

**Owner's handbook**

**2000**  
**2000**  
AUTOMATIC

**BMW AG**







In the interests of development we reserve the right to modify design, equipment and accessories. Dimensional, weight and performance data is to be understood as within appropriate tolerances. Errors and Omissions Excepted.

Dear BMW Owner,

Doubtless your BMW 2000 will not be your very first motor car — it may even be your second or third BMW. Perhaps we are therefore justified in assuming that you are a connoisseur in motoring matters and have every reason to demand great things of your latest acquisition.

First and foremost you will discover that our designers are thoroughly familiar with, and have devoted considerable care and attention to, your wishes and can truly be said to have fulfilled those wishes in superb fashion.

Despite all the motoring knowledge you will have accumulated from past experience, we would most respectfully recommend you to devote careful attention to the contents of this Owners Handbook. Only then can you be assured of the maximum benefit from all of the features offering reliable and luxurious motoring at all times. By reading the following pages you will also be able to gain some idea of the full standards of technical care and maintenance provided by your BMW Service Agent's network within the framework of the prescribed inspections.

You are strongly recommended to make maximum use of every service available to you as a BMW owner. By so doing you will be assured of reliable and enjoyable motoring to standards hitherto undreamed of over a period of many years to come.

Yours sincerely,

BAYERISCHE MOTOREN WERKE  
Aktiengesellschaft



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## Familiarisation





The identity of your car is established by information on the data plate and by chassis and engine numbers. Relevant entries in the vehicle logbook must coincide with the data on the vehicle. The precise location of this data is perhaps less important to you personally than to the servicing or repair workshops — e. g. when selecting the correct spares or accessories — vehicle licensing authorities or customs officials.

**Data Plate:** under the bonnet on the off-side wheel well. **Fig. 1.**



**Chassis Number:** under the bonnet on the outer edge of the offside wheel well. **Fig. 2.**



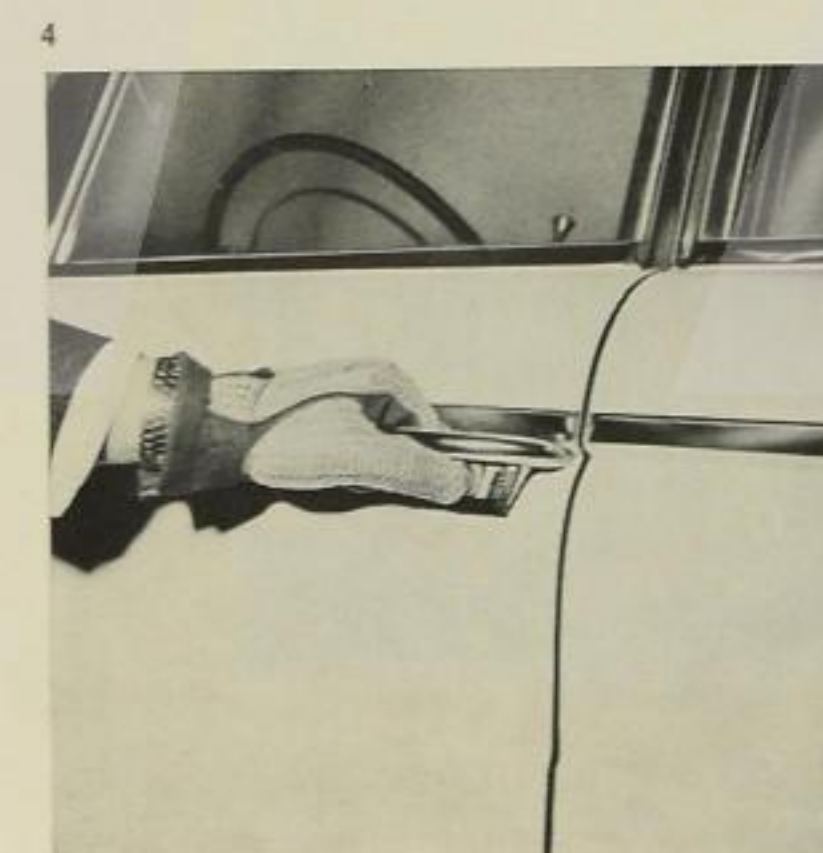
**Engine Number:** on the rear left-hand side of the engine housing. **Fig. 3.**



Your new BMW has come complete with two pairs of keys. We suggest that you deposit the spare set of keys at some convenient place from which you can retrieve it without delay if the original set is lost or mislaid. Obviously, wherever you may be your nearest BMW Agent will be delighted to render any assistance which you may require.

It is also advisable to make a note of the key numbers in your pocket diary or somewhere equally convenient as this will prove an invaluable timesaver if you ever want to purchase replacements.

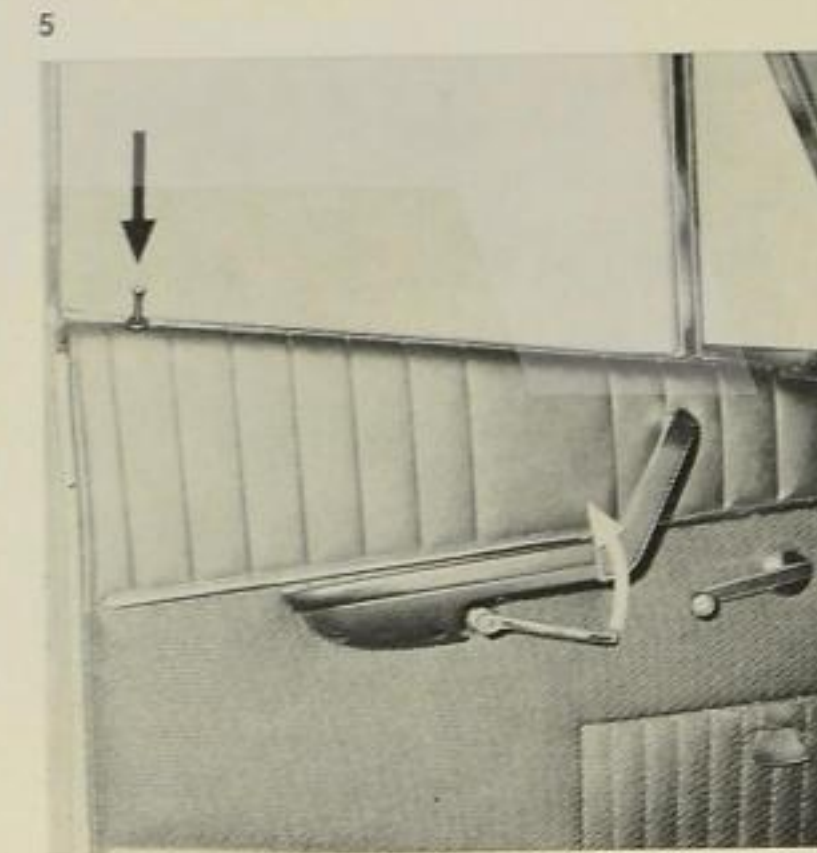
Please ensure that these key numbers have been entered in your Service Booklet.



The door locks are operated by the shorter of the two keys, having a tilting head turning toward the back of the car to unlock and toward the front to lock. The doors are opened by depressing the lock button below the door handle. **Fig. 4.**

Each door can be locked from inside by depressing the safety lock button; to open the door from the inside first lift the safety button and then raise the door handle located below the arm-rest. **Fig. 5.**

If the safety button is depressed while the nearside **front door** is open the button will spring back up when the door is closed and the lock will not engage,



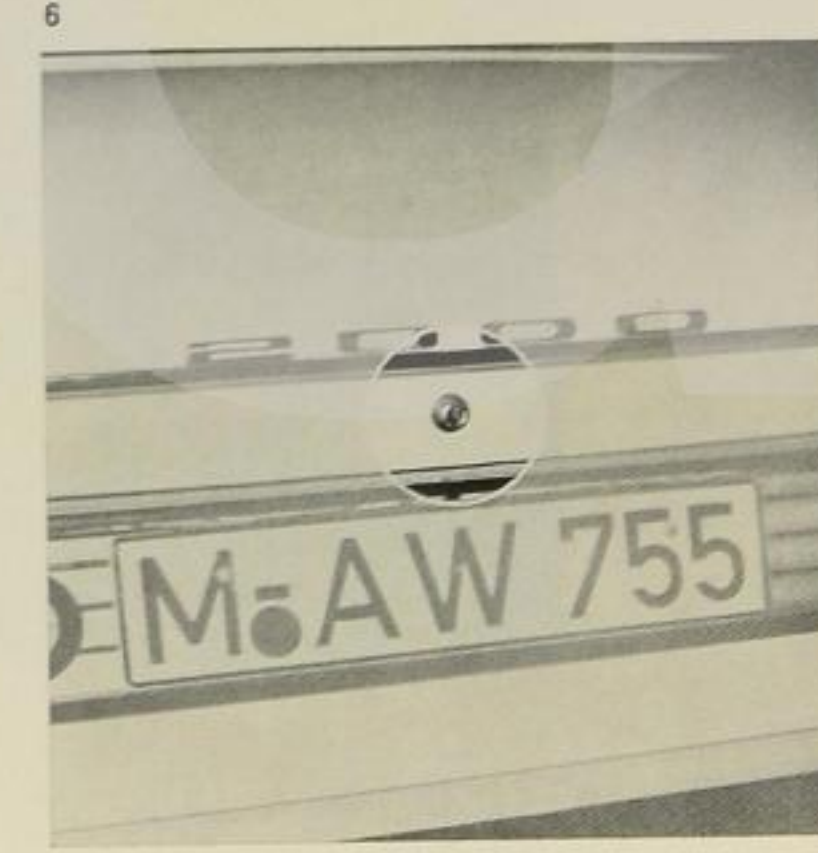
thus protecting you from being accidentally locked out.

The lock on the offside front door, on the other hand, remains engaged by simply depressing the outside lock button simultaneously while closing the car door.

The **rear doors** are locked by simply depressing the safety buttons, which also remain in position when closing the rear doors.

The **boot-lid** is opened and closed by means of the longer of the two keys. **Fig. 6.**

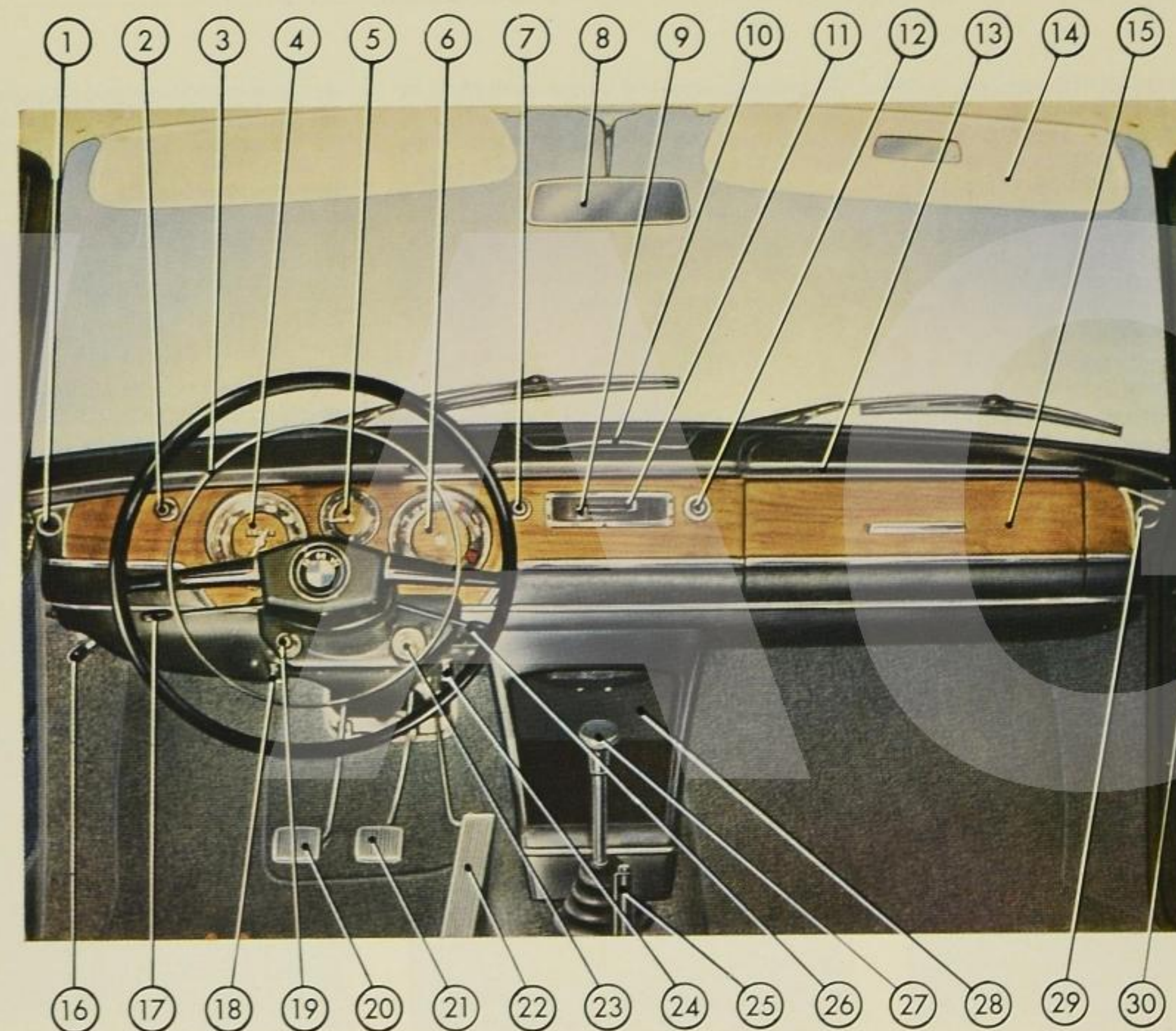
Please do not forget to lock the boot-lid after closing.





# Instrument and controls

1. Side air vent (left)
2. Headlamp switch, 2-stage, combined with dashboard lighting
3. Horn ring
4. Speedometer with permanent and trip mileage counters
5. Clock
6. Instrument cluster incorporating fuel gauge, radiator temperature gauge and control lamps for:  
Battery charge (red)  
Oil pressure (orange)  
Directional flasher (green)  
Fuel reserve and simultaneous manual choke button (white)  
High beam headlamps (blue)
7. Windshield wiper switch, 2-speed
8. Interior rear-view mirror
9. Air control lever
10. Ashtray
11. Hot air temperature control
12. Cigar lighter and socket
13. Grab handle
14. Sunvisors
15. Glove compartment
16. Bonnet lock lever
17. Low beam and overtake headlamp flasher signal
18. Reset button for trip mileage counter
19. Manual choke control
20. Clutch pedal (not applicable on BMW 2000 Automatic)
21. Brake pedal
22. Accelerator pedal
23. Steering lock with ignition-starter switch
24. Blower pull-switch, 2-speed
25. Handbrake lever
26. Directional flasher, parking light and windshield washer control
27. Gearshift lever (BMW 2000),  
Selector lever (BMW 2000 Automatic)
28. Parcel shelf
29. Side air vent (right)
30. Door contact switch (right)





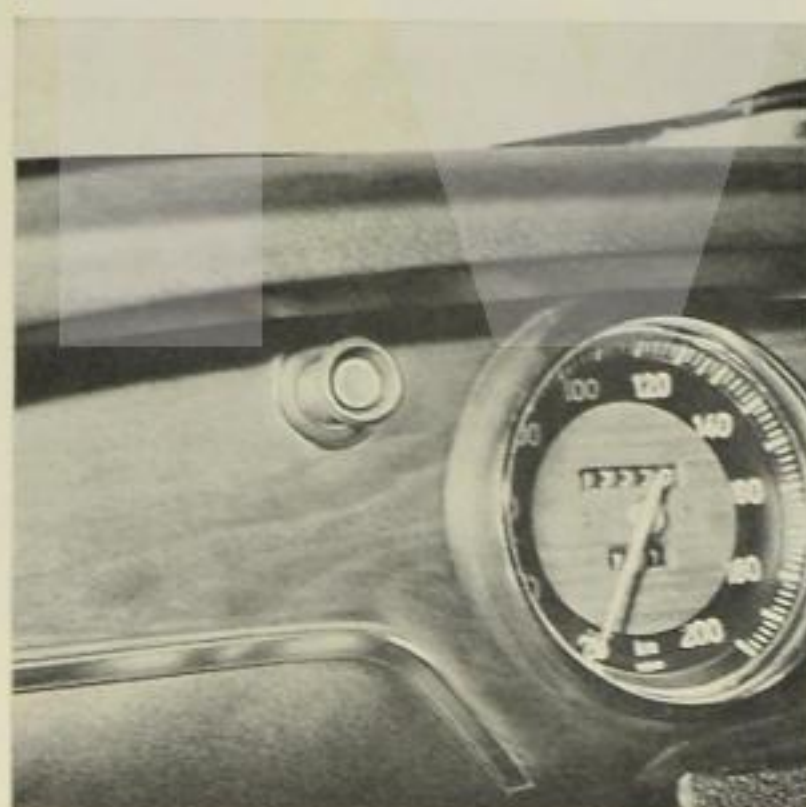
The **ignition/starter switch** on the right of the steering column housing also incorporates the steering lock. Insert the shorter of the two keys having a tilting head and turn to the right to "Garage" (lock disengages with a perceptible snap, if necessary turn the steering wheel slightly back and forth); the steering is now unlocked and the ignition key can be withdrawn and the radio (optional extra) switched on. **Fig. 7.**

Turning the ignition key further to the right into "Drive" position switches on the ignition and causes the battery (red) and oil pressure (orange) warning lamps to light up and the fuel gauge comes into operation; the ignition key cannot be withdrawn.

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To lock the steering system turn the key to "Halt" position and withdraw, if necessary rocking the steering wheel back and forth until the lock engages.

#### Headlamp switch, two-stage (Fig. 8.):

- 1st stage — Side lights
- 2nd stage — Headlamps

**Instrument lighting** can be varied in brilliance over an infinite range by rotating the pulled-out light switch button.

The **headlamp dipper switch** on the left of the steering column can be operated by one finger of the left hand without releasing the steering wheel (**Fig. 9.**). High beam position (lever upward) is indicated on the dashboard by a blue warning lamp in the instrument cluster.

The **overtake headlamp flasher signal** is operated by pulling this lever back toward the steering wheel.

The directional flashers are controlled by the **directional flasher lever** on the right of the steering column below the steering wheel; this lever is depressed or raised according to desired direction. **Fig. 10.**

Correct operation of the directional flasher is indicated on the dashboard by an intermittent ticking noise and illumination of the green warning lamp at the bottom of the combination instrument. **Fig. 11.**

The directional flasher lever cancels automatically on completion of the turning manoeuvre; only for minor directional changes should it be necessary to return the lever to neutral by hand.

The **parking lights** are switched on on the appropriate side of the car by either lifting or depressing the directional flasher lever after the steering lock has engaged.

Lever lifted — nearside front and rear

Lever depressed — offside front and rear

The **windshield wipers** can be set to either slow or fast speed by pulling out the control button. High-speed wiper operation should be used only in the event of heavy rainfall. **Fig. 12.**

The **automatic windshield washer** is operated by pulling back the directional flasher lever on the right of the steering column using one finger of the right hand. This switchest the electric pump and windshield wipers on simultaneously. After releasing the lever a delayed-action relay switches off the wipers after the windshield has been cleaned.

**Warning!** The automatic windshield washer located on the right-hand side in the engine compartment, should never be operated with the wash fluid reservoir empty.



Two **windshield washer nozzles** are located in a protected position below the bonnet. If the jets should become misaligned the two nozzles can readily be set to the correct position without any need for tools. **Fig. 13.**

The forward-opening **bonnet** is unlocked from inside the car by pushing forward the bonnet lock lever located on the left side wall below the dashboard. It can then be opened easily from outside with the aid of the integral spring mechanism.

**Warning!** The bonnet should be closed only when the bonnet locking lever is pushed forward. After closing, the bonnet must be re-locked by pulling the lever back. **Fig. 14.**

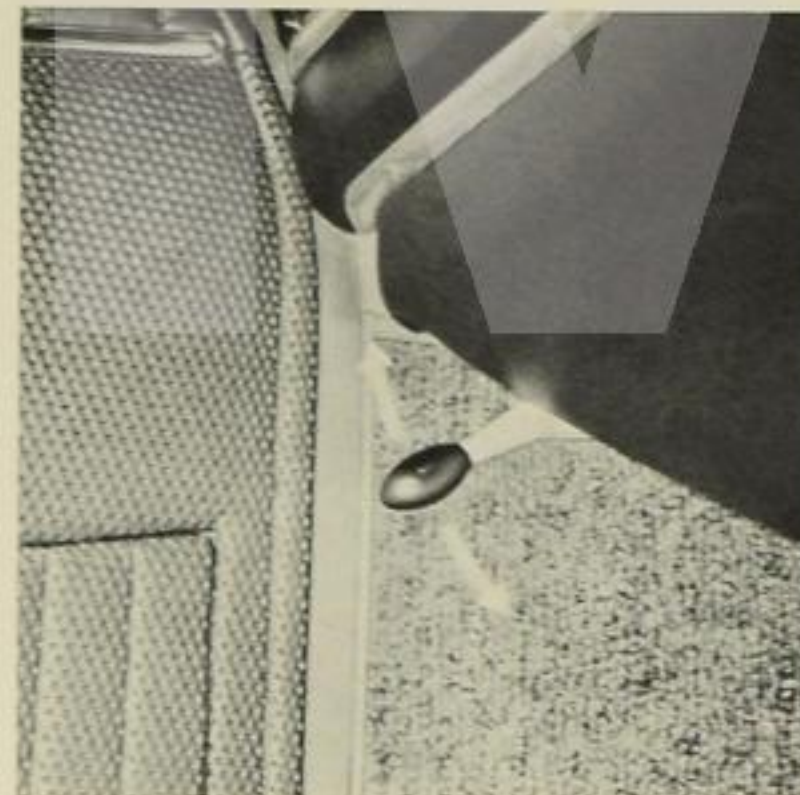
The hands on the **electric clock** are reset by pushing in the knurled button and turning as required. On the back of the clock, under a protective adhesive tape, is a regulating screw marked + (faster) and - (slower).

The **trip mileage counter** in the speedometer is reset to zero by turning the reset button to the left. **Fig. 15.**

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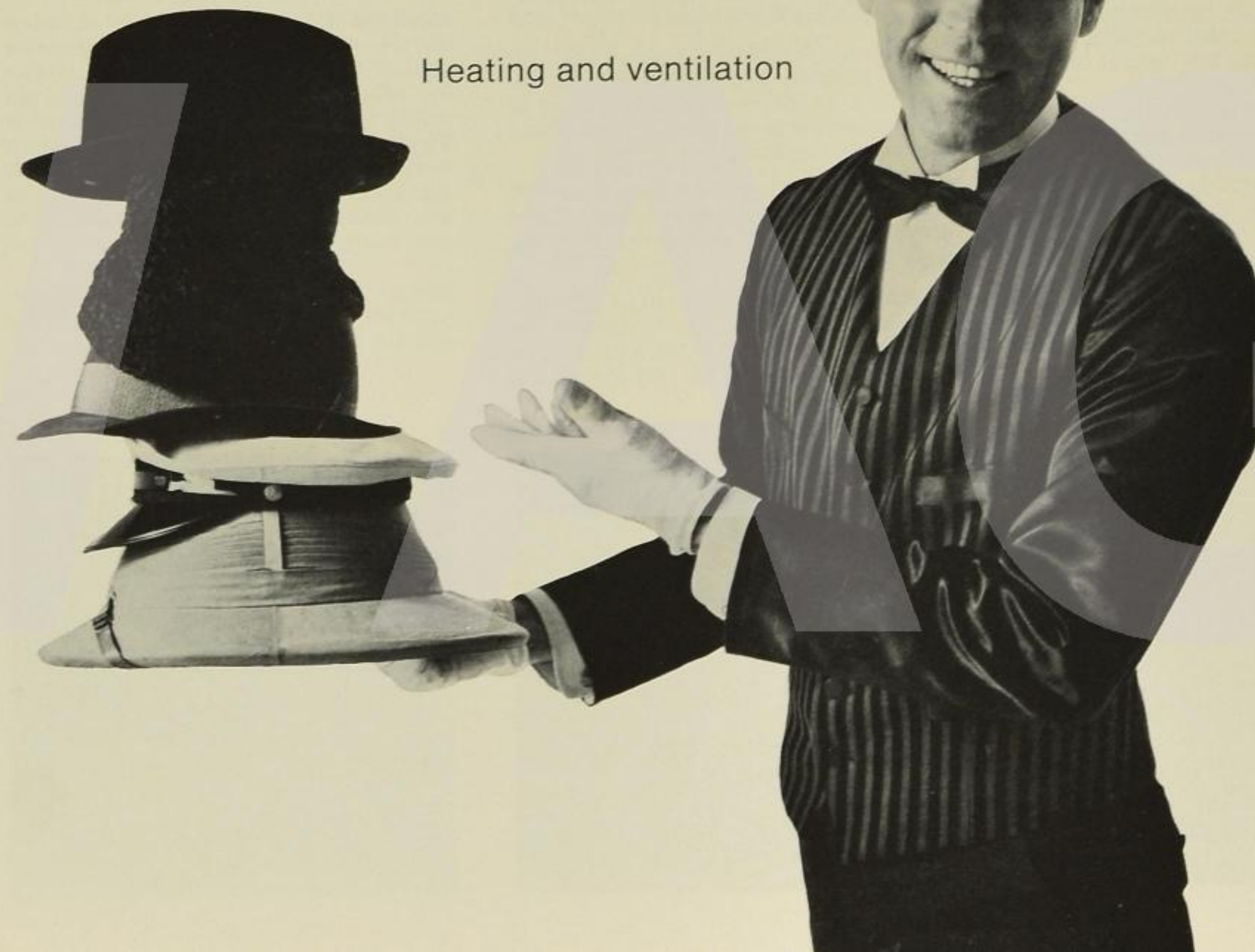
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## Heating and ventilation



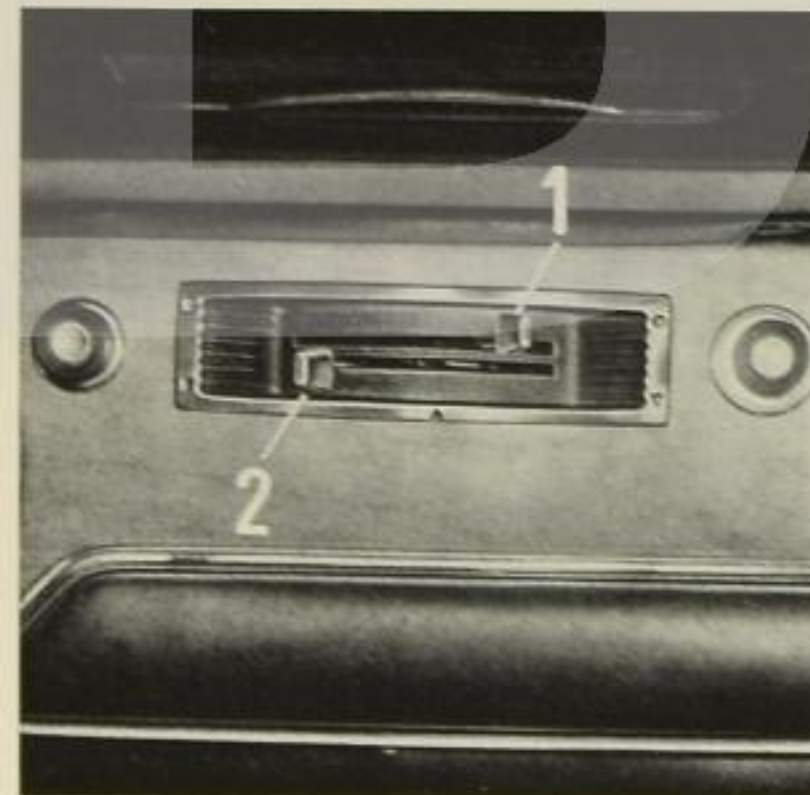


**Heating and fresh-air supply** are controlled easily and progressively by means of two centrally-located levers. Hot and fresh air can be mixed as required, thus ensuring ideal climatic conditions by maintaining the natural level of humidity within the car.

The heater is switched on by sliding the upper **hot air temperature control lever 1** from the left-hand position (blue) as required either partly or, for maximum heat output, fully over to the right (red). Fig. 16.

The lower **air distributor lever 2** provides efficient distribution of the air flow. Fig. 16.

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The air flow is **blocked** when the lever is fully in the left-hand position (e. g. for excluding exhaust fumes from commercial vehicles etc.).

By moving the lever to the right into **centre position** a progressively increasing flow of air is supplied upward to the **demister jets** on the windshield and to the side windows.

Between the centre position and **full right** a progressively increasing volume of additional heat is ducted into the **floor area**.

Where necessary, e. g. slow driving, heavily misted or iced-up windshield, the fresh air supply can be boosted by a **two-speed blower**. The pull switch on

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the right next to the steering column below the dashboard is shown in Fig. 17.

**Warning!** When the heater is switched on the radiator thermometer gauge is should not be used until the indicator on the second or fast blower speed within the white section of the dial.

**Ventilation:** while driving, stale air is evacuated from inside the car through slit apertures above the rear window and expelled through apertures in the rear roof posts. Fig. 18.

When travelling slowly or stationary the turnover of air can be boosted by the two-stage blower.

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The **cigar lighter** is operated by merely pressing in the lighter button as required. The button snaps automatically back as soon as the heater coil is glowing. Fig. 19.

The cigar lighter socket can also be used to plug in a handlamp, electric shaver or similar accessories up to an output of 50 Watts adapted for operation at 12 Volts. Care must be taken to avoid damaging the socket by use of unsuitable plugs.

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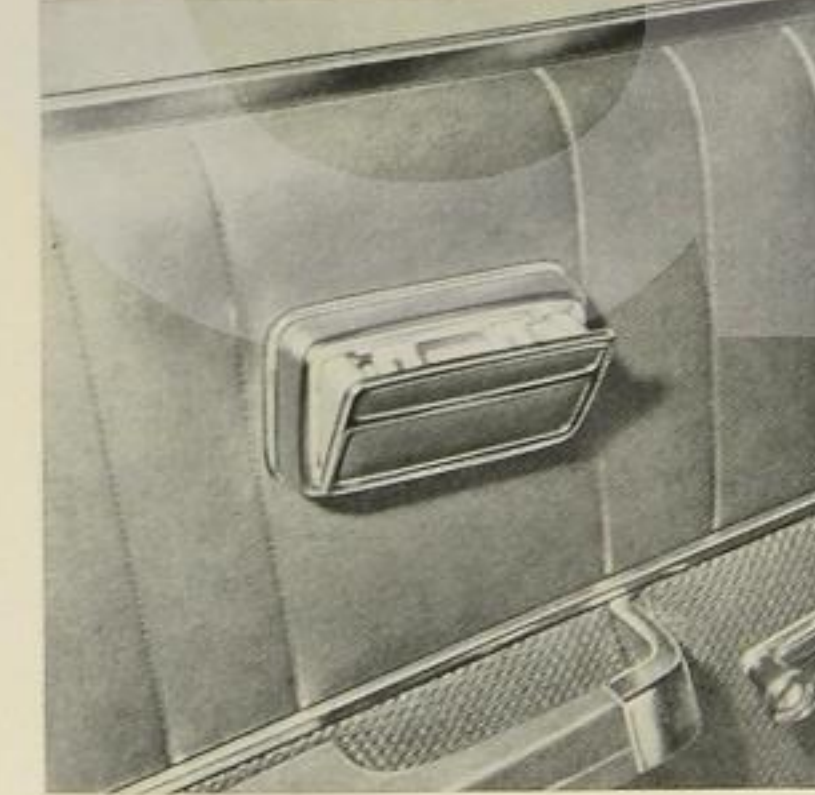
To empty the **dashboard ashtray**: raise ashtray lid, press the left-hand retaining spring to the right and lift the ashtray from the left-hand side. Fig. 20.

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To empty the **ashtrays on the rear doors**, swing out, press down and lift clear. Fig. 21.

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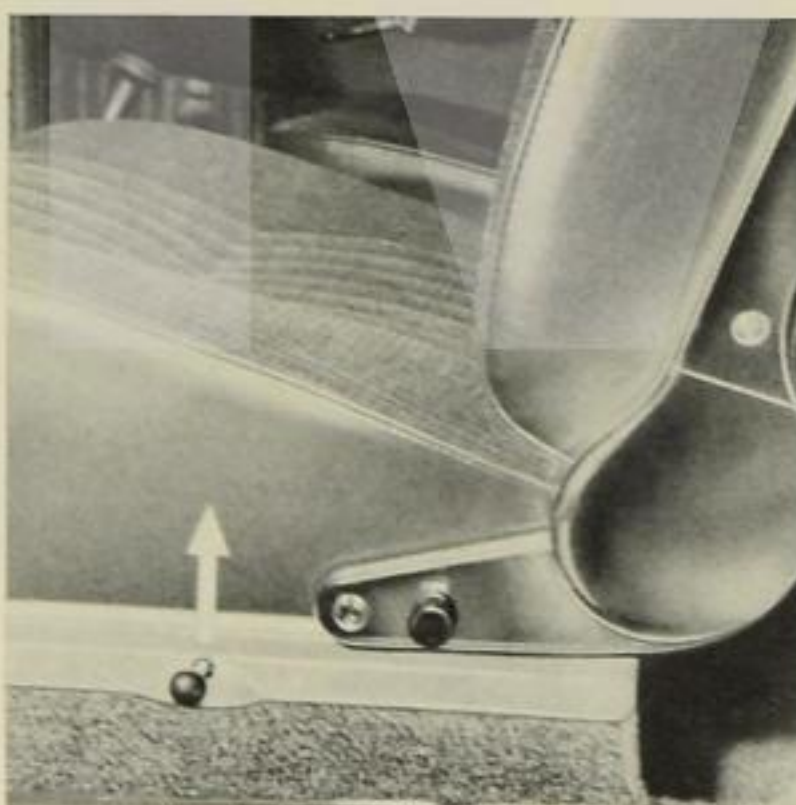
The **pivoted quarterlights** are opened or closed by rotating the screw control shown in **Fig. 22**.

When leaving your car please remember to protect your property against theft by screwing these window controls home until both pivoted quarterlights are closed securely.

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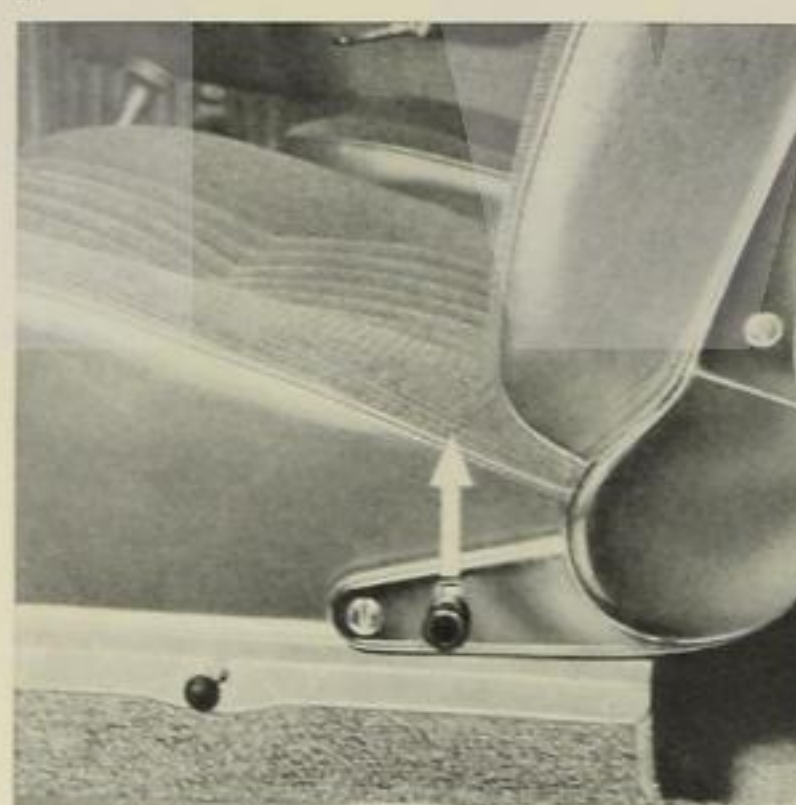


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The front seats can be moved forward or back by raising the lever on the outside of the seat and pushing the seat to the desired position, after which the lever can be released, making sure that the seat has locked securely into place. **Fig. 23**.

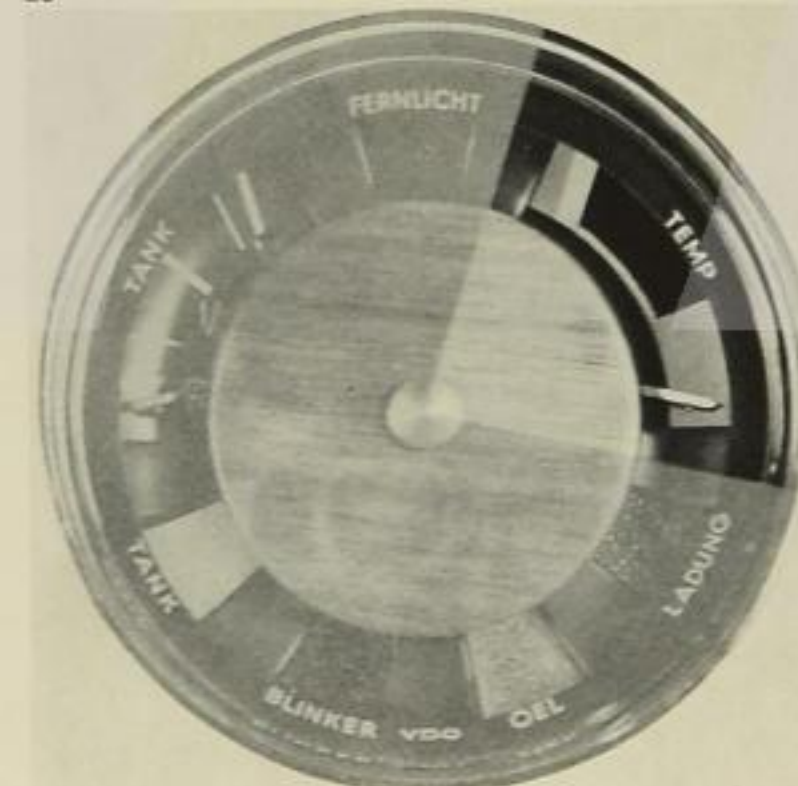
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The **front seat backrests** are adjustable for rake by raising the lever on the outside of the hinge mounting and pushing gently back against a slight spring pressure until fully reclined or allowing to spring forward unaided; then release the lever and the backrest will engage in the appropriate position. **Fig. 24**.

Mounting points are incorporated in the bodywork for fitting **safety belts** to the front and rear seats. Your BMW Service Agent knows the exact location of these points and will be delighted to install a set of safety belts in your car as an optional extra.

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The **radiator thermometer** in the instrument cluster (**Fig. 25**) has three colour bands:

**Blue:** Engine temperature below normal. Engine revolutions and driving speed should be kept within moderate limits while the needle remains in this area.

**White:** Normal operating temperature.

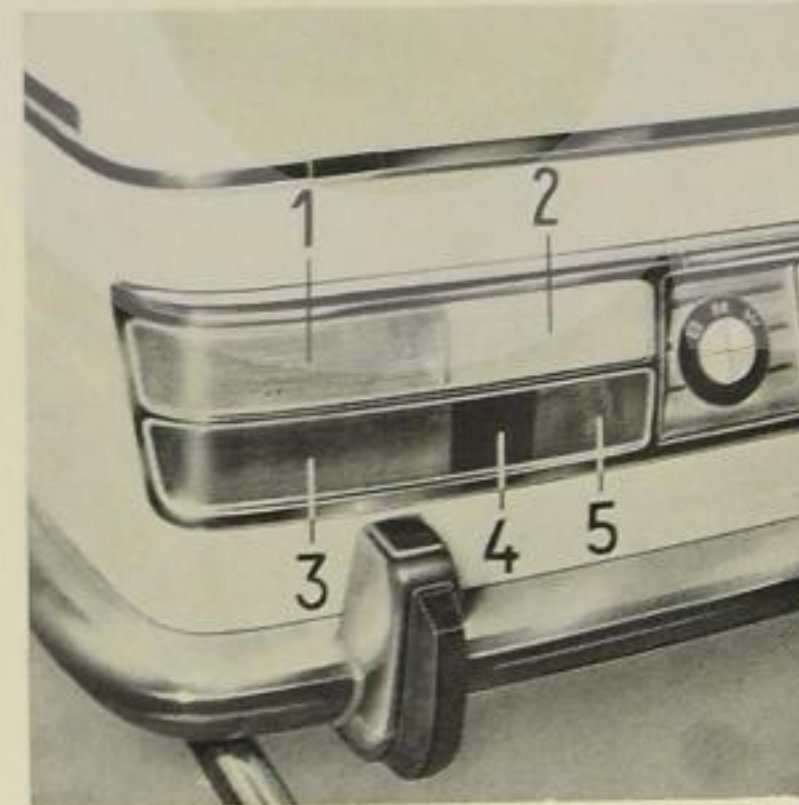
**Red:** Engine overheated. If outside temperatures are extremely high or if the engine is being subjected to heavy loads it is quite in order for the needle to encroach slightly into the red area for short periods. However, if the needle remains within the red shaded area for any length of time the cause will have to be investigated. In this connection see the "Minor Breakdowns" Section.

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When the ignition is switched on the fuel level is indicated on the **fuel gauge** in the instrument cluster. If the needle points to "Reserve" and the white warning lamp — incorporated as a warning lamp in the manual choke button — lights up, it is advisable to refill the petrol tank without delay, despite the fact that the fuel tank still contains sufficient fuel for about another 30 miles, depending on driving conditions. If the warning light burns continuously this indicates that you should refuel without further delay.

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The **fuel filler aperture** is located on the offside rear wing below a flap cover. **Fig. 26**.

**Fig. 27** shows the tail light arrangement, starting from the outside:

1. Directional flasher (amber)
2. Reversing lamp (white)
3. Tail lamp (red)
4. Rear reflector (red)
5. Brake light (red)

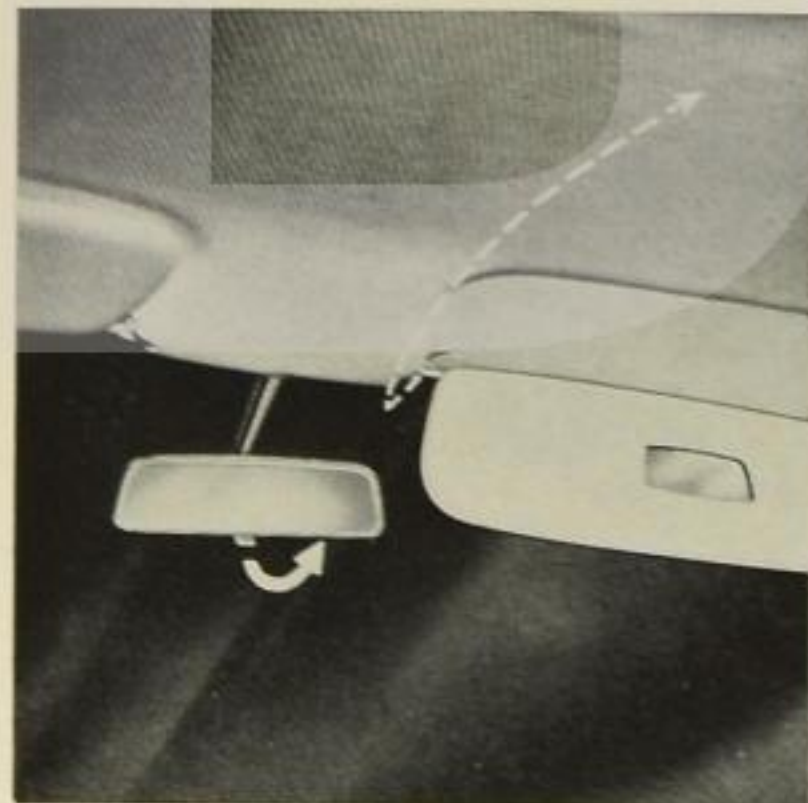


The **horns** are operated by depressing the hornring on the steering wheel.

Please adjust the **outside** and **interior** rear-view mirrors to provide the driver with perfect rear vision at all times.

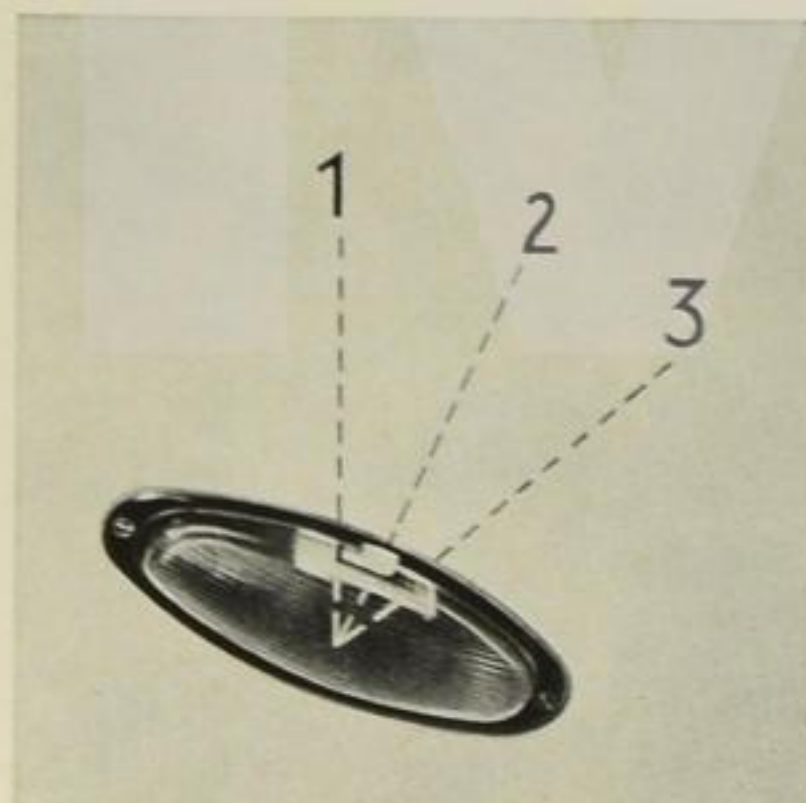
The **interior rear-view mirror** is of the anti-dazzle type and can be set by means of the small lever catch at the bottom to suppress dazzle from following traffic for night driving. **Fig. 28.**

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Each **sun visor** can also be pivoted round to deflect direct sunlight in the side windows. **Fig. 28.**

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The **interior roof light** is provided with three settings:

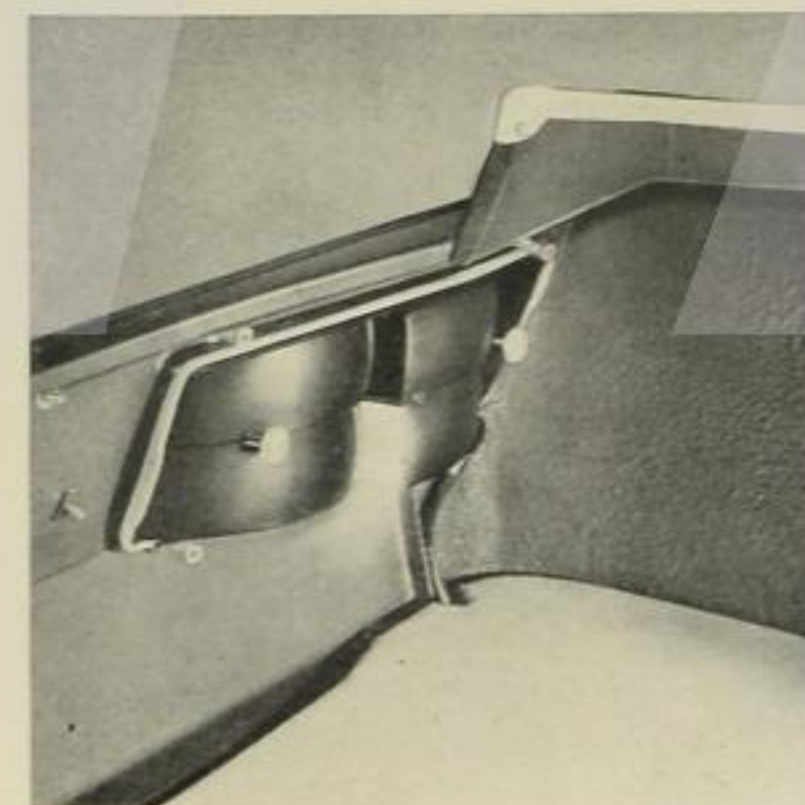
Setting 1: Lights burns only when the door is open (controlled by door contact switch)

Setting 2: Permanently off.

Setting 3: Permanently on. **Fig. 29.**

The **boot lamp** is controlled automatically when the headlamp switch (Page 10, Fig. 8) is pulled out. **Fig. 30.**

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The **handbrake** operates on the rear wheels. For braking or arresting the vehicle when stationary simply pull the brake lever up. To release the handbrake lift the lever slightly depress the button and push down. **Fig. 31.**

Just a tip: to engage the handbrake silently, depress the button when pulling the lever up.

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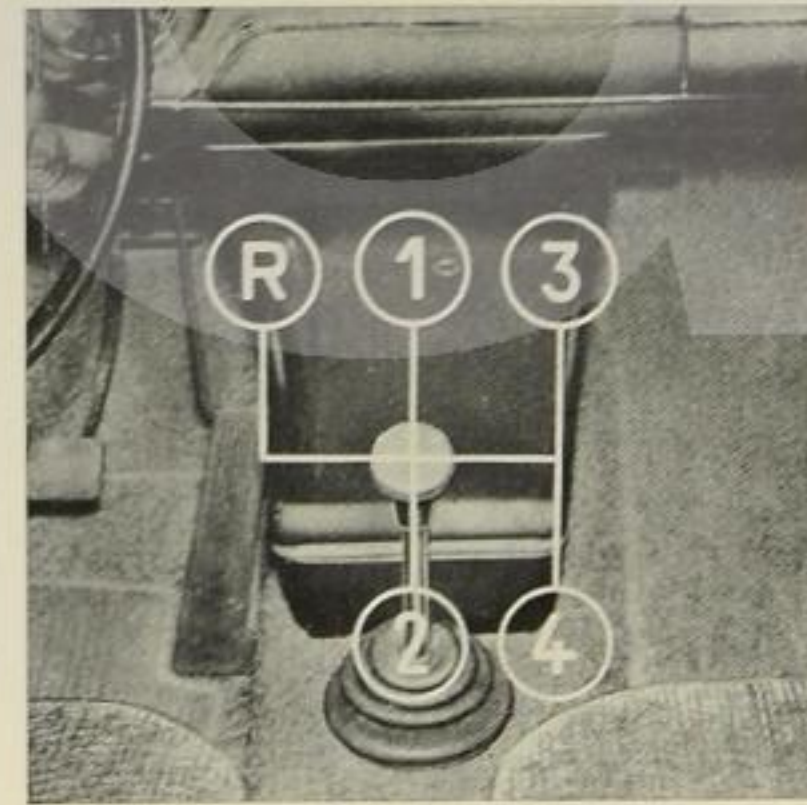


The gearshift lever position for the various gears is shown in **Fig. 32.** All forward gears are of synchromesh type.

To engage reverse gear (only when the vehicle is stationary) push the gear lever as far as it will go to the left, thereby overcoming a slight resistance.

Both **reversing lamps** light up automatically when the ignition is switched on and reverse gear is engaged.

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**Automatic Gearbox:** the following **selector lever settings (Fig. 33)** provide optimum performance adapted to a variety of driving conditions:

**P — O — A — 2 — 1 — R**

**P = Parking**

This should only be engaged when the car is stationary. When the lever is set to this position the driven wheels are locked, thus securing the car against movement. To engage the lever depress the left-hand lock button in the handle.

**O = Idling**

This severs all connections between the engine and the driven wheels.

**A = Automatic (Normal Driving)**

This setting is used for normal driving. The vehicle starts up in first gear and the gears engage smoothly and automatically in second and third as the driver accelerates; the moments of gear change are designed to produce maximum economy and efficiency in operation.

**2 = Hill Driving and Engine Braking Setting**

The setting produces optimum performance when driving in mountainous and hilly terrain. Engine performance is utilised to better effect and engine power is exploited to increase braking efficiency.

When the selector lever is in this position the gearbox does not shift into third gear; it is possible to drive in first and second gears only.

This setting should not be used at speeds in excess of 65 mph (110 kph), as this will cause the engine to over-rev.

**1 = Hill Driving and Engine Braking Setting**

This position is provided for driving conditions in which it appears advisable to remain in first gear, e. g. on steep hills and gradients.

If Position 1 is engaged at speeds above 45 mph (70 kph) the automatic gearbox will shift up into second gear without using the accelerator pedal.

As soon as driving speed reduces to around 45 mph (70 kph) the gearbox shifts back into first and will not shift up to 2nd even if the engine over-revs.

**R = Reverse Gear**

This should only be engaged when the vehicle is **stationary**. To engage reverse gear depress the left-hand lock button in the selector lever grip.

**"Kick-Down"**

The accelerator pedal can be depressed past maximum acceleration point by applying heavy foot pressure to overcome spring resistance.

In specific instances, e.g. when overtaking, this produces a spurt in acceleration by shifting down instantly into the next lower gear.

In such cases the transmission will not shift up to the next higher gear until the vehicle reaches a considerably higher speed; the precise moment in which the actual gear change occurs coincides approximately with the appropriate maximum permissible engine speed. This ensures that engine output is exploited to the full within individual gear ranges.

**Towing**

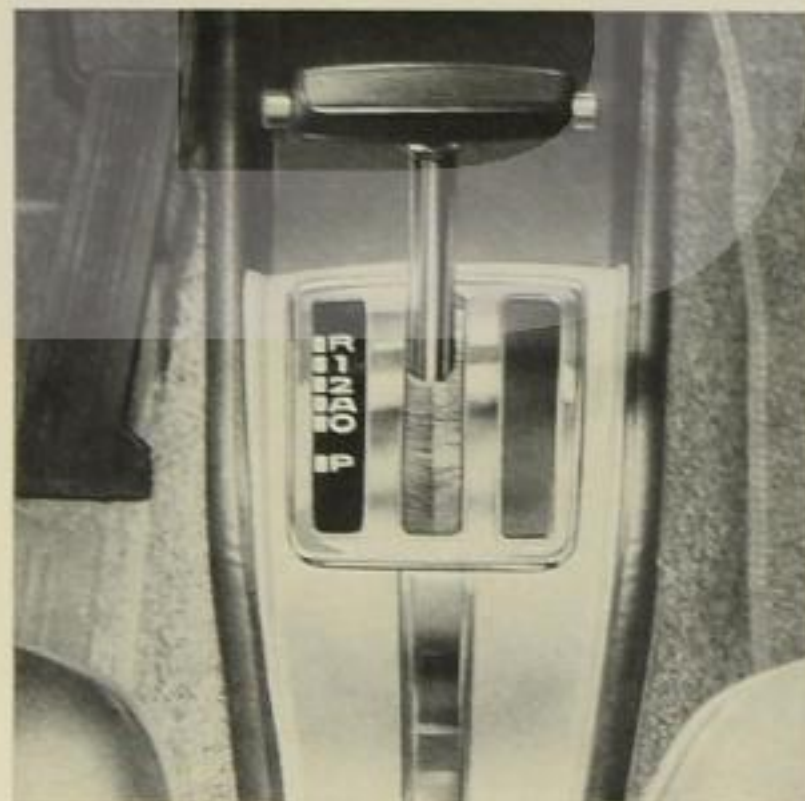
If the vehicle has to be towed the gear selector lever should be set to "O" = **Idling**.

The car should never be towed at speeds exceeding 30 mph (50 kph) or for distances greater than 25–30 miles (40–50 kms). If it is necessary to tow the car for longer distances the propeller shaft should be removed.

**Tow-Start**

Owing to the design of the automatic transmission system it is not possible to start engine by towing the car.

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Always ensure that the gear lever is in neutral before turning the starter switch. On cars fitted with automatic transmission the engine can only be started when the selector lever is set to "P" or "0".

Depending on outside and engine temperatures pull out the **choke button** with additional half-way stop position on the dashboard to the left of the steering column before operating the starter:

a) Pull out to maximum where outside temperatures are below  $-10^{\circ}\text{C}$ . **Fig. 34.**

b) Where outside temperatures are extremely low give one or two sharp jabs on the accelerator pedal to inject extra fuel into the intake tube while the starter is turning over the engine.

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The supplementary half-way stop position permits choke control in two steps:

First step: Increase of idling speed.

Second step: Operation of the choke valve in the carburetor.

For preserving the battery, especially under conditions of extreme frost, do not extend the first starting attempt beyond 10 seconds approx. A possibly necessary second starting attempt should only be made after a short interval of approx. 20–30 seconds and must likewise not exceed the duration of the first attempt.

After it has started up allow the engine to run for about three to five seconds and then push in the choke button into the half-way stop position so that the engine runs smoothly and evenly.

Move off with the choke button in this position until the pointer of the radiator temperature gauge within the blue section starts indicating the coolant temperature. Now push the choke button fully home.

To ensure that you do not forget push in the choke after the engine has warmed up, the white warning light in the instrument cluster — serving simultaneously as warning light for the fuel reserve — will continue burning until the choke has been pushed fully home. When the **engine is warm** (at normal operating temperature) the choke button

and accelerator pedal should not be operated.

When the **engine is hot** only accelerator pedal is to be depressed while starting.

**To start the engine** turn the ignition key to the right to "Start" setting until the engine has started but not for longer than about 10 seconds. When released the key returns automatically to "Drive" position.

During the starting process the radio (optional extra) switches off automatically.

For easier starting, particularly in conditions of heavy frost, it is advisable to switch off all possible current consumers and to depress the clutch pedal.

If the starter is to be used twice in succession the ignition key must first be turned back from the "Drive" to the "Garage" setting. This deliberate delay serves as a precaution against engagement of the starter when the engine is still running. Please avoid starting the engine before it has stopped completely, as this may cause damage to the fly-wheel or starter assembly.

Once the engine has started the oil pressure warning lamp (orange) and battery warning lamp (red) in the instrument cluster should extinguish as engine speed picks up.

If the oil pressure warning lamp lights up while driving engage the clutch **immediately** and switch off the ignition. If a check of the engine oil dipstick shows a satisfactory level call in your BMW Servicing Agent. If the warning lamp lights up briefly while the engine is idling this is no cause for alarm provided the light extinguishes when the accelerator pedal is depressed.

If the battery warning lamp lights up while driving consult a BMW Workshop without delay, as the battery may otherwise run down completely.

It is not advisable to allow the engine to warm up at idling speed; after starting move off at **moderate** engine speed and push the choke control — if it has been used — back in as soon as the remote engine temperature gauge shows an increase in cooling water temperature.

Only where there are low outside temperatures should the cold engine be allowed, after starting, to run up for about half a minute at increased idling speed to ensure thorough engine lubrication.

A cold engine should never be warmed up at high engine speed as this can have serious adverse effects upon its useful life.

Great caution should also be exercised when starting the engine inside garages or other enclosed spaces owing to the presence of odourless, invisible and extremely poisonous carbon dioxide gas in the exhaust fumes (open doors).

When declutching the clutch pedal should be pushed down to its full distance. Never allow your foot to "ride" on the clutch while driving.

#### Moving off with automatic transmission:

Automatic transmission settings A, 2, 1 and R can be engaged from the P and 0 settings when the engine is running at idling speed.

#### Stopping with automatic transmission:

With the engine running at idling speed and selector lever engaged in Drive position the car will show a tendency to creep forward on straight and level ground. The foot brake should therefore be applied gently.

The engine is switched off by turning the ignition key to the "Garage" position.





Running-in

No governor is fitted to the engine of your **BMW 2000**, i. e. no mechanical restriction has been imposed to limit performance. It is consequently in your own interests to observe the following **running-in instructions** if maximum possible durability and economy are to be obtained from your car.

**Maximum Permissible Speeds during the first 600 miles (1,000 kms):**

1st gear	20 mph ( 30 kph)
2nd gear	35 mph ( 60 kph)
3rd gear	55 mph ( 85 kph)
4th gear	75 mph (115 kph)

Fig. 35.

Selector lever position 1 25mph ( 45kph)  
Selector lever position 2 50mph ( 80kph)  
Selector lever position A 70mph (115kph)

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**Maximum Permissible Speeds between 600 miles (1,000 kms) and 1200 miles (2,000 kms):**

1st gear	20 mph ( 30 kph)
2nd gear	40 mph ( 65 kph)
3rd gear	60 mph ( 95 kph)
4th gear	80 mph (130 kph)

Fig. 36.

Selector lever position 1 25mph ( 45kph)  
Selector lever position 2 55mph ( 90kph)  
Selector lever position A 80mph (130kph)

During the running-in period the car should only be driven for short periods at the maximum permissible speeds for the individual gears. Frequent variation of travelling and engine speeds and

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prompt changing down from the higher gears are recommended — specially in hilly or mountainous terrain.

Use of the **"Kick-Down" accelerator setting** (see Page 20) must be avoided under all circumstances during the first 1,200 miles (2,000 kms).

**Running-in Instructions for the Braking System:** Sudden and fierce braking, specially from high speeds, must be avoided for the first 300 miles (500 kms), as should brake fade tests, since this will impair the ultimate brake lining performance in respect of wear and friction.

Slight resistance in the operation of the gearshift mechanism, steering etc., likely to occur during the **running-in period** will disappear after short.

Provided road and traffic conditions permit, **from 1,200 miles (2,000 kms) onward** you may **gradually** increase the driving speed of your car to a maximum figure of 104 mph. **The permissible cruising speed** in 4th gear or with the automatic gearbox lever set to "A" is:

102 mph (165 kph).

**Maximum Permissible Speed after Running-In:**

1st gear	27 mph ( 44 kph)
2nd gear	51 mph ( 82 kph)
3rd gear	78 mph (126 kph)
4th gear	104 mph (168 kph)

Selector lever position 1 40mph ( 65kph)  
Selector lever position 2 68mph (110kph)  
Selector lever position A 104mph (168kph)





Please, go ahead

To give of its best the engine needs a regular commercial **super-grade** petrol with a minimum octane rating of 95 based on the official (ROZ) research method.

If you should be obliged, in exceptional circumstances, to use a fuel of lower octane rating, e.g. lower knock resistance, observation of the following basic rule can contribute greatly to avoiding engine "pinking": always keep the engine running at over 2500 rev/min, change down promptly and accelerate only slowly and cautiously. On Page 66 you will find the "Speed-Engine Revolutions" graph applicable to the BMW 2000.

The **economy** achieved with your car depends to a great extent upon your method of driving. As with most other things in life, extreme demands and stresses can exact a heavy toll: fast driving, revving the engine up to maximum limits in individual gears (see Page 25), sharp cornering and sudden braking not only result in a higher consumption of fuel and oil, they also impose heavier wear on the tyres, braking system and the whole power transmission system.

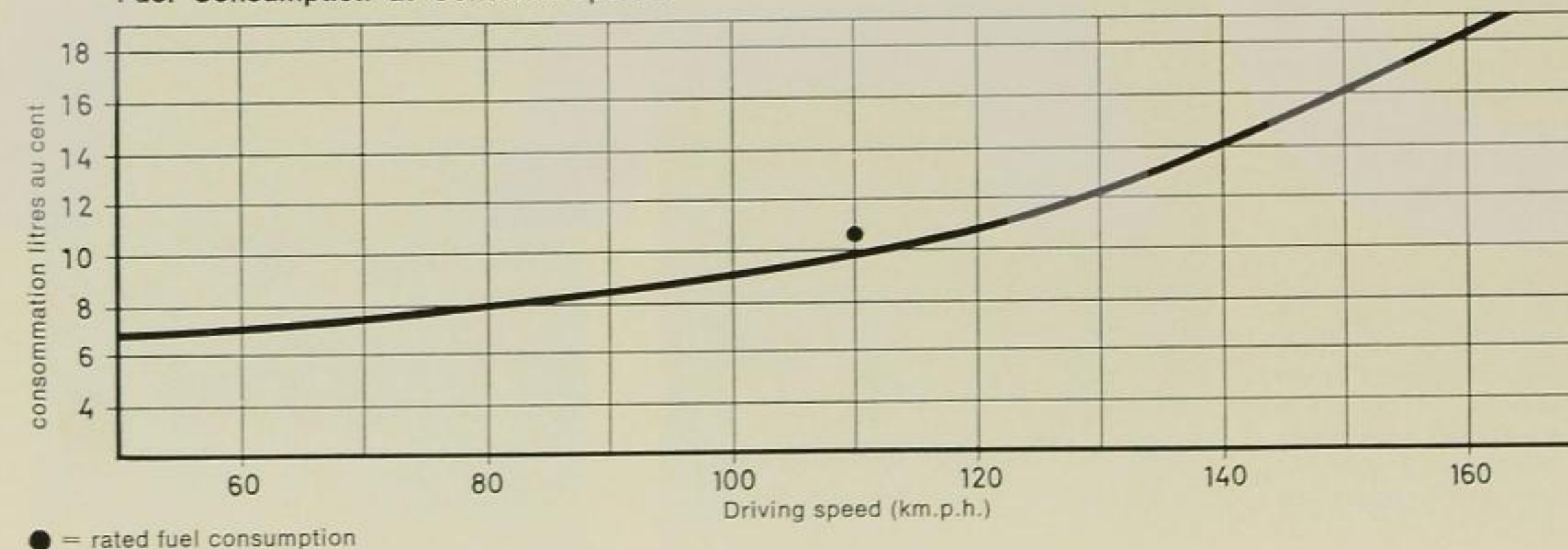
**Fig. 37 shows the fuel consumption** relative to vehicle speed with standard equipment and loaded with two persons.

The **standard fuel consumption** is determined by a standardised system of test regulations. It is by no means identical to average consumption, which can be influenced by such variables as driving methods, load, road conditions, traffic density and flow, weather, tyre pressures etc.

After drawing through heavy city traffic or being penned into slow moving single-lane convoys we advise you to allow your engine to "stretch" itself by driving for a few miles at engine speeds ranging between 4500 and 5500 rev/min. This will eliminate any soot and carbon deposits which may have accumulated.

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Fuel Consumption at Constant Speeds





Just as the fuel consumption, the **engine oil consumption** depends on a variety of factors.

We advise you to check the oil level before each journey (**Fig. 38, 1**) and, where appropriate, to top up with fresh oil of the same grade at the filler hole (**Fig. 38, 2**), filling only up to the top mark on the oil dipstick. Overfilling past the top mark is useless and can, indeed, result in damage. The quantity of oil between the two marks on the dipstick is approx. 3 pints. The oil level must never be permitted to drop below the lower mark. Never remove the oil filler cap while the engine is still running! **Changing from one brand or grade of oil to another should only be done when the complete oil and filter are changed.**

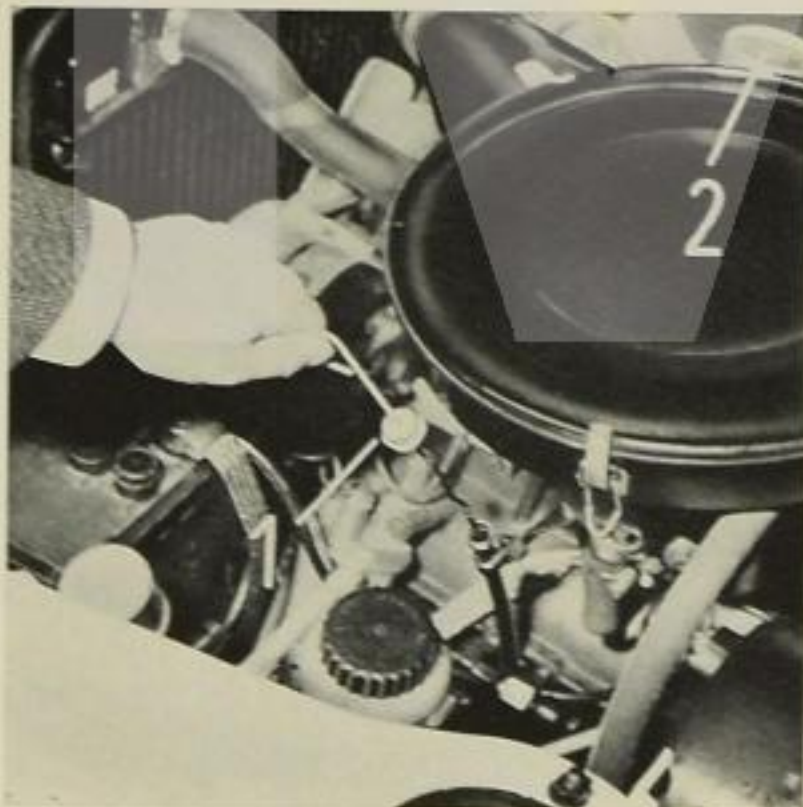
Our engines are designed to function efficiently on the latest highly developed brands of commercial lubricant and have **no need of additives**. The same applies to gearbox and differential lubricants.

Where appropriate, the **oil level in the automatic gearbox** must be checked at the same time as the engine oil (see Page 51), **Fig. 39**.

An old rule of motoring states that the engine should never be switched off immediately after travelling **at high speeds in mountainous conditions or on the motorway**, but should be run for a few minutes at idling speed or slightly faster in order to dispose of thermal build-up in the engine with consequent losses of cooling water.

**Warning!** When removing the radiator cap from an overheated engine do not forget to wear a glove or use a suitable rag; turn the radiator cap a quarter turn to the left until reaching the first retainer groove. Allow excess pressure to escape and then continue to turn and remove. When replacing screw right down until engaging in the second retainer groove. When descending **steep gradients** maximum use should be made of the braking action of the engine by changing down to a suitable lower gear. Never attempt to drive with the clutch disengaged, in neutral gear or, particularly, with the ignition key switched off!

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After driving for long periods on wet roads, in rain or in slush, the brakes may require slightly greater foot pressure than in normal conditions.

Sustained **excessive brake pedal pressure** will in due time indicate a pronounced **wear of the brake pads**. For safety reasons one spreader spring on each brake caliper will enter in action as the minimum lining thickness is attained, and remind you to look after it in order to avoid brake discs damages. In such a case have the brake pads immediately replaced at a BMW service station.

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Particularly for long **foreign trips** we recommend that a few minor spares should be carried, for example, lamp bulbs, fuses, V-belts, spark plugs, gaskets etc. Your BMW Agent will doubtless be only too pleased to provide you with any advice in this connection.

While foreign travel regulations normally require display of the officially recognised plate denoting your country of origin, additional regulations are imposed in some countries. Information in this connection can be obtained through the regular motoring associations, consular offices, etc. When crossing frontiers in countries where traffic drives on the opposite side of the road to that in your own country the wedge-shaped areas on your headlamp lenses must be

covered with a suitable piece of adhesive tape to prevent the asymmetric low beam driving lights on your car from dazzling oncoming traffic. **Fig. 40** shows this lens covering as applied when changing from right-hand to left-hand drive.

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## Trouble-free Winter driving



The following recommendations apply to **winter driving**: before the cold weather sets in it is always advisable to add a suitable quantity of a regular commercial grade of antifreeze to the contents of the radiator, mixed in the proportions recommended by the manufacturer (total radiator capacity slightly over 12.3 pints/7 litres); for draining and refilling see page 56.

Reliable functioning of the **windshield washer unit** should also be safeguarded by adding an appropriate amount of antifreeze to the contents in the unit reservoir (reservoir capacity approx. 1.8 pints/1 litre).

For outside temperatures **below 0° C** a commercial brand of HD engine oil **SAE 10 W 30** should be used.

In the event of a sudden drop in outside temperature, do not wait until the next oil change before adding the correct grade of oil.

Check automatic air intake pre-heat valve for freedom of movement and correct setting of lever for summer and winter operation (see page 61).

A well-charged **battery** is the prime requirement for reliable engine starting, since cold weather not only impairs battery efficiency it also dictates heavier use of electrical equipment.

**Warning!** When re-charging the battery in the vehicle (only when the engine is stationary) both battery leads must be disconnected.

When **winter tyres** are fitted, tyres of the same make and exactly the same type are to be installed **on all four wheels** —

in order to ensure reliable track accuracy and steering manoeuvrability. This applies particularly to M + S-Ice tyres. Do only use either normal tyres **or** radial ones, never both tyre types on the same vehicle. A maximum speed of 80 mph (130 kph) must not be exceeded. Particular attention must also be given to the maintenance of the tyre pressures prescribed for winter tyres and the wheels must be balanced after each tyre or wheel change. When **snow chains** are fitted never exceed a maximum speed of 45 mph (70 kph).

When **parking in conditions of extreme frost** engage 1st or reverse gear to prevent the car from moving. Do not apply the handbrake overnight as this may cause the brake linings to freeze on to the brake drums. If your car is fitted with an automatic transmission park with the selector lever set to "P" (P = Park).

A small quantity of fine graphite powder blown into the various **lock mechanisms** on your car will prevent freezing in cold weather. Glycerine or de-icer fluids should not be used for this purpose as they might impair lock operation. If, despite all precautions, a door lock does freeze up it can usually be thawed out by heating the key before insertion.

If there is a risk of the **rubber sealing strips** round the doors, bonnet or luggage compartment lid freezing, we recommend that the rubber surfaces only be coated with glycerine.

In winter, **chromium plated and polished components** may be protected with a transparent preservative lacquer.

The **underside** of your car is protected as standard with an underseal coating. Before the winter season commences, in particular, it is advisable to inspect the condition of the underseal and have it renewed if necessary. No lasting protection against rust is afforded by spraying with compounds containing oil, and in fact these will damage rubber components situated on the underside of the vehicle, and may in addition cause the existing underseal coating to become loose. You are therefore asked to use only preservative compounds with a wax or bitumen base. Your BMW dealer can recommend an approved brand.

Before applying underseal the disc brakes must be carefully shielded. No preservative should be allowed to reach the brake piston seals or the brake discs themselves.

After heavy snowfall clear the **air intake apertures** forward of the windshield to ensure efficient functioning of the heating system.

In winter we also recommend you to carry the following items in your car:

Sand to improve traction when starting on icy hills.

A shovel in case your car should get bogged down.

A suitable board or plank as a jack underlay, a hand brush and an ice scraper for removing snow and ice from bodywork and windows.



## Minor Breakdowns



Here are a few hints for remedying minor breakdowns yourself if no suitable workshop facilities are available.

Tyre breakdowns have become extremely rare nowadays. However, should you suffer this mishap the following procedure is recommended: first park the car safely away from traffic and apply the handbrake. Please don't forget to set up warning reflectors or a flasher lamp at a suitable distance from the car to warn other road users.

The spare wheel, jack and toolkit are to be found in the boot below the left-hand floor plate which is held in place by spring pressure and can be opened by merely lifting it up.

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The hexagonal retaining nut holding the spare wheel in place serves simultaneously as a reserve wheel nut. This is removed with the aid of the wheel nut wrench. **Fig. 41.**

Using the hook at one end of the wheel nut wrench apply gentle leverage below the rim of the hub cap at a point opposite to the valve and gently lever the hub cap off into your free hand. **Fig. 42.**

Remove the chrome embellisher ring and loosen the wheel nuts.

Position the jack as indicated in **Fig. 43** (please note the jack should be positioned only at one of the four **jacking**

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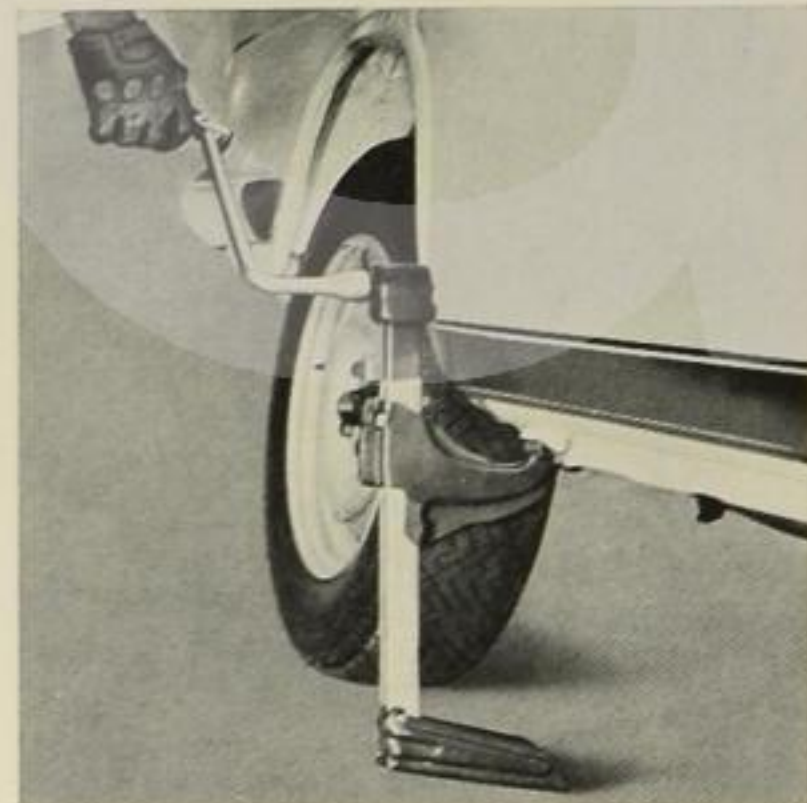
**points** provided for that purpose) and, using the wheel wrench, crank the car up until the appropriate wheel is sufficiently clear of the ground.

Remove the wheel nuts and change the wheel. Replace the wheel nuts and tighten evenly under moderate pressure. Lower the car and **thoroughly tighten** the wheel nuts, starting on one side and completing in a criss-cross pattern.

Replace the rimblishers and then refit the hubcap by first placing the rim over two of the retaining lugs and striking gently with the palm of the hand until it snaps over the last of the three lugs.

Don't forget to have the defective tyre repaired without delay.

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### Starter fails to operate when ignition key to "Start" position:

This can be checked by first turning on the headlamps and then engaging the starter.

1. If the headlamp beam dies down gradually the battery is either run down or defective. Recharge (see Page 31) or replace the battery. If necessary push or tow the car to start the engine. Cars fitted with automatic transmission cannot be started by either of these methods. For notes on towing see Page 20. A **towing shackle** is fitted on the front offside (nearside on the RHD vehicles) of the front axle member. **Fig. 44.** When being towed engage 3rd gear, switch on the ignition and declutch. Release the clutch when the car gathers momentum.
2. If the headlamps extinguish suddenly, check the lead connections on the battery and starter for satisfactory contact and tighten where necessary.
3. If there is no change in the brilliance of the headlamp beam consult your BMW Agent (possible starter defect).

### Engine fails to start despite starter operation:

Provided the starting instructions detailed on Pages 22 and 23 have been observed and sufficient fuel is in the tank this could be attributable to a fault in the ignition system or the fuel delivery system.

1. Check to ensure that the ignition lead caps are seated firmly on the spark plug heads and check the tight-

ness of all connections on the coil, distributor and lead plugs. Verify whether the defect is due to penetration of water during car washing or similar.

2. Check spark plugs for correct gap and appearance (see Page 58).
3. To check individual spark plugs for correct functioning unscrew each plug in turn and insert in the appropriate plug lead cap; then hold the metal exterior of the plug against a blank part of the engine housing. When the starter is operated sparks should jump between the electrodes. If no spark appears repeat this test on the same cable lead with a new spark plug. If this is also unsuccessful check the distributor (see Page 58).
4. To check the fuel supply system detach the fuel line from the carburettor and operate the starter. If no petrol appears check the fuel filter (see Page 57), fuel lines and fuel pump. On the other hand, if fuel does emerge unscrew the carburettor jets (see Page 63) in sequence and clean thoroughly, preferably by blowing through. If necessary a bristle from a clothes brush, hand brush or similar can be used, but never attempt to clean carburettor jets with a needle, piece of wire or any other hard object!

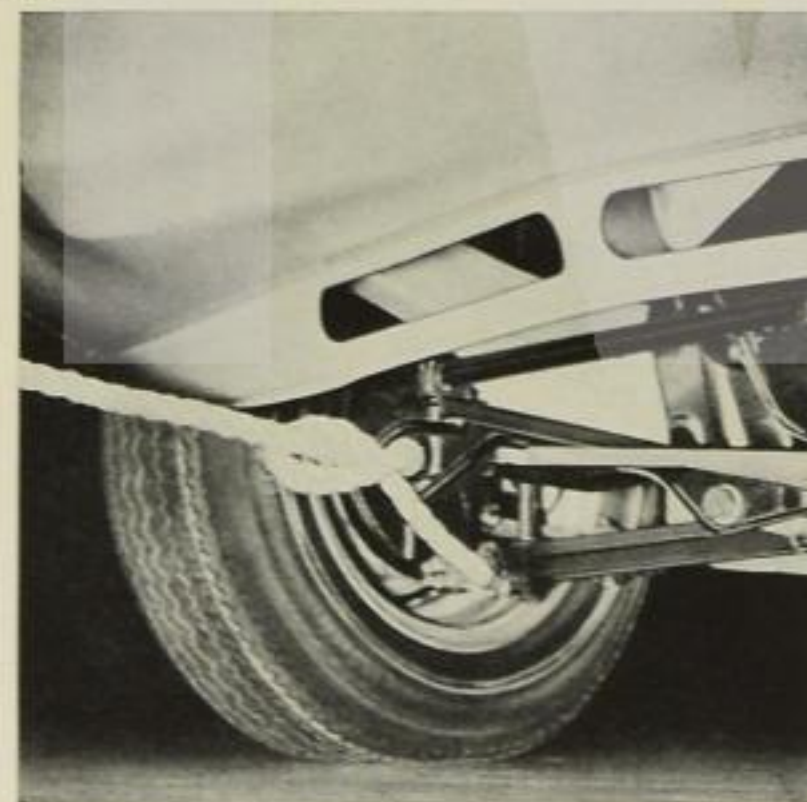
### Excessive coolant water temperature:

1. Cautiously remove the radiator cap and check the water level in the ra-

diator. If a large quantity of water has been lost a radiator should **never be filled when the engine is hot**; allow the engine to cool down sufficiently to allow hand contact.

2. If excessive coolant water has been lost check the radiator cap, all hose connections and the radiator block for leaks.
3. Check to ensure that any extra radiator covering which may have been used has been removed.
4. Check fan belt and tighten or replace where necessary (see Page 61).
5. Check timing (see Page 59).
6. If necessary have your cooling system flushed out by your BMW Agent.

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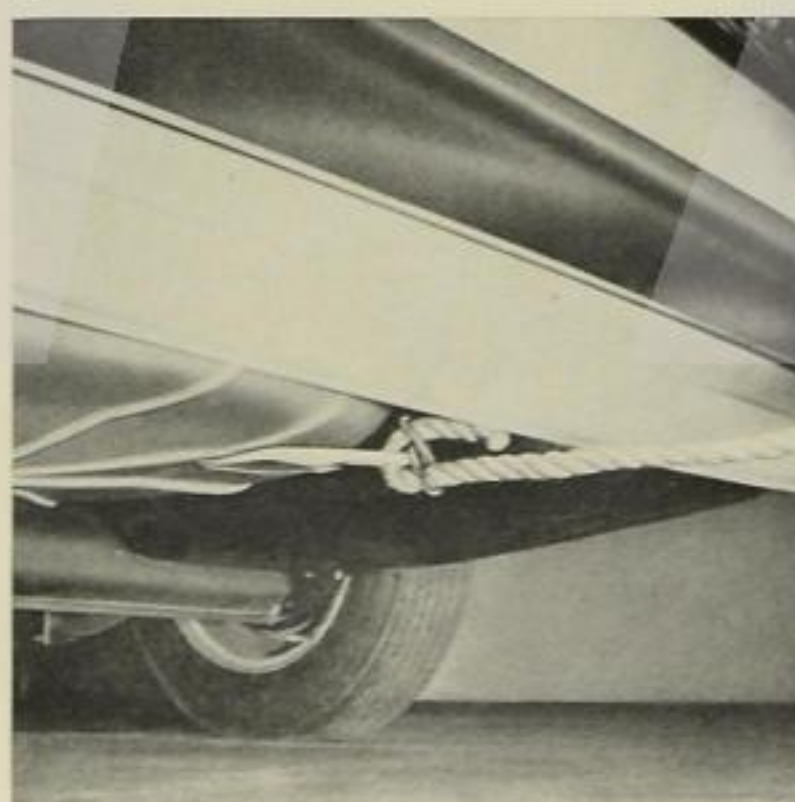
### Defective Brake System:

Should any defects arise in the braking system we urgently recommend you to contact your authorised BMW Workshop without delay.

### Bogged-Down (deep snow, sand, soft subsoil etc.):

Use the accelerator only sparingly and a suitable underlay should be set into position to allow the rear wheels to grip (if necessary use the car floor mats) and have the car pushed or towed out before the wheels bog down completely. If necessary apply the handbrake gently to prevent spinning on one side. Don't forget to release the handbrake afterward.

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### Towing Another Vehicle:

If you propose to assist another vehicle by towing with your BMW we advise you to ensure that the other vehicle is not heavier than your own. A **towing shackle** is positioned underneath on the reserve wheel well. **Fig. 45.**

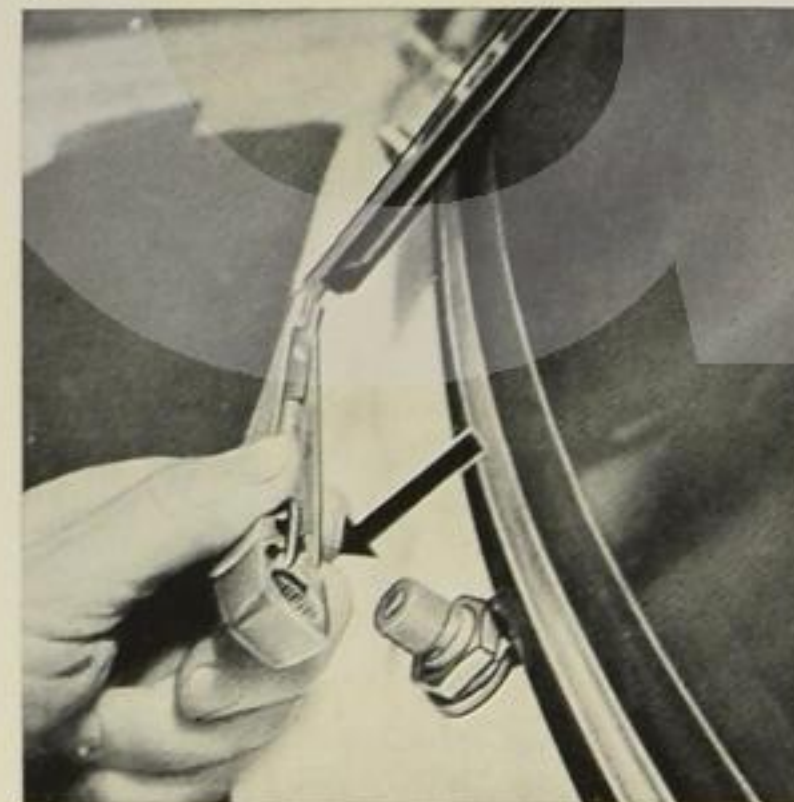
46



To pull off a **windshield wiper blade** fold the wiper arm away from the windshield. Push the centre part of the wiper blade upward and back and simultaneously lift off the retaining clip. **Fig. 46.**

The complete **wiper arm** can be taken off by lifting its spring retainer slightly clear of the drive pinion. **Fig. 47.**

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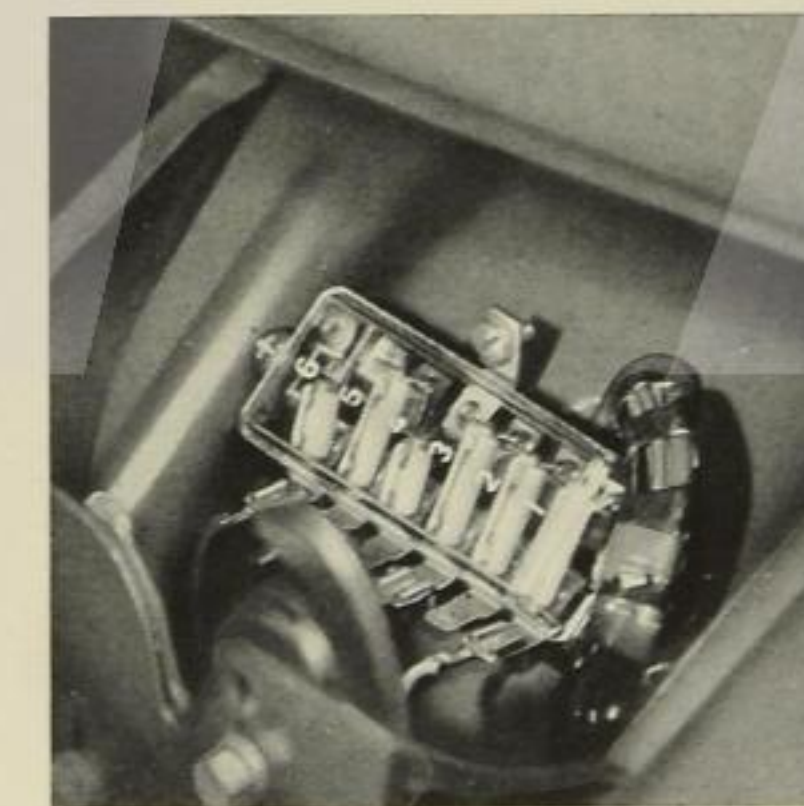
## Headlamps and Bulbs

If there is any breakdown in the electrical equipment on your car a check should first be made of the fuses. The **fusebox** is located on the upper left-hand side of the bulkhead in the engine well. **Fig. 48.**

A burned-out fuse can be recognised by the melted metal band visible through the transparent plastic jacket. The burned-out fuse should be pulled out of its spring fastening and replaced.

Never attempt to repair burned-out fuses provisionally with wire or some similar means as this might well result in fire. If fuses burn out repeatedly this indicates a defect which should be referred to your BMW Workshop.

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### List of Fuses in Numerical Sequence:

No.	Fuse Element (DIN 72 581 Standard)	Consumer
6	16 Amps	Brake lamp, horns, windshield wiper, windshield washer unit, oil pressure warning light, fuel warning light, fuel indicator, remote thermometer.
5	8 Amps	Blower, directional flashers, reversing lamp
4	16 Amps	Interior courtesy light, clock, cigar lighter or socket.
3	8 Amps	Tail, parking and side lights, offside.
2	8 Amps	Licence plate lights, selector position indicator lamp with automatic transmission.
1	8 Amps	Tail, parking and side lights, nearside.

When **changing bulbs** or carrying out other work on the electrical system please remember always to turn off the relevant consumer to avoid short circuits. Alternatively the earthing lead can be disconnected from the negative pole of the battery.

New bulbs should never be handled with bare hands; a clean cloth, paper serviette or similar should be employed. When changing headlamp bulbs please take care to avoid altering the setting of the adjusting screws.

### Instrument Lighting:

To change these bulbs it is first necessary to remove the padded panel below the dashboard. The burned-out bulb can be pulled out, together with its fitting, from the back of the instrument concerned. The bulbs are changed by turning under slight pressure.

### Speedometer:

Lighting: 2 indicator bulbs (H), 2 Watts.

### Clock Light:

1 indicator bulb (H), 2 Watts.

### Instrument Cluster:

Lighting: 2 indicator bulbs (H), 2 Watts.

High beam warning lamp: 1 indicator bulb (H), 2 Watts

Battery warning light: 1 indicator bulb (HL), 4 Watts

Oil pressure warning: 1 indicator bulb (H), 2 Watts

Choke warning and reserve fuel warning lamp: 1 indicator bulb (H), 2 Watts

**Warning!** It is essential to use a 4 Watts (HL) bulb for the battery warning light!



**Shift indicator lamp** with automatic transmission: removal of the plastic lens gives access to both indicator lamps (H), 2 Watts.

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#### High and Low Beam Headlamps:

Open bonnet and remove the plastic cap from the back of the headlamp unit. **Fig. 49.** Withdraw plug and turn the bayonet catch to the left and remove, take out bulb. When inserting the dual-filament lamp (A) 45/40 Watts note the relative position of the recess in the reflector. **Fig. 50.**

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#### Side and Parking Lights:

Open bonnet and remove the burned-out indicator bulb (HL), 4 Watts, including fitting and rubber cap. The bulb can be removed by turning under slight pressure. **Fig. 51.**

51



#### Directional Flasher, Front:

Loosen the two Phillips screws and take off the plastic lens with gasket. Turn the 21 Watt spherical bulb, Spare Parts No. 63 21 8 780 135 under slight pressure until it can be extracted. **Fig. 52.**

52



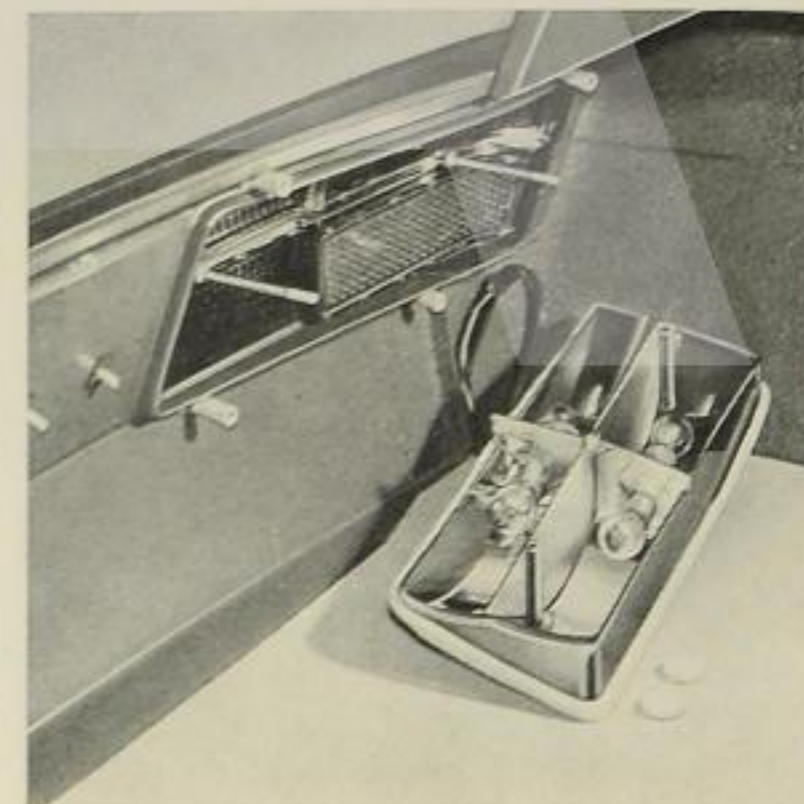
#### Tail Lights:

Open the boot, unscrew both knurled nuts and take off the lamp assembly. **Fig. 53.**

Take out the defective bulb from the fitting and replace:

1. Directional flasher spherical bulb, 21 Watts, Spare Parts No. 63 21 8 780 135.
2. Reversing lamp — spherical bulb (F), 15 Watts.
3. Tail, parking or side light — spherical bulb (G), 5 Watts.
4. Spherical tail lamp bulb, 21 Watts, Spare Parts No. 63 21 8 780 135.

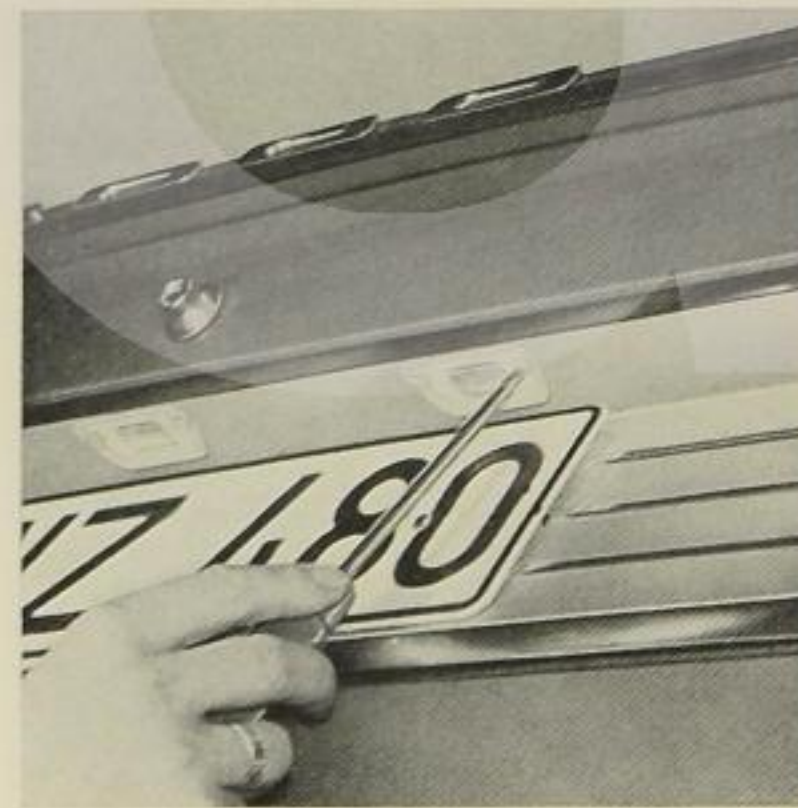
53



#### Licence Plate Light:

Loosen the two Phillips screws, remove the glass frame with rubber gasket **Fig. 54.** The contactors for the tubular bulb (L), 4 Watts, must offer adequate tension and a good metallic contact with the bulb, if necessary bend in and clean the contactors.

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**Interior Courtesy Light:**

Two 5 Watt (L) tubular bulbs are under the plastic cap and these can easily be changed after removing the chrome frame. **Fig. 55.**

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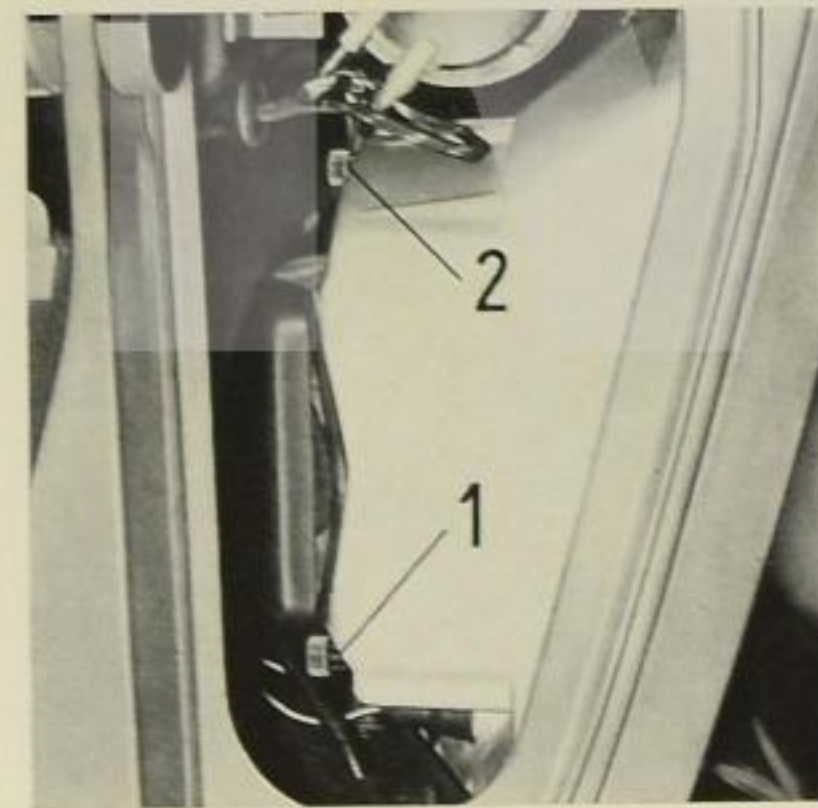


In view of its important role in road safety, **headlamp adjustment** should preferably be left to a qualified workshop equipped with the necessary specialist equipment. Open bonnet, turn the plastic knurled buttons as required. **Fig. 56.**

1 = Vertical adjustment

2 = Lateral adjustment.

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Follow the routine described below to adjust the headlamp if the proper equipment is not available:

Position the vehicle on a flat level surface at approx. 16' (5 m) from a light-coloured wall. Mark a point on this wall which coincides with the car's longitudinal centre-line.

Extend the centre-line vertically up the wall to give line v-v. **Fig. 57.**

Get someone to sit in the centre of the rear seat. Measure the actual height of the headlamp centres above the ground, and transfer this height to the wall, marking out horizontal line h-h.

Mark line a parallel to h-h and 2" (5 cm) below it.

Measure the distance separating the headlamps horizontally (e); divide this amount symmetrically and mark lines b and c on the wall at the corresponding distances from vertical centre-line v-v.

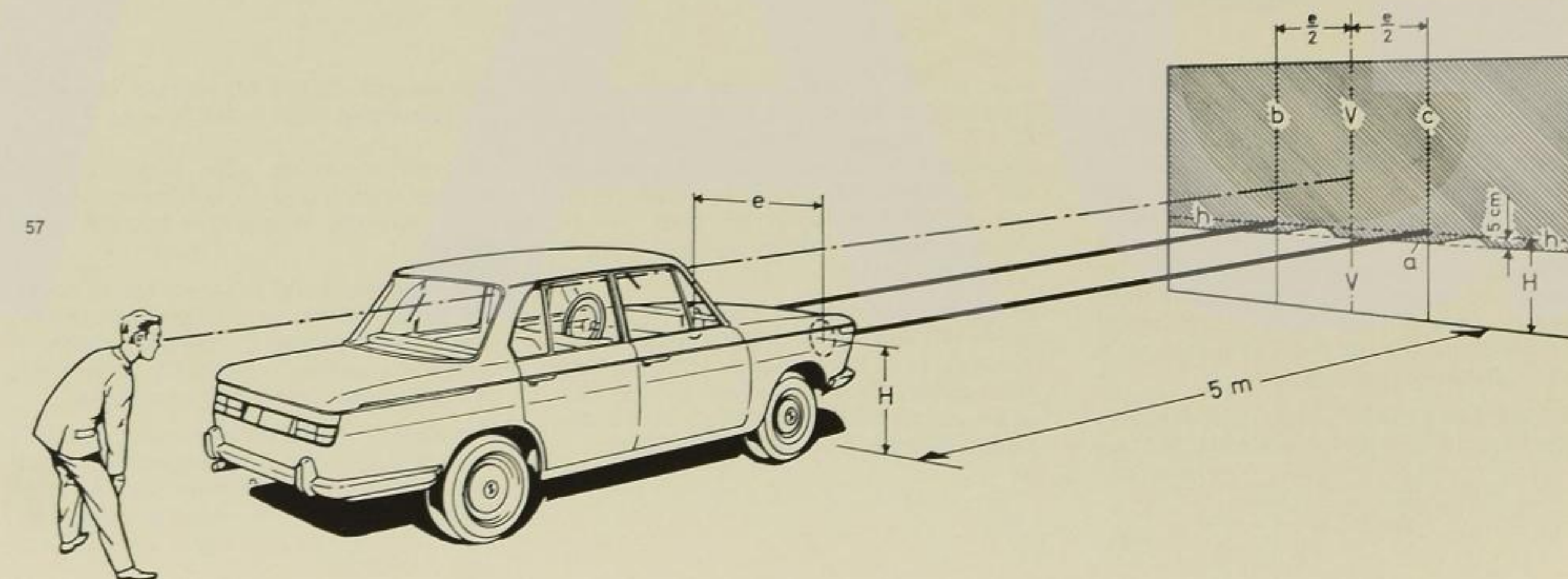
**Headlamp adjustment with dipped beam only:**

Cover up one headlamp. Set the other headlamp to the correct height by turning knob 1, **Fig. 56.** The height is correct when the left-hand side of the horizontal light/dark border coincides with line a. Next move the horizontal adjust-

ment knob 2, **Fig. 56**, until the junction between the horizontal part of the border and the part angled upwards at 15° coincides exactly with vertical line b (or c).

Repeat the procedure for the second headlamp.

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## Adjusting "Sealed-Beam" Headlamps

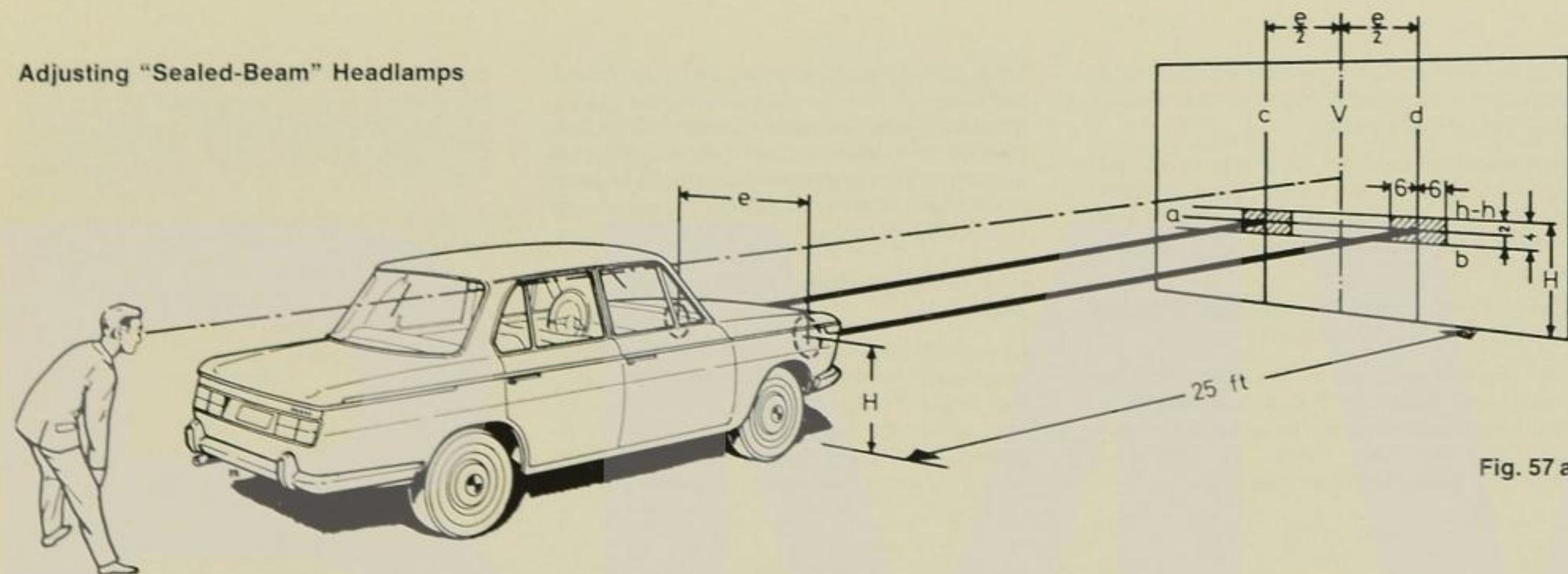


Fig. 57 a

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. 57 a).


**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. 56.

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.





## Care and Maintenance

### Care and Maintenance

A brand-new car, fresh off the production line, always presents a beautiful picture when gleaming in the showroom. But the appearance of your car after a couple of years have elapsed depends very much on the care which you are prepared to give it.

To avoid unsightly spots and smears on the paintwork your car must never be washed in direct sunlight or while the bonnet is still warm.

Road dirt and dust contain chemical constituents which, over a period of time, can cause damage to paintwork. Consequently, especially when it is still new, a car must be washed as frequently as possible.

Tar spots, dead insects or damage to the paint finish caused by stones or gravel must be remedied as soon as possible to prevent paint discolouration and rust.

After cleaning the inside of your car thoroughly with a hand brush or vacuum cleaner, first spray the outside bodywork with a finely atomised jet of water to soften and flush away surface dirt.

Avoid spraying water directly into the air intake apertures of the ventilation system forward of the windshield.

Now commence the actual car wash using a sponge, car washing glove or some similar aid and liberal quantities of tepid water, commencing from the

roof and working downward. Rinse out the sponge frequently.

The lower parts of the bodywork and the wheels should be left to last and preferably a different sponge should be reserved for that purpose.

After washing, the car should once again be sprayed liberally and rubbed down with a clean chamois leather to avoid leaving any unsightly water spots.

If straightforward water cleaning is not adequate a commercial car shampoo can be used mixed in the concentration recommended by the maker. Follow this by a thorough rinse using liberal quantities of water. Excessive shampooing will tend to take out the natural oils in the paintwork and cause brittleness in the paint finish; it is therefore advisable to finish off with a regular commercial brand of paintwork preservative.

You can best recognise the need for polish or for a paintwork preservative treatment when the water is no longer repelled in small droplets by the paint finish.

You are strongly advised to use only approved commercial cleaning and polishing materials and to adhere closely to maker's instructions.

**Minor paintwork damages** may be repaired with a BMW paint spray tin. You will find the respective colour code on a reference label located near the serial plate.

**Chromium-plated parts** should be cleaned with water, adding a little soap where necessary. This should be followed by applying an approved commercial chromium polish.

**Tar spots** should be removed with an approved commercial brand of tar remover. Never try to remove tar from paintwork with harsh abrasives or sharp, hard objects such as knife blades etc.

Apart from washing with water any **rubber components** should be treated only with glycerine.

The **windshield wiper blades** should be cleaned with soapy water only and renewed at least once per year.

**White-wall tyres** are supplied with a protective coating which is best left undisturbed until after the wheels have been fitted, when the coating can be removed by brushing with warm soapy water. Very dirty white-wall tyres can be cleaned quite easily with one of the approved commercial brands of white-wall cleaner.

**Upholstery spots** can be removed with a spot remover. These spot-removers should never be allowed to come into contact with leather or leatherette.

**Leatherette and leather** only need to be rubbed over with a slightly moist cloth and then dried.

**High-quality veneer finishes** should be cleaned with a soft duster only, if they are very dirty an approved brand of furniture polish can be used.



With your new car you will have received a **Servicing Booklet** made out in your name and containing the details of your car. After the **free** final delivery inspection your BMW Agent will tear out the appropriate perforated voucher and confirm completion of the inspection on the booklet. The same procedure is followed on occasion of the

First Inspection at  
1,000 miles (1,500 kms).

In addition your BMW Workshop will stick a label on the doorpost of the driver's door (**Fig. 58**) to remind you when the next inspection is due. Your confirmation of completion of this and all further maintenance inspections will

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be entered on the appropriate counter-foils in your Servicing Booklet.

You are advised to ensure that each inspection is confirmed by these entries, as this evidence will be required in the event of any guarantee claims and will also be of importance to you ultimately as proof of the regular maintenance your car has received.

We strongly advise you to have these maintenance inspections carried out **regularly** by your approved BMW Workshop. Only then will you be assured of completion of all work entirely in accordance with our latest instructions. The Service Guide which you will have received with your car contains details on the widespread BMW Servicing Network which has been established to provide any assistance you may require when travelling.

To maintain the reliability and durability of your car we strongly recommend completion of **maintenance inspections at least twice a year**, even if the mileages prescribed in your Servicing Booklet have not been completed.

### 1st Inspection

at 1,000 miles (1,500 kms)  
**Speedometer Reading**

1. Change the engine and filter oil after running the engine up to normal operating temperature. Replace filter cartridge.
2. Change gearbox oil at normal operating temperature.

3. Change oil in final drive while this is warm.
4. Check the oil level in the sliding joints on the driven shafts and examine the rubber gaiters for leaks. Top up where necessary.
5. Check the steering box and drop arm bearing for leaks and top up where necessary.
6. Check the radiator contents, checking for antifreeze in winter, and top up where necessary.
7. Check connections and lines in the brake system for leaks, damage and correct seating. Check the level of brake fluid in the compensating reservoirs ( $\frac{3}{4}$  full) and top up where necessary.
8. Clean the fine screen in the fuel pump. Tighten the screws on the fuel pump.
9. Take off the carburettor top cover, clean the float chamber and jets. Tighten the bolts on the carburettors, check idling speed and regulate where necessary.
10. Check the automatic intake air pre-heating flap for ease of operation and set the flap lever to summer or winter operation.
11. Check fan belt tension  $\frac{1}{4}$ " —  $\frac{1}{2}$ " (5–10 mm) (deflection on finger pressure, tighten where necessary).
12. Feed two drops of engine oil into the oil nipple on the distributor.

13. Tighten nuts and bolts on the engine (note torque ratings in Technical Data Section); the left and right engine mounting on the silent blocs, intake unions and exhaust manifold, exhaust pipe flange, oil sump. With the engine cold or not exceeding  $35^{\circ}\text{C}$  water temperature tighten the cylinderhead bolts (see diagram for sequence).



14. With the engine stationary or with the water temperature not exceeding  $35^{\circ}\text{C}$ , check the valve clearance (intake and exhaust 0.006–0.008" / 0.15–0.20 mm), contact breaker gap (0.016" / 0.4 mm, dwell angle  $60^{\circ}$ ) and timing ( $3^{\circ}$  BTDC with 12 Volts test lamp).

15. Tighten nuts and bolts (see Technical Data Section for torque loadings): front axle, steering box, gearbox, universal shafts, rear axle and brakes.
16. Tighten the nuts and bolts on the bodywork and exhaust system.
17. With the steering aligned straight ahead check for freedom from play and adjust where necessary.
18. Check the foot brake operation and adjust where necessary (rear only) and bleed the hydraulic system. Check the handbrake operation and adjust where necessary.

19. Check clutch play (approx. 3.5 to 4.5 mm / 0.14–0.18" on the slave cylinder pushrod), and adjust if necessary.

20. Check play in front wheel bearings and adjust, if necessary.

21. Check tyre pressures and correct, if necessary.

22. If required, balance all four running wheels (cost to be shown separately).

23. Check headlamp settings and correct, if necessary.

24. Carry out final check on items affecting road safety (brakes, steering, clutch, or automatic transmission, instrument readings, control knobs, rear view mirror, lights, horn). Check carburetor idling setting and adjust if required.



## Minor Inspection

**every 8,000 miles** (12,000 kms), starting at a speedometer reading of 4,000 miles (6,000 kms):

1. Change the engine and filter oil after running engine up to normal operating temperature. Replace filter cartridge.
2. Automatic transmission: oil change at normal operating temperature at 12,000 miles (18,000 kms). Further oil changes every 12,000 miles (18,000 kms).
3. Lubricate the universal joints on the propeller shaft and, if necessary, on the driven shafts.
4. Check level of water in radiator, in winter months check also for anti-freeze; top up where necessary.
5. Check battery level and top up with distilled water where necessary; apply suitable grease to battery terminals.
6. Intake muffler: carefully tap dust off the air filter cartridge and blow out the cartridge from inside. If heavily fouled replace the complete filter cartridge.
7. Check brake lines and connections for leaks, damage and correct seating. Check level of brake fluid in the compensating reservoirs ( $\frac{3}{4}$  full) and top up where necessary. Check total pad thickness (not less than 7 mm / 0.275") and if necessary, replace pads.
8. Final inspection with road safety test (brakes, steering, clutch or automatic

transmission, instrument readings, control buttons, rear-view mirrors, lighting system, horn). Check carburettor idling speed and adjust where necessary.

## Major Inspection

**every 8,000 miles** (12,000 kms), starting at a speedometer reading of 8,000 miles (12,000 kms):

1. Change the engine and filter oil after running the engine up to normal temperature. Replace filter cartridge.
2. Check oil level in gearbox; top up where necessary (oil change at operating temperature: manual gearbox every 16,000 miles/24,000 kms, automatic transmission every 12,000 miles/18,000 kms).
3. Check oil level in differential gearbox; top up where necessary.
4. Check the oil level in the driven shaft sliding joints; top up where necessary (oil change every 16,000 miles/24,000 kms); inspect seals for leaks. Does not apply to maintenance-free driven shafts.
5. Inspect for leaks and check the oil level in the steering box and right-hand drop arm bearing; top up where necessary.
6. Check water level in radiator, also for antifreeze in winter; top up where necessary.
7. Check battery level and top up with distilled water where necessary, apply suitable grease to battery terminals.
8. Check brake fluid level in the compensating reservoirs ( $\frac{3}{4}$  full) and top up where necessary.
9. Clean the gauze sieve in the fuel pump and tighten fuel pump screws.

10. Check the operation of the flap for automatic air induction pre-heating and ensure that it is set correctly for summer or winter operation.
11. Check fan tension (5–10 mm / 0.2 to 0.4" deflection under finger pressure) and tighten where necessary.
12. Feed a few drops of engine oil into the oil nipple on the distributor.
13. Oil carburettor linkage and joints.
14. Replace spark plugs. Standard electrode type: 8,000 miles (12,000 kms) intervals. Platinum electrode type following maker's instructions.
15. Take off distributor rotor arm and feed a few drops of oil on to the lubricating felt in the distributor shaft. Care must be taken to prevent oil overflowing or fouling the contact breaker points. Lightly grease the bearing race for the baseplate guide, using Bosch grease Ft 1 v 22. Apply a small portion of Bosch Ft 1 v 4 grease on the sliding member of the contact breaker hammer.
16. With the engine stationary and either cold or at a water temperature not exceeding 35°C, check the valve clearance (intake and exhaust 0.006 to 0.008" / 0.15–0.20 mm), contact breaker gap (0.016" / 0.4 mm, dwell angle 60°) and timing (3° BTDC with 12 Volts test lamp); adjust where necessary.
17. Tighten nuts and bolts on engine (torque loadings: see Technical

Data Section); check the silent bloc engine mountings left and right, intake stack and exhaust manifold, exhaust pipe flange, oil sump, cylinderhead bolts with the engine cold or at a water temperature not exceeding 35°C (follow the sequence indicated).

18. Intake muffler: replace filter cartridge.
19. Check steering play in straight-ahead position and adjust where necessary. Check the condition of the track rod.
20. Universal shafts and, where necessary, half-shafts: check the condition of universal and sliding joints and lubricate.
21. Tighten nuts and bolts (note the torque loadings in Technical Data): front axle, steering, gearbox, universal shafts, rear axle and brakes.
22. Check disc brakes — total thickness of brake pads (not below 7 mm / 0.28") and surface condition of the brake discs. If necessary, replace brake pads.
23. Front wheel bearings: check bearing play and adjust if necessary.
24. Interchange wheels as per instructions. Regulate tyre pressures as specified. Check condition of tyres. If uneven wear is shown check toe-in wheel geometry can be checked and corrected as an optional extra, subject to charge.

25. Balance all four wheels; subject to charge.
26. Check clutch play (approx. 3.5 to 4.5 mm / 0.14–0.18" on the slave cylinder pushrod); adjust where necessary.
27. Check connections and lines in the braking system for leaks, damage and correct seating. Clean brake drums and linings and check for wear. Check smooth operation of handbrake cables. Adjust brakes.
28. Tighten nuts and bolts on bodywork and exhaust system.
29. Lubricate hinges on doors, boot lid and bonnet. Lightly grease the lock on the bonnet and boot lid and the door catch mechanisms. Dust the door lock rotors and guide wedges lightly with talcum. Check operation.
30. Apply a light coat of glycerine to the door weather seal pivot window weather seal and other rubber frame strips.
31. Check headlamp alignment and adjust where necessary.
32. Final inspection with road safety test (brakes, steering, clutch or automatic transmission, instrument readings, control buttons, rear-view mirrors, lighting system, horn). Check carburettor idling speed; adjust where necessary.

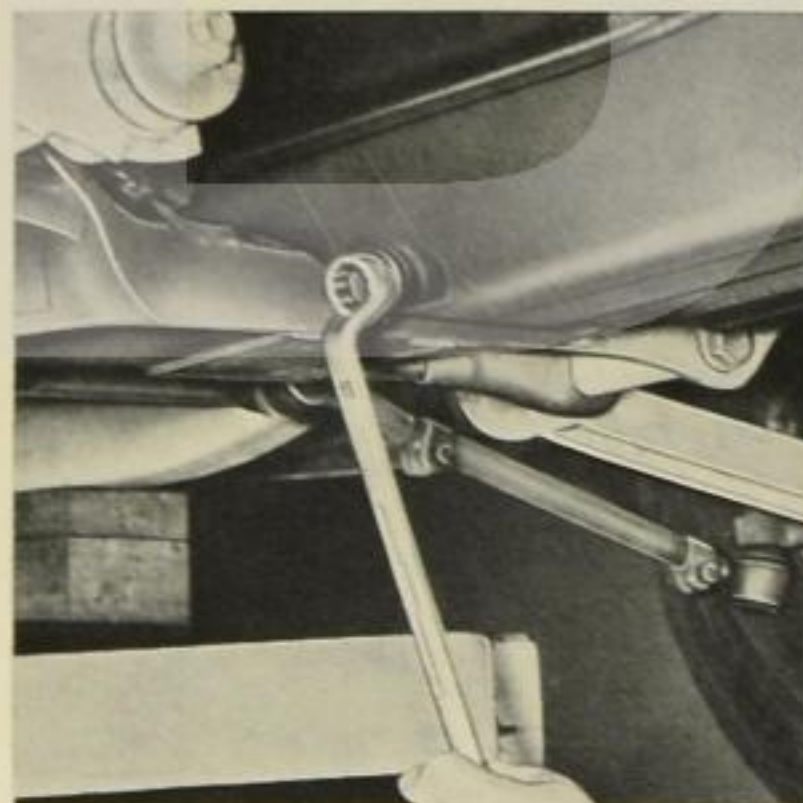


## Description of Maintenance Work

The engine oil should be changed only when the engine is at operating temperature and at 4,000 miles (6,000 kms) intervals during summer months and 2,000 miles (3,000 kms) intervals during the transitional and winter months, or alternatively once per month if the car is used exclusively for short journeys.

Using a metric size 19 ring spanner, remove the oil drain plug from the lower right-hand side of the oil sump and replace firmly after draining all of the old oil. Fig. 59.

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**Total capacity:** 4 litres (7 pints) + 0.25 litres (0.44 pint) for filter change.

**Oil level** only up to "max" mark on dipstick, never above.

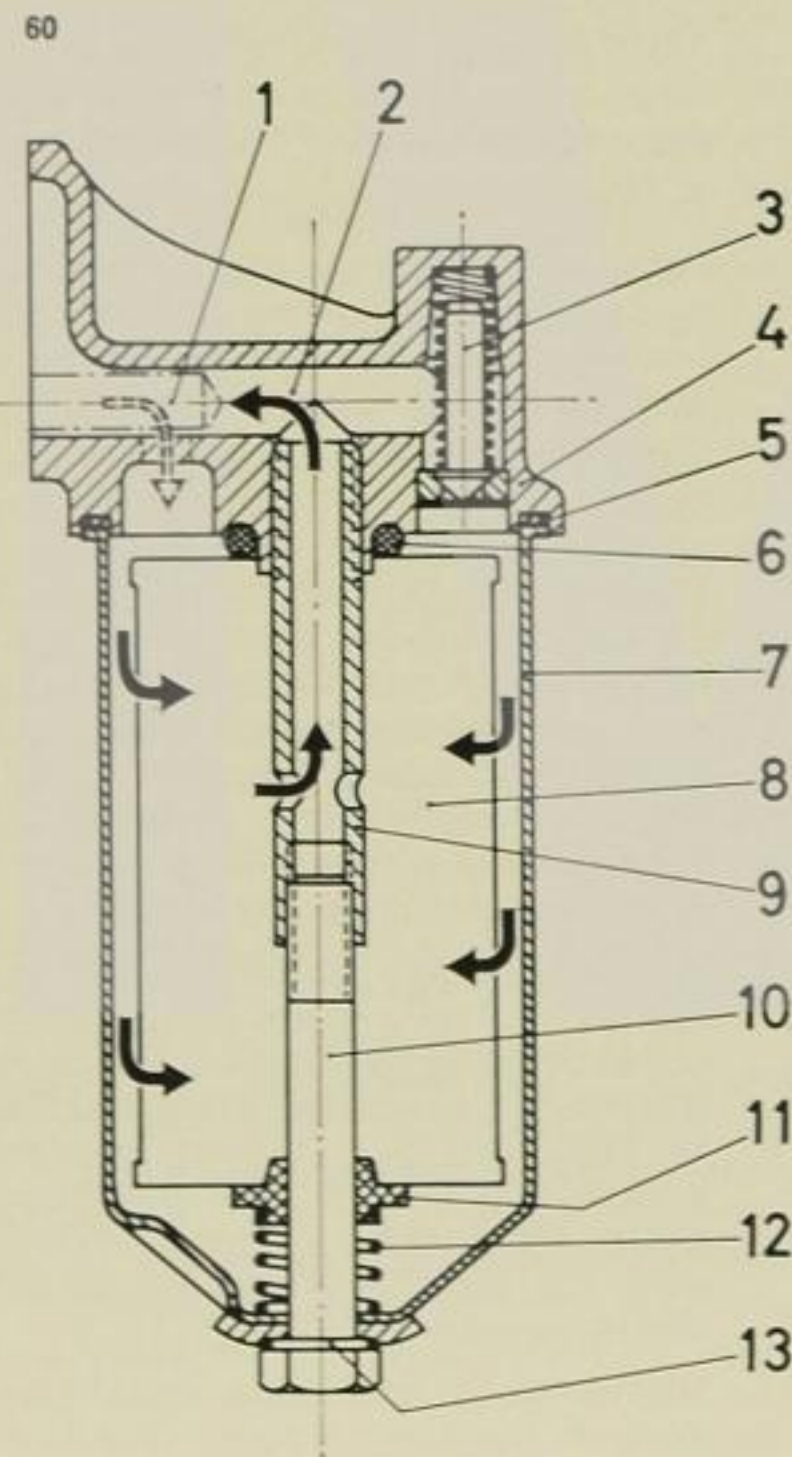
**Oil grades** regular commercial HD engine oil SAE 30 for outside temperatures above 0°C and SAE 10 W 30 for temperatures below 0°C.

**Oil filter cartridge** should be changed every 4,000 miles (6,000 kms) in conjunction with the engine oil change: Use a No. 17 metric spanner to remove the clamp screw with gasket ring and filter housing from the bottom of the oil filter.

Clean the filter housing, renew the filter cartridge and re-assemble with perfect gaskets. Fig. 60.

Main Oil Filter (Fig. 60)

1. Oil delivery from the oil pump
2. Filtered oil to the lubricating points
3. Oil safety valve
4. Oil filter — upper section
5. Gasket
6. Rubber gasket
7. Filter housing
8. Filter cartridge
9. Discharge tube
10. Clamp screw
11. Rubber gasket
12. Spring
13. Gasket



**Gearbox oil** should be changed at 16,000 miles (24,000 kms) intervals and only at normal operating temperature.

Using a No. 17 metric spanner remove the oil drain plug followed by the oil filler plug (No. 14) on the left-hand side of the gearbox, thus permitting the oil to drain more rapidly. Then replace the drain plug and tighten firmly. Both filler and drain plugs have a conical thread and consequently should not be substituted by bolts with metric threads. Fig. 61.

**Total capacity:** 1 litre (1¾ pints).

**Oil level:** to the lower edge of the filling aperture.

**Oil grade:** approved commercial gearbox oil SAE 80 (not hypoid oil).

### Checking oil level with automatic gearbox:

Position the car on a level surface, apply handbrake, allow the warmed-up engine to idle with the gear selector lever at "P". Take out the oil dipstick (see Page 28, Fig. 39), clean with a lint-free cloth and check the oil level. This should be between the two marks on the oil dipstick. Oil capacity between the two marks approx. 0.6 litres (0.6 quarts).

### Oil Change with automatic gearbox:

To be carried out at 12,000 miles (18,000 kms) intervals and only when the engine is at normal operating temperature: position the car on a level surface, apply

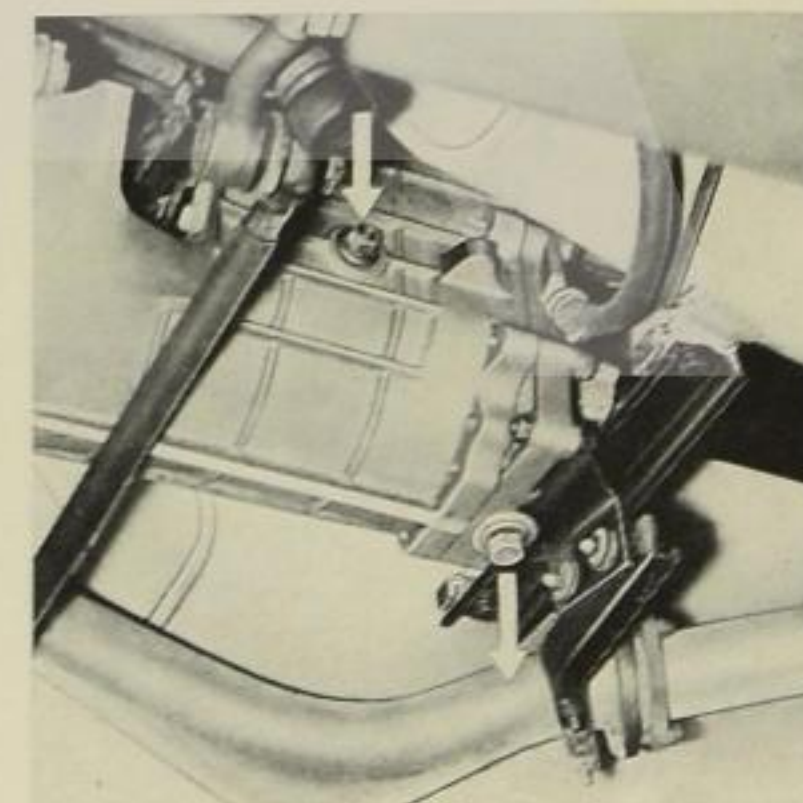
handbrake, engage transmission lever in "P" position, switch off engine. Using a No. 17 metric spanner remove the oil drain plug from the oil sump, drain the oil and replace the drain plug firmly.

Feed in 1 litre (1¾ pints) of oil, allow the engine to run at idling speed and top up with oil until reaching the upper third of the space between the two dipstick marks.

**Total capacity:** approx. 1.5 litres (2.8 pints) — total for first filling of new or exchange units 4.75 litres (8.4 qts.).

**Oil grades:** see page 83.

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**Oil change in the sliding joint of the half-shafts** at 16,000 miles (24,000 kms) intervals (does not apply to maintenance-free half-shafts):

Turn the rear wheels until the filler and drain plug (metric spanner No. 11), face downward. Remove the plug and allow the oil to drain out. Fig. 62.

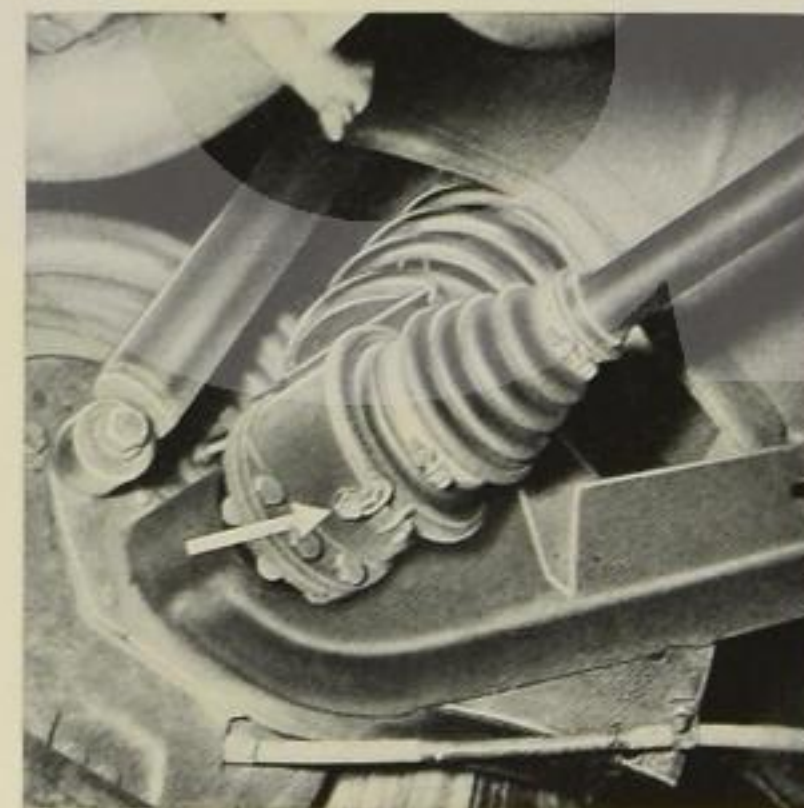
For refilling, the filler aperture must be at an upward angle of less than 45°.

**Total capacity:** 180 cc (6.3 fl. oz) for each of the two joints.

**Oil level:** up to the lower edge of the filler aperture. Inspection is aided by the transparent gaiters.

**Oil grade:** approved commercial SAE 90 hypoid gearbox oil.

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**Oil change in differential gearbox:** at first 1,000 miles (1,500 kms) service at normal operating temperature.

Using a 10 mm hex. Allen head metric spanner, remove oil drain plug (A) and then the oil filler plug (E) on the left-hand side of the differential housing, thus permitting the oil to drain out more rapidly. Then replace the drain plug and tighten firmly. **Fig. 63.**

**Total capacity:** approx. 1.3 liters (2.6 pints).

**Oil level:** up to the lower edge of the filling aperture. Check every 8,000 miles (12,000 kms).

**Oil grade:** approved commercial SAE 90 break-in hypoid gearbox oil. Your dealer knows the oil brands, recommended by the factory.

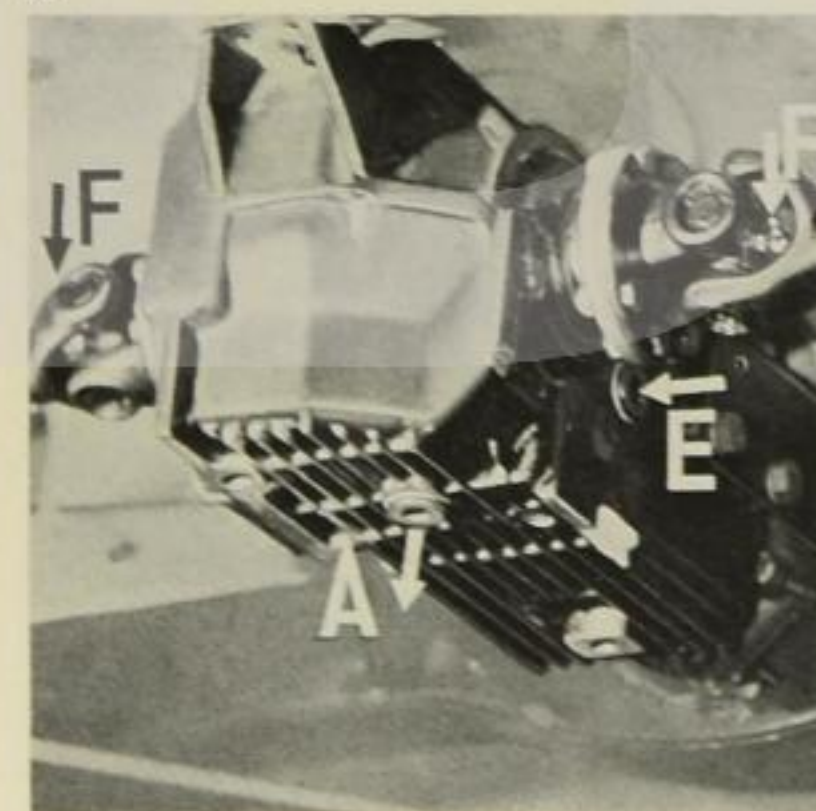
**The 2 universal joints on the front propeller shaft (Fig. 64 and 65) and where necessary, the 2 universal joints on the half-shafts (Fig. 63F) are to be lubricated every 4,000 miles (6,000 kms).**

**Lubricant:** approved commercial multi-purpose lubricating grease, drip point 180°C.

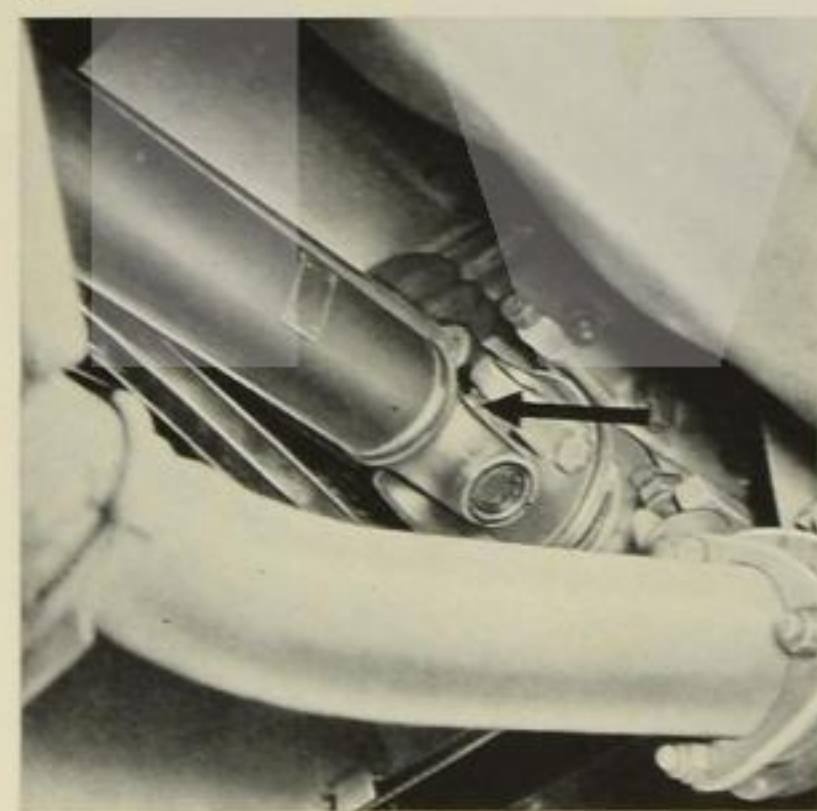
#### Oiling hinges, joints etc.:

All inter-acting metal components must be lubricated from time to time with a few drops of graphite-concent oil from an oilcan, e. g. carburettor linkage, bonnet catches and hinges, door catches and door hinges.

63



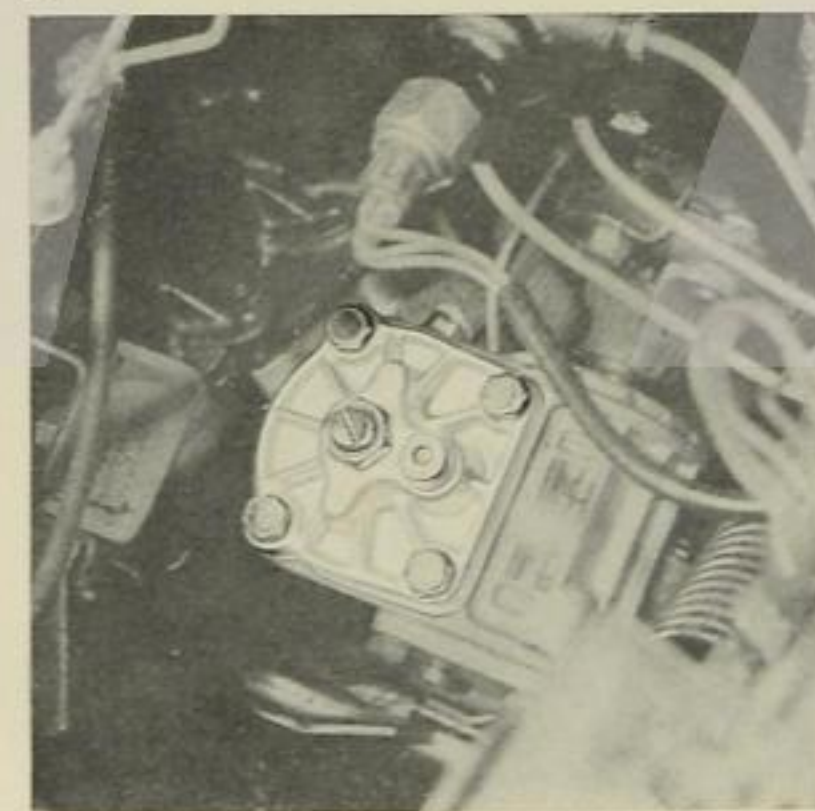
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65



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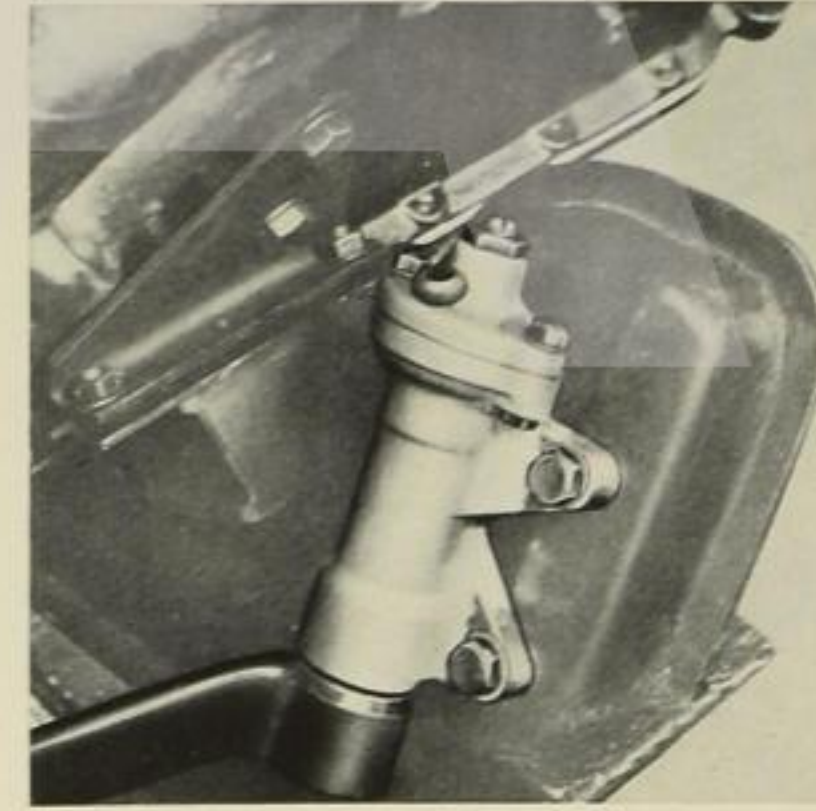
The **steering box** has a permanent oil filling (i. e. no draining plug) and should be checked for oil level and tightness every 8,000 miles (12,000 kms). **Fig. 66.**

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

**Oil level:** to lower edge of filler aperture.

**Oil grade:** approved commercial SAE 90 hypoid gearbox oil.

67



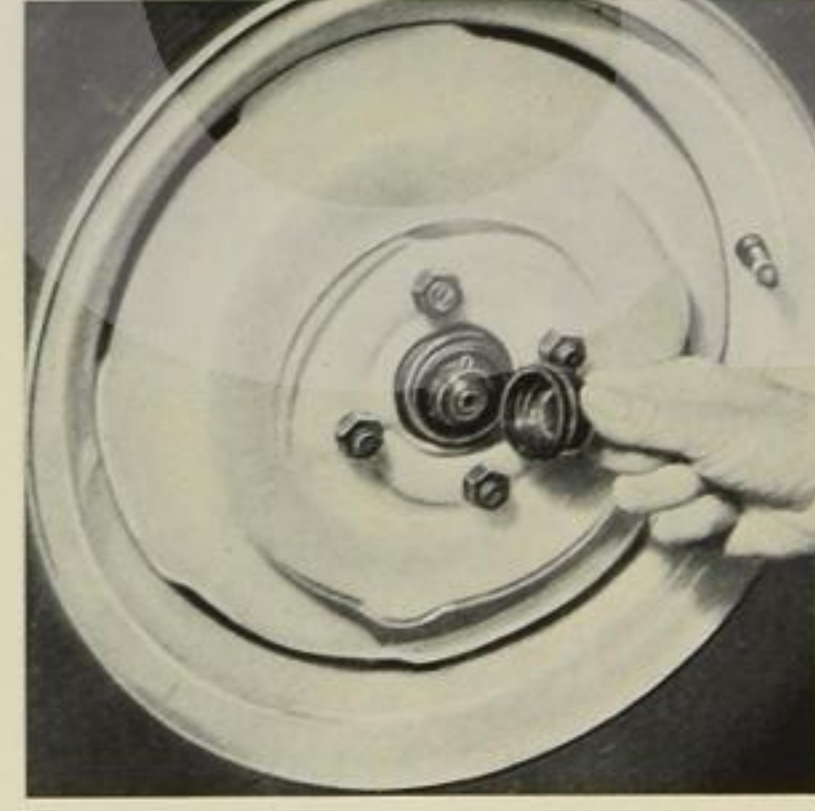
The **idler box** (of all RHD-vehicles as well as all LHD BMW 2000 up to chassis no. 1338 027 and LHD BMW 2000 A up to chassis no. 1213 930) on the front axle member also has a permanent oil filling, together with the steering box; check oil level and tightness every 8,000 miles (12,000 kms) — top up where necessary. **Fig. 67.**

**Total capacity:** 25 cc (0.88 fl. oz).

**Oil level:** to lower edge of filler aperture.

**Oil grade:** approved commercial SAE 90 hypoid gearbox oil.

68



The **wheel bearings** should be serviced only by an approved BMW Workshop; their grease packing should be checked and repacked every 40,000 miles (60,000 kms). **Fig. 68.**

**Lubricant:** approved commercial multi-purpose lubricating grease, drip point 180°C.



Lubricate the **distributor** at 8,000 miles (12,000 kms) intervals:

Apply a small amount of Bosch Ft 1 v 4 grease to the **fibre sliding member** of the contact breaker lever on the side facing the lever bearing.

Apply a small amount of Bosch Ft 1 v 22 grease to the **bearing track** for the base-plate guide. Fig. 69.

Take off the rotor arm and feed a few drops of engine oil on to the **lubricating**

**felt** in the distributor shaft. Fig. 70, left. Feed two drops of engine oil into the outer oil nipple on the distributor shaft and close the nipple. Fig. 70, right.

**Warning!** Take care to prevent oil from overflowing or reaching the contact breaker points. Oil vapour in the distributor causes increased point burning.

The transparent **compensating reservoirs for the brake and clutch hydraulic systems** are located in the engine well on

the left-hand side and the level of their contents can be checked from outside.

**1** = compensating reservoir for clutch system. **2** = compensating reservoir for brake system. Fig. 71.

We recommend inspection at regular intervals, but at least every 4,000 miles (6,000 kms). Care should be taken when handling brake fluid — it has a corrosive influence on paintwork. If brake fluid is leaking you are urgently advised to call in your BMW Workshop.

**Capacity:**  $\frac{3}{4}$  full.

**Grade:** ATE blue brake fluid.

The **clutch play** at the slave cylinder pushrod (on the lower left of the clutch housing) must be checked every 8,000 miles (12,000 kms). The prescribed play of 3.5–4.5 mm (0.14–0.18") can be regulated by the adjusting nut, using a No. 19 metric spanner, after releasing the locknut with a No. 13 metric spanner; then retighten the locknut. Fig. 72.

The presence of air in the hydraulic system or leakage of hydraulic fluid can result in inadequate declutching with consequent gearbox damage.

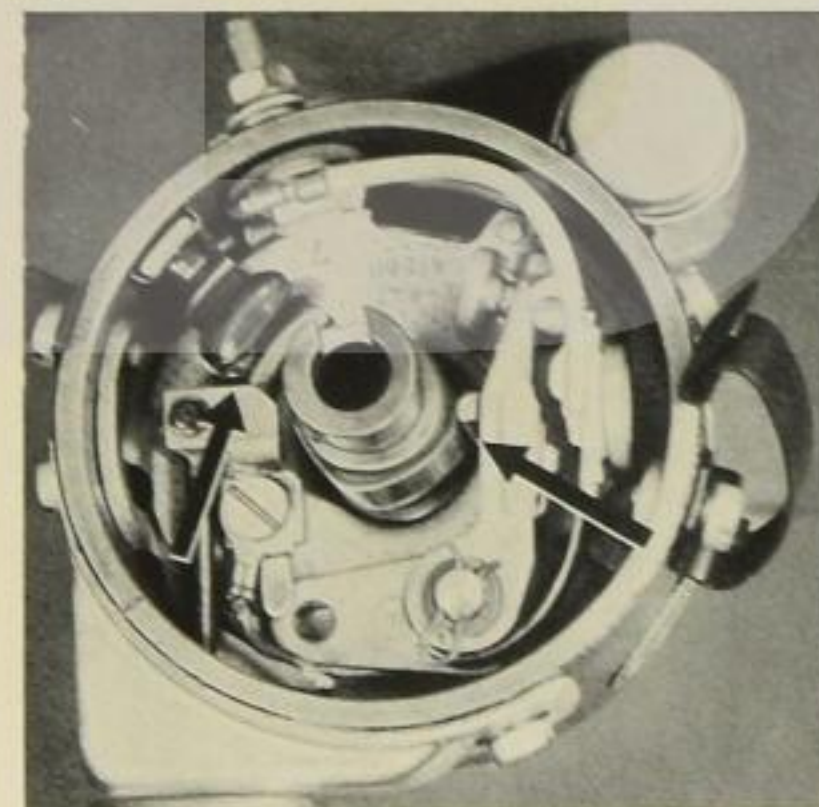
To balance tyre wear as evenly as possible the **wheels** should be changed

around every 8,000 miles (12,000 kms), specifically the two wheels on each side being interchanged from front to rear and viceversa — not crossed over! Naturally the spare wheel can also be included in this changeover. Fig. 73.

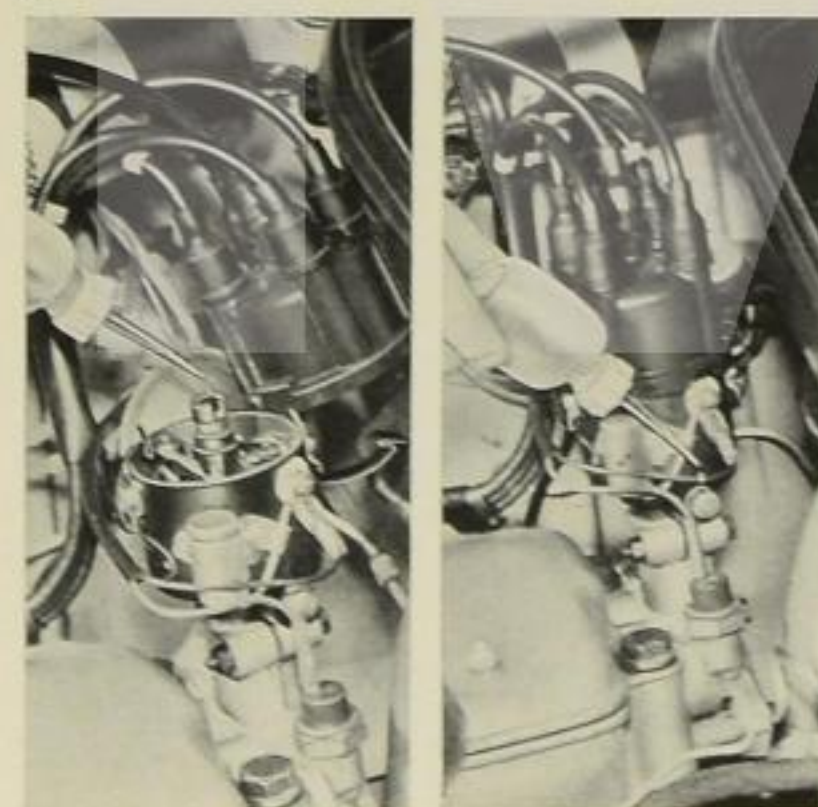
Static and dynamic **balancing of the four wheels** should be carried out every 8,000 miles (12,000 kms) and, wherever possible, on the car itself after changing the wheels around.

If uneven wear is found during the regular inspection of tyres for wear, damage, stone penetration etc., we urgently advise expert measurement of the wheel geometry with the prescribed vehicle load.

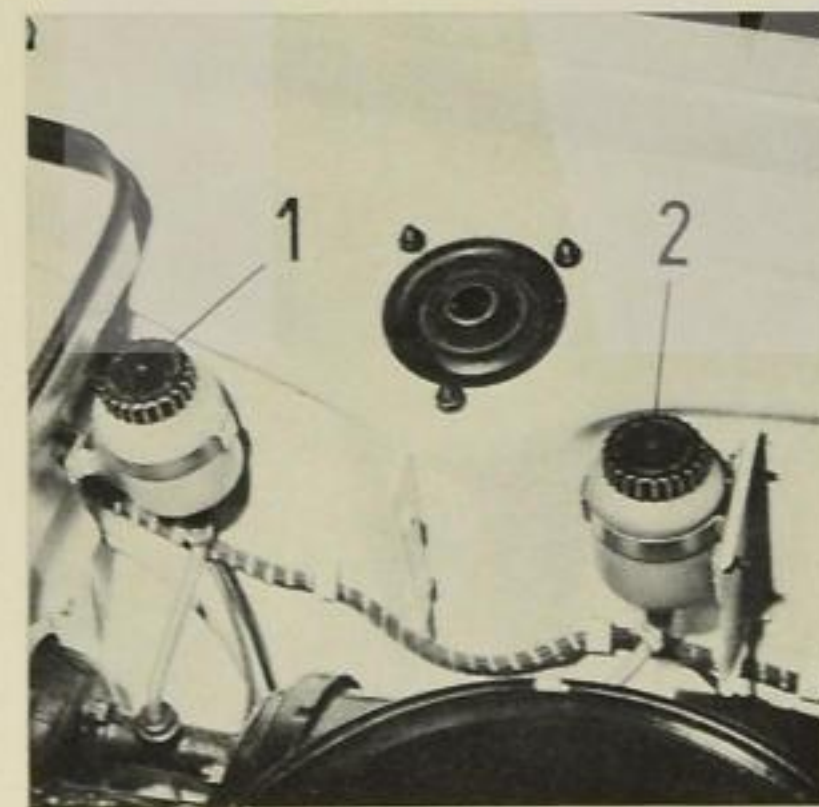
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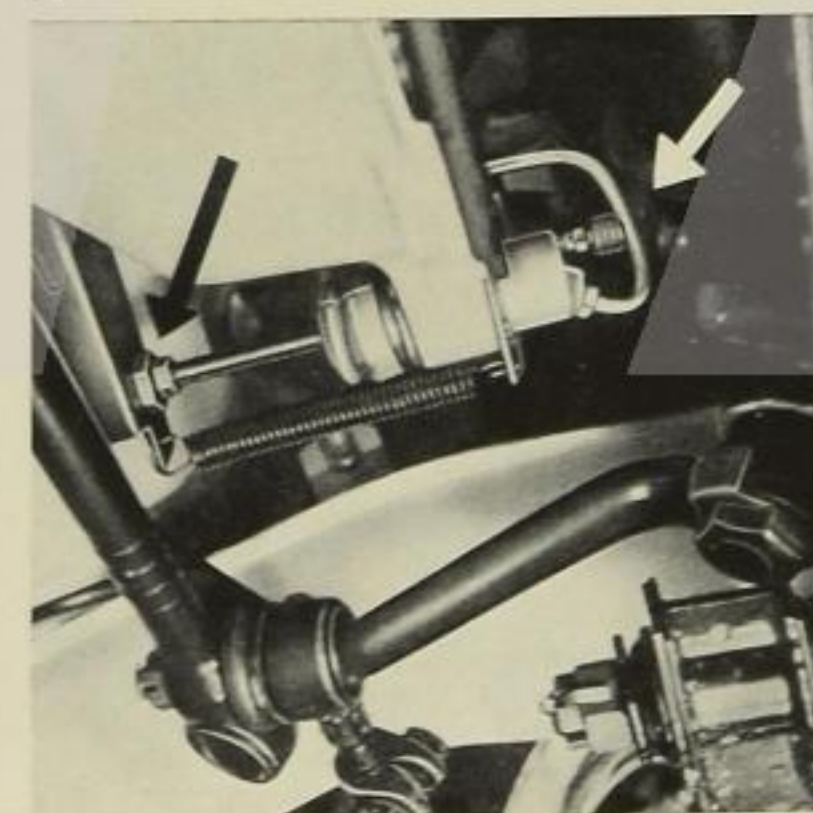
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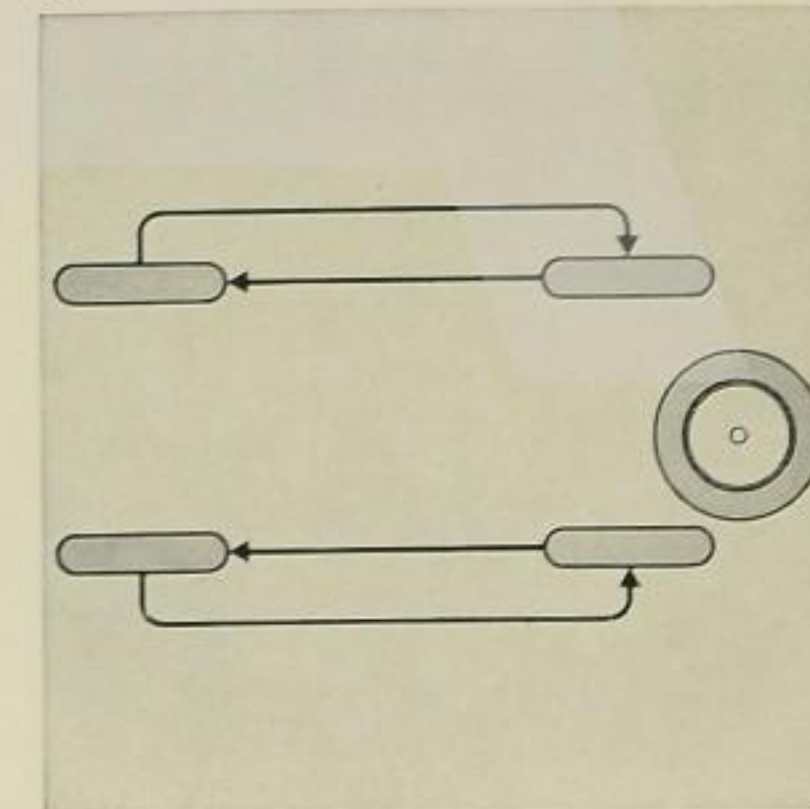
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73

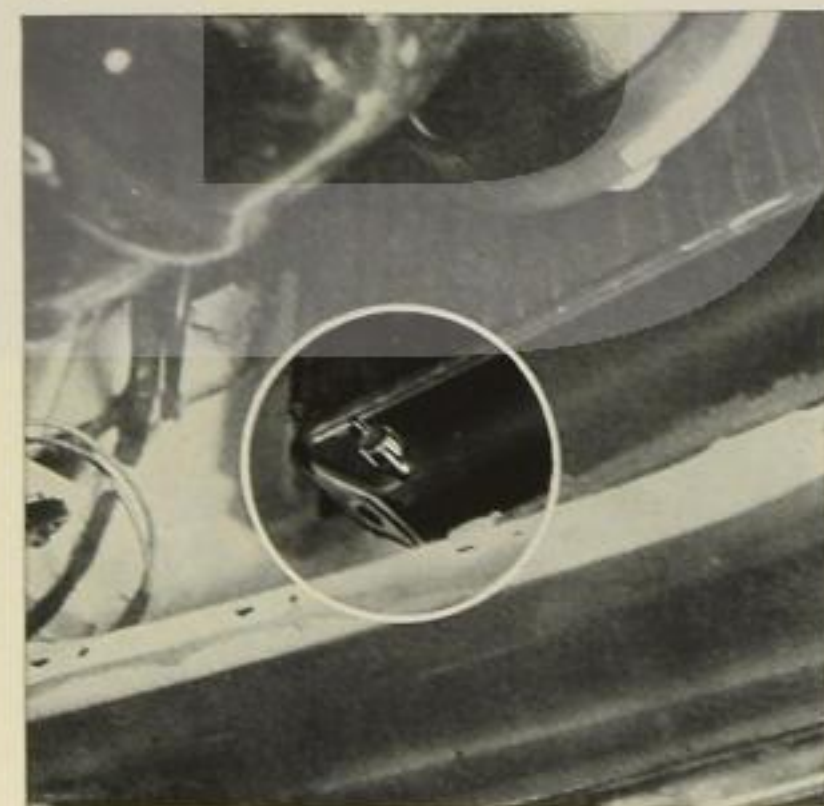




In addition to a regular inspection of the cooling water level we recommend that the **cooling system** be flushed out with mains water thoroughly twice a year with the heating switched on. The radiator cap should be checked at the same time for tightness and the functioning of the safety and vacuum valves should be checked, as follows:

1. Before the onset of the cold weather season and before filling with anti-freeze.
2. At the onset of the warmer season after draining the antifreeze. After flushing out the radiator you are recommended to use processed **cooling** water, i.e. water incorporating a regular commercial anti-corrosion agent in accordance with maker's instructions.

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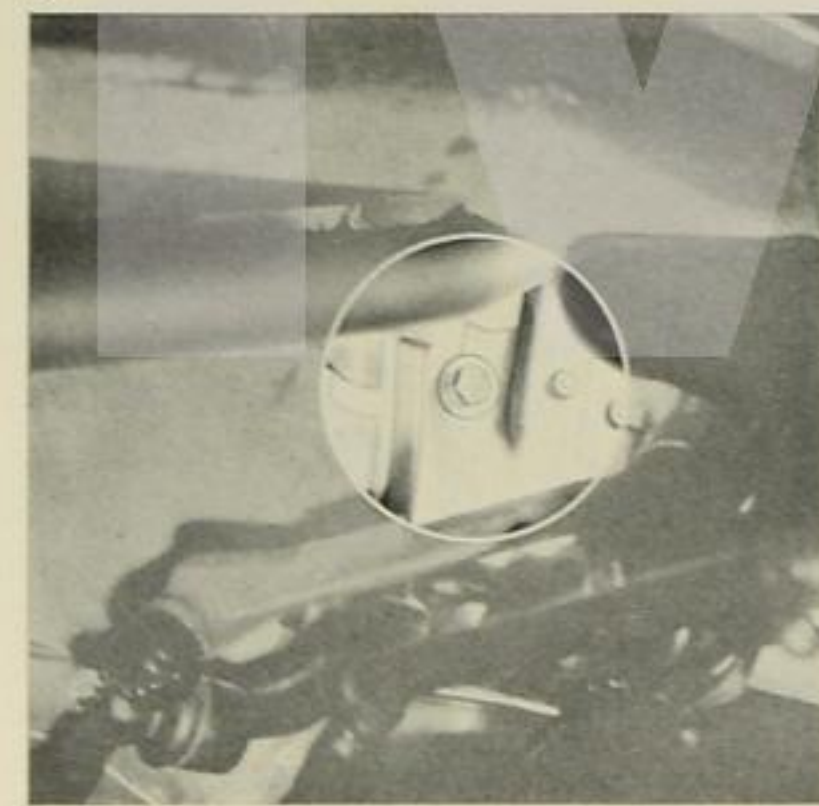
The **cooling system capacity** including heater is 7 litres (12.3 pints). Open two drain cocks to **drain water** from the cooling system:

1. On the radiator at the lower left.
2. On the engine block at the right rear. (No. 19 metric spanner) **Figs. 74 and 75.**

Thereby the heating air temperature lever 1 on the dashboard must be positioned to the right at "warm" (see Fig. 16, Page 14).

**Refilling** the cooling system: set the heater lever to "warm" and fill up the radiator. Close down the radiator cap until it engages at Point II, drive the car or let the engine run until normal operating temperature has been reached. Turn the radiator cap to limit stop I, thus per-

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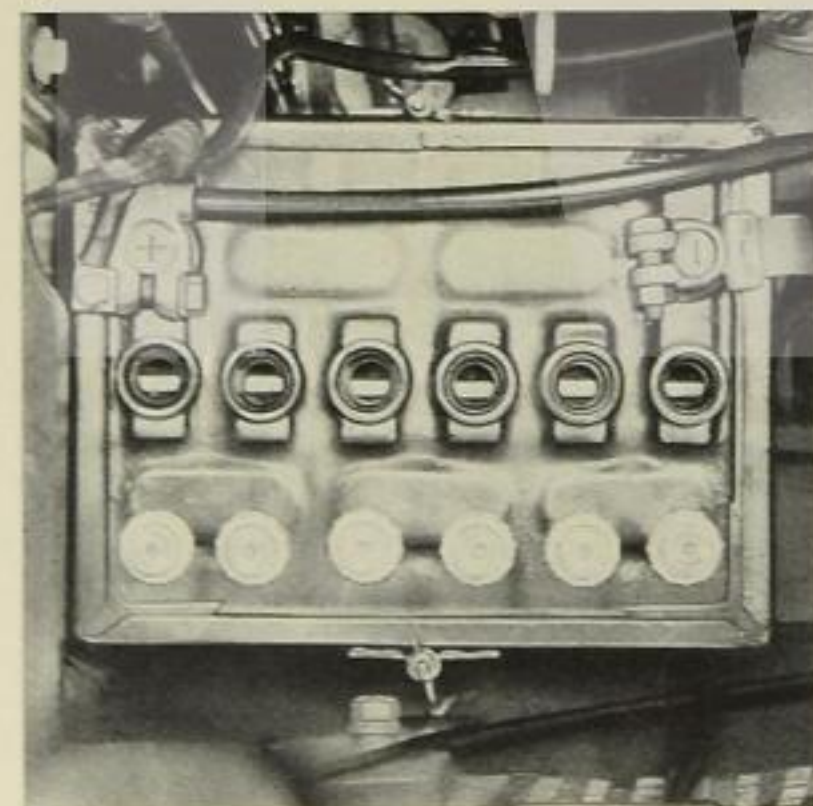


mitting the cooling system pressure to be relieved, and remove. The radiator should be topped up to a maximum of 2 cm ( $\frac{3}{4}$ ") below the base of the radiator cap, after which it is sealed.

Every 4,000 miles (6,000 kms), but at least once per month, the **battery** level is to be checked. For this the 6 plug caps are removed. The acid level should be about 5 mm (0.2") above the top of the plates in each cell or should reach the level mark which can be seen in the aperture. **Fig. 76.**

If necessary top up the battery contents with distilled water (acid should not be used).

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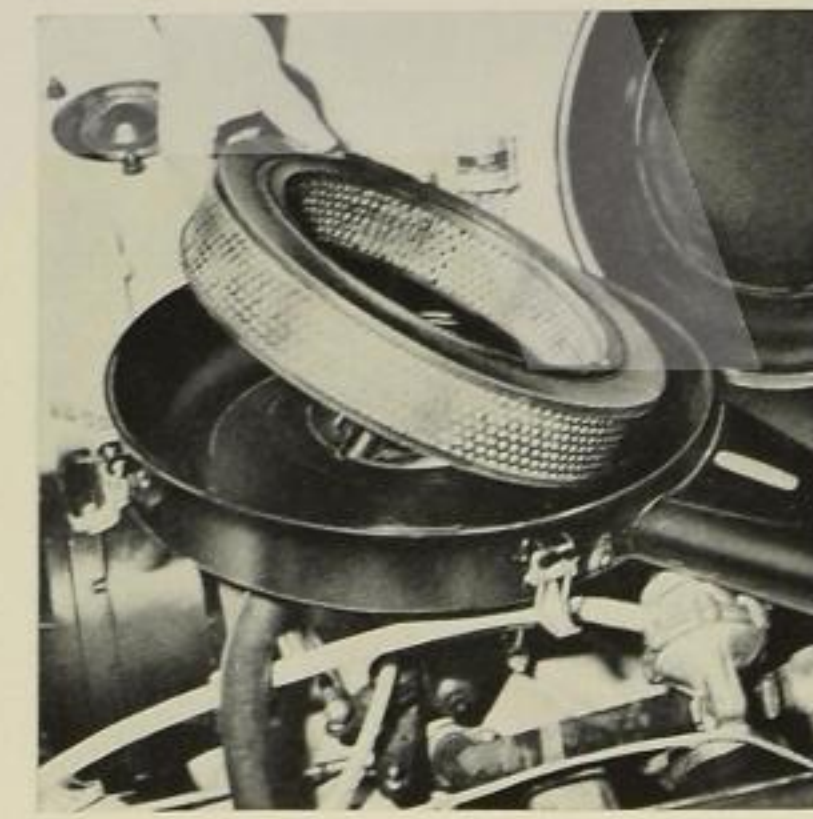
The top of the battery must be kept clean and dry. Protect the **battery terminals** from corrosion by applying Bosch Ft 1 v 40 anti-acid grease.

**Warning!** Be careful to keep acid away from clothing. Keep naked lights away from the battery owing to risk of explosion.

The **paper filter cartridge in the intake muffler** must be removed every 4,000 miles (6,000 kms) and checked for dirt. Carefully tap off any dust adhering to the cartridge; the cartridge must be replaced if heavily soiled at 8,000 miles (12,000 kms) intervals. **Fig. 77.**

Filter cartridges clogged with dirt increase fuel consumption and impair engine efficiency.

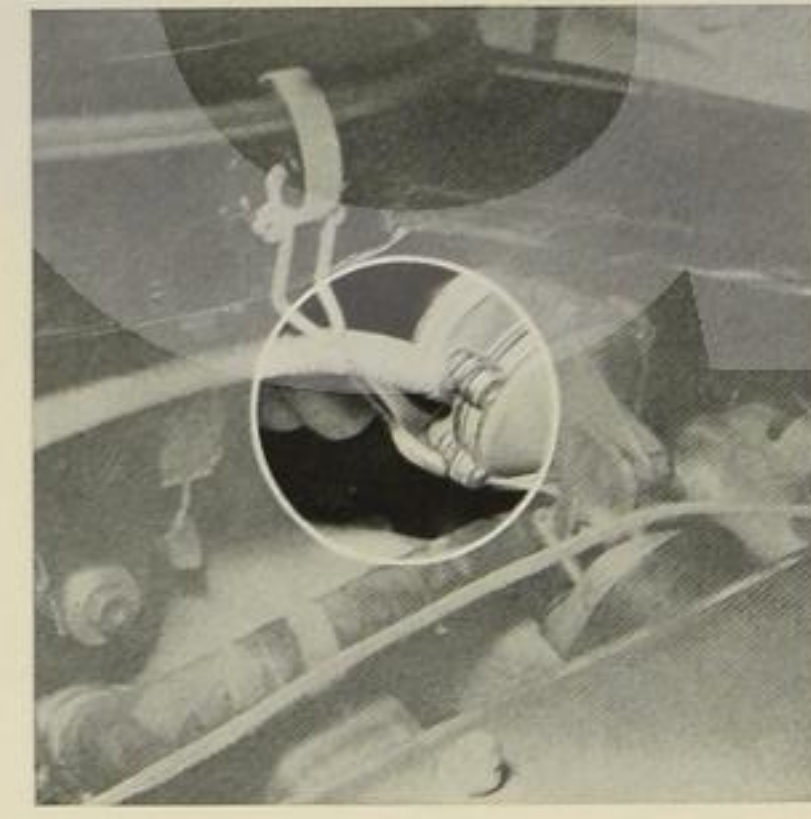
77



The **fine screen in the fuel pump** are to be cleaned every 8,000 miles (12,000 kms). Remove the fastening bolt (No. 13 metric spanner) with gasket. **Fig. 78.**

Take out the fine sieve and wash out in clean fuel. When re-assembling only perfect gaskets should be used. Tighten the 6 cylindrical screws in the fuel pump evenly with a screwdriver.

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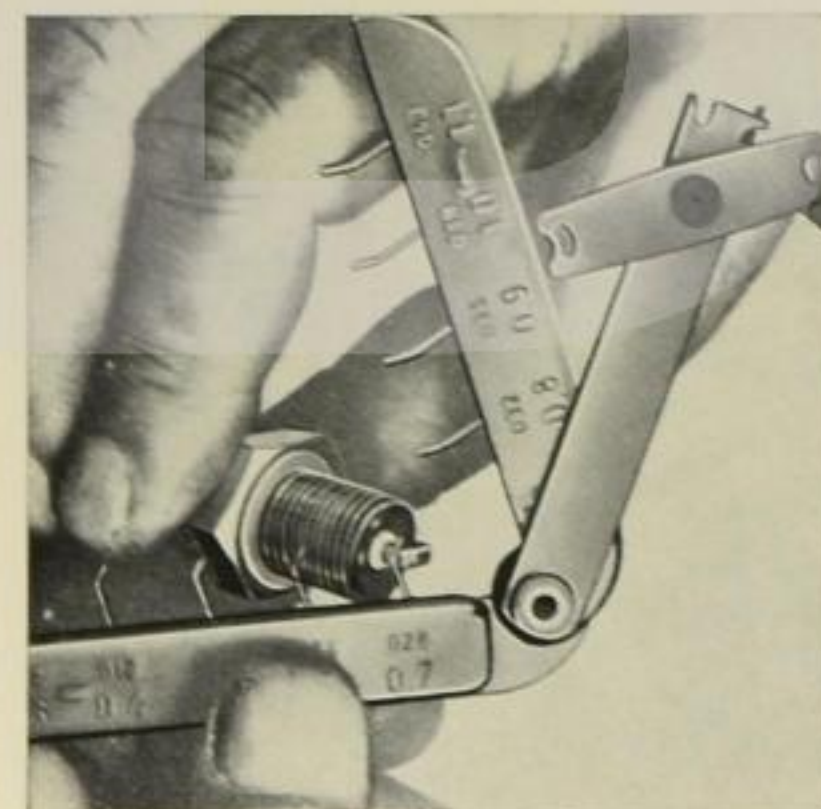




**The spark plug electrode gap** must be checked every 8,000 miles (12,000 kms) and new spark plugs should be checked before installation using a spark plug gauge. Where adjustment is necessary, bend the earthing electrode to the prescribed clearance —  $0.6 \pm 0.1$  mm ( $0.024 \pm 0.004$ ") — platinum electrodes 0.35 mm (0.014"). **Fig. 79.**

Spark plugs should be cleaned with ordinary brushes dipped in fuel — not wire brushes. Grease the plug thread lightly with graphite grease before fitting the plug in the engine. Standard type **spark plugs** should be replaced every 8,000 miles (12,000 kms).

79



When using platinum electrodes follow maker's instruction. You will find data on the correct type of plug on the last page of this booklet. If your driving is restricted mainly to short distances we advise you to fit platinum-electrode spark plugs.

**Contact breaker gap** should be checked every 8,000 miles (12,000 kms): if no dwell angle gauge is available remove the distributor cap, rake out the spark plugs and apply leverage on the crankshaft pulley fastening nut (not on the fan blades), using a special tool or a No. 30 metric socket wrench; turn the crankshaft clockwise until the contact breaker arm lifts clear. (Fibre sliding member on

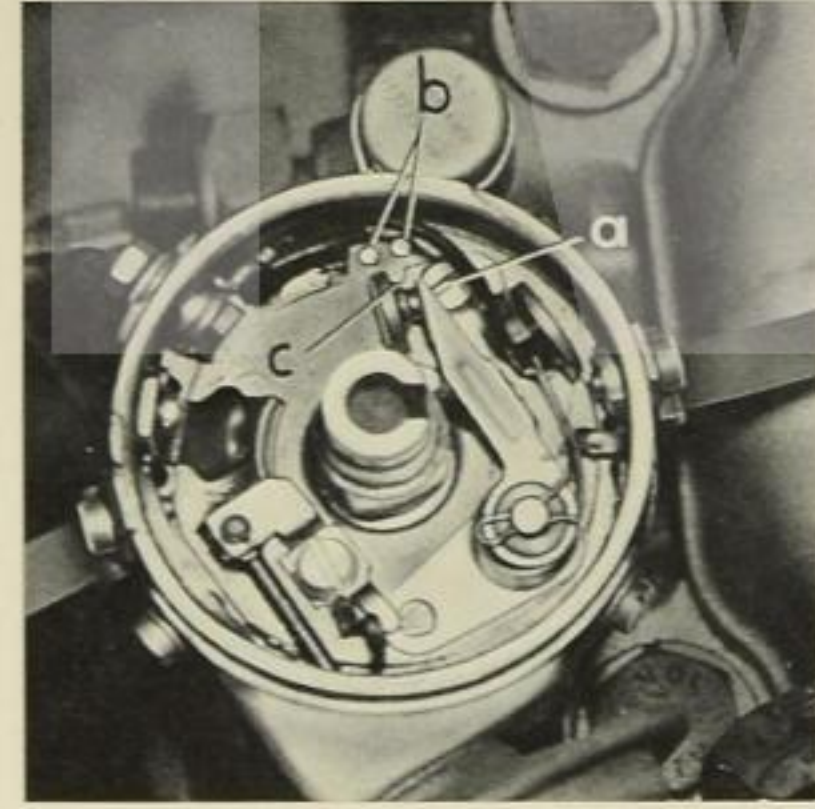
80



the cam tip of the distributor shaft.) Use a pointed file to clean off the blackened or slightly pitted contact points; heavily pitted contact points should be replaced. The contact point gap should be 0.4 mm (0.016") and this can be checked with a feeler gauge. **Fig. 80.**

Setting the contact breaker point: slightly loosen lock screw "a", insert a screwdriver between the two small studs "b" in the recess "c" on the contact breaker point and turn slightly to set the contact breaker point to 0.4 mm (0.016"). Tighten screw "a" and re-check the contact breaker point gap. **Fig. 81.**

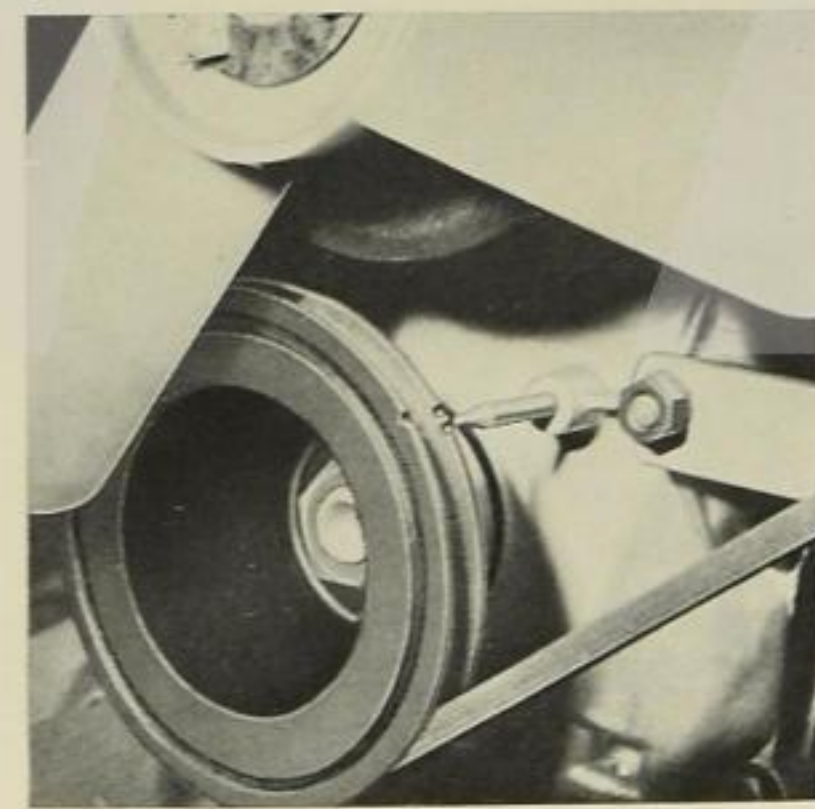
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**Timing check** — this is always necessary after setting the contact breaker point gap and should be carried out every 8,000 miles (12,000 kms), after first allowing the stationary engine to cool down to a water temperature not exceeding 35° C. The timing mark "Z" (3° BTDC) for the first cylinder is positioned on the crankshaft pulley — viewed in the direction of rotation — just **before** the "TDC" mark, which is indicated by a continuous notch. **Fig. 82.**

Connect a 12 Volt test lamp to terminal 1 on the ignition coil and to earth. Remove the high tension cable from the

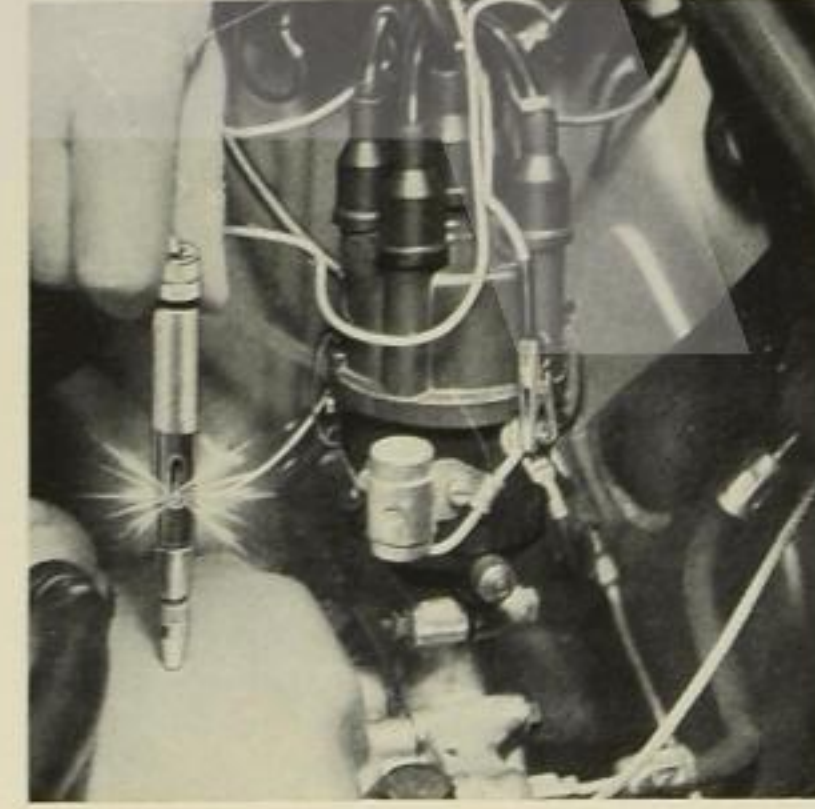
82



ignition coil or unscrew the spark plugs and switch on the ignition. Applying leverage with a special tool or socket wrench, No. 30 metric size, apply leverage to the securing nut on the crankshaft pulley to turn the engine over slowly in clockwise direction. The test lamp should light up when the timing mark on the pulley comes into line with the indicator tip. **Fig. 83.**

**Setting the ignition timing:** using a No. 10 metric spanner loosen the hexagonal nut on the clamp screw on the distributor neck and turn the distributor. **Fig. 84.**

83



Ignition is retarded by turning the distributor clockwise and advanced by turning anti-clockwise.

After turning and tightening the distributor, re-check timing as follows; turn the crankshaft back (counter-clockwise) by 45° (test lamp extinguishes) to eliminate all clearances between the transmission elements for the subsequent clockwise revolution. The test lamp should light up again as soon as the timing mark on the crankshaft pulley coincides with the indicator point.

84





The **valve clearance** should be checked and adjusted every 8,000 miles (12,000 kms) **with the engine cold and stationary** (water temperature not exceeding 35°C), as follows:

Disconnect the rubber breather hose from the valve cover.

Take off the cylinderhead cover (6 cap screws and 1 bolt, No. 10 metric size, with washers), paying attention to the retaining plate for the ignition cables.

Check the prescribed valve clearance of 0.15–0.20 mm (0.006–0.008") for the intake and exhaust valves, inserting a feeler gauge between valve and rocker

arm in a sequence corresponding to the **timing sequence 1–3–4–2**, in each case at TDC, reset where necessary. **Fig. 85.**

Top dead centre for each individual cylinder is reached when the valves of the next cylinder but one in the timing sequence overlap the valves being set:

Dead Centre Setting Cylinder No:		Valve Overlap Cylinder No:
1	=	4
3	=	2
4	=	1
2	=	3

To adjust valve clearance at the rocker arm loosen the hexagonal nut using a No. 10 metric spanner. **Fig. 86.**

With a slightly bent wire 2.5 mm (0.1") diameter turn the cam until the prescribed clearance is reached. **Fig. 87.**

Tighten the hexagonal nut and re-check the valve clearance.

85



86



87



**Check the fan belt tension every 8,000 miles (12,000 kms):** the fan belt is under correct tension if it deflects downward 5–10 mm (0.2–0.4") under finger pressure applied centrally between the a. c. alternator and the fan belt pulley. **Fig. 88.**

**Tightening fan belt:** using a No. 13 metric spanner, loosen the securing bolts at the top and bottom of the generator and tighten the fan belt by displacing the alternator on its clamp bracket. **Fig. 89.**

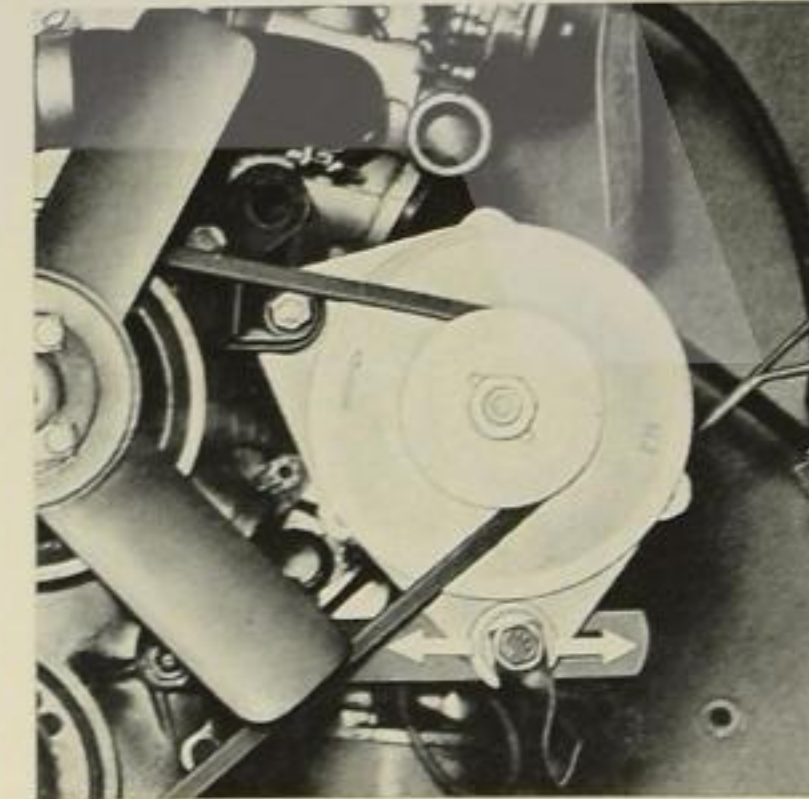
88



**Replacing fan belt:** using a No. 13 metric spanner, loosen the top and bottom fastening bolts on the alternator and push the alternator as far as it will go toward the engine. Pull on the new fan belt over the crankshaft, fan and alternator pulley and tighten into position.

A housing to the right of the radiator contains the **control flap for automatic intake pre-heating**. At 8,000 miles (12,000 kms) intervals check the flap operation at the "Winter" setting; oil lightly. At the "W" setting the fresh air inducted at the

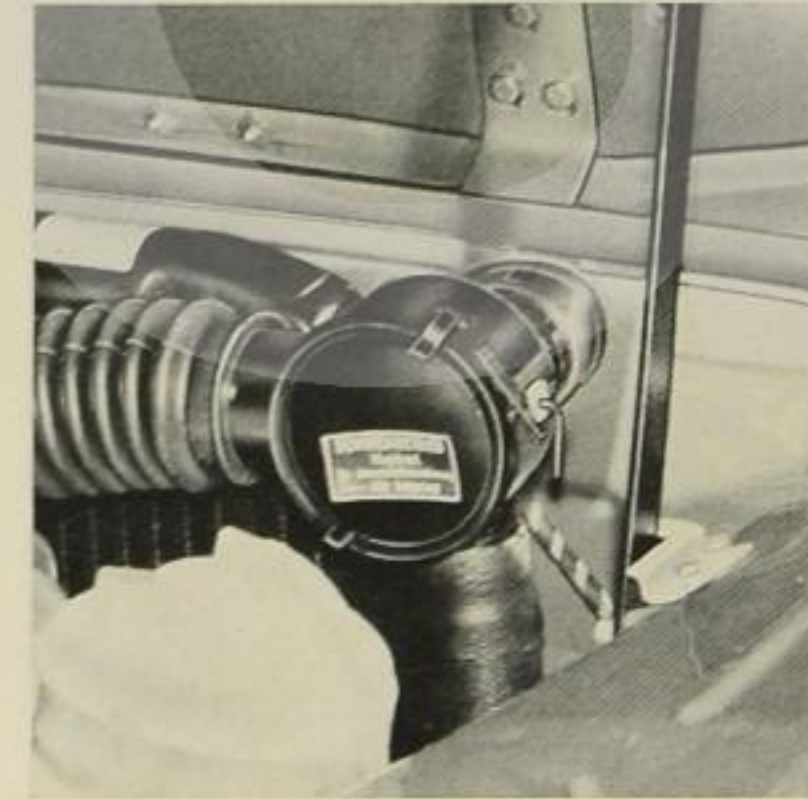
89



front of the vehicle is mixed with the hot air taken from the exhaust manifold to an approximate temperature of 30°C, depending on outside and engine temperatures. At an outside temperature of around 30°C the pre-heating air duct is closed completely and the fresh air duct is fully open.

In summer the flap is reset by means of the outside control lever (see also the transfer mounted on the housing cover, which can be removed for inspection by releasing two clip fasteners). **Fig. 90.**

90





The brakes should be adjusted at 8,000 miles (12,000 kms) intervals:

The disc brakes on the front wheels are of the selfadjusting type (see also page 28).

For the rear wheel brakes two adjusting cams, No. 17 metric size, are mounted on each brake bracket and these permit each of the two brake shoes to be adjusted individually.

Viewed vertically on the hexagonal cam the left shoe is adjusted counter-clockwise and the right shoe clockwise — turning the wheel sharply — until the brake shoe locks the brake drum. Then

turn back by about  $\frac{1}{8}$  revolution until the wheel just turns freely. **Fig. 91.**

**Warning!** The handbrake must be released when adjusting the rear wheel brake shoes.

If there is excessive play in brake pedal operation, i. e. the brake pedal has to be depressed a fairly long distance and imparts a spongy sensation, the brake system will have to be bled.

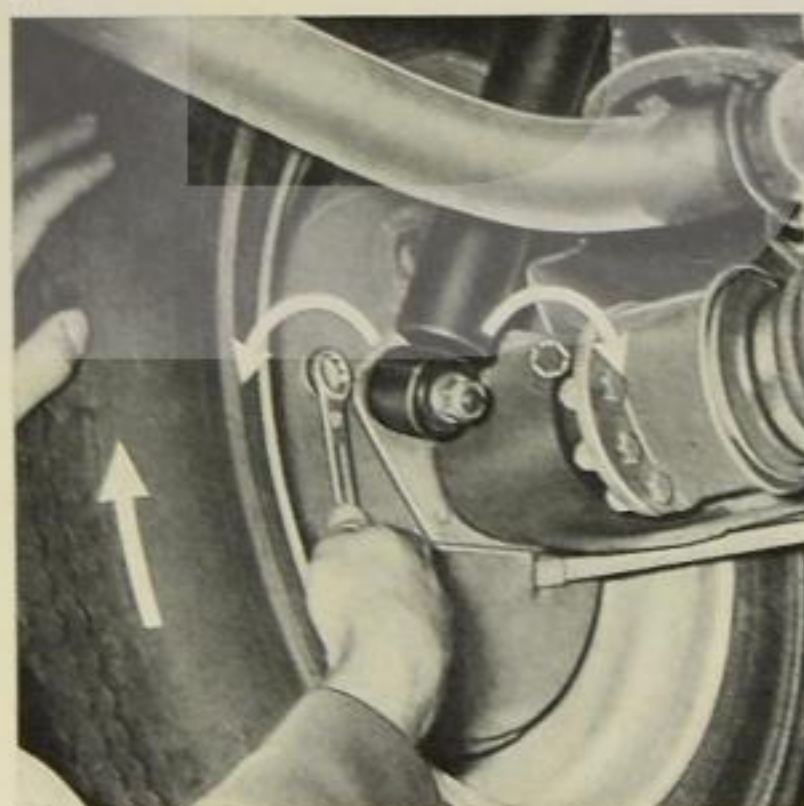
**Handbrake adjustment** (after adjusting the rear wheel brake shoes): push back the rubber gaiter on the handbrake lever, loosen the No. 10 metric locknut on

each adjusting bolt, pull on the handbrake to engage lightly, tighten the No. 10 adjusting nut (using an adjustable wrench to prevent the adjusting bolt from turning) until the wheel is locked. **Fig. 92, left.**

Re-tighten locknut. **Fig. 92, right.**

Finally check whether the rear wheels can be revolved freely when the handbrake is released. Even adjustment of both brake cables can be checked by turning the wheels by hand with the handbrake applied lightly.

91



92



### Solex 40 PDSI Downdraught Carburettor Fig. 93 and 94

1. Strangler flap.
2. Float chamber — vent
3. Fuel supply
4. Idling speed adjusting screw
5. Connection for timing adjustment
6. Idler jet
7. Idling mixture adjusting screw
8. Acceleration pump
9. Main jet plug screw
10. Choke linkage

**Carburettor cleaning** should preferably be left to a BMW Workshop. If necessary, however, the float chamber can be emptied and cleared of any accumulated water or dirt by unscrewing the screw plug (Fig. 94, 9 — No. 13 metric spanner).

In addition the following jets can be unscrewed and cleaned by blowing through:

Main jet (after removing the screw plug, No. 13 metric spanner, Fig. 94, 9).

Idler jet (No. 8 metric spanner, Fig. 93, 6).

Under no circumstances should the jets and basic settings of the carburettor be changed in any way. See Technical Data Section.

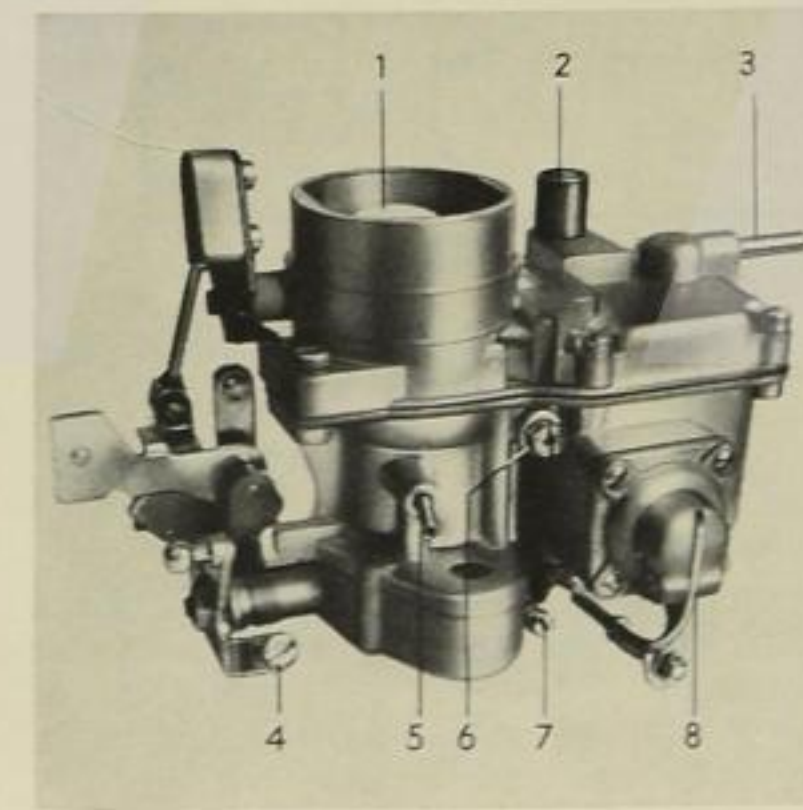
**Idling Adjustment** should only be carried out when the engine is at normal operating temperature:

Gently screw in the idling mixture adjusting screw as far as it will go and then unscrew by  $1\frac{1}{2}$  turns for the basic setting.

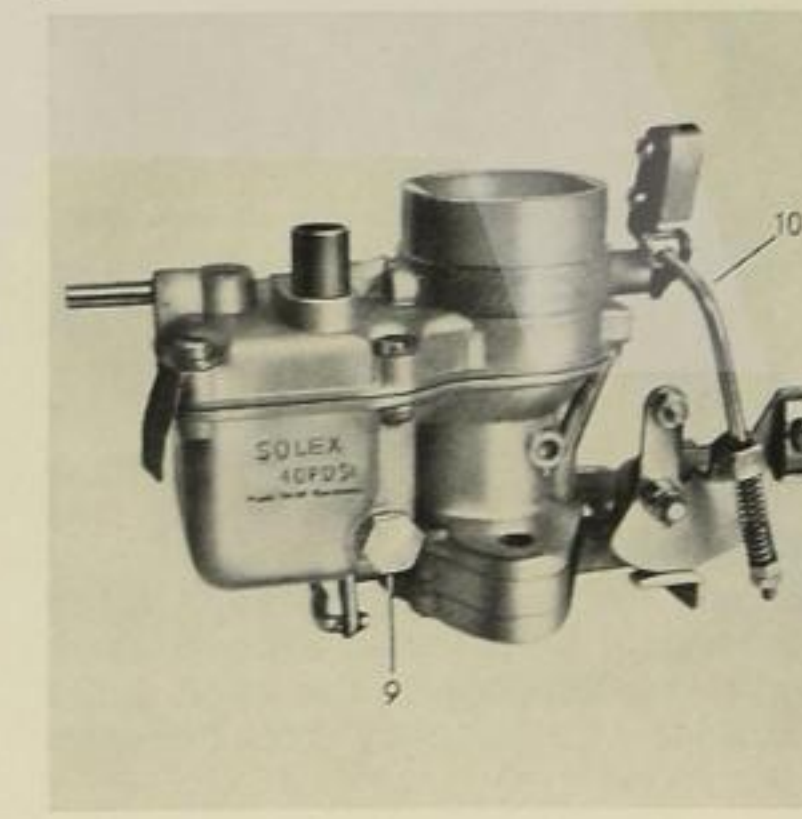
Set the idling revolution speed to between 700–800 rev/min by means of the idling speed adjusting screw.

By slightly screwing in (leaner mixture) or unscrewing (richer mixture) the idling mixture adjusting screw the most suitable fuel-air mixture can be ascertained from the increase in engine idling revolutions. The engine speed can then be cut back by screwing in the idling speed adjusting screw, ensuring that the engine runs smoothly. Otherwise reset the idling mixture adjusting screw.

93



94





## Technical Data

### ENGINE

#### Type:

Four-cylinder, four-stroke in-line engine, water cooled, overhead camshaft, inclined valves, hemispherical combustion chamber.

#### Installation:

Inclined at an angle of 30° over the front axle, in threepoint suspension: frontal mounting near centre of gravity in two lateral silent blocks directly on the front axle carrier; rear — bolted to the gearbox — on a silent bloc on the gearbox cross-member.

#### Cylinder Block:

Of special-purpose grey casting.

#### Cylinderhead:

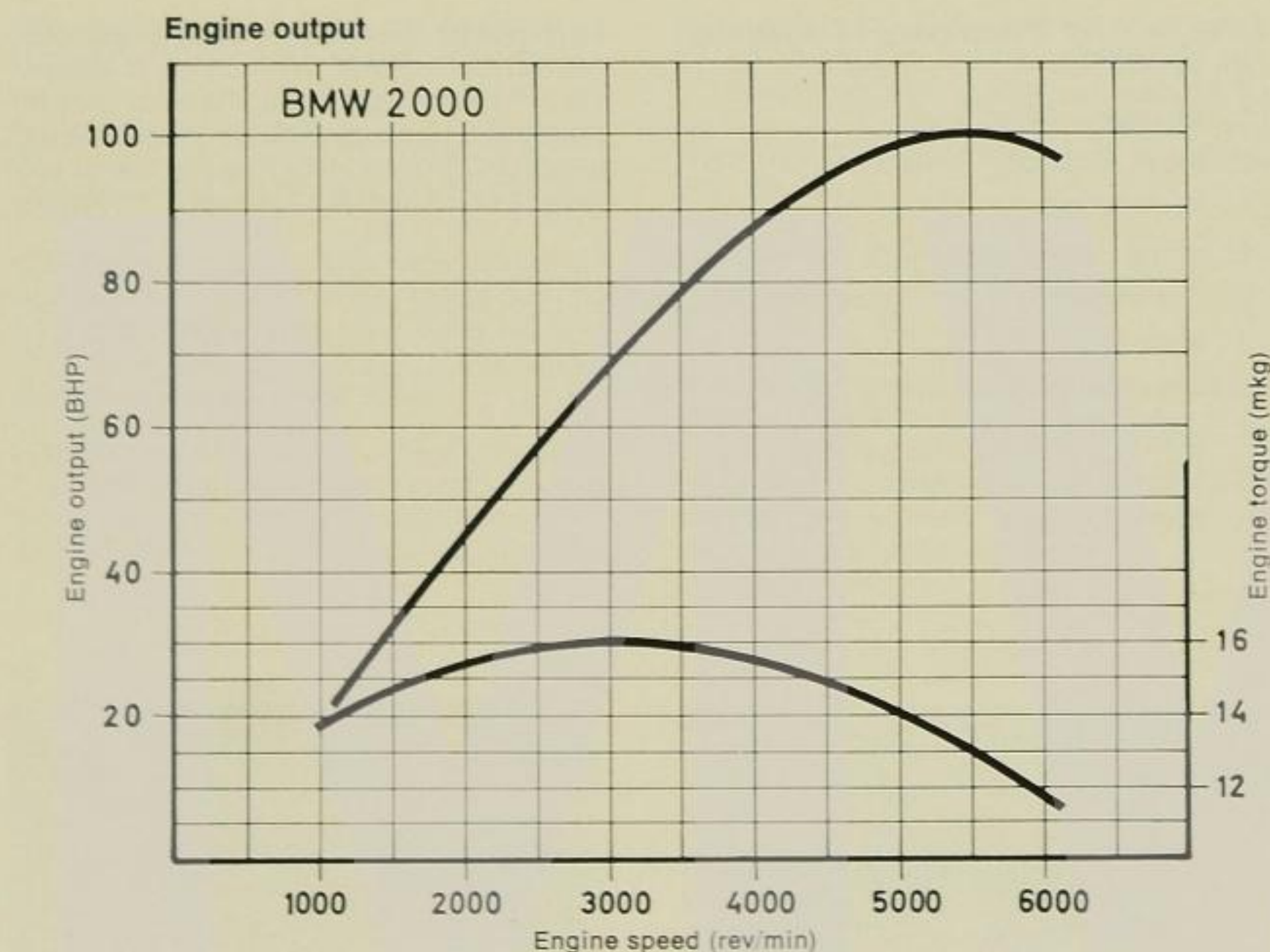
Of light-metal with shrink-fitted valve seating rings and guides.

#### Crankshaft:

Forged and tempered steel, 8 counterweights, 5 four-layer bearings.

#### Connecting rods and pistons:

Forged steel connecting rods with interchangeable four-layer bearings. Flat-top pistons, chromium-plated upper spherical graphite cast iron rings.



#### Valves:

Inclined suspension in cylinderhead in V-formation. Carbideclad exhaust valve. hard-chromium-plated valve shaft. Valve clearance adjustment by means of cams in the rocker arms.

#### Valve Operation:

By means of light-metal rocker arms with chill-cast tappets and overhead camshaft. Powered by double roller chain with automatic oil-damped chain tightener and safety valve.

### Cubic Capacity

Rating	1977 cc (120.6 cu. in.)
Actual	1990 cc (121.4 cu. in.)

### Maximum Brake Horsepower

At indicated rev/min	100 DIN hp (113 SAE hp)
	5500 rev/min (5800 rev/min)

### Specific engine output

50.3 HP/litre

### Maximum Permissible Engine Speed

6200 rev/min

### Maximum Permissible Engine Cruising Speed

6000 rev/min

### Maximum Torque

At indicated rev/min

16 mkp  
(115.73 ft. lbs.)  
3000 rev/min

### Compression Ratio

8.5:1

### Stroke/Bore

80/89 mm  
(3.1496 x 3.5039")

### Mean Piston Velocity

At indicated rev/min

14.7 m/sec  
(2894 ft./min)  
5500 rev/min

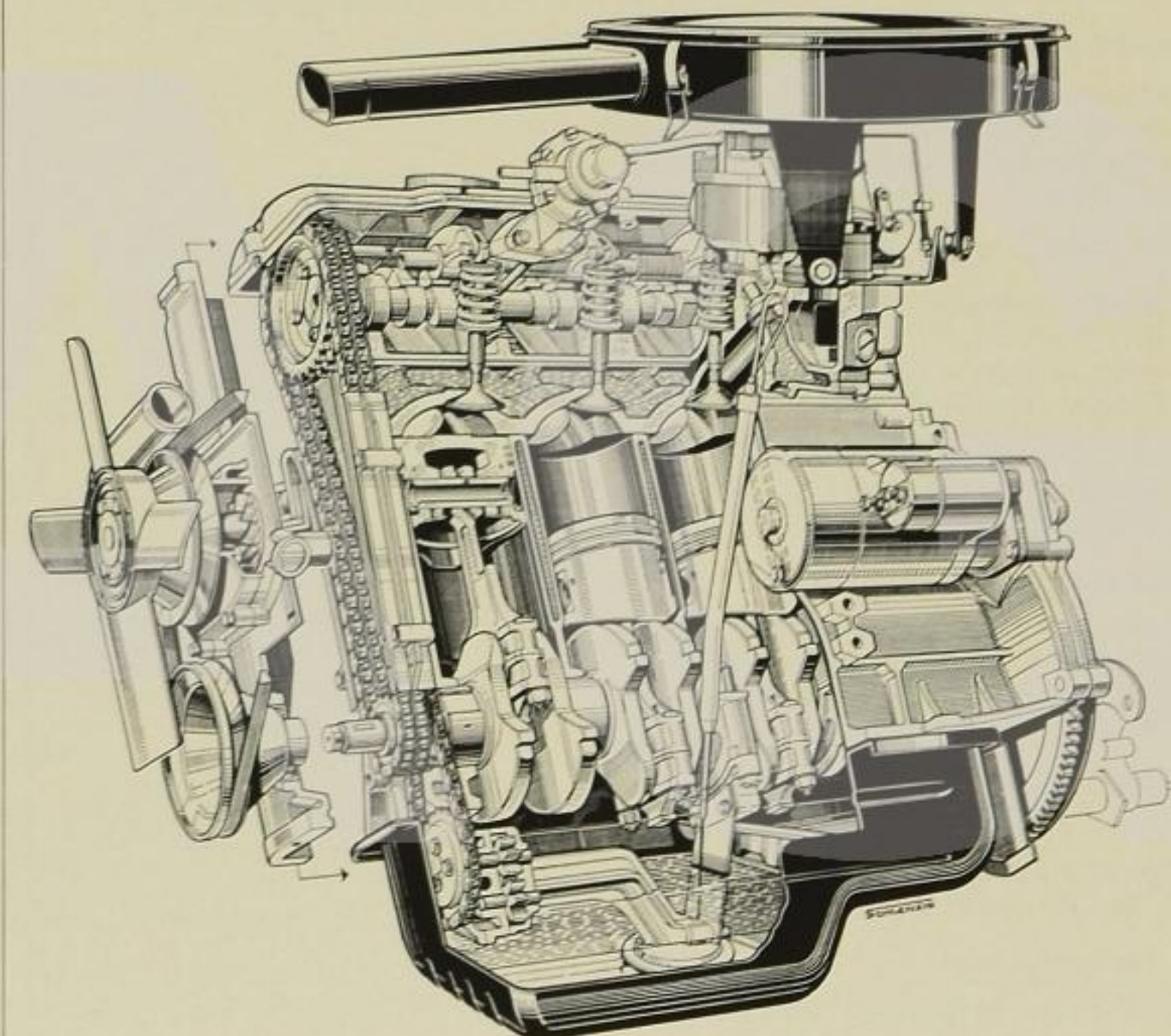
### Torque/Weight Ratio (unladen)

14.2 mkp/1000 kg  
102.6 ft. lbs./2205 lbs.

### Power to Weight Ratio

Car ready for driving, fully tanked:	11.3 kg/hp (24.9 lb/hp)
Vehicle fully loaded including baggage:	15.5 kg/hp (34.16 lb/hp)

### BMW 2000





**Breathing System:**

Crankcase and valve chamber interconnected by housing channel and connected to the induction line.

**Actual Operating Valve Clearance:**

Intake and exhaust 0.15–0.20 mm (0.006 to 0.008") measured with engine cold and stationary (maximum water temperature 35°C).

**Valve Control Timings:**

Intake opens 4° BTDC	} ± 2.5°
Intake closes 52° ABDC	
Exhaust opens 52° BBDC	
Exhaust closes 4° ATDC	

with a tolerance of 0.5 mm (0.02"), measured between rocker arms and cam base circle.

**Lubrication:**

Forced circulating lubricating with main lubricating oil filter, geared pump chain-driven from the crankshaft, sheet steel oil sump.

**Oil Filter:**

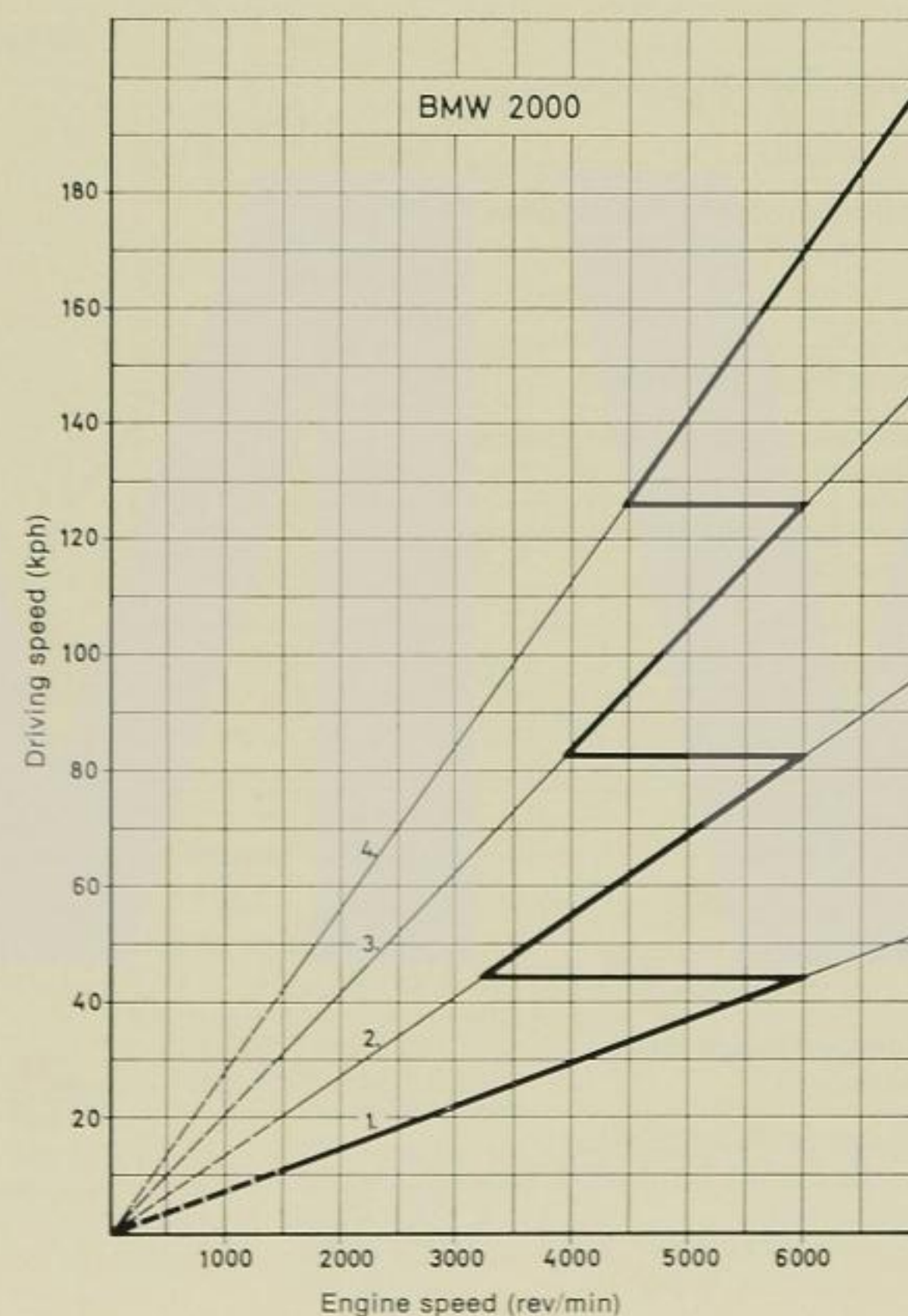
Main oil filter with micronic-paper cartridge and safety valve, opening pressure 18.5 ± 2.84 psi (1.3 ± 0.2 atü).

**Oil Consumption:**

0.05–0.1 litre per 100 km (180–360 miles per pint).

**Air Filter:**

One filter cartridge in intake muffler.

**Driving speed — Engine Speed****Standard Fuel Consumption to DIN 70030**

10.7 litres/100 kms  
(26.5 mpg)

**Carburettor**

1 Solex 40 PDSI  
down draught carburettor

**Carburettor Settings**

Main jet	X 155
Air Compensating Jet	130
Venturi Tube	30
Idling Jet	45
Enrichment Valve	100
Injection Volume	2 ± 0.2 cc/stroke (0.122 ± 0.012 cu. in.)
Float needle Valve	2.0
Float Weight	8.5 g (0.3 oz.)
Fuel Level	17–19 mm (0.67–0.75") below joint

**Radiator:**

Finned-tube radiator with safety and vacuum valve in filler cap.

**Opening Pressure:**

For the radiator cap valves:

Overpressure 0.7  $\pm$  0.15 kg/sq. cm  
– 0.10

( 9.96  $\pm$  2.13 psi )  
– 1.42

Vacuum to 0.05 kg/sq. cm (0.71 psi.)

**Coolant Water Thermostat:**

With air temperature compensator, positioned before the coolant water pump inlet. Commences opening at 75°C.

(Mixed water temperature corresponds with approx. 80°C at engine outlet.)

**Fuel Delivery System:**

Mechanical fuel pump, pump pressure 0.21–0.25 kg/sq. cm (3–3.6 psi).

**Fuel Filtering System:**

One fine screen filter in the fuel pump and one in the plunger tube of fuel tank sending unit.

**CLUTCH**

Hydraulically operated single-plate dry clutch with torsional vibration damper for manual gearbox or fluid coupling with torque converter for automatic transmission.

**GEARBOX:**

Manual: Four-speed gearbox with Porsche synchromesh in all forward gears, one reverse gear;

Automatic: ZF automatic transmission 3 HP-12.

**Gearbox Ratios:**

	Manual Gearbox	Automatic Transmission
1st Gear	3.835	2.56
2nd Gear	2.053	1.52
3rd Gear	1.345	1.0
4th Gear	1.0	—
Reverse Gear	4.18	2.0

**Torque Converter Ratio:**

1 – 2.1:1.



**UNIVERSAL SHAFT**

Divided universal shaft attached at front with knuckle joint and mounted centrally in needle bearings, centre bearing suspended flexibly, rear attachment to differential box by rubber coupling centred in guide lugs.

**DIFFERENTIAL GEARBOX**

Hypoid bevel gears in taper roller bearings.

**Ratio:**

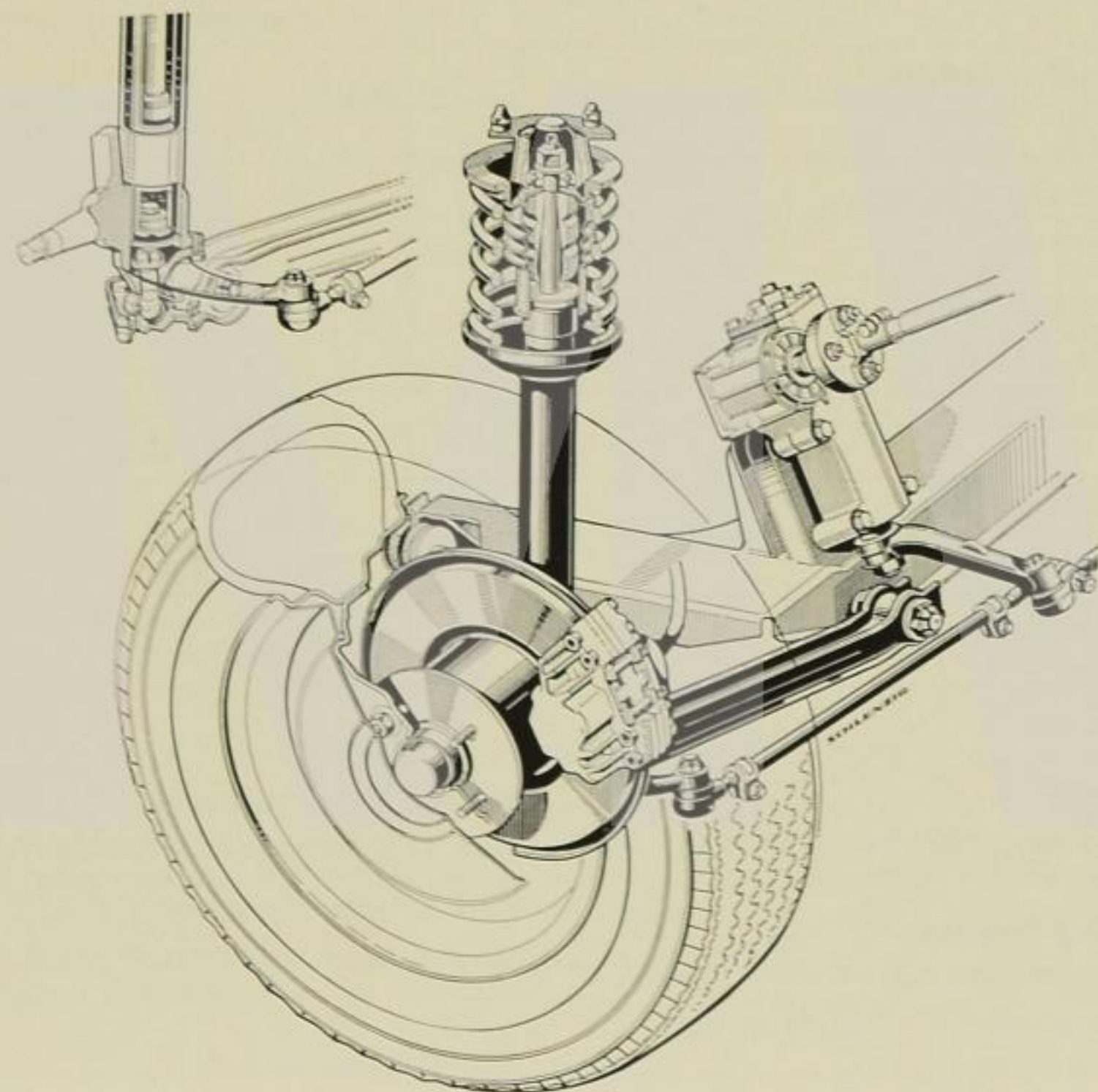
Pinion-/ crown wheel	No. of teeth	Type of tooth
4.11:1	9:37	Klingelnberg
or		
4.10:1	10:41	Gleason

**Final Drive:**

Left and right double-jointed half-shafts with knuckle joint mounted in needle bearings on the drive flange of the differential gearbox and an oil bath-immersed sliding joint mounted in needle bearings on the wheel shaft or left and right double-jointed half-shafts with maintenance-free homokinetic joints.

**CHASSIS****Front Wheel Suspension:**

Independent suspension on transverse steering arms with spring-assisted telescopic struts and double-acting shock absorbers. Coil springs with auxiliary rubber buffer, spring deflection 180 mm (7.09"). Torsion stabiliser bar in maintenance-free silent blocs as optional extra.

**Front Wheel Suspension — BMW 2000****Toe-in in normal position\***

$1 \pm 1 \text{ mm}$  ( $0.04 \pm 0.04''$ )

**Camber in normal position\***  $0^\circ 15' \pm 30'$ **Castor**  $3^\circ \pm 30'$ **Inclination of steering knuckle pin**  $8^\circ 40'$ 

**Difference in track angle** at  $20^\circ$  deflection of inside wheel :  $1^\circ$

**Maximum wheel lock:**

Inside wheel  $42^\circ$

Outside wheel  $34^\circ$

**Rear Wheel Suspension:**

Independently sprung wheels, tracked by inclined trailing arms mounted in maintenance-free silent blocs.

Delta-shaped box members for trailing arms and differential gearbox, bolted to the body at three points in silent blocs. Coil springs with auxiliary rubber buffers, 200 mm (7.87") spring deflection, double-acting hydraulic telescopic shock absorbers. Torsional stabiliser bar in silent blocs available as optional extra.

**Toe-in in normal position**

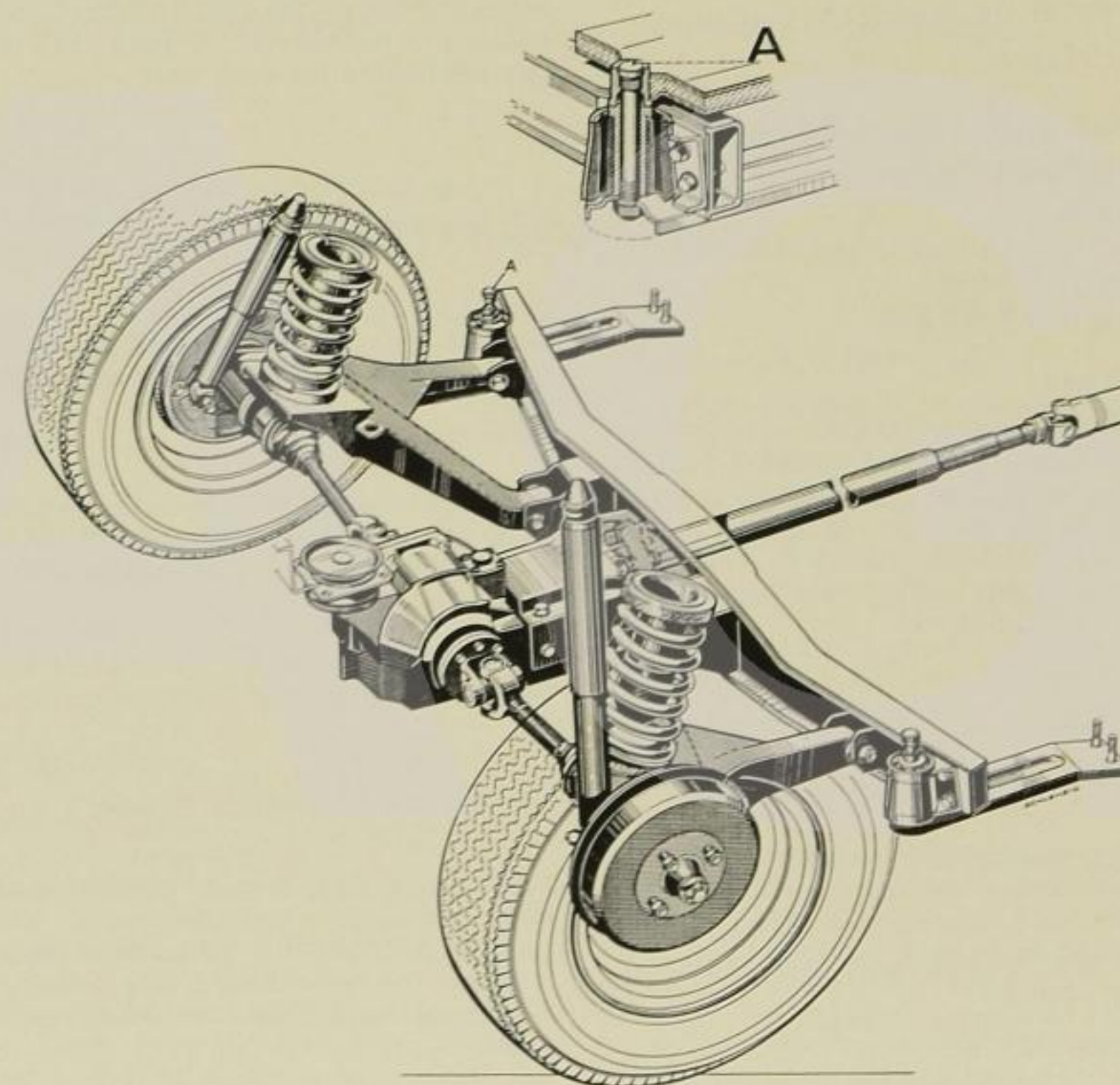
$1.5 \pm 1.5 \text{ mm}$  ( $0.06 \pm 0.06''$ )

**Camber in normal position**  $2^\circ$  negative**Steering**

ZF Gemmer steering with globoid worm and roller

**Transmission Ratio:** 15.5:1**Overall Ratio:** 17.58:1

\* Normal position: vehicle with 3 persons  
(= 3 x 65 kg plus 30 kg baggage)

**Rear Wheel Suspension — BMW 2000**



**Track Rod 3-piece****Steel disc wheels**

Drop-centre rim 5 JK x 14

**Tyres**

Standard tyres: 6.45/165 S 14 tubeless

Optional extra: radial tyres 165 SR 14, with tube.

**B R E A K S Y S T E M****Foot Brake**

Hydraulic four-wheel brakes with double-acting servo unit and brake pressure limiting valve for rear wheel brakes. Master brake cylinder positioned in engine well, cylinder diameter 23.81 mm (0.937"), compensating reservoir (transparent) in engine well.

**Front**

Self-adjusting with self-centering sliding blocks.

Brake disc diameter 272 mm (10.71").

Brake caliper cylinder 54 mm (2.13").

**Rear**

Drum-type brakes with self-centering sliding shoes

Wheel cylinder diameter 17.46 mm (0.69")

Brake drum diameter 250 mm (9.84")

Brake lining width 40 mm (1.57")

**Handbrake**

Mechanical action on the rear wheels. Adjusting device on the handbrake lever below the rubber cap. Cables individually adjustable for each rear wheel.

**C O N S T R U C T I O N**

Stressed, distortion-resistant all-steel welded monocoque lightweight structure. Doors and bonnet opening forward.

**Boot dimensions:** 1400 mm (55.1") wide, 1000 mm (39.4") in depth, 450 mm (17.7") high, approximate cubic capacity 600 litres (21.1 cu. ft.).

**Fuel tank capacity:** 55 Litres (12.1 Imp. galls., 14.5 US galls.)

**Heating and Ventilation System:**

Fresh-air heating system with hot water heat exchanger and two-speed axial blower. A total of 6 adjustable supply nozzles for windshield, side windows and floor area. Stale air is extracted from inside the car via slits above the rear window through apertures in the rear roof pillars (below the boot lid).

**E L E C T R I C A L S Y S T E M****Battery:** 12 V, 44 Ah**Ignition Coil:** Bosch K 12 V**Distributor:** Bosch IUR 4**Ignition Timing** 3° BTDC

Timing adjustment should only be carried out when the engine is stationary and cold (maximum water temperature 35°C).

**Timing Sequence:** 1 — 3 — 4 — 2**Contact Breaker Dwell Angle:** 60°**Contact Breaker Gap:** 0.4 mm (0.016")**Timing Adjustment:**

By centrifugal force and vacuum

**Centrifugal Force Adjustment:**

Commences at approx. 800 rev/min CS  
Ends at approx. 2400 rev/min CS  
Maximum adjustment range 37° CS

**Vacuum Adjustment:**

Begins at approx. 115 mm QS (5.118" MG)  
Ends at approx. 210 mm QS (8.267" MG)  
Maximum adjustment range 10° CS

**AC Generator:**

Bosch K 1/14 V 35 A 20

**Voltage Regulator**

Bosch A D N 1/14

**Starter**

Bosch G F (R) 12 V, 1 HP

**Spark plugs**

Beru 200/14/3 A	} Electrode gap: 0.6 + 0.1 mm (0.024" + 0.004")
Bosch W 200 T 30	
Champion N 9 Y	

For mainly short-distance operation and when using heavily leaded fuel:

Bosch W 215 P 21\*

Electrode gap 0.35 mm (0.014")

\* Spark plugs with platinum electrodes (also for motor way driving).

**Headlamps**

Two wide-band headlamps with 150 x 350 mm (5.9" x 13.8") lenses for asymmetric low and high beam.

**12 V Bulbs**

See Pages 37—40.

**Fusebox**

Mounted on the left-hand side of the engine well, six terminals, see Page 37 for fuse index.

**Cigar Lighter Socket in Dashboard**

Also suitable for use as a socket for handlamp, electric shaver with standardised plugs up to 50 Watts at 12 Volts.

**Automatic Windshield Washer**

Electrical geared pump with delayed-action relay, operated by finger contact on directional flasher lever.

**Horns**

Twin full-volume horns channelled in ideal acoustic direction, protected against dirt and fitted behind the radiator grille.

**D I M E N S I O N S A N D W E I G H T S****Length** 4500 cm (14'9")**Wight** 1710 mm (5'7 1/2")**Height (unladen)** 1445 mm (4'8.9")**Wheelbase** 2550 mm (8'4 1/2")**Ground Clearance (laden)** 140 mm (5 1/2")**Front Overhang** 900 mm (2'11 1/2")**Rear Overhang** 1050 mm (3'5 3/8")**Track, Front** 1330 mm (4'4 3/8")**Track, Rear** 1376 mm (4'6 1/4")**Minimum Track Circle dia.** 9.60 m (31'6")

**Minimum Turning Circle dia.**  
10.50 m (34'5")

**Weight, unladen**

(fully tanked) 1130 kg (2491 lbs.)

**Permissible Overall Weight**

1550 kg (3416 lbs.)

**Permissible Axle Load, Front**

760 kg (1675 lbs.)

**Permissible Axle Load, Rear**

810 kg (1785 lbs.)

**Permissible Trailer Load**

Without brakes: 500 kg (1100 lbs.)

With brakes: 1200 kg (2645 lbs.)

with brakes and automatic  
transmission): 800 kg (1763 lbs.)

**Permissible Roof Load** 75 kg (165 lbs.)

(The maximum permissible axle loads should not be exceeded when the vehicle is fully laden.)

**Stopping Distances**

When driving, the efficiency of even the best brakes is governed decisively by the adhesion which exists between tyre and road surfaces. As can be seen from the adjacent graph, (Page 72), for example, the maximum possible retardation of a vehicle on an icy surface is only approximately 1.5 m/sec<sup>2</sup> (4.92 ft/sec<sup>2</sup>).



This means that the driving speed can be reduced in one second by only  $1.5 \text{ m/sec}^2 = 5.4 \text{ kph}$  ( $4.9 \text{ ft/sec}^2 = 3.4 \text{ mph}$ ). Thus, for example, if you were driving at a speed of 33.5 mph it would take you at least 10 seconds to come to a halt — in the diagram this corresponds with a distance of almost 100 yards.

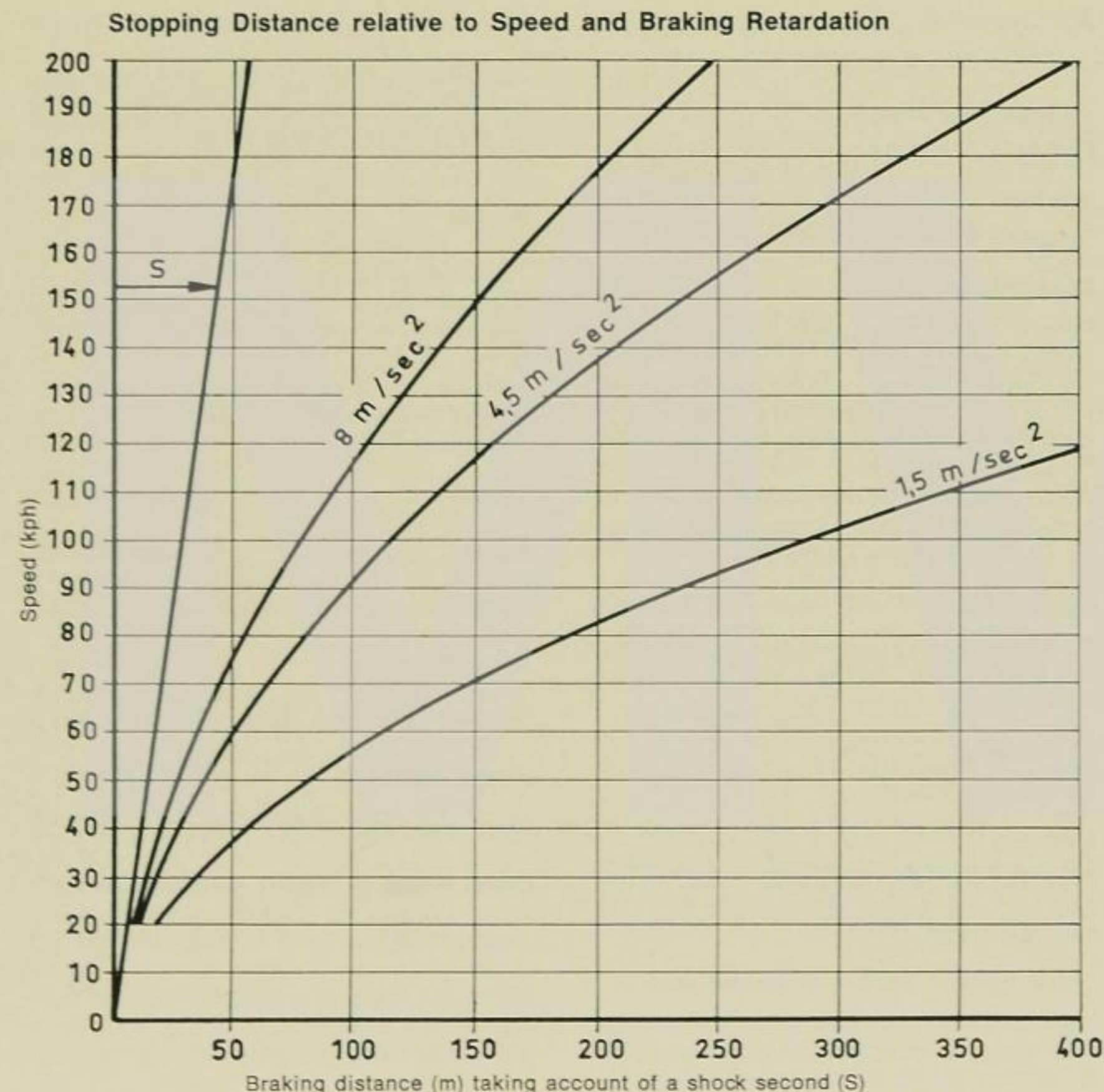
The lowest curve  $1.5 \text{ m/sec}^2$  ( $4.9 \text{ ft/sec}^2$ ) shows the braking path in relation to driving speed under these conditions. By comparison with this the upper curve  $8 \text{ m/sec}^2$  ( $26.25 \text{ ft/sec}^2$ ) indicates the shortest stopping distance which can normally be achieved under ideal conditions. The middle curve  $4.5 \text{ m/sec}^2$  ( $14.75 \text{ ft/sec}^2$ ) applies to road surfaces offering reasonable traction but which are wet and this represents a mean value which can also be taken as a reference basis for everyday driving with normal braking on dry road surfaces.

The values quoted can fluctuate upward or downward, according to the condition of the brakes, the tyre tread or the road surface.

The quoted stopping distance has already allowed for the distance travelled within the "S" period, or "shock second".

As is generally known the best braking effect is achieved with wheels which are still just barely revolving rather than wheels which have been locked.

Locked wheels can be extremely dangerous since sliding front wheels cannot be steered and skidding rear wheels cause the vehicle to "break out" and slide broadside.



## MOToring PERFORMANCE

**Maximum speed:** 104 mph (168 kph).

### Maximum Climbing Capacity

In 1st gear 71%

In 2nd Gear 32%

In 3rd Gear 18%

In 4th Gear 12%

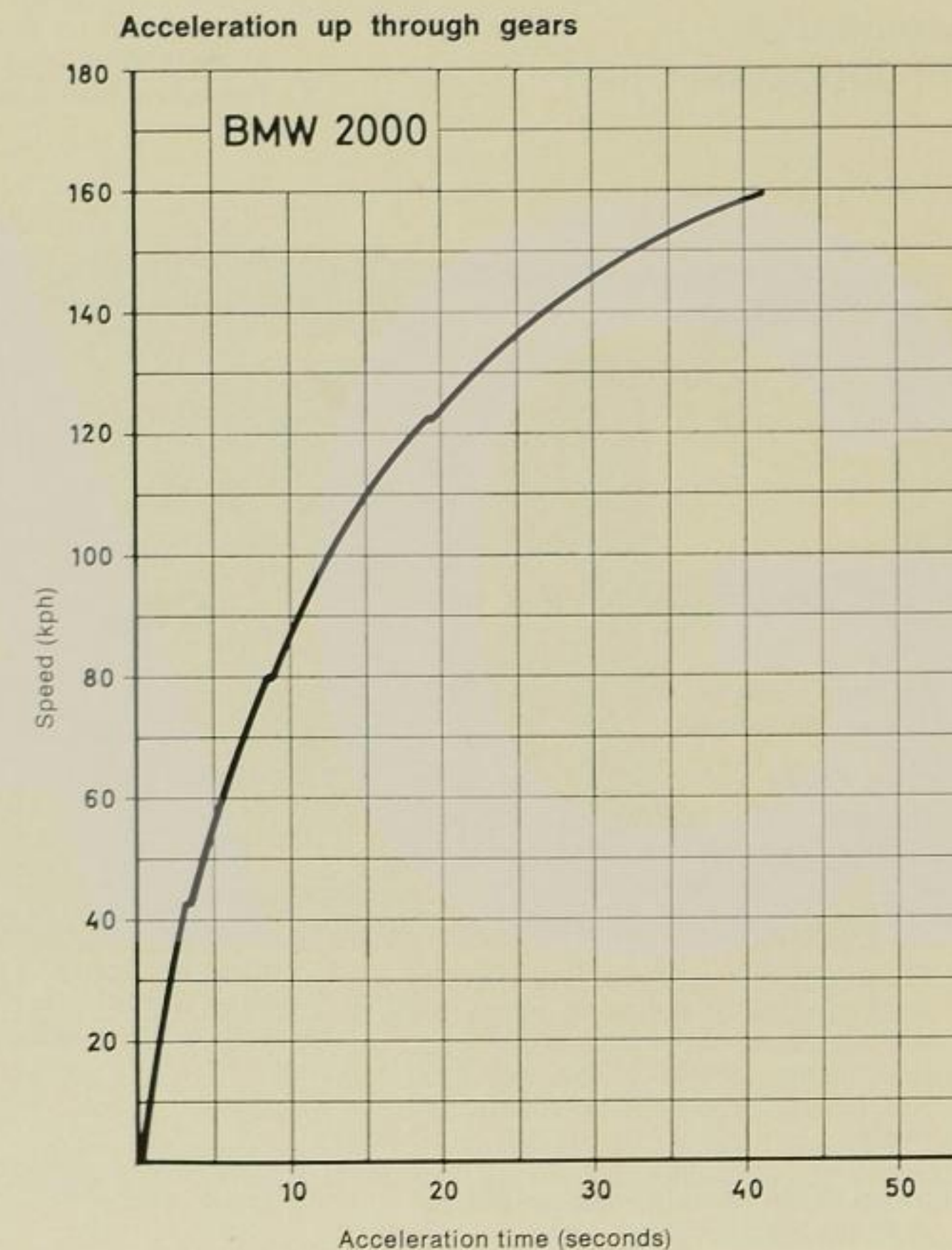
### Acceleration:

Gear	mph (kph)	Seconds
2nd	0-31 (0-50)	4.0
2nd	0-50 (0-80)	8.4
3rd	0-62 (0-100)	12.4
3rd	0-75 (0-120)	17.9
4th	0-87 (0-140)	27.0
4th	0-100 (0-160)	42.8

Standing kilometer in: 34.2 seconds

Average speed 65.5 mph (105.2 kph)

Producing a final speed of:  
94.5 mph (152 kph).





## Explanation of Lubrication Chart

### Important note for the servicing workshop

The lifting points for single-column ramps are as follows:

#### 4 Lifting Points:

Outside below the body skirt immediately adjacent to the reinforced points for the vehicle jack.

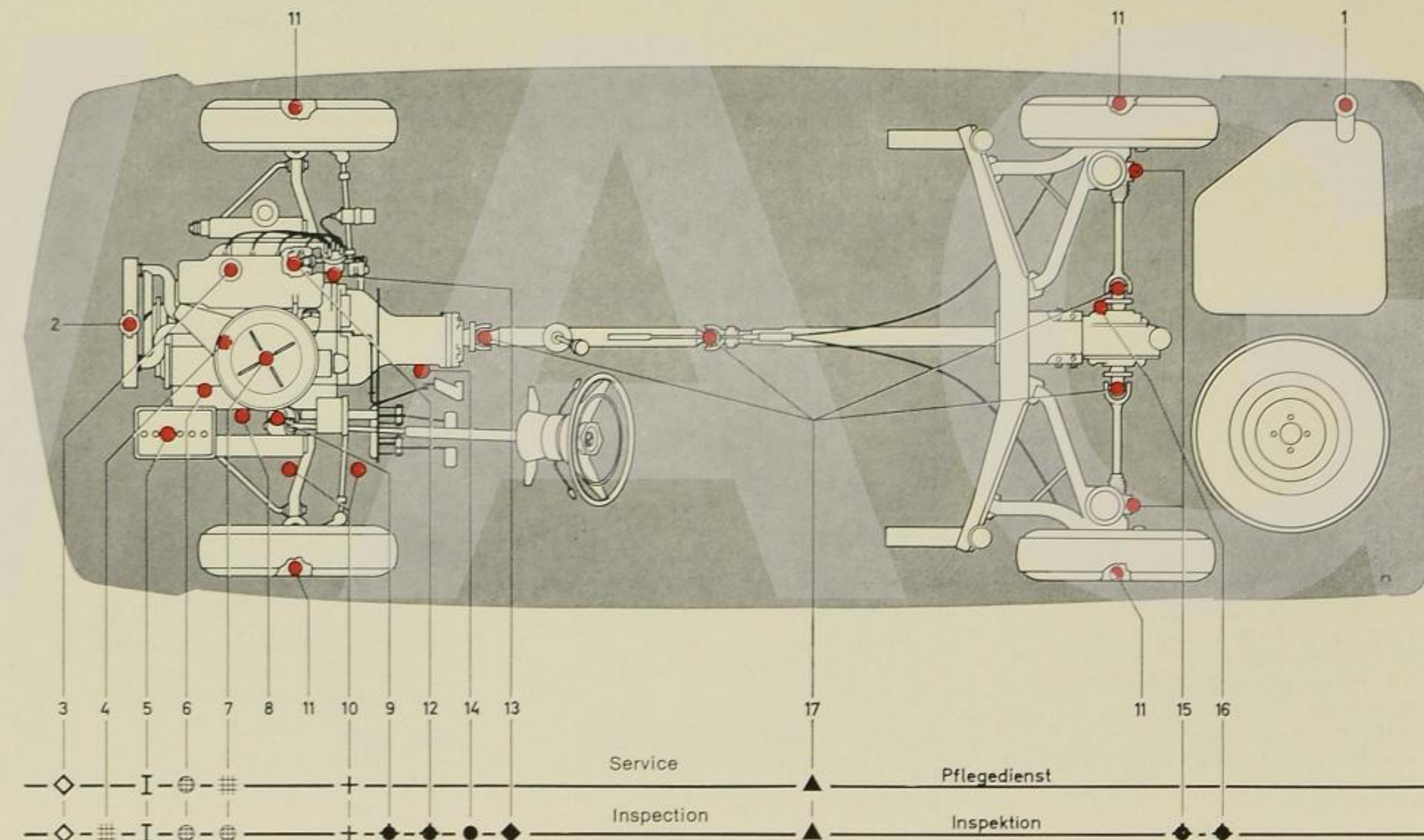
#### 3 Lifting points:

Front (approximately in line with the leading edge of the door) below the two members of the floor assembly.  
Rear in the centre of the V-shaped box member near the universal joint flange.

**Warning!** Never raise the vehicle directly beneath the differential gearbox.

1. Fuel filler pipe	Commercial super-grade petrol
2. Radiator filler pipe (water drain dock: at the bottom of the radiator on the left, at the rear of the engine block on the right)	Clean, lime-free water with a) anti-corrosion agent in summer b) antifreeze in winter
3. Engine oil filler opening	◆ Commercial HD engine oil SAE 30 for outside temperatures above 0°C; below 0°C — SAE 10 W 30 ◇ Symbol for oil change
4. Fuel pump fine sieve	≡ Symbol for filter cleaning
5. Battery	I Distilled water
6. Engine oil filter	⊗ Symbol for filter change
7. Intake air filter	≡ Symbol for filter cleaning ⊗ Symbol for filter change
8. Engine oil dipstick	Check oil level at regular intervals
9. Steering gearbox (permanent filling)	◆ Commercial hypoid transmission oil SAE 90
10. Compensating reservoir for brake and clutch hydraulic fluid	+ Blue ATE brake fluid
11. Wheel bearings (check at 40,000 miles/60,000 kms intervals)	▲ Commercial multi-purpose lubricating grease, drip point 180°C.
12. Drop arm bearing (permanent backing)	◆ Hypoid transmission oil SAE 90
13. Distributor (see Page 54 for remaining lubricating points)	◆ HD oil as for engine
14. Manual gearbox (oil change at 16,000 miles/24,000 kms intervals) Automatic gearbox (oil change at 12,000 miles/18,000 kms intervals)	● Commercial transmission oil SAE 80 Oil brands, see page 83
15. Half-shaft sliding joints (oil change at 16,000 miles/24,000 kms intervals), does not apply to maintenance-free drive shafts	◆ Commercial hypoid transmission oil SAE 90
16. Differential gearbox	◆ Commercial SAE 90 break-in hypoid transmission oil. (Your BMW Service Station knows the factory recommended oil brands.)
17. Lubricating nipple for propeller shafts and where necessary for half-shafts.	▲ Commercial multi-purpose lubrication grease, drip point 180°C.

## Lubrication Chart





## Key to electrical wiring diagram

Cable colour coding	
0.75 GN	
Cross-section (sq. mm)	Colour
BL = blue	GR = grey
BR = brown	RT = red
GE = yellow	SW = black
GN = green	WS = white

- 1 Turn indicator front right
- 2 Parking lamp right
- 3 Headlamp right
- 4 Fog lamp right (special equipment)
- 5 Horn right
- 6 Horn left
- 7 Fog lamp left (special equipment)
- 8 Headlamp left
- 9 Parking lamp left
- 10 Turn indicator front left

- 11 Soldering tag
- 12 Horn relay
- 13 Voltage regulator
- 14 Generator
- 15 Starter
- 16 Battery
- 17 Reversing lamp and starter lock switch (Automatic transmission)
- 18 Stop lamp switch
- 19 Fog lamp switch (special equipment)
- 20 Fog lamp relay (special equipment)
- 21 Distributor
- 22 Coil
- 23 Not used
- 24 Oil pressure warning contact
- 25 Not used
- 26 Starter relay (Automatic transmission)
- 27 Fuse box
- 28 Screen washer pump
- 29 Screen wiper motor
- 30 Washer delay relay
- 31 Blower motor
- 32 Cigar lighter and socket
- 33 Choke warning light
- 34 Screen wiper switch
- 35 Blower switch
- 36 Ignition switch

## Positions:

- I Halt (Off)
- II Garage
- III Fahrt (Drive)
- IV Start

- 37 Turn indicator, parking light and screenwasher switch
- 38 Horn ring
- 39 Headlamp switch
- 40 Dip switch and headlamp flasher

- 41 Rear window heating switch
- 42 Combined instrument
- 43 Speedometer
- 44 Clock
- 45 Revolution counter (special equipment)
- 46 Flasher unit
- 47 Flying fuse for radio (special equipment) 5 A
- 48 Radio aerial (special equipment)
- 49 Radio (special equipment)
- 50 Door contact light switch right
- 51 Door contact switch left
- 52 Interior light
- 53 Selector gate light (Automatic transmission)
- 54 Rear window heating element (special equipment)
- 55 Fuel gauge float contact
- 56 Rear lamp right
- 57 Number plate lamps
- 58 Rear lamp left
- X Flat pin connector

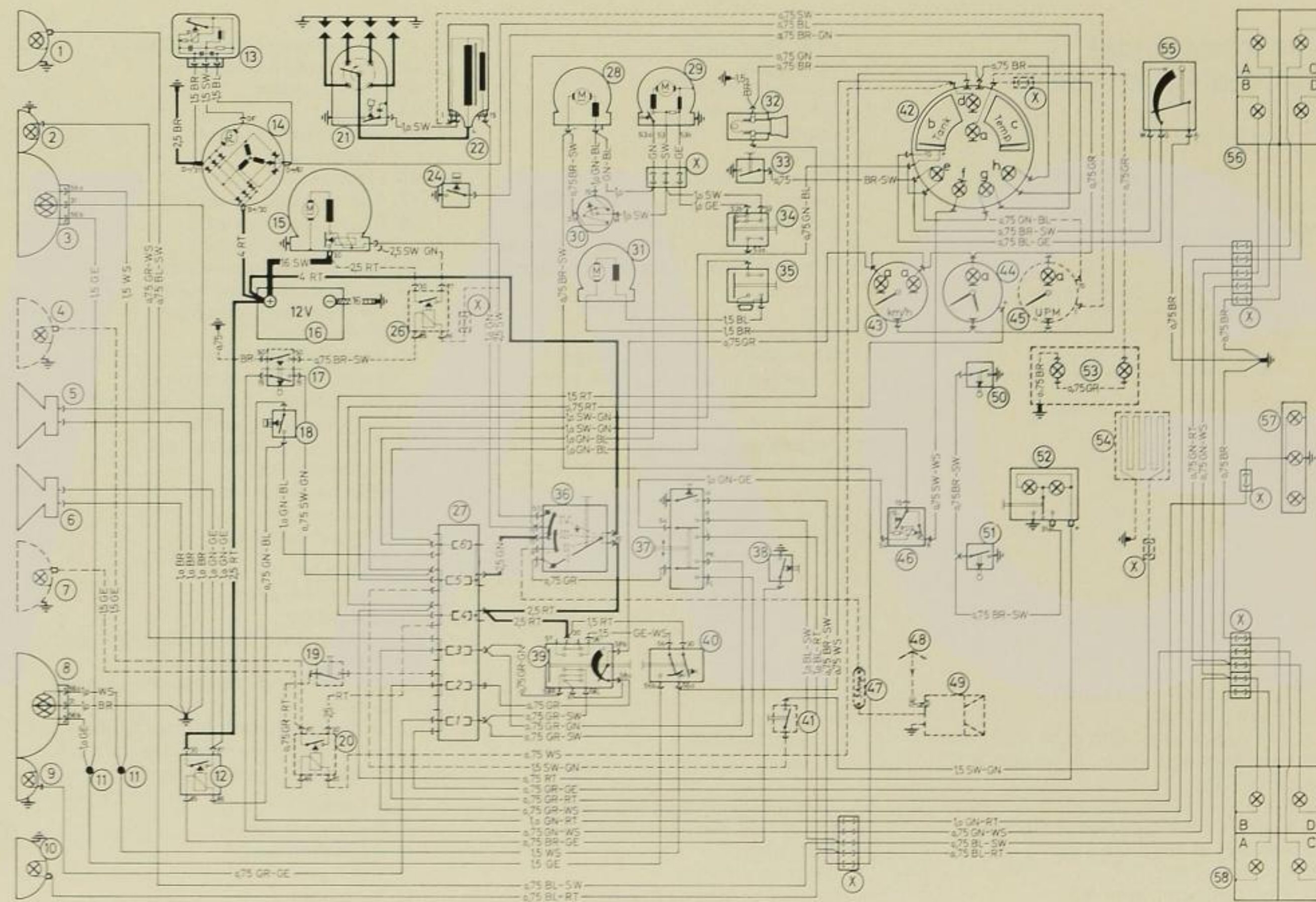
## Instruments:

- a) dial illumination
- b) fuel gauge
- c) water temperature gauge
- d) main beam warning (blue)
- e) fuel level and choke warning lamp (white)
- f) flashing indicator telltale (green)
- g) oil pressure warning (orange)
- h) battery charge warning (red)

## Rear lights:

- A Flashing indicator
- B Reversing lamp
- C Tail light
- D Stop light

## Electrical Wiring Diagram





## Key to electrical wiring diagram (USA)

Cable colour coding	
0.75 GN	
Cross-section (sq. mm)	Colour
BL = blue	GR = grey
BR = brown	RT = red
GE = yellow	SW = black
GN = green	WS = white

- 11 Diaphragm relay
- 12 Horn relay
- 13 Voltage regulator
- 14 Electric generator
- 15 Starter
- 16 Battery
- 17 Reversing lamp and starter lock switch (Automatic transmission)
- 18 Stop lamp switch
- 19 Fog lamp switch (special equipment)
- 20 Fog lamp relay (special equipment)
- 21 Distributor
- 22 Coil
- 23 Not used
- 24 Oil pressure warning contact
- 25 Break-down warning light switch
- 26 Starter relay (Automatic transmission)
- 27 Fuse box
- 28 Screen washer pump
- 29 Screen washer motor
- 30 Delay relay
- 31 Blower motor
- 32 Cigar lighter and socket
- 33 Choke warning light
- 34 Screen wiper switch
- 35 Blower switch
- 36 Ignition switch

Positions:

- I Halt (Off)
- II Garage
- III Fahrt (Drive)
- IV Start

- 1 Turn indicator front right
- 2 Headlamp right
- 3 Additional headlamp right
- 4 Fog lamp right (special equipment)
- 5 Horn right
- 6 Horn left
- 7 Fog lamp left (special equipment)
- 8 Additional headlamp left
- 9 Headlamp left
- 10 Turn indicator front left

- 37 Turn indicator, parking light and screenwasher switch
- 38 Horn ring
- 39 Headlamp switch
- 40 Dip switch and headlamp flasher

- 41 Rear window heating switch
- 42 Combined instrument
- 43 Speedometer
- 44 Clock
- 45 Revolution counter  
(special equipment)
- 46 Flasher unit
- 47 Turn indicator warning relay
- 48 Flying fuse for radio  
(special equipment)
- 49 Radio (special equipment)
- 50 Door contact light switch right
- 51 Door contact switch left
- 52 Interior light
- 53 Selector gate light  
(Automatic transmission)
- 54 Rear window heating element  
(special equipment)
- 55 Fuel gauge float contact
- 56 Rear lamp right
- 57 Number plate lamp
- 58 Rear lamp left
- X Flat pin connector

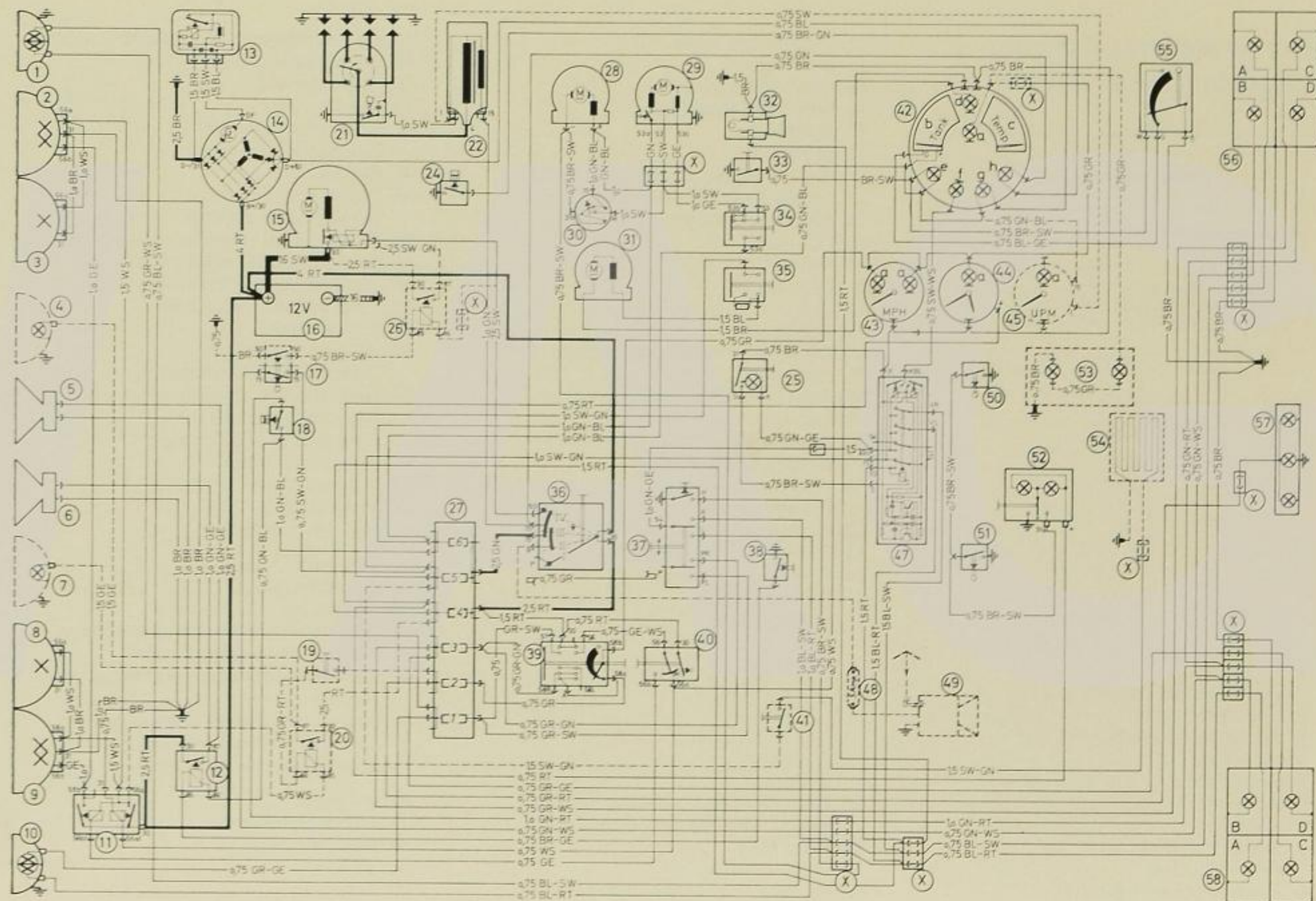
**Instruments:**

- a) dial illumination
- b) fuel gauge
- c) cooling water temperature gauge
- d) main beam warning (blue)
- e) fuel level and choke warning lamp (white)
- f) flashing indicator telltale (green)
- g) oil pressure warning (orange)
- h) battery charge warning (red)

Rear lights:

- A Flashing indicator
- B Reversing lamp
- C Tail light
- D Stop light

## Electrical Wiring Diagram (USA)



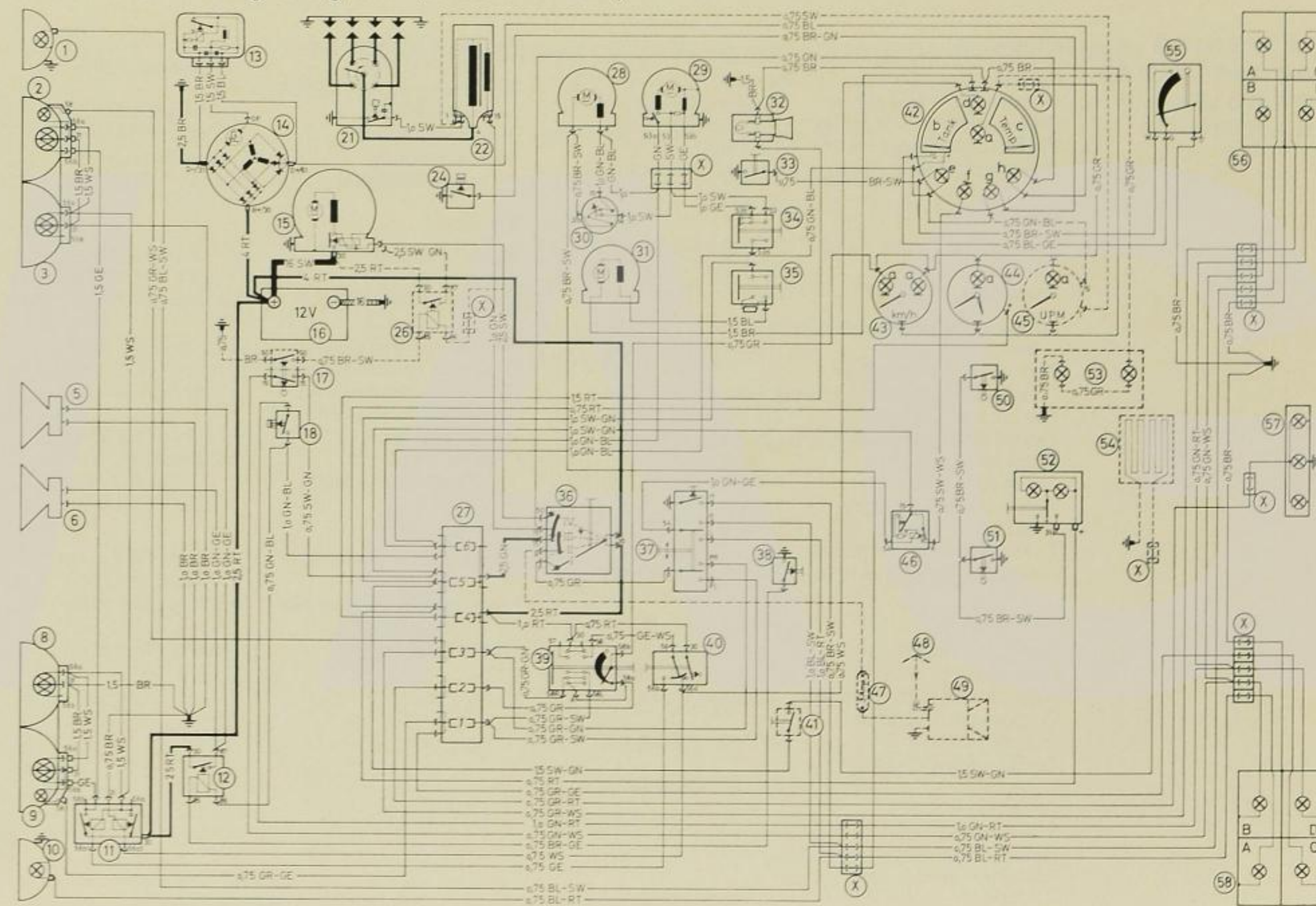


- 1 Turn indicator front right
- 2 Headlamp right
- 3 Additional main beam right
- 4 Not used
- 5 Horn right
- 6 Horn left
- 7 Not used
- 8 Additional main beam left
- 9 Headlamp left
- 10 Turn indicator front left

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

- 37 Turn indicator, parking light and screen washer switch
- 38 Horn ring
- 39 Headlamp switch
- 40 Dip switch and headlamp flasher

- A Flashing indicator
- B Reversing lamp
- C Tail light
- D Stop light





**TIGHTENING  
TORQUE VALUES  
FOR BOLTS  
AND NUTS**
**Engine**

Cylinder head bolts	7 ± 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 attachment flange	2.5 mkp (18.1 ft/lb) M8 4.7 mkp (34.0 ft/lb) M10
--------------------------	---

**Front axle**

Spring/shock absorber unit, top centre	8 mkp (57.8 ft/lb)
Spring/shock absorber unit, support bearing	2.5 mkp (18.1 ft/lb)
Tierod arm to king pin	2.5 mkp (18.1 ft/lb)
Tierod arm guide joint	7 mkp (50.6 ft/lb)
Front axle carrier to engine carrier	4.7 mkp (34.0 ft/lb)
Wishbone to front axle carrier	15 mkp (108.5 ft/lb)*
Tension strut at wishbone and front axle carrier	6 mkp (43.4 ft/lb)*

**Rear axle**

Casing to body floor	9 mkp (65.1 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	2.5 mkp (18.1 ft/lb)
Trailing arms on axle carrier	7.5 mkp (54.2 ft/lb)*
Shock absorber, lower end	7.5 mkp (54.2 ft/lb)*
Half shaft to drive flange	3 mkp (21.7 ft/lb)
Half shaft at rear axle shaft	3 mkp (21.7 ft/lb)

**Cardan shaft at gearbox**

take-off flange	3 mkp (21.7 ft/lb)
Rear axle carrier rubber mountings	3 mkp (21.7 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)

**Steering**

Steering wheel securing nut	5.5 + 0.5 mkp (39.7 + 3.6 ft/lb)
Plate joint mounting	1.9 mkp (13.7 ft/lb)

Flange joint mounting	2.5 mkp (18.1 ft/lb)
Drop arm to steering box	14 mkp (101.3 ft/lb)
Tierod castellated nuts	3.5 mkp (25.3 ft/lb)
Steering box to front axle carrier	4.7 mkp (34.0 ft/lb)
Drop arm bearing	2.5 mkp (18.1 ft/lb)
Track rod clamp bolts	1.2 + 0.3 mkp (8.7 + 2.2 ft/lb)

**Brakes**

Brake disc to wheel hub	6 + 0.7 mkp (43.4 + 5 ft/lb)
Fixed caliper to king pin	9.5 mkp (68.7 ft/lb)

**Wheel nuts**

9 mkp (65.1 ft/lb)

\* Normal position: vehicle loaded with 3 persons (= 3x65 kg/143 lb) + luggage (30 kg/66 lb)

**Recommended oil brands for automatic transmission**

Aral	Transmission oil SGF AQ-ATF-1841 A
BP	Automatic Transmission Fluid Type A Suffix A AQ-ATF-2518 A
Castrol	TQ ATF AQ Nr. 737 A
DEA	DG 53 Type A AQ-Nr. 1378 A
Esso	Automatic Transmission Fluid AQ-ATF-2974 A
Fina	Purfomatic Fluid AQ-ATF-2161 A
Fuchs	Automatic TF AQ 737 A
Gasolin	Transmission oil Fluid AQ-Nr. 1842 A
Labo	AQ-ATF-2660 A
Mobil	ATF 200 AQ-Nr. 752 A
Quaker	State Quadromatic Fluid, Type A, Suffix A AQ-ATF-899 A
Shell	Donax T 6 AQ-Nr. 24 15 A
Sunoco	ATF AQ-Nr. 737 A
Total	Fluide A AQ-Nr. 1577 A
Valvoline	Valvomatic ATF AQ-Nr. 2694 A
Veedol	Automatic Transmission Fluid Type A Suffix A AQ 1407 A



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Many thanks  
for your kind attention!





## Notes

## At a glance

**Tyre Pressures** in psi (atü) with **cold** tyres (increase by 4.25 psi — 0.3 atü—with heated tyres)

**Standard tyres:** 6.45/165 S 14

Load	Front	Rear
Up to 4 persons	24 (1.7)	24 (1.7)
5 persons + baggage	24 (1.7)	27 (1.9)
Increase by 2.8 psi (0.2 atü) for motorway driving		

**Radial Tyres 165 SR 14:**

Load	Front	Rear
Up to 4 persons	26 (1.8)	26 (1.8)
5 persons + baggage	26 (1.8)	29 (2.0)

### Capacities

Fuel tank	55 Litres (12.1 Imp. Galls.) (14.5 US Galls.)	<b>Branded Super Grade fuel</b>
Cooling system incl. heating	7 Litres (6.2 Imp. Qts.) (7.4 US Qts.)	Clean mains water, plus a) Anti-corrosion agent in summer b) Anti-freeze agent in winter.
Engine Oil (Oil filter change) add:	4 Litres (3.5 Imp. Qts.) (4.2 US Qts.) 0.25 Litres (1/2 pint)	Branded HD engine oil for petrol engines SAE 30 for outside temperatures above 0°C, SAE 10W30 below 0°C
Gearbox	1 Litre (0.9 Imp. Qts.) (1.1 US Qts.)	Branded transmission oil SAE 80
Automatic gearbox	Approx. 1.5 Litres (1.4 Imp. Qts.) (1.7 US Qts.), total for first filling of new or exchange units 4.75 Litres (4.2 Imp. Qts. or 5 US Qts.)	Oil brands, see page 83
Rear axle final drive	1.3 Litres (1.15 Imp. Qts.) (1.3 US Qts.)	Branded break-in hypoid gear oil, SAE 90 (Your BMW service station will gladly advise you on the brands admitted by the factory)
Half-shaft sliding joints (does not apply to maintenance-free half-shafts)	180 cc (6.3 fl. oz) per joint	Branded hypoid gear oil, SAE 90
Steering box	300 cc (10.5 fl. oz)	
Steering arm bearing	25 cc (0.87 fl. oz)	

### M&S and M&S-Ice Tyres

Increase by 2.8 psi (0.2 atü)

**Sports driving** subject to special regulations.

### Spark plugs

Beru 200/14/3 A	} Electrode gap 0.6 + 0.1 mm (0.024" + 0.004")
Bosch W 200 T 30	
Champion N 9 Y	

For mainly short-distance operation and when using heavily leaded fuel:

Bosch W 215 P 21\*

Electrode gap 0.35 mm (0.014")

\* Spark plugs with platinum electrodes (also for motorway driving).

**Contact breaker gap** 0.4 mm (0.016").  
Dwell angle 60° ± 1°.

### Ignition timing

3° bTDC; 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



# BMW AG

Bayerische Motoren Werke AG München