,** or the water temperature not higher than 35° C (95° F). Remove the fresh-air hose from the bulkhead tube, and pull off the engine breather connecting hose. **Fig. 77** left and right

75



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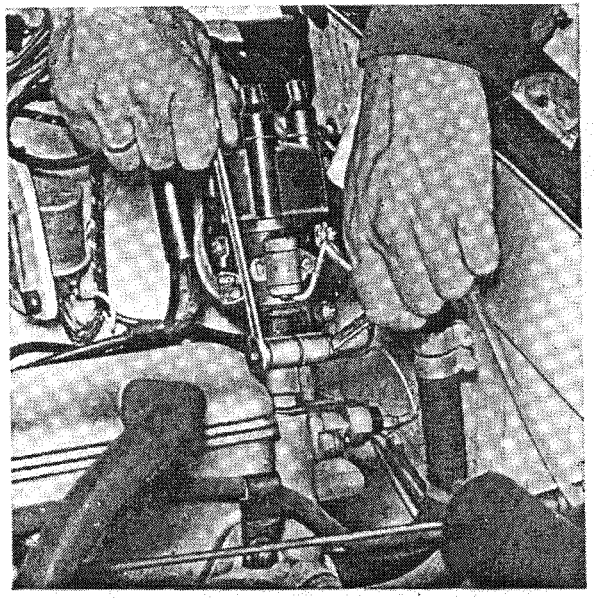

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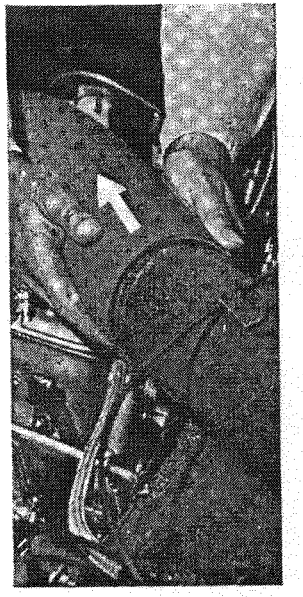
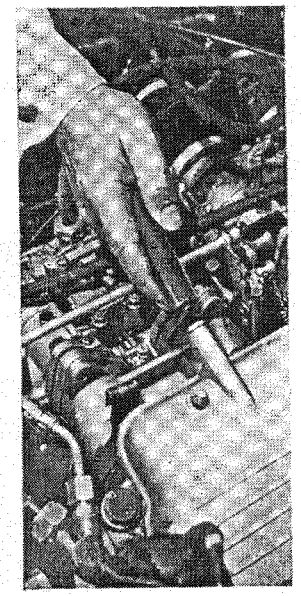




Take off the rocker cover (6 cap nuts and 1 bolt, 10 mm, with washers). Make sure the ignition lead clip is freed before removing cover.

The correct valve clearance for both inlet and exhaust valves is 0.15–0.20 mm (0.006″–0.008″). To measure, a feeler gauge should be inserted between the valve and the rocker; all measurements and adjustments should be carried out in a cylinder order corresponding **to the firing order: 1–3–4–2,** and at TDC for each cylinder on the compression stroke. **Fig. 78**

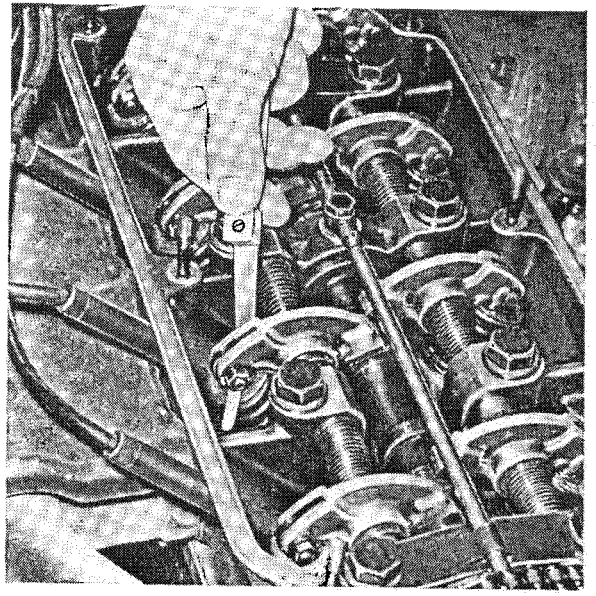
The compression stroke TDC is reached when the valves of the cylinder next but one in the firing order are on the overlap:

TDC position Cylinder No.		Valve overlap Cylinder No.
1	=	4
3	=	2
4	=	1
2	=	3

To adjust valve clearance, loosen the hexagon nut (10 mm) on the rocker. **Fig. 79**

Using a piece of 2.5 mm (0.1″) dia. steel wire bent in a slight angle, turn the eccentric adjuster until the correct clearance can be measured **Fig. 80.** Re-tighten the hexagon nut and check that the clearance has not altered.

78



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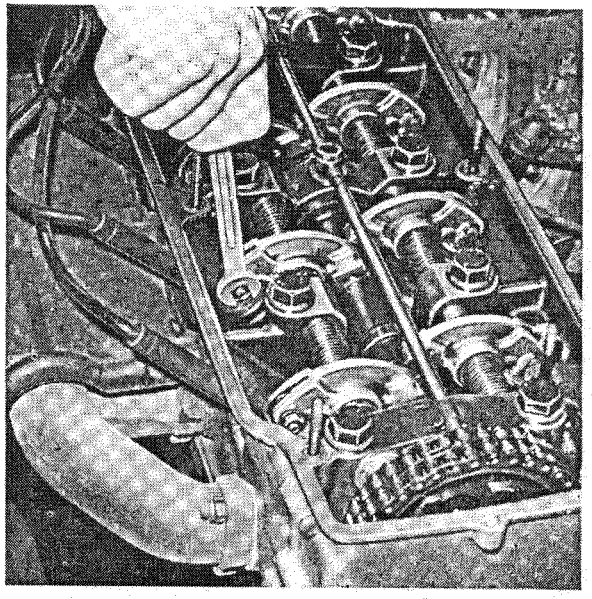

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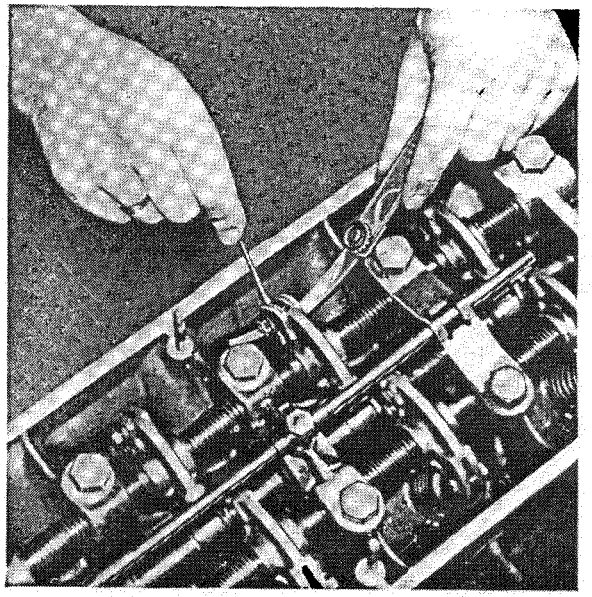


Check V-belt tension
every 8000 miles (12 000 km).

The V-belt is correctly tensioned if it can be pushed down by 5–10 mm (0.2–0.4″) with the finger in the centre of the top run, between the alternator and the fan pulley. **Fig. 81**

Resetting V-belt tension:

Loosen the upper and lower dynamo securing bolts (13 mm) and move the dynamo bodily to one side on the tensioning strap. **Fig. 82**

Renewing V-belt:

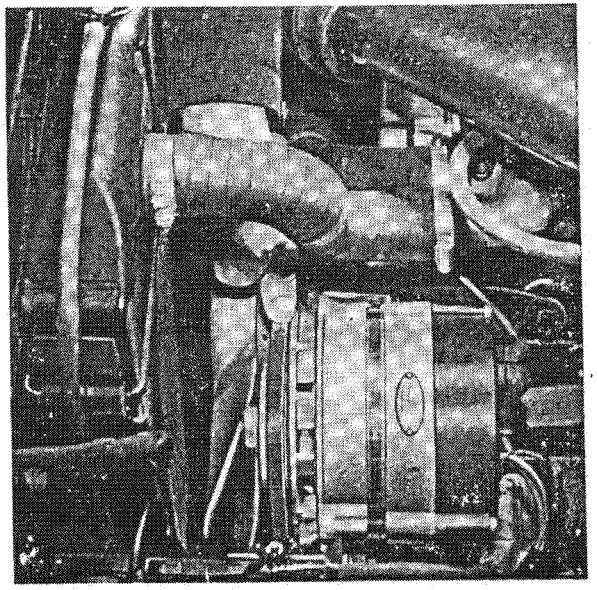
Loosen upper and lower dynamo securing bolts (13 mm) and move the dynamo as close as possible to the engine. Pass the new V-belt over the fan and the crankshaft, fan and dynamo pulleys, seat in pulley grooves and set correct tension as above.

The brakes should be adjusted every 8000 miles (12 000 km). The front disc brakes have automatic adjustment (see Page 56).

Each **rear wheel brake plate** carries 2 eccentric adjusters (17 mm spanner) providing separate adjustment of each brake shoe.

Turn the left eccentric hexagon nut anticlockwise and the right nut clockwise to adjust, at the same time turning the wheel forcibly forwards until the shoes contact the brake drum and prevent further movement. Then turn each adjuster back approx. 1/8 turn until the wheel just begins to turn without binding. **Fig. 83**

81



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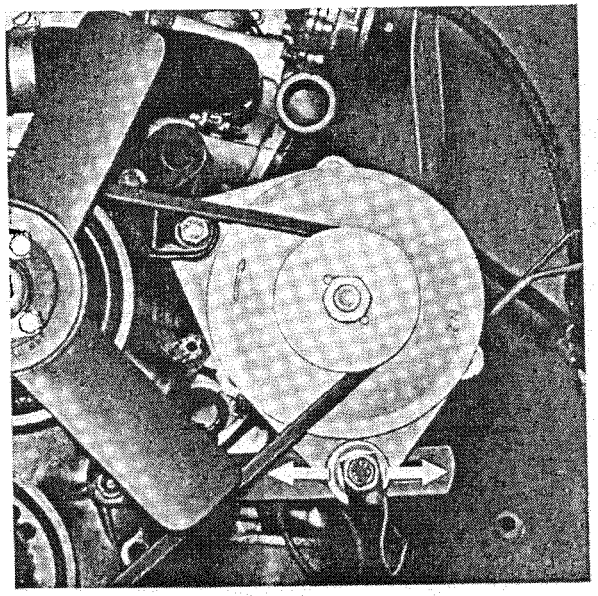

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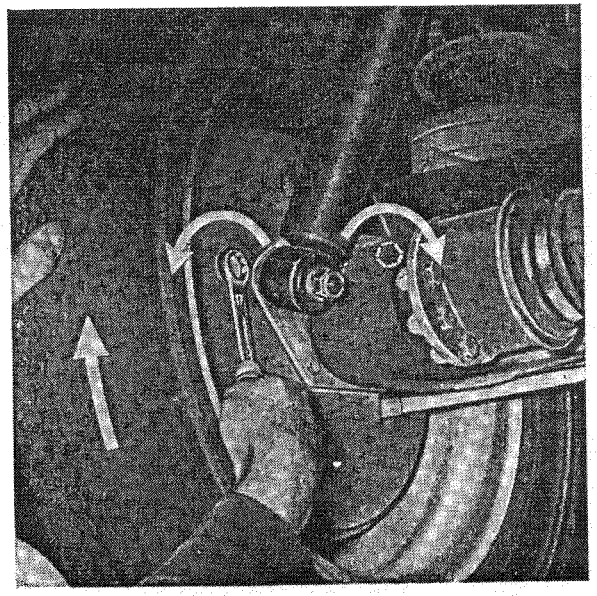


Warning: when adjusting the rear wheel brakes, make sure that the handbrake is released.

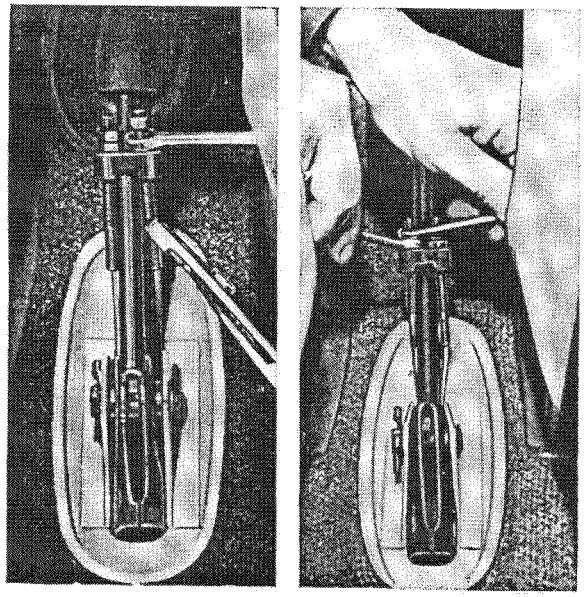
If the brake pedal is springy and has excessive travel, the brake system must be bled.

Handbrake adjustment (rear brakes should first be adjusted as described above):

Push back the rubber sleeve protecting the handbrake lever, loosen the locknut (10 mm) on each adjusting screw, pull the handbrake on for about 4 notches, tighten the adjusting nut (10 mm), while holding the adjusting screw with pliers to prevent it from turning, and check that the wheel cannot turn. **Fig. 84, left.** Retighten locknut. **Fig. 84, right**

Following this, check that the rear wheels can turn without binding when the handbrake is released. You can confirm that both cables from the handbrake lever to the rear wheels are set to give equal braking effort by pulling the handbrake lever on gently and turning both wheels round by hand.

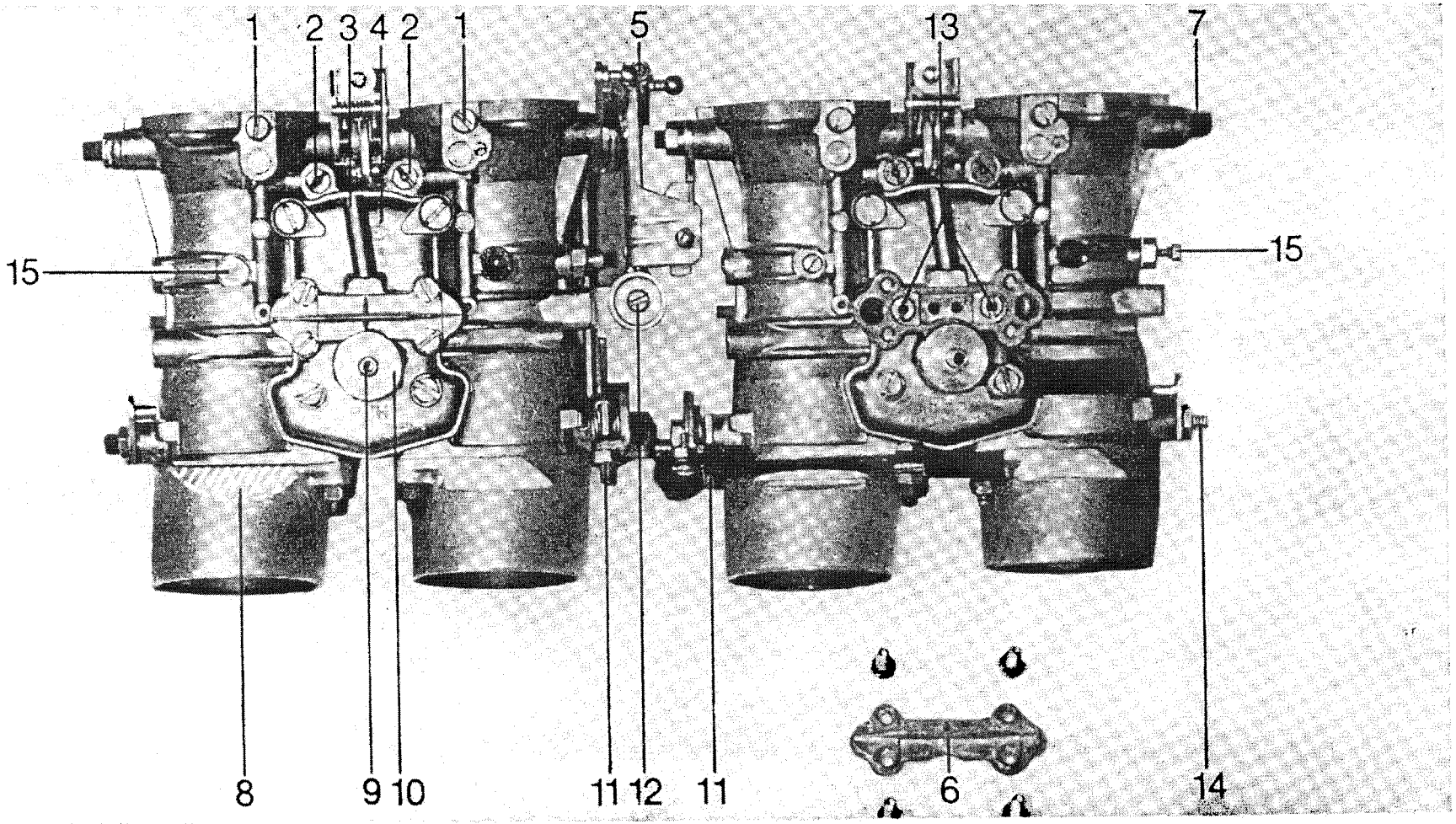
84



SOLEX 40 PHH twin-choke horizontal carburettors (Fig. 85 and 86)

1. Idling mixture adjustment screw
2. Idling jet
3. Float chamber breather
4. Carburettor cover
5. Choke valve aperture adjusting screw
6. Cover plate
7. Throttle butterfly pivot shaft
8. Choke butterfly with flap valve
9. Fuel inlet
10. Lever correction screw
11. Choke butterfly stop screw
12. Idling speed adjustment screw
13. Air corrector jets
14. Choke butterfly shaft
15. Venturi retaining screw

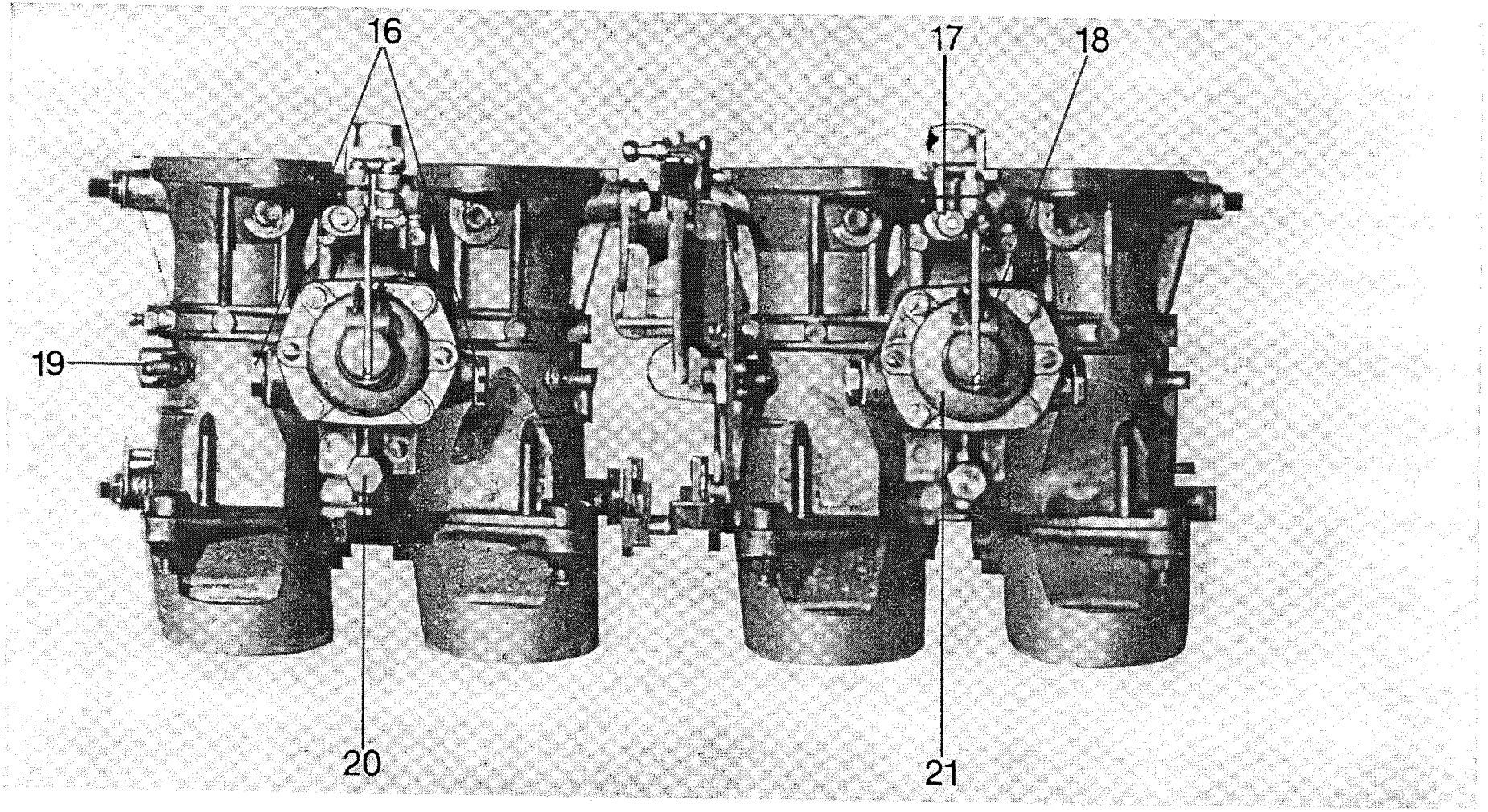
85 View from top



16. Main jet block
17. Accelerator pump setting nut
18. Accelerator pump
19. Pre-atomiser retaining screw
20. Pump pressure valve
21. Pump cover

Carburettor settings should be adjusted only by a BMW dealer or carburettor specialist. The jet sizes and basic settings with which the vehicle is delivered should not be changed. See Specification.

86 View from below



Specification

ENGINE

Type

4-cylinder, 4-stroke in-line water-cooled, with overhead camshaft (OHC), inclined valves and swirl-action hemispherical combustion chambers.

Position

Over front axle, inclined at 30° from vertical, 3-point mounting: at front close to centre of gravity on two side-mounted rubber cushions attached directly to the front axle cross-member; at rear, bolted rigidly to gearbox, with single rubber mounting on gearbox cross-member.

Cylinder block

Special grey cast iron.

Cylinder head

Light alloy, with shrunk-in valve seats and guides.

Crankshaft

Hardened forged steel with 4 balance weights and 5 four-layer main bearings.

Connecting rods and pistons

Forged steel connecting rods with replaceable four-layer big-end bearings. Pistons with raised flat top. Chromium plated spheroidal graphite cast iron upper piston ring.

Valves

Inclined in cylinder head at V angle. Armoured exhaust valve with chromium plated stem. Valve adjustment by eccentric-mounted rockers.

Valve operation

By means of light alloy rockers with case-hardened cam pads and a single overhead camshaft. Duplex roller chain drive to camshaft with automatic oil-damped chain tensioner and backlash reducer.

Capacity	
bore x stroke, for fiscal purposes	1563 cc
effective	1573 cc
Max. output	
at engine speed	105 bhp (DIN)/6000 rpm
	118 bhp (SAE)/6200 rpm
Output per litre	66.75 bhp
Max. permitted engine speed	6400 rpm
Max. continuous engine speed	6200 rpm
Max. torque	13.4 mkp (96.9 ft/lb)
at	4500 rpm
Compression ratio	9.5 : 1
Stroke/bore	71/84 mm
Mean piston speed	14.2 m/sec (2795 ft/min)
at	6000 rpm
Torque/weight ratio (unladen)	13.96 mkp/1000 kg (102.9 ft/lb/ton)
Power/weight ratio	
in running order, with full tank	9.14 kg/bhp (20.2 lb/bhp)
with all seats occupied and luggage	12.7 kg/bhp (28.0 lb/bhp)

Breathing
Crankcase and valve chamber linked by a duct connected to the inlet tract.

Valve clearance
Inlet and exhaust: 0.15–0.20 mm (0.006 to 0.008″) with engine stopped and cold (Max. water temperature 35° C [95° F]).

Valve timing

Inlet opens	4° b TDC	(± 2.5°)
Inlet closes	52° a BDC	
Exhaust opens	52° b BDC	
Exhaust closes	4° a TDC	

allowing 0.5 mm (0.02″) adjustment play measured between rocker and cam base circle.

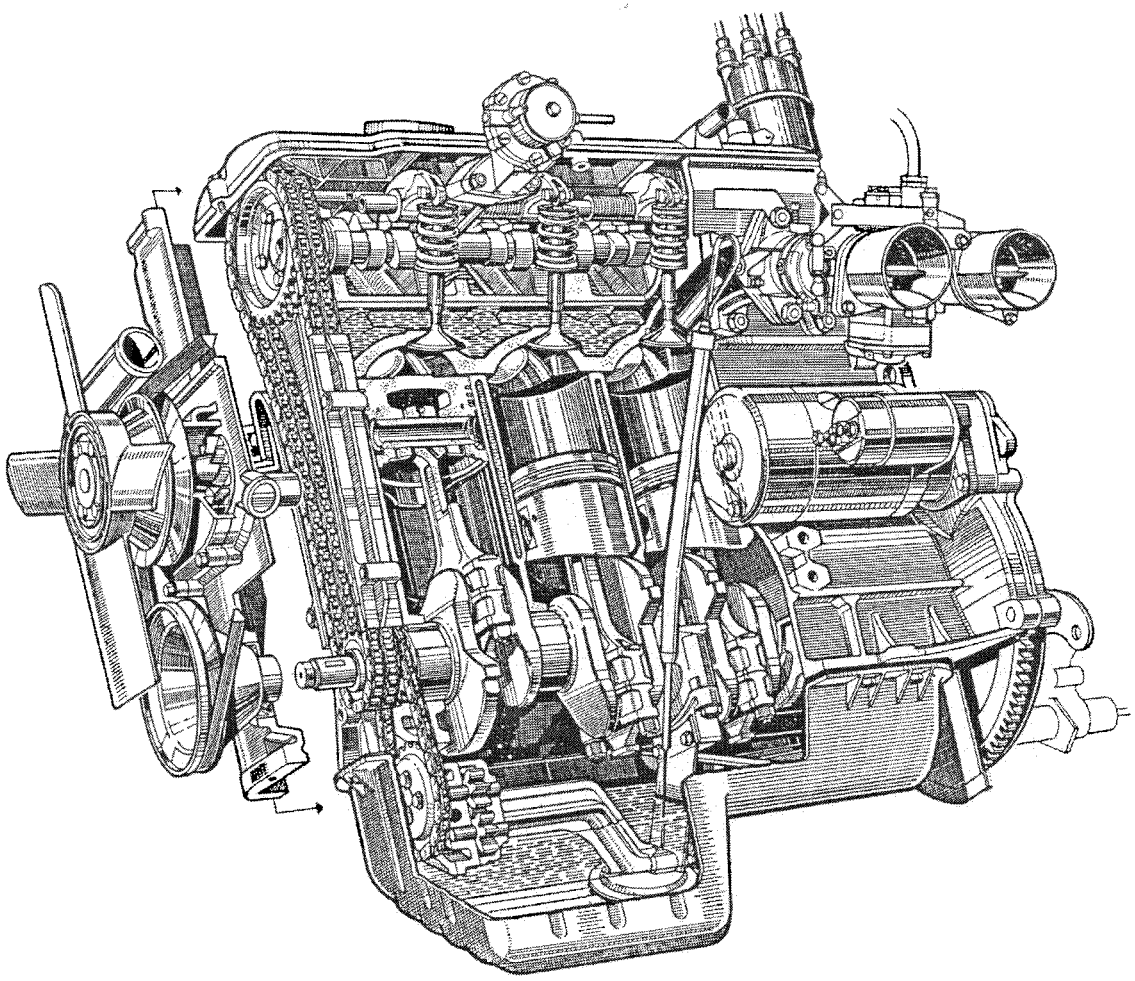
Lubrication
Pressure circulating system, with full flow oil filter, gear-type pump chain driven from crankshaft and light-alloy sump.

Oil filter
Full flow filter with Micronic paper element and pressure relief valve opening at a pressure of 1.3 ± 0.2 atü
(18.5 ± 2.8 psi)

Oil consumption
0.05–0.1 litre per 100 km
(1650–1900 mpg)

Air filter
2 filter elements within induction air silencer.

Engine – BMW 1600 GT



Fuel consumption according to DIN 70 030 standard test procedure

9.8 l/100 km (28.75 mpg.)

Carburettor type	
2 Solex 40 PHH twin-choke horizontal	
Carburettor settings	
Main jet	0120
Corrector jet	155
Venturi	30
Idling jet	50
Injection volume	0.6–0.8 cc/stroke (0.036–0.488 m. in.)
Float needle valve	2.0
Float weight	10 g (0.35 oz.)

Fuel supply

Mechanical fuel pump, operating pressure 0.21–0.25 kg/cm² (2.85–3.5 psi).

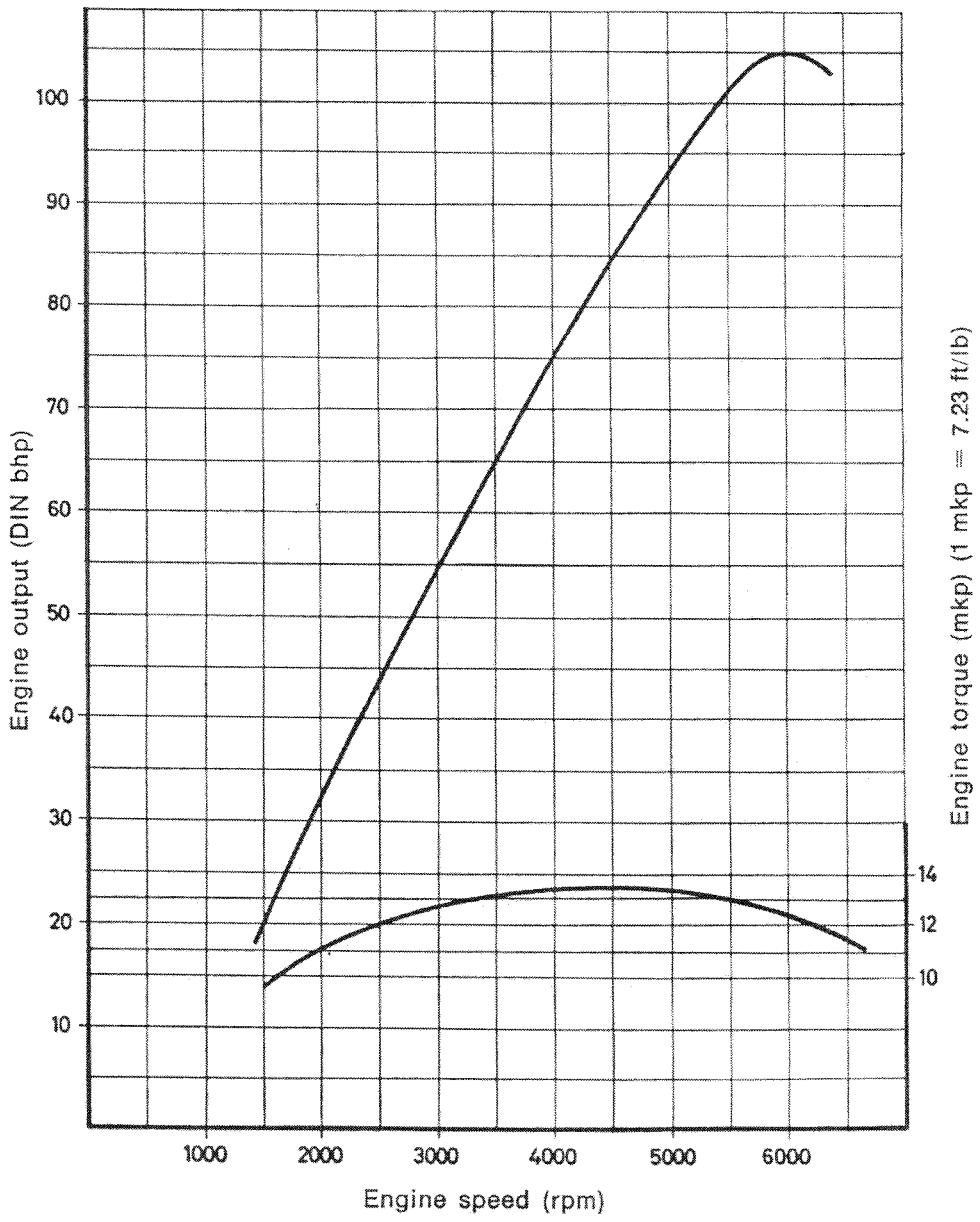
Fuel filter

Fine mesh filter within fuel pump and on indicator tube.

Radiator type

Gilled tube, with pressure relief and vacuum valves in filler cap.

Engine performance



Opening pressure

of radiator filler cap valves:
Excess pressure 1.0 ± 0.15 kg/cm² (14.2 ± 2.2 psi).
Under pressure up to 0.04 ± 0.01 kg/cm² (0.57 ± 0.14 psi).

Cooling water thermostat

with air temperature equalising device, mounted in front of water pump inlet. Opening begins at 75° C (167° F). (Secondary water temperature at engine cooling water outlet; approx. 80° C [176° F]).

CLUTCH

Mechanically operated single dry plate with torsional vibration damper.

GEARBOX

4-speed with Porsche synchromesh on all forward gears, 1 reverse gear.

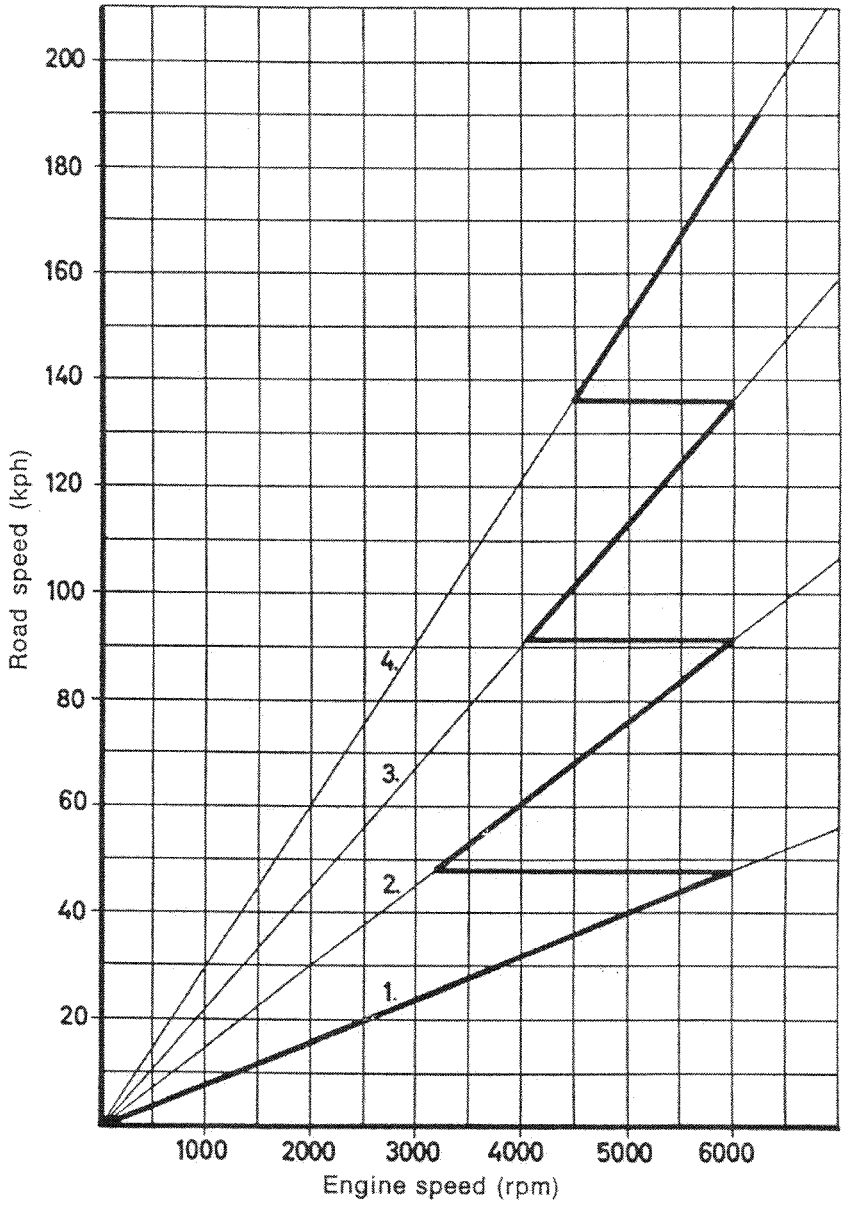
Ratios:

1st gear	3.835 : 1
2nd gear	2.053 : 1
3rd gear	1.345 : 1
4th gear	1.0 : 1
Reverse	4.18 : 1

PROPELLOR SHAFT

Divided shaft with flexible mounting for centre bearing and three rubber couplings.

Road speed / engine speed



FINAL DRIVE

Hypoid bevel crownwheel and pinion supported on taper roller bearings.

Ratio

Crownwheel/ pinion	No. of teeth	Contact pattern
3.64 : 1	11 : 40	Klingelnberg

Drive to rear wheels
Left and right halfshafts with homokinetic universal joints requiring no maintenance.

RUNNING GEAR

Front wheel mounting

Independent suspension by upper and lower wishbones, double-acting hydraulic shock absorbers, coil springs and rubber auxiliary springs. Wheel travel 150 mm (5.9″).

Toe-in with vehicle normally loaded*
0° 15′ ± 5′ = 1.5 ± 0.5 mm
(0.06 ± 0.02″)

Camber angle, vehicle normally loaded*:
1° ± 30′ (must not vary more than 30′ between left and right).

Castor angle: 3° ± 15′

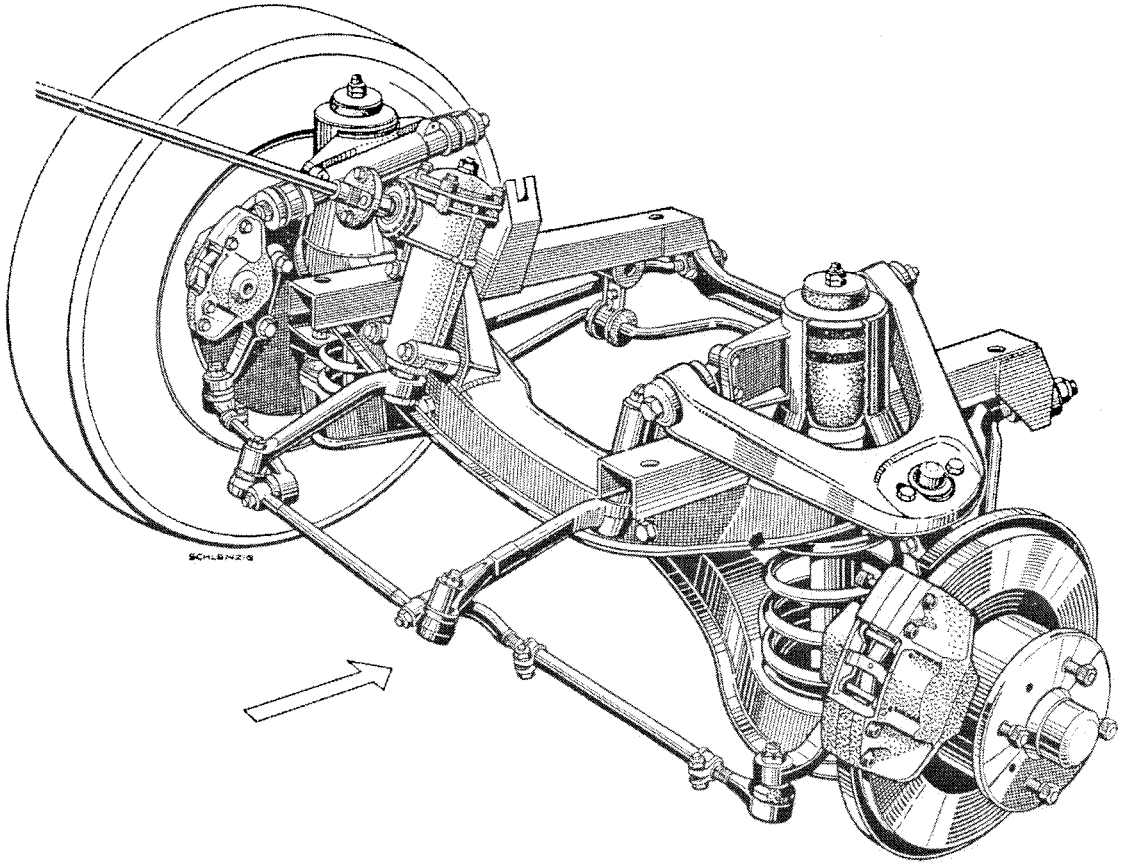
Kingpin angle: 7°

Toe-out on turns for 20° deflection of inside wheel: 1°.

Max. wheel lock
Inside wheel 37°
Outside wheel 31°

* Normal load: 2 persons = 2 x 65 kg (287 lb) + luggage 25 kg (55 lb)

Front Wheel Suspension – BMW 1600 GT



Rear wheel mounting
Independently sprung wheels with semi-trailing arms mounted on rubber bushes requiring no maintenance.
Delta-shaped box-section support beam for trailing arms and final drive, attached to bodywork at 4 points by rubber mountings.
Coil springs and auxiliary rubber bump stops; spring travel 180 mm (7.1″); double-acting hydraulic telescopic shock absorbers.

Normal toe-in* 1.5 ± 1.5 mm
(0.06 ± 0.06″)

Normal camber angle*: 2° ± 20′ negative

Steering
ZF Gemmer with hourglass worm and roller

Gear ratio 15.5 : 1

Overall steering ratio 16.45 : 1

3-piece track rod

Steel disc wheels
4 ½ JK x 13 well-base rims, ventilated

Tyres: 155 HR 14 radial-ply, tubed, with metal screw-in valve.

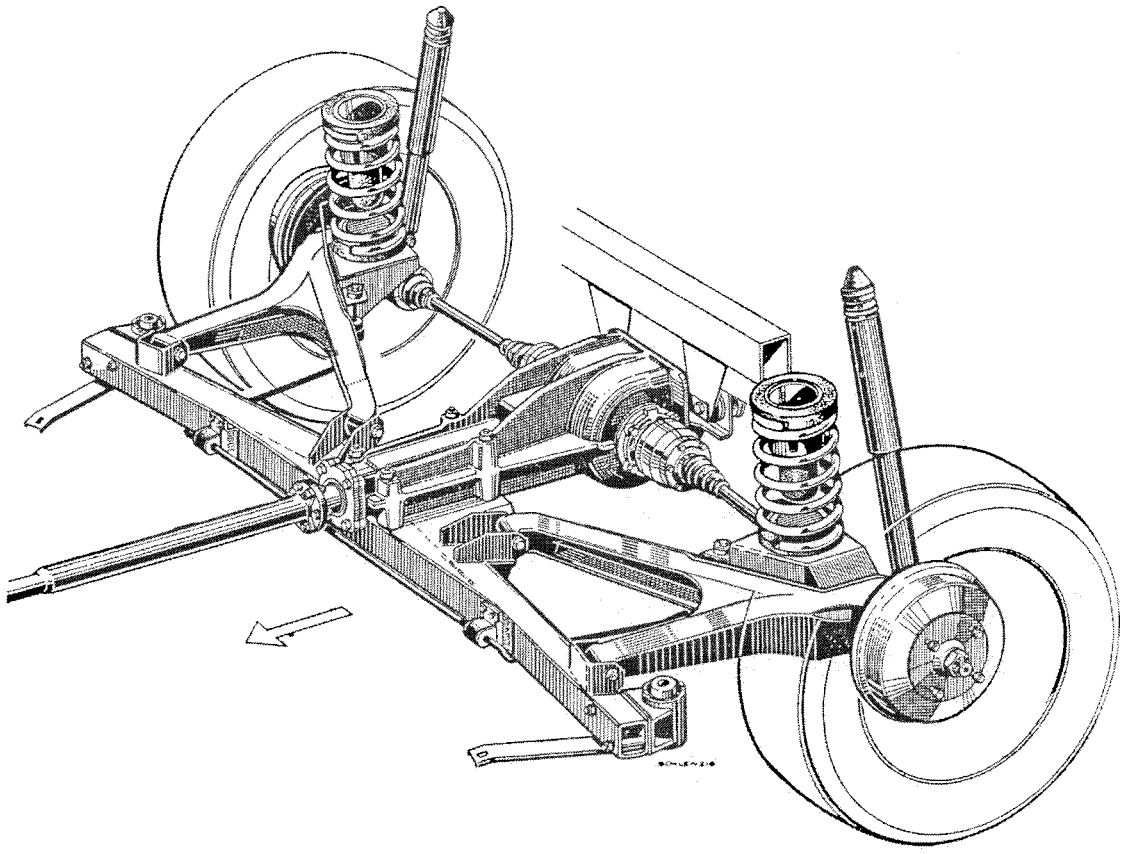
Tyre pressures (cold)
(increase by 0.3 atü = 4 psi when warm)

Front:	
Part load (up to 3 persons)	2.0 atü (28 psi)
Full load	2.0 atü (28 psi)
Rear:	
Part load (up to 3 persons)	1.7 atü (24 psi)
Full load	1.9 atü (27 psi)

Dynamic tyre radius 292 mm (11.50″)

* Normal load: 2 persons = 2 x 65 kg (287 lb) + luggage 25 kg (55 lb)

Rear Wheel Suspension – BMW 1600 GT



BRAKES

Foot brake

Hydraulic, acting on all 4 wheels. Main brake cylinder located under bonnet, diameter 19.05 mm (0.75″). Transparent reservoir for brake fluid also located under bonnet.

Front

Fixed caliper disc brakes with automatic pad wear and disc runout compensation.

Disc diameter	268 mm (10.55″)
Cylinder diameter	48 mm (1.89″)

Rear

Drum brakes with self-centering shoes.

Cylinder diameter	17.46 mm (0.68″)
Brake drum diameter	230 mm (9.06″)
Lining width	40 mm (1.57″)

Handbrake

Operates mechanically on rear wheels only. Adjust at handbrake lever after lifting rubber sleeve. Cable to each rear wheel adjustable separately.

Braking distance

The best possible brakes can only attain a road efficiency corresponding to the friction between tyre and road surface. As the graph shows, the maximum possible retardation of a vehicle travelling on an icy surface is only in the region of 1.5 m/sec^2 (4.9 ft. per sec per sec).

This implies that your car's speed in such circumstances is reduced in every second by only 1.5 metres per second 4.9 ft. per second). In other words, every second the speed drops by only 5.4 kph 3.375 mph). If you had, for example, been travelling at 54 kph (33.75 mph), it would take 10 seconds for you to stop. As the graph overleaf shows, you would cover almost 100 m (330′) in that time. The lowest curve (1.5 m/sec^2) shows you your braking distance related to travelling speed in the conditions just described.

In contrast, the uppermost curve (8 m/sec^2) refers to the shortest braking distances generally obtainable in ideal conditions.

The middle curve (4.5 m/sec^2) applies to a damp road not entirely devoid of grip for the tyres, and thus represents an average set of values which could be used as a guide for normal strength braking during everyday driving on dry roads.

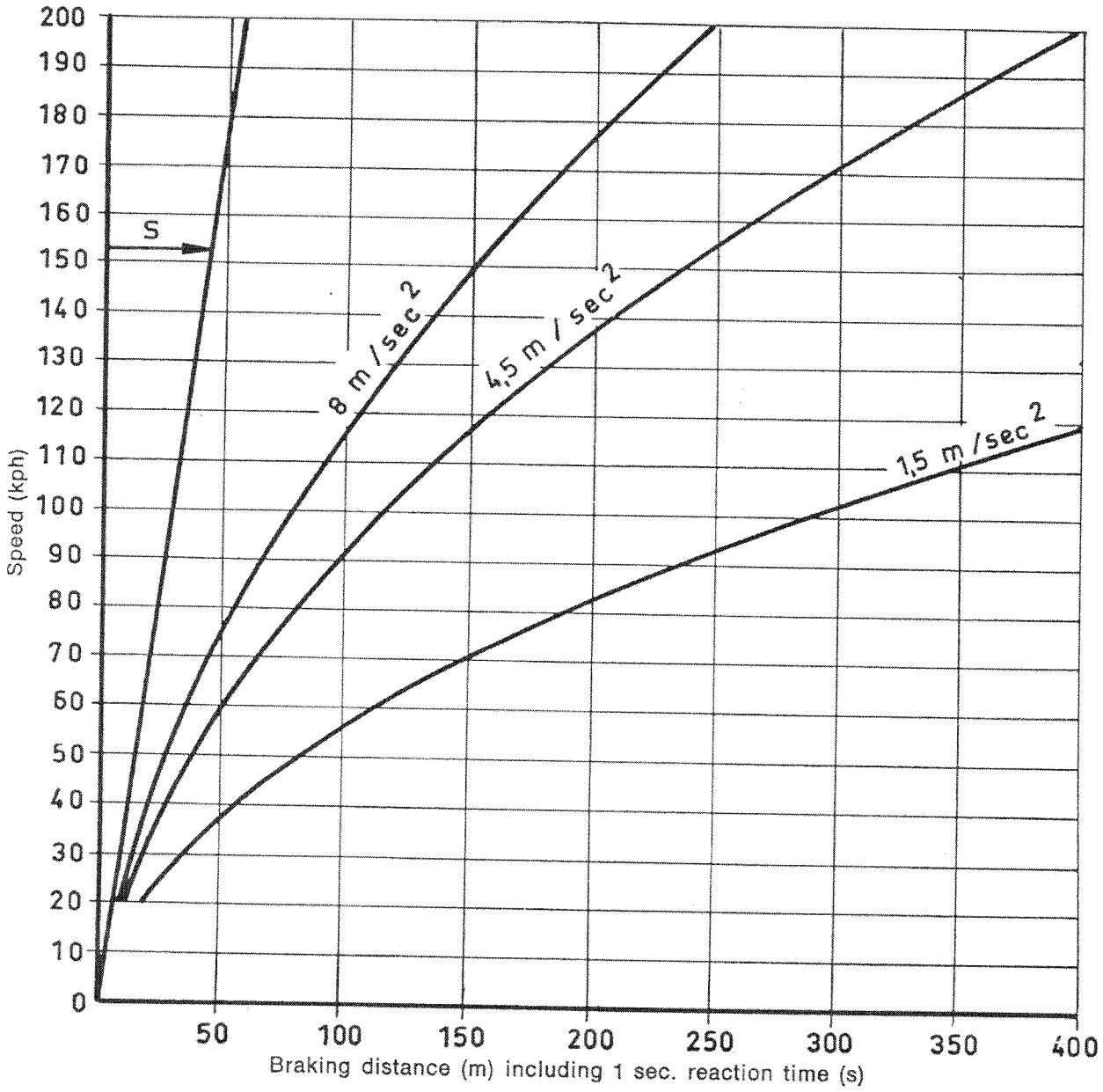
All the values plotted on the graph can vary for better or worse, depending on the state of the brakes, the condition of the tyre treads and the road surface itself.

The lengths quoted for braking distances include a proportion "S" covered during one second's reaction time on the part of the driver.

Most efficient braking takes place not with locked wheels, but when the wheels are still just turning.

Locking the wheels can be dangerous, as locked front wheels can no longer be steered, and locked rear wheels tend to allow the car to slide sideways or spin.

Braking distance related to speed and retardation



BODYWORK

Load-carrying all-steel body welded to floor section, and giving a particularly torsion-resistant complete unit. Two doors and engine compartment bonnet hinged at front.

Luggage compartment capacity:

approx. 300 litres (10.6 cu.ft.)

Fuel tank capacity: 55 litres (12.1 Imp. gal)

Heating and ventilation
Fresh-air heater with warm water heat exchanger and axial blower. 4 outlet nozzles covering front screen and foot area.

ELECTRICAL SYSTEM

Battery 12 V 44 Amp/hr.

Coil Bosch K 12 V

Distributor Bosch IFR 4

Ignition point TDC
Adjust only with engine stopped and cold (max. water temperature 35° C [95° F]).

Firing order 1–3–4–2

Contact breaker dwell angle 60°

Contact breaker gap 0.4 mm (0.016″)

Ignition advance and retard
Centrifugal

Centrifugal adjustment
Begins: approx. 800 rpm
Ends: approx. 2400 rpm
max. adjustment range 30° ± 2° at CS

Alternator
Bosch K 1 – 14 V 35 A 20

Voltage regulator
Bosch AD 1/14 V

Starter
Bosch GF (R) 12 V 1 hp

Spark plugs
Bosch W 200 T30

For heavy motorway use in summer:

Beru 230/14/3 A
Bosch W 230 T 30

Electrode gap: 0.6 + 0.1 mm (0.024 + 0.004″)

Headlamps
with asymmetric dipped beam and side/parking lights included. Lens diameter 170 mm (6.7″).

12 V bulbs
see pages 27–29.

Fuse box
Under bonnet on left-hand side; contains 9 fuses. For circuits controlled by each fuse, see page 26–27.

Automatic screenwasher
Electric gear-type pump operated by screen wiper lever (full travel = wash).

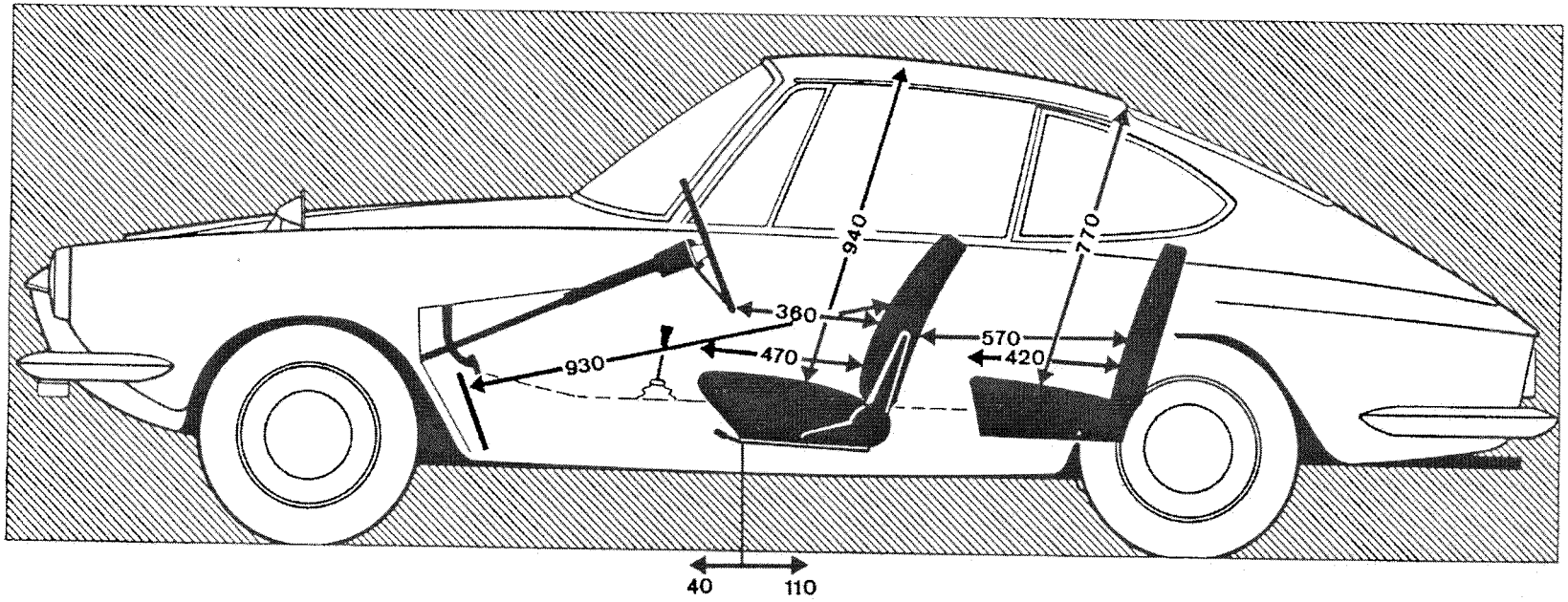
Horns
Two full-tone flat disc horns well positioned for maximum penetration behind radiator grille and protected against dirt.

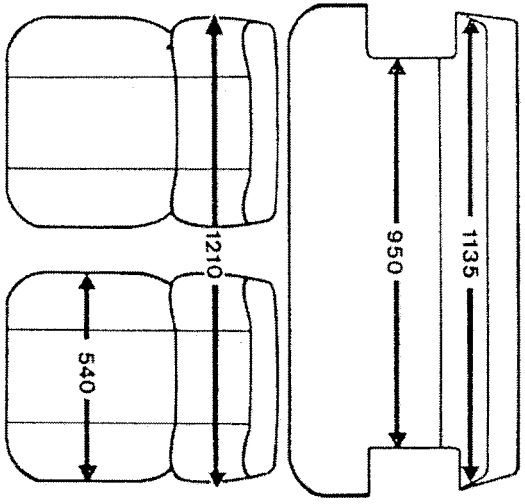
DIMENSIONS AND WEIGHTS

Overall length	4050 mm (13′ 3½″)
Overall width	1550 mm (5′ 1¼″)
Height (unladen)	1280 mm (4′ 2½″)
Wheelbase	2320 mm (7′ 7½″)
Ground clearance (laden)	150 mm (6″)
Front overhang	750 mm (2′ 5½″)
Rear overhang	1000 mm (3′ 3½″)
Front track	1260 mm (4′ 1¾″)
Rear track	1260 mm (4′ 1¾″)
Min. turning circle dia. (wheels)	9.75 m (32′)
Min. turning circle dia. (overall)	10.50 m (34′ 5″)
Vehicle weight, unladen (ready for use with full tank)	960 kg (2116 lb)
Permitted total weight	1330 kg (2932 lb)
Permitted front axle load	600 kg (1323 lb)
Permitted rear axle load	760 kg (1675 lb)
Permitted trailer load	
without brakes	500 kg (1103 lb)
with brakes	1200 kg (2645 lb)
Permitted load on roof	50 kg (110 lb)

(In the fully loaded condition the permitted axle loads must not be exceeded).

Body interior dimensions (mm)





PERFORMANCE

Maximum speed 119 mph (190 kph)

Max. gradients

1st gear	59 %	(1 in 1.7)
2nd gear	26 %	(1 in 3.8)
3rd gear	13.5 %	(1 in 7.2)
4th gear	8 %	(1 in 13.5)

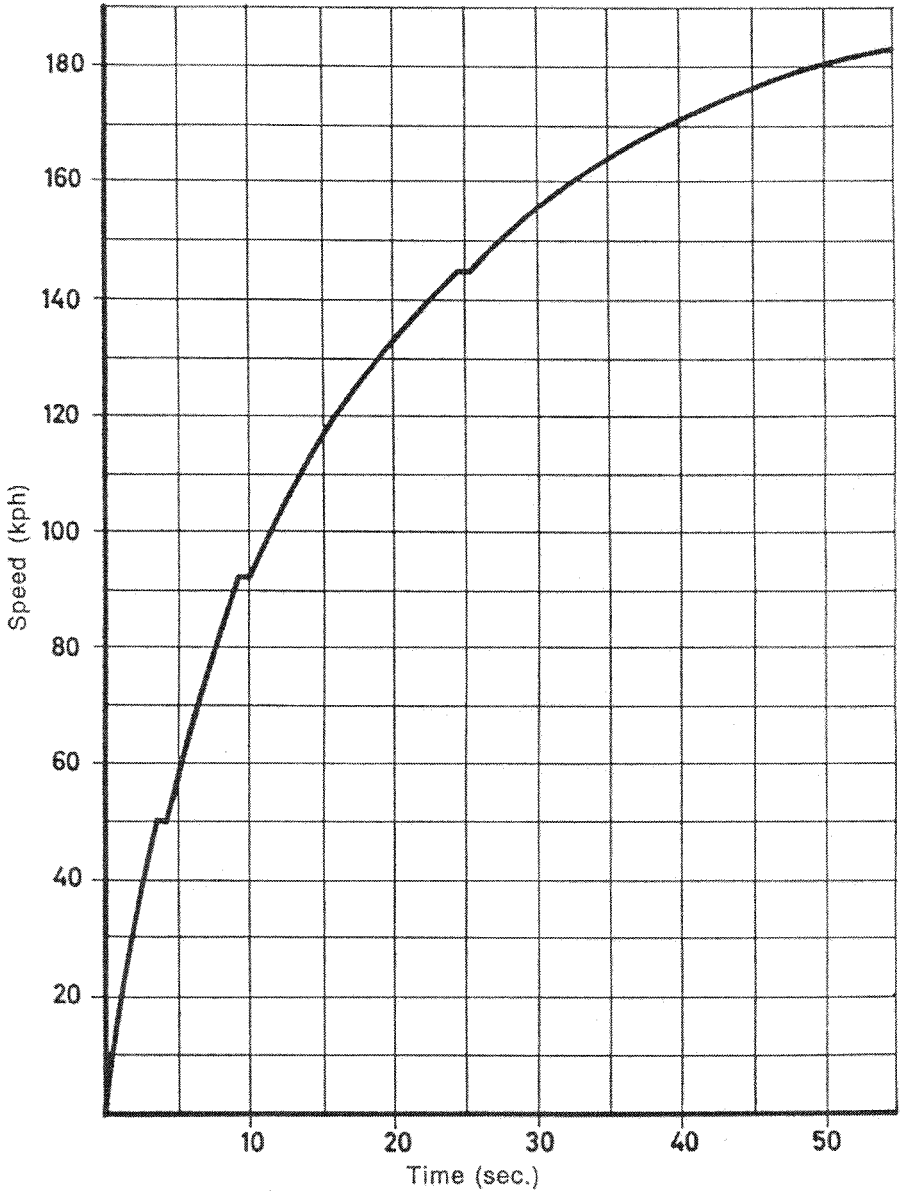
Acceleration

Gear	mph	(km/h)	sec.
2nd	0– 31	(0– 50)	3.9
2nd	0– 50	(0– 80)	7.5
3rd	0– 62	(0–100)	11.2
3rd	0– 75	(0–120)	16.0
3rd	0– 87	(0–140)	22.0
4th	0–100	(0–160)	32.6

Standing start kilometer in 32.0 sec.
Average speed over the distance:
70 mph (112.5 kph)

Terminal speed 99 mph (159 kph)

Acceleration through gears



TIGHTENING TORQUE VALUES FOR BOLTS AND NUTS

Engine

Cylinder head bolts	7.0 ± 0.2 mkp (50.6 ± 1.4 ft/lb)
Crankshaft V-belt pulley	14 mkp (101.3 ft/lb)
Water pump V-belt pulley	4 mkp (28.9 ft/lb)
Engine mounting bracket	4.7 mkp (34.0 ft/lb)
Rubber mounting nuts	2.5 mkp (18.1 ft/lb)

Gearbox

Engine attachement flange	2.5 mkp (18.1 ft/lb) M 8 4.7 mkp (34.0 ft/lb) M 10

Front axle

Front axle carrier	4.7 mkp (34.0 ft/lb)
Lower wishbone	5 mkp (36.0 ft/lb)*
Upper wishbone	5 mkp (36.0 ft/lb)
Guide joint	3 mkp (21.7 ft/lb)
Clamp bolt	3.4 mkp (24.6 ft/lb)
Upper wishbone bearing bracket	2.5 mkp (18.1 ft/lb)
Trailing link to front axle carrier	6 mkp (43.4 ft/lb)*
Trailing link to wishbone	6.5 mkp (47.0 ft/lb)
Load-bearing joint	6 mkp (43.4 ft/lb)
Lower shock absorber mounting	3 mkp (21.7 ft/lb)*
Upper shock absorber mounting	5.5 mkp (39.8 ft/lb)

Rear axle

Cross-member to body floor	4.5 mkp (32.5 ft/lb)
Casing to cross-member	4.5 mkp (32.5 ft/lb)
Final drive to axle carrier	9 mkp (65.1 ft/lb)
Axle carrier to body floor	12 mkp (86.8 ft/lb)
Compression strut to body floor	4.5 mkp (32.5 ft/lb)
Trailing arms on axle carrier	7.5 mkp (54.2 ft/lb)
Shock absorber, lower end	4.5 mkp (32.5 ft/lb)
Half shaft pick-up flange	3.4 mkp (24.6 ft/lb)
Half shaft at rear axle shaft	3.4 mkp (24.6 ft/lb)
Universal joint shaft at gearbox take-off flange	4.5 mkp (32.5 ft/lb)
Rear axle carrier rubber mountings	4.5 mkp (32.5 ft/lb)
Rubber coupling	4.5 mkp (32.5 ft/lb)
Rear axle shaft castellated nuts	30 + 5 mkp (217.0 + 36.2 ft/lb)
Body floor support points	4.5 mkp (32.5 ft/lb)

Steering

Steering wheel securing nut	4 mkp (28.9 ft/lb)
Plate mounted joint	1.9 mkp (65.1 ft/lb)
Flange mounted joint	2.4 mkp (17.4 ft/lb)
Drop arm to steering box	14 mkp (101.3 ft/lb)
Tierod castellated nuts	min. 3.5 mkp (25.3 ft/lb)
Steering box to front axle carrier	4.7 mkp (34.0 ft/lb)
Track rod clamp bolts	1.2 + 0.3 mkp (8.7 + 2.2 ft/lb)

Brakes

Brake disc to wheel hub	6 mkp (43.3 ft/lb)
Caliper to king pin	9.5 mkp (68.7 ft/lb)

Wheel nuts

9 mkp (65.1 ft/lb)

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* Normal load: 2 persons = 2 x 65 kg (287 lb) + luggage = 25 kg (55 lb).

Key to Lubrication Chart

1. Fuel filler	Branded premium grade petrol
2. Radiator filler (Water drain cocks are situated at the bottom right of the radiator block and the rear right of the engine block)	Clean water with low lime content and a) in summer an anti-corrosion agent b) in winter an anti-freeze
3. Engine oil filler	◆ Branded HD petrol-engine oil; SAE 30 for outside temperatures above 0° C (32° F), SAE 10 W 30 for temperatures below 0° C (32° F) ◇ indicates oil change
4. Fuel pump fine mesh filter	# indicates filter cleaning
5. Battery	I Distilled water
6. Engine oil filter	⊕ indicates filter renewal
7. Induction air filter	# indicates filter cleaning ⊕ indicates filter renewal
8. Engine oil level dipstick	Check oil level regularly
9. Steering box (permanently filled)	✦ Branded hypoid gear oil, SAE 90
10. Hydraulic brake fluid reservoir	+ ATE brake fluid, blue
11. Wheel bearings (examine every 40 000 miles [60 000 km])	Branded multi-purpose grease with drip point 180° C (356° F)
12. Oil nipple for ignition distributor shaft (for remaining lubrication points, see page 39)	◆ Branded HD oil, as engine oil
13. Gearbox (change oil every 16 000 miles [24 000 km])	● Branded gear oil, SAE 80
14. Rear axle final drive	✦ Branded hypoid gear oil, SAE 90

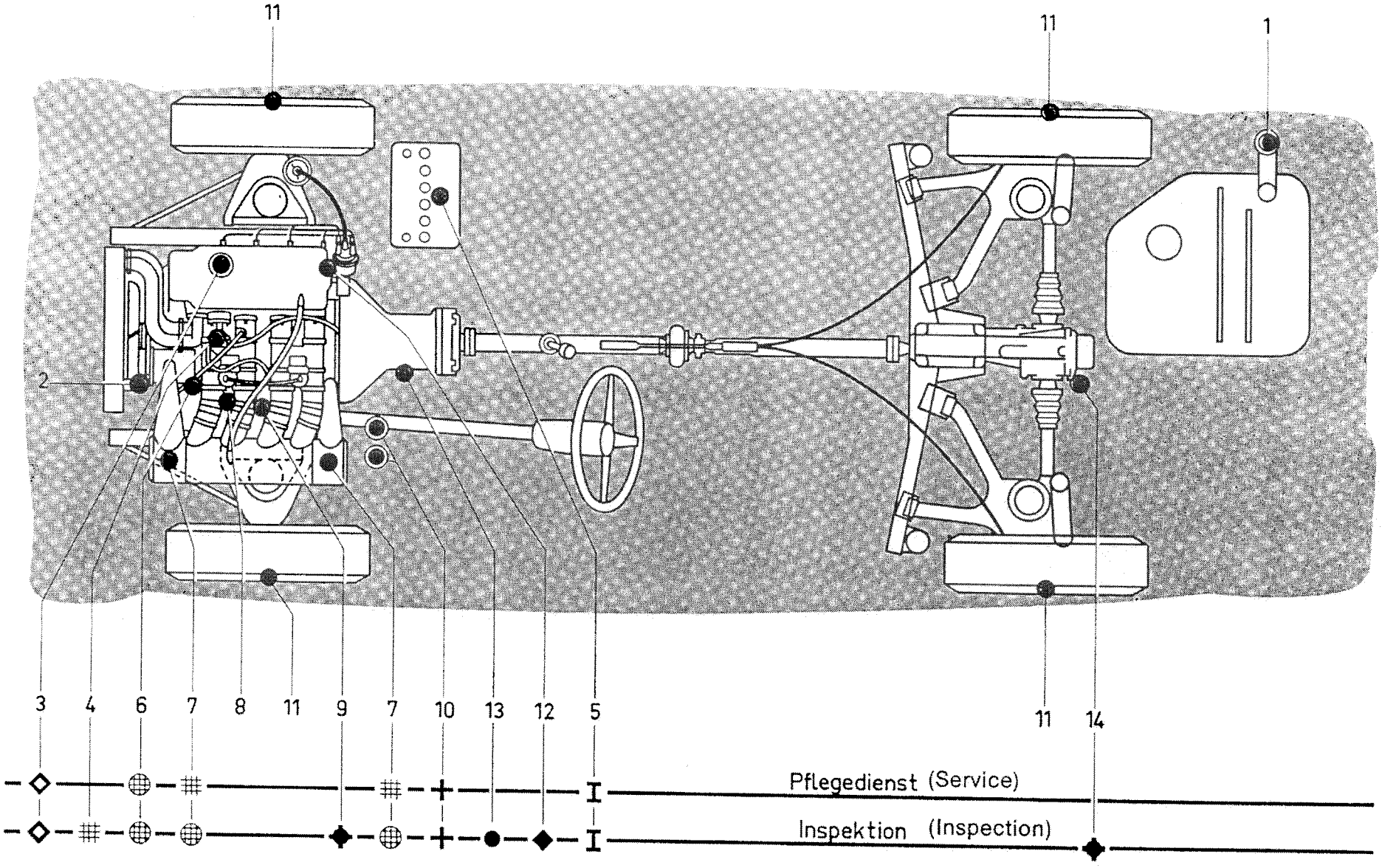
Key to Lubrication Chart
Important instruction to service stations

Strengthened points for single column car lifts with 4 lifting points:

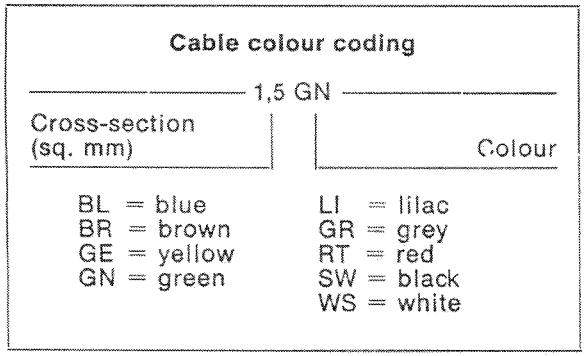
Outer extremity of body under fold. These are the reinforced points for the car's own jack, and are on the longitudinal floor panel members close to the wheel arches.

Warning: Never jack up directly on to the final drive casing.

Lubrication Chart



Key to electrical wiring diagram



1 Battery
2 Starter
3 Dynamo
4 Voltage regulator
5 Ignition/starter switch

Positions:
I Halt (off)
II Garage
III Fahrt (Drive)
IV Start

6 Combined relay (flasher and multi-stage relay fuse)
7 Coil
8 Ignition distributor
9 Horn relay
10 Horn (right)
11 Horn (reft)
12 Horn button
13 Headlamp right, with parking lamp
14 Headlamp left, with parking lamp
15 Rear lamp cluster, right

A reversing lamp
B rear lamp
C turn indicator
D brake lamp

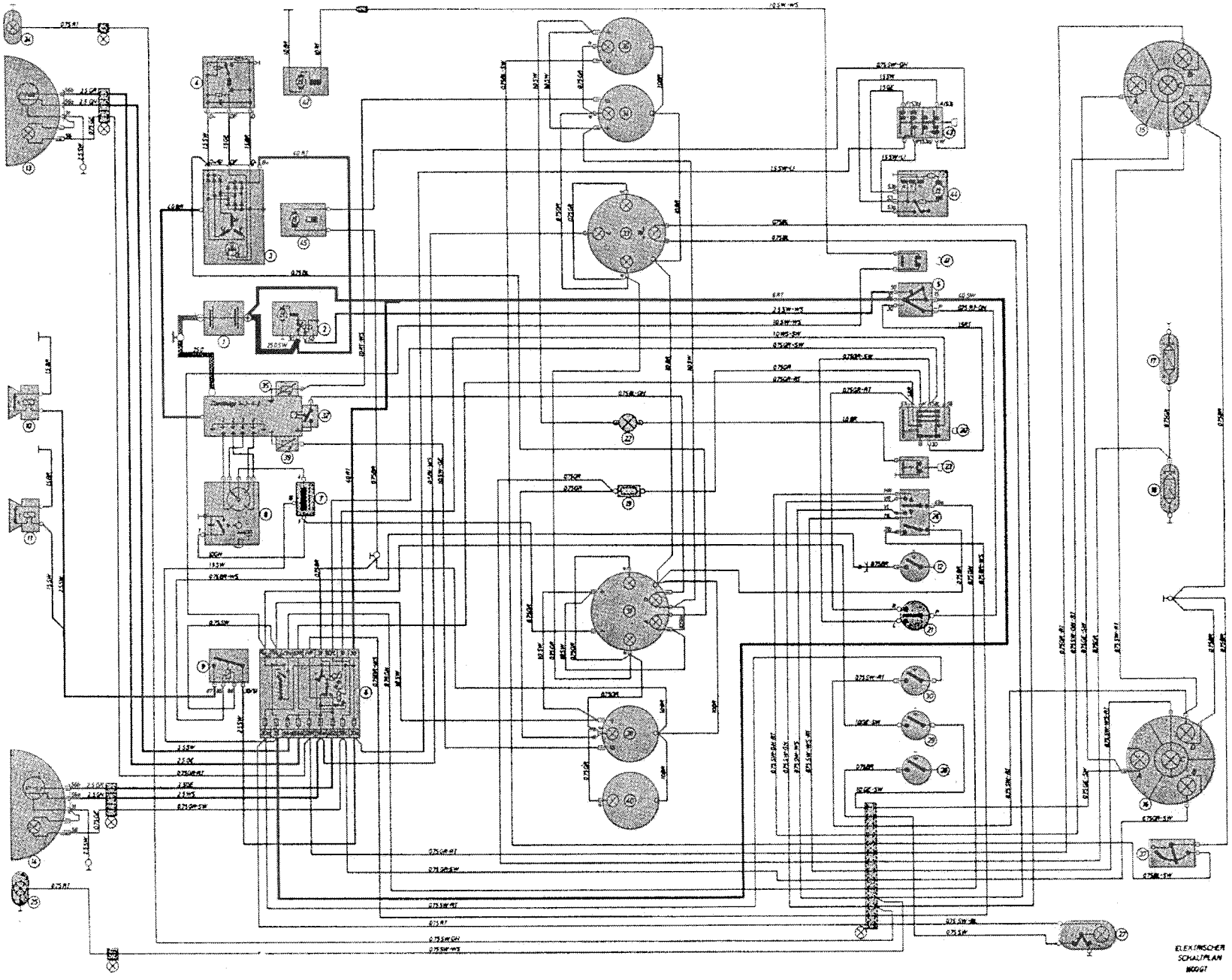
16 Rear lamp cluster left

A reversing lamp
B rear lamp
C turn indicator
D brake lamp

17 Number plate lamp right
18 Number plate lamp left
19 Fuse box
20 Light switch
21 Parking lamp switch
22 Choke telltale (orange)
23 Choke cable
24 Turn indicator front right
25 Turn indicator front left
26 Turn indicator and dip switch
27 Interior light
28 Door contact light switch
29 Reversing lamp switch
30 Stop lamp switch
31 Transistorised revolution counter
a. lighting
A battery charge telltale (red)
O oil pressure telltale (green)
32 Oil pressure telltale contact
33 Speedometer
a. lighting
L main beam telltale (blue)
B turn indicator telltale (green)
34 Water temperature gauge
a. lighting
35 Water temperature contact
36 Fuel gauge
a. lighting
37 Fuel gauge, contact in tank
38 Oil temperature gauge
a. lighting
39 Oil temperature gauge contact
40 Oil pressure gauge
a. lighting
41 Blower switch
42 Blower motor
43 Screen wiper/washer switch
44 Screen wiper motor
45 Screen washer pump

X Flat pin flexible connector

Electrical wiring diagram



Item reference

At a glance

Tyre pressures in atü (psi) when **cold;** when tyres are hot, increase by 0.3 atü (4 psi).

Radial-ply tyres, 155 HR 14

Load	front	rear
Part load, up to 3 persons	2.0 (28)	1.7 (24)
Full load	2.0 (28)	1.9 (27)

For **competition** use special rules apply.

Winter or **spiked tyres:**

155 R 14 M + S (E)

Load	front	rear
Part load, up to 3 persons	2.2 (31)	1.9 (27)
Full load	2.2 (31)	2.1 (30)

Spark plugs

Bosch W 200 T 30
For hard motorway driving in summer,
Beru 230/14/3 A
Bosch W 230 T 30
Electrode gap 0.6 + 0.1 mm
(0.024 + 0.004″)

Contact breaker gap
0.4 mm (0.016″) (Dwell angle 60°)

Ignition timing
TDC: test with engine stopped and cold

Valve clearance (engine cold)
Inlet and exhaust:
0.15–0.20 mm (0.006–0.008″)

V-belt

At choice:
9,1 x 870
9,5 x 875 LA DIN 7753

Capacities

Fuel tank	55 litres (12.1 Imp. gal)	Branded premium grade petrol
Cooling system incl. heater	9.5 litres (15.8 Imp. pints)	Clean water with low lime content and with: a) in summer an anti-corrosion additive b) in winter an anti-freeze
Engine	4 litres (7 Imp. pints) + 0.25 litre (0.44 Imp. pint) if oil filter is changed	Branded HD petrol engine oil, SAE 30 for outside temperatures above 0° C (32° F), SAE 10 W 30 for below 0° C (32° F)
Gearbox	1 litre (1.76 Imp. pints)	Branded gearbox oil, SAE 80
Rear axle final drive Steering box	0.9 litre (1.58 Imp. pints) 300 cc (10.5 fl. oz.) permanently filled	Branded hypoid gear oil, SAE 90

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