

# Owner's handbook

**1602 2002**  
**1802 2002**  
AUTOMATIC  
**2002 tii**









BMW 2002/2002 tii

We reserve the right to modify designs,  
equipment and fittings in the interests of  
continuing technical development.  
Dimensions, weights and performance data  
are quoted to generally accepted tolerances.  
Errors and omissions excepted.

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Dear BMW enthusiast,

The engineers who develop BMW cars are enthusiasts too. Now you have taken delivery of a BMW, and with it go our congratulations and good wishes.

Our Owner's Handbook contains all you need to know for lasting driving pleasure, and also full details of the service work necessary to keep your car in as-new condition. After reading through the handbook, you will soon feel entirely at home with every aspect of your car.

And now it is time for you to start enjoying sheer driving pleasure — on crowded city roads, through the tight corners of steep mountain passes, or over the endless concrete strip of the inter-city highway.

Sincerely yours  
BAYERISCHE MOTOREN WERKE  
Aktiengesellschaft

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Before you start —  
**Where is everything?**



"Daddy said  
I'm too young to understand —  
those grown ups!"



The **maker's plate, chassis and engine numbers** are the means of identifying your car and can be checked against its official registration papers.

The type designation, chassis number and other information are entered on these official registration papers. It is a good idea to compare these entries with the details stamped at various points on the car. Queries, inspections and spare part orders all require these details to be given, so it is essential to know where to find them.

**Maker's plate:** in the engine compartment, at the back on the right-hand side (looking forward). **Fig. 1**

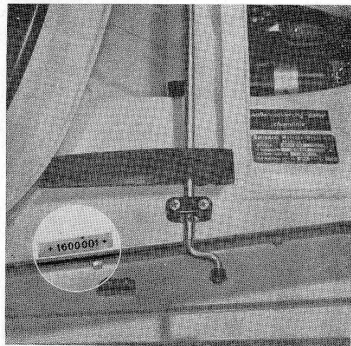
**Chassis No.:** on the underside of the engine compartment lid, on the right of the bulkhead (looking forward) next to the lock. **Fig. 1**

**Engine No.:** on the rear left-hand side of the crankcase (looking forward) above the starter. **Fig. 2**

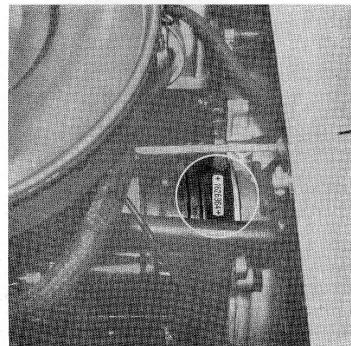
You have received two pairs of keys for your new BMW. It is a good idea to put the second pair in a safe place straight away so that you can get at them immediately if you should lose the first pair. Of course any BMW dealer will gladly help you out in case of difficulty, no matter where you are at the time.

If you should need to buy new keys, always quote the numbers on the keys when ordering. This speeds up the whole process considerably. Check that the key numbers are correctly recorded in the service booklet. **Fig. 3**

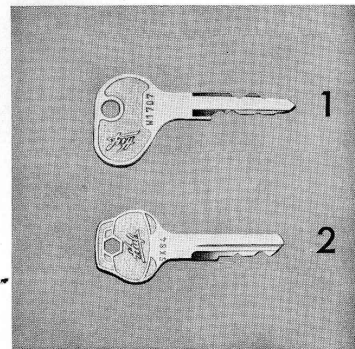
1



2



3



To unlock the doors, insert key 1 and turn towards the front of the car. To lock the doors, turn the key in the opposite direction. When unlocked, press the button beneath the handle to open the door. **Fig. 4**

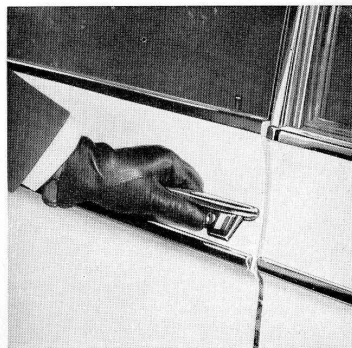
To lock the doors from the inside, press down the safety knob; to open from the inside, first raise the safety knob, then pull up the handle beneath the armrest. **Fig. 5**

When the door is open the safety knob cannot be pressed down. This prevents the door from being locked accidentally.

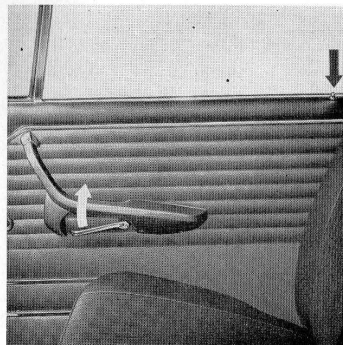
The **luggage compartment** is locked and unlocked by key 2. **Fig. 6**

Do not forget to lock the luggage compartment with the key after closing the lid.

4



5



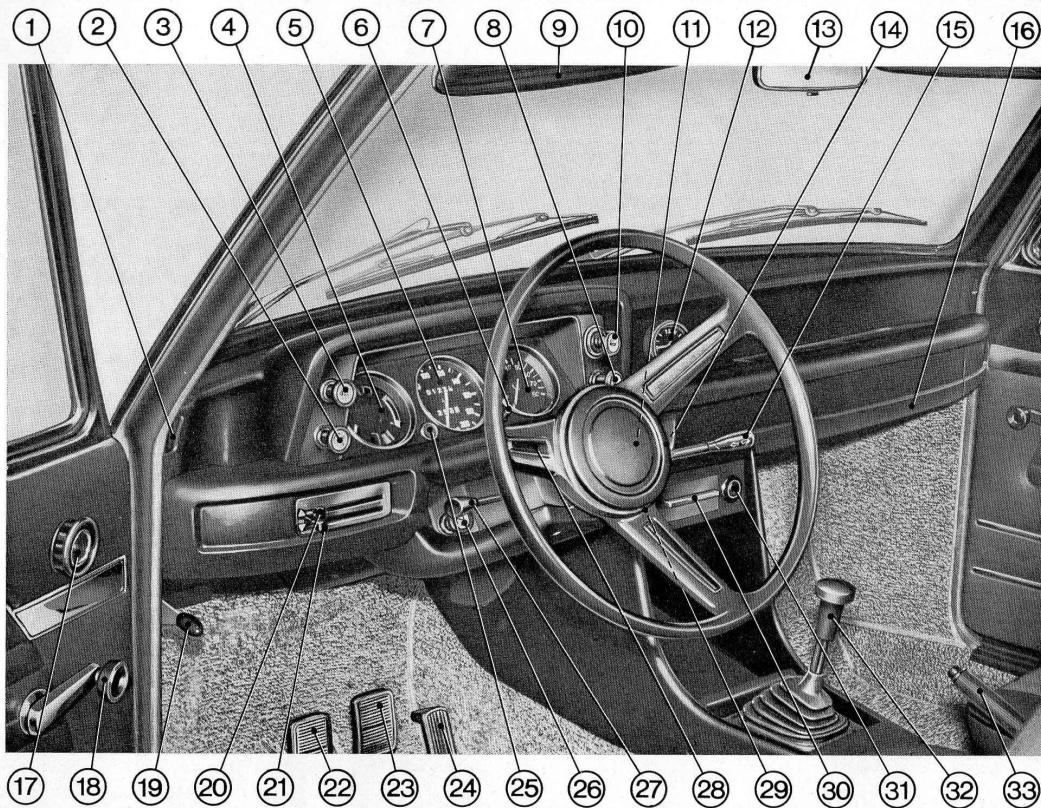
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## Instruments and controls

**Note:** Number in square brackets [ ] indicates page on which description is to be found.

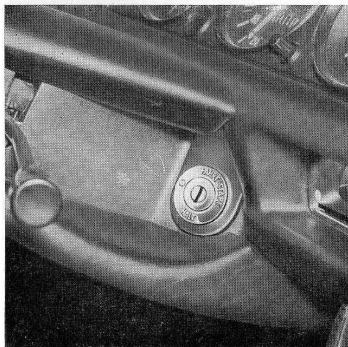
1. Air distributing vent for side window (left) [19]
2. 3-speed blower turning knob, and pull knob for heated rear window (optional) [19, 20]
3. 2-position head and side light switch, with instrument panel illumination [10]
4. Combined instrument containing fuel gauge, coolant temperature gauge and warning lamps [15] for:
  - battery charge (red)
  - oil pressure (orange)
  - turn indicators (green)
  - main beam (blue)
5. Speedometer with mileage recorder and trip recorder [13]
6. Trip recorder reset knob [13]
7. Revolution counter on BMW 2002 tii;  
clock on BMW 1602/1802/2002/ [13]
8. 2-speed screenwiper switch [11]
9. Sun visor [15]
10. Combined cigar lighter and plug socket [18]
11. Steering lock and ignition [10]
12. Clock [13] (does not apply to BMW 1602/1802/2002)
13. Interior rear view mirror [15]
14. Heater temperature control lever [19]
15. Turn indicator, parking light, screenwiper and screenwasher lever [11]
16. Glove compartment [17]
17. Turning knob for front vent window (left) [17]
18. Window crank (left)
19. Lever for engine compartment lock [12]
20. Air distributing lever for defroster vents [19]
21. Air distributing lever for footwells [19]
22. Clutch pedal [26] (does not apply to BMW 2002 Automatic)
23. Brake pedal [26]
24. Accelerator pedal [25]
25. Warning lamp (red) for fuel tank reserve, handbrake and choke pull knob [13]  
(latter does not apply to BMW 2002 Automatic and 2002 tii)
26. Choke pull knob [24]  
(does not apply to BMW 2002 Automatic and 2002 tii)
27. Headlamp dip and flash lever [10]
28. Horn pushers [13]
29. Hazard warning flasher switch [14]
30. Ashtray [18]
31. Switch for fog lamps and rear fog light [14]  
(optional)
32. Gear lever [17] (BMW 1602/1802/2002/2002 tii),  
selector lever [21] (BMW 2002 Automatic)
33. Handbrake [17]



The **ignition and starter switch**, mounted on the right-hand side of the steering column housing, is combined with the steering lock. Insert key 1 only at the "Halt" position of the lock. **Fig. 7**

Turn the key to the right as far as the "o" position: the steering lock will be released with an audible click as the key is turned (if necessary the steering wheel should be moved slightly to assist). The steering is now unlocked, the radio and the electric steel sliding roof (optional extra) will operate if required. If the key is now turned further to the "Fahrt" (Drive) position, the ignition will be switched on, the battery charge (red) and oil pressure (orange) telltales will be illuminated, and the fuel gauge will register.

7



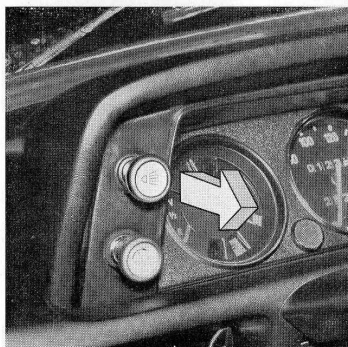
To lock the steering, turn the key back to the "Halt" position and withdraw. Move the steering wheel slightly if necessary until the steering lock is heard to engage. The ignition key can be withdrawn **only** in this position.

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

- Position 1 — parking lights
- Position 2 — headlights

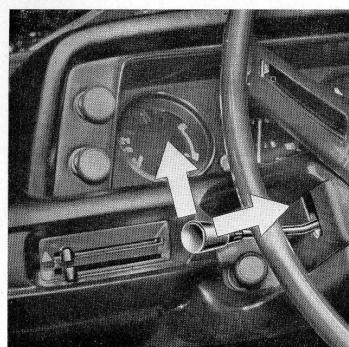
The intensity of the **instrument panel lighting** can be continuously adjusted by turning the light switch knob in its pulled-out position.

8



The **dip lever** at the left of the steering column can be finger-tip operated with your left hand, while both hands are holding the steering wheel (**Fig. 9**). When the lever is set to main beam (upper position) a blue warning lamp in the combination instrument is illuminated. To **flash the headlights**, pull the lever towards the steering wheel. If the ignition key is turned to "o" or "Halt" while the headlights are on, the headlights will be switched off and only the parking lights will stay on.

9





The **turn indicator lever** beneath the steering wheel on the right-hand side of the steering column operates the appropriate flashing indicators when moved to correspond with the movement of the steering wheel. **Fig. 10**

A regular ticking sound and illumination of the green warning light in the combination instrument tells you that the flasher unit is operating correctly (**Fig. 11**). The oil pressure telltale also serves as a turn indicator telltale for a trailer.

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

If the flashing indicators are to be operated for a short period only (e.g. changing lanes, overtaking, starting) press the turn indicator lever only slightly from its original position in the direction desired, without letting it engage. As soon as you let it go it will return to its original position without the steering wheel being turned.

When the steering lock is engaged, the turn indicator lever is used instead to switch on the **parking lights** on the appropriate side of the car:

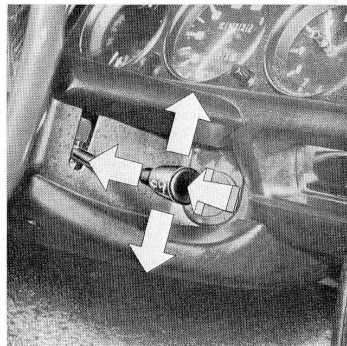
Lever up — left front and rear  
Lever down — right front and rear

Operate the **screenwipers** by pressing the turn indicator lever towards the steering column. **Fig. 10**

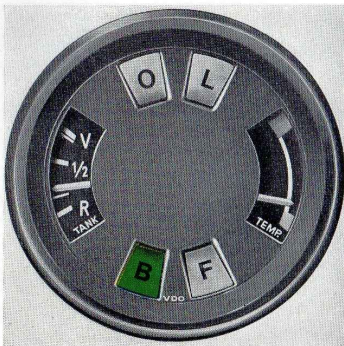
The **screenwiper switch** can be pulled out to select either of 2 operating speeds:

switch pressed in  
= normal speed  
switch pulled out  
= fast **Fig. 12**

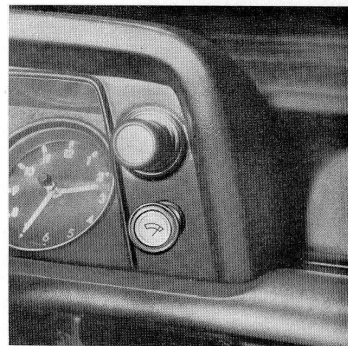
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11



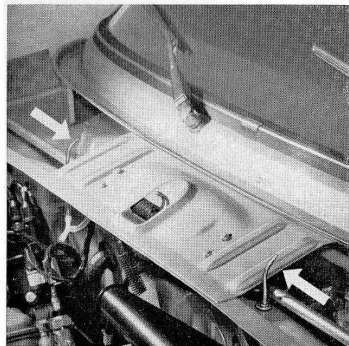
12



Pulling the tip of the turn indicator lever at the right of the steering column towards the wheel will operate the **automatic washer unit**. The electric pump and the wipers are both set in motion simultaneously. When the lever is released, a relay prevents the wipers from switching off immediately.

**Warning:** The automatic washer unit should not be operated when the fluid container is empty.

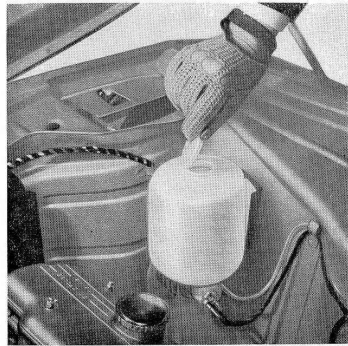
13



The two **washer jets** are located under the rear edge of the engine compartment lid in a position where they are not likely to be damaged. If either water jet fails to strike the glass correctly, the jet nozzle can easily be bent by hand to the correct position. **Fig. 13**

The **fluid container** (approx. 1.5 litres/ 2.6 Imp. pints/3.2 US pints) is located on the right-hand side of the engine compartment. **Fig. 14**

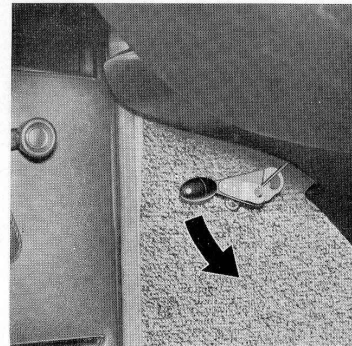
14



The forward-opening **engine compartment lid** is released from inside the car by pushing forward the lever close to the left side panel beneath the instrument panel. **Fig. 15** A built-in spring mechanism then assists in raising the lid from the outside.

**Warning:** Close the engine compartment only when the interior lever is in the forward position. After closing, lock by pulling the lever back.

15



A knurled knob in the centre of the electric **clock** should be pushed in and turned to adjust the hands (**Fig. 16,1 — BMW 1602/1802/2002; Fig. 17,1 — BMW 2002 tii**). On the back of the clock there is a regulating screw marked + (faster) and — (slower) under an adhesive tape.

A reset knob is provided to return the **trip mileage recorder** in the speedometer to zero. The knob should be turned to the right. **Fig. 16,2 — BMW 1602/1802/2002; Fig. 17,2 — BMW 2002 tii**.  
Operating the **horns**:

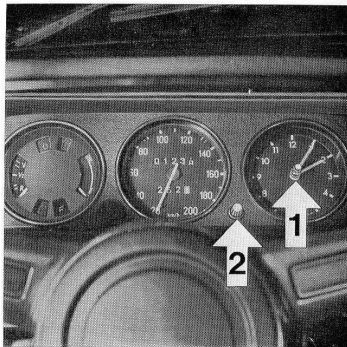
**BMW 1602/1802/2002:** horn pushes in the steering wheel spokes.

**BMW 2002 tii:** Horn button in centre of steering wheel.

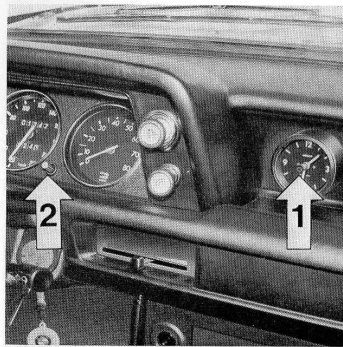
The **red warning lamp** on the instrument panel is illuminated if:

1. the fuel tank level drops to the reserve mark
2. the handbrake is pulled
3. the choke knob is pulled (does not apply to BMW 2002 Automatic and 2002 tii). **Fig. 18**

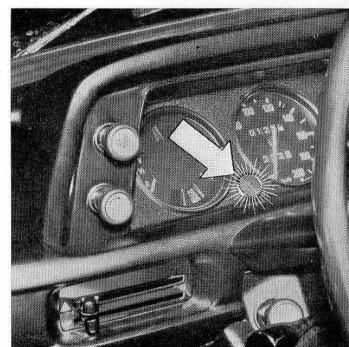
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17



18



The **hazard warning flashers** can be operated with the ignition switched on or off by pressing in the knob at the left of the ashtray. The **red knob** is illuminated periodically to show that the hazard warning flashers are operating correctly. **Fig. 19**

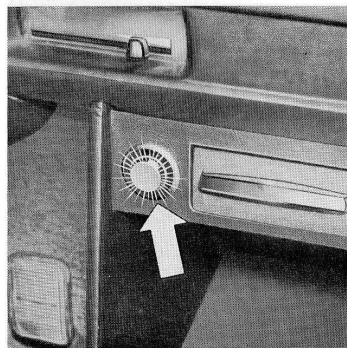
**Press the knob** at the right of the ashtray to switch on the **fog lamps** (optional) and the rear fog lamp. When the lamps are switched on, the telltale lamp in the **green knob** is illuminated. **Fig. 20**

The **interior light switch** has 3 positions:

- Position 1: permanently switched on;
- Position 2: permanently switched off;
- Position 3: light operates only when a door is opened (switches fitted to door pillars).

**Fig. 21**

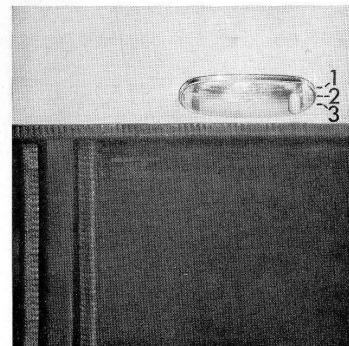
19



20



21



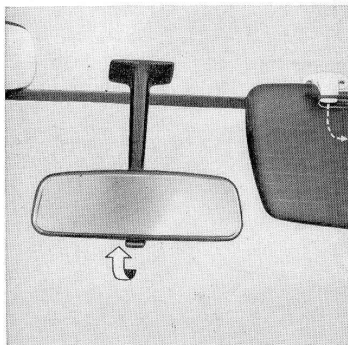


Adjust the positions of both the **interior and exterior rear view mirrors** to suit your driving position.

The **interior mirror** — **BMW 2002/A, 2002 tii** — can be dipped by pressing the small lever at its base. **Fig. 22**

Each **sun visor** may be swung sideways to cover the side window if the sun is dazzling from that direction. **Fig. 22**

22



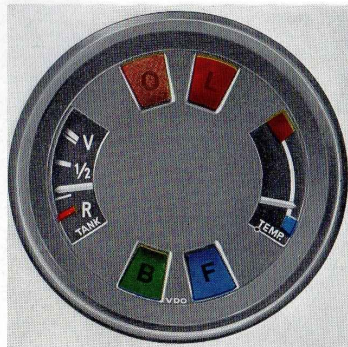
The **combination instrument** contains the fuel gauge, coolant thermometer and telltale lamps for:  
Oil pressure (O) orange, also turn indicator for trailer  
Battery charge (L) red  
Turn indicators (B) green  
Headlight main beam (F) blue  
**Fig. 23**

The **coolant thermometer** is divided into 3 colour zones:

**Blue:** engine is running too cold. If the thermometer needle is in this region road speed and engine speed must be kept low.

**White:** normal operating temperature range.

23



**Red:** engine is too hot. No anxiety need be felt if the needle reaches the red zone or enters it for a short period if the engine is working very hard or the outside temperature is extremely high. However, if the needle tends to remain in the red zone for longer periods, the engine is definitely in need of attention (see procedure described on p. 44).

When the ignition is switched on, the **fuel level** can be seen from the gauge. If the needle is indicating "**Reserve**" or if the red warning lamp on the instrument panel is illuminated fill up as soon as possible, although the tank still contains enough fuel for about another 30 miles, depending on how you drive.

The **fuel filler cap** is located on the right side of the car at the rear.



**Fig. 24** shows the layout of the **rear light cluster**:

1. Turn indicator light (yellow)
2. Rear light and reflector (red)
3. Stop light (red)
4. Reversing light (white)

When the headlight switch is on (page 10, **Fig. 8**), the **luggage compartment lighting** is also switched on.

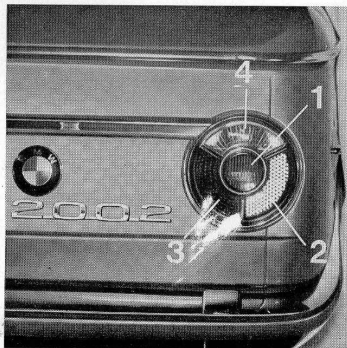
For fore-and-aft **adjustment of the front seats**, pull up lever at the outside edge of the seat base and slide the seat to the desired position. Release the lever and move the seat very slightly to ensure that the locking catch has engaged. **Fig. 25, 1**

The **front seat backrests** are adjustable for rake by lifting the lever (**Fig. 25, 2**) on the outside seat hinge fitting and leaning back against slight spring pressure until the desired angle is reached or allowing the backrest to spring forward automatically. On releasing the lever the seat engages at the point. The seat backs also have a locking mechanism to prevent accidental tipping forward. To release, pull up the knob (**Fig. 25, 3**) on the outer edge of the seat back.

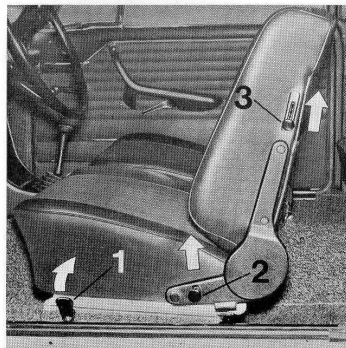
The height of both the **headrests** (optional extras) can be altered by either pushing down or pulling up. Make sure that the headrests are not distorted and that the locking catch has engaged. In the interest of safety the headrests should be on the level of the head and on no account behind the neck. **Fig. 26**

Mountings are located on the bodywork at the back and front of the car for the installation of **safety belts** for the front seats and the back seats. Your BMW workshop knows the correct mounting points and will be glad to install a set of safety belts in your car.

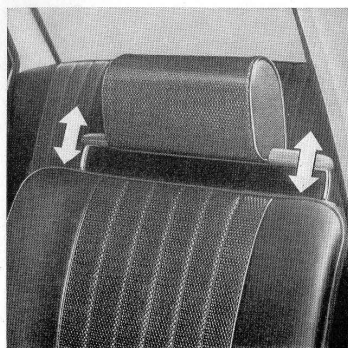
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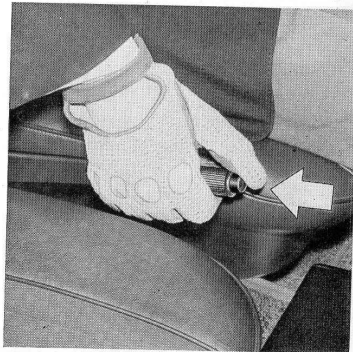


The **handbrake** works on the rear wheels. To brake or secure the car, pull the lever upwards. To release the lever, first pull upwards slightly, then press the knob on the end of the lever and push downwards. **Fig. 27**

A useful hint: to avoid the noise of the handbrake when being pulled, first depress the knob.

When the handbrake is pulled, the red warning lamp on the instrument panel is illuminated (see page 13).

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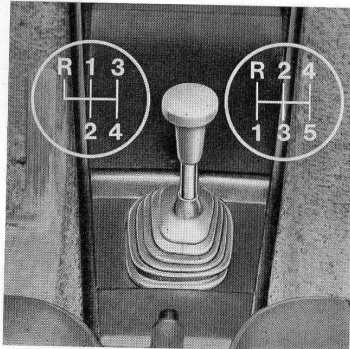


The position of the gear lever for each speed can be seen from the **gate layout**. All forward gears are synchronized. **Fig. 28**

To engage reverse gear (only when car is standing still) press the lever over to the left until a slight resistance is felt and overcome.

When the ignition is on and reverse gear is engaged, both **reversing lights** will be illuminated.

28



The **hinged vent windows** are opened and closed by turning the rotary knob immediately beneath. Before leaving the car unattended remember to guard against break-in by turning both knobs until the vent windows are completely shut.

Open the **glove compartment** by pulling down the recessed grip; close by moving the lid firmly upwards. **Fig. 29**

29



To use the **cigar lighter**, press the knob inwards. When the coil filament glows red-hot the knob will automatically spring back to the original position. **Fig. 30**

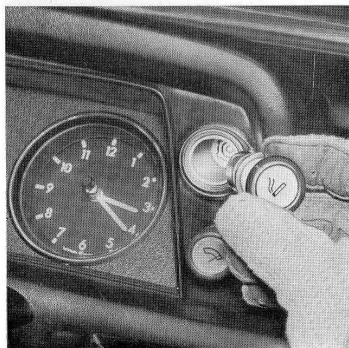
The cigar lighter **socket** is also designed to accept plugs attached to handlamps, electric razors or similar apparatus. The maximum rating must not exceed 200 watts for a 12 volt supply. Make sure that the socket is not damaged by attempting to insert the wrong kind of plug.

To empty the **ashtray on the instrument panel**:

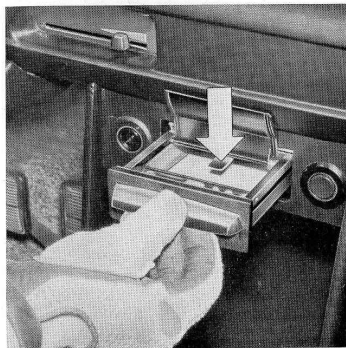
Pull out ashtray as far as possible, press down on the leaf spring and withdraw the ashtray completely. **Fig. 31**

To empty the **ashtray in the rear passenger compartment**: Hinge out, press down firmly and remove. **Fig. 32**

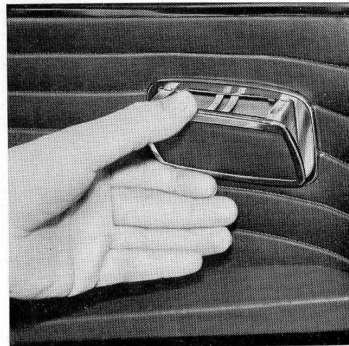
30



31



32



The **heating and ventilating unit** in your BMW allows particularly accurate temperature control: The single slide lever on the right-hand side of the steering column permits infinitely variable temperature adjustment and varies output between full heat (lever to right, red symbol) and cool air only (lever to left, blue symbol). Except when at the extreme limit positions, slightly cooler air is automatically passed to the demister slots than to the footwells. This provides stratified heating throughout the vehicle, with adequate warmth for the feet yet

a pleasantly cool atmosphere at head height. **Fig. 33**

**Lever to right: warm**

**Lever to left: cool**

The twin levers on the left-hand side of the steering column serve to open and close the outlet slots for demisting the windows (upper lever) and warming the footwells (lower lever), and can be operated independently. In very damp conditions or when the screen mists over it is recommendable at first to move the lower lever to the right to cut off the supply to the footwells, so that the full output can reach the front and side windows.

**Lever to left: air supply open**

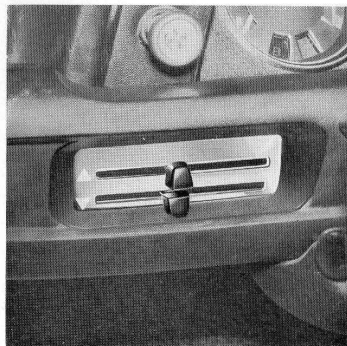
**Lever to right: air supply shut off**

When warm or cool air output is needed, it is always advisable to switch on the blower and to increase air throughput by adjusting the turning knob (**Fig. 35**) to positions 1 or 2. If the windows are misted over or icy, or if the car's interior is exceptionally cold, use the fast blower speed 3, provided that the water temperature is sufficiently high (pointer of temperature gauge in white zone).

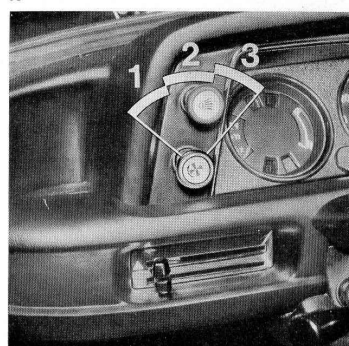
33



34



35

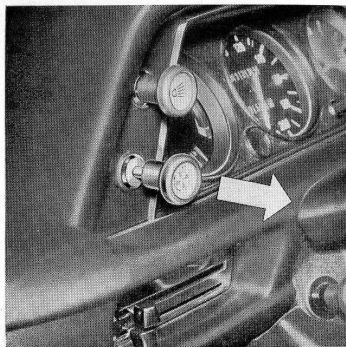


**Heated rear window** (optional extra): The rear window is electrically heated by **pulling out the blower turning knob** when the ignition is switched on. **Fig. 36**

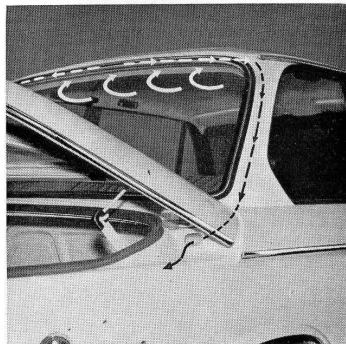
**Air axtraction:** While the car is moving stale air is extracted from the interior through slots above the rear window and ducted to openings below the luggage compartment lid (only on vehicles without steel panel sliding roof). **Fig. 37**

Extra ventilation or air extraction can be obtained by opening the front door vent windows and the hinged rear side windows. **Fig. 38**

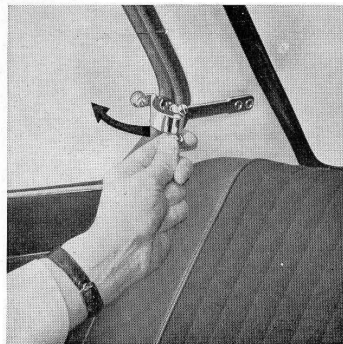
36



37



38





**Automatic transmission, BMW 2002 A:**

The following **selector lever positions (Fig. 39)** are available to suit various traffic conditions:

**P-R-0-A-2-1**

**P = Park**

**Select only when the car is standing still.** The drive train is locked as an additional precaution against running away on a slope. To select, depress button on the left. The engine can still be started.

**R = Reverse**

**Select only when the car is standing still.** To select, push in the left-hand safety knob. If reverse gear is engaged whilst the car is moving forwards, the rear wheels will lock and there could be an accident.

**0 = Neutral**

The engine is completely disconnected from the drive train and can be started. Select this position also when stopped for **lengthy periods** (for instance in severe traffic jams).

**A = Automatic (normal driving position)**

This position should be selected for all normal road conditions. The car moves off in 1<sup>st</sup> gear and changes up to 2<sup>nd</sup> and 3<sup>rd</sup> gears as soon as the most favourable and economical point is reached.

**2 = Hill-climbing and engine braking**

This position can be selected on mountain roads or other lengthy rising or falling gradients. Better use is made of available engine power and the engine braking effect.

Position 2 can be selected at any road speed. If the speed is initially too high for 2<sup>nd</sup> gear to engage, it will come into operation only after road speed has fallen to about 100 kph (62 mph). If the road speed then rises again, the transmission will not re-engage 3<sup>rd</sup> gear, and so excessive engine speeds can result.

**1 = Hill-climbing and engine braking**

This position is normally reserved for road and traffic conditions in which it is desirable to hold 1<sup>st</sup> gear in engagement, for instance on very steep uphill or downhill gradients.

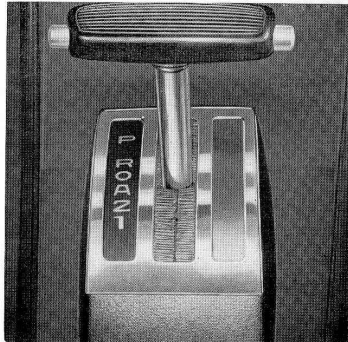
Position 1 can also be selected at any road speed. At about 62 mph (100 kph), 2<sup>nd</sup> gear will then engage, and after speed has fallen to about 37 mph (60 kph), 1<sup>st</sup> gear will be engaged in turn. However, even if road speed then rises the transmission will not change up again into 2<sup>nd</sup> or 3<sup>rd</sup> gear, and so excessive engine speeds can result.

**Kick-down**

The accelerator pedal can be depressed beyond the normal full-throttle position (increased resistance will be felt). In special circumstances, for example when overtaking, more rapid acceleration can be thus obtained; the transmission will select, up to a certain engine speed level, the correct gear.

When the kick-down has been used the subsequent upward changes will occur at a considerably higher road speed than normal, close to the maximum permitted engine speeds in each gear. This ensures that the full available engine power can be made use of when needed.

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### **Towing away**

If the car has to be towed away, place the selector lever in the **"0" (Neutral)** position.

Speeds reached when the car is being towed must not exceed 31 mph (50 kph), and the distance covered should be limited to 25–30 miles (40–50 km). For longer distances, an additional 1.8 Imp. pints/2.1 US pints/1 litre of ATF gearbox oil should be added to the prescribed amount, or the propeller shaft should be removed from the vehicle. Once the vehicle has been attended to, make sure that the gear oil is reduced to the prescribed level immediately.

### **Tow starts**

The design of the automatic transmission does not permit the engine to be started by towing the car.

Starting off —  
**a few hints**



"You think I don't know what I'm doing, don't you?"

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

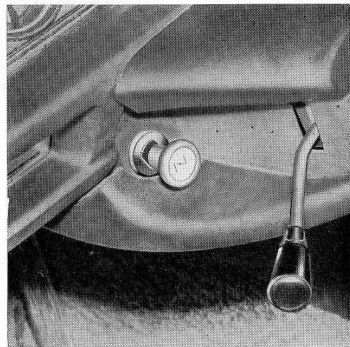
On automatic transmission vehicles the engine can only be started with the selector lever in the "P" or "0" position.

### BMW 1602/1802/2002

Depending on engine and outside temperature, it may be necessary before operating the starter to pull out the **choke knob** (fitted with a half-way stop position) located to the left of the steering column housing. (Fig. 40):

- a) pull out fully if outside temperature is below  $-10^{\circ}\text{C}$  ( $14^{\circ}\text{F}$ );

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

The 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 carburettor.

After the engine has fired, allow it to run for 3–5 seconds, then push the choke knob in to the half-way stop position so that the engine idles smoothly. Leave the choke in this position after moving off until the needle of the water temperature gauge begins to indicate the temperature in the blue zone. The choke knob may then be pushed back completely.

**If the engine is warm** (within the normal operating temperature range), the choke and accelerator need not be touched when starting the engine.

**If the engine is hot**, the accelerator only should be depressed while operating the starter.

The **starter** is operated by turning the ignition key fully to the right ("Start" position) until the engine begins to fire. However, do not allow the starter to turn the engine for longer than about 10 seconds. When released, the ignition key will spring back of its own accord to the "Fahrt" ("Drive") position.

While operating the starter the radio (optional extra) is automatically switched off.

To make starting easier, especially during extremely cold weather, it is a good idea to switch off all other items which draw their electric supply from the battery, and to press down the clutch pedal.

If the starter has to be operated a second time before the engine will run, the ignition key must first be returned from the "Fahrt" ("Drive") to the "0" position. This intentional delay is introduced in order to prevent as far as possible the starter from being reengaged while the engine is still turning. Always try to avoid using the starter unless the engine has come to a complete standstill. This will prevent damage to the starter and flywheel.

In very cold weather protect the battery by operating the starter for not more than about 10 seconds. If the engine does not fire, wait about 20–30 seconds before making a second attempt, which should be no longer than the first.

Your **BMW 2002 A** is equipped with an automatic choke carburettor. Please observe the following operating instructions:

**If the engine is cold**, depress the accelerator pedal briefly once before operating the starter. This will trip the automatic choke mechanism and bring it to the cold-start position.

Switch on the ignition and turn the key to operate the starter without depressing the accelerator again. When the engine starts its speed will rise to the relatively high figure of 2500–3000 rpm. Next, depress the accelerator again — without delay if outside temperature is high, after a few seconds have elapsed if outside temperature is low. The engine speed will fall to a fast tickover.

The automatic choke mechanism will automatically control the engine speed until the coolant thermometer needle has reached more or less the centre of the blue zone.

If the engine will not start or fires only intermittently after several attempts, try again **with the accelerator fully depressed**. This will force open the throttle butterfly and the mixture will be weakened considerably. Never depress the accelerator repeatedly or suddenly, as this will only inject still more fuel into the intake manifold.

**If the engine is warm**, (normal operating temperature) do not touch the accelerator pedal at all when starting.

**If the engine is very hot**, depress the accelerator pedal fully when starting.

**When the engine is running**, the oil pressure (orange) and battery charge (red) telltales should go out as soon as engine speed reaches a fast tickover.

If the oil pressure telltale light is illuminated while driving, depress the clutch **immediately** and switch off the ignition. (For trailers see instructions on pages 11 and 15.) Check the engine oil level; if there is enough oil, consult a BMW service station. No danger is implied if the warning light glows briefly while the engine is running at idling speed, provided that it is extinguished immediately the accelerator is pressed down.

Your **BMW 2002 tii** is equipped with an automatic starting and warming-up device.

### Starting

When starting, a magnetic valve controlled by the ignition current is opened so that fuel is injected into the inlet manifold for a certain period depending on the temperature of the coolant. The fuel/air mixture is enriched further while the engine is warming up by means of a warm-up runner in the injection pump, which also operates according to the temperature of the coolant.

To **start the engine** turn ignition key past the “Fahr” position (fuel injection pump is switched on) to the “Start” position.

The additional starting device operates for a certain period only (depending on engine temperature), so that the engine cannot be flooded. It is therefore bad for the engine to repeat the starting procedure at short intervals. Rather, operate the starter non-stop until the engine fires (max. approx. 20 seconds).

When starting, do not depress the accelerator pedal at all. When the engine has fired, depress the pedal only a bit. It is possible to start driving immediately after the engine has fired, running at a medium engine speed only.

If the battery charge telltale light is illuminated while on the road, you should take the car to a BMW service station as soon as possible, or else the battery will become completely discharged.

It is not recommendable to let the engine warm up while idling; it is better to move off immediately after starting the engine, using **moderate** engine speeds. If the choke was used for starting, push it in as soon as the thermometer begins to indicate that the water temperature is approaching the normal operating range. If the outside temperature is exceptionally low, however, it is better to run a cold engine for about half a minute at a fast idling speed, mainly to ensure that all parts of the engine receive an adequate supply of lubricant. In all cases avoid running a cold engine at high speeds, as this will shorten its working life.

If you start the car inside a garage, remember that the exhaust fumes contain an odourless and invisible but highly toxic gas (carbon monoxide). Always open a door first.

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

When driving an automatic transmission car, operate both brake pedal and accelerator with **the right foot only**.

#### **Driving away an automatic transmission car:**

At engine idling speed, move the selector lever from P or 0 to A, 2, 1 or R, **keeping the brake applied** until ready to move. Let the transmission engage (noticeable transmission shift) before pressing down the accelerator.

#### **Stopping an automatic transmission car:**

When the engine is running at idling speed and the transmission is in normal driving position the car will tend to creep forwards on a level road. To prevent this, keep the foot brake applied lightly.

To **stop the engine**, turn the key to the **"0" position**.



The first few miles —  
**take it easy!**

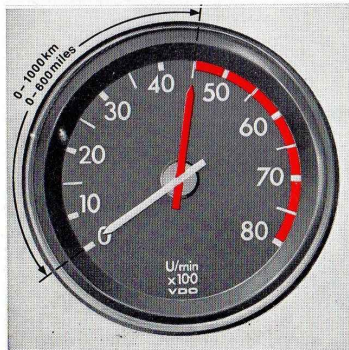


"Okay, old boy, not so fast!"

The engine of your BMW is not governed, in other words we have imposed no artificial limitation on its performance. It is therefore up to you to achieve maximum life expectancy and economic results from your car by observing the following simple **rules for running in**.

The maximum permitted speeds in each gear should only be maintained for short periods while running in (see table on page 29). Make frequent speed changes and alter engine speed as much as possible during a journey. Change down in good time, especially when climbing gradients.

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The **kick-down position** of the accelerator pedal (see page 21) should **not** be used **at all** during the first 1200 miles (2000 km).

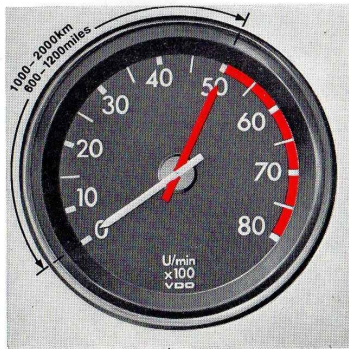
The engine revolution speed can be read on the **revolution counter** (standard on the BMW 2002 tii; optional on the other models). Please observe the following **revolution speed limits during the running-in period**:

from 0—600 miles: 4500 rpm **Fig. 41**  
(0—1000 km)

from 600—1200 miles: 5000 rpm **Fig. 42**  
(1000—2000 km)

Running the engine too slowly is equally as harmful as exceeding the permitted revolution speed. Therefore drive as much as possible over 1500 rpm.

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### Running in the brakes:

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

**During the running-in period** the gear lever, steering and other controls may be a bit **stiff to move**. As the running-in process continues this stiffness will soon disappear.

**After you have reached 1200 miles (2000 km)** you may **gradually** increase your driving speed, provided traffic conditions permit, to the permitted **continuous and maximum speeds** (see table on page 29).

At all times avoid engine revolution speeds in the red zone on the dial, e.g. when driving on long downhill stretches of motorway or in low gears.

**Max. permitted speed****during the first 600 miles (1000 km):**

		<b>BMW 1602</b>	<b>BMW 1802</b>	<b>BMW 2002</b>	<b>BMW 2002 A</b>	<b>BMW 2002 tii</b>
1 <sup>st</sup> gear	Selector lever position 1	20 mph (30 kph)	20 mph (30 kph)	20 mph (30 kph)	28 mph (45 kph)	20 mph (30 kph)
2 <sup>nd</sup> gear	Selector lever position 2	35 mph (55 kph)	35 mph (55 kph)	37 mph (60 kph)	50 mph (80 kph)	39 mph (65 kph)
3 <sup>rd</sup> gear	Selector lever position A	53 mph (85 kph)	53 mph (85 kph)	56 mph (90 kph)	74 mph (120 kph)	60 mph (95 kph)
4 <sup>th</sup> gear		72 mph (115 kph)	72 mph (115 kph)	74 mph (120 kph)		81 mph (130 kph)

**Max. permitted speed****from 600—1200 miles (1000—2000 km):**

1 <sup>st</sup> gear	Selector lever position 1	20 mph (30 kph)	20 mph (30 kph)	20 mph (30 kph)	35 mph (55 kph)	22 mph (35 kph)
2 <sup>nd</sup> gear	Selector lever position 2	37 mph (60 kph)	39 mph (65 kph)	39 mph (65 kph)	56 mph (90 kph)	44 mph (70 kph)
3 <sup>rd</sup> gear	Selector lever position A	60 mph (95 kph)	60 mph (95 kph)	62 mph (100 kph)	90 mph (145 kph)	69 mph (110 kph)
4 <sup>th</sup> gear		78 mph (125 kph)	78 mph (125 kph)	84 mph (135 kph)		90 mph (145 kph)

**Permitted continuous engine speed:**

		6000 rpm	6000 rpm	6000 rpm	6000 rpm	6000 rpm
--	--	----------	----------	----------	----------	----------

**Equivalent to:**

1 <sup>st</sup> gear	Selector lever position 1	26 mph (42 kph)	26 mph (42 kph)	29 mph (47 kph)	39 mph (65 kph)	32 mph (52 kph)
2 <sup>nd</sup> gear	Selector lever position 2	49 mph (79 kph)	49 mph (79 kph)	55 mph (88 kph)	69 mph (110 kph)	59 mph (94 kph)
3 <sup>rd</sup> gear	Selector lever position A	74 mph (120 kph)	74 mph (120 kph)	84 mph (135 kph)	103 mph (165 kph)	90 mph (145 kph)
4 <sup>th</sup> gear		98 mph (158 kph)	98 mph (158 kph)	106 mph (170 kph)		116 mph (187 kph)

**Permitted maximum engine speed:**

		6200 rpm	6200 rpm	6200 rpm	6200 rpm	6400 rpm
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**Permitted top speed:**

1 <sup>st</sup> gear	Selector lever position 1	27 mph (43 kph)	27 mph (43 kph)	30 mph (48 kph)	39 mph (65 kph)	33 mph (53 kph)
2 <sup>nd</sup> gear	Selector lever position 2	51 mph (81 kph)	51 mph (81 kph)	56 mph (90 kph)	69 mph (110 kph)	62 mph (100 kph)
3 <sup>rd</sup> gear	Selector lever position A	75 mph (122 kph)	75 mph (122 kph)	86 mph (138 kph)	103 mph (165 kph)	95 mph (153 kph)
4 <sup>th</sup> gear		99 mph (160 kph)	103 mph (165 kph)	106 mph (170 kph)		118 mph (190 kph)

And now —  
**full speed ahead!**



"This is daddy's helmet —  
and this is my BMW racer!"

For correct functioning the engine requires **branded super petrol** as normally available (without additives – e.g. oils) with a minimum octane rating of 95 for the BMW 1602/1802/2002, and 99 for the BMW 2002 ti (Research Method).

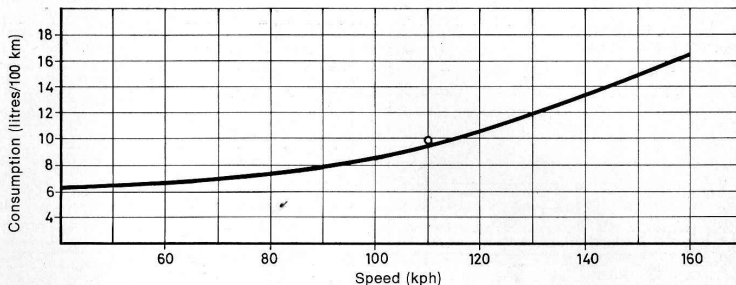
If you find yourself compelled to buy petrol with a lower octane rating, in other words with less anti-knock resistance, the following procedure should largely avoid “knocking” or “pinking” in the engine: keep the engine turning at 2500 rpm or above, change down in good time and accelerate only gently.

A graph of road speed/engine speed is shown on pages 81, 84 and 87.

The **fuel economy** of your BMW depends mainly on your own style of driving. High speeds, acceleration to the limits of the gears, violent cornering and braking all take their toll, not only in terms of increased petrol and oil consumption but also through rapid tyre wear, early brake lining renewal and a more severe load on the transmission.

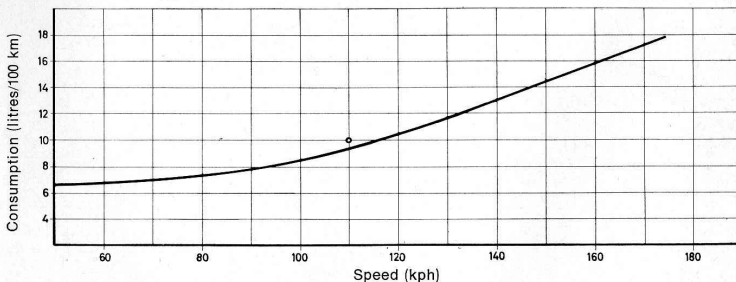
**Figs. 43, 44 and 45** show **fuel consumption** throughout the speed range for standard models with 2 passengers.

**43 Fuel consumption at steady speeds BMW 1602**



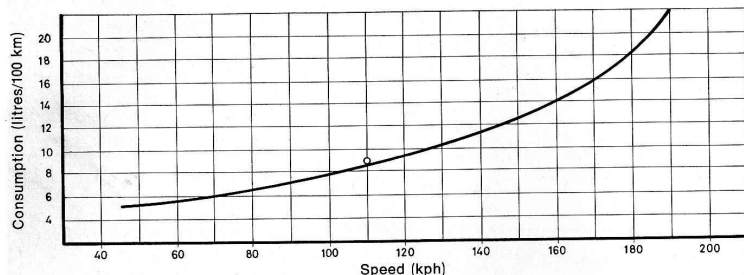
○ = Standard fuel consumption

**44 Fuel consumption at steady speeds BMW 2002**



○ = Standard fuel consumption

## 45 Fuel consumption at steady speeds BMW 2002 tii



o = Standard fuel consumption

The **standard fuel consumption** graph is calculated in accordance with the standardized test procedures. It is in no way identical with the average fuel consumption, which may be affected by a large number of different factors: way of driving, load carried, road conditions, traffic density and flow, weather conditions, tyre pressures, etc.

If you have been in a traffic jam or slow-moving column of cars for a long time, we suggest that you take the first opportunity of letting your car's engine "take a deep breath", as it were, by travelling for a mile or two using fairly high engine speeds. If any build-up of carbon has occurred, this routine will disperse it.

The **prescribed tyre pressures** are to be observed not only for preserving the tyres, but also for maintaining good driving conditions and fuel consumption, etc.

The tyre pressures should be checked regularly, i.e. at least once a week and before embarking on a long journey. Charts with the prescribed pressures are to be found on the inside of the engine compartment lid (on the left-hand side) and on the last page of this owner's handbook.

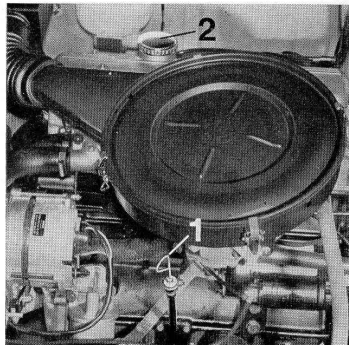


**Engine oil consumption**, like fuel consumption, depends on a variety of factors.

We recommend checking the oil level at regular intervals (BMW 1602/1802/2002 — **Fig. 46, 1**; BMW 2002 tii — **Fig. 47, 1**). If necessary add fresh oil of the same brand as that already filled into the engine. The filler cap for the BMW 1602/1802/2002 can be seen in **Fig. 46, 2** and for the BMW 2002 tii in **Fig. 47, 2**. Fill until the oil level reaches the upper mark on the dipstick. It is useless to overfill the engine and can even cause harm in certain circumstances.

The quantity of oil represented by the distance between the upper and lower marks on the dipstick is 2.6 Imp. pints/3.2 US pints/1.5 litres. The oil level must

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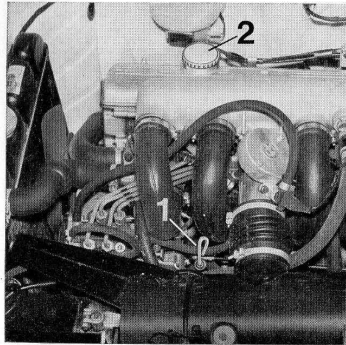


never fall below the lower mark. Do not take off the filler cap when the engine is running.

**Do not change to a different make of oil unless a complete oil change, including the oil filter, is undertaken.**

Our engines are designed in such a way that they take full advantage of the highly developed oils supplied by well-known companies. Neither the engine itself nor the gearbox and final drive oils require the employment of **any additive**. Check **automatic transmission oil level** (BMW 2002 A) whenever engine oil level is checked (see pages 58 and 59). **Fig. 48**

47

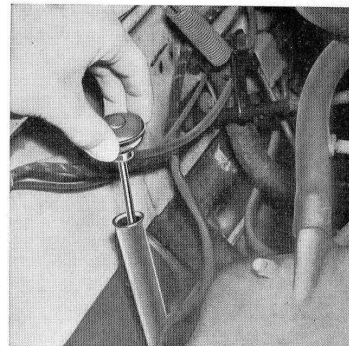


121 engine ↑

A well-tryed rule: After a long spell of **pass climbing** or **motorway and freeway driving** at full throttle, do not switch off the engine at once but allow it to idle or run under light load for a short while. This will disperse pockets of heat in the cooling system and prevent loss of the cooling water.

**Warning:** To remove the radiator cap when the engine is warm, use a glove or cloth, and turn the cap a quarter-turn to the left until it reaches the first stop; let the pressure escape, then turn further and remove. When replacing the cap, tighten all the way to the second stop.

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

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

If one circuit of the **dual twin circuit hydraulic brake system** should fail, **brake pedal travel** will immediately increase. Higher **pedal pressure** will thus be needed for the same braking effect. Although the vehicle can still be braked effectively with only one circuit in action, it is wise to consult a BMW service station without delay.

A spreader spring in each brake caliper makes **increased pedal pressure** necessary as soon as the **minimum brake pad thickness** is reached. To protect the brake discs, the pads should be renewed without delay, by a BMW service station.

Whenever you go on a long **journey abroad** we recommend that you pack certain spare parts in case of emergency; bulbs, fuses, V-belts, spark plugs, gaskets, etc., are useful. Your BMW dealer will gladly help you in the selection of these parts.

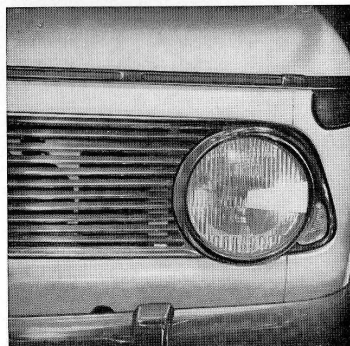
In general, you are required to display an international registration plate at the rear of your car when driving abroad, but the regulations differ in various countries. You can obtain information from motor clubs, consulates, etc.

When crossing the border into a country where traffic runs on the other side of the road, stick a piece of paper over the

wedge-shaped area on the headlamp lenses, so that the asymmetric dipped beam of your car does not dazzle oncoming traffic. **Fig. 49** shows how to attach the strip when using a left-hand drive car in a country where traffic runs on the left-hand side of the road.

Before carrying out any **technical modifications** on your vehicle, please consult a BMW service station. They will gladly inform you about the value, the legal requirements and the factory recommendations.

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Your BMW can be fitted with a ZF Lok-O-Matic disc-type **limited-slip differential** as an optional extra.

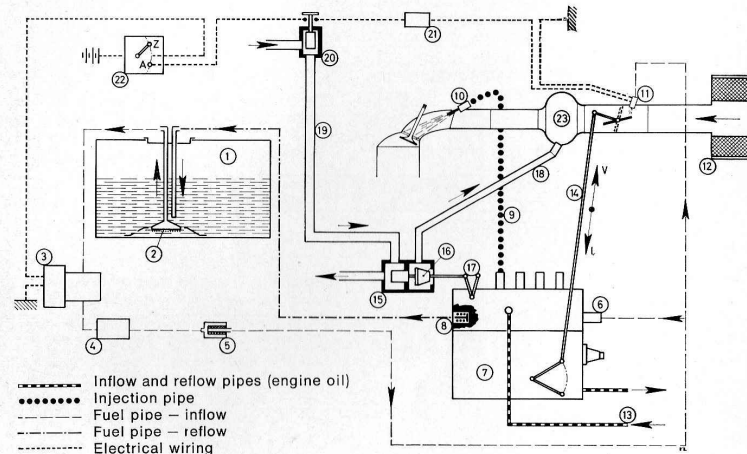
If road conditions are poor, the torque transmitted by a normal differential to the driving wheels may prove too great, and one wheel will then spin. In certain situations a spinning rear wheel can be dangerous, and can to a large extent be prevented by fitting a limited-slip differential.

The locking action is based on internal friction directly related to load, and is developed by the tendency of the differential bevel shafts to move apart under load, thus acting on thrust rings and symmetrically disposed internal discs.

The internal disc friction effect related to the movement apart of the bevel pinion shafts helps to prevent or at least deter the more lightly loaded wheel from spinning. The action is thus closely related to the torque transfer capacity of the driving wheels themselves.

A significant advantage of the limited-slip differential is its ability to operate when needed without any special action on the part of the driver being required.

Chart of the fuel injection system — BMW 2002 tii



Z = drive    L = idling speed  
 A = start    V = full speed

1. Fuel tank with induction unit
2. Fine-mesh filter in the induction unit
3. Fuel pump
4. Expansion container for pressure balance
5. Main fuel filter
6. Fine-mesh filter in fuel intake
7. Injection pump
8. Fuel reflow with pressure valve
9. Injection pipe
10. Injection valve
11. Starter valve
12. Air filter
13. Inflow and reflow of engine oil
14. Adjustment of engine idling and top speed (by accelerator pedal)
15. Warm-up runner with expansion element
16. Air adjustment cone
17. Lever for eccentric shaft
18. Intake pipe for additional air
19. Coolant pipe
20. Temperature retard switch
21. Retard switch
22. Ignition switch
23. Air container

In the **injection engine powering the BMW 2002** the two mixture components — fuel and air — are fed in from two separate units: the injection pump and the throttle butterfly manifolds. Fuel and air are then mixed in the inlet manifolds.

Fuel is injected into the inlet manifolds and onto the open intake valve under high pressure and is thus dispersed very accurately. All further combustion procedures of the four-stroke system remain unchanged.

### 1. Fuel flow

The electrical fuel pump sucks fuel out of the tank via a fine-mesh filter in the induction unit and one in the flow pipe. The fuel then flows through the expansion container and the main fuel filter into the injection pump (at a pressure of approx. 1.5–2.5 atmospheres = 21.3–35.5 psi). Excess fuel and any bubbles flow back into the tank through a reflow pipe. This ensures the fuel is always kept cool and free of bubbles. Even if the tank is completely empty it is not necessary to bleed air out of the pipes, as this is done automatically by the fuel pump whenever the ignition is switched on (no need to start the engine).

### 2. Injection pump

The camshaft of the injection pump is driven by the car's crankshaft via a serrated belt. Four pumping pistons operating in the same sequence as the firing order inject the required amount of fuel. These pistons are driven by sliding tappets. The amount of fuel injected depends on engine load and engine speed.

#### Fuel injection according to engine load:

The accelerator pedal is connected with the throttle butterfly and the adjustment lever on the injection pump. When the pedal is depressed the throttle butterfly is moved and the stroke of the pump piston is altered by the regulating cam.

#### Fuel injection according to engine speed:

The stroke of the pump piston is also adjusted by means of the rev governor in the injection pump and by the regulating cam.

**Engine warm-up:** The fuel/air mixture is enriched additionally until the temperature of the engine has reached 60–65°C (140–149°F). An expansion element surrounded by coolant also controls the stroke of the piston pump. Additional air is sucked into the air container according to the degree of fuel enrichment. (This air does not pass through the throttle butterfly.)

### 3. Injection valves

The injection valves open when the pressure of the injection pump reaches 30–38 atmospheres (426–530 psi) and fuel is injected.

### 4. Intake air flow

The intake air flows through an extra large air filter and the throttle butterfly manifolds to the air container, and from there through four vibration pipes (intake manifolds with a dynamic charge effect) and intake manifolds to the combustion chambers.

### 5. Accuracy of fuel/air mixture

The connecting bars between the adjustment lever of the injection pump and the operating lever of the throttle butterfly must always be adjusted accurately to ensure that the fuel/air mixture is correct under all driving conditions.

### 6. Starting unit

When the engine is started, fuel is injected into the intake system by means of a magnetic valve controlled by the ignition current. This process is continued for a certain period, depending on the coolant temperature.

The right thing to do —  
**trouble-free winter driving**



"Next winter I'll borrow  
Daddy's spiked tyres"



When using the car in the winter months, please note the following recommendations to be complied with in good time before the winter:

A long-term **antifreeze and corrosion inhibitor** has already been added to the cooling water.

Total capacity of the cooling system including heater

12.3 Imp. pints/14.7 US pints/7 litres  
Frost level down to approx.  
—25° C (—12° F)

The factory recommended antifreeze brands are known to your BMW service station. To ensure the required frost resistance, it is necessary to renew the coolant **every 2 years**. (Draining and filling the coolant, see pages 61 and 62.) Before and during the cold season the antifreeze properties of the coolant should be checked. At the same time, examine the cooling system for leaks and renew porous or brittle hoses.

Engine temperature is controlled by the thermostat, taking into account engine load and ambient temperature. For this reason the **radiator and air inlet grill should not be blanked off**.

The **screenwasher unit** can be maintained in working order during cold weather with temperatures of up to —20° C (approx. —5° F) by adding 40% branded antifreeze (total reservoir capacity approx. 2.6 Imp. pints/3.2 US pints/1.5 litres; 40% branded antifreeze = 1 Imp. pint/1.3 US pints/0.6 litres).

Please note the **regulations** concerning the **engine oil** prior to the cold season (see page 57).

If the weather suddenly becomes much colder, change to the required grade of oil even if a routine oil change is not yet due.

Do not forget to move the **flap** for automatic intake air preheat to the "winter" position during cold weather (see pages 68 and 69).

One essential for quick starting is a well-charged **battery**. In cold conditions the battery's efficiency falls, but the loads imposed on it are much greater than in summer.

**Warning:** If the battery is recharged **without** removing it from the car, both battery cables must be disconnected. Do this only with the car's engine switched off!

In the interests of directional stability and accurate steering winter tyres, whether cross or radial ply (M+S or M, S+E), should be of the same make and type, and should be fitted to **all four wheels** (and to the spare if possible).

The speed limits laid down by law or by the tyre manufacturer must be observed. Spiked tyres should be run in for about 200 miles (300 km) at a moderate speed. We recommend that you note which way round the tyres are facing when you

change them, so that they can be put back the same way round. The spikes will have become imbedded in the rubber and therefore need not be run in again.

Always inflate the tyres to the correct pressures, and have the wheel rebalanced whenever the tyre or the wheel itself is changed.

When driving with **snow chains** on the wheels, never exceed 45 mph (70 kph). If **parking** the car in **freezing conditions**, engage 1<sup>st</sup> or reverse gear or P on automatic transmission cars to hold the car firm, but do not pull on the handbrake. This is to ensure that the brake pads and linings do not freeze solid to the discs or drums.

To lubricate the **locks**, use only factory-approved products (your BMW service station can advise you). These will help to prevent freezing in cold weather. If a lock freezes despite this precaution it can be thawed by heating the key before insertion.

To prevent the **rubber seals** on the doors and lids from freezing, we recommend coating them with a little glycerin.

**Chromium-plated and polished components** should be protected in winter with a transparent preservative lacquer.

The **underside** of the car is undersealed at the factory. Before the cold season it is a good idea to inspect the underseal and renew if necessary. Spraying with oil-based products provides no lasting protection against rust, but rather damages rubber components beneath the car and loosens the existing underseal. Your BMW service station knows the branded products recommended by the factory. When applying underseal, carefully protect the disc brakes. No preservative must reach the piston or the discs themselves.

After heavy snowfall, clear the **slots** in front of the windscreen, so that the heater can operate at maximum efficiency.

In winter it is wise to carry the following items in the luggage compartment:

sand, to assist starting on icy uphill roads;  
a shovel, in case the car has to be dug out of a drift;  
a flat board or plank to put under the jack; a brush and scraper for the removal of snow and ice from the body and windows.

It can happen to anyone:  
**What to do in an emergency**

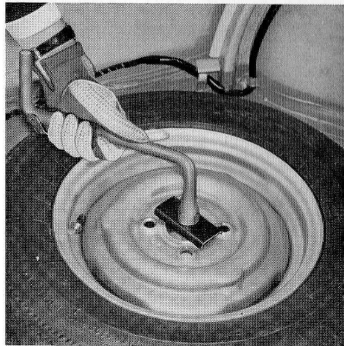
"Won't you spare a minute  
to help a guy in trouble!"



A flat tyre is fortunately a rare event these days. If you should be unlucky, pull to the side of the road as soon as possible and put the handbrake on. Please do not forget to switch on the hazard warning flasher lights (see page 14) and display a warning triangle or flashing signal light at an adequate distance to the rear.

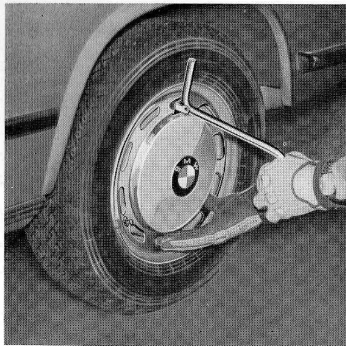
The **spare wheel, jack and tools** are housed in the luggage compartment under the left-hand floor panel. This is retained under light spring pressure and should be lifted up to remove.

Loosen the hexagon nut holding the spare wheel by turning it with the wheel brace. The nut also acts as a spare wheel nut. **Fig. 50**



Carefully prise off the hub cap, using the hook provided on one end of the wheel brace. With the other hand, support the hub cap as it becomes loose (**Fig. 51**). Loosen the wheel nuts slightly.

51

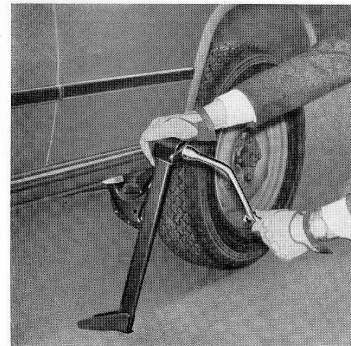


Set up the jack (please attach only to one of the **4 points on the body specially designed to accept it**) and raise the car by turning the jack pivot nut with the wheel brace until the wheel concerned is sufficiently clear off the ground.

**Fig. 52**

Screw off the wheel nuts and exchange the wheels. Replace the wheel nuts and screw up evenly all round the wheel. Lower the car with the jack, then **firmly tighten** the wheel nuts, working cross-wise. Push the hub cap over the 2 protrusions on the wheel, then strike the edge of the hub cap gently to drive it home over the third protrusion. Do not forget to have the flat tyre attended to and balanced at the earliest opportunity.

52

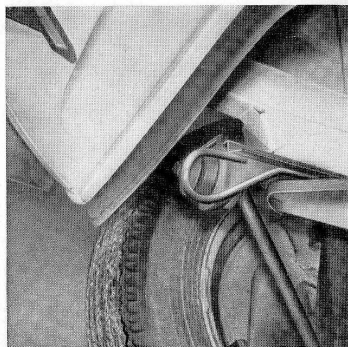


### **Starter fails to operate when ignition key is in "Start" position:**

Test by switching on headlights, then try starter again.

1. If the lights go out slowly, the battery is insufficiently charged or faulty. Recharge the battery or exchange it. To start the car it may be necessary to push or have it towed. The design of a car fitted with automatic transmission is such that it does not permit pushing or towing. For towing see page 22. The front axle support beam is fitted with a **towing eye** at the left and the right side. **Fig. 53**

53



To tow-start, engage third gear, switch on the ignition and depress the clutch pedal. When the car is moving steadily forward, engage the clutch.

2. If the headlights go out instantly, check that the cable terminals at the battery and starter are making good contact, and tighten if necessary.
3. If the brightness of the lights does not diminish, consult your BMW service station (a fault in the starter is indicated).

### **Engine will not start although starter functions correctly:**

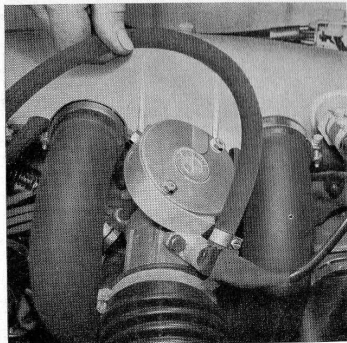
Assuming that the starting routine on pages 24, 25 and 26 was followed, and that there is enough fuel in the tank, failure to start could be due to a fault in the ignition system or the fuel supply line.

1. Check that the spark plug cables are properly in place on the spark plugs and that all cables on the coil, distributor and plug leads are making good contact. Examine for traces of water left over from when the car was washed, in case these are causing the fault.
2. Remove spark plugs and check gaps and general appearance (see page 65).

3. Each plug can be checked by attaching the appropriate lead and laying the metal body of the plug on an unpainted part of the engine block. When the starter is operated, sparks should be seen jumping the electrode gap. If no spark is visible, attach a different plug to the same lead and repeat the test. If no spark occurs this time, the ignition distributor must be examined (see page 66).
4. To check that fuel is reaching the engine, separate the fuel supply line from the carburettor and operate the starter. If no fuel emerges from the supply line, the fuel lines and the fuel pump must be examined (see pages 63 and 64). On the other hand, if fuel is pumped through to the carburettor, unscrew the carburettor jets (see pages 71 and 72) one after the other and clean them by blowing. If this fails use a single bristle from a clothes brush, dusting brush or similar, but never clean the jets with a needle, wire or other hard object.

On the BMW 2002 tii check whether fuel flows properly when ignition is switched on (pressure build-up in pipe leading to injection pump and to the starter valve, pipe clearly becomes harder — press between fingers — **Fig. 54**). If this is not the case, check fuel pump (above the right-hand rear half axle — **Fig. 88**), main fuel filter in the injection pump, fine-mesh filter in the fuel pump inlet and in the induction unit of the fuel tank (see pages 64 and 65). However, if fuel is nevertheless pumped through the system correctly, ask the nearest BMW service station.

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It is not necessary to bleed the injection system when the fuel tank is empty, as this is done automatically by the fuel pump if the ignition is switched on (no need to start the engine).

#### Coolant temperature too high:

1. Carefully remove the filler cap on the radiator and inspect the water level. Never top up the radiator straight away if the **engine is hot** and if a great deal of water has been lost; wait until the engine has cooled to the extent that you can place your hand upon it.
2. If coolant escapes, check the filler cap, all hose connections and the radiator block itself for leaks.
3. Check V-belt, and adjust tension or replace if necessary (see page 68).
4. Check ignition timing (see page 67).
5. If necessary, instruct your BMW service station to flush out the radiator system.

#### Faulty brakes

At the first sign that a fault may have occurred in the brake system, we strongly recommend that you contact your BMW service station immediately.

**Car brought to a standstill** with the wheels spinning (deep snow, sand, soft ground, etc.):

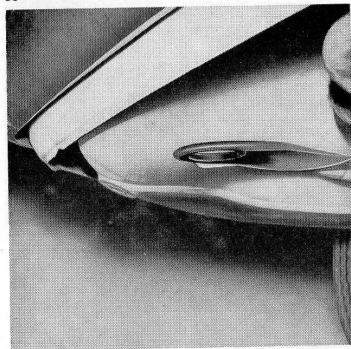
Do not press the accelerator down too far; before the next attempt to extricate the car is made, place some form of

firm support beneath the rear wheels (in a real emergency the car's own mats will do). Obtain help in pushing the car out of the ruts it has made before they become too deep. Apply the handbrake to the extent necessary to prevent a single rear wheel from spinning. Do not forget to release the handbrake as soon as it has had the desired effect.

#### Towing another car

If you wish to assist another motorist by towing his car with your BMW, first ensure that the other car is not larger and heavier than your own. A **towing eye** is provided beneath the spare wheel well. **Fig. 55**

55



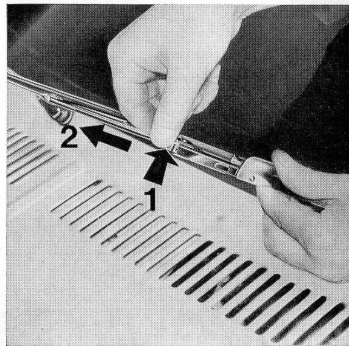


**To remove a wiper blade,** hinge the wiper arm forward away from the windscreen. Press the blade out of its locking spring on the arm (**Fig. 56, 1**) and withdraw upwards. (**Fig. 56, 2**)

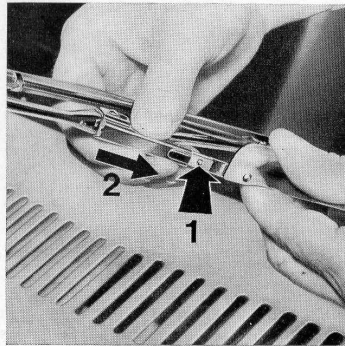
**When fitting on a wiper blade,** make sure it is properly engaged (**Fig. 57, 1**). Then push wiper blade as shown below (**Fig. 57, 2**) until the locking spring snaps into position.

The complete **wiper arm** can be removed if its spring retainer is lifted away from the pivot shaft slightly. **Fig. 58**

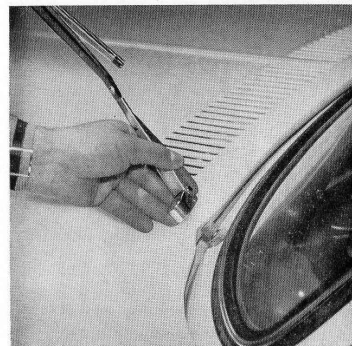
56



57



58



If any power-consuming electrical component fails on your car, you should first check the fuses. The **fuse-box** is located under the bonnet at the top on the left-hand side. **Fig. 59**

The melted metal band indicating a blown fuse can be clearly seen through the clear plastic cover of the fuse-box. Snap the blown fuse out of its spring clip fastenings and press in a replacement fuse.

Never try to replace a blown fuse with a piece of wire etc. (this entails a fire risk). If the fuse blows repeatedly, the fault should be investigated by a specialist workshop.

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### Fuse coding

No.	Fuse insert to DIN 72581	Item
1	5 A (yellow)	Rear, side and parking lights (left)
2	5 A (yellow)	Rear, side and parking lights (right), number plate lights, instrument panel lights, rear fog light, fog lamp relay
3	8 A (white or black)	Dipped headlamp (left)
4	8 A (white or black)	Dipped headlamp (right)
5	5 A (yellow)	Turn indicator (left)
6	5 A (yellow)	Turn indicator (right)
7	16 A (red)	Cigar lighter
8	8 A (white or black)	Clock, interior light, hazard warning flashers, turning indicator for trailer
9	16 A (red)	Heater blower
10	16 A (red)	Heated rear window
11	8 A (white or black)	Electrical fuel pump, automatic choke, fuel and temperature gauges, oil pressure telltale, revolution counter, telltale for handbrake, choke pull knob and fuel tank reserve
12	16 A (red)	Stop lights, turn indicator lights, horn relay, wiper motor, screenwasher, reversing lights

When **changing bulbs** or carrying out any other work on the electrical system always switch off the item concerned in order to avoid short circuits. The earth cable can also be removed from the negative pole of the battery.

Try to avoid touching the glass of new bulbs with your hands. Rather, handle them with a clean cloth or paper handkerchief. When removing headlamp bulbs, do not disturb the setting of the beam adjustment screws.

#### **Instrument panel lights:**

Before the bulbs can be changed, the padded cover below the instrument panel must be removed. The affected bulb in its holder can then be withdrawn from the rear face of the instrument concerned. The bulb is released from its holder by pressing in slightly and turning.

#### **Speedometer:**

Illumination:

2 indicator type bulbs, 3 W (V)

#### **Clock illumination:**

1 indicator type bulb, 3 W (I)

#### **Combination instrument:**

Illumination:

2 indicator type bulbs, 3 W (V)

Main beam telltale:

1 indicator type bulb, 3 W (V)

Battery charge telltale:

1 indicator type bulb, 3 W (V)

Oil pressure telltale:

1 indicator type bulb, 3 W (V)

Turn indicator telltale:

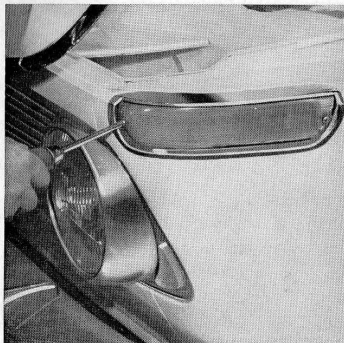
1 indicator type bulb, 3 W (V)

**Automatic transmission lighting:** Pull off plastic cover to change the two indicator bulbs, 2 W (H).

#### **Front flashing indicators:**

Unscrew the 2 Philips screws and remove the plastic lens and seal. Press in the round-headed bulb slightly and turn until it can be removed. Bulb rating 21 W spherical. **Fig. 60**

60

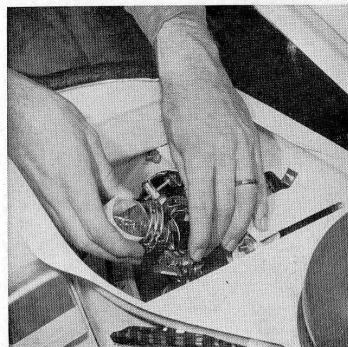


#### **Main and dipped headlamp beams:**

To gain access to headlamps, open the engine compartment lid and remove the plastic cover protecting the rear of the lamp. Withdraw the plug, turn the bayonet joint to the left and remove. Take out the bulb. When inserting the twin-filament 45/40 W (A) bulb note the recess formed in the reflector to simplify fitting. **Fig. 61**

The **side and parking bulbs** (4 W indicator type, H) are held in the reflector by a small spring and can be withdrawn without difficulty by pulling rearwards.

61



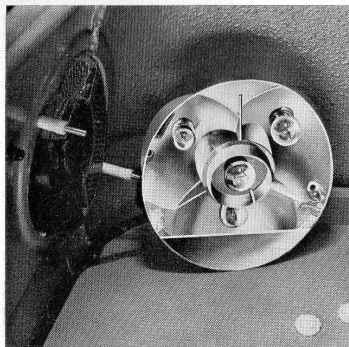
**Rear lights:**

Open the lid of the luggage compartment, unscrew the 2 knurled nuts holding each light pressing and remove the complete assembly. **Fig. 62**

Remove the defective bulb from its holder and renew as follows:

1. Flashing indicator, spherical bulb, 21 W;
2. Reversing light, spherical bulb (F), 15 W;
3. Rear, side or parking light, spherical bulb (G), 5 W;
4. Stop light, spherical bulb, 21 W.

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**Number plate light:**

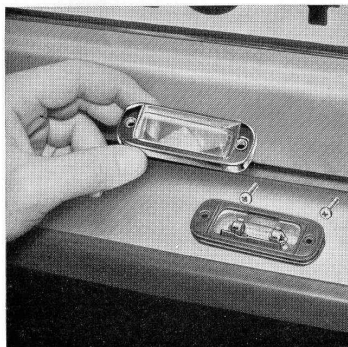
Remove 2 Philips screws and withdraw frame complete with glass and seal. **Fig. 63**

The contact clamps for the 5 W (L) festoon-type bulbs must have adequate spring tension and make good metal-to-metal contact with the bulb end caps. If necessary squeeze the contact clamps together slightly and clean the contact surfaces.

**Interior light:**

The lamp housing contains 1 10 W (L) festoon-type bulb. Using a screwdriver or similar tool, the housing can easily be removed and the bulb changed if required.

63

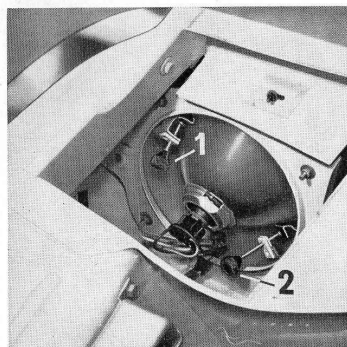


Because **correct headlamp adjustment** is of such vital importance for road safety it is best for the job to be done by a specialist workshop with the proper equipment. If this is not possible, open the engine compartment lid and turn the knurled plastic knobs until the correct setting is obtained. **Fig. 64**

1 = Vertical adjustment

2 = Horizontal adjustment

64



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

Position the vehicle on a flat level surface at approx. 16' (5 metres) 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. 65**

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.

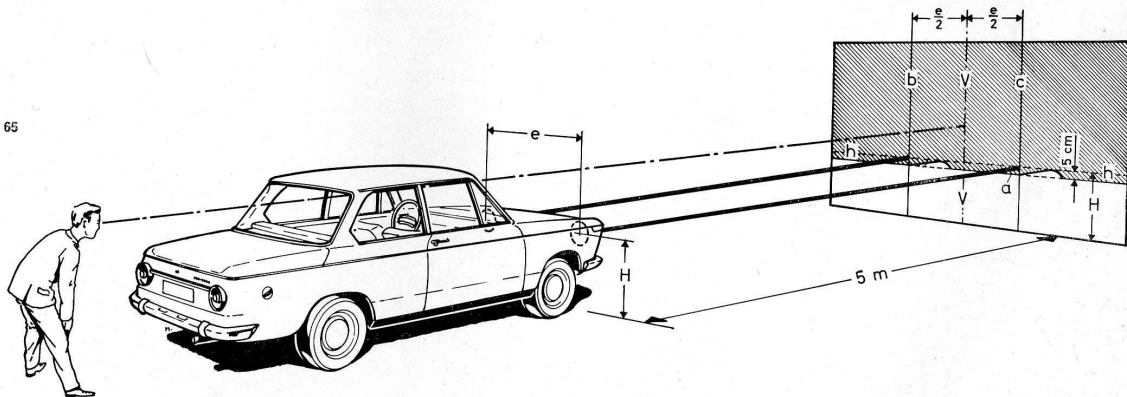
Measure the distance separating the headlamps horizontally (e); divide this amount symmetrically and mark lines b and c on the wall at the corresponding distances from vertical centre-line V-V.

### Headlamp adjustment with dipped beam only:

Cover up one headlamp. Set the other headlamp to the correct height by turning knurled knob 1 (**Fig. 64**). The height is correct when the left-hand side of the horizontal light/dark border coincides with line a. Next move knurled horizontal adjustment knob 2 (**Fig. 64**) 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.

65



If **SEALED BEAM** headlamps of American design are fitted, **adjust as follows:** Use an optical or photo-electric beam-setting device and follow the manufacturer's instructions. If no suitable device is available, park the car on a flat level surface at 25' (7.6 metres) from a light-coloured wall. Inflate the tyres to the correct pressures and get someone to sit in the centre of the front seat. Extend the car's centre-line forward to the wall and mark vertical line V on the wall.

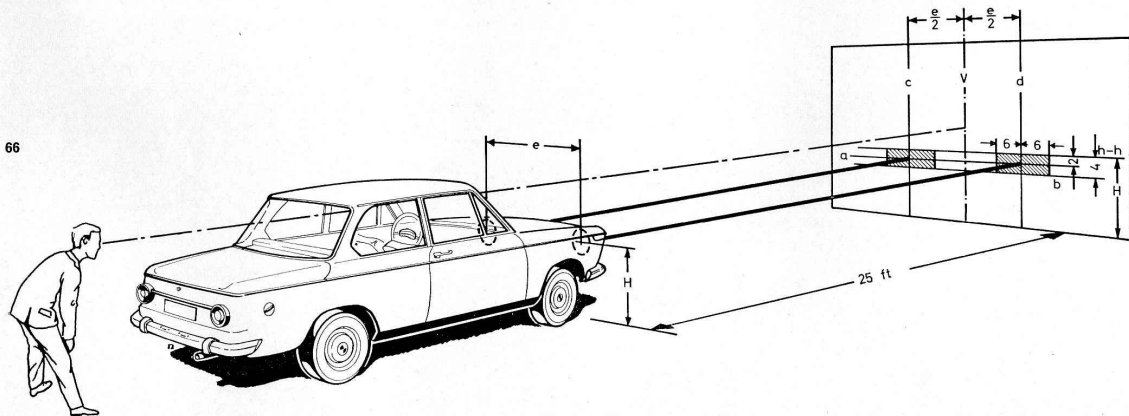
Next mark horizontal line h-h at the height of the headlamp centre-line with distance H approx. 26 1/2" (66 cm). Mark lines a and b 2" (5 cm) and 4" (10 cm) below and parallel to the line h-h. Transfer the distance between the headlamp centres (approx. 44" = 110 cm) on the wall, and mark lines c and d symmetrically on either side of centre-line V. Distances e/2 to right and left must be exactly the same.

Mark additional vertical lines to right and left of lines c and d at a distance of 6" (15 cm). This will form rectangles, the centre-lines of which can be used to align the headlamp beams. **Fig. 66**

### Adjust only on full beam

For vertical adjustment, turn the upper knurled plastic knob; for sideways adjustment the knob at the side (see **Fig. 64**). The headlamp is correctly adjusted as soon as the centre of the brightest circular section of the beam strikes the intersecting lines in the shaded areas or falls somewhere within these areas. The second headlamp is then adjusted similarly.

66



What must be, must be:  
**Care and maintenance**



"Hey, Mr. BMW,  
my rear wheel squeaks like hell!"  
"Not surprising, old boy,  
if you forget the regular inspections!"

## Care and maintenance

Your brand-new BMW is a fine sight. How it will look in a few years' time is quite another matter, and depends on the trouble you take to look after it.

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

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

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

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

The paintwork should be cleaned down with a fine spray of water, and all traces of dirt hosed away.

Do not direct the hose into the heater intake slots in front of the windscreen.

After hosing down, wash the car with abundant luke-warm water using a sponge or car-wash-glove starting with the roof. Rinse the sponge at frequent intervals.

Wash the lower part of the body and the wheels last of all and if possible keep a separate sponge for these areas. After washing, spray the car down thoroughly a second time and dry off with a clean leather, so that no marks are left by residual water.

If washing with water alone is not sufficient, use a branded car cleaner or shampoo, mixed with the water in proportions specified by the manufacturer. The car should then be washed or hosed down with an abundant supply of pure water. Too frequent use of shampoos and cleaners removes oil from the paintwork, which then tends to become brittle, necessitating the application of a good quality paintwork preservative.

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

Use only branded products for your car's bodywork and always apply these products in strict accordance with the maker's instructions.

**Minor paintwork damage** may be touched up with the aid of a BMW paint spray

aerosol or a paint improver stick. You will find the respective colour code on a reference label located near the maker's plate.

**Chromium-plated and polished parts** should be cleaned with water or with soapy water if necessary. A branded chrome protector can then be applied. In winter especially, we recommend protection of the underside (see page 40). During application, the disc brakes should be carefully covered over. On no account should any oil, spray, or protective product reach the piston seals or the discs.

**Patches of tar** should never be removed with a hard object such as a knife. Instead use a commercially-available tar remover. **Rubber parts** may be washed down with water, but no other substance should be allowed to contact them except pure glycerin.

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

**Stains on the cloth upholstery** can be removed with stain remover, but the product should not be allowed to come into contact with any real or artificial leather.

**Artificial leather** can be wiped down with a damp cloth and dried immediately, using a separate drying cloth.



When you take delivery of your car you will also receive a **Service Booklet**, in which your name and details of the car will have been entered. After carrying out the **free pre-delivery inspection**, your BMW dealer will remove the appropriate section in the booklet and will make an entry to confirm that the work has been done. The same procedure will be followed when it is time for your 1st BMW Program Test at 600 miles (1000 km).

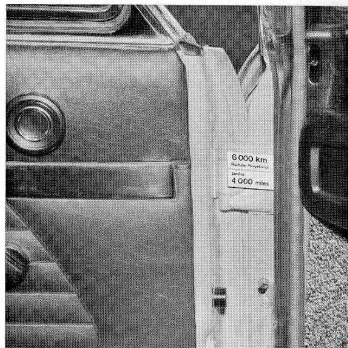
Your BMW dealer will also put an adhesive label on the driver's door post (**Fig. 67**) to remind you when the next service is due. You will receive confirmation that this and all other specified

services or BMW Program Tests have been carried out when you look in the appropriate area of the service booklet. Always ensure that the confirming entries are made correctly; if it is ever necessary to make a claim under the warranty this evidence may be required, and you will in any case be glad later on to have this clear proof that your car has been well looked after.

We strongly recommend you to have the prescribed services and BMW Program Tests carried out **at the correct intervals** by your BMW service station. This is the only safe way of ensuring that all the work is done in accordance with the latest factory standards. A list giving details of the widespread BMW dealer network is supplied to you on delivery, so that your car can receive proper attention even if you have travelled a long way from your normal service station.

To ensure the reliability and long life of your car we advise **a minimum of two** BMW Program Tests a year, even if the mileage laid down between services has not yet been reached.

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## 1st BMW Program Test

after 600 miles (1000 km)

1. Change oil in engine together with oil filter, while engine is warm. Renew oil filter element. BMW 2002 tii: Renew Micronic oil filter element.
2. Change oil in gearbox while warm. (Not applicable to automatic transmission).
3. Change oil in final drive while warm.
4. Rear half-shaft sliding joints: check for leaks.
5. Check oil in steering box for leaks, and top up if necessary.
6. Check coolant level and top up if necessary.
7. Examine brake lines and connections for leaks, damage or distortion. Check level of brake fluid in reservoir and top up if necessary.
8. Clean out fine mesh filter. Tighten screws on fuel pump.
9. Tighten screws and nuts on carburettor.
10. BMW 2002 tii: Tighten cap nuts on the injection pipes and fastening clamps on the vibration pipes. Apply grease on the moving parts of the throttle butterflies.
11. Check automatic intake air pre-heat valve for freedom of movement, and operating lever setting for summer/winter adjustment (1602/1802/2002).
12. Check V-belt tension, and retension if necessary.
13. Take up any slack on all engine bolts and nuts to the required torque levels (see specifications). Check nuts on rubber engine mountings (right and left), inlet manifold and exhaust pipe, oil sump and cylinder head bolts.
14. Check valve clearances and adjust if necessary.
15. Tighten all bolts and nuts on front axle, steering, gearbox, drive shafts, rear axle and brakes to the torque levels stated in the specifications for these parts.
16. Tighten all bolts and nuts on front and rear compartment lids, hinges, catches, door locks, strikers and exhaust system.
17. Check steering in straight-ahead position for absence of play, and adjust if necessary.
18. Test foot brake and adjust (rear only) as necessary. Bleed the brake system. Check handbrake and adjust as necessary.
19. Check front wheel bearing play and adjust if necessary.
20. Check the track of the front wheels and adjust if necessary.
21. Check tyre pressures and adjust if necessary.
22. Check lighting system, instrument readings, horns, controls and mirror.
23. Check headlamp settings and correct if necessary.
24. Examine engine as instructed with a BMW Program Tester. Check engine idling and adjust if necessary.
25. Make a final check on items affecting road safety (brakes, steering, clutch or automatic transmission).

**Note:** If desired, rebalance all four road wheels (to be invoiced separately).

## Service

### every 8000 miles (12000 km)

beginning at 4000 miles (6000 km)

1. Change oil in engine and oil filter while engine is warm. Renew oil filter element. BMW 2002 tii: Renew Micronic oil filter element.
2. Check coolant level, and top up if necessary.
3. Check battery acid level, and top up with distilled water if necessary.
4. Check brake fluid level in reservoir.
5. Check overall brake pad thickness.
6. Check tyre pressures, and correct if necessary.
7. Top up screenwasher reservoir.
8. Check lighting system, instrument readings, horns, control knobs and mirror.
9. Carry out final check on items affecting road safety (brakes, steering, clutch or automatic transmission).
10. Tighten cylinder head bolts (keep to correct torque values shown in specifications).

**Warning:** this is only necessary for the 1<sup>st</sup> service at a mileage reading of 4000 miles (6000 km).

## BMW Program Test

### every 8000 miles (12000 km)

beginning at 8000 miles (12000 km)

1. Renew spark plugs.
2. Renew contact breaker points. Apply a small quantity of Bosch Ft 1 v4 grease to the heel of the contact breaker arm. Allow two drops of engine oil to soak into the lubricating pad in the distributor shaft.
3. Change oil in engine and oil filter while the engine is warm. Renew oil filter element. BMW 2002 tii: Renew Micronic oil filter element.
4. Check gearbox oil level and top up if necessary (check oil while engine is warm: manual transmission and automatic transmission every 24000 miles = 36000 km).
5. Check final drive oil level, top up if necessary.
6. Half shafts: check tightness of sliding joints for leaks.
7. Check oil level in steering and top up if necessary.
8. Check coolant level, top up if necessary.
9. Check battery acid level, top up with distilled water if necessary.
10. Check brake fluid level in reservoir, and top up if necessary.
11. Clean the fuel pump mesh filter.

12. BMW 2002 tii: Clean the fine-mesh filters on the induction unit in the fuel tank, the fuel pump and the injection pump every 40000 miles (60000 km). Renew main fuel filter.
13. Check automatic air intake pre-heat valve for freedom of movement and correct setting of lever for summer and winter operation (1602/1802/2002).
14. Check V-belt tension, and retension if necessary.
15. Oil joints and bearing of the carburettor linkage.
16. BMW 2002 tii: Oil the joints and bearing points on the injection pumps and the throttle butterflies. Apply grease on the moving parts of the throttle butterflies.
17. Tighten the following bolts and nuts (keep to correct torque value shown in specifications): check nuts on rubber engine mountings (left and right), inlet and exhaust manifolds, carburettor and fuel pump.
18. Check valve clearances. Adjust as necessary.
19. Renew intake air silencer filter element(s). With greater dust deposits, change at more frequent intervals.
20. Check steering for absence of play in straight-ahead position, and adjust accordingly. Check condition of track rod joints.
21. Final drive and half-shafts: check condition of rubber couplings and examine universal and sliding joints.
22. Tighten the following bolts and nuts (keep to correct torque values shown in specifications): steering and brake mountings.
23. Disc brakes: check overall thickness of pads and surface of discs. If necessary renew pads.
24. Front wheel bearings: check play and adjust if necessary.
25. Check tyre pressure and correct if necessary. Check condition of tyres. If uneven wear is evident, check toe-in. Optional complete check and correction of wheel position measurements (to be invoiced separately).
26. Check clutch driving plate for wear.
27. Check brake lines and connections for leaks, damage or distortion. Clean out brake drums and linings and examine for wear. Check that handbrake cables move easily. Adjust brakes.
28. Tighten all bolts and nuts on door locks, strikers and exhaust system.
29. Oil door, engine and luggage compartment hinges. Lightly grease engine and luggage compartment lid catches as well as door strikers and latches. Test for correct operation.
30. Check lighting system, instrument readings, horns, controls and mirror.
31. Check headlamp beam settings and adjust if required.
32. Examine engine as instructed with a BMW Program Tester. Check engine idling and adjust if necessary.
33. Make a final check on items affecting road safety (brakes, steering, clutch or automatic transmission).

**Note:** If desired, interchange all four road wheels as instructed and rebalance.

## Details of maintenance routines

### Engine oil

#### Frequency of oil changes

After 4000 miles (6000 km) or 6 months at the latest, applicable throughout the whole year. If the car is used for short distances only and when temperatures are below 0°C (32°F), oil change every 3 months or after 2000 miles (3000 km) at the latest.

mainly over  
+ 10°C (50°F)

mainly under  
+ 10°C (50°F)

#### Branded HD petrol engine oil

##### single grade oil **preferably**

SAE 30

SAE 20

##### multigrade oil

SAE 20 W 40

SAE 20 W 50

SAE 10 W 30

SAE 10 W 40

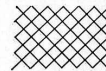
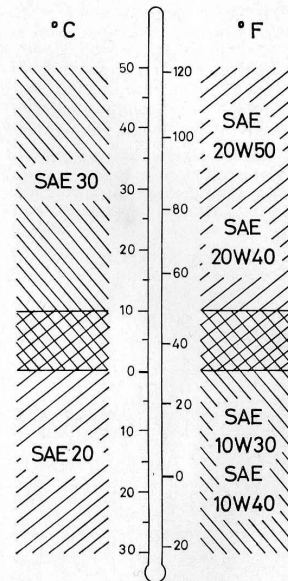
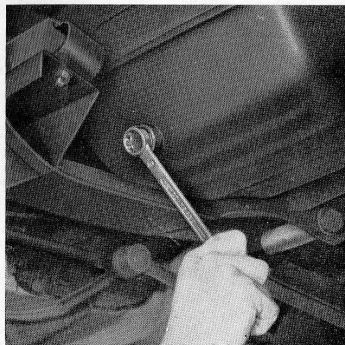
**Total oil capacity:** 7 Imp. pints/8.5 US pints/4 litres + 0.44 Imp. pints/0.53 US pints/0.25 litres if the oil filter is changed.

**Oil level:** Fill to the upper mark on the dipstick; never higher.

#### Engine oil change:

Unscrew the oil drain plug (19 mm) on the right-hand lower part of the sump, allow the old oil to run out and retighten the plug firmly. **Fig. 68**

68



When changing the engine oil according to seasons, an overlapping of temperature between 0°C and +10°C (32°F and 50°F) has no negative effects whatsoever.

Change **oil filter element** every 4000 miles (6000 km), when engine oil is changed:

Unscrew holding bolt (17 mm) and remove it, together with the sealing ring and the filter casing, leaving the upper part of the filter in place. **Fig. 69**

Clean the casing, renew the element, inspect the sealing ring for perfect quality and re-assemble (see torque specifications on page 99).

69



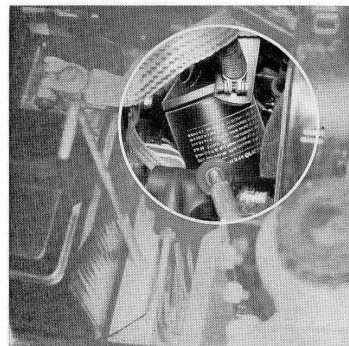
#### Oil filter on the BMW 2002 tii

Renew oil filter element every 4000 miles (6000 km) when changing the engine oil:

Screw off filter.

Apply a bit of oil on the seal of the new element. Then screw in the element until seal rests in position and tighten by hand by turning the element round once. Make sure that the filter does not leak while the engine is running. **Fig. 70**

70



**Change the oil in the gearbox** only when it has become warm. The change should be made every 24000 miles (36000 km). First unscrew the oil drain plug (17 mm), then the oil filter plug (14 mm) on the left-hand side of the gearbox. This will assist the oil in draining more rapidly. When fully drained, screw back the drain plug firmly into place. Both drain and filler plugs have conical threads and should therefore not be replaced by plugs having metric threads. **Fig. 71**

#### Total oil capacity:

4-speed box: 1.8 Imp. pints/2.1 US pints/  
1 litre

5-speed box: 2.5 Imp. pints/3 US pints/  
1.4 litres

**Correct oil level:** to underside of filler aperture.

**Oil grade:** any branded SAE 80 gearbox oil (not hypoid gear oil), or, if not available, HD engine oil SAE 30.

#### Checking oil level in automatic transmission:

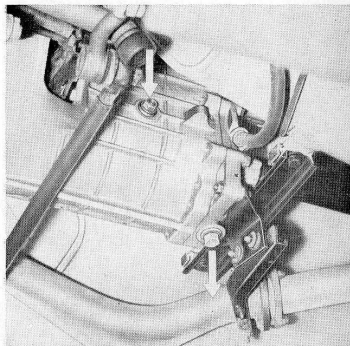
Place the car on a flat level surface and apply the handbrake. With the selector lever in position "P", run the engine at idling speed. The engine should be at its normal operating temperature. Take out the oil dipstick (see page 33, Fig. 48), wipe with a **non-fluffy** cloth and measure the oil level. It should be between the two marks on the dipstick. The quantity of oil represented by the space between the two marks is approx. 0.7 Imp. pints/0.9 US pints/0.4 litres.

**Change the oil in the automatic transmission** only when the engine is at normal operating temperature, every 24000 miles (36000 km).

Place the car on a flat level surface and apply the handbrake. Engage selector lever in position "P" and stop the engine. Unscrew the oil drain plug (17 mm spanner) on the oil sump of the automatic transmission, allow the oil to drain, and tighten plug firmly.

Add only 1.8 Imp. pints/2.1 US pints/1 litre at first, then run the engine at idling speed and continue to add oil until the level reaches the upper third of the space between the two marks on the dipstick.

**Capacity** approx. 2.8 Imp. pints/3.4 US pints/1.6 litres or with oil cooler 3 Imp. pints/3.6 US pints/1.7 litres (total capacity 71



ity of a new or exchange transmission when initially filled is 8.0 Imp. pints/9.5 US pints/4.5 litres or with oil cooler 9.2 Imp. pints/10.9 US pints/5.2 litres).

#### Oil grades

see page 108.

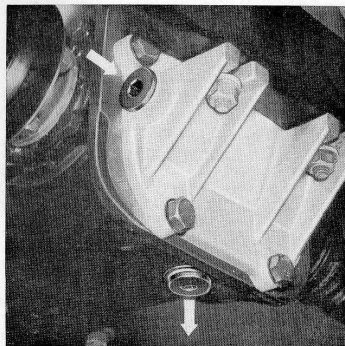
**Change oil in the final drive** at 600 miles (1000 km) while engine is warm:

Unscrew the oil drain plug (int. hex. 10 mm) and then the oil filler plug (int. hex. 10 mm) on the left of the final drive housing, so that the oil can drain away more quickly. Clean the drain plug and tighten firmly. **Fig. 72**

**Total capacity:** 1.5 Imp. pints/1.7 US pints/0.8 litres.

**Oil level:** to lower edge of filler aperture. Check every 8000 miles (12000 km).

72



**Oil grade:** branded running-in grade hypoid gear oil, SAE 90. (Your BMW service station knows the factory-approved oil grades.)

The **steering box** is permanently oil-filled, and thus no drain plug is fitted.

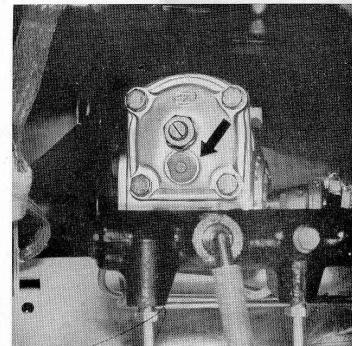
The oil level should be checked every 8000 miles (12000 km). **Fig. 73**

**Total capacity:** 0.56 Imp. pints/0.65 US pints/0.3 litres.

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

**Oil grade:** branded hypoid gear oil, SAE 90.

73





The **wheel bearings** should be serviced only by a BMW service station; every 10000 miles (60000 km) the grease content should be checked and grease added if required. **Fig. 74**

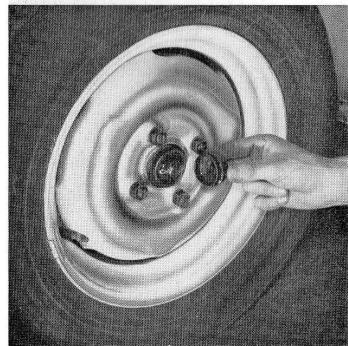
**Grease:** Shell Darina II grease, drip point in excess of 260° C (500° F).

#### Greasing hinges, pivots etc.

Every 8000 miles (12000 km) apply a few drops of an oil containing graphite to the pivot and support points of the carburettor linkage, engine and luggage compartment lids and catches, door stays and hinges.

**Lubrication of ignition distributor** every 3000 miles (12000 km), during a BMW Program Test:

74



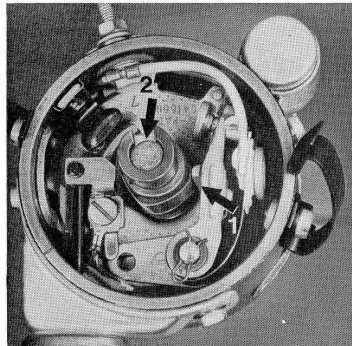
Apply a narrow layer of Bosch Ft 1v4 grease to the **fibre heel** of the contact breaker rocker arm. **Fig. 75, 1**

Take out the distributor rotor and let a couple of drops of engine oil soak into the **felt pad** in the distributor shaft. **Fig. 75, 2**

**Warning:** Do not let any oil overflow and reach the contact breaker points. Excess oil in the ignition distributor can cause misfiring. Oil vapour in the ignition distributor can give rise to increased contact erosion.

The transparent **reservoir for brake and clutch fluid** is in the engine compartment on the left hand side, and enables the level to be inspected at a glance. **Fig. 76**

75



Brake fluid is a hygroscopic substance, and over a period absorbs moisture from the atmosphere. To ensure that the brakes remain absolutely safe we recommend that the **brake fluid be drained and renewed once a year** by a BMW service station.

**Capacity:** fill to upper "MAX" mark on reservoir. **Fig. 76**

**Grade:** ATE blue brake fluid.

The **clutch requires no maintenance** and is automatically adjusted at the clutch slave cylinder. In the course of a BMW Program Test every 8000 miles (12000 km), wear of the clutch driving plate should be measured in situ.

76





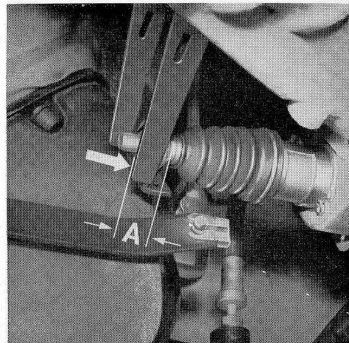
Push the withdrawal lever by hand towards the front of the car until it contacts the stop on the clutch slave cylinder.

When new, travel at the thrust rod A is 0.67–0.75" (17–19 mm).

As the clutch plate wears, distance A becomes smaller; and when the lower limit  $A = 0.2"$  (5 mm) is reached, the clutch driving plate must be renewed by a BMW service station. **Fig. 77**

Loss of fluid from the hydraulic clutch operating system, or air in the hydraulic system can lead to incomplete clutch disengagement and thus to gearbox damage.

77

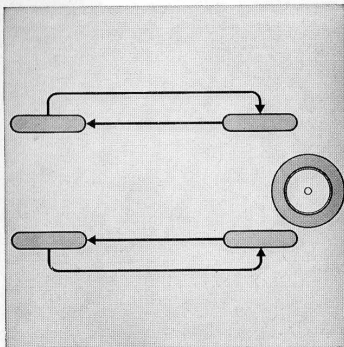


Bleed the hydraulic system in good time by means of the bleed screw provided.

With a view to achieving even tyre wear, the **wheels** should be changed round on request in the course of a BMW Program Test every 8000 miles (12000 km). On each side of the car the front and rear wheels should be exchanged. Never change the wheels crosswise from one side of the car to the other. The spare wheel can naturally be included in the wheel changing pattern if desired. **Fig. 78**

Have the **wheels** statically and dynamically **balanced** every 8000 miles (12000 km), if desired, i.e. when carrying out a BMW Programm Test. Do this if possible while in place on the car and as

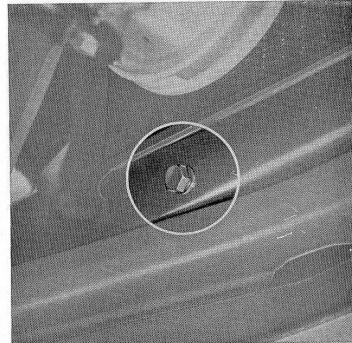
78



soon as they have been changed round. If signs of uneven wear are detected in the course of a regular tyre inspection for wear, damage, foreign bodies, etc. we recommend that an expert check on wheel positioning at normal load be carried out as soon as possible.

In addition to regular checks on water level in the radiator, the hoses and hose connections we also suggest that the **water in the cooling system** (see page 39) be thoroughly renewed every second year. While doing this, check the filler cap for good sealing and correct functioning of the pressure and vacuum relief valves.

79



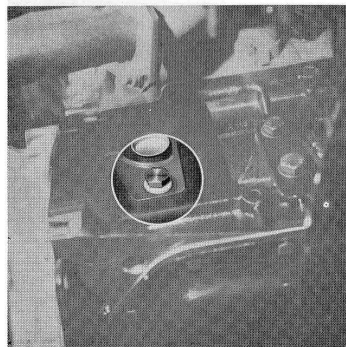
The complete **cooling system**, including heater, has a **capacity** of 12.3 Imp. pints/ 4.8 US pints/7 litres. To **drain the system**, open

1. drain plug at the bottom left on the radiator (13 mm hex. nut);
2. plug at the rear right-hand side of the engine block (19 mm hex. nut).

#### Figs. 79 and 80

While draining the cooling system the heater temperature control on the instrument panel must be set to "warm" (see page 19, Fig. 33).

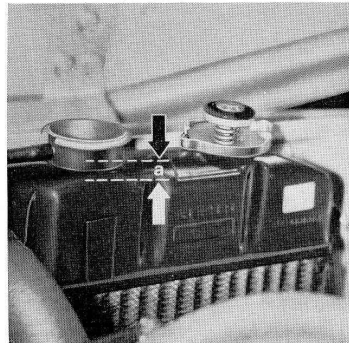
10



#### Refilling the cooling system:

Set the heater temperature control lever to "warm", and fill the radiator. Replace the filler cap, turning as far as the second stop. Drive the car or allow the engine to run, until normal operating temperature is reached. Unscrew filler cap as far as the first stop, thereby allowing air to escape from the cooling system, then remove completely. Top up radiator to a point no higher than  $\frac{3}{4}$ " (2 cm) below the base of the filler aperture. Replace cap and tighten. **Fig. 81**

81



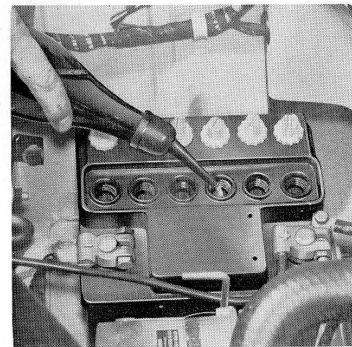
Every 4000 miles (6000 km) or at least once a month, the **battery acid level** should be checked. To do this, unscrew and remove the 6 plugs along the centre of the battery. The acid level should be approx. 0.2" (5 mm) above the upper surface of the plates in each cell, or level with the bar which can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

If the level is too low, top up to the correct marking with distilled water. Do not use acid for this purpose. **Fig. 82**

The top part of the battery should always be kept clean and dry.

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

82



Every 4000 miles (6000 km) the **air intake silencer filter element** should be removed, by undoing the over-centre catches, and examined to see how much dirt it contains. Dirt adhering to the element can be carefully knocked off and blown out from the inside; if the element is severely contaminated, however, and in any case after every 8000 miles (12000 km) when carrying out a BMW Program Test, the element should be renewed. **Fig. 83** (BMW 1602/1802/2002)

**Fig. 84** (BMW 2002 tii)

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

#### **BMW 1602/1802**

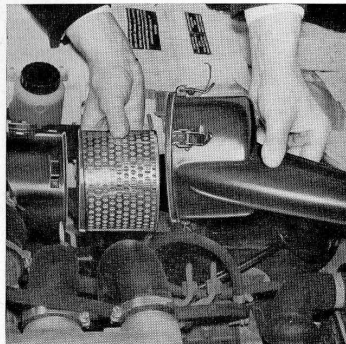
The **fine mesh filter** and bowl in the fuel pump should be cleaned every 8000 miles (12000 km) when carrying out a BMW Program Test: take off the fuel pump cover plate (8 mm bolt and seal ring). **Fig. 85**

Extract the mesh filter sieve and wash in clean petrol. Clean out the bowl. The sealing ring used when replacing must be in a perfect condition. The 6 cheese-headed screws on the fuel pump should be tightened evenly with a screwdriver.

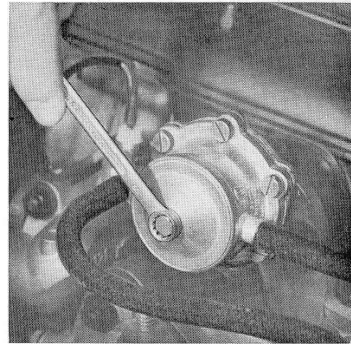
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84



85

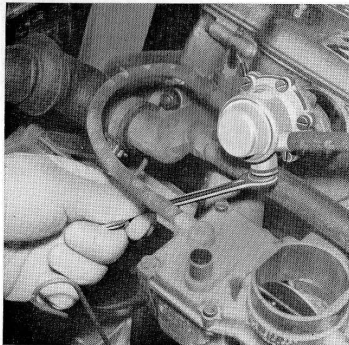


**BMW 2002**

The **fine mesh filter** in the **fuel pump** should be cleaned every 8000 miles (12000 km) when carrying out a BMW Program Test. Unscrew bolt and seal ring (13 mm spanner). **Fig. 86**

Extract mesh filter sieve and wash in clean petrol. The sealing ring used when replacing must be in a perfect condition. The 6 cheese-headed screws on the fuel pump should be tightened evenly with a screwdriver.

86

**Fuel filter BMW 2002 tii**

Clean the fine mesh filters in the fuel flow pipes every 40000 miles (60000 km) and renew the main filter.

**Fine mesh filter in the induction unit of the fuel tank:**

1. Remove the right-hand floor panel in the luggage compartment.
2. Loosen the fastening clamp on the feed pipe and pull the pipes off the induction unit.
3. Turn induction unit counter-clockwise by means of a suitable tool (screwdriver applied as a lever) — bayonet catch — and pull off.
4. Clean fine mesh filter. **Fig. 87**

87

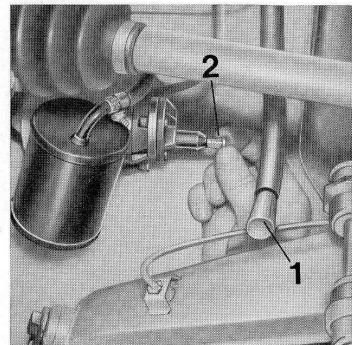


**Warning:** Always use a new sealing ring when re-assembling.

**Fine mesh filter in the fuel pump:**

1. Loosen the fastening clamp on the feed pipe, pull the feed pipe off the fuel pump and close the end of the pipe. **Fig. 88, 1**
2. Take out fine mesh filter (bag-type) from connecting manifold. **Fig. 88, 2**
3. Clean fine mesh filter.

88

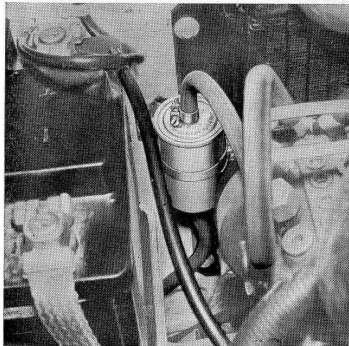


**Renew main fuel filter:**

1. Loosen fastening clamps on the fuel pipes and the filter.
2. Pull off pipes and renew complete filter. **Fig. 89**

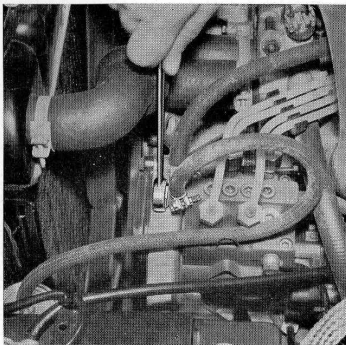
**Warning:** When re-assembling note the prescribed direction of flow shown on the filter label.

89

**Fine mesh filter in the fuel injection pump:**

1. Remove the hollow screw (size 17 spanner) in the fuel inflow pipe. **Fig. 90**
2. Clean fine mesh filter in the hollow screw.

90

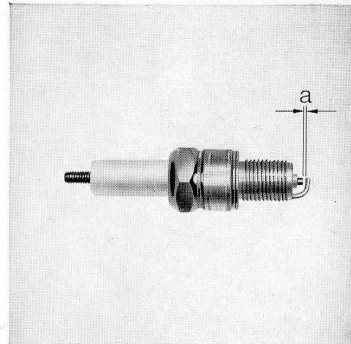


Check **spark plug electrode gaps:** Check the gaps of new plugs before fitting. Use a feeler gauge and set the correct gap "a" at  $0.024 \pm 0.004$ " ( $0.6 \pm 0.1$  mm) by bending the earth electrode. **Fig. 91**

In all cases, **renew the spark plugs** every 8000 miles (12000 km) during a BMW Program Test, and apply a little graphite grease to the threads before replacing in the cylinder head.

Details of the correct types of spark plug are given on the last page.

91



**Renew contact breaker points** every 8000 miles (12000 km) during a BMW Program Test:

Adjust dwell angle (see last page) using a BMW Program Tester (instrument for measuring dwell angle).

If no instrument for the measurement of dwell angle is available, regulate the contact breaker points gap in the following way:

Turn the engine until the contact breaker arm is fully raised (fibre heel is resting on the highest point of the distributor shaft cam).

Resetting contact breaker gap:

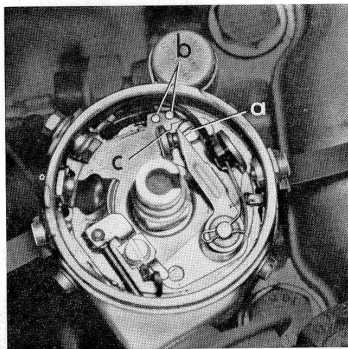
Slightly loosen locking screw "a", insert a screwdriver blade between the 2 small studs "b" so that it engages with slot "c" on the contact breaker mounting,

then turn the blade gently until a gap of 0.016" (0.4 mm) can be measured between the points. Re-tighten locking screw "a" and check that the setting has not altered by using a feeler gauge. **Figs. 92, 93 and 94** (BMW 2002 tii)

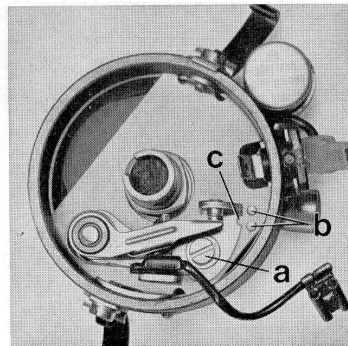
92



93



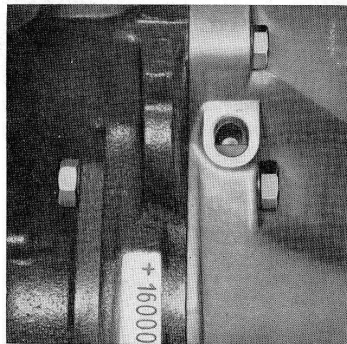
94



**Check the ignition timing** when carrying out a BMW Program Test every 8000 miles (12000 km) — after the contact breaker gap has been reset — dynamically without vacuum adjustment, with a timing (strobe) light and a tachometer running at 1400 rpm (BMW 2002 till 2400 rpm). The timing mark “Z” (pressed-in steel ball) for the first cylinder will be found on the flywheel and is visible through the inspection hole in the clutch bell housing — above the starter motor. **Fig. 95**

The ignition timing should be reset and checked by a BMW service station only.

95



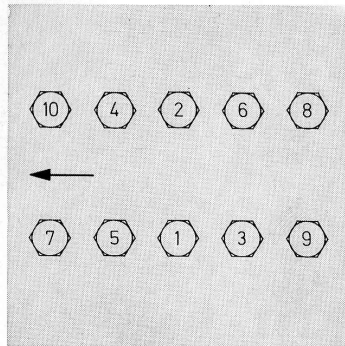
**Check valve clearances and adjust if necessary** every 8000 miles (12000 km) when carrying out a BMW Program Test. The **engine** should be **at rest and cold** — the water temperature should not be higher than 35°C (95°F) — or as directed by a BMW service station.

Take off engine breather connecting hose.

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

When carrying out the first BMW Program Test at 600 miles (1000 km) and again at the 4000 miles (6000 km) Service, the **cylinder head bolts** should be tightened in the given sequence (**Fig. 96**)

96



and at the torque values indicated in the specifications.

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

TDC position is reached for each respective cylinder when the valves of the next but one cylinder in the sequence overlap:

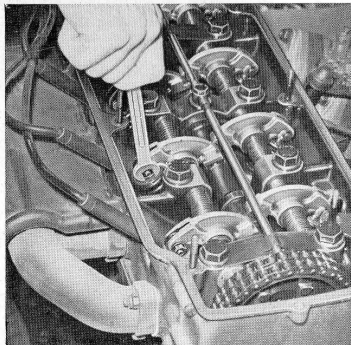


TDC position Cylinder No.		Valve overlap Cylinder No.
1	=	4
3	=	2
4	=	1
2	=	3

To adjust valve clearance, loosen the hexagon nut (10 mm) on the rocker. **Fig. 97**

Using a piece of steel wire (diameter 0.1" = 2.5 mm) bent in a slight angle, turn the eccentric adjuster until the correct clearance can be measured. **Fig. 98** Re-tighten the hexagon nut and check that the clearance has not altered.

97



### Check V-belt tension

every 8000 miles (12000 km) during a BMW Program Test. The V-belt is correctly tensioned if it can be pushed down by 0.2–0.4" (5 to 10 mm) with the finger in the centre of the top run, between the alternator and the fan pulley.

**Fig. 99**

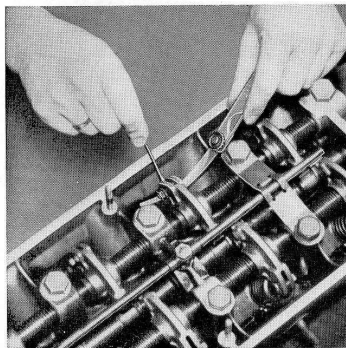
### Resetting V-belt tension

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

### Renewing V-belt

Loosen upper and lower alternator securing bolts (13 mm) and move the alternator as close as possible to the engine.

98



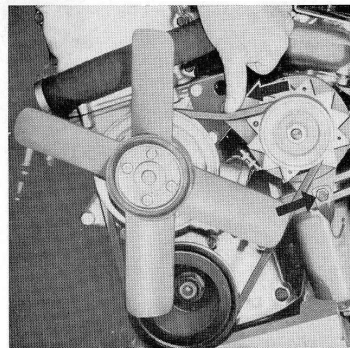
Pass the new V-belt over the fan and the crankshaft, fan and alternator pulleys, seat in pulley grooves and set correct tension as above.

### BMW 1602/1802/2002

The **automatic induction air preheat valve** is located in a housing to the right of the radiator. Every 8000 miles (12000 km) when carrying out a BMW Program Test the lever should be placed in the winter (W) setting and the valve's freedom of movement checked. If necessary, oil the valve.

In the "W" position fresh air drawn in at the front of the car is mixed with air preheated round the exhaust manifold in proportions dependent on outside and engine temperatures, until it reaches

99

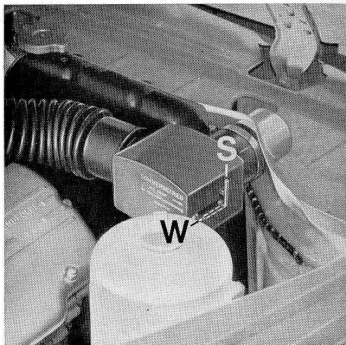




approx. 30° C (86° F). At approx. 30° C (86° F) outside temperature the preheat supply hose is completely closed and the car obtains all its induction air supply from the fresh air hose.

In summer, the external lever should be used to set the valve to position "S" (see also text on valve housing cover plate. The cover plate can be removed for inspection purposes by unfastening one slotted screw). **Fig. 100**

100

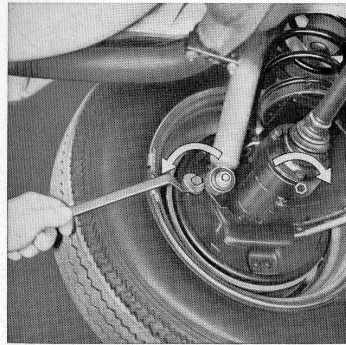


**The brakes should be adjusted** every 8000 miles (12000 km) when carrying out a BMW Program Test: The front disc brakes have automatic adjustment.

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

Turn the left eccentric hexagon nut counter-clockwise and the right nut clockwise to adjust, at the same time turning the wheel forcibly forwards until the shoes contact the brake drum and prevent further movement. Then turn each adjuster back approx. 1/8 turn until the wheel just begins to turn without binding. **Fig. 101**

101



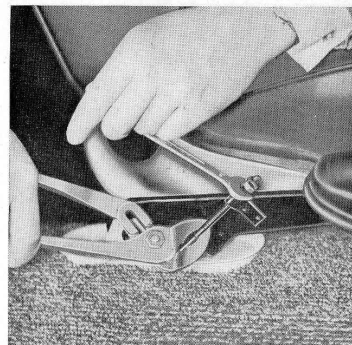
**Warning:** When adjusting the brake shoes, make sure that the handbrake is released.

If the brake pedal is springy and has excessive travel, the brake system must be bled (see also page 34).

**Handbrake adjustment** (brake shoes should first be adjusted as described above):

Push back rubber sleeve protecting the handbrake lever, loosen the locknut (10 mm) on each adjusting screw, pull the handbrake up for about 4 notches, tighten the adjusting nut (10 mm) while holding the adjusting screw with pliers to prevent it from turning, and check that the wheel cannot turn. **Fig. 102**

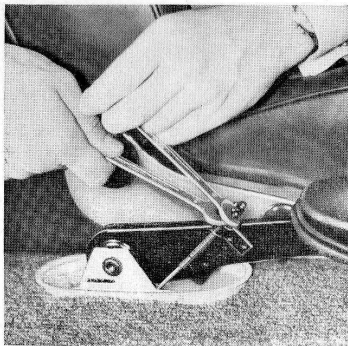
102



**Re-tighten locknut. Fig. 103**

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

103



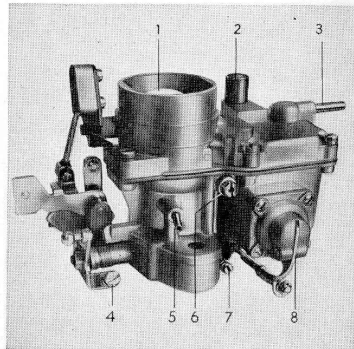
**Solex downdraught carburettor**  
**38 PDSi (BMW 1602/1802)**  
**40 PDSi (BMW 2002) Figs. 104 and 105**

- 1 Cold start butterfly
- 2 Float chamber breather
- 3 Fuel inlet
- 4 Idling adjustment screw
- 5 Vacuum regulator connection
- 6 Idling jet
- 7 Idling mixture control screw
- 8 Accelerator pump
- 9 Main jet closure plug
- 10 Cold start connecting link

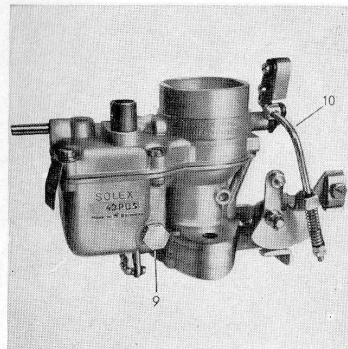
The carburettor should be **adjusted and cleaned** only by a BMW service station. The jet sizes and basic carburettor adjustment adopted by the manufacturers should not be tampered with.

See specifications for details.

104



105



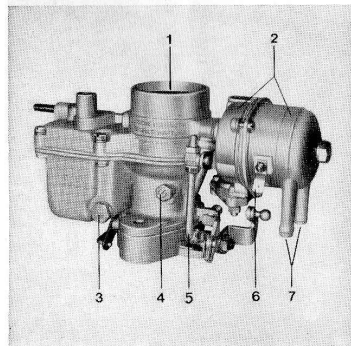
**Solex 40 PDSIT downdraught carburettor  
(BMW 2002 A) with automatic choke.  
Figs. 106 and 107**

- 1 Cold start butterfly
- 2 Automatic choke mechanism
- 3 Main jet cover screw
- 4 Venturi retaining screw
- 5 Choke connecting linkage
- 6 Terminal for electric heating of automatic choke mechanism
- 7 Coolant unions for heating automatic choke mechanism
- 8 Float chamber breather

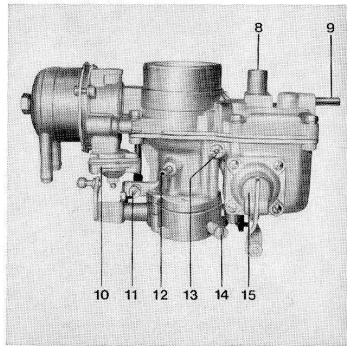
- 9 Fuel feed
- 10 Vacuum diaphragm housing
- 11 Idling speed adjusting screw
- 12 Vacuum regulator connection
- 13 Idling jet
- 14 Idling mixture adjusting screw
- 15 Accelerator pump

The Solex 40 PDSIT carburettor uses a combined automatic choke system with both electric and coolant heating of the bimetallic spring. It needs no maintenance in service. For cleaning and adjustment, see PDSI carburettor.

106



107

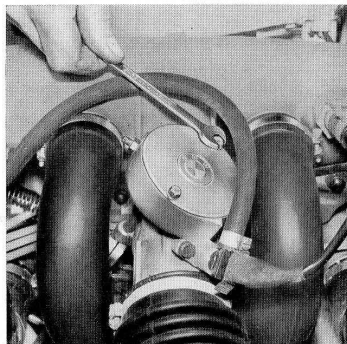


Adjustment of idling speed BMW 2002 tii: All adjustment operations should be carried out by a BMW service station only, as these stations have the necessary equipment and adjustment data.

Note the following adjustment procedure only in the case of an emergency. (To be applied at normal operating temperature with the warm-up runner switched off.)

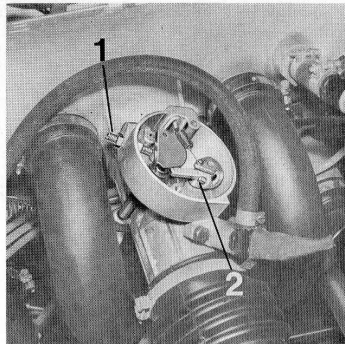
1. Remove cap from top of throttle butterfly manifold. **Fig. 108**

108



2. Turn idling speed screw until engine runs at  $900 \pm 50$  rpm. **Fig. 109, 1**
3. Now adjust CO volume to 2 – 3 % by turning throttle butterfly adjustment screw. (Turn in screw for less CO, turn out for more.) **Fig. 109, 2**
4. Depress accelerator pedal briefly once or twice. Should this make the idling speed change substantially, repeat adjustment procedure.

109



Last but not least:  
**Specifications  
and technical information**



"Now Daddy and I will  
discuss the whole matter  
again as man to man!"

## Specifications

### BMW

1602/1802/2002/2002 tii

#### ENGINE

##### Type

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

##### Position

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

##### Cylinder block

Special grey cast iron.

##### Cylinder head

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

##### Valves

Inclined in cylinder head at a narrow V angle. Armoured exhaust valve with hard chromium-plated shaft. Adjustment by eccentric-mounted rockers.

##### Valve operation

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

##### Valve operating clearance

Inlet and exhaust: 0.006–0.008" (0.15–0.20 mm) with engine stopped and cold (max. coolant temperature 35° C/95° F).

##### Valve timing

Inlet opens	4° bTDC	} (± 2.5°)
Inlet closes	52° aBDC	
Exhaust opens	52° bBDC	
Exhaust closes	4° aTDC	

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

##### Lubrication

Pressure circulating system with full-flow oil filter, gear-type pump (Eaton system) chain-driven from crankshaft, and pressed steel sump.

##### Oil consumption

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

##### Radiator type

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

##### Opening pressure

of radiator filler cap valves:

Pressure + 0.15 kg/cm<sup>2</sup> (+ 2.13 psi)  
relief 1 — 0.10 kg/cm<sup>2</sup> (— 1.42 psi)  
Under- up to 0.10 kg/cm<sup>2</sup> (1.42 psi)  
pressure

Mixed temperature corresponds to approx. 89° C—99° C (192° F—210° F) at engine outlet.

##### Coolant thermostat

Thermostatic control of the engine coolant circulation in engine inlet, compensating the engine load and ambient temperature variations (BMW system).  
Opening begins: 84° C (183° F)

## BMW 1602

### Crankshaft

Hardened forged steel with 4 balance weights and 5 three-component main bearings.

### Connecting rods and pistons

Forged steel connecting rods with replaceable three-layer big-end bearings. Pistons with raised flat top. Chromium plated top rings.

### Oil filter

Full-flow type, with Micronic paper element and pressure relief valve. Opening pressure  $18.5 \pm 2.8$  psi ( $1.3 \pm 0.2$  atmospheres).

### Breathing

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

### Air filter

One filter element within induction air silencer.

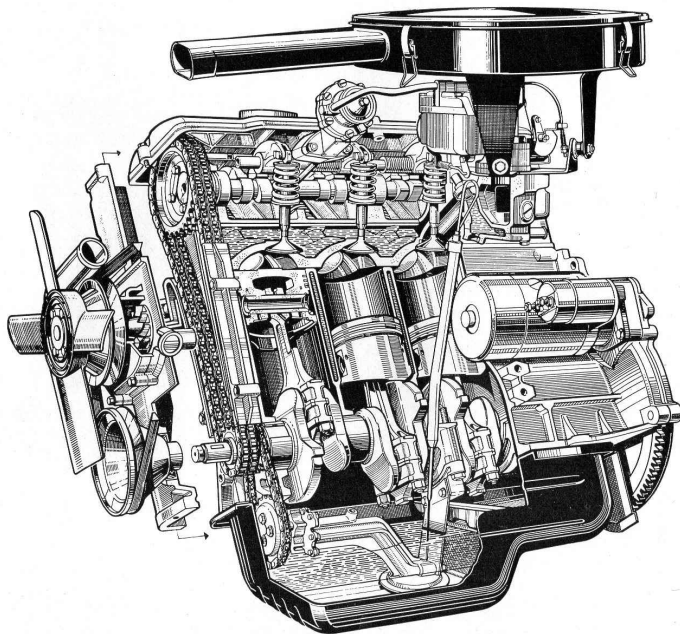
### Fuel supply

Mechanical fuel pump, operating pressure 2.85–3.5 psi (0.21–0.25 atm).

### Fuel filter

Fine mesh filter within fuel pump and on fuel gauge plunger tube in tank.

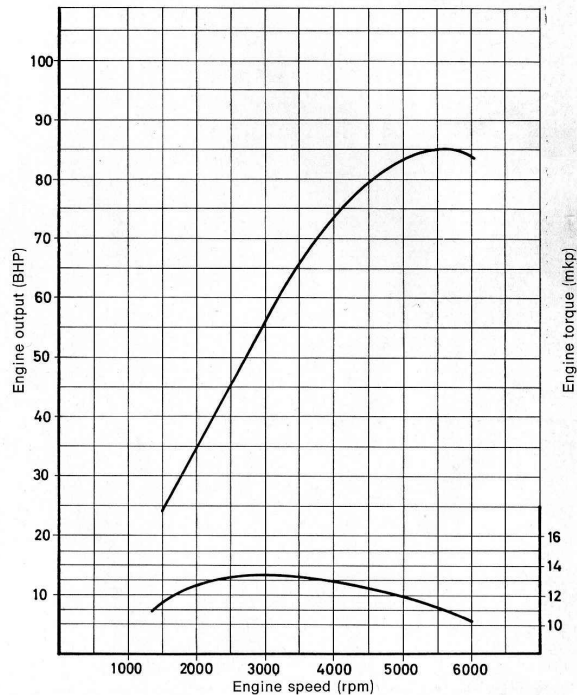
Engine — BMW 1602





<b>Capacity</b>	
fiscal	95.38 cu. in (1563 cc)
effective	95.99 cu. in (1573 cc)
<b>Max. output</b>	85 bhp (DIN) 5700 rpm
at	96 bhp (SAE) 5800 rpm
<b>Output per litre</b>	54.0 bhp
<b>Max. permitted engine speed</b>	6200 rpm
<b>Max. continuous engine speed</b>	6000 rpm
<b>Max. torque</b>	95.4 ft/lb (13.2 mkp)
at	3500 rpm
<b>Compression ratio</b>	8.6:1
<b>Stroke/bore ratio</b>	71/84 mm
<b>Mean piston speed</b>	2657 ft/min. (13.5 m/sec.)
at	5700 rpm
<b>Torque/weight ratio</b>	101 ft/lb-ton
(unladen)	(14.0 mkp/1000 kg)
<b>Output/weight ratio</b>	
Car with full tank	92 bhp/ton (11.0 kg/bhp)
Car fully laden, with luggage	63 bhp/ton (15.8 kg/bhp)

Engine output BMW 1602



**Fuel consumption  
(DIN 70030 standard procedure)**

23.8 mpg (US)  
28.5 mpg (Imp.)  
9.9 litres/100 km

**Carburettor type**

1 Solex 38  
PDSI downdraught  
(see page 71)

**Carburettor settings**

Main jet X 130

Corrector jet 110

Venturi 26

Idling jet 47.5

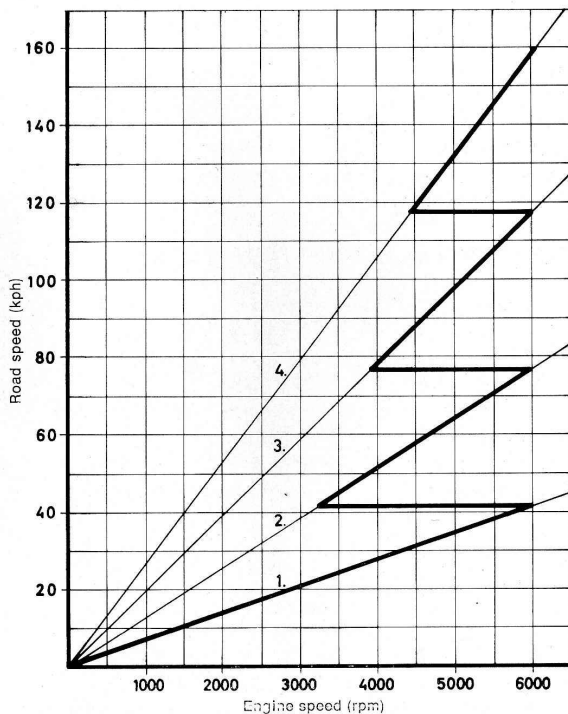
Rich mixture valve 90

Injection volume 0.109–0.134 cu.in  
(1.4–1.7 cc)  
per stroke

Float needle valve 2.0

Float weight 0.3 oz (8.5 g)

Fuel level 0.67–0.75"  
(17–19 mm)  
below joint

**Road speed/engine speed — BMW 1602**

## BMW 1802

### Crankshaft

Hardened forged steel with 4 balance weights and 5 three-component main bearings.

### Connecting rods and pistons

Forged steel connecting rods with replaceable three-layer big-end bearings. Pistons with raised flat top. Chromium plated top rings.

### Oil filter

Full-flow type, with Micronic paper element and pressure relief valve. Opening pressure  $18.5 \pm 2.8$  psi ( $1.3 \pm 0.2$  atmospheres).

### Breathing

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

### Air filter

One filter element within induction air silencer.

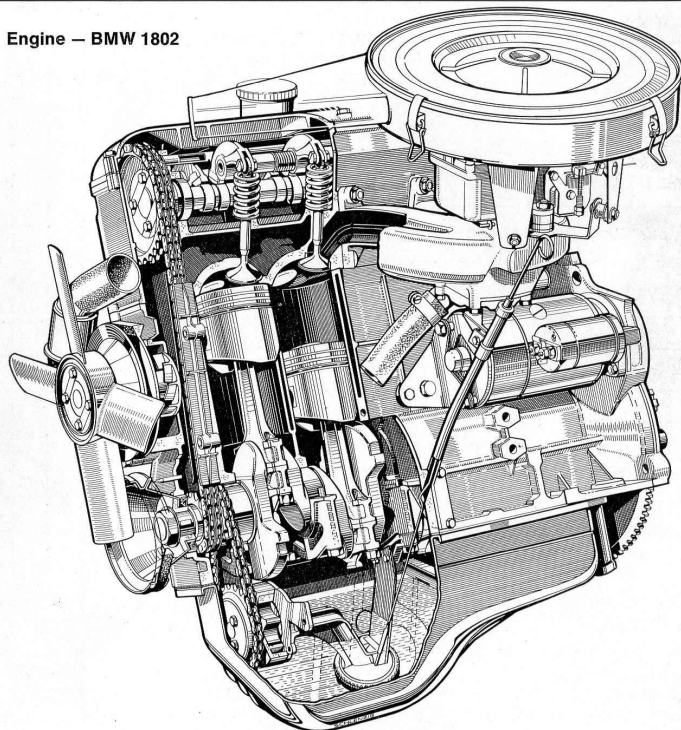
### Fuel supply

Mechanical fuel pump, operating pressure 2.85–3.5 psi (0.21–0.25 atm).

### Fuel filter

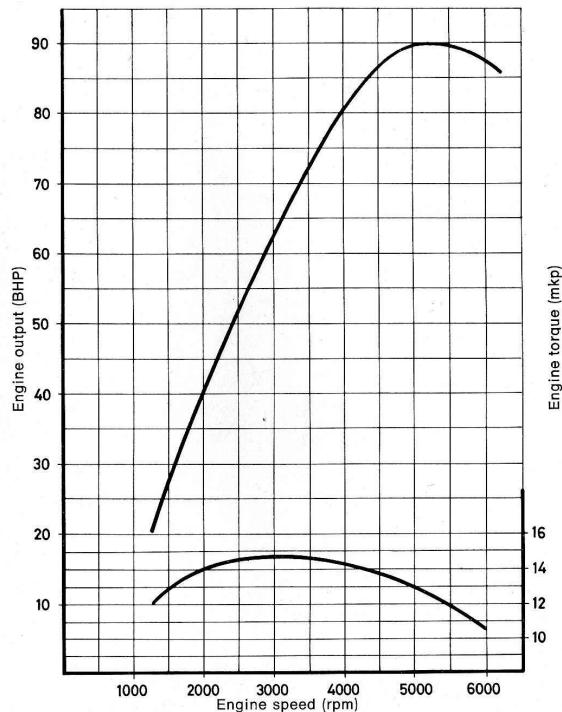
Fine mesh filter within fuel pump and on fuel gauge plunger tube in tank.

Engine — BMW 1802



<b>Capacity</b>	
fiscal	107.0 cu. in (1754 cc)
effective	107.8 cu. in (1766 cc)
<b>Max. output</b>	
at	90 bhp (DIN) 5250 rpm
	102 bhp (SAE) 5800 rpm
<b>Output per litre</b>	
	51.0 bhp
<b>Max. permitted engine speed</b>	
	6200 rpm
<b>Max. continuous engine speed</b>	
	6000 rpm
<b>Max. torque</b>	
at	105.6 ft/lb (14.6 mkp)
	3000 rpm
<b>Compression ratio</b>	
	8.6:1
<b>Stroke/bore ratio</b>	
	71/89 mm (= 0.8)
<b>Mean piston speed</b>	
at	2500 ft/min. (12.7 m/sec.)
	5250 rpm
<b>Torque/weight ratio</b>	
(unladen)	112 ft/lb-ton
	(15.5 mkp/1000 kg)
<b>Output/weight ratio</b>	
Car with full tank	97 bhp/ton (10.45 kg/bhp)
Car fully laden, with luggage	69 bhp/ton (14.85 kg/bhp)

Engine output BMW 1802



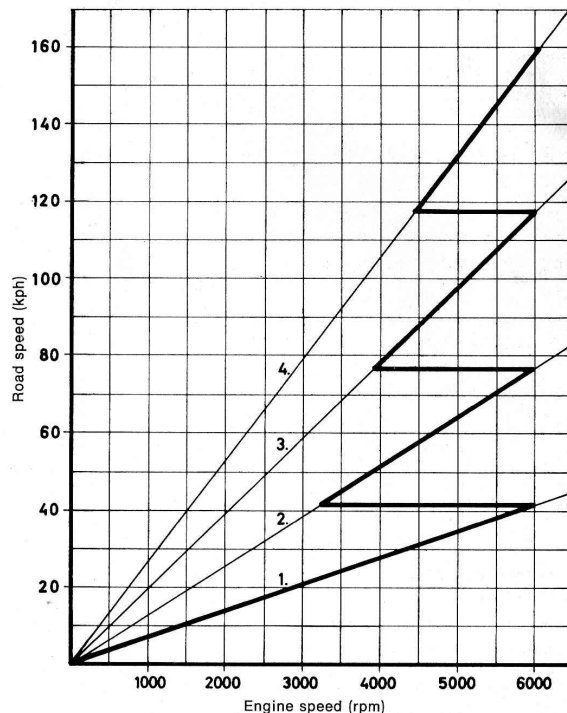
<b>Fuel consumption (DIN 70030 standard procedure)</b>	23.5 mpg (US)
	28.2 mpg (Imp.)
	10.0 litres/100 km

<b>Carburettor type</b>	1 Solex 38 PDSI downdraught (see page 71)
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### Carburettor settings

Main jet	X 160
Corrector jet	155
Venturi	30
Idling jet	45
Rich mixture valve	1.1 calibr., 1 bore
Injection volume	0.11–0.12 cu.in (1.8–2.0 cc) per stroke
Float needle valve	2.0
Float weight	0.3 oz (8.5 g)
Fuel level	0.67–0.75" (17–19 mm) below joint

Road speed/engine speed — BMW 1802



## BMW 2002

### Crankshaft

Hardened forged steel with 8 balance weights and 5 three-component main bearings.

### Connecting rods and pistons

Forged steel connecting rods with replaceable three-layer big-end bearings. Pistons with flat top. Chromium plated top rings.

### Oil filter

Full-flow type, with Micronic paper element and pressure relief valve. Opening pressure  $18.5 \pm 2.8$  psi ( $1.3 \pm 0.2$  atmospheres).

### Breathing

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

### Air filter

One filter element within induction air silencer.

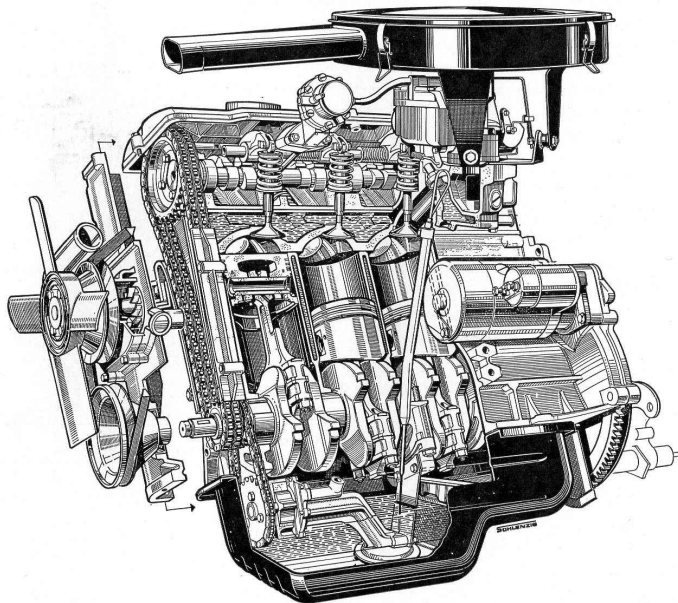
### Fuel supply

Mechanical fuel pump, operating pressure 2.85–3.5 psi (0.21–0.25 atm).

### Fuel filter

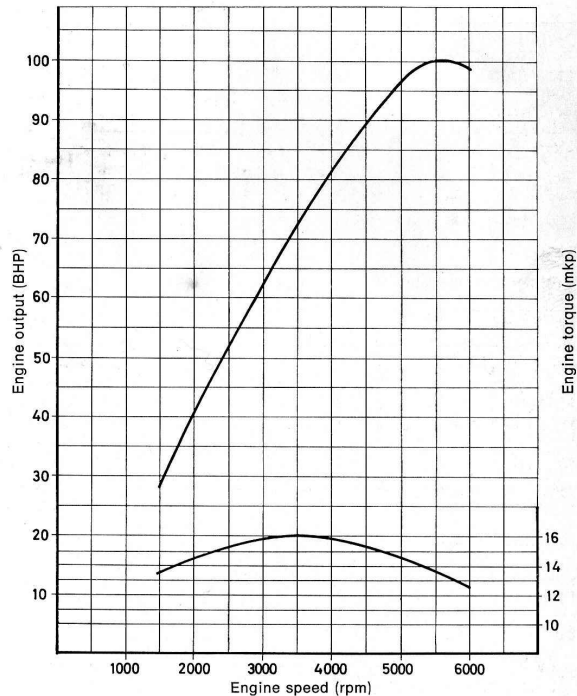
Fine mesh filter within fuel pump and on fuel gauge plunger tube in tank.

Engine — BMW 2002



<b>Capacity</b>	
fiscal	120.6 cu. in (1977 cc)
effective	121.4 cu. in (1990 cc)
<b>Max. output</b>	
at	100 bhp (DIN) 5500 rpm 113 bhp (SAE) 5800 rpm
<b>Output per litre</b>	50.3 bhp
<b>Max. permitted engine speed</b>	6200 rpm
<b>Max. continuous engine speed</b>	6000 rpm
<b>Max. torque</b>	
at	115.7 ft/lb (16 mkp) 3500 rpm
<b>Compression ratio</b>	8.5:1
<b>Stroke/bore ratio</b>	80/89 mm
<b>Mean piston speed</b>	
at	2892 ft/min. (14.7 m/sec.) 5500 rpm
<b>Torque/weight ratio</b>	
(unladen)	125 ft/lb-ton (17 mkp/1000 kg)
<b>Output/weight ratio</b>	
Car with full tank	108 bhp/ton (9.4 kg/bhp)
Car fully laden, with luggage	76 bhp/ton (13.4 kg/bhp)

Engine output BMW 2002



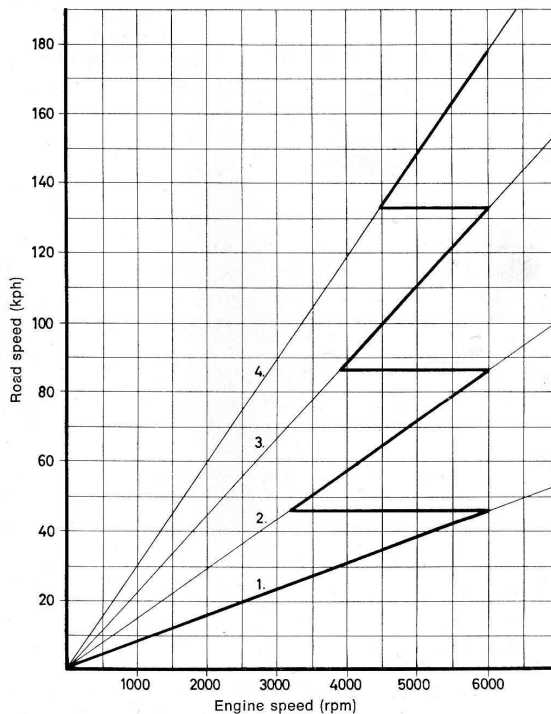
<b>Fuel consumption (DIN 70030 standard procedure)</b>	23.5 mpg (US)
	28.2 mpg (Imp.)
	10.0 litres/100 km

**Carburettor type**

BMW 2002	1 Solex 40 PDSI down draught (see page 71)
BMW 2002 A	1 Solex 40 PDSIT down draught with auto- matic choke (see page 72)

**Carburettor settings**

Main jet	X 155
Corrector jet	130
Venturi	30
Idling jet	45
Rich mixture valve	100
Injection volume	0.122 $\pm$ 0.012 cu.in (2 $\pm$ 0.2 cc) per stroke
Float needle valve	2.0
Float weight	0.3 oz (8.5 g)
Fuel level	0.67–0.75" (17–19 mm) below joint

**Road speed/engine speed — BMW 2002**



## BMW 2002 tii

### Crankshaft

Hardened forged steel with 8 balance weights and 5 three-component main bearings.

### Connecting rods and pistons

Forged steel connecting rods with replaceable three-layer big-end bearings. Pistons with raised flat top. Chromium plated top rings.

### Breathing

Crankcase and valve chamber linked by a duct connected to the air filter and throttle butterfly manifold.

### Lubrication

Pressure circulating system with full-flow oil filter and connection for lubrication of the injection pump, gear-type pump (Eaton system) chain-driven from crankshaft, pressed steel sump.

### Oil filter

Full-flow filter with Micronic paper element and pressure relief valve opening at a pressure of  $35.5 \pm 4.3$  psi ( $2.5 \pm 0.3$  atmospheres).

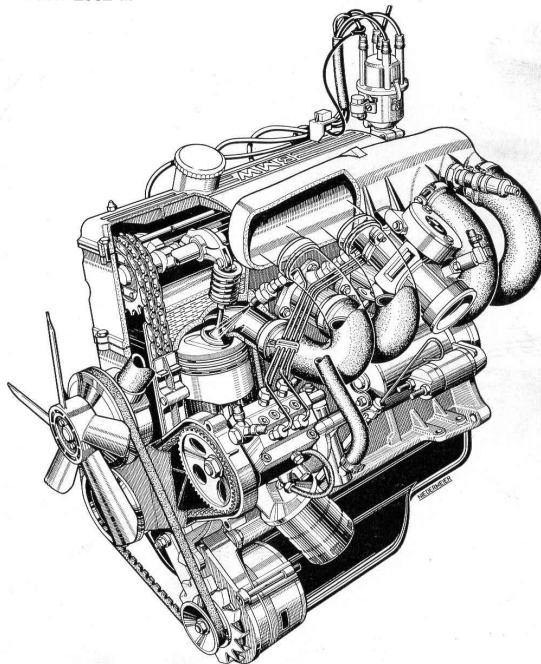
### Air filter

Two filter elements within induction air silencer with one opening leading to throttle butterfly manifold.

### Induction air flow

Through induction air silencer, throttle butterfly manifold and air container to the four vibration pipes and intake manifolds with injection valves.

Engine — BMW 2002 tii



**Fuel consumption**  
**(DIN 70030 standard procedure)**

27.0 mpg (US)  
 31.6 mpg (Imp.)  
 8.8 litres/100 km

**Injection system**

Inlet manifold fuel injection  
 (Kugelfischer system)

**Injection pump**

Kugelfischer PLO 4  
 4-piston pump with adjustment cam and  
 warm-up runner

**Injection valves**

Kugelfischer type DLO  
 Opening at a pressure of 30 – 38 at-  
 mospheres (426 – 532 psi)

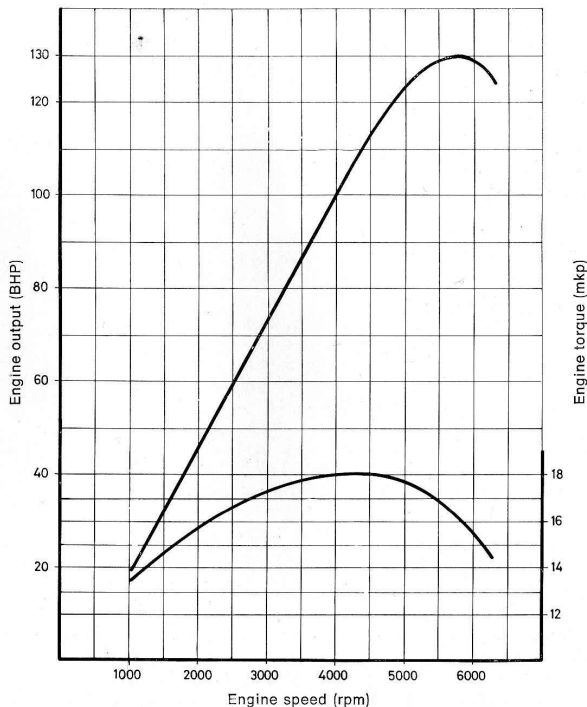
**Fuel flow**

Electrical fuel pump with expansion  
 container:  
 max. volume 110 litres/hr.  
 pump pressure 1.5 – 2.5 atmospheres  
 (21.3 – 35.5 psi)

**Fuel filter**

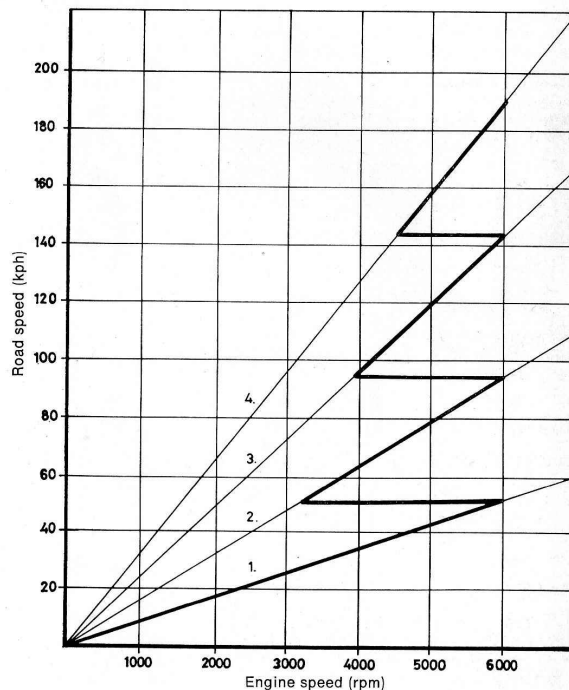
Full-flow filter – Micronic filter element.  
 One additional fine-mesh filter in the in-  
 duction unit and in the inflow pipes for  
 the fuel pump and the injection pump.

**Engine output BMW 2002 tii**



<b>Capacity</b>	
fiscal	120.6 cu. in (1977 cc)
effective	121.4 cu. in (1990 cc)
<b>Max. output</b>	
at	130 bhp (DIN) 5800 rpm 147 bhp (SAE) 5800 rpm
<b>Output per litre</b>	65.3 bhp
<b>Max. permitted engine speed</b>	6400 rpm
<b>Max. continuous engine speed</b>	6000 rpm
<b>Max. torque</b>	
at	131 ft/lb (18.1 mkp) 4500 rpm
<b>Compression ratio</b>	10:1
<b>Stroke/bore ratio</b>	80/89 mm (= 0.9)
<b>Mean piston speed</b>	
at	3051 ft/min. (15.5 m/sec.) 5800 rpm
<b>Torque/weight ratio</b>	
(unladen)	132 ft/lb — ton (18.3 mkp/1000 kg)
<b>Output/weight ratio</b>	
Car with full tank	126 bhp/ton (7.6 kg/bhp)
Car fully laden, with luggage	95 bhp/ton (10.7 kg/bhp)

Road speed/engine speed — BMW 2002 tii



**CLUTCH****BMW 1602**

Hydraulically operated single dry plate with **helical spring** and torsional vibration damper, automatic adjustment.

**BMW 1802/2002/2002 tii**

Hydraulically operated single dry plate with **plate spring** and torsional vibration damper, automatic adjustment.

**GEAR BOX****BMW 1602/1802/2002/2002 tii**

a) Manual transmission:

Four-speed (five-speed built in on special request) with BORG-WARNER synchromesh on all forward gears, 1 reverse gear (five-speed gearbox with Porsche synchromesh).

b) Automatic transmission:

ZF Automatic transmission 3 HP-12/7

**Gear ratios**

Manual	4-speed	5-speed	Auto- matic
1st gear	3.764	3.368	2.56
2nd gear	2.02	2.16	1.52
3rd gear	1.32	1.579	1.0
4th gear	1.0	1.241	—
5th gear	—	1.0	—
Reverse gear	4.096	4.0	2.0

**Torque conversion ratio**

1–2.1:1

**PROPELLER SHAFT**

Divided shaft with flexible mounting for centre bearing and rubber coupling at front, universal joints in the centre and at rear, needle rollers.

**FINAL DRIVE**

Hypoid bevel, running on taper roller bearings.

**Ratio: BMW 1602/1802**

Pinion/ crown wheel	No. of teeth	Contact pattern
4.11:1 or 4.10:1	37:9	Klingelberg
	41:10	Gleason

**Ratio: BMW 2002**

Pinion/ crown wheel	No. of teeth	Contact pattern
3.64:1	40:11	Klingelberg

**Ratio: BMW 2002 tii**

Pinion/ crown wheel	No. of teeth	Contact pattern
3.45:1	38:11	Klingelberg

Optional: ZF disc-type limited-slip differential.

**Rear axle drive**

Left and right double universal joint halfshafts with no-maintenance homokinetic joints.

## WHEELS AND SUSPENSION

### Front wheel mounting BMW 1602/1802

Independent suspension by lower wishbones and spring struts incorporating double-acting hydraulic shock absorbers, coil springs and rubber auxiliary springs. Wheel travel 7.1" (180 mm).

### Front wheel mounting BMW 2002/tii

As for BMW 1602/1802, but with torsion bar stabilizer with no-maintenance rubber mountings.

**Toe-in** with vehicle normally loaded\*  $0.04 \pm 0.04''$  ( $1 \pm 1$  mm) equals  $0^\circ 10' \pm 0^\circ 10'$

**Camber angle** with vehicle normally loaded\*  $0^\circ 30' \pm 30'$

**Castor angle**  $4^\circ \pm 30'$

**King pin angle**  $8^\circ 30'$

**Toe-out on turns** for  $20^\circ$  deflection of inside wheel:  $1^\circ$

### Max. wheel lock

Inside wheel  $42^\circ$

Outside wheel  $34^\circ$

### Steering

ZF Gemmer hourglass worm and roller

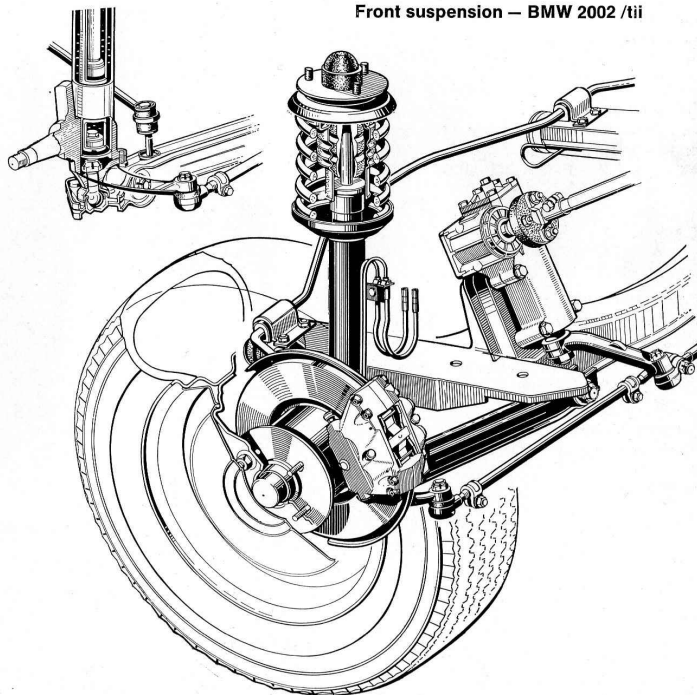
**Gear ratio** 15.5:1

**Overall steering ratio** 17.57:1

**Three-piece track rod**

\* Normal load: car with full tank, 2 x 143 lb (65 kg) on front seats, 1 x 143 lb (65 kg) on back seats + 66 lb (30 kg) in luggage compartment.

Front suspension — BMW 2002 /tii



**Rear wheel mounting BMW 1602/1802**

Independently sprung wheels with semi-trailing arms mounted on rubber bushes requiring no maintenance.

Delta-shaped box-section support beam for trailing arms and final drive, attached to bodywork at 4 points by rubber mountings.

Coil springs with rubber auxiliary springs, spring travel 7.5" (190 mm); double-acting hydraulic telescopic shock absorbers.

**Rear wheel mounting BMW 2002/tii**

As BMW 1602/1802, but with torsion bar stabilizer with no-maintenance rubber mountings.

**Toe-in** with vehicle normally loaded\*  $0.06 \pm 0.06''$  ( $1.5 \pm 1.5$  mm) equals  $0^\circ 15' \pm 0^\circ 15'$

**Camber angle** with vehicle normally loaded\*  $2^\circ \pm 20'$  negative

**Steel disc wheels**

BMW 1602/1802/2002

4 1/2 J x 13 H 2 well-base rims

BMW 2002 tii

5 J x 13 H 2 well-base rims

**Tyres**

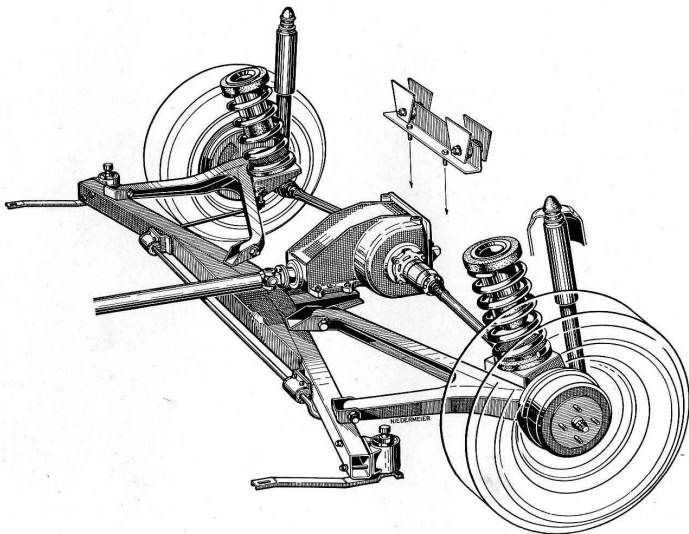
BMW 1602/1802/2002

165 SR 13 radial ply, without tube and metal screw valve 43 GS 7817

BMW 2002 tii

165 HR 13 radial ply, with tube and metal screw valve 40 G DIN 7771

\* Normal load: car with full tank, 2 x 143 lb (65 kg) on front seats, 1 x 143 lb (65 kg) on back seats + 66 lb (30 kg) in luggage compartment.

**Rear suspension — BMW 2002/tii**

## BRAKES

### Foot brake (dual twin-circuit system)

Hydraulic, acting on all four wheels, and fitted with servo assistance.

Tandem master cylinder diameter:

BMW 1602/1802/2002 0.81" (20.64 mm)

BMW 2002 tii 0.93" (23.81 mm)

Transparent brake fluid reservoir located in engine compartment.

### Front

4-piston fixed caliper disc brakes with automatic pad wear compensation.

Disc diameter:

BMW 1602/1802/2002 9.43" (240 mm)

BMW 2002 tii 10.06" (256 mm)

Piston diameter:

BMW 1602/1802/2002 1.34" (34 mm)

BMW 2002 tii 1.57" (40 mm)

### Rear

Drum brakes with self-centering shoes.

Cylinder diameter:

BMW 1602/2002 tii 0.68" (17.46 mm)

BMW 1802/2002 0.625" (15.87 mm)

Brake drum diameter:

BMW 1602 7.87" (200 mm)

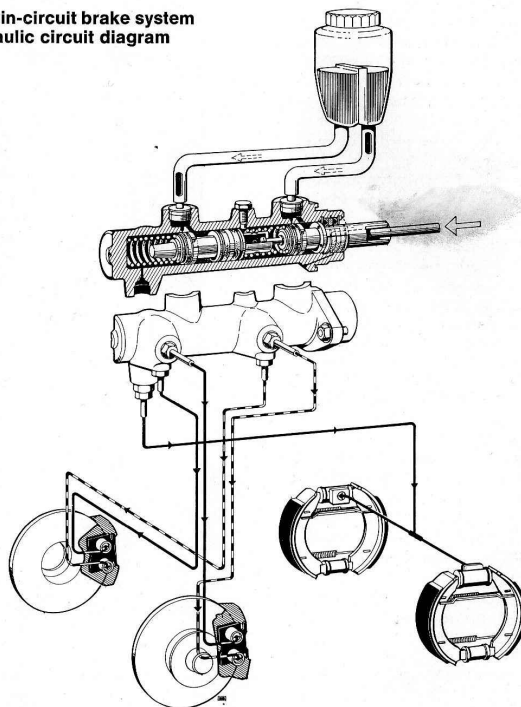
BMW 1802/2002/tii 9.05" (230 mm)

Lining width 1.57" (40 mm)

### Handbrake

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

Dual twin-circuit brake system  
— hydraulic circuit diagram



### The overall stopping distance

This takes into account one second reaction time (about 30 yards at 60 mph), the time needed for the brakes to apply, and the actual braking distance.

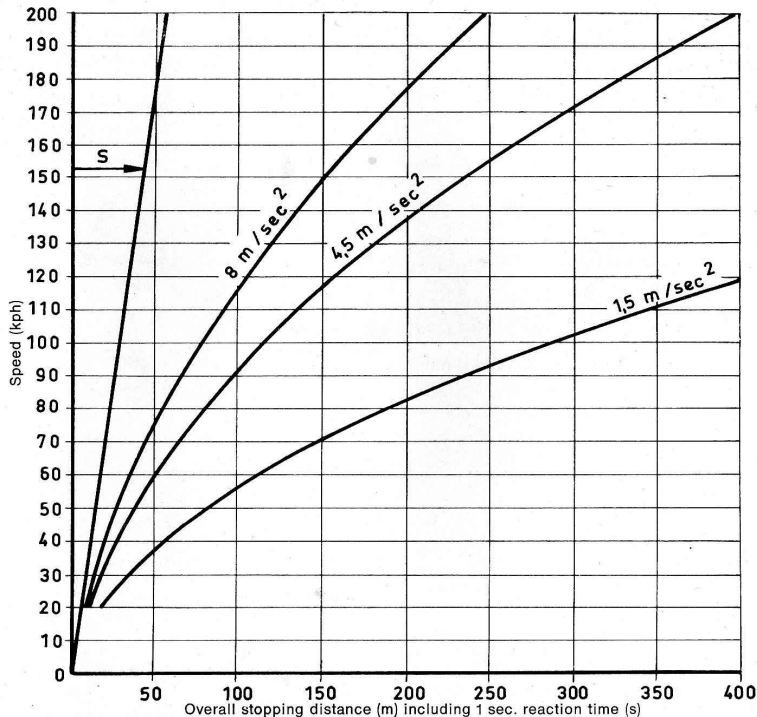
The best possible brakes can only attain a degree of road efficiency corresponding to the friction between tyre and road surface. As the graph shows, the maximum possible retardation of a vehicle travelling on an icy surface is only in the region of  $1.5 \text{ m/sec}^2$  ( $4.9 \text{ ft per sec}$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

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

In contrast the uppermost curve ( $8 \text{ m/sec}^2$ ) refers to the shortest overall stopping distances generally obtainable in ideal conditions.

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

Overall stopping distance related to speed and retardation





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

The lengths quoted for overall stopping distances include the factor "S" covered during one second's reaction time on the part of the driver.

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

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

## BODYWORK

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

**Luggage compartment** capacity: approx. 15.9 cu. ft (450 litres).

**Fuel tank** capacity: 10.1 Imp. gal.; 12.1 US gal.; 46 litres.

## Heating and ventilation

Fresh-air heater with warm water heat exchanger and 3-speed axial blower (120 Watts). Output volume: 1<sup>st</sup> speed 2.5 cu. m/min (98.3 cu. ft/min), 2<sup>nd</sup> speed 3.7 cu. m/min (130.6 cu. ft/min), 3<sup>rd</sup> speed 5.1 cu. m/min (180.1 cu. ft/min).

6 outlet nozzles in all covering all parts of the front screen, side windows and foot area. Air extraction from the car's interior through slots above the rear window (only on vehicles without a

sliding roof), conveying stale air to outlets in the rear body pillars (concealed below the luggage compartment lid).

## ELECTRICAL SYSTEM

### Battery

BMW 1602  
12 V, 36 Amp/hr  
BMW 1802/2002/tii  
12 V, 44 Amp/hr

### Coil

BMW 1602/1802  
Bosch TE 12 V  
BMW 2002/tii  
Bosch K 12 V

### Distributor

BMW 1602/1802/2002  
Bosch JFUR 4  
BMW 2002 tii  
Bosch JFR 4

### Ignition point

BMW 1602/1802/2002  
25° bTDC at 1400 rpm  
BMW 2002 tii  
25° bTDC at 2400 rpm

Check adjustment: dynamically without vacuum adjustment with engine running at its normal operating temperature (1400 or 2400 rpm) by pointing a strobe light at the ignition timing mark on the flywheel.

### Firing order 1-3-4-2

### Contact breaker dwell angle

BMW 1602/1802  
61° — 66°

BMW 2002/tii  
59° — 65°

**Contact breaker gap** 0.016" (0.4 mm)

### Ignition advance and retard

BMW 1602/1802/2002  
centrifugal and vacuum  
BMW 2002 tii  
centrifugal  
BMW 1602/1802  
Begins: approx. 800 rpm  
Ends: approx. 3800 rpm  
Max. adjustment range 44° ± 2° CS  
BMW 2002  
Begins: approx. 800 rpm  
Ends: approx. 2700 rpm  
Max. adjustment range 44° ± 2° CS  
BMW 2002 tii  
Begins: approx. 800 rpm CS  
Ends: approx. 3500 rpm CS  
Max. adjustment range 35° ± 2° CS

### Vacuum adjustment

BMW 1602/1802/2002  
Begins: approx. 5.12" (115 mm) Hg  
Ends: approx. 8.27" (210 mm) Hg  
Max. adjustment range 10° CS

### Alternator

BMW 1602/1802/2002  
Bosch K 1/14 V 35 A 20 (490 W)  
BMW 2002 tii  
Bosch K 1/14 V 45 A 20 (630 W)

### Voltage regulator

Bosch AD 1/14 V

### Starter

BMW 1602/1802  
Bosch EF (R) 12 V 0.8 PS  
BMW 2002/tii  
Bosch GF (R) 12 V 1 PS

**Spark plugs**

BMW 1602/1802/2002

Beru 200/14/3 A

Bosch W 200 T 30

Champion N 8 Y

BMW 2002 tii

Bosch WG 190 T 30

Vehicles fitted with automatic transmission, USA and Scandinavian vehicles have

Bosch WG 190 T 30

air surface gap spark plugs fitted as standard.

Spark plug gap:

0.024+0.004" (0.6+0.1 mm)

**Headlights**

with asymmetric dipped beam and side/parking lights included.

Lens diameter 6.7" (170 mm)

**12 V bulbs**

see pages 47 and 48

**Fuse box**

Under engine compartment lid on left-hand side; contains 12 fuses. For circuits controlled by each fuse, see page 46.

**Cigar lighter and plug socket on instrument panel**

Can also be used to plug in a handlamp or an electric razor with standard type plug not exceeding 200 W rating at 12 V.

**Automatic screenwasher**

Electric gear-type pump with delaying relay; operated by finger-tip switch on turn indicator lever.

**Horns**

Two full-tone horns well positioned for maximum audibility behind the radiator grille, with protection against dirt.

**DIMENSIONS AND WEIGHTS****Overall length** 13' 10 1/2" (4230 mm)**Overall width** 5' 2 9/16" (1590 mm)**Height (unladen)** 4' 7 1/2" (1410 mm)**Wheelbase** 8' 2 3/8" (2500 mm)**Ground clearance  
(laden)** 6 5/16" (160 mm)**Front overhang** 2' 4 3/8" (720 mm)**Rear overhang** 3' 3 3/4" (1010 mm)**Front track**

BMW 1602/1802/2002

4' 4 3/8" (1330 mm)

BMW 2002 tii

4' 5 3/4" (1348 mm)

**Rear track**

BMW 1602/1802/2002

4' 4 3/8" (1330 mm)

BMW 2002 tii

4' 5 3/4" (1348 mm)

**Min. track circle dia.** 31' 6" (9.60 m)**Min. turning circle dia.** 34' 2" (10.4 m)**Vehicle weight, empty**

(ready for use with full tank)

BMW 1602/1802/2002

2073 lb (940 kg)

BMW 2002 tii

2183 lb (990 kg)

**Permitted total weight**

BMW 1602/1802/2002

2954 lb (1340 kg)

BMW 2002 tii

3065 lb (1390 kg)

**Permitted front axle load**

BMW 1602/1802/2002

1433 lb (650 kg)

BMW 2002 tii

1477 lb (670 kg)

**Permitted rear axle load**

BMW 1602/1802/2002

1587 lb (720 kg)

BMW 2002 tii

1654 lb (750 kg)

**Permitted trailer load**

without brakes

1103 lb (500 kg)

with brakes

2645 lb (1200 kg)

**with automatic transmission**

no oil cooling

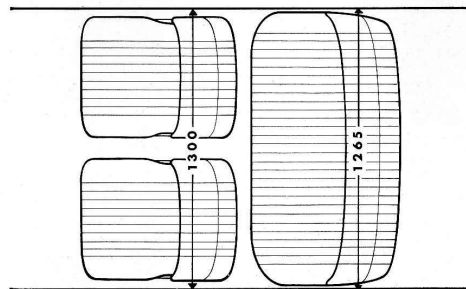
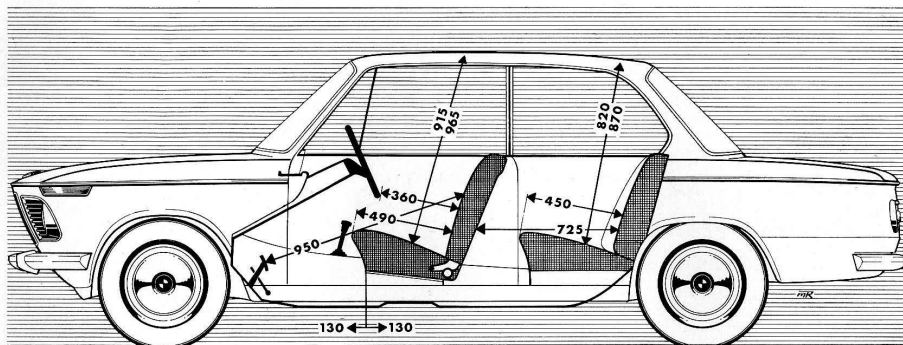
1764 lb (800 kg)

with oil cooling

2645 lb (1200 kg)

**Permitted roof load** 165 lb (75 kg)

(The vehicle's fully loaded condition must not exceed the permitted axle loads.)

**Internal dimensions (mm)**

## PERFORMANCES

	BMW 1602	BMW 1802
Maximum speed	99 mph (160 kph)	103 mph (165 kph)

## Maximum gradients

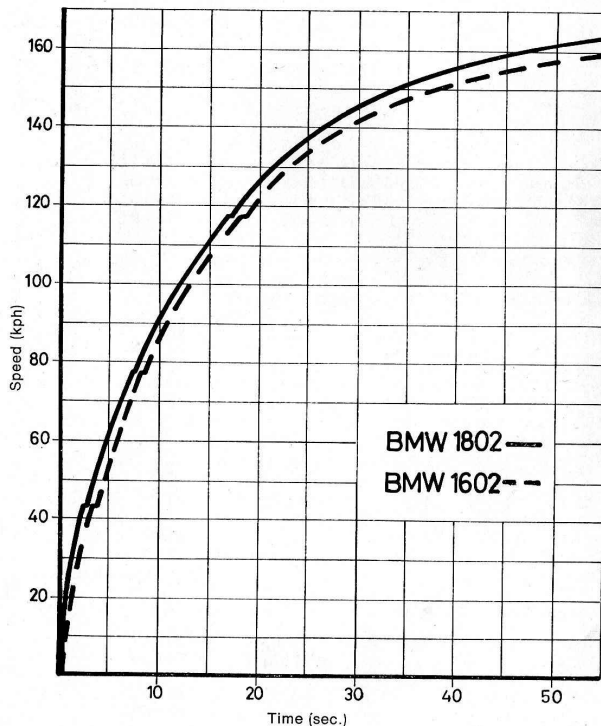
1 <sup>st</sup> gear	65 ‰ (1 in 1.5)	66 ‰ (1 in 1.3)
2 <sup>nd</sup> gear	30 ‰ (1 in 3.3)	33 ‰ (1 in 3.0)
3 <sup>rd</sup> gear	18 ‰ (1 in 5.5)	19 ‰ (1 in 5.3)
4 <sup>th</sup> gear	12 ‰ (1 in 8.3)	13 ‰ (1 in 7.9)

## Acceleration

Gears	kph	(mph)	sec.	sec.
-2	0- 50	(0-31)	4.0	3.8
-3	0- 80	(0-50)	8.5	7.7
-3	0-100	(0-62)	12.8	11.8
-3	0-120	(0-75)	18.7	17.2
-4	0-140	(0-87)	29.0	26.2
	0-160	(0-99)	55.9	46.3

Standing start kilometre	34.5	33.6
Average speed over this distance	65 mph (104 kph)	66 mph (107 kph)
Terminal speed	93 mph (148 kph)	95 mph (150.5 kph)

Acceleration through gears — BMW 1602/1802



## PERFORMANCE

	BMW 2002	BMW 2002 tii
Maximum speed	106 mph (170 kph)	118 mph (190 kph)

## Maximum gradients

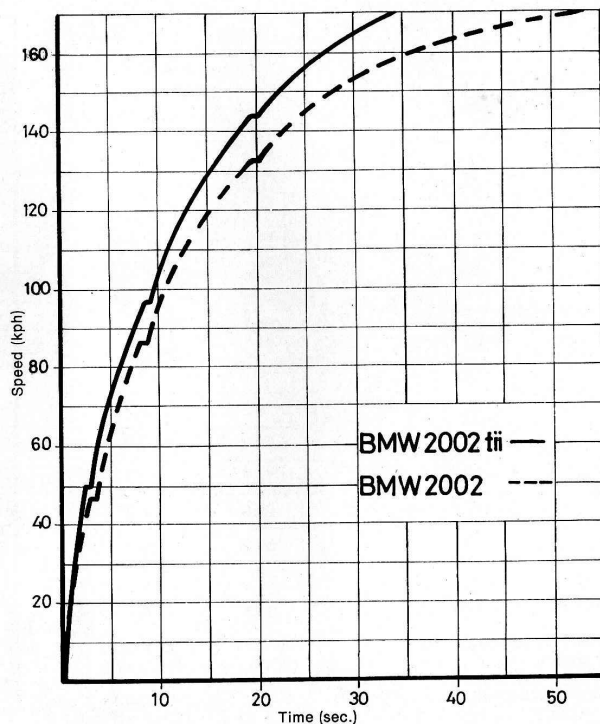
1st gear	66 % (1 in 1.3)	60 % (1 in 1.8)
2nd gear	33 % (1 in 3.0)	32 % (1 in 3.1)
3rd gear	19 % (1 in 5.3)	18 % (1 in 5.5)
4th gear	13 % (1 in 7.9)	12 % (1 in 8.3)

## Acceleration

Gears	kph	(mph)	sec.	sec.
-2	0-50	(0-31)	3.5	2.8
-2	0-80	(0-50)	7.0	6.2
-3	0-100	(0-62)	10.9	9.4
-3	0-120	(0-75)	15.4	13.1
-4	0-140	(0-87)	22.0	17.8
-4	0-160	(0-99)	36.1	26.4

Standing start kilometre	32.5	30.7
Average speed over this distance	69 mph (111 kph)	73 mph (117 kph)
Terminal speed	98 mph (159 kph)	105 mph (168 kph)

Acceleration through gears — BMW 2002/2002 tii



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

## **Engine**

Cylinder head bolts	50.6 ± 1.4 ft/lb (7 ± 0.2 mkp)
Crankshaft V-belt pulley	100 ft/lb (14 mkp)
Coolant pump V-belt pulley	28.9 ft/lb (4 mkp)
Engine mounting bracket	34.0 ft/lb (4.7 mkp)
Rubber mounting nuts	18.1 ft/lb (2.5 mkp)
Oil filter housing	21.7 ± 3.6 ft/lb (3 ± 0.5 mkp)

## **BMW 2002 tii:**

Injection valves	21.7–28.9 ft/lb (3–4 mkp)
Cap nuts on the injection valves	18.1 ft/lb (2.5 mkp)
Anti-dust cover	2.2 ft/lb (0.3 mkp)

## **Gearbox**

Engine attachment flange	18.1 ft/lb M 8 (2.5 mkp) 34 ft/lb M 10 (4.7 mkp)
--------------------------	---

## **Front axle**

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

## **Rear axle**

Cross member on underbody	32.5 ft/lb (4.5 mkp)
---------------------------	----------------------

Casing to cross member	32.5 ft/lb (4.5 mkp)
Final drive to axle carrier	65.1 ft/lb (9 mkp)
Axle carrier to body floor	86.8 ft/lb (12 mkp)
Compression strut to body floor	32.5 ft/lb (4.5 mkp)
Trailing arms on axle carrier	54.2 ft/lb (7.5 mkp)*
Shock absorber, lower end	32.5 ft/lb (4.5 mkp)*
Half shaft pick-up flange	21.7 ft/lb (3 mkp)
Half shaft at rear-axle shaft	21.7 ft/lb (3 mkp)
Universal joint shaft at gearbox take-off flange	32.5 ft/lb (4.5 mkp)
Rear axle carrier rubber mountings	32.5 ft/lb (4.5 mkp)
Rubber coupling	32.5 ft/lb (4.5 mkp)
Rear axle shaft	217.0 ± 36.2 ft/lb (30 ± 5 mkp)
Castellated nuts	32.5 ft/lb (4.5 mkp)
Axle carrier support points	

## **Steering**

Steering wheel securing nut	39.7 ± 3.6 ft/lb (5.5 ± 0.5 mkp)
Plate mounted joint	13.7 ft/lb (1.9 mkp)
Flange mounted joint	18.1 ft/lb (2.5 mkp)
Drop arm to steering box	101.3 ft/lb (14 mkp)
Tierod castellated nuts	25.3 ft/lb (3.5 mkp)
Steering box to front axle carrier	34.0 ft/lb (4.7 mkp)
Track rod clamp bolts	18.1 ft/lb (2.5 mkp)

## **Brakes**

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

## **Wheel nuts**

	57.8 ± 7.25 ft/lb (8 ± 1 mkp)
--	----------------------------------

\* Normal load: car with full tank, 2 x 143 lb (65 kg) on front seats, 1 x 143 lb (65 kg) on back seats + 65 lb (30 kg) in luggage compartment.

## Key to Lubrication Chart

### Important instruction to service stations

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

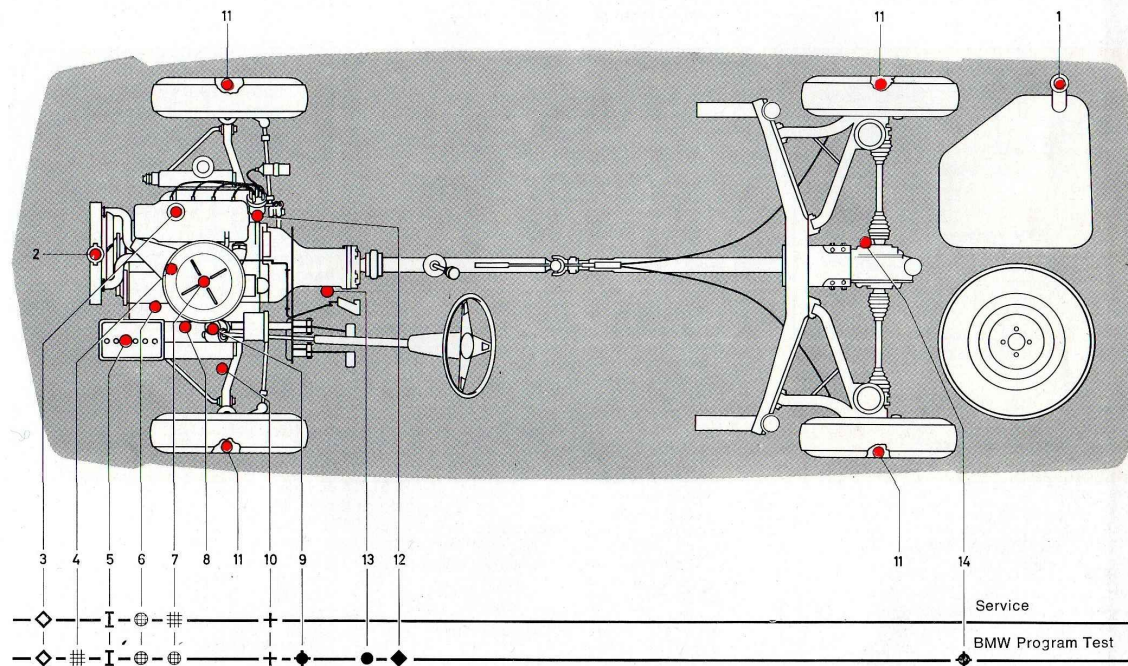
Outer extremity of body under fold directly adjacent to the reinforced points for the car's own jack.

**Warning:** If the car is jacked up under the final drive housing, place a suitable piece of packing material between the final drive and the jack lifting pad, to prevent damage to the housing.

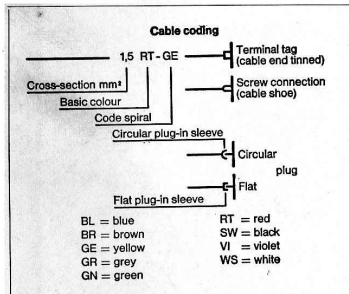
1. Fuel filler	Branded super grade fuel
2. Radiator filler (Coolant outlets are situated at the bottom left of the radiator and the bottom right of the engine block)	Further details see page 39 Check for frost at the beginning and during the cold season
3. Engine oil filler	Branded HD petrol engine oil; for oil grades see page 57 ◆ indicates oil change
4. Fuel pump fine mesh filter	⦿ indicates filter cleaning
5. Battery	I Distilled water
6. Engine oil filter	⊕ indicates filter renewal
7. Induction air filter	⦿ indicates filter cleaning ⊕ indicates filter renewal
8. Engine oil level dipstick	Check oil level regularly
9. Steering box (permanently filled)	◆ Branded hypoid gear oil SAE 90
10. Hydraulic fluid reservoir for brakes and clutch	+ ATE brake fluid "S", blue Renew brake fluid once a year
11. Wheel bearings (examine every 60000 km/40000 miles)	Shell Darina II grease with drip point 260° C (500° F)
12. Oil nipple for ignition distributor shaft (see page 60)	◆ Branded HD oil, as engine oil, and Bosch Ft 1v4 grease
13. Manual transmission (oil change every 24000 miles/ 36000 km) Automatic transmission (oil change every 24000 miles/ 36000 km)	● Branded gear oil SAE 80 (in an emergency HD-engine oil SAE 30) For oil grades, see page 108
14. Final drive	◆ Branded hypoid gear oil SAE 90, running-in grade (your BMW service station is familiar with the factory approved grades)



## Lubrication chart



# Key to electrical wiring diagram BMW 1602/1802/2002/A



Number following colour code = cable number

- 1 Turn indicator, front right
- 2 Headlamp, right, with parking light
- 3 Horn, right
- 4 Horn, left
- 5 Terminal for fog lamp relay
- 6 Headlamp, left, with parking light
- 7 Turn indicator, front left
- 8 Earth (ground)
- 9 Horn relay
- 10 Solder tag
- 11 Connection for diagnosis unit
- 12 Regulator
- 13 Battery
- 14 Terminal for fuel injection system

- 15 Generator
- 16 Starter
- 17 Connection for diagnosis unit
- 18 Distributor
- 19 Coil
- 20 Screenwasher pump
- 21 Wiper motor
- 22 Blower motor
- 23 5-pole plug for wiper motor
- 24 Radio terminal
- 25 Oil pressure sensor
- 26 Remote thermometer sensor
- 27 Automatic choke  
(only with automatic transmission)
- 28 Sensor for reversing lights with starting lock  
(only with automatic transmission)
- 29 Sensor for reversing lights
- 30 2-pole plug  
(only with automatic transmission)
- 31 Fuel pump terminal
- 32 Solder tag
- 33 Fuse box
- 34 Solder tag
- 35 Earth (ground)
- 36 Blower switch
- 37 Cigar lighter
- 38 Wiper switch
- 39 Automatic wiper/washer sensor
- 40 Stop light switch
- 41 Combination instrument

- a = dial illumination  
 b = clock  
 c = speedometer  
 d = coolant thermometer  
 e = fuel gauge  
 f = battery charge telltale (red)  
 g = oil pressure telltale (orange)  
 h = headlight main beam telltale (blue)  
 i = turn indicator telltale (green)  
 k = 12-pole socket  
 m = 3-pole socket (clock)  
 n = 3-pole socket (revolution counter)  
 o = central telltale  
 (choke, handbrake, fuel reserve)

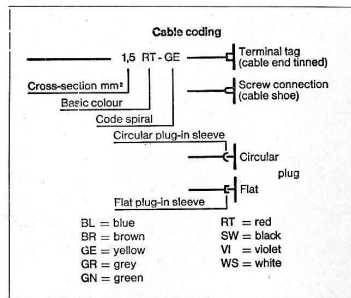
- 42 5-pole plug
  - 43 Starter relay  
(only with automatic transmission)
  - 44 Ignition/starter switch  
I = Halt; II = 0; III = Fahrt (Drive);  
IV = Start
  - 45 Main light switch
  - 46 Hazard warning flasher switch
  - 47 9-pole plug for turn indicator switch
  - 48 Turn indicator switch
  - 49 6-pole plug for dip (low beam) switch
  - 50 Horn
  - 51 Dip (low beam) switch
  - 52 Terminal for number plate light  
and foglamps
  - 53 Door operated switch, left
  - 54 Hazard warning flasher unit
  - 55 Interior light
  - 56 Terminal for heated rear window
  - 57 Terminal for lighting of automatic transmission panel
  - 58 12-pole connection for combination instrument
  - 59 Heated rear window
  - 60 Lighting of automatic transmission panel
  - 61 Fuel gauge float
  - 62 Door operated switch, right
  - 63 Rear light unit, right
- A = Reversing light  
 B = Stop light  
 C = Turn indicator  
 D = Rear light
- 64 Number plate lights
  - 65 Earth (ground)
  - 66 Rear light unit, left
- A = Reversing light  
 B = Stop light  
 C = Turn indicator  
 D = Rear light
- 67 Terminal for revolution counter
  - 68 Choke
  - 69 Handbrake switch
  - 70 Solder tag

[illegible]

[illegible]

## Key to electrical wiring diagram

### BMW 2002 tii



Number following colour code = cable number

- 1 Turn indicator, front right
- 2 Headlamp, right, with parking light
- 3 Horn, right
- 4 Horn, left
- 5 Terminal for fog lamp relay
- 6 Headlamp, left, with parking light
- 7 Turn indicator, front left
- 8 Earth (ground)
- 9 Horn relay
- 10 Solder tag
- 11 Connection for diagnosis unit
- 12 Regulator
- 13 Battery

- 14 Terminal for fuel injection system
- 15 Generator
- 16 Starter
- 17 Connection for diagnosis unit
- 18 Distributor
- 19 Coil
- 20 Screenwasher pump
- 21 Wiper motor
- 22 Blower motor
- 23 5-pole plug for wiper motor
- 24 Radio terminal
- 25 Oil pressure sensor
- 26 Remote thermometer sensor
- 27 Time switch
- 28
- 29 Sensor for reversing lights
- 30 Electromagnetic starting valve
- 31 Fuel pump terminal
- 32 Solder tag
- 33 Fuse box
- 34 Solder tag
- 35 Earth (ground)
- 36 Blower switch
- 37 Cigar lighter
- 38 Wiper switch
- 39 Automatic wiper/washer sensor
- 40 Stop light switch
- 41 Combination instrument
  - a = dial illumination
  - b = revolution counter
  - c = speedometer
  - d = coolant thermometer
  - e = fuel gauge
  - f = battery charge telltale (red)
  - g = oil pressure telltale (orange)
  - h = headlight main beam telltale (blue)
  - i = turn indicator telltale (green)
  - k = 12-pole socket
  - m = 3-pole socket (clock)
  - n = 3-pole socket (revolution counter)
  - o = central telltale (choke, handbrake, fuel reserve)
- 42 5-pole plug
- 43 Temperature time switch

- 44 Ignition/starter switch
  - I = Halt; II = 0; III = Fahrt (Drive); IV = Start
- 45 Main light switch
- 46 Hazard warning flasher switch
- 47 9-pole plug for turn indicator switch
- 48 Turn indicator switch
- 49 6-pole plug for dip (low beam) switch
- 50 Horn
- 51 Dip (low beam) switch
- 52 Terminal for number plate light and foglamps
- 53 Door operated switch, left
- 54 Hazard warning flasher unit
- 55 Interior light
- 56 Terminal for heated rear window
- 57 Terminal for lighting of automatic transmission panel
- 58 12-pole connection for combination instrument
- 59 Heated rear window
- 60 Handbrake switch
- 61 Fuel gauge float
- 62 Door operated switch, right
- 63 Rear light unit, right
  - A = Reversing light
  - B = Stop light
  - C = Turn indicator
  - D = Rear light
- 64 Number plate lights
- 65 Earth (ground)
- 66 Rear light unit, left
  - A = Reversing light
  - B = Stop light
  - C = Turn indicator
  - D = Rear light
- 67 Terminal for high performance ignition system
- 68 Fuel pump
- 69 Plug connection for fuel pump
- 70 Clock
- 71 Terminal for choke
- 72 Solder tag

**APPROVED OIL GRADES FOR AUTOMATIC TRANSMISSION****Initial or subsequent filling**

Avia	ATF 68 DEXRON Fluid	B-10915
Chevron	Automatic Transmission Fluid (DEXRON)	B-10122
ESSO	Automatic Transmission Fluid (DEXRON)	B-10103
Quaker State	DEXRON, Quadromatic ATF	B-10128
Shell	Automatic Transmission Fluid DEXRON	B-10709
Valvoline	Valvomatic ATF, Type B	B-10312

**Subsequent filling**

Amoco	ATF DEXRON	B-10595
Antar	DEXRON	B-10968
Aral	ATF gear oil (DEXRON)	B-10373
Aral	ATF 546 gear oil (DEXRON)	B-10546
Aseol	Aseol DEXRON 16-712	B-10669
BP	AUTRAN DX	B-11026
Castrol	TQ (DEXRON)	B-10658
Castrol	TQ (DEXRON)	B-10578
Castrol	TQ DEXRON	B-10476
Deutsche Renault	DEXRON Fluid Elfmatic G	B-10746
Exactol	HFL B 492	B-10492
Fina	DEXRON ATF	B-10572
Frisia	DEXRON ATF	B-10492
Fuchs	Automatic TF 25 DEXRON	B 10653
Gasolin	DEXRON gear oil	B-10290
Gasolin	DEXRON gear oil	B-10547
Gulf	Automatic Transmission Fluid (DEXRON)	B-10486
Labomatic	DEXRON	B-10647
Mobil	ATF 220 DEXRON	B-10104
Mobil	ATF 220 DEXRON	B-10467
Orvematic	ATF - DEXRON Fluid	B-10588
Oest	ATF DEXRON	B-10752
O.I.S.	Automatic Transmission Fluid DXS	B-11051
Shell	Automatic Transmission Fluid (DEXRON)	B-10492
Stinnes Fanal	ATF DEXRON	B-10755
Sunamatic	128 DEXRON Automatic Transmission Fluid	B-10107
Texaco	Texamatic Fluid 6673	B-10334
Total	DEXRON	B-10631
Veedol	ATF Special B 101 DEXRON	B-10579
Zeller and Gmelin	Divinol Fluid DEXRON B 92	B-10752

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## Notes

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## Notes

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## Notes

## At a glance

**Tyre pressures** in atm (psi) with **cold** tyres (add 0.3 atm = 4.26 psi with warm tyres):

**Radial tyres** 165 SR 13  
(BMW 1602/1802/2002)

Load	front		rear	
	atm	psi	atm	psi
up to 4 persons	1.8	26	1.8	26
5 persons and luggage	1.8	26	2.0	29

**Radial tyres** 165 HR 13 (BMW 2002 tii)

Load	front		rear	
	atm	psi	atm	psi
up to 4 persons	1.8	26	1.8	26
5 persons and luggage	1.8	26	2.0	29

Special rules apply for **competition** use.

### Capacities

Fuel tank	10.1 Imp. gal/12.1 US gal/46 litres	Branded super grade fuel
Cooling system incl. heater	1.28 Imp. gal/1.5 US gal/7 litres	For details, see page 39
Engine oil	7 Imp. pints/8.5 US pints/4 litres plus 0.44 Imp. pints/0.53 US pints/ 0.25 litres if oil filter is changed	Branded HD petrol engine oil (for oil grades, see page 57)
Manual gearbox	1.8 Imp. pints/2.1 US pints/1 litre (2.5 Imp. pints/3.0 US pints/1.4 litres) (5-speed gearbox)	Branded gearbox oil SAE 80 (or if not available, HD petrol engine oil SAE 30)
Automatic transmission	approx. 2.8 Imp. pints/3.4 US pints/ 1.6 litres, or, with oil cooler 3 Imp. pints/3.6 US pints/1.7 litres (total capacity of a new or exchange transmission when initially filled is 8.0 Imp. pints/9.5 US pints/4.5 litres, or, with oil cooler 9.2 Imp. pints/ 10.9 US pints/5.2 litres)	For oil grades, see page 108
Final drive	1.4 Imp. pints/1.7 US pints/0.8 litres	Branded running-in grade hypoid oil, SAE 90 (your BMW service station knows the approved grades)
Steering box	0.55 Imp. pints/0.64 US pints/0.3 litres (Permanently filled, with no drain plug)	Branded hypoid gear oil, SAE 90.

### Winter and spiked tyres

165 R 13 M + S (E)

Load	front		rear	
	atm	psi	atm	psi
up to 4 persons	2.0	29	2.0	29
5 persons and luggage	2.0	29	2.2	32

### Spark plugs

BMW 1602/1802/  
2002

Beru 200/14/3 A  
Bosch W 200 T 30  
Champion N 8 Y

BMW 2002 tii

Bosch WG 190 T 30

Vehicles fitted with automatic transmis-  
sion, USA and Scandinavian vehicles  
have

Bosch WG 190 T 30  
air surface gap spark plugs fitted as  
standard.

Spark plug gap:  
0.024+0.004" (0.6+0.1 mm)

**Contact breaker gap** 0.016" (0.4 mm)

### Dwell angle

BMW 1602/1802 61°–66°  
BMW 2002/tii 59°–65°

### Ignition timing

BMW 1602/1802/2002  
25° bTDC at 1400 rpm  
BMW 2002 tii  
25° bTDC at 2400 rpm

**Valve clearance** (engine cold):

Inlet and exhaust:  
0.006–0.008" (0.15–0.20 mm)

### V-belt

alternatively:  
9.1 x 870  
9.5 x 875 LA DIN 7753

**Bayerische Motoren Werke AG München**